CITY OF REDMOND

CITY HALL
411 SW 9th STREET
REDMOND, OR 97756
541.923.7710
FAX: 541.548.0706
info@redmondoregon.gov
redmondoregon.gov

CITY COUNCIL

December 8, 2020
Council Chambers • 411 SW 9th Street

COUNCIL MEMBERS

George Endicott
Mayor

Jay Patrick
Council President

Jon Bullock
Councilor

Krisanna Clark-Endicott
Councilor

Camden King
Councilor

Ginny McPherson
Councilor

Vacant
Councilor

DECEMBER 8, 2020 REGULAR MEETING AGENDA 6:00 PM

I. CALL TO ORDER / ESTABLISH A QUORUM

II. BLESSING - Pastor Mike Ferry, Cornerstone Christian Fellowship

III. PLEDGE OF ALLEGIANCE

IV. COMMENTS FROM CITIZENS AT THE MEETING

V. PRESENTATIONS

A. Current Events

B. Redmond Committee for Art in Public Places - Redmond Tunnel Street Art Pilot Project

VI. PROCLAMATIONS

A. Declaring Results of the November 3, 2020, General Election

VII. BID AWARDS / BID REJECTIONS

A. Financial Advisor Services RFP - Piper Sandler: Fee for Service

VIII. CONTRACT REVIEW BOARD

A. Audio-Visual Upgrade to Redmond City Hall Civic Rooms 207 & 208: $64,139.38

IX. PUBLIC HEARINGS

A. Ord. 2020-18 - An ordinance updating the Redmond Transportation System Plan, inclusive of the 2018 Airport Master Plan, making it the transportation element of the Redmond Comprehensive Plan.

B. Ordinance #2020-20 - An ordinance adopting a new Redmond Comprehensive Plan 2040, including a Zone Map and Economic Opportunities Analysis.

X. ORDINANCES

In accordance with the City of Redmond Charter, an ordinance takes effect 30 days after its enactment except when a later effective date is specified in the ordinance; when the ordinance contains an emergency clause, it takes effective immediately.

A. Ord #2020-19 - An ordinance of the City of Redmond approving the establishment of the South 97 Urban Renewal District and directing that Notice of Approval be published.

XI. ACTION ITEMS

A. Res. #2020-22 - A resolution of the City of Redmond to make Budget Adjustments.

B. Resolution #2020-23 - A resolution setting fees and charges imposed by the City of Redmond.

XII. MAYOR'S COMMENTS

A. Airport Committee - Reappointment of Kelly Coffelt as the Crook County Representative, term expiring December 31, 2024, and appointment of Evan Eby as the Youth Ex-Officio, term expiring December 31, 2021.

B. Bicycle & Pedestrian Advisory Committee - Reappointment of Ken Piarulli and appointment of Cathy Drzyzgula, Jennifer Gottfried, and Diane Hower, terms expiring December 31, 2024, and appointment of Alex Lunny as the Youth Ex-Officio, term expiring December 31, 2021.

C. Budget Committee - Appointment of Troy Baker, Phillip Meagher and Ron Osmundson, terms expiring December 31, 2024.

D. Downtown Urban Renewal Advisory Committee - Reappointment of Cheriee Perrine and appointment of Tobias Colvin and Monica Huey, terms expiring December 31, 2024, and appointment of Luke Smith as the Youth Ex-Officio, term expiring June 30, 2021.

E. Historic Landmarks Commission - Reappointment of Trish Pinkerton and appointment of Chrisie Lockwood, terms expiring December 31, 2024.

F. Housing & Community Development Committee - Reappointment of Heather DeWolf, Clair Sagiv, and Whitney Swander and appointment of Shannon Dills and Ron Osmundson, terms expiring December 31, 2024.

G. Juniper Golf Committee - Appointment of Wells Green and Jim McDonald, terms expiring December 31, 2024.

H. Nuisance Appeals Board - Appointment of Adam DuQuette as the Full Member and Cameo Chambers as the Alternate Member, terms expiring December 31, 2022.

I. Parks Committee - Reappointment of Alan Ewert and appointment of Alysa Martinez, terms expiring December 31, 2024.

J. Redmond Committee for Art in Public Places - Appointment of Juniper Maurer as the Youth Ex-Officio, term expiring December 31, 2021.

K. Urban Area Planning Commission - Reappointment of Michael Kusinska and Cat Zwicker and appointment of Laura Garcia and Ron Osmundson, terms expiring December 31, 2024.

XIII. COUNCIL COMMENTS

XIV. CITY MANAGER COMMENTS

XV. ADDITIONAL COMMENTS FROM CITIZENS AT THE MEETING

XVI. ADJOURN

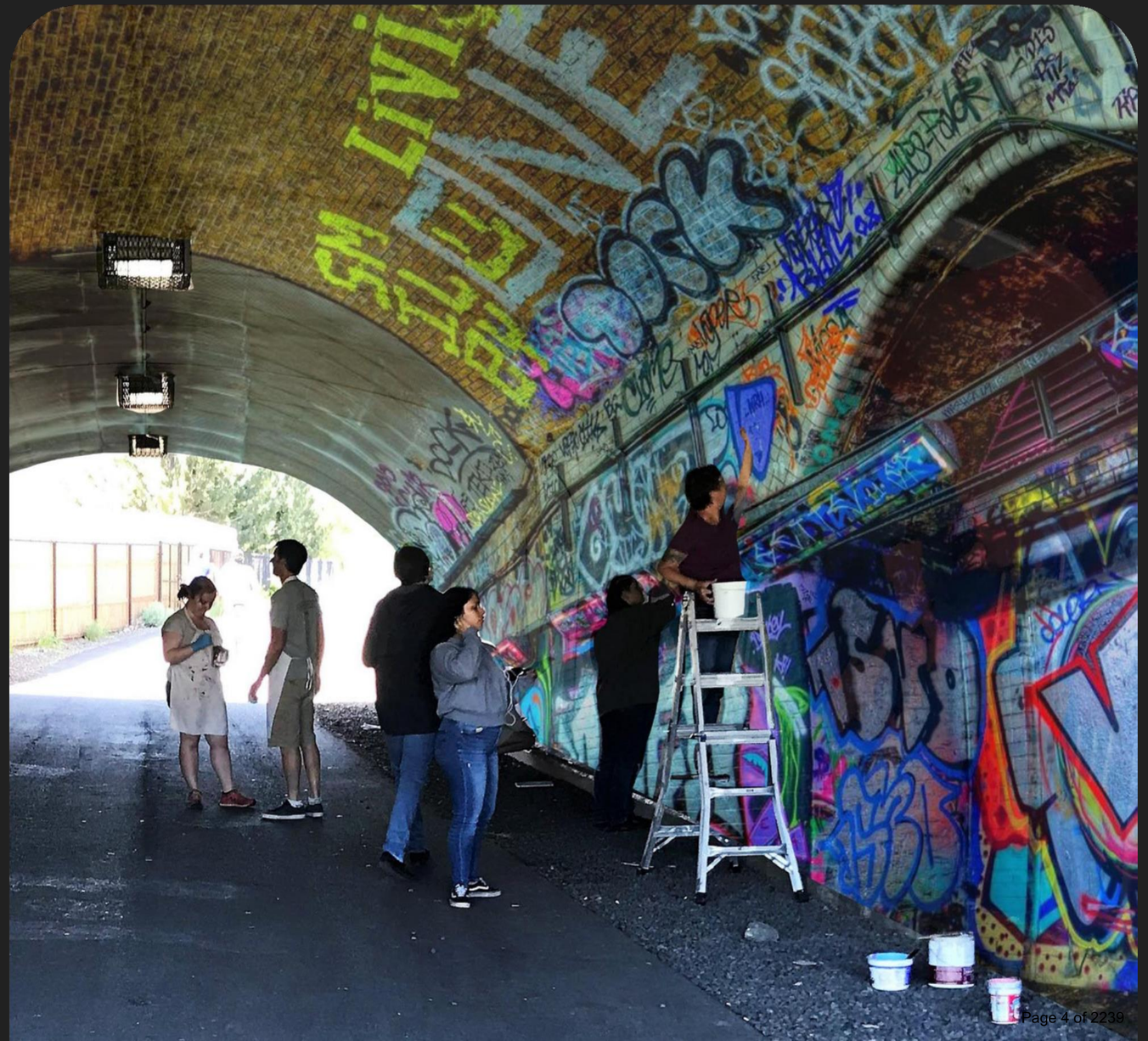
Regular Council meetings are broadcast live on COTV11 – BendBroadband Channel 11 beginning at 6:00 p.m. on the 2nd and 4th Tuesdays of each month. Rebroadcasts are scheduled for the non-meeting Tuesdays at 6:00 p.m.
The City of Redmond encourages all citizens to participate in its programs and activities. This meeting location is accessible to people with disabilities. Requests for accommodation may include sign language interpreter service, assistive listening devices, materials in an alternate format or any other accommodation. If any accommodations are needed, please contact the ADA Coordinator at 541-504-3036 or access@redmondoregon.gov. Requests should be made as soon as possible, but at least 3 business days prior to the scheduled meeting.
The City of Redmond does not discriminate on the basis of disability status in the admission or access to, or treatment, or employment in, its programs or activities

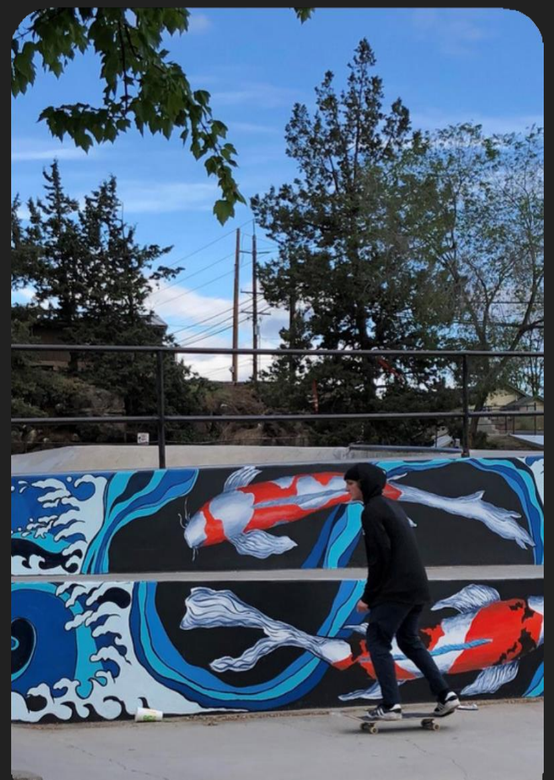
01

REDMOND TUNNEL STREET ART PROJECT

REDMOND-TSAP

City of Redmond, Oregon





Student RCAPP Projects

2020 Summer Projects

Even with COVID-19, we safely organized and managed two student art projects this summer. The Skate Park and Pump Track Projects are a prime example of the talented youth we have in this community. We want to continue this into the Tunnel Project.

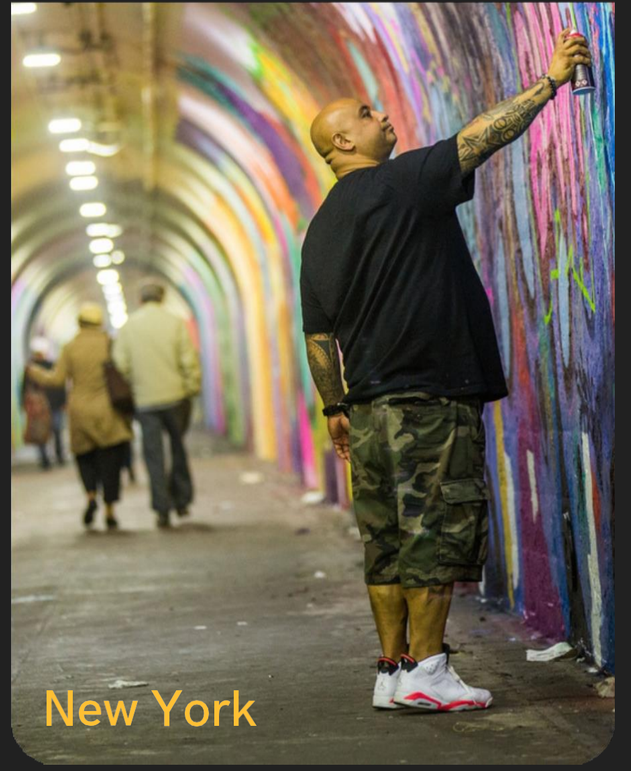
Redmond Skate Park

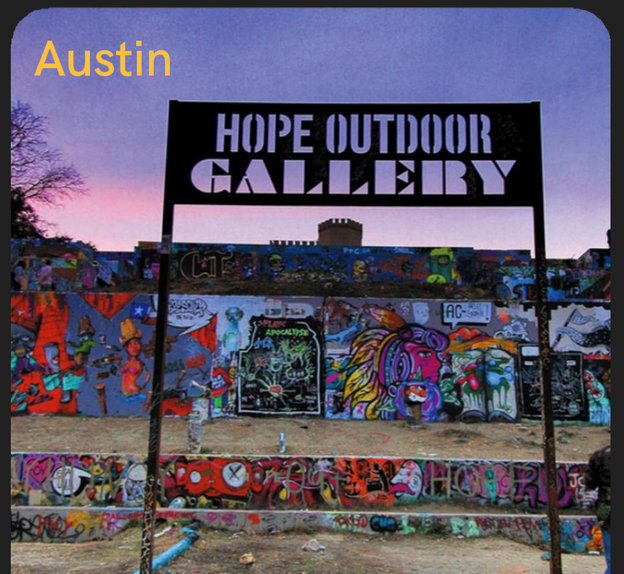
Homestead Pump Track

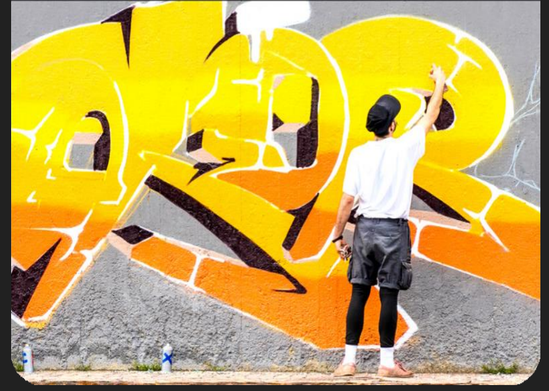
02

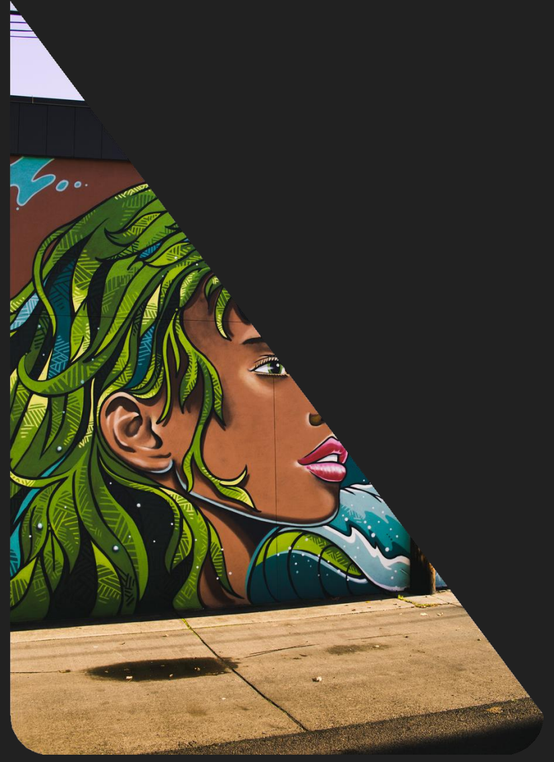
Examples of graffiti and street art projects in other cities around the world.

The goal of this project would be to beautify Redmond with street art. The Redmond Tunnel is the ideal location for this project. The tunnel is not seen by passing motorists and is already a "tagging" location. The last art mural painted by RPA students suffered significant tagging. Our hopes is Redmond-TSAP will be overpowered by street art. Also artists going into the site realize that their work could be painted over at any time by other artists which is the risk of street art but part of the joy of an ever changing art piece. We hope people will be drawn to the tunnel to see new art pieces throughout the process.









03

Terminology

What is the difference?

Tagging:

Tagging is the most basic and the most prevalent form of graffiti. Tagging is usually written with marker or spray paint in one color. It is a stylized personal signature and contains graffiti writer's name, also known as a moniker. Graffiti writers often tag their pieces, following the practice of traditional artists who sign their artwork. The word 'tag' is also very widely used as a verb meaning 'to sign'.

Graffiti:

Graffiti is writing or drawings made on a wall or other surface within public view. Graffiti ranges from simple written words to elaborate wall paintings, and has existed since ancient times, with examples dating back to ancient Egypt.

Street Art:

Unofficial and independent visual art created in public locations for public visibility. Coming from the context of urban spaces, street art now lives in the cultural spaces of galleries, virtual communities, public discourses and recently it has become an object of appropriation by the popular culture and the mainstream symbolism of contemporaneity.

05

From Phoenix to Melbourne people love to interact with street art. RCAPP will be encouraging artist to paint interactive art where people could take photos and hashtag #RedmondTSAP on social media platforms ultimately bringing more artists to Redmond.

Signage at both ends of the tunnel

06

We plan to create 2 signs for both ends of the tunnel.

The Redmond Tunnel Street Art Pilot Project will not allow for anything deemed inappropriate. All will be painted over by the Parks Department.

Our Next Steps

07

RCAPP

Organize students, professional artists, and other various local artists to paint the initial batch of street art creations.

Parks Dept.

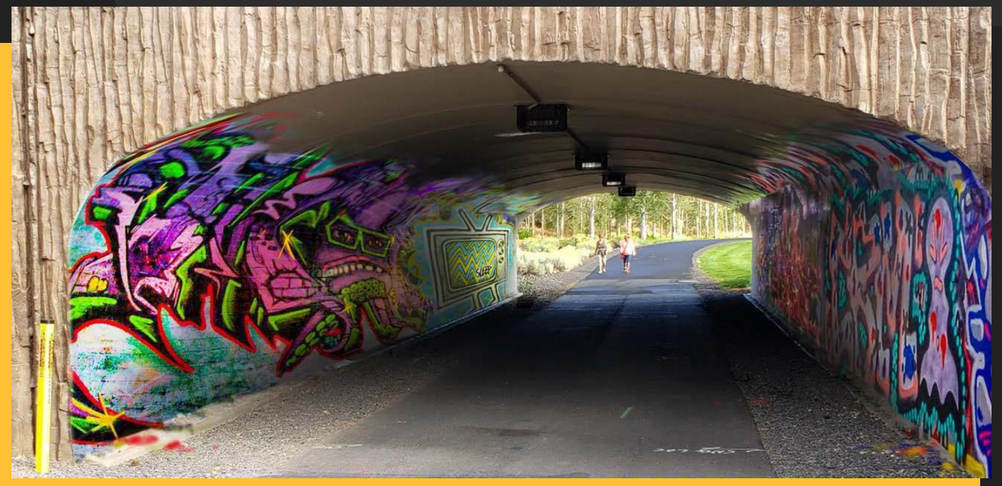
Monitor the site and continue to cover up any inappropriate material daily as they already enforce.

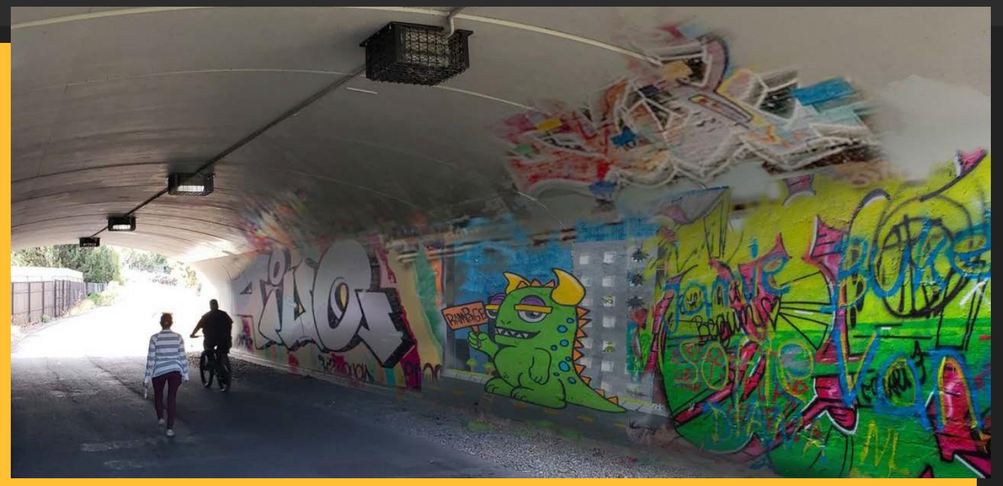
Trash Cans

We would like trash cans available at the site to dispose of spent paint cans and other trash.

Pilot Program

RCAPP will initiate and monitor one year pilot program to see how youth and adults stay involved in the program.





Thank you - Redmond Committee for Art in Public Places

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STAFF REPORT

DATE: December 8, 2020
TO: Redmond City Council
THROUGH: Keith Witcosky, City Manager
FROM: Kelly Morse, City Recorder
SUBJECT: Declaring Results of the November 3, 2020, General Election

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Addresses Council Goal:
N/A

Report in Brief:
Per Oregon Revised Statute (ORS) Chapter 254 - Conduct of Elections requires the City Elections Official to determine election results based on the Abstract of Votes received from the Deschutes County Clerk. The votes have been canvassed and a proclamation has been prepared declaring the results.

Background:
At the General Election held on November 3, 2020, qualified voters of the City of Redmond considered candidates for the position of Mayor and City Council. A canvass of votes has determined that George Endicott has been elected to the position of Mayor and Ed Fitch, Shannon Wedding, and Clifford B. Evelyn Sr. have been elected to the position of City Councilor.

Discussion:
N/A

Fiscal Impact:
N/A

Alternative Courses of Action:
1. Accept the Proclamation.
2. Do not accept the Proclamation.
3. Request more information.

Recommendation / Suggested Motion:
“I move to accept the proclamation declaring the results of the November 3, 2020, General Election.”

City of Redmond
PROCLAMATION

A PROCLAMATION OF THE CITY OF REDMOND DECLARING THE RESULTS OF THE NOVEMBER 3, 2020, GENERAL ELECTION.

WHEREAS, a General Election was held on the 3rd day of November 2020, in the City of Redmond, Deschutes County, Oregon; and

WHEREAS, eligible voters of the City of Redmond considered the election of City Officers; and

WHEREAS, the Abstract of Votes (Exhibit A), prepared and certified by Nancy Blankenship, County Clerk for the County of Deschutes, Oregon, has been filed in the office of the City of Redmond's Chief Elections Official; and

WHEREAS, the City of Redmond's Chief Elections Official, being the proper official to do so, has canvassed the votes for said election and finds that they are as follows:

MAYOR

George Endicott	8,780
Tanner Robertson	6,997
Charles Baer	679
Write-Ins	89
Total Votes Cast:	**16,545**

COUNCIL

Ed Fitch	6,861
Shannon Wedding	6,848
Clifford B. Evelyn Sr.	6,637
Camden King	5,881
Ronald H. Osmundson	4,717
Don Crouch	3,703
David Wegener	2,628
Michael A. Kusinska	2,291
Albert Calderon	1,298
Write-Ins	177
Write-Ins	73
Write-Ins	43
Total Votes Cast:	**41,157**

NOW, THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF REDMOND, OREGON, AS FOLLOWS:

SECTION ONE: I, George Endicott, Mayor of the City of Redmond, do hereby proclaim and declare that pursuant to the foregoing election results it is hereby found, determined, and declared that the following are the official results of the General Election held on November 3, 2020:

> **GEORGE ENDICOTT** was duly elected **MAYOR** for a two-year term beginning January 1, 2021, and ending December 31, 2022.
>
> **ED FITCH** was duly elected **COUNCILOR** for a four-year term beginning January 1, 2021, and ending December 31, 2024.
>
> **SHANNON WEDDING** was duly elected **COUNCILOR** for a four-year term beginning January 1, 2021, and ending December 31, 2024.
>
> **CLIFFORD B. EVELYN SR.** was duly elected **COUNCILOR** for a four-year term beginning January 1, 2021, and ending December 31, 2024.

SECTION TWO: The City of Redmond's Chief Elections Official is hereby ordered and directed to issue Certificates of Election to the persons declared in Section One above within thirty (30) days after passage of this Proclamation.

APPROVED by the City Council and **SIGNED** by the Mayor this 8th day of December 2020.

The City of Redmond, Oregon

_____
George Endicott, Mayor

ATTEST:

_____
Kelly Morse, City Recorder

Statement of Votes Cast by Contests, Geography by Choice
Deschutes County, November, 2020 General Election,Final Official Results
All Precincts, All Districts, All ScanStations, All Contests, All Boxes
Total Ballots Cast: 126550, Registered Voters: 150696, Overall Turnout: 83.98%
50 precincts reported out of 50 total

City of Redmond, Mayor (Vote for 1)

Precinct	Ballots Cast	Reg. Voters	Total Votes	Charles Baer		Tanner Robertson		George Endicott		Write-in	
Precinct 17	4093	5724	3691	215	5.82%	1584	42.92%	1867	50.58%	25	0.68%
Precinct 28	5505	6960	5005	191	3.82%	2185	43.66%	2609	52.13%	20	0.40%
Precinct 29	3712	4625	3445	132	3.83%	1435	41.65%	1862	54.05%	16	0.46%
Precinct 36	4791	5778	4404	141	3.20%	1793	40.71%	2442	55.45%	28	0.64%
Total	18101	23087	16545	679	4.10%	6997	42.29%	8780	53.07%	89	0.54%

City of Redmond, Mayor (Vote for 1)

Precinct	Ballots Cast	Reg. Voters	Total Votes	Over Votes	Under Votes
Precinct 17	4093	5724	3691	1	401
Precinct 28	5505	6960	5005	0	500
Precinct 29	3712	4625	3445	0	267
Precinct 36	4791	5778	4404	1	386
Total	18101	23087	16545	2	1554

I, Nancy Blankenship, Deschutes County Clerk, do hereby certify that the votes recorded on this report correctly summarize the tally of votes cast at the November 3, 2020 General Election.

Dated November 20, 2020

Nancy Blankenship
Deschutes County Clerk

City of Redmond, City Council (Vote for 3)

Precinct	Ballots Cast	Reg. Voters	Total Votes	David Wegener		Shannon Wedding		Ed Fitch		Albert Calderon	
Precinct 17	4093	5724	9081	596	6.56%	1402	15.44%	1501	16.53%	331	3.64%
Precinct 28	5505	6960	12484	801	6.42%	2110	16.90%	2046	16.39%	389	3.12%
Precinct 29	3712	4625	8549	562	6.57%	1454	17.01%	1461	17.09%	291	3.40%
Precinct 36	4791	5778	11043	669	6.06%	1882	17.04%	1853	16.78%	287	2.60%
Total	18101	23087	41157	2628	6.39%	6848	16.64%	6861	16.67%	1298	3.15%

City of Redmond, City Council (Vote for 3)

Precinct	Ballots Cast	Reg. Voters	Total Votes	Don Crouch		Camden King		Michael A Kusinska		Clifford B Evelyn Sr	
Precinct 17	4093	5724	9081	883	9.72%	1324	14.58%	494	5.44%	1456	16.03%
Precinct 28	5505	6960	12484	1100	8.81%	1756	14.07%	708	5.67%	2055	16.46%
Precinct 29	3712	4625	8549	757	8.85%	1179	13.79%	499	5.84%	1266	14.81%
Precinct 36	4791	5778	11043	963	8.72%	1622	14.69%	590	5.34%	1860	16.84%
Total	18101	23087	41157	3703	9.00%	5881	14.29%	2291	5.57%	6637	16.13%

City of Redmond, City Council (Vote for 3)

Precinct	Ballots Cast	Reg. Voters	Total Votes	Ronald H Osmundson		Write-in		Write-in		Write-in	
Precinct 17	4093	5724	9081	1014	11.17%	47	0.52%	21	0.23%	12	0.13%
Precinct 28	5505	6960	12484	1445	11.57%	50	0.40%	16	0.13%	8	0.06%
Precinct 29	3712	4625	8549	1023	11.97%	37	0.43%	14	0.16%	6	0.07%
Precinct 36	4791	5778	11043	1235	11.18%	43	0.39%	22	0.20%	17	0.15%
Total	18101	23087	41157	4717	11.46%	177	0.43%	73	0.18%	43	0.10%

City of Redmond, City Council (Vote for 3)

Precinct	Ballots Cast	Reg. Voters	Total Votes	Over Votes	Under Votes
Precinct 17	4093	5724	9081	3	3195
Precinct 28	5505	6960	12484	21	4010
Precinct 29	3712	4625	8549	12	2575
Precinct 36	4791	5778	11043	6	3324
Total	18101	23087	41157	42	13104

I, Nancy Blankenship, Deschutes County Clerk, do hereby certify that the votes recorded on this report correctly summarize the tally of votes cast at the November 3, 2020 General Election.

Dated November 20, 2020

Nancy Blankenship
Deschutes County Clerk

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STAFF REPORT

DATE: December 8, 2020
TO: Redmond City Council
THROUGH: Keith Witcosky, City Manager
FROM: Jason Neff, Chief Financial Officer
SUBJECT: Financial Advisor Services RFP - Piper Sandler: Fee for Service

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Addresses Council Goal:
1. Sustain Operations
3. Preserve and Enhance the City's Infrastructure
4. Economic Development
5. Redmond Airport / Roberts Field

Report in Brief:
The action requests City Council authorization to enter into a three-year contract with Piper Sandler for financial advisor services, with two optional one-year extensions (City's option).

Background:
The City of Redmond has used a third party financial advisor for the past five years. The City uses a financial advisor for several reasons:

- Federal law requires a formal separation between Underwriters and Financial Advisors to avoid potential conflicts of interests during the debt issuance process. This separation is also noted as a best practice by the Government Finance Officers Association (GFOA) to best obtain independent and conflict-free advice when undertaking debt financing.
- Having a Financial Advisor is strategically important. The City's list of growth projects is steady, which requires complex financial analysis and structuring. A third-party advisor who has years of experience in municipal finance reduces risks and provides important expertise with regards to analytical support, review and recommendations.

Services associated with this contract include:

- Recommend financing options (size, timing, security, maturity schedules and marketing);
- Review debt structure for compliance with local, state and federal regulations;
- Preparation of official statements in accordance with disclosure guidelines;
- Recommend competitive or negotiated debt issuance sales and participation in the negotiation of price and terms for negotiated sales;
- Coordinate the delivery of bonds, and interact with Bond Counsel and rating agencies;
- Recommend acceptance or rejection of underwriting bids;
- Other related financial consulting services as needed.

The City may also get assistance with:

- Support, review, advice and recommendations on financial feasibility models and/or studies;
- Support, research and review of financial policies, practices and/or goals.

Discussion:

In October 2020, staff solicited proposals for a Financial Advisor. Four responses were received:

- RockFleet
- DA Davidson
- Piper Sandler
- PFM

Proposals were evaluated on seven different categories: Experience, financial innovation/problem solving, financial planning advice, financial feasibility support, financial policy support, key personnel/structure and fee structure.

Piper Sandler was ranked 1st or 2nd in all categories. Piper Sandler was ranked 1st for its fee structure. The two highest RFP scores moved on to a final interview where Piper Sandler unanimously scored highest.

In selecting Piper Sandler, the City will retain Lauren MacMillan as its primary advisor/project manager. Lauren has more than 14 years of experience as a financial advisor and underwriter. Current Oregon clients include the City of Hillsboro, City of Salem, City of Gresham, Bend-La Pine School District and Portland Public Schools.

The City will also retain Dick Schober who has more than 31 years of experience as a financial advisor and underwriter and has extensive experience with airports including currently the financial advisor to Seattle-Tacoma International Airport and Bellingham International Airport.

Piper Sandler has experience with the City of Redmond; most recently they were the underwriter for the 2019 Debt Issuance for Water and Airport projects. Piper Sandler is one of Oregon's largest financial advisors. Over the past decade Piper Sandler has been the financial advisor on 116 debt transactions which equated to about $5.8 billion in debt issuances.

Fiscal Impact:

Proposed fees from Piper Sandler is highly dependent on the debt issuances pursued by the City over the five-year period. The typical Financial Advisory fee associated with a debt issuance is about 0.1%-0.3% of the total debt issued. For example, when the City issued $40 million of debt in 2019 the financial advisor fee was $44k. Below is a summary of Piper Sandler's fees associated with debt issuances:

Security	Base Fee	Plus Per $1,000
General Obligation (GO) or Full Faith & Credit (FFC)	$15,000	$0.50
Revenue Borrowing	$20,000	$0.75

Example Fees

GO/FFCO Issue			Revenue Borrowing		
Par Amount	Fee	Fee/$1,000	Par Amount	Fee	Fee/$1,000
$10,000,000	$20,000	$2.00	$10,000,000	$27,500	$2.75
$20,000,000	$25,000	$1.25	$20,000,000	$35,000	$1.75
$30,000,000	$30,000	$1.00	$30,000,000	$42,500	$1.42

Non-debt issuance fees are anticipated to be $0 - $10,000 annually ($0 in FY 2020/21 budget) depending on the size and scope of specific projects.

Alternative Courses of Action:

1. Award Financial Advisor Services contract to Piper Sandler
2. Reject all proposals.
3. Request additional information.

Recommendation / Suggested Motion:

"I move to award the Financial Advisor Services RFP to Piper Sandler and authorize the City Manager to sign a three-year contract with two optional one-year extensions."

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STAFF REPORT

DATE: December 8, 2020
TO: Redmond City Council
THROUGH: Keith Witcosky, City Manager
FROM: Heather Cassaro, Communications Director
SUBJECT: Audio-Visual Upgrade to Redmond City Hall Civic Rooms 207 & 208: $64,139.38

Addresses Council Goal:
1A. SUSTAIN OPERATIONS: Provide critical and necessary services for the entire City.

1B-iv. SUSTAIN OPERATIONS: Seek and achieve efficiencies through the acquisition and implementation of new technologies.

Report in Brief:
This item requests City Council adopt Sole Source findings and approve a $64,139.38 contract with Delta AV to provide engineering, design and construction services to upgrade the existing audio-visual system in the Redmond City Hall Civic Rooms 207-208.

Background:
As the City's strives to strengthen citizen confidence in government, increase openness and accessibility to information, and invite active community engagement in the development of public policy; there is a growing need to upgrade the City Hall audio-visual system. Currently the only meetings the City of Redmond films and records are City Council meetings held in the Council Chambers. By leveraging existing technology and upgrading the current audio-visual system staff will be better equipped to provide citizens access to other public meetings such as Open Houses, Budget and Committee meetings.

In 2016, the reconstruction of the current Redmond City Hall building included plans for an audio-visual communication system with the capability to film and record meetings in Civic Rooms 207 and 208 (see attached proposal dated 8/16/2016). These features were cut due to budget constraints and instead infrastructure was installed to accommodate future system expansion and integration of burgeoning technologies.

The COVID-19 pandemic has limited public access to city-owned buildings, heightening the need for increased meeting accessibility through technology. The pandemic has required more creativity about how to connect Council deliberations with citizen participation.

Discussion:
Delta AV engineered, designed, and built the existing audio-visual system in Redmond City Hall. The City has a maintenance contract with Delta AV to remotely monitor, troubleshoot, and maintain the system. Having continuity with Delta AV from the initial engineering phase to the maintenance phase has been paramount to the system's functionality, reliability and responsiveness.

The installed audio-visual systems are connected to an isolated network that is part of Delta AV's proprietary remote monitoring solution. This allows them to proactively monitor and remotely resolve any problems that occur. For security reasons, access to this network is carefully controlled and only accessible by Delta AV technicians. The proposed upgrade would integrate with this existing network and infrastructure to maximize system efficiency and requires contracting with Delta AV (see attached Sole Source Findings).

Civic Rooms 207 and 208 are the largest meeting spaces at City Hall. Upgrading their audio-visual functionality would allow broadcasting of the limited in-person meetings, while observing State of Oregon COVID-19 guidelines and spacing requirements, not otherwise possible. This project is eligible Federal Coronavirus Relief Funds (CRF).

Design and construction services are slated to be complete by December 30, 2020. Training and additional programming will be completed in January 2021.

Fiscal Impact:

Funding for the audio-visual upgrade to Civic Rooms 207 and 208 project has no direct fiscal impact to the City. The $64,139.38 contract will be covered by CRF. The FY 2020/21 budget will need to be adjusted to recognize the CRF resource and the corresponding expense.

Alternative Courses of Action:

1. Adoption of the Sole Source findings for Delta AV and approval of the $64,139.38 contract with Delta AV to provide engineering, design and construction services to upgrade the existing audio-visual system in Redmond City Hall, Civic Rooms 207 and 208.
2. Do not approve.
3. Take no Action and Request more information.

Recommendation / Suggested Motion:

“I move to adopt the Sole Source findings for Delta AV and approve the $64,139.38 contract with Delta AV to provide engineering, design and construction services to upgrade the existing audio-visual system in Redmond City Hall Civic Rooms 207 and 208."

AV INTEGRATION PROPOSAL

TO: **Matt Hayes**
City of Redmond

RE: **AV System Upgrade Rev 1**

DATE: **Nov 13, 2020**

PROJECT SUMMARY

An upgrade has been requested to the public meeting spaces. This upgrade consists of adding cameras to both rooms for recording and streaming and adding microphones for recording, streaming and voice amplification.

AV SYSTEMS NARRATIVE:

Public Meeting Space

The video system will be upgraded to include one PTZ Optics camera in Room 207 and one in Room 208. These cameras will be routed through a seamless switcher and fed to the existing Extron recorder. Switching and control of these cameras will be through a new portable 10" touchpanel identical to the one used in the council chambers. The touchpanel will allow pan-tilt-zoom movement of the camera as well as the same picture-in-picture capabilities of the recording system in the council chambers.

Shure DC 6120 P Microphone

The audio system in Room 208 will be expanded with a Shure Discussion System identical to the one currently installed in the council chambers. This system can be easily setup and torn down as all microphones connect daisy-chained by Cat6 patch cables and connect to the AV system by one Cat6 connection in the floor box in the front of Room 208. These microphones will feed audio to the recorder as well as the overhead speakers for voice amplification. Seven microphones are provided in this quote, but more can be added by purchasing additional Shure DC 6120 P microphone units.

In addition to the Shure microphone system, four Shure handheld wireless mics will be provided for audience participation or general use. These microphones are rechargeable via a provided Shure smart recharging base.

Design/ Documentation:

Delta AV will develop the shop drawings as necessary for construction coordination. This will include line diagrams of the system. Also included will be rack elevations, monitor mount details,

lectern details and plate details as required. Shop Drawings and material cut sheets will be submitted for approval.

Provision/Installation:
Delta will provide all materials as noted for a complete, turnkey, operational system. This will include all installation services and materials including cable, mounting materials and structural support for projectors, devices, programming, connection panels etc. Installation will also include owner provided devices as noted.

Commissioning / Programming / Testing / Support:
Delta will provide the necessary control and audio processor programming services for the system. Prior to installation, a programming meeting will be held to review the programming scope. After commissioning, a Delta Representative will demonstrate the system and its complete functionality to for final sign off. After completion of the project, as-built documentation, O&M Manuals, and soft copies of all DSP and control programs developed for the project will be turned over to the client.

These upgrades will be incorporated into the existing Delta AV Remote Monitoring/Management. The additions to this system will be covered by a 2 year warranty.

Pricing:

Public Spaces TOTAL EQUIPMENT	$ 29,198.96
Public Spaces TOTAL LABOR	$ 27,259.26
Public Spaces TOTAL INCIDENTALS	$ 7,681.16
Public Spaces TOTALS	$ 64,139.38

Project Total: $64,139.38

Notes & Conditions:

1. Quote is good for 60 days.
2. NO conduit is included in the price quoted. It is assumed that conduit will be supplied between the rack and remote locations such as the speaker system or monitors.
3. Terms are net 30.
4. It is assumed all work will take place during typical weekday construction hours.
5. It may take 2-4 weeks to receive equipment after receipt of purchase order.
6. Power and network are installed by others.
7. Engineering on this project will take approximately 1 week to develop drawings.

Thank You.
DELTA AV SYSTEMS

Delta AV Systems
2450 NW Eleven Mile Ave.
Gresham OR 97030
503.907.0137

John Shaferly
Technical Designer

Delta AV Systems
2450 NW Eleven Mile Ave.
Gresham OR 97030
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REDMOND OREGON

CITY HALL CMC CENTER

437 SOUTHWEST 9TH STREET

REDMOND, OREGON 97756

AUDIO VISUAL COMMUNICATION SYSTEMS

PREPARED BY JEREMY PHILLIPS, DELTA SYSTEMS INTEGRATION

08/16/2016

Introduction:
Herein is a system design and integration proposal for the audio visual systems integration at Redmond City Hall in Redmond, Oregon. The outlined scope of work is a result of vetting previously prepared documents, numerous meetings and discussions, the functional needs and requirements, and the current project buildout in progress.

The systems are designed for consistent and reliable operation with simple and intuitive user interfaces. With the system functionality, reliability, and user friendly interfaces paramount in the design, efficiencies and cost remain key factors. Economical solutions are employed, while leaving avenues for future expansion and integration of burgeoning technologies.

This design and proposal represent the culmination of all the indicated requirements, functionality, and aspects of the project known to date. The integration proposal is inclusive of administration and project management, final engineering and documentation, equipment and materials, installation, programming, and commissioning labor. Training is also included for key personnel. The system is warrantied for a period of one year, and the workmanship is warrantied for the life of the system.

Summary:
Audio visual systems are installed in several locations within the facility. The primary systems and main equipment rack are located in the Council Chambers and adjoining Media Room. Ancillary systems are installed in the Executive Conference Room and five Small Conference Rooms. Additionally, the Public Meeting Rooms are a dividable/combinable space for flexibility.

It is assumed that all local area network connections are provided by others. All necessary conduit and raceways, and line voltage electrical work is assumed to be provided by the electrical contractor. Any structural backing needed for display or equipment mounting is assumed to be provided by the general contractor. Projection screens are furnished by Delta AV to be installed by the general contractor and connected to power by the electrical contractor; Delta AV will complete the low voltage control connections.

Council Chambers:
The Council Chamber is the most complex system with many capabilities. The adjacent Media Room houses the main equipment rack.

- An 8200 lumen HD video projector is installed at the ceiling to show onto a 8’ x 5’ screen.
    - The screen is located behind the Dais and council members. It is primarily for audience and presenter viewing.
- Two additional 60” displays are installed on the south wall.
    - An articulating mount allows for the displays to be moved and angled for better viewing in different situations.
- Three (3) Pan/Tilt/Zoom cameras are installed. One at the back of the room and two at the front wall at each side of the projection screen.
    - The cameras are automated to follow a particular speaker/presenter based on microphone input. They can also be manual selected and moved through the control system.
- A discussion microphone system is integrated for the council chambers. It consists of one (1) chairperson station, six (6) delegate stations and seven (7) additional simple delegate stations.
    - Each station has a microphone and a loudspeaker.
    - The system can be configured for many different types of scenarios, and changed easily through a web interface.

    - The following are some of the features:
        - Request to speak
        - Seat Naming
        - Voting
        - Speaking Queue
- A Staff Lectern houses an Owner Furnished (OFE) PC, and provides additional connectivity for a laptop or another device.
    - The existing floor box is used for lectern connectivity.
        - An HDMI connection is provided for the OFE PC.
        - A VGA w/ audio, and HDMI connection is provided for a laptop or mobile device.
        - A digital discussion microphone connection is provided in the floor box.
        - An analog microphone connection is provided in the floor box.
        - Power and LAN floor box connection are provided by others.
    - Two 22” Monitors are provided for the OFE PC.
        - Dual monitor mount is included.
    - The lectern is provided by others.
        - Coordination with AV technology should be carefully considered.
- Another floor box is located at the Presenter’s Table location, and provides additional connectivity for a laptop or another device.
    - The existing floor box is used at the presenter’s table location.
        - A VGA w/ audio, and HDMI connection is provided for a laptop or mobile device.
        - A digital discussion microphone connection is provided in the floor box.
            - This connection allows for two delegate microphones.
        - An analog microphone connection is provided in the floor box.
        - Power and LAN floor box connection are provided by others.
    - The Presenter’s Table is provided by others.
        - Coordination with AV technology should be carefully considered.
- A Recorder Station provides additional connectivity for a laptop or another device.
    - A 10” touch panel controller is installed for system operation.
        - Digital media recorder is located in the main equipment rack and controlled from this panel.
        - This is considered to be the main clerks station and the control panel will be custom programmed for all desired functionality.
    - A VGA w/ audio, and HDMI connection is provided for a laptop or mobile device.
    - A digital discussion microphone connection is provided in the floor box.
        - This connection allows for two delegate microphones.
    - Two 22” Monitors are provided for viewing and selection of content and sources.
        - Dual monitor mount is included.
    - Furniture is provided by others.
        - Coordination with AV technology should be carefully considered.
- A 7” touch panel is located at the chairperson station.
    - This will allow for control of the discussion system as well as any other system aspect that is deemed necessary.
    - Touch panel is custom programmed for user preferences.
- Seven (7) 22” display monitors are located on the dais, one for each member.
    - These are capable of display any source content, however they are all the same feed.
- Six (6) ceiling loudspeakers are installed over the audience area and two (2) over the dais presentation area.
- Two (2) ceiling loudspeakers are installed in the Chamber Lobby area.

  - A key volume control is installed in the lobby area for volume adjustment.
  - The control system can mute the lobby audio system if desired.
- Four (4) ceiling loudspeakers are installed in the Grand Hall area.
  - A key volume control is installed in the hall area for volume adjustment.
  - The control system can mute the hall audio system if desired.
- A four channel audio amplifier is provided and installed at the main equipment rack.
- An assisted listening system is installed with 12 receivers.
  - The system comes with a charging station, a remote mounted antenna, and placard.
- A Biamp audio digital signal process is provided and installed at the main equipment rack.
  - The DSP is programmed for not only the audio processing for the rooms but also for Teleconferencing in both the Chambers and the Executive Conference Room.
    - Teleconferencing will require two assigned SIP endpoints from the Owner Furnished Shoretel phone system.
- A matrix video switching and routing system is installed in the main equipment rack.
  - It is a card based system that is only loaded with what is needed and allows for future expansion.
- A wireless microphone system is installed.
  - The wireless microphones can be used for presentations and conferencing applications. The system includes a charging station and the following microphone transmitters:
    - Two Handheld
    - Two Bodypack with Lavalier
- A 10” touch panel controller is installed in the main equipment rack for system configuration.
- Provisions for an OFE cable tuner and Satellite Tuner are accommodated in the main equipment rack.
- Two 22” monitors are provided for source monitoring and preview.
- A streaming appliance is provided and installed in the video matrix for sending to a broadband connection for live streaming, or other room systems.
  - Broadband connection is provided by others.
- A media recorder is installed in the main equipment rack.
  - The media recorder is controlled through the control system and can record functions in the Chambers as well as the Executive Conference Room, but not simultaneously.

Equipment List:

8	ea	JBL	CONTROL 24CT MICRO	4" COMPACT CEILING SPKR W/TRANS
600	ft	Liberty Cable	14-2C-P-WHT	14 AWG Speaker Cable
2	ea	JBL	CONTROL 24CT MICRO	4" COMPACT CEILING SPKR W/TRANS
1	ea	Lowell	KL100-DW	100W Keylock, 70V/25V, 1-gang Decora
300	ft	Liberty Cable	14-2C-P-WHT	14 AWG Speaker Cable
4	ea	JBL	CONTROL 24CT MICRO	4" COMPACT CEILING SPKR W/TRANS
1	ea	Lowell	KL100-DW	100W Keylock, 70V/25V, 1-gang Decora
500	ft	Liberty Cable	14-2C-P-WHT	14 AWG Speaker Cable
1	ea	Biamp	Tesira AMP-4300R CV	Tesira 4 channel, 300W digital amplifier
1	ea	Listen	LP-41-072-01	Intelligent DSP RF Receiver 12-Pack (72 MHz)
1	ea	Listen	LT-800-072-01	Stationary RF Transmitter (72 MHz)
2	ea	Listen	LA-304	Assistive Listening Notification Signage Kit
1	ea	Listen	LA-326	Universal Rack Mounting Kit
1	ea	Listen	LA-122	Universal Antenna Kit (72 & 216 MHz)
1	ea	Panel Crafters	Custom	Antenna Connection Panel
150	ft	Listen	LA-390	Preassembled RG8 Coaxial Cable
1	ea	Biamp	Tesira SERVER-IO AVB	DSP server with up to 48 channels of I/O
1	ea	Biamp	Tesira DSP-2	Tesira DSP card with two DSPs

1	ea	Biamp	Tesira DAN-1	Tesira 64x64 Dante™ module
2	ea	Biamp	Tesira SEC-4	Tesira 4 channel mic/line input card with AEC
1	ea	Biamp	Tesira SVC-2	Tesira 2 line VoIP telephone interface card
1	ea	Biamp	Tesira SOC-4	Tesira 4 channel mic/line output card
1	ea	Biamp	Tesira SEC-4	Tesira 4 channel mic/line input card with AEC
1	ea	Biamp	Tesira SEC-4	Tesira 4 channel mic/line input card with AEC
1	ea	Biamp	NG GS724T AVB V4	Netgear®24-port Gigabit Smart Switch AVB
1	ea	Biamp	Tesira EX-IN	Tesira 4 channel mic/line input expander PoE+
1	ea	Biamp	Tesira EX-OUT	Tesira 4 channel mic/line output exp PoE+
2	ea	Biamp	PH POE36U-1AT-R	PHIHONG Gigabit PoE+ Injector
1	ea	Delta AV	Misc. Materials	Installation materials & Cables
1	ea	Shure	MXWANI8	Audio Network interface
1	ea	Shure	MXWNCS8	Networked Charging Station
1	ea	Shure	MXWAPT8 (Band Z10)	Access Point Transceiver
2	ea	Shure	MXW2/BETA58	Handheld transmitter with BETA58
2	ea	Shure	MXW1/0	Bodypack Transmitter
2	ea	Shure	MX150B/0-TQG	Omni directional 5mm Lavalier Mic
200	ft	TBD	STP	Shielded CAT6a Cable
2	ea	TBD	STP Connector	Shielded CAT6a Connector
4	ea	Panel Crafters	Custom	FB & Wall Plate with 1 XLRF
600	ft	Liberty	22-2C-SH-P-WHT	Line/Microphone Audio Cable
1	ea	TBD	TBD	Projection Screen Installed by Others
200	ft	Liberty	TBD	Control Cable
1	ea	Christie	DHD951-Q White	HD 1920x1080, 8200lm, Projector
1	ea	Christie	Ultra-Short Throw	Ultra Short Throw Lens 0.8-1.1
1	ea	Chief	CMA 440	Ceiling Mounting Plate
1	ea	Chief	CMA 472	Recessed Plenum Back Box
1	ea	Chief	RPAU??	Ceiling Mounting Brackets & Materials
1	ea	Delta AV	Misc. Materials	Installation Hardware and Materials
1	ea	Crestron	DM-RMC-4K-100-C	4K DigitalMedia 8G+® Receiver
150	ft	TBD	STP	Shielded CAT6a Cable
2	ea	TBD	STP Connector	Shielded CAT6a Connector
7	ea	Planar	PCT2265	22 inch Wide Black Monitor
7	ea	Delta AV	TBD	HDMI M/M Cable
1	ea	Crestron	HD-DA8-4K-E	1-to-8 4K HDMI® Distribution Amplifier
1	ea	Delta AV	Misc. Materials	Installation Hardware and Materials
1	ea	Crestron	DM-RMC-4K-100-C	4K DigitalMedia 8G+® Receiver
200	ft	TBD	STP	Shielded CAT6a Cable
1	ea	TBD	STP Connector	Shielded CAT6a Connector
2	ea	Sharp	LC-60LE661U	60"LEDHDTV,1080p Display
2	ea	FSR	PWB-273-CRST-DM-WHT	3" Walls – Wall box for Crestron DM Scaler
2	ea	Chief	PDR2000B	Large Flat Panel Swing Arm Wall Mount - 37"
2	ea	Chief	PSB2029	Interface Bracket for Swing Arm Mount
2	ea	Delta AV	Misc. Materials	Installation Hardware
2	ea	Crestron	DM-RMC-4K-100-C	4K DigitalMedia 8G+® Receiver
400	ft	TBD	STP	Shielded CAT6a Cable
4	ea	TBD	STP Connector	Shielded CAT6a Connector
2	ea	Planar	PCT2265	22 inch Wide Black Monitor
2	ea	Crestron	DM-RMC-4K-100-C	4K DigitalMedia 8G+® Receiver
2	ea	Delta AV	TBD	HDMI M/M Cable
1	ea	Chief	KTG225B	Widescreen Dual Horizontal Grommet Mount
400	ft	TBD	STP	Shielded CAT6a Cable
4	ea	TBD	STP Connector	Shielded CAT6a Connector

1	ea	OFE	TBD	Owner Furnished Staff Lectern
1	ea	OFE	TBD	Owner Furnished House PC
1	ea	Crestron	DM-TX-200-C-2G-W-T	Wall Plate DigitalMedia 8G+® Transmitter
1	ea	FSR	MMS-FL-500/540P-4	Wall Plate Bracket Kit for FL-500/540P-4
1	ea	Crestron	DM-TX-4K-100-C-1G-W-T	Wall Plate 4K DigitalMedia 8G+® Transmitter
2	ea	Planar	PCT2265	22 inch Wide Black Monitor
3	ea	Delta AV	TBD	HDMI M/M Cable
1	ea	Crestron	HD-DA2-4K-E	1-to-2 4K HDMI® Distribution Amplifier
1	ea	Chief	KTG225B	Widescreen Dual Horizontal Grommet Mount
1	ea	Crestron	DM-TX-200-C-2G-W-T	Wall Plate DigitalMedia 8G+® Transmitter
1	ea	FSR	MMS-FL-500/540P-4	Wall Plate Bracket Kit for FL-500/540P-4
1	ea	Crestron	DM-TX-200-C-2G-W-T	Wall Plate DigitalMedia 8G+® Transmitter
1	ea	Crestron	DM-TX-200-C-2G-W-T	Wall Plate DigitalMedia 8G+® Transmitter
1050	ea	TBD	STP	Shielded CAT6a Cable
14	ea	TBD	STP Connector	Shielded CAT6a Connector
1	ea	OFE	TBD	Owner Furnished Cable TV Tuner
1	ea	Middle Atlantic	U2	Rack Mounting Shelf
1	ea	OFE	TBD	Media Room Source
1	ea	Extron	SMP 352 3G-SDI-400GBSSD	Dual Recording H.264 Streaming Media Processor
3	ea	Vaddio	RoboSHOT 12 QDVI System	PTZ Camera, 12x Zoom
3	ea	Delta AV	Misc. Materials	Installation Hardware
3	ea	Monoprice	2404	HDMI to DVI 6' Cable Assembly
3	ea	Vaddio	998-6000-003	camera interface rack mount kit
1	ea	Crestron	DM-MD16X16	16x16 DigitalMedia™ Switcher
1	ea	Crestron	DM-PSU-16	16-Port PoDM Power Supply
6	ea	Crestron	DMC-4K-C-HDCP2	HDBaseT® Certified 4K DigitalMedia 8G+® Input Card for DM® Switcher
5	ea	Crestron	DMC-4K-HD-HDCP2	4K HDMI® Input Card for DM® Switcher
2	ea	Crestron	DMC-4K-CO-HD-HDCP2	Dual HDBaseT® Certified 4K DM Output Card
3	ea	Crestron	DMC-HDO	2-Channel HDMI® Output Card for Switcher
1	ea	Crestron	DMC-STRO	Streaming Output Card for DM® Switcher
2	ea	Planar	PCT2265	22 inch Wide Black Monitor
2	ea	Delta AV	TBD	HDMI M/M Cable
1	ea	Chief	KTG225B	Widescreen Dual Horizontal Grommet Mount
1	ea	Crestron	DMC-STR	Streaming Input Card
1	ea	Crestron	TSW-752-B-S	7” Touch Screen, Black Smooth
1	ea	Crestron	TSW-750-TTK-B-S	Tabletop Kit for TSW-750 & TSW-752
2	ea	Crestron	TSW-1052-B-S	10.1” Touch Screen, Black Smooth
2	ea	Crestron	TSW-1050-TTK-B-S	Tabletop Kit for TSW-1052, Black
600	ft	TBD	STP	Shielded CAT6a Cable
6	ea	TBD	STP Connector	Shielded CAT6a Connector
1	ea	Crestron	AV3	3-Series Control System
1	ea	Crestron	CAGE3	Control Card Expansion
2	ea	Crestron	C3COM-3	3-Series™ Control Card – 3 COM Ports
1	ea	Crestron	CEN-SWPOE-16	16-Port Managed PoE Switch
1	ea	Delta AV	Misc. Materials	Cables, Connectors, and Hardware
1	ea	Middle Atlantic	WRK-40-27LRD	Floor Standing Equipment Rack
1	ea	Middle Atlantic	TBD	Equipment Rack Accessories
1	ea	TBD	TBD	Power Distribution Solution
1	ea	Delta AV	Misc. Materials	Installation Materials

Equipment	$135,201.11
Labor	$41,716.56
Incidentals	$11,546.55
Total	**$188,464.21**

Chamber Lobby Display:
A display is added to the Chamber lobby for viewing of any source.

- A 60” display is installed in the Chamber Lobby and connected to the system.
  - An articulating mount is used to allow for the adjustment viewing angles.
  - Any source can be viewed and it is controlled via the control system.
  - Line voltage connections are provided by the electrical contractor.

Equipment List:

1	ea	Sharp	LC-60LE661U	60"LED HDTV,1080p,120HZ, Display
1	ea	FSR	PWB-273-CRST-DM-WHT	3" Walls – Wall box for Crestron DM Scaler - White
1	ea	Chief	PDR2000B	Large Flat Panel Swing Arm Wall Mount - 37"
1	ea	Chief	PSB2029	Interface Bracket for Swing Arm Mount
1	ea	Delta AV	Misc. Materials	Installation Hardware
1	ea	Crestron	DM-RMC-4K-100-C	4K DigitalMedia 8G+® Receiver & Room Controller
200	ft	TBD	STP	Shielded CAT6a Cable
2	ea	TBD	STP Connector	Shielded CAT6a Connector
1	ea	Crestron	DMC-4K-CO-HD-HDCP2	Dual HDBaseT® Certified 4K DigitalMedia Output Card

Equipment	$3,542.39
Labor	$2,081.57
Incidentals	$792.28
Total	**$6,416.24**

Grand Hall Displays:
Three (3) displays are added to the Grand Hall for viewing of any source.

- Three (3) 60” displays are installed in the Grand Hall area and connected to the system.
  - An articulating mount is used to allow for the adjustment viewing angles.
  - Any source can be viewed and it is controlled via the control system.
    - Sources can be independent.
  - Line voltage connections are provided by the electrical contractor.

Equipment List:

3	ea	Sharp	LC-60LE661U	60"LED HDTV,1080p,120HZ, Display
3	ea	FSR	PWB-273-CRST-DM-WHT	3" Walls – Wall box for Crestron DM Scaler - White
3	ea	Chief	PDR2000B	Large Flat Panel Swing Arm Wall Mount - 37"
3	ea	Chief	PSB2029	Interface Bracket for Swing Arm Mount
3	ea	Delta AV	Misc. Materials	Installation Hardware
3	ea	Crestron	DM-RMC-4K-100-C	4K DigitalMedia 8G+® Receiver & Room Controller
600	ft	TBD	STP	Shielded CAT6a Cable
6	ea	TBD	STP Connector	Shielded CAT6a Connector
3	ea	Crestron	DMC-4K-CO-HD-HDCP2	Dual HDBaseT® Certified 4K DigitalMedia Output Card

Equipment	$9,854.97
Labor	$4,907.08
Incidentals	$1,571.68
Total	**$16,333.74**

Executive Conference Room:

The executive conference room leverages a lot of the Chamber's equipment. The Matrix Switcher, Audio DSP, Media Recorder, and Control Processor are all used for this system as well. The design allows for teleconferencing, video conferencing via the OFE house PC and its soft codec, and presentations. Additionally, functions that happen in this room can be recorded with the media recorder, as long as it is not in use by the Council Chamber.

- An 80" display is installed at the north wall.
- A PTZ Camera is installed above or next to the display.
  - The camera is routed back to the main equipment rack, with a USB connection returning to the OFE PC.
- An OFE PC is installed for presentations and soft codec conferencing.
  - PC location is to be determined.
- Three (3) table boxes with connections down to existing floor boxes are provided.
  - Two table boxes have VGA w/ audio and HDMI connections.
  - All three have USB connection to the House PC.
  - All LAN connection are provided by others.
  - Millwork for table box is to be provided by others.
- A 7" touch panel is installed at the table for system control.
  - Touch panel is custom programmed for user preferences.
- Six (6) ceiling loudspeakers are installed for audio reproduction
- A two channel speaker bar is installed below the display.
- A four channel audio amplifier is provided and installed at the main equipment rack.
- Two Tri-Element ceiling microphones are installed for audio capture.

Equipment List:

1	ea	Sharp	LC-80LE661U	80"LED HDTV,1080p,120HZ,240 Display
1	ea	FSR	PWB-273-CRST-DM-WHT	3" Walls – Wall box for Crestron DM Scaler - White
1	ea	Chief	XTM1U	Micro-Adjust Tilt Wall Mount, X-Large
1	ea	Delta AV	Misc. Materials	Installation Hardware
1	ea	Crestron	DM-RMC-4K-100-C	4K DigitalMedia 8G+® Receiver & Room Controller
150	ft	TBD	STP	Shielded CAT6a Cable
2	ea	TBD	STP Connector	Shielded CAT6a Connector
6	ea	JBL	CONTROL 24CT MICRO	4" COMPACT CEILING SPKR W/TRANS 8mstrpk
250	ft	Liberty Cable	14-2C-P-WHT	14 AWG Speaker Cable
1	ea	Innovox	FS-H2	Horiz. 2-chan. Video Display Loudspeaker (each)
250	ft	Liberty Cable	14-2C-P-WHT	14 AWG Speaker Cable
1	ea	Biamp	Tesira AMP-4300R CV	Tesira 4 channel, 300W digital networked amplifier
2	ea	Biamp	Tesira EX- AEC	Tesira 4 channel mic/line input expander with AEC
2	ea	Audix	M3W	Tri-element hanging ceiling microphone
250	ft	TBD	STP	Shielded CAT6a Cable
4	ea	TBD	STP Connector	Shielded CAT6a Connector
1	ea	Delta AV	Misc. Materials	Installation Hardware and Materials
1	ea	OFE	TBD	Owner Furnished House PC

1	ea	Crestron	DM-TX-4K-100-C-1G-W-T	Wall Plate 4K DigitalMedia 8G+® Transmitter
2	ea	Crestron	DM-TX-200-C-2G-W-T	Wall Plate DigitalMedia 8G+® Transmitter 200
2	ea	FSR	MMS-FL-500/540P-4	Wall Plate Bracket Kit for FL-500/540P-4
2	ea	Panel Crafters	Custom	Custom FB Connection Panel
3	ea	Extron	70-1045-08	Cable Cubby 500, Brushed Al, No AC
3	ea	Extron	60-1384-01	US (2) AC & (2) USB Power Module
2	ea	Extron	26-663-12	HDMI Ultra/12. 12' (3.6 m) 4K Premium
2	ea	Extron	26-567-03	MVGA M-M/12. 12' (3.6 m)
2	ea	Extron	26-571-06	A Mini/12. 12' (3.6 m)
1	ea	Extron	70-1067-01	Cable Collar Kit - Black, Qty. 10
1	ea	Extron	70-1067-12	Cable Collar Kit - Red, Qty. 10
1	ea	Vaddio	RoboSHOT 12 QUSB	12x PTZ Camera with HDMI & USB
1	ea	Vaddio	998-6000-003	camera interface rack mount kit
250	ft	TBD	STP	Shielded CAT6a Cable
4	ea	TBD	STP Connector	Shielded CAT6a Connector
1	ea	Delta AV	Misc. Materials	Cables & Connectors
1	ea	Delta AV	Misc. Materials	Installation Hardware
2	ea	Crestron	USB-EXT-DM-LOCAL	USB over DM/Ethernet
2	ea	Crestron	USB-EXT-DM-REMOTE	USB over DM/Ethernet
250	ft	TBD	STP	Shielded CAT6a Cable
4	ea	TBD	STP Connector	Shielded CAT6a Connector
3	ea	Delta AV	Misc. Materials	Installation Hardware and Materials
3	ea	Crestron	DMC-4K-C-HDCP2	HDBaseT® Certified 4K DigitalMedia 8G+® Input
1	ea	Crestron	DMC-4K-HD-HDCP2	4K HDMI® Input Card for DM® Switcher
1	ea	Crestron	DMC-4K-CO-HD-HDCP2	Dual HDBaseT® Certified 4K DM Output Card
600	ft	TBD	STP	Shielded CAT6a Cable
8	ea	TBD	STP Connector	Shielded CAT6a Connector
1	ea	Crestron	TSW-752-B-S	7” Touch Screen, Black Smooth
1	ea	Crestron	TSW-750-TTK-B-S	Tabletop Kit for TSW-750 & TSW-752
150	ft	TBD	STP	Shielded CAT6a Cable
2	ea	TBD	STP Connector	Shielded CAT6a Connector

Equipment	$28,169.23
Labor	$12,556.40
Incidentals	$2,851.87
Total	**$43,577.50**

Public Meeting Rooms:

The public meeting rooms are three dividable and combinable space. Each room has a floor box input connection and a wall plate input connection. Each room has a wall mounted control panel. Two of the rooms, the outer edge rooms, have video projection display systems. All rooms have an in ceiling loudspeaker audio system. The auxiliary equipment rack location for this space is in the Storage room 209A.

- The existing floor box location in each room is used for added connectivity.
  - A VGA w/ audio and HDMI connection is installed in the floor box.
  - Two (2) analog microphone inputs are installed in the floor box.
- A wall panel input location in each room provides additional inputs.
  - A VGA w/ audio and HDMI connection is installed in the wall panel.
  - Two (2) analog microphone inputs are installed in the wall panel.

- Ten (10) flush ceiling mounted loudspeakers are installed throughout the public meeting space for even coverage.
- A four channel audio amplifier is provided and installed at the main equipment rack.
- An assisted listening system is installed with 12 receivers.
    - The system comes with a charging station, a remote mounted antenna, and placard.
- Two (2) 6000 lumen video projectors are installed. One in room 207 and the other in room 209.
    - Room 208 does not have a projector or display in scope at this time.
- The Biamp audio digital signal process installed in the main equipment rack is leveraged to economize cost.
        - DSP input and output expansion modules are installed on the audio network and connected to the local system.
- A matrix video switching and routing system is installed in the auxiliary equipment rack.
    - It is a card based system that is only loaded with what is needed and allows for future expansion.
- A wireless microphone system is installed.
    - The wireless microphones can be used for presentations and conferencing applications. The system includes a charging station and the following microphone transmitters:
        - One Handheld
        - one Bodypack with Lavalier
- A 7” touch panel controller is installed in each room system configuration.
- Provisions for an OFE cable tuner and Satellite Tuner are accommodated in the main equipment rack.
- Two 22” monitors are provided for source monitoring and preview.
- A streaming appliance is provided and installed in the video matrix for sending to a broadband connection for live streaming, or other room systems.
    - Broadband connection is provided by others.
- A media recorder is installed in the auxiliary equipment rack.
    - The media recorder is controlled through the control system and can record functions in the room.
- This is not the same recorder that is in the Council Chambers system, so therefore simultaneous recording is possible, but not multiple functions within the Public Meeting Spaces.

Equipment List:

2	ea	TBD	TBD	Projection Screen Installed by Others
2	ea	Hitachi	CP-WU8461	6000 Lumen, 1920x1200 video projector
2	ea	Chief	CMA 440	Ceiling Mounting Plate
2	ea	Chief	CMA 472	Recessed Plenum Back Box
2	ea	Chief	RPAU??	Ceiling Mounting Brackets & Materials
2	ea	Delta AV	Misc. Materials	Installation Hardware and Materials
2	ea	Crestron	DM-RMC-4K-100-C	4K DigitalMedia 8G+® Receiver
200	ft	TBD	STP	Shielded CAT6a Cable
2	ea	TBD	STP Connector	Shielded CAT6a Connector
1	ea	Liberty	TBD	Control Cable
6	ea	Crestron	DM-TX-200-C-2G-W-T	Wall Plate DigitalMedia 8G+® Transmitter
2	ea	OFE	TBD	Owner Furnished House Computer
2	ea	Crestron	DM-TX-4K-100-C-1G-W-T	Wall Plate 4K DigitalMedia 8G+® Transmitter
1400	ea	TBD	STP	Shielded CAT6a Cable
14	ea	TBD	STP Connector	Shielded CAT6a Connector
1	ea	Delta AV	Misc. Materials	Cables & Connectors

1	ea	Extron	SMP352 3GSDI-400GBSSD	Dual Recording H.264 Streaming Media
4	ea	Biamp	Tesira EX-IN	Tesira 4 channel mic/line input expander PoE+
1	ea	Biamp	Tesira EX-OUT	Tesira 4 channel mic/line output expander PoE+
3	ea	Biamp	PH POE36U-1AT-R	PHIHONG Gigabit PoE+ Injector
1	ea	Biamp	NG GS724T AVB V4	Netgear®24-port Gigabit Smart Switch with AVB
10	ea	JBL	CONTROL 24CT MICRO	4" COMPACT CEILING SPKR W/TRANS
1000	ft	Liberty Cable	14-2C-P-WHT	14 AWG Speaker Cable
1	ea	Biamp	Tesira AMP-4300R CV	Tesira 4 channel, 300W digital networked amp
1	ea	Delta AV	Misc. Materials	Installation Materials
1	ea	Listen	LP-41-072-01	Intelligent DSP RF Receiver 12-Pack (72 MHz)
1	ea	Listen	LT-800-072-01	Stationary RF Transmitter (72 MHz)
2	ea	Listen	LA-304	Assistive Listening Notification Signage Kit
1	ea	Listen	LA-326	Universal Rack Mounting Kit
1	ea	Listen	LA-122	Universal Antenna Kit (72 & 216 MHz)
1	ea	Panel Crafters	Custom	Antenna Connection Panel
150	ea	Listen	LA-390	Preassembled RG8 Coaxial Cable
1	ea	Shure	MXWANI8	Audio Network interface
1	ea	Shure	MXWNCS8	Networked Charging Station
1	ea	Shure	MXWAPT8 (Band Z10)	Access Point Transceiver
1	ea	Shure	MXW2/BETA58	Handheld transmitter with BETA58
1	ea	Shure	MXW1/0	Bodypack Transmitter
1	ea	Shure	MX150B/0-TQG	Omni directional 5mm Lavalier Mic
200	ft	TBD	STP	Shielded CAT6a Cable
2	ea	TBD	STP Connector	Shielded CAT6a Connector
1	ea	Crestron	DM-MD16X16	16x16 DigitalMedia™ Switcher
1	ea	Crestron	DM-PSU-16	16-Port PoDM Power Supply
8	ea	Crestron	DMC-4K-C-HDCP2	HDBaseT® Certified 4K DM Input Card
2	ea	Crestron	DMC-4K-HD-HDCP2	4K HDMI® Input Card for DM® Switcher
1	ea	Crestron	DMC-4K-CO-HD-HDCP2	Dual HDBaseT® Certified 4K DM Output Card
1500	ft	TBD	STP	Shielded CAT6a Cable
20	ea	TBD	STP Connector	Shielded CAT6a Connector
1	ea	Crestron	DMC-STRO	Streaming Output Card for DM® Switcher
1	ea	Crestron	DMC-STR	Streaming Input Card
1	ea	Crestron	DMC-HDO	2-Channel HDMI® Output Card for DM
1	ea	Delta AV	Misc. Materials	Cables, Connectors, and Hardware
3	ea	Panel Crafters	Custom	4G Custom Panel with 2 XLRF and Double Dec
3	ea	Panel Crafters	Custom	4G Custom Wall Plate with 2 XLRF and Double
900	ft	Liberty	22-2C-SH-P-WHT	Line/Microphone Audio Cable
1	ea	Middle Atlantic	WRK-40-27LRD	Floor Standing Equipment Rack
1	ea	Middle Atlantic	TBD	Equipment Rack Accessories
1	ea	TBD	TBD	Power Distribution Solution
1	ea	Delta AV	Misc. Materials	Installation Materials
3	ea	Crestron	TSW-752-B-S	7” Touch Screen, Black Smooth
300	ft	TBD	STP	Shielded CAT6a Cable
6	ea	TBD	STP Connector	Shielded CAT6a Connector
1	ea	Crestron	CP3N	3-Series Control System
1	ea	Crestron	CEN-SWPOE-16	16-Port Managed PoE Switch

Equipment	$73,210.20
Labor	$23,478.18
Incidentals	$6,133.00
Total	**$102,821.38**

Conference Rooms (Quantity of 5):
This section encompasses the design for general presentation in five conference rooms. Each room is outfitted with an 80" display, and a VGA w/ audio and HDMI wall panel connection. A system controller is installed at the display that facilitates the simple and intuitive auto-operation. When a signal is present at the wall connection panel the display will automatically turn on, and when there is no signal, it will automatically turn off.

- An 80" display is installed on the wall.
  - A system controller is installed behind the display.
  - A DM receiver is installed at the display.
- A wall connection panel and transmitter is installed.\
  - Location is to be determined.
- The system is programmed for automation.
  - The system is also capable of remote management and monitoring through a web panel interface.

Equipment List:

5	ea	Sharp	LC-80LE661U	80"LED HDTV,1080p,120HZ,240 Display
5	ea	FSR	PWB-273-CRST-DM-WHT	3" Walls – Wall box for Crestron DM Scaler
5	ea	Chief	XTM1U	Micro-Adjust Tilt Wall Mount, X-Large
5	ea	Delta AV	Misc. Materials	Installation Hardware
5	ea	Crestron	DM-TX-200-C-2G-W-T	Wall Plate DigitalMedia 8G+® Transmitter
5	ea	FSR	MMS-FL-500/540P-4	Wall Plate Bracket Kit for FL-500/540P-4
500	ft	TBD	STP	Shielded CAT6a Cable
10	ea	TBD	STP Connector	Shielded CAT6a Connector
5	ea	Crestron	RMC3	3-Series® Room Media Controller
5	ea	Crestron	CNPWS-75	Cresnet Power Supply
5	ea	Crestron	PWE-4803RU	POE Injector
5	ea	Delta AV	Misc. Materials	Installation Materials
5	ea	Crestron	DM-RMC-4K-100-C	4K DigitalMedia 8G+® Receiver
5	ea	Panel Crafters	DELAV-CQ477992	Custom floor box input plate
5	ea	Delta AV	Misc. Materials	Installation Materials

Equipment	$35,477.00
Labor	$13,913.97
Incidentals	$3,338.77
Total	**$52,729.74**

Alternate #1 – Add ShareLink (Per Conference Room):
To handle multiple people connecting and collaboration on the same screen we can add a Collaboration Appliance. The ShareLink allows multiple participants to connect to a single display showing up to four images simultaneously over is built in secured wireless network. It can also be connected to the Local Area Network.

- A ShareLink collaboration appliance is installed at the display location.
  - LAN configuration is subject to Redmond IT personnel.
- An occupancy sensor system is installed to maintain the automation control system.

Equipment List:

1	ea	Extron	ShareLink 200	Wireless Collaboration Gateway - with WAP
1	ea	Monoprice	14580	6' HDMI Cable Assembly
1	ea	Crestron	GLS-ODT-C-NS	Dual-Technology Ceiling Mount Occupancy Sensor
1	ea	Crestron	GLS-REMOTE-ODT/OIR	IR Remote for GLS Occupancy Sensor
1	ea	Crestron	GLS-SIM	Sensor Integration Module
1	ea	Crestron	CNPWS-75	Cresnet Power Supply

Equipment	$1,607.35
Labor	$1,662.31
Incidentals	$647.82
Total	**$3,917.48**

Notes & Conditions

1. We assume any OFE Equipment is in good working condition.
2. We will require the AV and Architectural CAD files for production of our shop drawings.
3. No millwork or modifications to millwork are included in the price quoted.
4. Any changes or modifications to the system, changes in scope, components of the system, or any other modification to the submitted equipment list will impact the price quoted.
5. The warranty will begin at beneficial usage of the system, portions of the system, substantial completion or acceptance of the system, whichever is first.
6. Warranty does not include owner furnished equipment, and is for the supplied equipment, materials, labor, and workmanship as part of this scope of work.
7. Delta AV is a licensed contractor in the State of Oregon, CCB #113213.
8. Delta AV is fully qualified for this type of system and has installation references available.
9. Pricing is based on model numbers in the equipment listing. If any models are discontinued or have been replaced, it may affect the price.
10. Delta AV field labor rate is based on work being performed during regular construction hours and the rate quoted herein is specific for this project. After hours are specifically excluded. Should after hours be required, they will be quoted separately per incident.
11. This proposal is valid for a period of 45 days.

CITY OF REDMOND
CONTRACT REVIEW BOARD

FINDINGS AND DECISION OF THE CITY OF REDMOND CONTRACT REVIEW BOARD REGARDING THE SOLE SOURCE SELECTION OF DELTA AV AS THE SOLE SOURCE FOR AUDIO VISUAL SYSTEM UPGRADES TO CITY HALL.

The City of Redmond Contract Review Board, having reviewed in documents provided by City Staff and heard their reports, makes the following findings of fact in support of the Sole Source award of the contract for $64,139.38 to Delta AV pursuant to ORS 279B.075 and Redmond City Code 2.410.

THE CITY OF REDMOND CONTRACT REVIEW BOARD FINDS AS FOLLOWS:

1. Delta AV engineered, built, and programmed the current AV systems that are installed throughout City Hall.

2. Delta AV currently maintains and services our existing system. Other than Delta AV, no other company has security access to our AV network and Delta's Crestron control system programming. The system's programming is proprietary.

3. Redmond City Hall Civic Rooms 207 and 208 require enhanced audio visual (AV) capabilities to record and live-stream public meetings. The most efficient utilization of the existing AV system and pre-wiring in Civic Rooms 207 and 208 requires acquiring compatible goods or services from Delta AV. (see quote/design provided).

4. Delta AV will provide all necessary engineering and equipment needed to upgrade existing AV systems in Civic Rooms 207 and 208. (see quote provided).

5. The alternative to sole source procurement would be to acquire another AV vendor, through a competitive process with another proprietary system at significantly greater cost and would not result in the efficient utilization of existing goods.

6. The contracting agency has negotiated with the sole source to obtain contract terms that are the most advantageous to the contracting agency.

ADOPTED by the City of Redmond Contract Review Board this 8th day of December 2020.

_____
George Endicott, Mayor

ATTEST:

_____
Kelly Morse, City Recorder

To Whom it May Concern,

Thank you for this opportunity to expand on your current AV system. We believe it is in the best interest of the city to sole-source this work to Delta AV for a few reasons.

First, the current AV systems were done as a design-build by us. We worked closely with the city in developing the design, so we already have an in-depth knowledge of the systems, the building's infrastructure and the city's expectations and needs. This allows us to keep our costs low as we already know exactly what to expect and the engineering/ programming groundwork is already in place.

Second, we have continued to service all the AV systems through extended service contracts. The public spaces that are being considered for an upgrade already contain an AV system that is covered under this service contract and if another vendor were to perform this upgrade, there would be no clear line of delineation between their warranty responsibility and ours.

Third, and most important, the currently installed AV systems are connected to an isolated AV network that is part of our proprietary remote monitoring solution allowing us to proactively monitor and remotely resolve any problems that occur. For security reasons, access to this network is very tightly controlled and only accessible to a handful of Delta AV technicians. A different AV vendor would need to install their own AV network and Crestron control system which would add additional redundant cost.

We appreciate and value the relationship we have had with the city and look forward to continuing to assist the city in carrying out their work.

Sincerely,
John Shaferly
Director of Technical Services

Delta AV Systems
2450 NW Eleven Mile Ave.
Gresham OR 97030
503.907.0137

CITY OF REDMOND

CITY HALL
411 SW 9th STREET
REDMOND, OR 97756
541.923.7710
FAX: 541.548.0706
info@redmondoregon.gov
redmondoregon.gov

STAFF REPORT

DATE: December 8, 2020
TO: Redmond City Council
THROUGH: Keith Witcosky, City Manager
John Roberts, Deputy City Manager
FROM: Deborah McMahon, Planning Manager
SUBJECT: Ord. 2020-18 - An ordinance updating the Redmond Transportation System Plan, inclusive of the 2018 Airport Master Plan, making it the transportation element of the Redmond Comprehensive Plan.

Addresses Council Goal:
7. COMPREHENSIVE PLANNING: Enhance the quality of life through adoption of programs, policies, and standards that balance growth while maintaining our unique character.

C. Update Transportation System Plan and associated plans that advance the City's long-term development goals.

Report in Brief:
This item requests City Council adopt Ordinance #2020-18 which authorizes the incorporation of the updated Transportation System Plan (TSP) and Airport Master Plan into the City Comprehensive Plan. The TSP establishes a system of transportation investments (facilities and programs) to serve the City over the next 20-years.

Attachments - City of Redmond Transportation System Plan (TSP):

- Volume 1
- Volume 2 (Appendix A – K)
- Errata Table (Topics 1 – 4)
- Errata Map - Functional Classification Redmond, Oregon (Figure X)
- Fly Redmond – Redmond Municipal Airport Master Plan

Background:
As part of planning for the City's future, frequent updates are made to master plans, pertinent reports and documents that support and implement the Redmond Comprehensive Plan.

The TSP is the mandated transportation element to the Comprehensive Plan and was last updated in 2008. The TSP also includes the Airport Master Plan. The TSP provides for a long-term community approach to accommodate new growth while maintaining and improving transportation facilities for all users over the next 20-years.

The TSP satisfies the state's requirements for a local transportation system plan as prescribed by Oregon Statewide Planning Goal 12: Transportation.

The Oregon Revised Statutes require that the TSP be based on the Comprehensive Plan land uses and provide for a transportation system that accommodates the expected growth in population and employment.

The City enlisted the expertise of transportation consultant Kittleson to complete the work. The City also collaborated the Oregon Department of Transportation (ODOT), Deschutes County, businesses and community members during this multi-year update effort which began in 2018.

Kittelson analyzed a breadth of current data to guide the process and develop the plan, such as transportation model details and mobility scenarios and growth projections. A significant public participation effort was also conducted to ensure community involvement.

Engagement included:

- A public facing project website that included web-based surveys and all technical reports, draft goals and policies, meeting summaries, a document library, and links to other regional planning activities;
- Regular updates and work sessions with the Redmond Urban Area Planning Commission;
- Three Public Advisory Committee Meetings;
- Two public open houses;
- Targeted outreach with local community, neighborhood and service organizations; and
- City Urban Area Planning Commission, City Council, and Deschutes County Board of Commissioners worksessions and public hearings.

Through these activities, the City provided community members with a variety of forums to identify their priorities for future transportation projects, programs, and policies.

Airport Master Plan
The Airport Master Update was updated by Mead and Hunt through a separate process.

The Airport Master Plan was approved and accepted by the Federal Aviation Administration on July 29, 2019. However, the Statewide Planning Program requires the Airport Master Plan be an element of the TSP, and the December 8 City Council action will accomplish this task. The Airport Master Plan occurred across three years and was guided by a twelve member Planning Advisory Committee. Five advisory committee meetings, three open houses and two stakeholder meetings were conducted throughout the region as part of the update.

The Redmond Urban Area Planning Commission held a public hearing on the TSP and Airport Master Plan on September 8, 2020. The planning commission unanimously recommended approval.

Discussion:
Transportation is the backbone that supports the City as it continues to grow and accommodate new residents. The TSP update articulates City goals, policies and priorities. Additionally, it provides a list of construction projects and programs to ensure that the transportation system continues to support the City's needs and vision, and conforms to state and regional policies. The TSP must remain relevant and responsive and typically receives smaller scale updates every five years.

TSP Organization
The TSP comprises two volumes. Volume 1 is the main document and includes the items that are of interest to the broadest audience.

Volume 2 contains the technical memoranda, data, and related transportation plans that support Volume 1. While not all of Volume 2 is adopted as part of the TSP, all of the documents provide useful information regarding the basis for the decisions represented in Volume 1.

Purpose
The TSP serves as a resource for future transportation and land use decision-making by providing:

- Solutions to address existing and future transportation needs for biking, walking, using transit, driving, freight, air, and rail;
- A blueprint for investments in transportation projects and programs that improve safety and access for all travelers, improve Regional and State resilience, and support City and Regional economic development priorities;
- A tool for coordination with regional and local agencies and governments;
- Information to ensure prudent land use and transportation choices;
- Order of magnitude cost estimates for transportation infrastructure investments needed to support economic development and growth, and possible sources of funding these improvements;
- Function, capacity and location of future streets, sidewalks, bikeways, pathways, transit, and other transportation facilities; and
- Potential programs to help improve opportunities to travel by walking, bicycling and transit in the future.

Guiding Principles and Context
The TSP provides a flexible, adaptable framework for making transportation decisions. Decisions about the City’s transportation system will be guided by the goals and policies contained in Chapter 2, but ultimately the decisions will be

made within the overall context of the City's land use plans, support for local and regional Economic Development, and the City's role in the Oregon Resilience Plan. These guiding plans and principles provide a foundation for the TSP's goals, policies, and potential actions.

Among the implementation steps of the TSP is the adoption of land use and land division ordinance amendments needed to protect transportation facilities and provide active transportation facilities between residential, commercial, and employment/ institutional areas. As required by the Transportation Planning Rule, the TSP was developed in coordination with local, regional and state transportation plans.

Goals

The TSP Goals are intended to be broad statements that characterize the community's desires and vision for the future transportation system. The goals are intended to be aspirational and may not be fully attained within the 20-year planning horizon of this plan. The goals are intended to be supported by the policies as well as specific implementation items for the City to address after the TSP has been adopted.

The seven TSP goals:

1. Provide a safe and efficient transportation network to complement key economic development priority areas, the comprehensive plan, recreational needs, and adopted state, regional and local plans and policies.
2. Advance community and statewide emergency preparedness efforts through support of the Oregon Resiliency Plan.
3. Provide transportation choices and address the needs and safety of all travelers, including people of all ages, abilities, ethnicities, and incomes.
4. Provide comfortable, convenient and safe pedestrian and bicycle facilities for all users.
5. Provide reliable and convenient transit service to Redmond residents, its businesses, and its connection to surrounding cities, as well as special transit options for the City's elderly and disabled residents.
6. Ensure efficient and effective freight transportation infrastructure is developed and maintained to support local and regional economic expansion and diversification consistent with City and Regional economic plans and policies.
7. Implement the plan in a timely fashion and keep it up to date with respect to local and regional priorities.

Policies

The TSP policies are statements adopted to provide a consistent course of action and move the community toward attainment of its goals. Policies in the TSP guide the work of the City staff in formulating proposed changes to the Development Code and other regulatory documents, to guide other work programs and long-range planning projects, and to prepare budget and capital improvement program. These policies will not be used in determining whether the City shall approve or deny individual land use applications.

Existing Transportation System Conditions

Existing transportation needs, opportunities, and constraints reflect an inventory of the multimodal transportation system characteristics conducted in 2017. This inventory included all major transportation-related facilities and services within the Urban Growth Boundary (UGB) at that time. Key roadway features, traffic conditions, safety performance, bicycle and pedestrian facilities, and transit service, among other topics, were analyzed.

Detailed findings of the technical analysis are summarized in Volume 2, Appendix D: Existing Conditions Analysis.

Key findings were:

- Approximately 57% of Redmond's population consists of demographic groups related to age, disabilities and income that typically rely on public transportation in transit heavy communities. However, less than one percent of the Redmond population (0.4%) utilizes public transportation.
- Citywide, sidewalks networks are frequently missing on one or both sides of the street, there is a lack of consistent street lighting, and there are long distances between protected pedestrian crossings. Walking can be improved by filling gaps in the sidewalk network, improving buffers from traffic, and providing improved crossings and other safety measures.
- A number of arterial roadway corridors and key intersections could benefit from strategic capital improvements to the existing system to provide better connectivity, improved safety measures and an improved walking and cycling effort.
- An increase in low-stress bicycle facilities is needed citywide.
- Freight access, particularly on the east side of town, is a critical component of the Redmond economy.

Transportation Priorities and Project Categories
The TSP recommends transportation programs and infrastructure improvements to fulfill the plan's goals and policies. These are organized into the following categories that suggest timeframes for implementation based on complexity, likely available funding (including potential funding sources), and assessment of need:

1. Strategic Street Capacity Investment Corridors
2. New Planned Streets
3. Intersection Capacity Improvements
4. Grade-Separated Intersection Improvements
5. Key Multi-Use Pathways, Bicycle Corridors, Pedestrian Improvements.

Note: Kittleson identified a few refinements/clarifications since the public hearing with the Planning Commission. These are contained in an errata sheet the consultant will present at the public hearing. The two errata sheets are attached.

Fiscal Impact:
The TSP includes projects under the jurisdiction and ownership of ODOT, Deschutes County, the City, and Cascade East Transit (CET), as well as projects that will be implemented by private developers. Individual TSP projects will be funded through a different combination of federal, state, City, county, SDC revenue, and or private sources.

The TSP discusses current and possible new funding mechanisms that may be available to implement projects during the life of the TSP. A complete list of the multimodal projects and planning level cost estimates is provided in Chapter 5 of the TSP.

The forecasted cost of the TSP listed improvements is approximately $500 million. The difference between available funding and needed funding is around $400M - $445M. Like most cities, City funding is insufficient to address TSP needs. Thus, as noted, the City will need to partner with other agencies (like ODOT) and private developers, and pursue alternative funding sources over the next 20 years.

The timing of project implementation will depend on future policy direction and funding availability at the federal, state, or local level; changes in local development priorities; or the formation of public-private or public-public partnerships.

Alternative Courses of Action:
Conduct the public hearing and consider additional public testimony. Courses of action include:

1. Approve Ordinance 2020-18.
2. Direct staff to make additional changes and approve Ordinance 2020-18.
3. Do not approve Ordinance 2020-18.
4. Take no action and request more information for review at a continued hearing.

As required by City Charter, notices regarding this public hearing were posted in three places (the Library, the Police Department, and the Redmond Chamber of Commerce) in addition to City Hall on December 1, 2020, and three copies of the ordinance were available for review at City Hall.

Recommendation / Suggested Motion:
"I move to have a first and second reading of Ordinance #2020-18, by title only." (Voice vote)

(City Attorney will read ordinance by title only, twice.)

"I move to approve Ordinance #2020-18." (Roll call vote)

To: Mayor and Council
From: Ed Fitch
Re Transportation Plan

Today our community is defined, in part, by the Dry Canyon that provides open space, parks, as well as frequently used walking and biking paths . Most now probably take the attributes of the canyon for granted. In the mid 1970's, however, the future of the canyon as a public playground was not assured at all. During that time Redmond was in a boom growth cycle and there was increasing pressure to develop the canyon for residences. In 1978, the city council and a group of citizens saw the potential of the canyon and adopted a goal of preserving the canyon for the benefit of future generations It has taken a lot of hard work, political determination and resources to make that goal a reality but I believe all would agree that it was well worth it.

The city is now presented with another long term question that requires the attention of the council and the community. Should we protect the opportunity to complete the 97 reroute through Redmond or, in the long run, abandon that plan in favor of a 97 bypass around Redmond in the future? The engineers would argue we should not address this for another 20 years. In the plan before you they simply erased phase 2 which has been part of our transportation plan for almost twenty years. This is being recommended for approval without any real public discourse.

By 2040 , however, and assuming our growth projections both in Rdemond and Central Oregon are correct, it is highly unlikely there will be any economically feasible path to implementing a phase 2 of the reroute within Redmond itself. Instead, after the current S Highway 97 fails - and it will within the 20 year period, it would be logical for ODOT to look at a bypass east of town. That will take time and in the meantime the traffic congestion on the current S Highway 97 will be unbearable. If you think traffic in Bend is bad now - our future scenario in this corridor will make that traffic congestion look like child's play. Engineers may assert people will drive less in the future. I really doubt that will happen. The movement of goods by truck will continue to increase. Cars will become more efficient and by 2020 may all be non polluting. In rural and semi rural areas vehicular transportation will still be an integral part of our every day life.

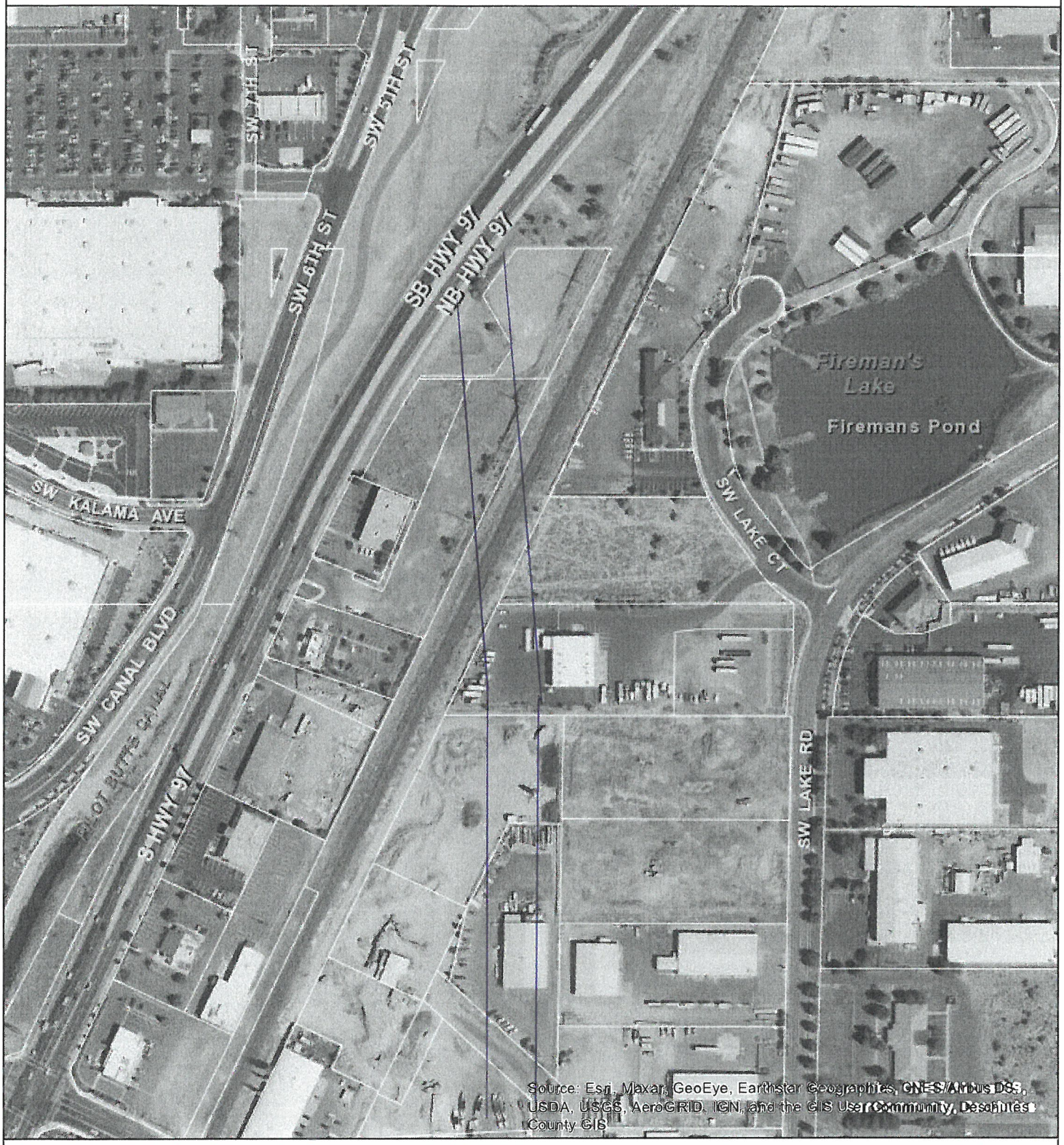
From my perspective and many who I have discussed this matter with, the time is now to preserve a corridor and insure a successful transition from the current S Highway 97 to phase two of the reroute. I am attaching one example of what a corridor could look like. This one for example goes through a lot of public and vacant private land as well as land that does not have significant structures on them. Will this path or any other path be difficult. Yes it will but nothing truly worthwhile is easy. As with the preservation of the canyon, it will take hard work, dedication and resources to pull off. I hope as a community we can make that commitment. Future generations will benefit just as we have by those who went before us.

As you know I have also question the plan for grade separated crossings east west at the railroad. The proposed plan only provides for crossing at the very north and south ends of town. This will not work. In 20 years the eastside from Evergreen to the fairgrounds will undergo significant growth. We cannot simply funnel all of that traffic to the grade separated crossings proposed. The intersections at grade in between will be seriously stressed. There must be at least one grade separated crossing between Elkhorn and Hemlock. My guess is the Salmon/Odem Medo is the most logical. Engineering may come up with reasons that would not be ideal but physically it is and should be examined.

I understand the financial motive of adopting the flawed plan on December 8th. I think it would be prudent to adopt it for that purpose with the understanding these other issues will be addressed in the coming year.

Deschutes County Property Information - Dial

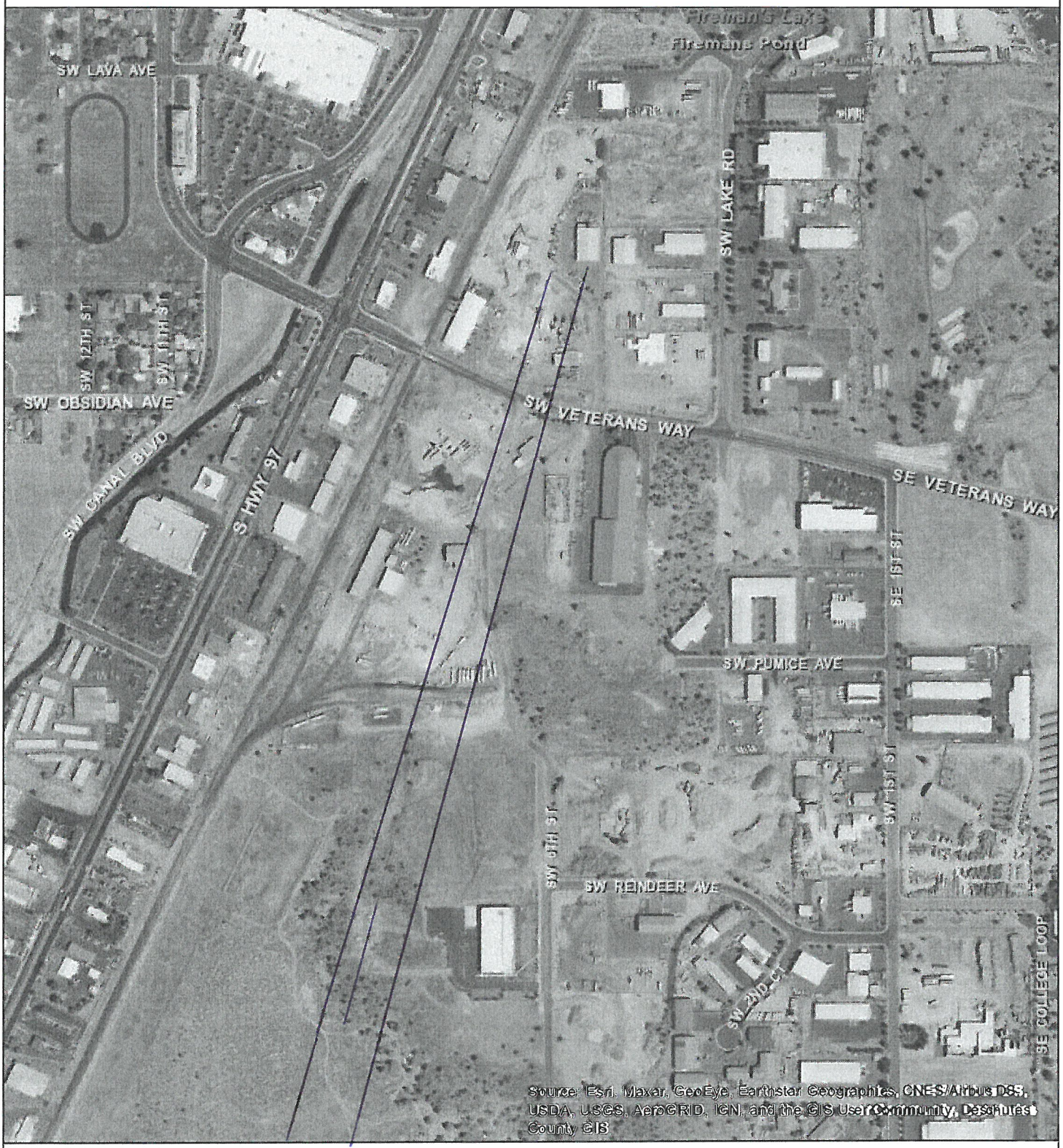
Overview Map

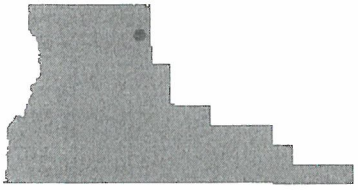


Map and Taxlot: 151321C000105

Deschutes County Property Information - Dial

Overview Map

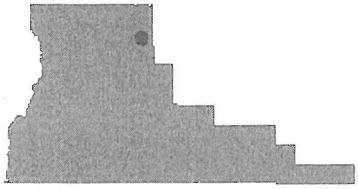




Map and Taxlot: 151321C000105

Deschutes County Property Information - Dial

Overview Map

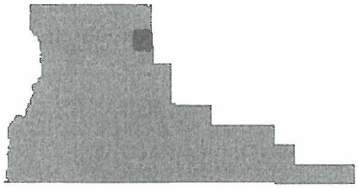


Map and Taxlot: 151321C000105

DESCHUTES COUNTY

Deschutes County Property Information - Dial

Overview Map



Map and Taxlot: 151321C000105

DESCHUTES COUNTY

CITY OF REDMOND
ORDINANCE NO. 2020-18

AN ORDINANCE UPDATING THE REDMOND TRANSPORTATION SYSTEM PLAN, INCLUSIVE OF THE 2018 AIRPORT MASTER PLAN, MAKING IT THE TRANSPORTATION ELEMENT OF THE REDMOND COMPREHENSIVE PLAN.

WHEREAS, the City of Redmond Urban Area Planning Commission conducts periodic review of the Transportation System Plan, considers needed updates and recommends changes in accordance with Oregon Revised Statutes Chapter 227 that regulate and control the development of land within the City; and

WHEREAS, the City Council has an adopted set of goals that include: "Enhance the quality of life through the adoption of programs, policies and standards that balance growth while maintaining our unique character" and "Update Transportation System Plan and associated plans that advance the City's long-term development goals"; and

WHEREAS, the Redmond Urban Area Planning Commission held one work session, and a public hearing on September 8, 2020, and, after reviewing the record and gathering public testimony, has recommended that the City Council adopt updates to the Transportation System Plan; and

WHEREAS, the City Council held a public hearing on December 8, 2020, to consider the recommendations of the Redmond Urban Area Planning Commission, review the existing record and gather additional evidence and public testimony; and

WHEREAS, the City Council determines that the findings for the adoption of the amendments to the Transportation System Plan have fully addressed the City's Comprehensive Plan, applicable state law, Statewide Planning Goals and the City's standards and criteria for an amendment to the Code; and,

WHEREAS, the City Council finds that the attached amendments to the Transportation System Plan and Airport Master Plan are necessary to further these interests.

NOW, THEREFORE, THE CITY OF REDMOND ORDAINS AS FOLLOWS:

SECTION ONE: The City of Redmond hereby amends the Transportation System Plan, inclusive of the Airport Master Plan. The updated Transportation System Plan are attached hereto as "Exhibit A."

SECTION TWO: In support of the amendments in Section One, the City hereby adopts the findings, attached hereto as "Exhibit B" which were prepared by City staff and demonstrate compliance with the City's Comprehensive Plan and the applicable Statewide Planning Goals.

SECTION THREE: The provisions of this Ordinance are severable. The invalidity of any section, clause, sentence, or provision of this Ordinance shall not affect the validity of any other part of this Ordinance, which can be given without such invalid part, or parts.

PASSED by the City Council and **APPROVED** by the Mayor this 8th day of December 2020.

_____
George Endicott, Mayor

ATTEST:

_____
Kelly Morse, City Recorder

Exhibit A (attached hereto):

City of Redmond Transportation System Plan:

- Volume 1
- Volume 2 (Appendix A – K)
- Errata Table (Topics 1 – 4)
- Errata Map - Functional Classification Redmond, Oregon (Figure X)
- Fly Redmond – Redmond Municipal Airport Master Plan

Exhibit B

FINDINGS FOR AMENDMENTS/UPDATES TO THE CITY OF REDMOND TRANSPORTATION SYSTEM PLAN AND REDMOND COMPREHENSIVE PLAN

FILE NO. 711-000021-TA

REQUEST: A Legislative Amendment to the Redmond Transportation System Plan, inclusive of the Airport Master Plan to make revisions, update growth data and maps.

APPLICANT: City of Redmond, 411 SW 9th Street Redmond, OR 97756

STAFF: Deborah McMahon, Planning Manager

HEARINGS BODY: City Council & Redmond Urban Area Planning Commission

DATE& TIME: September 8, 2020 at 4:30 pm; Redmond Urban Area Planning Commission
December 8, 2020 at 6:00 pm; Redmond City Council

LOCATION: Virtual Meeting through 'GoTo' as noticed and published - City Council Chambers, 411 SW 9th Street, Redmond, OR 97756

I. APPLICABLE CODE SECTIONS AND CRITERIA:

- Oregon Revised Statutes (ORS) – ORS 197.250, 197.610, 197.763. Oregon Administrative Rule (OAR), LCDC, Division 15, Statewide Planning Goals and Guidelines – OAR 660-015-0000 (as applicable) OAR 660-012 – Transportation Planning,OAR 660-034 – Airport Planning
- Development Code Section 8.0760 (Criteria for Amendments).

II. BACKGROUND SUMMARY:

As part of planning for the City's future, frequent updates are made to master plans, pertinent reports and documents that support and implement the Redmond Comprehensive Plan. The Redmond Transportation Plan (TSP) is the mandated transportation element to the Comprehensive Plan and was lasted updated in 2008. The TSP also includes the Airport Master Plan. The adoption prepares Redmond for accommodating transportation needs and facilities within its urban growth boundary (UGB) through the 2040 planning horizon.

The 2020 TSP identifies the transportation facilities and services to support the City's adopted Comprehensive Plan. The TSP provides for a long-term community approach to accommodate new growth while maintaining and improving transportation facilities for all users over the next 20-years.

The 2020 TSP satisfies the state's requirements for a local transportation system plan as prescribed by Oregon Statewide Planning Goal 12: Transportation. The Oregon Revised Statutes (ORS) require that the TSP be based on the Comprehensive Plan land uses and provide for a transportation system that accommodates the expected growth in population and employment.

The 2020 TSP has been developed to build on the City's successes while proposing improvements to better achieve community values related to safety, mobility, accessibility, economic vitality, equity, environmental stewardship, and financial sustainability. The updated TSP identifies needs, under existing conditions and under projected future conditions. Transportation solutions are proposed to address those needs, including new and upgraded infrastructure and new and ongoing system improvement programs.

The amendments to the 2020 TSP were initiated legislatively by the City in a cooperative program with the Oregon Department of Transportation. The findings contained herein demonstrate that the adoption of the updated TSP is consistent with relevant Statewide Land Use Planning Goals, Oregon Transportation Plan policies, Oregon Highway Plan policies, Oregon Administrative Rules, Redmond Comprehensive Plan policies, and Development Code Section 8.0760. The criteria set forth in the Section 8.0760 are addressed herein, as well as applicable state laws and requirements.

III. PROPOSAL: The request is for a Legislative Amendment to update the Redmond Transportation System Plan, inclusive of the Airport Master Plan. The update helps the City better guide and manage growth. It is important to update the TSP when new information is available through new State law, and local needs related to transportation needs.

Transportation is the backbone that supports the City as it continues to grow and accommodate new citizens. The TSP update articulates City goals, policies and priorities. Additionally, it provides a list of construction projects and programs to ensure that the transportation system continues to support the City's needs and vision, and conforms to state and regional policies. The TSP must remain relevant and responsive and will be revisited over time.

IV. EXHIBITS: The following exhibits make up the record in this matter:

1. The proposed text of the updated Transportation System Plan (Volume I and II), errata sheets and Airport Plan Master Plan (Exhibit A).
2. Proposed Findings and Conclusions included herein (Exhibit B).
3. Notices to Department of Land Conservation and Development (DLCD), Notice of Redmond Urban Area Planning Commission Public Hearing in the "Bulletin", Notice of City Council Public Hearing in the "Bulletin".

4. Staff reports and hearing minutes prepared for City Council and Redmond Urban Area Planning Commission work session or public hearings.
5. Public testimony received.

V. FINDINGS AND CONCLUSIONS:

A. REDMOND DEVELOPMENT CODE (RDC), Chapter 8, Sections 8.0750 through 8.0775 (Amendments) sets forth the procedure and standards for an amendment to the text of the Code or to the adopted Redmond Comprehensive Plan or Zoning map. Specifically, Section 8.0760 - Criteria for Amendments, sets forth four (4) criteria that must be met:

1. Conformity with all applicable State statutes;

Finding: The State statutes that directly apply to this application include:

1. ORS 197.610, *Local Government Notice of Amendment or New Regulation/*
2. ORS 197.250, *Compliance with Goals Required.*
3. ORS 197.763, *Conduct of Local Quasi-Judicial Land Use Hearings*; *Notice Requirements*.

The Oregon Revised Statutes require that the TSP be based on the Comprehensive Plan land uses and provide for a transportation system that accommodates the expected growth in population and employment. Development of this TSP was guided by Oregon Revised Statute (ORS) 197.712 and the Department of Land Conservation and Development (DLCD) administrative rule known as the Transportation Planning Rule (TPR, OAR 660-012-0060).

The applicable RDC standards (sections 8.0750 to 8.0775, *Amendment Procedures and Notice Requirements),* and (sections 8.1100 through 8.1125, *Legislative Procedures*), were developed in compliance with the applicable State Statutes listed above regarding noticing and public hearings. Applicability of the Statewide Planning Goals is addressed below. The relevant findings, incorporated by reference herein, show compliance with the aforementioned Statutes.

Regarding Statutory noticing requirements, notice of the proposed amendment has been provided to DLCD and advertised in the local newspaper (public notice) as required by City Code and State Statute.

Regarding Statutory public hearing requirements, this proposal is legislative. Sections 8.1100 through 8.1125 of the RDC implement the quasi-judicial Statutory requirements in similar fashion and have been met. The Redmond Urban Area Planning Commission and City Council's

public hearing and review processes meet the Statutory requirements for the purpose of the review.

Notwithstanding the Statutory requirements addressed herein, the Oregon Administrative Rules (OAR) also implement the Statutes. The applicable Rules are addressed in the ensuing review.

Conclusion: Based on the findings addressing amendment criterion 1, the proposed text amendments to the Transportation System Plan and Comprehensive Plan conform to applicable State statutes.

2. **Conformity with the State-wide planning goals whenever they are determined to be applicable;**

Goal 1- Oregon's Statewide Planning Goals: Citizen Involvement.
To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

Finding: The Redmond Urban Area Planning Commission serves as the City's formal citizen advisory committee to fulfill Goal 1 and is made up of Redmond area residents. The City conducted two public meetings (Planning Commission work sessions) and one public hearing over the past 12-months regarding the amendments.

Public notices and agendas for Planning Commission meetings where and when the proposed amendments were discussed were provided in accordance with law. All documents were available for public review. Further, public notice advertising the public hearing was published in the Bend Bulletin.

The City continually provided public review and involvement opportunities during public work sessions and public hearings conducted by both the Planning Commission and City Council.

Moreover, as part of the project a variety of outreach was conducted to ensure effective public outreach and engagement.

Specific opportunities for engagement included:

- Project website that included web-based surveys and all technical reports, draft goals and policies, meeting summaries, a document library stocked by members of the public, and links to other planning activities in the region;
- Monthly Project Management Team Meetings attended by City, ODOT and County staff;

- Regular updates and work sessions with the Redmond Urban Area Planning Commission;
- Three Public Advisory Committee Meetings;
- Two public open houses co-led with the South Corridor Project;
- Targeted outreach with local community, neighborhood and social service organizations; and
- City Urban Area Planning Commission, City Council, and Deschutes County Board of Commissioners work sessions and public hearings.

Through these public involvement activities, the City provided community members with a variety of forums to identify their priorities for future transportation projects, programs, and policies.

Airport Master Plan

The Airport Master Update was updated by Mead and Hunt and was a completely separate process. The Statewide Planning Program requires the Airport Master Plan be an element of the TSP, and said adoption accomplishes this. The Airport Master Plan update was a three-year process guided by a twelve member Planning Advisory Committee. Five advisory committee meetings, three open houses and two stakeholder meetings were conducted throughout the region as part of the update.

Conclusion: Based on these actions, Oregon Planning Goal 1 for Citizen Involvement has been met.

Goal 2- Oregon's Statewide Planning Goals: Land Use Planning.
To establish a land use planning process and policy framework as a basis for all decisions and actions related to use of land and to assure an adequate factual base for such decisions and actions.

Finding: Through the course of review of the update and amendments to the Transportation System Plan, input was received input from: ODOT, Deschutes County, City staff, Redmond Urban Area Planning Commission, State legislators, developers, stakeholders, and residents of the community.

The City Council has determined adequate factual and policy basis exists to support the proposed amendments. The amendments will better implement policies of the Comprehensive Plan and provide clearer regulations and policies for the City staff to administer.

The TSP serves as a resource for future transportation and land use decision-making by providing:
- Solutions to address existing and future transportation needs for biking, walking, using transit, driving, freight, air, and rail;
- A blueprint for investments in transportation projects and programs that

improve safety and access for all travelers, improve Regional and State resilience, and support City and Regional economic development priorities;
- A tool for coordination with regional and local agencies and governments;
- Information to ensure prudent land use and transportation choices;
- Order of magnitude cost estimates for transportation infrastructure investments needed to support economic development and growth, and possible sources of funding these improvements;
- Function, capacity and location of future streets, sidewalks, bikeways, pathways, transit, and other transportation facilities; and
- Potential programs to help improve opportunities to travel by walking, bicycling and transit in the future.

Conclusion: Based on these findings, the proposed amendments meet Goal 2.

3. <u>Conformity with the Redmond Comprehensive Plan, land use requirements and policies;</u>

<u>Chapter 1 – Redmond Comprehensive Plan: Citizen Involvement.</u>
To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

Finding: The Redmond Urban Area Planning Commission serves as the City's formal citizen advisory committee (as required by State Administrative Rule) and is made up of Redmond area residents. The Planning Commission is formally recognized through City Code and is appointed by the Mayor and City Council. As such, the Planning Commission is the appropriate public review and recommendation body to the City Council to meet this goal.

The City, through the Planning Commission, has conducted public meetings, and one public hearing over the past 12 months regarding the proposed text amendments. Public notices and agendas for Planning Commission meetings where the proposed amendments were discussed were provided. All documents were available for the public review. Further, notice of the public hearing was published in the Bend Bulletin.

The City has continually provided public review and involvement opportunities during public work sessions and public hearings both at the Planning Commission and City Council levels as deemed necessary by such bodies.

The proposed amendments to the TSP and Comprehensive Plan serve

the following Policies of Chapter 1 of the Redmond Comprehensive Plan to meet citizen involvement requirements:

1. The City shall establish a citizen involvement program to provide for widespread citizen involvement.
2. The citizen involvement program shall involve a cross-section of affected citizens in all phases of the planning process.
3. The City shall assign the Redmond Urban Area Planning Commission as its officially recognized committee for citizen involvement (CCI).
4. The City shall establish mechanisms to assure two-way communications between citizens and elected and appointed officials.
5. The City shall provide the opportunity for citizens to be involved in all phases of the planning process.
6. The City shall assure that technical information is available to citizens in an understandable form.
7. The City shall assure that recommendations resulting from the citizen involvement program shall be retained and made available for public assessment. Citizens who have participated in this program shall receive a response from policy-makers.
8. The City shall allocate adequate human, financial and informational resources for the citizen involvement program.

Chapter 2 – Redmond Comprehensive Plan: Land Use Planning.
Establish a land use planning process and policy framework as a basis for all decisions and actions related to use of land and to assure an adequate factual base for such decisions and actions.

Finding: The Redmond Urban Area Planning Commission, City Council, and staff have provided opportunities for and have received public input throughout the review process. Based on this input, the City Council finds that the proposed text amendments are necessary to implement Chapters 1 and 2 of Redmond's Comprehensive Plan. The Council has determined that enough factual and policy basis exists to support the proposed language amendments. The proposed amendments will better implement policies of the Comprehensive Plan and State law and will provide clearer regulations and policies for the City staff to administer.

The proposed amendments serve the following Policies of Chapter 2 of the Redmond Comprehensive Plan to serve land use planning framework requirements:

(***)

2. The plan shall be the basis for specific implementation measures. These measures shall be consistent with and adequate to carry out the

plans. Each plan and related implementation measure shall be coordinated with the plans of affected governments.

3. All land use plans and implementation ordinances shall be adopted by the governing body after public hearing and shall be reviewed and, as needed, revised on a periodic cycle to take into account changing public policies and circumstances, in accord with a schedule set forth in the plan.

4. Opportunities shall be provided for review and comment by citizens and affected governmental units during preparation, review and revisions of plans and implementing ordinances

5. To provide a sound basis for orderly and efficient urbanization by establishing proper relationships between residential, commercial, industrial, public and open land uses, and transportation uses.

(***)

The following Statewide Planning Program Goals are not subject to the text amendments to the Transportation System Plan and deemed to not be applicable:

Goal 3 Agricultural Lands

Goal 4 Forest Lands

Goal 5 Natural Resources, Scenic and Historic Areas, and Open Spaces

Goal 6 Air, Water and Land Resources Quality

Goal 7 Areas Subject to Natural Hazards

Goal 8 Recreational Needs

Goal 10 Housing

Goal 13 Energy

Goals 15 – 19

Chapter 9 – Economic Development
Provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.

Finding: The Redmond Urban Area Planning Commission, City Council, and staff have provided opportunities for and have received public input throughout the review and update process. Based on this input, the City Council finds that the amendments are necessary to implement Chapters

1 and 2 of the City of Redmond's Comprehensive Plan and other Chapters related to economic development. The Council has determined that enough factual and policy basis exists to support the proposed language amendments. The text amendments will better implement policies of the Comprehensive Plan and will provide clearer regulations for the City staff to administer as it relates to transportation planning.

Many of Redmond's Comprehensive Plan's concepts, goals and policies are consistent with the proposed text amendments. Updating the Transportation System Plan provides current data, greater clarity and ease of use and reduces cost and effort for citizens as they prepare proposals for review. The updated Transportation System Plan assures the community that growth needs are identified.

Chapter 11 – Public Facilities and Services

Plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.

Finding: The Redmond Urban Area Planning Commission, City Council, and staff have provided opportunities for and have received public input throughout the update review and update process. Based on this input, the City Council finds that the proposed text amendments are necessary to implement Chapters 1 and 2 of the City of Redmond's Comprehensive Plan and other Chapters related to public facilities and services. The City Council has determined that enough factual and policy basis exists to support the proposed language amendments. The proposed amendments will better implement policies of the Comprehensive Plan and will provide clearer regulations for the City staff to administer. Many of the Plan's existing concepts, goals and policies are consistent with the proposed amendments. The proposed text amendments serve the following Goal of Chapter 11 of the Redmond Comprehensive Plan as it relates to the development of public facilities and services.

1. To provide for a close correlation between the provisions of urban services and urban development in order to bring about a more orderly and efficient development pattern, and thereby avoid unnecessary tax burdens and excessive utility costs normally associated with scattered, unrelated development.

(***)

Chapter 12 - Transportation

To provide and encourage a safe, convenient and economic transportation system.

Finding: The TSP provides a flexible, adaptable framework for making transportation decisions in an increasingly unpredictable and financially constrained future. Decisions about the City's transportation system will be guided by the goals and policies contained in Chapter 2 of the TSP, but ultimately the decisions will be made within the overall context of the City's land use plans, support for local and regional Economic Development, and the City's role in the Oregon Resilience Plan. These guiding plans and principles provide a foundation for the TSP's goals, policies, and potential actions.

The TSP identifies multimodal transportation needs to serve users of all ages, abilities, and incomes. As such, solutions to address existing and future transportation needs for bicycling, walking, transit, motor vehicles, freight, and rail, and improved safety for all travelers are included. Further, one of the implementation steps of the TSP will include adoption of land use and land division ordinance amendments needed to protect transportation facilities and provide active transportation facilities between residential, commercial, and employment/ institutional areas. Finally, as required by the Transportation Planning Rule, the TSP was developed in coordination with local, regional and state transportation plans.

Finding: The Redmond Urban Area Planning Commission, City Council, and staff have provided opportunities for and have received public input throughout the review and update process. Based on this input, the City Council finds that the proposed amendments are necessary to implement Chapters 1 and 2 of the City of Redmond's Comprehensive Plan and other Chapters related to transportation. The City Council has determined that enough factual and policy basis exists to support the proposed language amendments. The proposed amendments will better implement policies of the Comprehensive Plan and will provide clearer regulations for the City staff to administer. Many of the Plan's existing concepts, goals and policies are consistent with the proposed amendments. The proposal text amendments to the Transportation System Plan serves the following Goal of Chapter 12 of the Redmond Comprehensive Plan as it relates to transportation:

> *Within the Redmond Urban Growth Boundary, an urban area transportation system will be developed which enhances the livability of Redmond and accommodates growth and development through careful planning and management of existing and future transportation facilities.*
>
> Policy 1 - Transportation System Management
> Plan or ordinance amendments which significantly affect a transportation facility shall assure that allowed land uses are consistent with the identified function, capacity, and level of service of the facility.

(***)

Finding: The Redmond Urban Area Planning Commission, City Council, and staff have provided opportunities for and have received public input throughout the review and update process. Based on this input, the City Council finds that the proposed Transportation System Plan Update and amendments are necessary for growth management. The proposed updates assure that land uses are consistent with the identified function, capacity, and level of service of the community's transportation facilities.

(***)

Chapter 14 – Urbanization
Provide for an orderly and efficient transition from rural to urban land use, to accommodate urban population and urban employment inside urban growth boundaries, to ensure efficient use of land, and to provide for livable communities.

Finding: The Redmond Urban Area Planning Commission, City Council, and staff have provided opportunities for and have received public input throughout the review and update process. Based on this input, the City Council finds that the proposed amendments are necessary to implement Chapters 1 and 2 of the City of Redmond's Comprehensive Plan and other Chapters related to urbanization.

The City Council has determined that enough factual and policy basis exists to support the proposed text amendments. The proposed amendments will better implement goals and policies of the Comprehensive Plan and will provide clearer regulations for the City staff to administer. Many of the Plan's existing concepts, goals and policies are consistent with the proposed amendments. The proposed text amendments to the TSP and Comprehensive Plan serves the following Goal of Chapter 14 of the Redmond Comprehensive Plan:

1. To direct development within the Redmond UGB at urban level densities in a phased and orderly manner, and with the provision of an adequate level of urban services, including but not limited to public water, sewer, and urban streets.

4. That there is a change of circumstances or further studies justifying the amendment or mistake in the original zoning;

Finding: Since 2008 there were a change of circumstances or further studies justifying the amendment. The proposed amendments responds to a change of circumstances where new data from the State regarding

transportation, as well as a need to manage growth and identify needed transportation improvements. The update process and changes in the community require evaluation and updates to the Transportation System Plan. The amendment is necessary to reflect new information and support implementation of the Comprehensive Plan.

Based on the findings addressing RDC amendment criterion 4, the proposed amendments support the need to provide more clarity and improve processes for better outcomes in transportation planning.

COMPLIANCE WITH OREGON TRANSPORTATION PLAN

The Oregon Transportation Plan (OTP) is the state's long-range, multimodal transportation plan. The OTP is the overarching policy document for a series of modal and topic plans that together form the state's TSP. Per direction from the Department of Land Conservation and Development, a local TSP must make findings to demonstrate compliance with applicable OTP goals and policies will be part of the basis for TSP approval. The TSP update complies with the OTP. The following demonstrates how the TSP update complies with state transportation policy:

Policy 1.1 – Development of an Integrated Multimodal System. It is the policy of the State of Oregon to plan and develop a balanced, integrated transportation system with modal choices for the movement of people and goods.

Findings: Included in the TSP is direction to plan, fund, and develop a balanced multi-modal transportation system that meets the needs of the community. The TSP update includes many policies addressing modal choices for the movement of people and goods. In particular, see attached TSP Goals and Policies.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 1.1. Policy 1.2 – Equity, Efficiency and Travel Choices. It is the policy of the State of Oregon to promote a transportation system with multiple travel choices that are easy to use, reliable, cost-effective and accessible to all potential users, including the transportation disadvantaged.

Findings: The TSP update includes policies addressing choice and equity.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 1.2. Policy 1.3 – Relationship of Interurban and Urban Mobility. It is the policy of the State of Oregon to provide intercity mobility through and near urban areas in a manner which minimizes adverse effects on urban land use and travel patterns and provides for efficient long distance travel.

Findings: The TSP update includes policies addressing mobility, efficiency travel, and minimization of adverse effects on urban land use.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 1.3. Policy 2.1 - Capacity and Operational Efficiency It is the policy of the State of Oregon to manage the transportation system to improve its capacity and operational efficiency for the long term benefit of people and goods movement.

Findings: The TSP update includes policies addressing capacity enhancements and efficiency improvements.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 2.1 Policy 2.2 – Management of Assets. It is the policy of the State of Oregon to manage transportation assets to extend their life and reduce maintenance costs.

Findings: The TSP update includes addressing operations and maintenance of transportation infrastructure.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 2.2. Policy 3.1 – An Integrated and Efficient Freight System. It is the policy of the State of Oregon to promote an integrated, efficient and reliable freight system involving air, barges, pipelines, rail, ships and trucks to provide Oregon a competitive advantage by moving goods faster and more reliably to regional, national and international markets.

Findings: The TSP update includes modal plans and planned improvements include a description of the air, freight, pipeline, rail, aviation systems in the Redmond area, and plan for a system to move goods throughout the planning area.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 3.1. Policy 3.2 – Moving People to Support Economic Vitality. It is the policy of the State of Oregon to develop an integrated system of transportation facilities, services and information so that intrastate, interstate and international travelers can travel easily for business and recreation.

Findings: The TSP update plans for an integrated system of transportation facilities that meet the needs of people who live, work, and travel in and to the Redmond area.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 3.2. Policy 3.3 – Downtowns and Economic Development. It is the policy of the State of Oregon to provide transportation improvements to support downtowns and to coordinate transportation and economic development strategies.

Findings: The TSP update includes transportation programs and improvements to support downtown and was created in coordination with the City's economic development strategies. The TSP update includes policies to provide a multi-modal transportation system to meet the needs of the community into the future, including

accommodating future employment growth and the transport of goods and services needed to support economic development. The transportation system identified in the TSP update was developed using the City's current land use patterns, and designed to connect people, services, goods, and to meet the economic needs of the City.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 3.3. Policy 3.4 – Development of the Transportation Industry. It is the policy of the State of Oregon to promote, incubate and develop transportation related industry and services in Oregon.

Findings: The TSP update includes modal plans, improvements and policies, including a description of the air, freight, pipeline, rail, aviation systems in the Redmond area, and plan for a system that promotes the movement of goods throughout the planning area.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 3.4. Policy 4.1 - Environmentally Responsible Transportation System. It is the policy of the State of Oregon to provide a transportation system that is environmentally responsible and encourages conservation and protection of natural resources.

Findings: The TSP update includes infrastructure improvements and policies that will provide an environmentally responsible transportation system, and result in an overall reduction in vehicle miles traveled by 2040.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 4.1. Policy 4.2 - Energy Supply. It is the policy of the State of Oregon to support efforts to move to a diversified and cleaner energy supply, promote fuel efficiencies and prepare for possible fuel shortages.

Findings: The TSP update includes infrastructure improvements and policies that will support a more diversified and cleaner energy supply and promote fuel efficiencies, including support of electric vehicles and other alternatives to the internal combustion engine.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 4.2. Policy 4.3 - Creating Communities. It is the policy of the State of Oregon to increase access to goods and services and promote health by encouraging development of compact communities and neighborhoods that integrate residential, commercial and employment land uses to help make shorter trips, transit, walking and bicycling feasible; Integrate features that support the use of transportation choices.

Findings: The TSP update includes infrastructure improvements and policies that will increase access to good and services and support the City's plans for increased density and mixed-use within key areas of the City to help make shorter trips, transit, walking and bicycling feasible. Included in the TSP is direction to plan, fund, and develop a multi-modal transportation system that meets the needs of the community and region

and supports compact communities and mixed-use neighborhoods. The TSP update includes facility improvements, both on-street and off-street, intended to provide improved connectivity for people walking and bicycling. It also includes policy direction and facility improvements intended to provide improved public transit efficiency and connectivity.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 4.3. Policy 5.1 – Safety. It is the policy of the State of Oregon to continually improve the safety and security of all modes and transportation facilities for system users including operators, passengers, pedestrians, recipients of goods and services, and property owners.

Findings: The TSP update includes policies, improvements, and programs that promote safety for all modes and system users.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 5.1. Policy 5.2 – Security. It is the policy of the State of Oregon to provide transportation security consistent with the leadership of federal, state and local homeland security entities.

Findings: The TSP update supports and enables the provision of transportation security consistent with the leadership of federal, state and local homeland security entities. Deschutes County Fire/EMS services, the Bend/Redmond MPO, and Redmond police, fire and other public safety and first responders were consulted during TSP preparation.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 5.2. Policy 6.1 – Funding Structure. It is the policy of the State of Oregon to develop a transportation finance structure that addresses the public funding aspects of all modes and reinforces plan strategies. This structure should include provisions for flexibility in the use of new funding sources and new partnerships to achieve system integration while also protecting transportation funds for transportation purposes.

Findings: The TSP update includes a Transportation Funding Strategy which identified possible existing and potential new funding sources and a summary of improvement and program costs. While the Transportation Funding Strategy does identify possible funding mechanisms, it is non-binding and does not commit or allocate funds towards transportation projects. The proposed TSP update and Comprehensive Plan amendments address the public funding aspects of all modes and reinforce plan strategies, and include provisions for flexibility in the use of new funding sources and new partnerships to achieve system integration.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 6.1. Policy 6.2 – Achievement of State and Local Goals. It is the policy of the State of Oregon to plan and manage the transportation finance structure to

contribute to the accomplishment of state and local environmental, land use and economic goals and objectives.

Findings: The TSP funding strategy supports the accomplishment of the transportation projects and programs identified by providing a funding strategy, which will help to contribute to the accomplishment of the state and local environmental, land use and economic goals and objectives as discussed in detail above. While the strategy does identify possible funding mechanisms, it is non-binding and does not commit or allocate funds towards transportation projects.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 6.2. Policy 6.3 – Public Acceptability and Understanding. It is the policy of the State of Oregon to use finance mechanisms that have broad public acceptance and are understandable to transportation system users.

Findings: The TSP update includes funding strategies, which provides direction about how projects and programs identified in the TSP may be funded. While the Transportation Funding Strategy does identify possible funding mechanisms, it is nonbinding and does not commit to the use of any specific finance mechanisms. The TSP update, including the Transportation Funding Strategy, underwent a public participation process to engage the public and seek acceptance for the plan update and that the possible finance mechanisms identified in the plan are understandable to transportation system users.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 6.3. Policy 6.4 – Beneficiary Responsibilities. It is the policy of the State of Oregon to examine mechanisms to expand the beneficiary pay concept to reflect the costs and benefits of uses of the transportation system and reinforce the relationship between benefiting from transportation facilities and paying for their benefit, but to retain essential fairness including cost responsibility. This policy recognizes some modes will continue to need subsidies to achieve overall transportation system goals and provide essential services.

Findings: The TSP update includes a funding strategy, including existing and potential new funding sources and a summary of improvement and program costs. While it does identify possible funding mechanisms, it does not require specific funding mechanisms to be used. Consistent with OTP Policy 6.4, the Transportation Funding Strategy examined mechanisms to expand the beneficiary pay concept to reflect the costs and benefits of uses of the transportation system and reinforce the relationship between benefiting from transportation facilities and paying for their benefit while retaining essential fairness, including cost responsibility.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 6.4. Policy 6.5 – Triage in the Event of Insufficient Revenue. It is the policy of the State of Oregon to resolve revenue shortfalls by means that maximize public

acceptance and that minimize undesirable long-term consequences to the overall transportation system in urban and rural areas.

Findings: The Transportation Funding Strategy finds that the projects and programs outlined in the TSP are reasonably likely to be funded and therefore this policy is met.

Policy 7.1 – A Coordinated Transportation System. It is the policy of the State of Oregon to work collaboratively with other jurisdictions and agencies with the objective of removing barriers so the transportation system can function as one system.

Findings: The Project Management Team (PMT), Project Advisory Committee (PAC), Technical Advisory Committee (TAC), and Redmond Urban Area Planning Commission, representatives of Deschutes County, ODOT, REDI, Chamber of Commerce, Department of Land Conservation and Development, City of Redmond, Cascades East Transit, Redmond School District, OSU Cascades, Central Oregon Community College, Redmond Bicycle and Pedestrian Advisory Committee and 27 members of the public appointed as committee members were part of the TSP development for all required coordination. The private freight industry and Redmond Fire/EMS services were also consulted during TSP preparation.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 7.1. Policy 7.2 – Public/Private Partnerships. It is the policy of the State of Oregon to maintain, expand and provide tools to encourage partnerships to improve efficiency in the delivery of transportation facilities and services benefiting the state transportation system and the state's citizens. Partners include transportation providers, public agencies and private businesses at all levels across jurisdictions and ownerships.

Findings: The TSP update process included participation and input from a large number of partners and stakeholders with the intent of improving the efficiency in transportation facilities implementation and benefiting the public. Public and partner engagement tools included: The Project Management Team (PMT), Project Advisory Committee (PAC), Technical Advisory Committee (TAC), and Redmond Urban Area Planning Commission, representatives of Deschutes County, ODOT, CEC, COIC, Department of Land Conservation and Development, City of Redmond, Cascades East Transit, Redmond School District, OSU Cascades, REDI, Chamber of Commerce, Central Oregon Community College, Redmond Bicycle and Pedestrian Advisory Committee and 27 members of the public appointed as committee members were part of the TSP development for all required coordination. The private freight industry and Redmond Fire/EMS services were also consulted during TSP preparation.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 7.2. Policy 7.3 – Public Involvement and Consultation. It is the policy of the State of Oregon to involve Oregonians to the fullest practical extent in transportation planning and implementation in order to deliver a transportation system that meets the diverse needs of the state.

Findings: The City followed its adopted citizen involvement program to ensure citizens had the opportunity to be involved in all phases of the planning process for the TSP update and Comprehensive Plan amendments. The Citizen Involvement Program states the City will use variety of methods for involving citizens in land use decisions, including updates to the Comprehensive Plan. These methods include those the City used for involving citizens in the TSP process: public advisory committee meetings through which public input was solicited, technical advisory committee, open houses, neighborhood meetings, releasing materials through the City's website, and notifying stakeholders and interested citizens through media notices and direct electronic mail communications.

The TSP update process involved multiple steps to gain an understanding of existing and future conditions and community needs, evaluate alternatives and projects to meet those needs, and refine recommendations. City staff, decision-makers, stakeholders, and volunteer members of the community were enlisted to assist in the project as noted above. All meetings were noticed and open to the public, with opportunities to comment included in the agenda.

The City received both written and oral testimony at each meeting. Written comments were included in the minutes of each meeting. All meetings were noticed and open to the public with opportunities to comment included in the agenda. The City received both written and oral testimony at each meeting. A website was updated regularly throughout the process, with interactive maps and a link for public comment.

The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 7.3. Policy 7.4 – Environmental Justice. It is the policy of the State of Oregon to provide all Oregonians, regardless of race, culture or income, equal access to transportation decision-making.

Findings: The updated TSP includes policies addressing choice and equity, and providing expanded means for equal access to participation in transportation decision making. The proposed Comprehensive Plan amendments and TSP update are consistent with OTP Policy 7.4.

COMPLIANCE WITH THE OREGON HIGHWAY PLAN

The 1999 Oregon Highway Plan, including amendments (OHP), establishes policies and investment strategies for Oregon's Statewide Highway System over a 20-year period and refines the goals and policies found in the OTP. Policies in the OHP emphasize the efficient management of the highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments, and the use of new techniques to improve road safety and capacity. These policies also link land use and transportation, set standards for highway performance and access

management, and emphasize the relationship between state highways and local road, bicycle, pedestrian, transit, rail, and air systems.

The Redmond TSP update meets the state's policies in the OHP as follows: Policy 1A: State Highway Classification System. It is the policy of the State of Oregon to develop and apply the state highway classification system to guide ODOT priorities for system investment and management.

Findings: The TSP update includes policies to preserve and protect the functional classification of state facilities, and support ODOT's proprieties for system investment and management. Besides the policies and Functional Classification Map the proposed Comprehensive Plan amendments and TSP update are consistent with OHP Policy 1A.

Policy 1B: Land Use and Transportation This policy recognizes the need for coordination between state and local jurisdictions.

Findings: The Project Management Team (PMT), Project Advisory Committee (PAC), Technical Advisory Committee (TAC), and Redmond Urban Area Planning Commission, representatives of Deschutes County, ODOT, CEC, COIC, Department of Land Conservation and Development, City of Redmond, Cascades East Transit, Redmond School District, OSU Cascades, REDI, Chamber of Commerce, Central Oregon Community College, Redmond Bicycle and Pedestrian Advisory Committee and 27 members of the public appointed as committee members were part of the TSP development for all required coordination. The private freight industry and Redmond Fire/EMS services were also consulted during TSP preparation. The TSP was also closely coordinated with the Cascades East Transit Master Plan.

The proposed Comprehensive Plan amendments and TSP update are consistent with OHP Policy 1B. Policy 1C: State Highway Freight System. It is the policy of the State of Oregon to balance the need for movement of goods with other uses of the highway system, and to recognize the importance of maintaining efficient through movement on major truck freight routes.

Findings: The TSP update plans for an integrated system of transportation facilities that meet the needs of people who live, work, and travel in and to the Redmond area. Close coordination with ODOT and the South Highway Corridor Plan seeks to enhance efficiency on freight routes.

The proposed Comprehensive Plan amendments and TSP update are consistent with OHP Policy 1C. Policy 1D: Scenic Byways. It is the policy of the State of Oregon to preserve and enhance designated Scenic Byways, and to consider aesthetic and design elements along with safety and performance considerations on designated Byways.

Findings: There are no designated Scenic Byways located within the Redmond UGB therefore OHP Policy 1D is not applicable to the proposed Comprehensive Plan amendments and TSP update.

COMPLIANCE WITH THE TRANSPORTATION PLANNING RULE (TPR)
OAR 660-012-0015; Preparation and Coordination of Transportation System Plans

(***)

(3) Cities and counties shall prepare, adopt and amend local TSPs for lands within their planning jurisdiction in compliance with this division: (a) Local TSPs shall establish a system of transportation facilities and services adequate to meet identified local transportation needs and shall be consistent with regional TSPs and adopted elements of the state TSP;

Findings: The TSP documents the existing conditions and analysis needed to support compliance with the TPR. The TSP data outlines all of the identified needs associated with today's conditions for each mode as well as those intersections and streets not meeting applicable operating standards. The TSP documents the baseline ("no build") analysis, outlining all of the identified year 2040 needs assuming no additional infrastructure beyond that currently funded is added. Each mode's needs as well as intersection and streets not meeting applicable standards are noted. The proposed TSP update and Comprehensive Plan amendments demonstrate that the proposed system of transportation facilities and services are adequate to meet the City and regional needs to 2040.

(b) Where the regional TSP or elements of the state TSP have not been adopted, the city or county shall coordinate the preparation of the local TSP with the regional transportation planning body and ODOT to assure that regional and state transportation needs are accommodated.

Findings: The City coordinated with ODOT on all aspects given that ODOT funded over ½ of the study and TSP update. The Redmond model is carefully developed with coordination between Redmond/Bend MPO model, as well as the Cascades East Transit Master Plan. The proposed TSP update and Comprehensive Plan amendments demonstrate coordination with State and Regional planning processes to assure that regional and state transportation needs are met.

(4) Cities and counties shall adopt regional and local TSPs required by this division as part of their comprehensive plans. Transportation financing programs required by OAR 660-012-0040 may be adopted as a supporting document to the comprehensive plan.

Findings: The TSP, including supporting Appendices, will be adopted as part of the Redmond Comprehensive Plan. The TSP contains all the required components of the -0040(2) finance plan, which include a list of planned transportation facilities and major improvements, general estimate of the timing for planned transportation facilities and major improvements, a determination of rough cost estimates for the transportation

facilities and major improvements identified in the TSP. The proposed TSP update and Comprehensive Plan amendments meet the requirements of this section of the TPR.

(5) The preparations of TSPs shall be coordinated with affected state and federal agencies, local governments, special districts and private providers of transportation services.

Findings: As noted above, the City of Redmond created numerous coordination efforts with many agencies and groups. The proposed TSP update and Comprehensive Plan amendments meet the requirements of this section of the TPR.

OAR 660-012-0016 Coordination with Federally-Required Regional Transportation Plans in Metropolitan Areas (1) In metropolitan areas, local governments shall prepare, adopt, amend, and update transportation system plans required by this division in coordination with regional transportation plans (RTPs) prepared by MPOs required by federal law.

Findings: Redmond is not within a MPO. This criterion does not apply.

OAR 660-012-0020 Elements of TSPs (1) A TSP shall establish a coordinated network of transportation facilities adequate to serve state, regional and local transportation needs.

Findings: The Redmond TSP describes a coordinated network of facilities to serve all modes throughout the City. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(2) The TSP shall include the following elements:

(a) Determination of transportation needs as provided in OAR 660-012-0030

Findings: The TSP and Appendix document the Existing Conditions Inventory and Analysis. These outline all of the identified needs associated with today's conditions for each mode as well as the No Build analysis. These outline all of the identified year 2040 needs assuming no additional infrastructure beyond that currently funded is added. Each mode's needs as are noted. The proposed TSP update and Comprehensive Plan amendments provide an adequate provision of transportation needs through 2040.

(b) A road plan for a system of arterials and collectors and standards for the layout of local streets and other important non-collector street connections. Functional classifications of roads in regional and local TSP's shall be consistent with functional classifications of roads in state and regional TSP's and shall provide for continuity between adjacent jurisdictions. The standards for the layout of local streets shall provide for safe and convenient bike and pedestrian circulation necessary to carry out OAR 660- 012-0045(3)(b). New connections to arterials and state highways shall be consistent with designated access management categories. The intent of this

requirement is to provide guidance on the spacing of future extensions and connections along existing and future streets which are needed to provide reasonably direct routes for bicycle and pedestrian travel. The standards for the layout of local streets shall address: (A) Extensions of existing streets; (B) Connections to existing or planned streets, including arterials and collectors; and (C) Connections to neighborhood destinations.

Findings: The TSP includes a functional classification plan and roadway standards to address this requirement. The street design standards are contained in the City's Standards and Specifications, which will be revised subsequent to the adoption of this TSP.

The Comprehensive Plan and other implementing ordinances address extensions of existing streets; connections to existing or planned streets, including arterials and collectors, as well as connections to neighborhood destinations. The pedestrian and bicycle projects listed in the TSP provide direct routes for walking and bicycling travel, including connections to neighborhood destinations such as schools, parks, shopping, and employment. The TSP includes the planned roadway facilities and associated costs. The identified roadway facility projects and roadway plan are consistent with state and regional transportation plans. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(c) A public transportation system plan which: (A) Describes public transportation services for the transportation disadvantaged and identifies service inadequacies; (B) Describes intercity bus and passenger rail service and identifies the location of terminals; (C) For areas within an urban growth boundary which have public transit service, identifies existing and planned transit trunk routes, exclusive transit ways, terminals and major transfer stations, major transit stops, and park-and-ride stations. Designation of stop or station locations may allow for minor adjustments in the location of stops to provide for efficient transit or traffic operation or to provide convenient pedestrian access to adjacent or nearby uses. (D) For areas within an urban area containing a population greater than 25,000 persons, not currently served by transit, evaluates the feasibility of developing a public transit system at buildout. Where a transit system is determined to be feasible, the plan shall meet the requirements of paragraph (2)(c)(C) of this rule.

Findings: The TSP and the Appendix describe the existing public transportation services. The TSP presents planned City-related transit improvements and strategies, developed in coordination with CET. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(d) A bicycle and pedestrian plan for a network of bicycle and pedestrian routes throughout the planning area. The network and list of facility improvements shall be consistent with the requirements of ORS 366.514.

Findings: The City of Redmond currently complies with ORS 366.514 by requiring sidewalks and bike lanes on all collectors and arterials. The Appendix documents the Existing Conditions Inventory and Analysis. The TSP includes plans for improved bicycle and pedestrian projects and programs and associated costs. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(e) An air, rail, water and pipeline transportation plan.

Findings: The TSP and the Appendix outline the identified needs associated with today's conditions for air (including an Update Airport Master Plan for the Regional Airport), rail, water and pipelines, and the location of these facilities. The TSP does not find the need for or anticipate any fundamental changes to these facilities. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(f) Plan for transportation management and demand management.

Findings: The TSP identifies policies to expand Transportation Demand Management (TDM) plans. The proposed TSP update and Comprehensive Plan amendment are in compliance with this section of the TPR.

(g) Parking plan as provided in OAR 660-012-0045(5)(c).

Findings: The City is not within a MPO and this criterion does not apply to Redmond.

(h) Policies and land use regulations for implementing the TSP as provided in OAR 660-012-0045.

Findings: Policies and potential actions for implementing the TSP are contained in Chapter 2. Additional work for amending the Redmond Codes will be undertaken following adoption of the TSP. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

Transportation financing program as provided in OAR 660-012-0040.

Findings: The TSP includes the transportation financing plan, including existing and potential new funding sources and a summary of improvement and program costs. The TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(3) Each element identified in subsections (2)(b) – (d) of this rule shall contain: An inventory and general assessment of existing and committed transportation facilities and services by function, type, capacity and condition. (A) The transportation capacity analysis shall include information on: (i) The capacities of existing and committed facilities; (ii) The degree to which those capacities have been reached or surpassed on

existing facilities; and (iii) The assumptions upon which these capacities are based. (B) For state and regional facilities, the transportation capacity analysis shall be consistent with standards of facility performance considered acceptable by the affected state or regional transportation agency; (C) The transportation facility condition analysis shall describe the general physical and operational condition of each transportation facility (e.g., very good, good, fair, poor, very poor). A system of planned transportation facilities, services and major improvements. The system shall include a description of the type or functional classification of planned facilities and services and their planned capacities and performance standards.

Findings: The TSP and Appendix document the Existing Conditions Inventory and Analysis and describe the existing and planned facilities and services by function, type and condition for each mode, including a capacity analysis for each mode as described in the rule. These outline the identified needs associated with today's conditions for each mode as well as those intersections and streets not meeting applicable operating standards, including the No Build analysis. These outline all of the identified year 2040 needs assuming no additional infrastructure beyond that currently funded is added.

These present a transportation capacity analysis of the existing and committed roadway system, including streets and intersections consistent with existing city, county, and state standards; in some instances state adoption of alternative mobility standards will be requested in the future through an OHP amendment for Veterans Way Intersection. This operational analysis describes the degree to which those capacities have been reached or surpassed on existing facilities, and the assumptions upon which these capacities are based. The TSP summarizes the proposed system of existing and planned transportation facilities, services and major improvements by functional classification. The City maintains a separate inventory of street physical conditions. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

OAR 660-012-0025 Complying with Goals in Preparing TSPs (1) Adoption of a TSP shall constitute a land use decision regarding the need for transportation facilities, services and major improvements and their function, mode and general location. (2) Findings of compliance with applicable statewide planning goals and acknowledged comprehensive plan policies and land use regulations shall be developed in conjunction with the adoption of the TSP.

Findings: The TSP update is being adopted as a legislative land use decision, consistent with the Redmond Development Code and this rule. These findings of compliance accompany that decision. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR. (

3) The City may defer decisions regarding function, general location and mode of a refinement plan if findings are adopted that: (a) Identify the transportation need for which decisions regarding function, general location or mode are being deferred. (b) Demonstrate why information required to make final determination cannot be made

available within time for TSP preparation. (c) Explain how deferral does not invalidate the assumptions upon which the TSP is based ore preclude implementation of the remainder of the TSP. (d) Describe the nature of the findings which will be needed to resolve issues deferred to a refinement plan; and, (e) Set a deadline for adoption of a refinement plan prior to initiation of the periodic review following adoption of the TSP.

Findings: The TSP does not identify refinement plans at this time. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

OAR 660-012-0030 Determination of Transportation Needs (1) The TSP shall identify transportation needs relevant to the planning area and the scale of the transportation network being planned including: (a) State, regional and local transportation needs (b) Needs of the transportation disadvantaged (c) Needs for movement of goods and services to support industrial and commercial development planned for, pursuant to Goal 9.

Findings: The TSP and the Appendix document the Existing Conditions Inventory and Analysis. These outline all of the identified needs associated with today's conditions for each mode as well as those intersections and streets not meeting applicable operating standards. The TSP and the Appendix document the No Build analysis.

These outline all of the identified year 2040 needs assuming no additional infrastructure beyond that currently funded is added. Each mode's needs as well as intersection and streets not meeting applicable standards are noted. The Appendix documents the transportation needs, by mode, related to state, regional and local transportation needs, needs of transportation disadvantaged, and needs for goods movement to support industrial and commercial development. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(2) Local governments preparing local TSPs shall rely on the analyses of state and regional transportation needs in adopted elements of the state TSP and adopted regional TSPs.

Findings: The TSP has been coordinated with the analyses included in applicable state plans and the Bend/Redmond MPO model data. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(3) Within UGBs, the determination of local and regional transportation needs shall be based upon: (a) Population and employment forecasts and distributions that are consistent with acknowledged comp plan. Forecasts and distributions shall be for 20 years and, if desired, for longer periods;

Findings: The TSP has been coordinated with the population and employment forecasts consistent with the Redmond Comprehensive Plan, which used forecasts through 2028, updated to 2040, and adjusted to include the most recent Portland State

University estimates, as required by rule. The Appendix documents the assumptions for the 20-year housing and employment forecasts. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(b) Measures adopted pursuant to OAR 660-012-0045 to encourage reduced reliance on the automobile.

Findings: Many of the goals, policies, and implementing actions contained in the TSP will help reduce reliance on the automobile and increase the safety and convenience of using other modes. The pedestrian, bicycle, and transit improvement projects contained in the TSP are intended to increase mode choice and reduce reliance on the automobile. The proposed TSP update is in compliance with this section of the TPR.

(4) In MPO areas, calculation of local and regional transportation needs also shall be based on accomplishment of the requirement in OAR 660-012-0035(4) to reduce reliance on the automobile.

Findings: The City of Redmond is not within a MPO. This criterion does not apply.

OAR 660-012-0035 Evaluation and Selection of Transportation System Alternatives (1) The TSP shall be based on evaluation of potential impacts of system alternatives that can reasonably be expected to meet the identified transportation needs in a safe manner and at a reasonable cost with available technology. The following shall be evaluated as components of system alternatives. (a) Improvements to existing facilities or services.

Findings: The multimodal system improvements were assessed against the goals and policies in the TSP to ensure that needs are met with a safe and reasonable manner with available technology. Improvements to existing facilities and services are the fundamental basis and highest priority of the TSP goals, policies and project lists. As iterated within the goals and policies, the City's priority is to improve system efficiency, safety and management and re-purpose existing rights-of-way to include high-quality facilities for non-auto users before widening streets to expand capacity for motorized vehicles.

Per the analysis documented in the Appendix, improvements to the existing facilities and services were examined through the existing conditions study, needs analysis with a "No Build" scenario, and a scenario that explored improvements and additions to the existing system. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(b) New facilities and services, including different modes or combinations of modes that could reasonably meet identified transportation needs.

Findings: All new facilities identified will be designed and built to City Standards to accommodate all modes to increase transportation choices, reduce reliance on the

automobile, and improve safety. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(c) Transportation system management measures;

Findings: The TSP policies as a whole, focuses on increasing the efficiency of the existing transportation system, supporting the economy and encouraging a reduction in vehicle miles traveled. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(d) Demand management measures;

Findings: Transportation Demand Management is a tool Redmond continues to explore and expand within its implementation codes.

(e) A no-build system alternative required by the NEPA or other laws.

Findings: The TSP and the Appendix document the No Build system alternative and associated transportation needs in the year 2040. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(3) The following standards shall be used to evaluate and select alternatives: The transportation system shall support urban and rural development by providing types and levels of transportation facilities and services appropriate to serve the land uses identified in the acknowledged comprehensive plan;

Findings: The TSP and the Appendix document the anticipated land uses and the TSP projects (types and levels of service) needed to support those land uses. The TSP and Volume 2 (Alternatives Evaluation Process) document the alternatives evaluation and selection process. The TSP supports urban growth as planned for the Redmond UGB area in the acknowledged comprehensive plan and regional travel and restricts facility extension that might encourage inappropriate growth on rural lands. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(b) The transportation system shall be consistent with state and federal standards for protection of air, land and water quality; (c) The transportation system shall minimize adverse economic, social, environmental and energy consequences;

Findings: The City is in compliance with State and Federal environmental guidelines while supporting the critical economic and social needs for access to jobs and housing. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

d) The transportation system shall minimize conflicts and facilitate connections between modes of transportation;

Findings: The goals and policies included in the TSP are focused on creating a safe, complete, connected transportation system that meets the needs and safety of travelers of all ages, abilities, races, ethnicities and incomes. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(e) The transportation system shall avoid principal reliance on any one mode of transportation by increasing transportation choices to reduce principal reliance on the automobile. Select transportation alternatives that meet the requirements in section (4) of the rule.

Findings: The alternatives analysis summarized in TSP and the Appendix documents is fundamentally based on the need to decrease reliance on the automobile. The goals and policies emphasize the importance of increasing transportation choices, and the list of needed programs and improvements support the goals and policies for increasing transportation choices. Analysis of the proposed transportation system demonstrates a significant increase in the use of other modes and a reduction in VMT per capita. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

4) Local TSPs shall be designed to achieve adopted standards for increasing transportation choices and reducing reliance on the automobile. Adopted standards are intended as means of measuring progress of metropolitan areas towards developing and implementing transportation systems and land use plans that increase transportation choices and reduce reliance on the automobile. It is anticipated that metropolitan areas will accomplish reduced reliance by changing land use patterns and transportation systems so that walking, cycling, and use of transit are highly convenient and so that, on balance, people need to and are likely to drive less than they do today.

Findings: The TSP implements the Redmond Comprehensive Plan, and the reliance on master planning in order to reduce reliance on the single occupancy vehicle (SOV) as well as VMT for those who do chose to drive. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR.

(2) A transportation financing program shall include the items listed in (a)-(d): (a) A list of planned transportation facilities and major improvements; (b) A general estimate of the timing for planned transportation facilities and major improvements; (c) A determination of rough cost estimates for the transportation facilities and major improvements identified in the TSP;

Findings: The TSP lists the planned transportation facilities and programs, along with a general time estimate. Each project or program is assigned a planning level cost estimate and matched to potential funding. The proposed TSP update and Comprehensive Plan amendments are in compliance with this section of the TPR planning process.

Conclusion

The TSP includes goals, policies, map amendments, and projects and programs needed to implement the community's desired transportation system plan, including requiring analysis by proposed development of the adequacy of the transportation system to serve new development, and requiring mitigation where necessary and appropriate.

The TSP includes policies related to funding to provide greater certainty to new development of needed transportation infrastructure. The proposed TSP supports the Redmond Comprehensive Plan intended to promote a land use pattern that encourages alternative modes of transportation such as transit, walking, and bicycling and to reduce trips and vehicle miles travelled.

The TSP is based on recommendations developed through a robust planning process that used advisory committees. The proposed TSP update implements the Comprehensive Plan by providing a complete transportation network to serve the City, emphasizing the need to provide full access to existing and planned jobs and housing for employees, customers, emergency services, and freight.

City of

REDMOND

Transportation System Plan

DRAFT

June 2020

Acknowledgments

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1

Introduction

In This Chapter

- Why did the Transportation System Plan need to be updated?
- What principles guided the update?
- Who participated in the update's development?

1

Introduction

Welcome to the Redmond Transportation System Plan (TSP). This document establishes a system of transportation facilities and programs to serve the City over the next 20 years. The TSP is the transportation element of Redmond's Comprehensive Plan and updates the TSP adopted in 2008.

The City's transportation system supports how people and goods move from one place to another and affects nearly every aspect of our lives. We import food, clothing, and building materials to our homes. A constant flow of freight supplies many aspects of our lives. We travel to work and school and move about to socialize and play. Streets, pathways, rail lines, and the Redmond Airport create the framework around which our City is built and helps define our livability. Our personal choices about how we travel affect our daily lives and our physical and mental well-being. Transportation is the backbone that supports our city as it continues to grow and accommodate new citizens.

This TSP update articulates City policies and priorities and provides a list of construction projects and programs to ensure that the transportation system continues to support the City's needs and visions, an economically vital, healthy, and equitable community, and conforms to state and regional policies. The TSP must remain relevant and responsive and will be revisited over time.

PACIFIC
POWER
NITURE

TSP Organization

The City of Redmond's TSP is in two volumes. Volume 1 is the main document and includes the items that will be of interest to the broadest audience. Volume 2 contains the technical memoranda, data, and related transportation plans that enhance and support Volume 1.

Volume 1

Volume 1 includes the following:

- Chapter 1: a brief overview of the planning context for the TSP
- Chapter 2: goals and policies that express the City's long-range vision for the transportation system
- Chapter 3: the transportation system deficiencies and needs as well as the process to develop the TSP's list of planned capital improvements and transportation programs
- Chapter 4: an overview of the recommended projects for the multimodal system (this chapter also serves as the Transportation Element of the Comprehensive Plan)
- Chapter 5: a list of the multimodal projects and the costs estimated for their construction
- Chapter 6: a summary of transportation funding and implementation, including estimated revenue stream, cost of 20-year needs, and potential funding sources

Volume 2

Volume 2 includes the following technical documents:

- Appendix A: Public Involvement Plan
- Appendix B: Plans and Policy Review
- Appendix C: Analysis and Assumptions Methodology
- Appendix D: Existing Conditions Analysis
- Appendix E: Future Systems Conditions
- Appendix F: Alternatives Analysis
- Appendix G: Redmond Airport Master Plan Update
- Appendix H: Identification of Preferred and Cost-Constrained Alternatives
- Appendix I: South Corridor Recommendations
- Appendix J: Cost Estimates
- Appendix K: Quarry Avenue Analysis

While not all of Volume 2 is adopted as part of the TSP, all of the documents provide useful information regarding the basis for the decisions represented in Volume 1.

Purpose

The TSP identifies the transportation facilities and services to support the City's adopted Comprehensive Plan. This TSP provides for a long-term community approach to accommodate new growth while maintaining and improving transportation facilities for all users over the next 20 years.

The TSP also serves as a resource for future transportation and land use decision-making by providing:

- Solutions to address existing and future transportation needs for biking, walking, using transit, driving, freight, air, and rail;
- A blueprint for investments in transportation projects and programs that improve safety and access for all travelers, improve Regional and State resilience, and support City and Regional economic development priorities;
- A tool for coordination with regional and local agencies and governments;
- Information to ensure prudent land use and transportation choices;
- Order of magnitude cost estimates for transportation infrastructure investments needed to support economic development and growth, and possible sources of funding these improvements;
- Function, capacity and location of future streets, sidewalks, bikeways, pathways, transit, and other transportation facilities; and
- Potential programs to help improve opportunities to travel by walking, bicycling and transit in the future.

The TSP satisfies the state's requirements for a local transportation system plan as prescribed by Oregon Statewide Planning Goal 12: Transportation.

Guiding Principles And Context

The TSP provides a flexible, adaptable framework for making transportation decisions in an increasingly unpredictable and financially constrained future. Decisions about the City's transportation system will be guided by the goals and policies contained in Chapter 2, but ultimately the decisions will be made within the overall context of the City's land use plans, support for local and regional Economic Development, and the City's role in the Oregon Resilience Plan. These guiding plans and principles provide a foundation for the TSP's goals, policies, and potential actions.

The Oregon Revised Statutes require that the TSP be based on the Comprehensive Plan land uses and provide for a transportation system that accommodates the expected growth in population and employment.

Development of this TSP was guided by Oregon Revised Statute (ORS) 197.712 and the Department of Land Conservation and Development (DLCD) administrative rule known as the Transportation Planning Rule (TPR, OAR 660-012-0060).

Per the TPR, this TSP identifies multimodal transportation needs to serve users of all ages, abilities, and incomes. As such, solutions to address existing and future transportation needs for bicycling, walking, transit, motor vehicles, freight, and rail, and improved safety for all travelers are included. Further, one of the implementation steps of the TSP will include adoption of land use and land division ordinance amendments needed to protect transportation facilities and provide active transportation facilities between residential, commercial, and employment/ institutional areas. Finally, as required by the TPR, this TSP was developed in coordination with local, regional and state transportation plans.

Regional Coordination & Community Engagement

Because traffic and mobility needs do not stop at a city's borders, the City is and remains committed to coordinating transportation plans within Central Oregon. This TSP was collaboratively developed by the City and community members, businesses, ODOT, and Deschutes County. Opportunities for engagement included:

- Project website that included web-based surveys and all technical reports, draft goals and policies, meeting summaries, a document library stocked by members of the public, and links to other planning activities in the region;
- Monthly Project Management Team Meetings attended by City, ODOT and County staff;
- Regular updates and work sessions with the Redmond Urban Area Planning Commission
- Three Public Advisory Committee Meetings;
- Two public open houses co-led with the South Corridor Project;
- One "virtual" Open House on the draft TSP;
- Targeted outreach with local community, neighborhood and social service organizations; and
- City Planning Commission, City Council, and Deschutes County Board of Commissioners work sessions and public hearings.

Through these public involvement activities, the City provided community members with a variety of forums to identify their priorities for future transportation projects, programs, and policies.

FOR LEASE
Welcome
to
Redmond
PACK 21
REDMOND, OREGON

2

Goals & Policies

In This Chapter

- What goals guide the 20-year Transportation System Plan
- What policies will be set to carry out these goals?
- What is the difference between goals and policies?

2

Goals & Policies

The TSP Goals are intended to be broad statements that characterize the community's desires and vision for the future transportation system. The goals are intended to be aspirational and may not be fully attained within the 20-year planning horizon of this plan. The goals are intended to be supported by the policies as well as specific implementation items for the City to address after the TSP has been adopted.

TSP Goals

1 Provide a safe and efficient transportation network to complement key economic development priority areas, the comprehensive plan, recreational needs, and adopted state, regional and local plans and policies.

2 Advance community and statewide emergency preparedness efforts through support of the Oregon Resiliency Plan.

3 Provide transportation choices and address the needs and safety of all travelers, including people of all ages, abilities, ethnicities, and incomes.

4 Provide comfortable, convenient and safe pedestrian and bicycle facilities for all users.

5 Provide reliable and convenient transit service to Redmond residents, its businesses, and its connection to surrounding cities, as well as special transit options for the City's elderly and disabled residents.

6 Ensure efficient and effective freight transportation infrastructure is developed and maintained to support local and regional economic expansion and diversification consistent with City and Regional economic plans and policies.

7 Implement the plan in a timely fashion and keep it up to date with respect to local and regional priorities.

Policies

Policies are statements adopted to provide a consistent course of action and move the community toward attainment of its goals. Policies in the TSP guide the work of the City staff in formulating proposed changes to the Zoning Code and other regulatory documents, to guide other work programs and long-range planning projects, and to prepare budget and capital improvement program. These policies will not be used in determining whether the City shall approve or deny individual land use applications.

System Policies to Support Economic Development

Policy 1.1: Manage the City's street, bike, pedestrian, and transit system to facilitate economic growth of existing and future businesses in Redmond.

Policy 1.2: Consider environmental impacts of the overall transportation system and strive to mitigate negative effects and enhance positive features of the natural landscape and topography.

Policy 1.3: Provide a multi-modal transportation system to help reduce reliance on single-occupancy vehicle travel and supports mixed-use areas, employment centers, recreation, commercial, residential, and public developments.

Policy 1.4: Manage the on-street parking system to preserve adequate capacity and turnover for access to businesses in the downtown area.

Policy 1.5: Facilitate prompt emergency responses by ensuring that fire and emergence response routes remain passable by design.

Policy 1.6: Coordinate underground capital improvement projects to coincide with needed transportation project expenditures.

Oregon Resiliency Plan Policies

Policy 2.1: Prioritize transit and roadway improvements that help ensure access to local schools and other public buildings that could be used during emergencies.

Policy 2.2: Prioritize roadway improvements that can be used as alternative routes to US 97 and OR 126 in the case of emergencies

Policy 2.3: Prioritize roadway improvements that provide land-side access to the Redmond Municipal Airport and the BNSF line.

Source: Oregon Department of Transportation

Multimodal Policies

Policy 3.1: Address the mobility and safety needs of motorists, transit users, bicyclists, pedestrians, freight, and the needs of emergency vehicles when planning and constructing roadway system improvements.

Policy 3.2: Consider safety first when making transportation decisions. Strive for zero transportation-related fatalities and severe injuries through design, operations, maintenance, education and enforcement.

Policy 3.3: Foster neighborhoods where all residents can meet many of their basic daily needs without an automobile by providing streets, sidewalks, bike facilities and access to transit in an environment where people feel safe and secure.

Policy 3.4: Expand existing Transportation Demand Management (TDM) programs related to carpooling, alternate work schedules, walking, bicycling, and transit use in order to reduce peak hour congestion and reliance on SOVs.

Bicycle and Pedestrian Policies

Policy 4.1: Maintain and preserve a safe and efficient bike and pedestrian system in Redmond.

Policy 4.2: Strive to increase the percentage of bicycle and pedestrian system users by planning, designing, and managing systems to support the needs of diverse populations and types of users, including meeting Americans with Disabilities Act (ADA) needs.

Policy 4.3: Ensure that there are safe, accessible, comfortable, and direct sidewalk connections between residential areas, schools, major destinations, and transit stops.

Policy 4.4: Improve community health by designing streets and paths to encourage increased physical activity by the public.

Policy 4.5: Prioritize improvements that complement and improve access to the Dry Canyon trail system.

Policy 4.6: Coordinate with Deschutes County and other agencies to provide additional trail extensions throughout the community including connections beyond the city limits.

Transit Policies

Policy 5.1: Coordinate with Cascades East Transit to increase the transit system's accessibility and convenience for all users, including the transportation-disadvantaged population.

Policy 5.2: Prioritize improved transit service in areas with access to key employment and recreational areas.

Freight Policies

Policy 6.1: Manage traffic operation systems for efficient freight and goods movement along designated freight, truck, and rail routes in Redmond.

Policy 6.2: Facilitate efficient access for goods, employees, and customers to and from employment, commercial, and industrial lands, including freight access to the Redmond Municipal Airport.

Policy 6.3: Reduce conflicts between rail and street traffic.

Regional Coordination Policies

Policy 7.1: Coordinate the design of Redmond's transportation system with ODOT, Deschutes County, Cascades East Transit and other relevant local, regional, and state agencies.

Policy 7.2: Support development of a stable and flexible transportation finance system that provides adequate resources for transportation needs identified in the TSP.

Policy 7.3: Build and maintain public support for the TSP through open information, public participation, public discussion of the plan's effects on the community, and periodic reassessment of the plan's goals and policies.

Policy 7.4: Evaluate opportunities for providing Transportation System Management and Operations (TSMO) improvements that address safety and efficiency for all modes.

Policy 7.5: Coordinate with ODOT on the implementation of the South Corridor Plan, including local roadway connections and circulation.

3

Needs Assessment & Evaluation

In This Chapter

- What is Redmond's transportation system like now?
- What types of projects will likely best meet current and future needs?

3

Needs Assessment & Evaluation

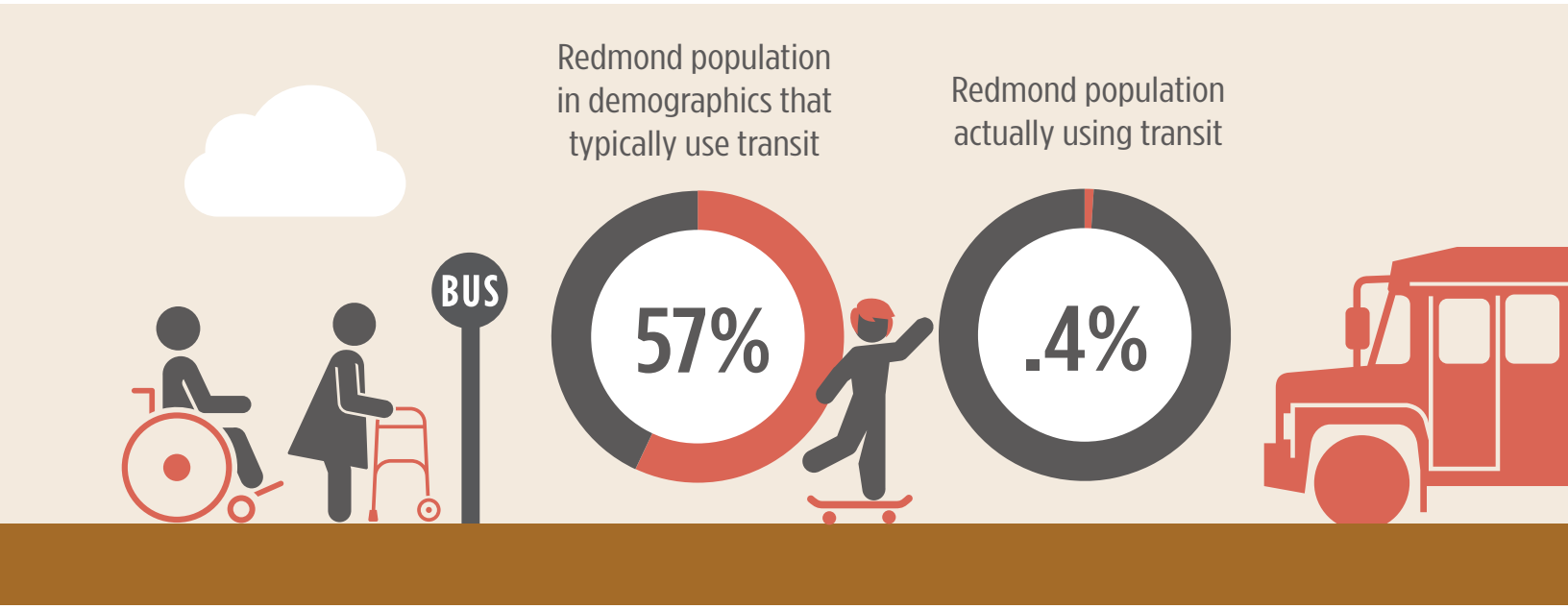
The TSP goals, policies, projects, and potential implementing actions are based on analysis by, and input received from, the community, City of Redmond staff, partner agency staff, and City policy-makers. Their review included analysis of existing transportation conditions for all modes of travel, forecast deficiencies in the transportation system, and an evaluation of possible system improvements that can meet the transportation needs for all users (including the transportation disadvantaged) and address the need for movement of goods and services to support local and regional economic development priorities. The list of recommended projects and programs was identified based on an analysis of the City's transportation needs, potential system alternatives, and a detailed review of relevant state, regional, and local plans, policies, and funding opportunities. The following sections outline the key findings from the existing and future needs analyses that helped shape the recommendations.

Existing Transportation System Conditions

Existing transportation needs, opportunities, and constraints reflect an inventory of the multimodal transportation system characteristics conducted in 2017. This inventory included all major transportation-related facilities and services within the Urban Growth Boundary (UGB) at that time. Key roadway features, traffic conditions, safety performance, bicycle and pedestrian facilities, and transit service, among other topics, were analyzed. Detailed findings of the technical analysis are summarized in Volume 2, Appendix D: Existing Conditions Analysis. Key findings of this review are outlined below.

Key Findings

- Approximately 57% of Redmond's population consists of demographic groups related to age, disabilities and income that typically rely on public transportation in other communities; however, less than one percent of the population (0.4%) utilizes public transportation.
- Citywide, sidewalks are frequently missing on one or both sides of the street, there is a lack of consistent street lighting, and there are long distances between protected pedestrian crossings. Walking can be improved by filling gaps in the sidewalk network, improving buffers from traffic, and providing improved crossings and other safety measures.
- A number of arterial roadway corridors and key intersections could benefit from strategic capital improvements to the existing system to provide better connectivity, improved safety measures and an improved walking and cycling effort.
- An increase in low-stress bicycle facilities is needed citywide.
- Freight access, particularly on the east side of town, is a critical component of the Redmond economy.



Basis Of Need Assessment

The TSP addresses the projects, programs, and policies needed to support growth in population and jobs within the Redmond UGB as well as the travel associated with regional and state economic growth between now and the year 2040. Over time, the City, Deschutes County, and ODOT will monitor the multimodal transportation needs and will periodically update the TSP to respond to changing conditions.

The needs assessment and resulting projects (set forth in Chapter 4) intended to meet the identified transportation needs are based upon the land use designations established by the City's Adopted Comprehensive Plan. The TSP reflects Redmond policy makers' and community members' priorities to maintain existing facilities and reduce congestion, save money, and provide health benefits for the entire community by providing alternatives to single occupancy vehicle travel and by making existing streets safer and more efficient without costly increases to automobile-oriented infrastructure.

2040 Population and Employment Forecasts

Table 1 shows the household and job growth forecasts within the City's UGB. The City of Redmond, in coordination with ODOT, allocated this growth to developable areas within the UGB consistent with the land use designations shown in the adopted Comprehensive Plan at the time the TSP was prepared.

Traffic Volume Development

Based on the geographic allocations of future job and household growth within the UGB, ODOT's Transportation Planning and Analysis Unit (TPAU) developed traffic volume forecasts for the City's collector and arterial street system using the Bend-Redmond regional travel demand model, which is a tool that is used to forecast future street volumes based on projected increases in jobs and housing as well as changing travel preferences. This model is calibrated to existing traffic volumes measured on streets and highways within the City. In addition to land use and street network inputs, the model also relies on information about existing traveler behavior and trip-making characteristics derived from surveys, and from research that forecasts how people might use the transportation system in the future.

The travel demand forecasts and measured traffic counts at 45 intersections within the City were used to calculate year 2040 intersection and roadway volumes for use in the analyses of future system deficiencies. The future volume calculations were performed using the procedures outlined in ODOT's Analysis and Procedures Manual (APM).

Table 1: City of Redmond Land Use Estimates

	Year 2010	Year 2040	Growth
Households	10,061	22,433	12,372 (123%)
Employees	10,134	28,550	18,416 (181%)

Baseline Streets and Intersections Analyses

Previously adopted plans and policies for the City, Deschutes County and ODOT all identified a variety of street, pedestrian, bicycle, and transit projects that could be implemented in the future. The Baseline Analysis assumes the 2040 population and employment forecast and the existing transportation system will not change by 2040 except for the construction of transportation improvements that have already been started or for which funding is already allocated. At the time the TSP was prepared, there were no guaranteed funding sources for any major projects that will materially affect traveler behaviors and traffic volumes on the City's street network in the future. This analysis informs the development of the project list reflected in Chapter 4.

Source: Oregon Department of Transportation

Multimodal circulation and capacity improvements are needed to support continued economic growth and vitality.

Identified Transportation Needs

The results of the year 2040 Analyses are summarized in Volume 2, Appendix E: Future Systems Conditions.

Key Findings

- Several primary street corridors are anticipated to experience increased congestion in the future. Notable examples include OR 126 within the UGB, Maple Avenue between US 97 and Northwest Way, Yew Avenue between Airport Way and S 27th Street and US 97 south of SW Glacier Avenue. Multimodal circulation and capacity improvements are needed to support continued economic growth and vitality within the city and to offer a variety of route and mode choices to help alleviate this congestion.
- Many of the arterial and collector intersections are anticipated to need geometric and/or traffic control modifications in the next twenty years to maintain a desired quality of service for future users.
- Several of the streets within the City lack sidewalks, especially in the neighborhoods to the west of US 97. The City should consider prioritization of new sidewalks and pathways that connect neighborhoods to schools, commercial areas, and other key destinations.
- Cyclists are required to “share the road” on most streets within Redmond or ride on busier collector and arterial bike lanes, which are classified as “high-stress” under existing and year 2040 baseline conditions and are not suitable for riders of all ages and abilities. When bike lanes are provided, the facilities are often non-buffered and located on higher volume/higher speed roads, which typically offset the “stress reducing” attributes of the bike lane. Additional low stress bike facilities to support commuting, recreational and personal travel are needed.
- The bicycle trail system should be expanded to encourage greater access, including inter-agency coordination.
- Increased transit options are needed to facilitate travel throughout the City.

Evaluation Of Transportation System Alternatives To Address Identified Needs

The Project Advisory Committee (PAC), Project Management Team (PMT), and participants at open houses and other community forums identified transportation system alternatives that had the potential to address existing and future transportation needs. These alternatives address all modes of travel and include programs that would reduce vehicular travel demand. Further, these potential system alternatives avoid principal reliance on any one mode of transportation and increase transportation choices for all users. The PMT developed these ideas into a potential project list that was screened by agency staff against the TSP's evaluation criteria and ultimately identified for the 20-year list of projects reflected in Chapter 5. This multistep process is described below.

The potential alternatives were first screened against a set of key questions, including:

- Does the project address an identified transportation problem or opportunity?
- Is the project within the City's Urban Growth Boundary? Is it within the City's control, or the control of its partnering agencies, to implement?
- Is it technically feasible to construct and/or implement?
- Could the project be reasonably funded within the next twenty years?

If the answer to any question was "no," the project idea was not further considered. The remaining ideas were evaluated by the PMT against the criteria that are intended to help differentiate between alternatives. The criteria considered included:

- Balances impacts to developable parcels with system and community needs;
- Minimizes impacts to Goal 5 resources;
- Supports or enhances the ability to implement the Oregon Resiliency Plan and/or other key state or regional projects;
- Leverages future transportation investments to reduce access, economic, safety and health disparities between neighborhoods, particularly those with greater populations of low income, minority, youth and/or elderly population than the City as a whole.
- Addresses key connectivity needs on the collector and arterial street system;
- Addresses known safety issues;
- Supports enhanced multimodal access to major activity centers and/or economic development priority areas within the City as well as the region;
- Provides pedestrian and bicycle connectivity to key transit corridors;
- Provides pedestrian and bicycle connectivity to key routes to school;
- Addresses key gaps in the bicycle system;
- Addresses key gaps in the pedestrian system;
- Improves freight mobility on designated freight, truck, rail and air routes;
- Improves mobility for through traffic on state highways; and,
- Leverages public and private investments.

The resultant 20-year project list is intended to address the identified transportation needs, meet the TSP goals and reflect the criteria included in ORS 660-012-0035. The recommended multimodal transportation projects are organized into the following categories for implementation based on complexity, likely availability of funding and assessment of need:

- Strategic Street Capacity Investment Corridors,
- New Planned Streets,
- Intersection Capacity Improvements,
- Grade-Separated Intersection Improvements,
- Key Multi-Use Pathways,
- Key Bicycle Corridors, and
- Key Pedestrian Improvements.

The draft project lists and a map of the project locations were posted to the City's website prior to adoption. The project lists are provided in Chapter 5.

Source: Wikimedia Commons, by Ian Poellet - Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=7327699

4

Creating Multimodal Systems

In This Chapter

- What types of facilities are needed to support people using different modes of transportation?
- What features characterize Redmond's pedestrian, motor vehicle, bicycle, freight, rail, air, pipeline, and waterway facilities?

4

Creating Multimodal Systems

The TSP is a coordinated set of multimodal policies, programs, and projects that address the transportation needs within Redmond's UGB over the next 20 years. This chapter provides an overview of these programs and projects; the detailed project list and associated cost estimates are shown in Chapter 5.

Planning for a network of "Complete Streets" that can serve the City's identified transportation needs is an integral part of the TSP. Although automobiles will continue to be a primary mode of travel, and preservation and improvement of the existing street system remains important, the projects, policies, and programs highlight improvements that are designed to increase transportation choices, reduce reliance on the automobile by better accommodating and encouraging travel by foot and bike for short trips, improve safety for all street users, and provide for improved transit service. The TSP, in partnership with the City's adopted land use plans and regulations will ultimately result in land use patterns and transportation systems that make walking, cycling, and use of transit highly convenient so that, on balance, people need to and are likely to drive less than they do today.

Vehicular Needs

The preliminary screening evaluation identified arterial and collector streets that experience or are projected to experience traffic congestion and delay and/or are lacking pedestrian and bicycle facilities that comfortably serve a broad range of users. To meet the identified street system needs, the TSP focuses strategies that improve connections between existing neighborhoods, employment, and commercial areas; provide connections to newly developed areas; improve safety for all travelers; and increase the efficiency of the existing system.

Functional Classification of Streets

The City's street functional classification system organizes the roadway network as a balanced hierarchy of mobility and access to, through, and between different types of land uses. Some factors that are considered in setting a roadway's functional classification are average daily traffic (ADT) volumes, street connectivity, spacing of streets, and the mix and amounts of different travel modes on a typical segment (e.g., bikes and cars). As the community continues to grow and mature, the City will revisit functional classifications periodically to ensure that particular street classifications are still appropriate. The functional classification of the roadway system in Redmond is shown in Figure 1.

The functional classification system is intended to provide more certainty for both private development investment expectations as well as for City construction process. This system categorizes streets in the city as:

- Standard Local Residential
- Industrial Street
- Minor Collector
- Major Collector
- Minor Arterial

Street Design Standards

Street design standards provide information on how streets within each of the functional classifications "look and feel." The City's Street Design Standards identify how existing streets can be modified and new streets can be constructed to accommodate the needs of people with disabilities, riding bicycles, using transit, walking, driving automobiles, and moving freight. In the past, most street design standards were primarily oriented toward moving vehicular traffic, providing rudimentary bike lanes and sidewalks for pedestrians. The TSP reflects design standards intended to ensure streets provide comprehensive and integrated transportation networks that serve all modes of transportation and create quality facilities that invite people of all ages and abilities to pursue active transportation.

Redmond Engineering Standards maintain more specific design elements for each of these sections, including applicable variances and pavement design requirements. The typical sections included in the TSP are intended to provide general guidance on right-of-way width requirements, number and type of lanes, pedestrian facilities and bicycle facilities by functional classification type. In some cases, additional features may be added on a case-by-case basis and per the direction of the City Engineer, such as wider sidewalks, multi-use paths, protected bicycle facilities, protected parking bays, or medians.

The typical sections are illustrated in Figure 2 through Figure 6.

Figure 1: Functional Roadway System Classification

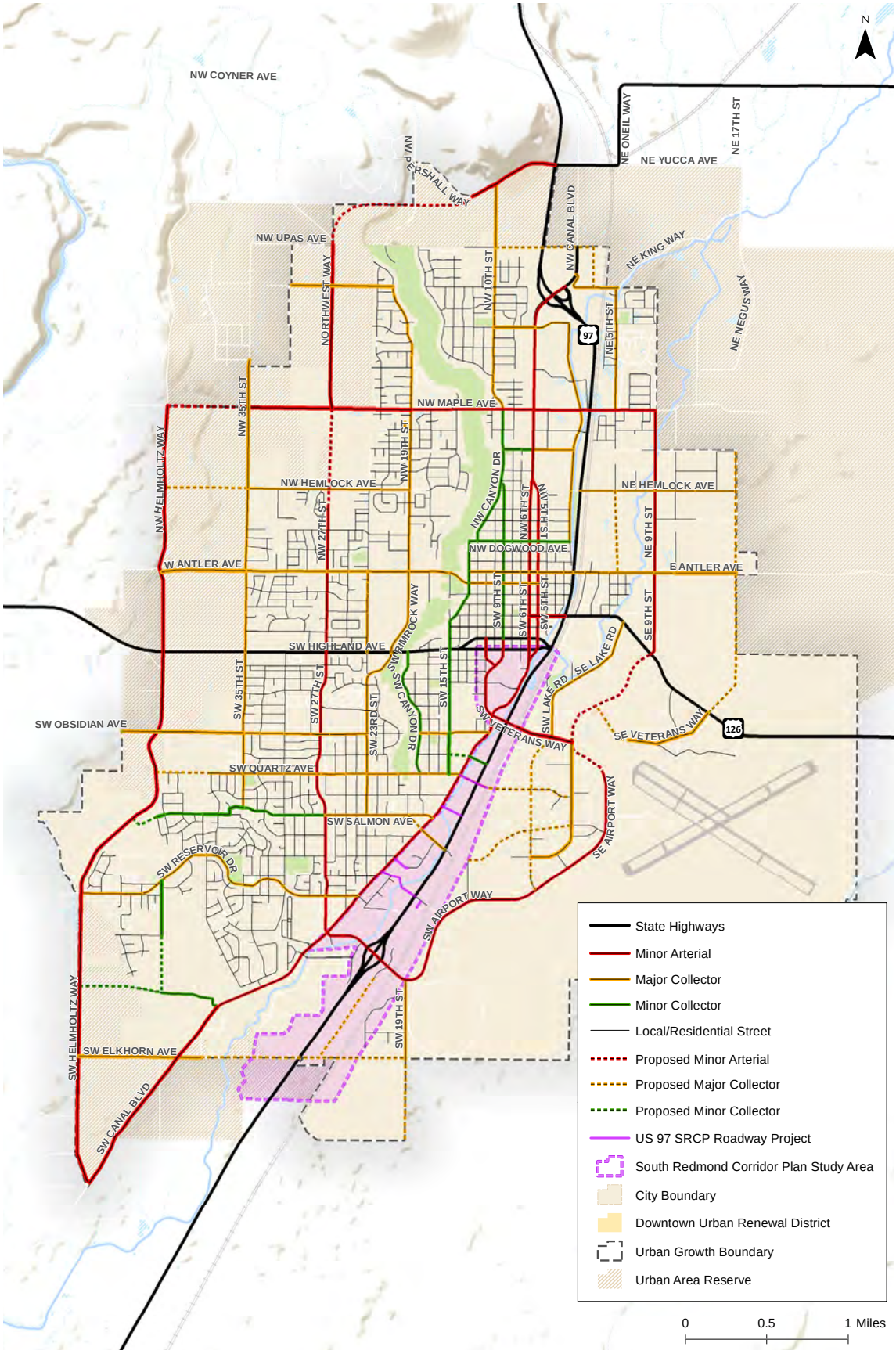
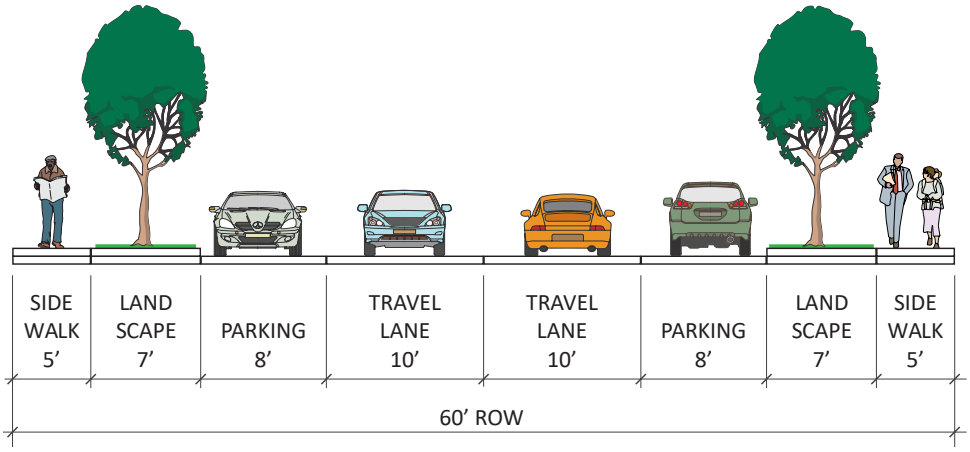
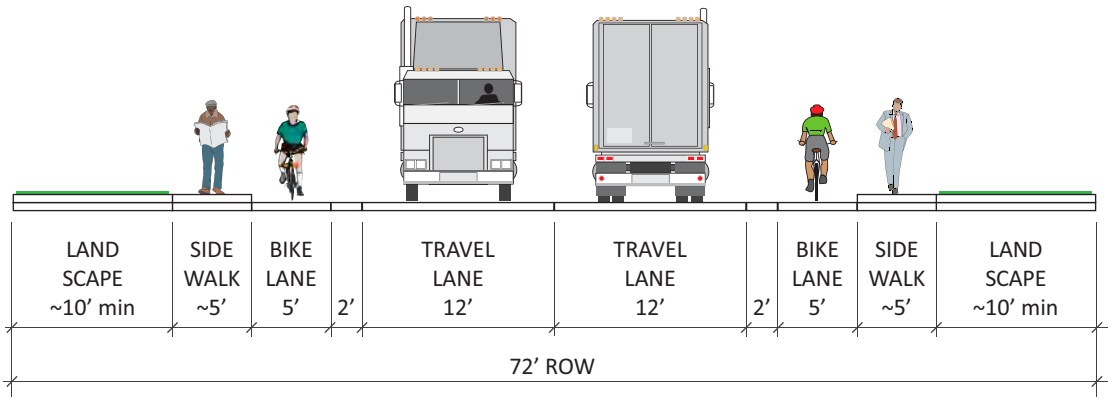


Figure 2: Standard Local Residential Typical Section



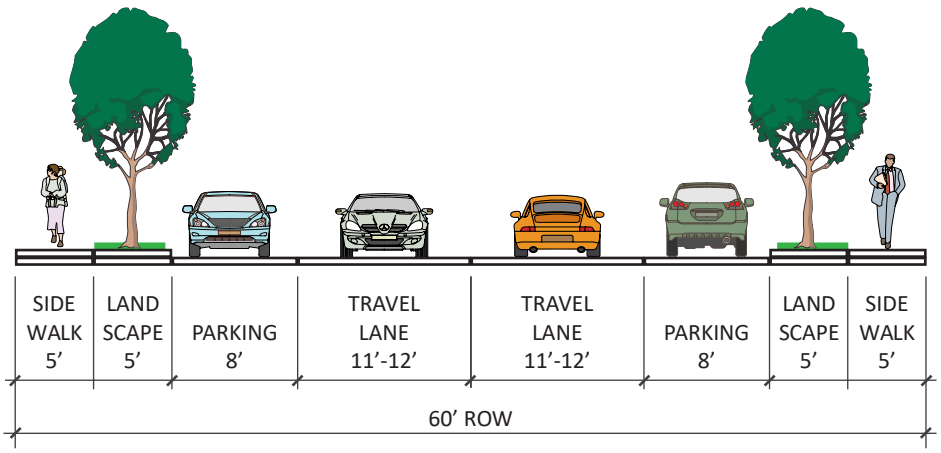
Note: Landscape & sidewalk width can be varied

Figure 3: Industrial Street Typical Section



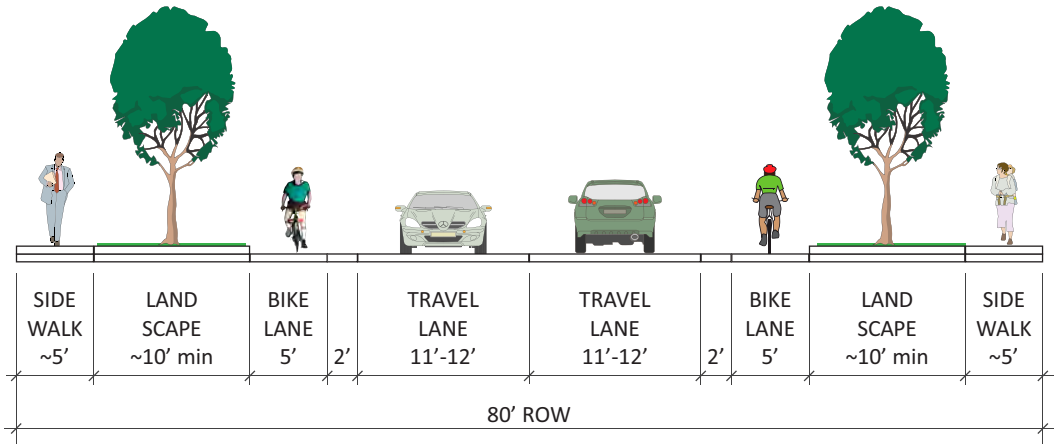
Note: Landscape & sidewalk width can be varied

Figure 4: Minor Collector Typical Section



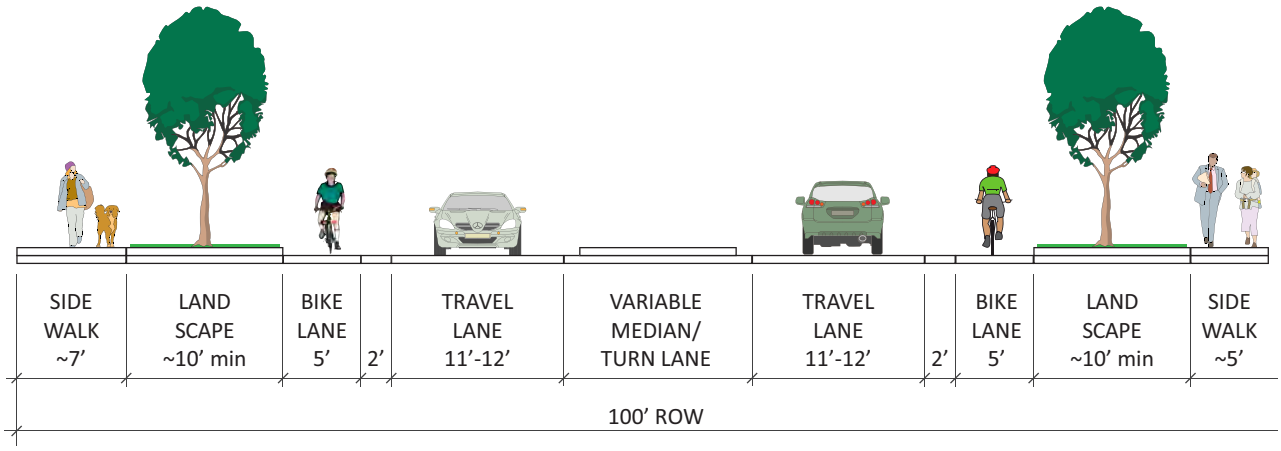
Note: Landscape & sidewalk width can be varied

Figure 5: Major Collector Typical Section



Note: Landscape & sidewalk width can be varied

Figure 6: Minor Arterial Typical Section



Note: Landscape & sidewalk width can be varied

Street Capacity Improvements

The needs analysis identified arterial and collector streets that experience or are projected to experience traffic congestion and delay, lack pedestrian and bicycle facilities to comfortably serve a broad range of users, and/or could hinder implementation of the provision of future reliable transit services in a cost-effective manner. Six corridors reflect the City's current strategic focus for capacity improvements, including: Pershall Way, Northwest Way, SW Helmholtz Way, OR 126 east of US 97, OR 126 west of the downtown, and SW Veteran's Way.

Roadway widening and similar improvements to these key corridors can help accommodate growth and economic development in the region and continue to shape the urban context for the City. Such improvements can improve mobility and connectivity as well as create opportunities to incorporate bicycle, pedestrian, and transit facilities where they do not exist.

New Planned Streets

A number of new streets are planned to improve connectivity between and within existing neighborhoods, employment, and commercial areas; provide connections to newly developed/developing areas; and to provide alternative travel routes for all modes to existing streets. Twenty-three streets were identified for extension and/or providing new connections.

Intersection Capacity Improvements

Intersection capacity improvements are typically related to modifications which are lower in cost than a typical street corridor project and are ones that generally do not often require significant right-of-way acquisition. The TSP is not inclusive of all of the intersection projects that the City will pursue over the next twenty years. Rather, the projects are those that the City can pursue to strategically improve the operational efficiency of specific intersections and important roadways. These projects can enhance system operations and can be completed as opportunities arise. In all cases, the City will review the appropriate intersection control options at the time of project development and delivery.

Graded-Separated Intersection Improvements

Three intersections were identified for grade separation to eliminate conflict points and improve traffic flows whereas one location was identified for future evaluation.

Source: Oregon Department of Transportation

Key Multi-Use Pathways

Multi-use pathways are paved and separated from streets and are designed for both walking and bicycling. Where space allows, corridors with high usage may be developed with redundant paths to separate people walking from people biking. The paths for people walking or running may be unpaved depending on the intended use. The multiuse pathway system improves continuity for bicyclists and pedestrians to move freely throughout the transportation network and helps to eliminate north-south barriers for east-west access, particularly through the Dry Canyon and across US 97. Twenty-one new multi-use pathways were identified for inclusion into the TSP.

Key Bicycle Corridors

In addition to the multiuse pathways, new bike lanes, quiet streets and protected bike lanes will serve the cyclists of Redmond in the future. A brief description of each is provided below.

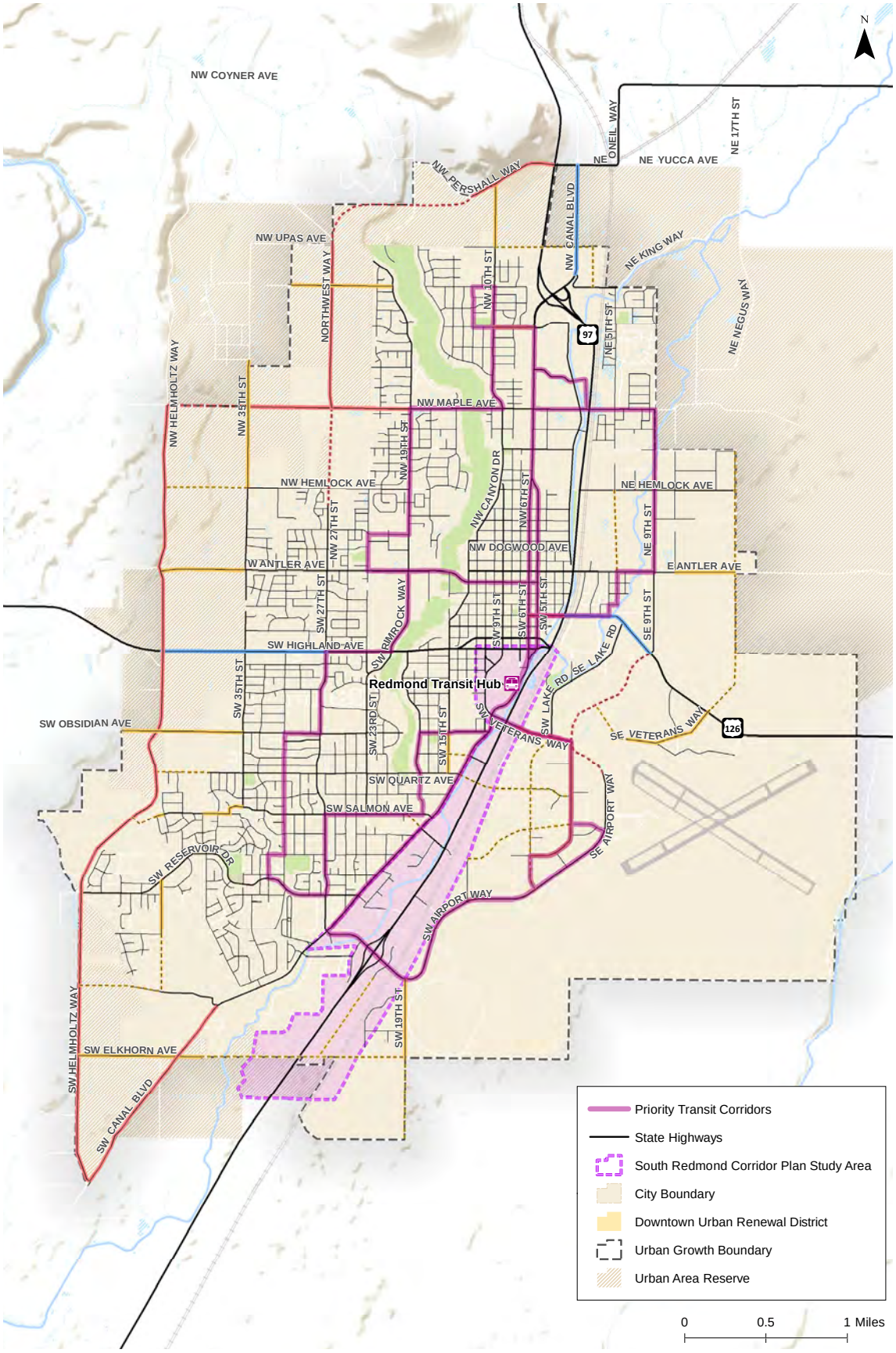
- A quiet street is a bike route on a low-volume, low-speed street that has been optimized for bicycle travel. These streets contain different features depending on adjacent land uses; however, they are all intended to contain wayfinding signs, pavement markings, and intersection treatments. Some may also feature diversion to reduce automobile volumes and traffic calming to slow motor vehicle speeds.
- A bike lane is a marked space along a length of roadway that is designated for use by people bicycling. Wheelchair users and some motorized scooters are allowed in bike lanes.
- Buffered bike lanes feature a buffer strip to provide space between the bike lane and the auto lane or parked cars.
- A protected bike lane, sometimes called a “cycle track”, is an exclusive bicycle facility adjacent to, but separated from, the roadway. Separation is generally achieved using planters, parked cars, curbs, or posts to separate people biking from people driving. They are best on roads with few cross streets and driveways, particularly on roadways with high auto volumes and speeds. A protected bike lane provides a logical extension of a shared use path because it provides the sensation of riding on a path due to the separation from motorized traffic.

Fifty-two bicycle corridors were identified for inclusion into the TSP.

Crossing improvements, though not specifically identified in the TSP, may be provided when bicycle facilities are constructed that cross major roads. The need for and type of crossing treatment will be evaluated at the time of project development and design.

The City of Redmond will consider upgrades to existing bicycle facilities (such as including a marked buffer) on a case-by-case basis. Such upgrades typically occur in conjunction with scheduled maintenance operations.

Figure 7: Future Transit Corridors



Key Pedestrian Improvements

Sidewalks are paved walkways adjacent to streets. Sidewalks are particularly important for providing basic mobility for people with disabilities. Setback sidewalks (featuring a planted barrier between the sidewalk and travel way) can create more comfort and safety for people walking. All streets within the City are anticipated to have sidewalks over time. The identified TSP pedestrian improvements are intended to prioritize sidewalk facilities along ADA routes, as defined by the City of Redmond.

Crossing improvements, though not specifically identified, may be provided when pedestrian facilities are constructed that cross major roads. The need for and type of crossing treatment will be evaluated at the time of project development and design.

Key Transit Corridors

The provision of high-quality, available, and reliable transit service fundamentally supports the environment, economic development, and equity for all travelers. The TSP includes, as shown in Figure 7, both key north-south and east-west transit within all quadrants of the City's UGB between the downtown urban core, residential neighborhoods, existing and planned pedestrian and bicycle corridors, and places of interest. These corridors correlate with the Redmond Transit Hub located at the corner of SW Kalama Avenue and SW Canal Blvd. Multimodal infrastructure along these corridors will be pursued by the City to enhance the accessibility of future transit service.

The City and Cascades East Transit (CET) will continue to work to refine these transit corridors and identify a program to implement more robust transit service within Redmond. Specifically, the City intends to explore various service options in partnership with CET to better serve the community, including the potential for implementing fixed-route service.

Key Freight Routes

Both the TSP and the many state policies and plans recognize the important role that an efficient and reliable transportation system plays in supporting the region's economy, growth, and quality of life. Within the City, highways, city streets, airports, pipelines, and railways provide freight mobility. Trucks, rail, and air service must function together to ensure the efficient and timely movement of freight to, within, and through the community.

As part of the needs analysis, changes to the existing freight and truck routes were identified to ensure consistency with state and federal designations and guidance and in reflection of ongoing planning efforts. In particular, the TSP includes freight routes that provide alternative access points to the industrial lands east of US 97 both to the north and south of OR 126. These routes utilize SW Airport Way, SE 9th Street, and NE Hemlock Avenue.

Redmond Municipal Airport

The City of Redmond owns and operates Redmond Municipal Airport/Roberts Field for the tri-county area. It is located two miles southeast of downtown Redmond and provides passenger and commercial service, air cargo and general aviation. The airport has two asphalt paved runways – 7,040 by 150 feet and 7,006 by 100 feet. The facility is designated as Category I (Commercial Service Airport) according to the Oregon Aviation Plan and the Redmond Municipal Airport Master Plan. The Oregon Aviation Plan defines Category I airports as airports that "support some level of scheduled commercial airline service in addition to a full range of general aviation aircraft." The flight destinations can be domestic and international.

Airport development is governed by its own Master Plan, which is included in Volume 2, Appendix G. The recently updated Master Plan includes recommendations to extend the runway, provide additional parking, and evaluate potential development opportunities on lands surrounding the airport. The City, County, ODOT and the Airport will continue to coordinate on future transportation system improvements that support ongoing upgrades to the Airport as well as provide support for the Oregon Resilience Plan.

Rail System

The needs analysis identified rail as an important, energy efficient mode of freight transportation. The TSP supports the continued use of freight rail tracks and service provided in the City by the BNSF Railway and Union Pacific Railroad. These rail services are and will continue to be significant drivers of economic opportunity for Redmond.

The two companies share use of track through Redmond and the ability of Redmond freight shippers and receivers to use either carrier is a competitive privilege infrequently found elsewhere. The rail line interfaces with the Redmond community between US 97 and the industrial area near the airport. The TSP supports continued coordination between the rail providers, ODOT, the City and Deschutes County to ensure multimodal safety is provided in the future at the seven at-grade crossings of the railroad within the City as well as to ensure support of the Oregon Resilience Plan.

Waterways/Pipelines

Central Oregon Irrigation District (COID) maintains the Pilot Butte Canal, which runs north-south through the City of Redmond and connects to Terrebonne to the north and Bend to the south. This canal diverts water from the Deschutes River for a variety of purposes, including to provide water to the City of Redmond. The TSP supports the continued coordination with COID, the City of Bend, Deschutes County and ODOT.

Vehicular System Performance

The City uses motor vehicle level of service (LOS) standards to evaluate acceptable vehicular performance on the local, collector, and arterial streets. LOS standards are presented as grades A (free flow traffic conditions) to F (congested traffic conditions). ODOT uses mobility targets based on volume to capacity (V/C) ratios to evaluate acceptable vehicular performance on state facilities. As V/C ratios approach 1.0, traffic congestion increases.

In some cases, it may not be possible or desirable to meet the designated mobility target or LOS standard. In those cases, an alternative mix of strategies such as land use, transportation demand management, safety improvements or increased use of active modes may be applied.

The LOS and mobility targets to be applied in Redmond are listed below. ODOT mobility targets apply to state highways as well as to city streets near highway interchanges; this interchange influence area is generally defined as one-quarter mile from a ramp terminal or as the area between the ramp terminal and the first public street intersection.

- City signalized intersections: LOS E
- City unsignalized intersections: LOS E and volume-to-capacity ratio less than 0.9 for critical approach
- US 97 and OR 126: volume-to-capacity ratio of 0.8 or 0.85, depending on location. In addition, the City has adopted alternative mobility targets at the Evergreen Avenue/US 97 and Veteran's Way/OR 126 intersections.

As part of implementation of the TSP, the City and ODOT will collaborate on establishing and adopting alternative mobility targets on the state facilities, as needed to address future year traffic volumes.

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5

Transportation Priorities & Project Categories

In This Chapter

- What are the priority projects for roadways, intersections, and bicycle and pedestrian facilities?
- What specific needs do the South Redmond and South Redmond US 97 corridor areas have?

5

Transportation Priorities & Project Categories

The TSP recommends transportation programs and infrastructure improvements to fulfill the plan's goals and policies. These are organized into the following five categories that suggest timeframes for implementation based on complexity, likely available funding (including potential funding sources), and assessment of need:

- Strategic Street Capacity Investment Corridors
- New Planned Streets
- Intersection Capacity Improvements
- Grade-Separated Intersection Improvements
- Key Multi-Use Pathways
- Key Bicycle Corridors
- Key Pedestrian Improvements

Some projects may be accelerated, and others postponed due to changing conditions, funding availability, public input, or more detailed study performed during programming and budgeting processes. Further, the projects included in the preferred TSP list represent the best estimation for appropriate design available at this time. Because the TSP is being drafted at a citywide scale, project design may change before construction commences as public input, available funding, and unique site conditions are taken into consideration. Projects identified herein may be funded through a variety of sources including federal, state, or local transportation funds, system development charges (SDCs), through partnerships with private developers, or a combination of these sources.

Project Costs

The estimated construction costs for each project are provided in the subsequent tables. These costs are order-of-magnitude (e.g., planning-level) estimates that account for right-of-way, design engineering, and construction and generally include a 30 percent contingency factor. The costs were calculated for each project using the methodology and procedures recommended by the American Association of Cost Engineers (Class 5 estimates). All costs are rounded to the nearest $100,000 and provided in 2018 dollars. Detailed cost estimate sheets are included in Volume 2, Appendix H. The detailed costs include all estimation assumptions as well as any deviations related to unique topographic, right-of-way, or other constraints.

Costs for individual transit corridors are not provided. The City and Cascades East Transit are working to refine the transit corridors and identify a list of capital improvements and strategic policies that can help implement more robust transit service within Redmond. These efforts are currently ongoing, and the results can be incorporated into future updates of the TSP.

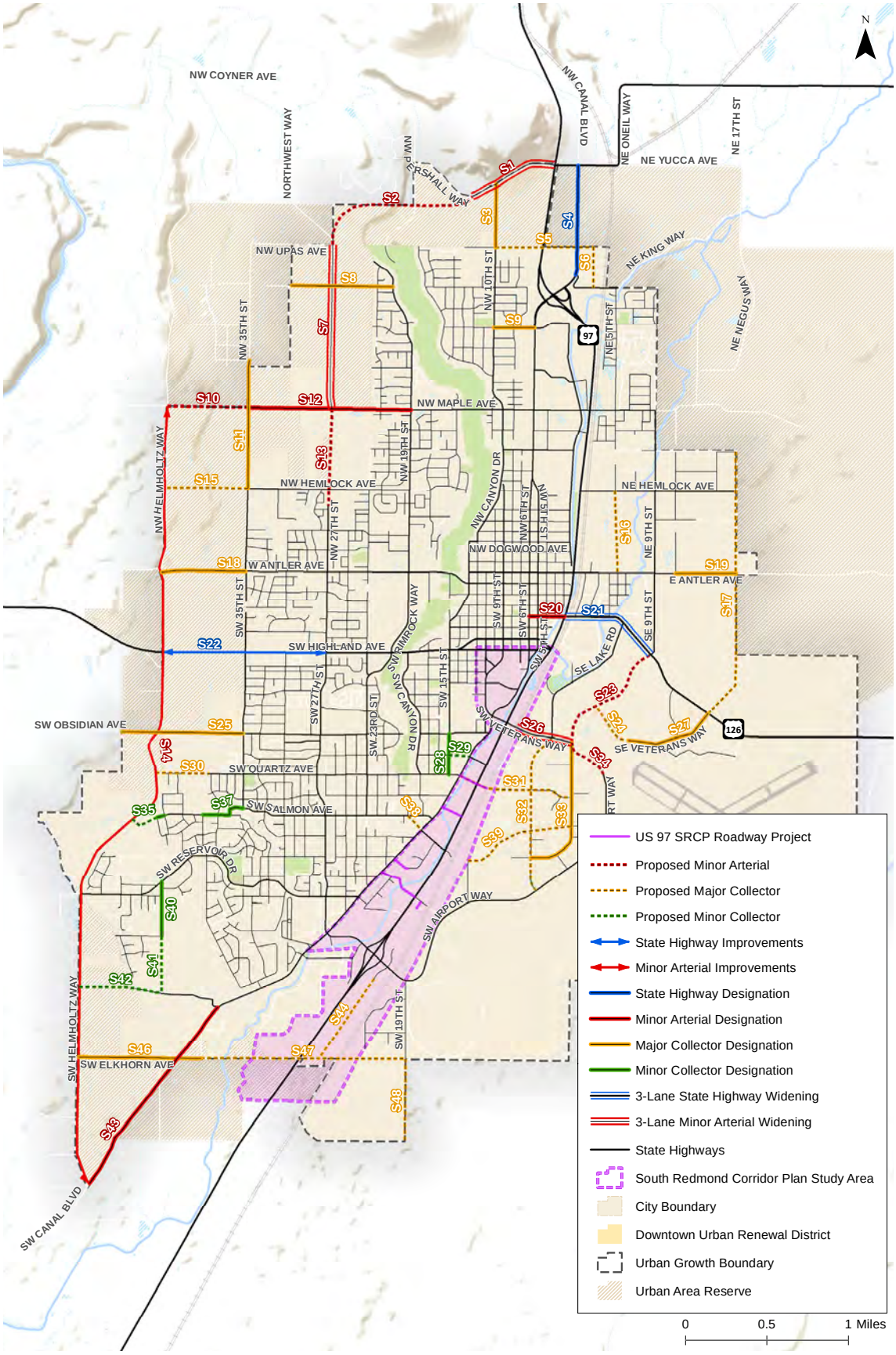
Strategic Street Capacity Investment Corridors

The projects shown in Table 2 represent the City's current priorities for street capacity investments. Improvements to these key corridors help accommodate growth and economic development in the region and continue to shape the urban context for the City. Such improvements can strengthen mobility and connectivity as well as create opportunities to incorporate bicycle, pedestrian, and transit facilities where they do not exist. These projects are illustrated in Figure 8.

Table 2: Priority Street Capacity Investments

Map ID	Corridor	S-W Limit	E-N Limit	Improvement	Length (miles)	2020 Cost Estimates
S1	Pershall Way	New Pershall Arterial	US 97	Widen to 3-Lane Arterial	0.6	$3.2M
S7	Northwest Way	Maple Ave	NW Upas Ave	Widen to 3 Lanes	1.0	$5.8M
S14	SW/NW Helmholtz Way	SW Canal Boulevard	NW Maple Avenue	Widen roadway to add center turn lane	5.0	$29.0M
S21	OR 126	US 97	SE 9th St	Widen to 3 Lanes	0.6	$5.4M
S22	OR 126	SW Helmholtz Way	SW 27th St	Provide a 3-lane cross-section with sidewalks and bicycle lanes throughout entire corridor	1.0	$8.7M
S26	SW Veterans	Railroad	SE 1st St	Widen to 3 Lanes (turn lanes where needed	0.4	$2.0M
				TOTAL:		**$54.1M**

Figure 8: Planned Roadway Projects



New Planned Streets

The projects shown in Table 3 represent the City's current priorities for planned new streets to improve connectivity between and within existing neighborhoods, employment, and commercial areas; provide connections to newly developed or developing areas; and to provide alternative travel routes for all modes to existing streets. These projects are illustrated in Figure 8.

Table 3: Priority Planned New Streets

Map ID	Corridor	S-W Limit	E-N Limit	Improvement	Length (miles)	2020 Cost Estimates
S2	NW Pershall Way	NW Upas Way	NW Pershall Way	Proposed 3-Lane Arterial	1.0	$8.9M
S5	NW Upas Ave	NW 10th St	East of NW Canal Blvd	Proposed Collector & Overcrossing	0.6	$11.0M
S6	NE 3rd	King Way	UGB	Proposed Collector	0.3	$1.5M
S10	NW Maple Ave	SW Helmholtz Way	NW 35th St	Proposed 3-Lane Arterial	0.5	$4.3M
S13	NW 27th St	NW Greenwood Ave	NW Maple Ave	Proposed Arterial	0.6	$5.2M
S15	NW Hemlock Ave	NW Helmholtz Way	NW 35th St	Proposed Collector	0.5	$2.9M
S16	NE 5th St	E Antler Ave	NE Hemlock Ave	Proposed Collector	0.5	$2.9M
S17	SE/NE 17th St	OR 126	NE Kingwood	Proposed Collector	1.7	$9.6M
S23	SE 9th St	Veterans Way	OR 126	Proposed Arterial	0.8	$6.8M
S24	SE Veterans Way	SE 1st St	SE Veterans Way	Proposed Collector	0.4	$2.1M
S29	SW Pumice Ave	SW 15th St	SW Canal Blvd	Proposed Collector	0.1	$0.7M
S30	SW Quartz Ave	SW Helmholtz Way	SW 37th St	Proposed Collector	0.3	$1.9M
S31	SW Quartz Ave	SW Canal Blvd	S 1st St	Proposed Collector	0.7	$7.2M
S32	SW 6th St	SE Airport Way	SE Veterans Way	Proposed Collector	1.0	$3.7M
S34	SE Airport Way	SE Airport Way	SW Veterans Way	Proposed Arterial	0.3	$2.3M
S35	SW 45th St	SW Salmon Ave	SW Helmholtz Way	Proposed Collector	0.1	$0.6M
S38	SW Odem Medo	SW Canal Blvd	SW 19th St	Proposed Collector	0.1	$0.7M
S39	SE Salmon Drive	13th Street	S 1st St	Proposed Collector	0.7	$4.0M
S41	SW 43rd Street	SW Badger Avenue	SW Yew Street	Proposed Collector	0.4	$2.0M
S42	SW Badger Avenue	SW Helmholtz Way	SW 43rd Street	Proposed Collector	0.5	$2.9M
S44	SW 21st Street	SW Elkhorn Avenue	South of SW Airport Avenue	Proposed Collector	0.6	$3.5M

Table 3: Priority Planned New Streets (continued)

Map ID	Corridor	S-W Limit	E-N Limit	Improvement	Length (miles)	2020 Cost Estimates
S47	SW Elkhorn Ave	SW 39th St	SW 19th St	Proposed Collector and Overcrossing	1.3	$26.0M
S48	SW 19th St	UGB	SW Elkhorn Ave	Proposed Collector	0.5	$3.4M
US 97 SRCP	North Connection (Motel 6)	SW Canal wBlvd	US 97	Proposed Roadway Connection with Canal Crossing	0.2	N/A
US 97 SRCP	SW 17th Pl	SW Canal Blvd	SW 17th Pl	Proposed Roadway Connection (Extension)	0.1	N/A
US 97 SRCP	SE Airport Way	SW Canal Blvd	US 97	Proposed Roadway Connection with Canal Crossing	0.3	N/A
US 97 SRCP	Local Access Road	Possibilities Thrift Store	SE Airport Way	Proposed Roadway Connection	0.1	N/A
				TOTAL:		**$114.1M**

Intersection Capacity Improvements

The projects shown in Table 4 and Table 5 represent the City's current priorities for intersection capacity improvements. The TSP is not inclusive of all of the intersection projects that the City will pursue over the next twenty years. Rather, these are those that the City can pursue to strategically improve the operational efficiency of specific intersections and important roadways. These projects can enhance system operations and can be completed as opportunities arise. In all cases, the City will review the appropriate intersection control options at the time of project development and delivery. These projects are illustrated in Figure 9.

Table 4: Priority Intersection Capacity Improvements

Map ID	N-S Street	E-W Street	Improvement	Note[1]	2020 Cost Estimates
I3	NW Canal Blvd	NE Upas Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.2M (roundabout)
I4	NW Helmholtz Way	NW Maple Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.2M (roundabout)
I5	NW 35th St	NW Maple Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.2M (roundabout)
I6	NW 27th St	NW Maple Ave	Consider traffic signal or roundabout	Roundabout Preferred	$3.2M
I7	NW 19th St	NW Maple Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I8	NW 9th St	NW Maple Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I10	NE 5th St	NE Maple Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.2M (roundabout)
I11	NE 9th St	NE Maple Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.2M (roundabout)

[1] Intersection control preference noted where applicable. However, specific intersection control decisions will be made at the time of project development and project delivery.

Table 4: Priority Intersection Capacity Improvements (continued)

Map ID	N-S Street	E-W Street	Improvement	Note[1]	2020 Cost Estimates
I13	NW 6th St	NW Kingwood Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I14	NW 27th St	NW Hemlock Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I15	NE 9th St	NE Hemlock Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I16	NW 27th St	W Antler Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I17	NE 9th St	E Antler Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I22	SW Helmholtz Way	OR 126	Consider traffic signal or roundabout	Roundabout Preferred	$3.2M
I23	SW 35th St	OR 126	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I25	SW 15th St	OR 126	Consider traffic signal modification or roundabout	-	$0.5M (signal) or $3.2M (roundabout)
I29	SE 9th St	OR 126	Consider traffic signal or roundabout	Roundabout Preferred	$3.2M
I30	SW Helmholtz Way	SW Obsidian Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.2M (roundabout)
I31	SW 27th St	SW Obsidian Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I34	SE 9th St	SW Veterans Way	Consider traffic signal or roundabout	Roundabout Preferred	$3.2M
I36	SE Veterans Way	OR 126	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.2M (roundabout)
I37	SW Canal Blvd	SW Pumice	Consider traffic signal or roundabout	Disconnect SW Obsidian Ave	$0.5M (signal) or $3.2M (roundabout)
I38	SW Canal Blvd	SW Quartz Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I39	SW Helmholtz Way	SW Salmon Ave	Consider traffic signal or roundabout		$0.5M (signal) or $3.2M (roundabout)
I40	SW 27th St	SW Salmon Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I41	SW Helmholtz Way	SW Wickiup Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M

[1] Intersection control preference noted where applicable. However, specific intersection control decisions will be made at the time of project development and project delivery.

Table 4: Priority Intersection Capacity Improvements (continued)

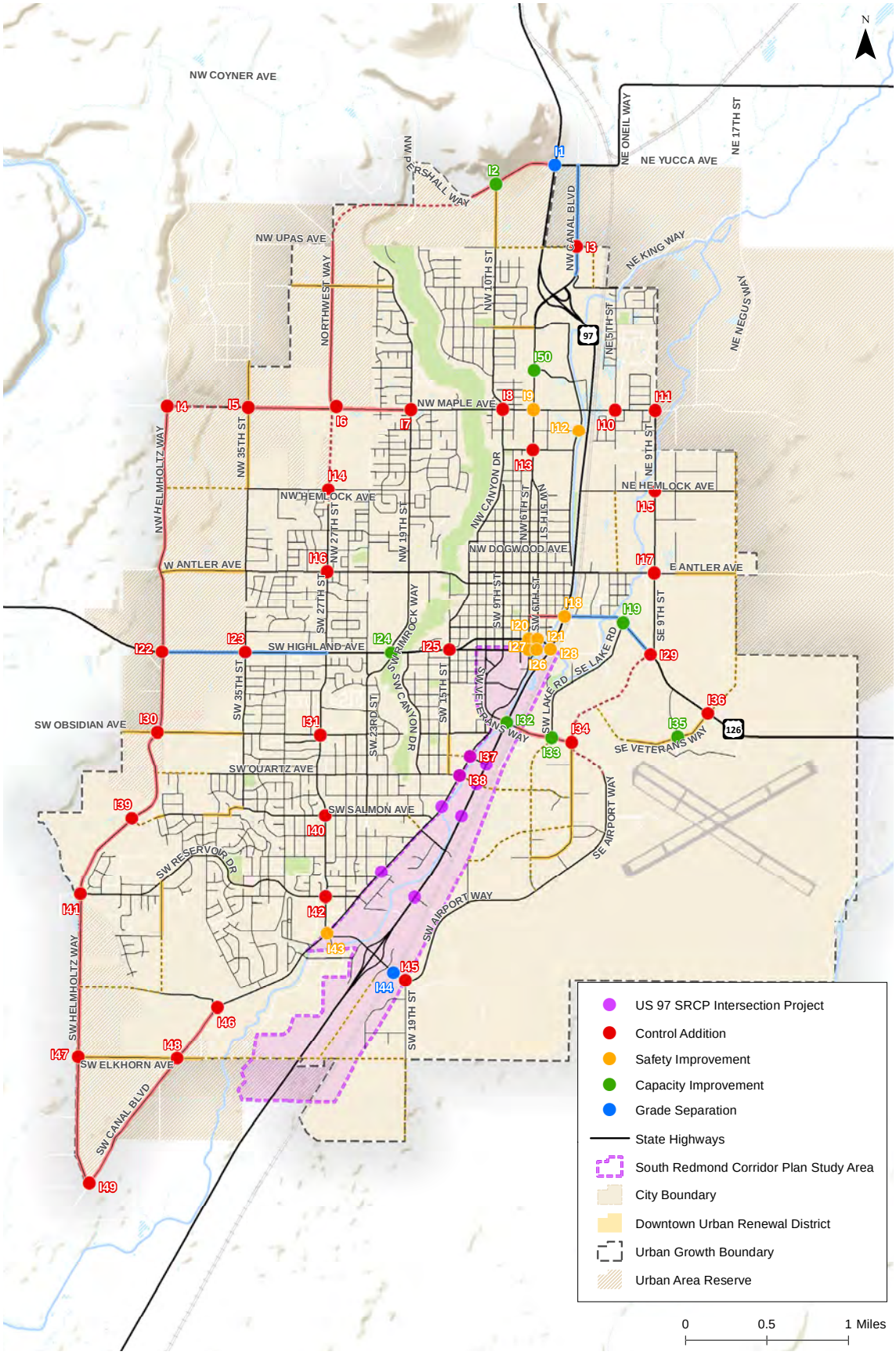
Map ID	N-S Street	E-W Street	Improvement	Note[1]	2020 Cost Estimates
I42	SW 27th St	SW Wickiup Ave	Consider traffic signal or roundabout	Roundabout Preferred	$3.2M
I45	SW 19th St	SW Airport Way	Consider traffic signal or roundabout	Roundabout Preferred	$3.2M
I46	SW Canal Blvd	SW Badger Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.2M (roundabout)
I47	SW Helmholtz Way	SW Elkhorn Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.2M (roundabout)
I48	SW Canal Blvd	SW Elkhorn Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.2M (roundabout)
I49	SW Helmholtz Way	SW Canal Blvd	Consider traffic signal or roundabout	Roundabout Preferred	$3.2M
I50	NW 6th St	NW Oak Ave	Traffic Signal Modification	-	$0.5M
US 97 SRCP	SW Canal Blvd	SE Pumice Ave	Roundabout	-	Included in SRCP
US 97 SRCP	US 97	SE Pumice Ave	Traffic Signal	-	Included in SRCP
US 97 SRCP	SW Canal Blvd	SW Quartz Ave	Roundabout	-	Included in SRCP
US 97 SRCP	US 97	SW Quartz Ave	Traffic Signal	-	Included in SRCP
US 97 SRCP	SW Canal Blvd	New Northern Roadway Connection (Motel 6)	Roundabout	-	Included in SRCP
US 97 SRCP	US 97	New Northern Roadway Connection (Motel 6)	Traffic Signal	-	Included in SRCP
US 97 SRCP	SW Canal Blvd	SE Airport Way	Roundabout	-	Included in SRCP
US 97 SRCP	US 97	SE Airport Way	Traffic Signal	-	Included in SRCP
			TOTAL INTERSECTION CAPACITY IMPROVEMENTS:		**$35.4M to $70.5M depending on control type selected**

[1] Intersection control preference noted where applicable. However, specific intersection control decisions will be made at the time of project development and project delivery.

Table 5: Other Priority Intersection Capacity Improvements

Map ID	N-S Street	E-W Street	Improvement	Note[1]	2020 Cost Estimates
I2	NW 10th St	NW Pershall Way	Consider Additional Lanes	Add Eastbound Right-Turn	$0.3M
I19	SE Lake Rd	OR 126	Consider Access Management	Create Right-In/Right-Out in Conjunction with 9th Street Project	$0.1M
I24	SW Rimrock Way	OR 126	Consider Capacity Improvement	Intersection improvement should consider westbound lane drop	$0.7M
I32	US 97	Veterans Way	City of Redmond to Pursue Alternative Mobility Standard		-
I33	SW Lake Rd	SW Veterans Way	Consider Access Management	Create Right-In/Right-Out in Conjunction with 9th Street Project	$0.1M
I35	SE 10th St	SE Veterans Way	Consider Intersection Control Change	Remove Stop Signs on Veterans in Conjunction with 9th Street Project	$0.5M (signal) or $3.2M (roundabout)
			Total for Other Intersection Capacity Improvements:		**$1.7M to $4.4M depending on intersection control type selected**

Figure 9: Planned Intersection Projects



Grade-Separated Intersection Improvements

Three intersections were identified for grade separation to eliminate conflict points and improve traffic flows. One intersection was identified for future evaluation. These are identified in Table 6 and shown in Figure 8 and Figure 9. A brief description of each is included below:

- **US 97/O'Neil Highway:** The Interchange Area Management Plan (IAMP) for this location identified the need to provide a grade-separated overcrossing of US 97 that would connect O'Neil Highway to Pershall Way. An interim option is to restrict the US 97/O'Neil Highway intersection to right-in, right-out.
- **Airport Way Rail Crossing:** Airport Way connects US 97 to the Redmond Airport. US 97 and the Redmond Airport are both critical statewide infrastructure as identified in the Oregon Resilience Plan. The planned grade-separation would eliminate the at-grade rail crossing between the highway and airport.
- **US 97/Elkhorn Avenue:** Construct overcrossing of US 97 as part of the Elkhorn Avenue extension from Canal Boulevard to SW 19th Street.
- **US 97/Hemlock Avenue:** Conduct a study to evaluate a possible grade-separated crossing of US 97.

Table 6: Identified Grade-Separated Intersection Improvements

Map ID	N-S Street	E-W Street	Improvement	Description	2020 Cost Estimates
I1	US 97	O'Neil Hwy	North Interchange IAMP Project	Interim project would modify US 97/O'Neil Hwy intersection to right-in/right-out; eventual project would result in grade-separation	$0.1M
I44	Railroad	SW Airport Way	Grade Separated Crossing	Remove Existing At-Grade Rail Crossing	$16.8M
S47	US 97	Elkhorn Avenue	Grade Separated Crossing	Construct US 97 overcrossing at part of roadway extension.	$26.0M
				Total Grade-Separated Intersection Improvements	**$42.9M**

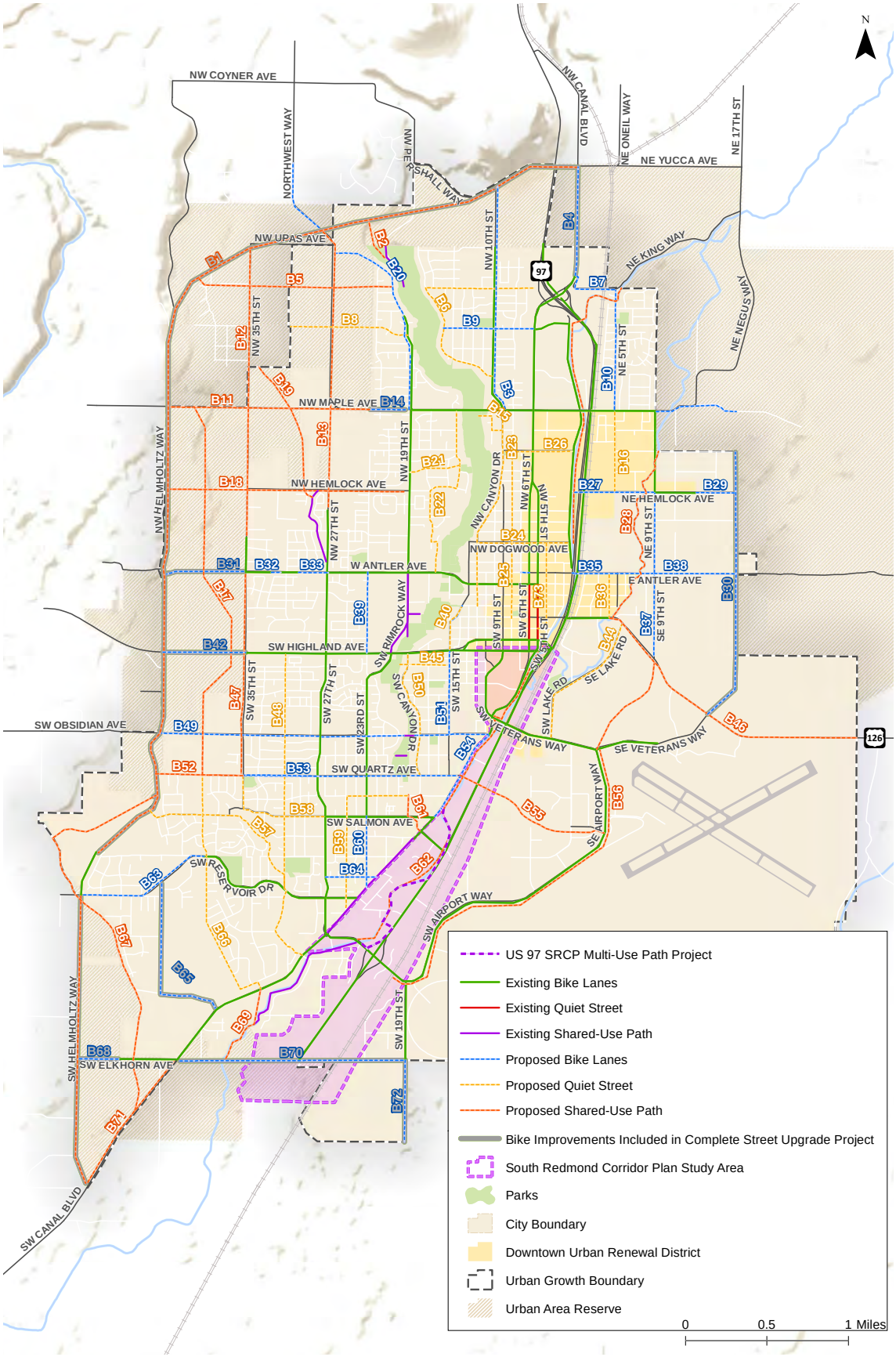
Key Multi-Use Pathways

The projects shown in Table 7 represent the City's current priorities for multi-use pathways. The multiuse pathway system is intended to improve continuity for bicyclists and pedestrians to move freely throughout the transportation network and help to eliminate north-south barriers for east-west access, particularly through the Dry Canyon and across US 97. These projects are shown in Figure 8. Table 7 identifies the associated costs.

Table 7: Priority Multi-Use Pathways

Map ID	Corridor	S-W Limit	E-N Limit	Length (miles)	2020 Cost Estimates
B1	SW/NW Helmholtz Way	SW Canal Blvd	NW Canal Blvd	8.0	Costs included in S14
B2	NW Pershall Way	Dry Canyon Trail	B1	0.3	$1.0M
B5	NW Spruce Ave	NW Helmholtz Way	NW 19th St	1.2	$4.6M
B11	NW Maple Ave	NW Helmholtz Way	west of NW 22nd St	1.2	$4.7M
B12	NW 35th St	NW Dogwood Ave	NW Upas Way	1.8	$6.7M
B13	NW 27th St	NW Greenwood Ave	NW Upas Way	1.7	$6.6M
B17	SW 39th St	SW Quartz Ave	NW Maple Ave	2.4	$9.2M
B18	NW Hemlock Ave	NW Helmholtz Way	NW 19th St	1.4	$5.5M
B19	NW 29th St	NW Hemlock Ave	UGB	0.9	$3.5M
B28	Lateral E Pilot Butte Canal	OR 126	NE Kingwood Ave	1.2	$4.8M
B46	OR 126	SE Jackson St	UGB	1.8	$7.0M
B47	SW 35th St	SW Quartz Ave	W Antler Ave	1.2	$4.7M
B52	SW Quartz Ave	SW Helmholtz Way	SW 35th St	0.5	$2.1M
B55	SW Quartz Ave	SW Canal Blvd	SE Airport Way	1.0	$7.5M
B56	SE Airport Way/SE 9th St	Railroad	OR 126	3.0	$11.4M
B61	SW 19th St	SW Canal Blvd	SW Reindeer Ave	0.3	$1.0M
B62	SW Canal Blvd/Pilot Butte Canal	SW 27th St	NE King Way	2.4	$9.1M
B67	SW Helmholtz Way	SW Canal Blvd	SW Reservoir Dr	2.5	$9.8M
B69	Pilot Butte Canal	SW Elkhorn Ave	SW Canal Blvd	0.5	$2.0M
B71	SW Canal Blvd	SW Helmholtz Way	SW Elkhorn Ave	0.9	$3.5M
US 97 SRCP	SW Canal Blvd/US 97	SW Yew Ave	New Northern Roadway Connection (Motel 6)	1.3	Included in SRCP
			Total Multi-Use Pathways		**$104.7M**

Figure 10: Existing and Planned Bicycle Facilities



Key Bicycle Corridors

More than forty bicycle corridors were identified as the City's current priorities for inclusion into the TSP. Crossing improvements, though not specifically identified in the TSP, may be provided when bicycle facilities are constructed that cross major roads. The need for and type of crossing treatments will be evaluated at the time of project development and design. Further, the City of Redmond will consider upgrades to existing bicycle facilities (such as including a marked buffer) on a case-by-case basis. Such upgrades typically occur in conjunction with scheduled maintenance operations.

These projects are shown in Figure 10. Table 8 identifies the associated costs.

Table 8: Current Bicycle Corridor Priorities

Map ID	Corridor	S-W Limit	E-N Limit	Improvement	Length (miles)	2020 Cost Estimates
B3	NW 10th St	NW Maple Ave	NW Pershall Way	Bike Lanes	1.0	$0.2M
B6	NW Canyon Dr/NW Spruce Ave	NW 10th St	US 97	Quiet Street	1.4	$0.4M
B7	NE King Way	NW Canal Blvd	NE 5th St	Bike Lanes	0.3	$0.5M
B8	NW Quince Ave	UGB	NW 19th St	Quiet Street	0.7	$0.2M
B9	NW Quince Ave	NW Canyon Dr	NW 6th St	Bike Lanes	0.3	$0.5M
B10	NE 5th St	NE Negus Way	NE King Way	Bike Lanes	0.7	$1.1M
B15	NW 10th St/NW Larch/NW Rockcrest Ct	Dry Canyon Trail	NW 9th St	Quiet Street	0.2	$0.1M
B16	NE 5th St	NE Hemlock Ave	NE Maple Ave	Quiet Street	0.5	$0.1M
B20	NW 19th St	NW Maple Ave.	Northwest Way	Bike Lanes	0.7	$0.5M
B21	NW Ivy Ave	NW 19th St	NW Rimrock Ct	Quiet Street	0.3	$0.1M
B22	NW 17th St/NW Rimrock Ct	W Antler Ave	NW Maple Ave	Quiet Street	1.2	$0.4M
B23	NW Canyon Dr	SW Deschutes Ave	NW Maple Ave	Quiet Street	1.2	$0.4M
B24	NW Dogwood Ave	NW Canyon Dr	NW Canal Blvd	Quiet Street	0.5	$0.2M
B25	SW 8th St	SW Evergreen Ave	NW Kingwood Ave	Quiet Street	1.0	$0.3M
B26	NW Kingwood Ave	NW Canyon Dr	NW Canal Blvd	Quiet Street	0.4	$0.1M
B27	NE Hemlock Ave	NW Canal Blvd	NE 9th St	Bike Lanes/ Crossing	0.5	$0.7M
B29	NE Hemlock Ave	west of NE 15th St	NE 17th St	Bike Lanes	0.2	$0.1M
B32	W Antler Ave	NW 32nd Ct	SW 31st St	Bike Lanes	0.1	$0.1M
B33	W Antler Ave	NW 29th St	SW 27th St	Bike Lanes	0.2	$0.3M

Table 8: Current Bicycle Corridor Priorities (continued)

Map ID	Corridor	S-W Limit	E-N Limit	Improvement	Length (miles)	2020 Cost Estimates
B35	E Antler Ave	SW 7th St	NE 17th St	Bike Lanes/ Crossing	0.8	$1.1M
B36	SE Jackson St	OR 126	E Antler Ave	Quiet Street	0.3	$0.1M
B37	SE 9th St	OR 126	NE Hemlock Ave	Bike Lanes	1.0	$1.4M
B38	E Antler Ave	SE 9th St	NE 17th St	Bike Lanes	0.1	$0.2M
B39	SW 23rd St	SW Highland Ave	W Antler Ave	Bike Lanes	0.5	$0.1M
B40	SW 15th St	SW Highland Ave	SW Deschutes Ave	Quiet Street	0.3	$0.1M
B44	SW Lake Rd	SW Veterans Way	OR 126	Quiet Street	0.9	$0.3M
B45	SW Juniper Ave	Dry Canyon Trail	SW 15th St	Quiet Street	0.3	$0.1M
B48	SW 31st St	SW Canal Blvd	SW Highland Ave	Quiet Street	2.0	$1.0M
B49	SW Obsidian Ave	SW Helmholtz Way	SW Canal Blvd	Bike Lanes	1.4	$0.3M
B50	SW Canyon Dr	SW Quartz Ave	SW Highland Ave	Quiet Street	0.8	$0.2M
B51	SW 15th St	SW Obsidian Ave	SW Highland Ave	Bike Lanes	0.5	$0.7M
B53	SW Quartz Ave	SW 35th St	SW Canal Blvd	Bike Lanes	1.3	$0.3M
B54	SW Canal Blvd	SW Salmon Ave	SW Obsidian Ave	Bike Lanes	0.6	$0.9M
B57	SW Salmon Ave/SW Valleyview Dr/SW 32nd Ct	SW Helmholtz Way	SW 31st St	Quiet Street	0.9	$0.3M
B58	SW 35th St/SW Salmon Ave	SW Quartz Ave	SW 27th St	Quiet Street	0.7	$0.2M
B59	SW 25th St/SW Reindeer Ave	SW Canal Blvd	Dry Canyon Trail/ SW 19th St	Quiet Street	1.1	$0.3M
B60	SW 23rd St	SW Canal Blvd	SW Salmon Ave	Bike Lanes	0.4	$0.6M
B63	SW Reservoir Dr	SW Helmholtz Way	SW 39th St	Bike Lanes	0.8	$1.2M
B64	Volcano Avenue	27th Street	SW Canal Boulevard	Bike Lanes	0.3	$0.2M
B66	SW Cascade Vista Dr/SW Antelope Ave	SW Canal Blvd	SW Quartz Ave	Quiet Street	1.5	$1.3M
B73	SW 4th St/SW Forest/SW 5th	SW Highland	SW Dogwood Ave	Quiet Street	0.6	$0.2M
			Total Bicycle Corridors			**$17.4M**

Key Pedestrian Improvements

Key priority sidewalk investment areas are intended to prioritize new sidewalk facilities along ADA routes and provide key missing connections in the pedestrian system. Pedestrian crossing improvements at intersections, though not specifically identified, may be provided when pedestrian facilities are constructed that cross major roads. The need for and type of crossing treatments will be evaluated at the time of project development and design.

These projects are shown in Figure 11. Table 9 and Table 10 identify the associated costs.

Table 9: Priority New Sidewalk Facilities Along ADA Routes

Map ID	Corridor	S-W Limit	E-N Limit	Street Side	Note	Length (miles)	2020 Cost Estimates
P4	NW 10th St	NW 9th St	NW Quince Ave	West	Add Sidewalk or Ramps	0.4	$0.4M
P8	NW 9th St	NW Hemlock Ave	NW Maple Ave	Both	Add Sidewalk or Ramps	0.9	$0.9M
P9	NW 6th St	North of NW Larch Ave	NW Maple Ave	Both	Add Sidewalk or Ramps	0.2	$0.2M
P11	NW 6th St	NW Jackpine Ave	NW Larch Ave	East	Add Sidewalk or Ramps	0.1	$0.1M
P12	NW 6th St	South of NW Kingwood Ave	South of Larch Ave	West	Add Sidewalk or Ramps	0.1	$0.1M
P13	NW Larch Ave	NW 6th St	NW 4th St	Both	Add Sidewalk or Ramps	0.1	$0.1M
P14	NW Larch Ave	NW 4th St	West of NW Canal Blvd	South	Add Sidewalk or Ramps	0.1	$0.1M
P16	NW Kingwood Ave	NW 6th St	NW Canal Blvd	Both	Add Sidewalk or Ramps	0.4	$0.4M
P18	NW 6th St	North of NW Jackpine Ave	South of NW Kingwood Ave	West	Add Sidewalk or Ramps	0.04	<$0.1M
P19	NW 6th St	NW Jackpine Ave	NW Kingwood Ave	East	Add Sidewalk or Ramps	0.1	$0.1M
P20	NW Canal Blvd	NW Elm Ave	NW Larch Ave	West	Add Sidewalk or Ramps	0.4	$0.4M
P21	NW Hemlock Ave	NW Canyon Dr	NW 9th St	Both	Add Sidewalk or Ramps	0.03	<$0.1M
P23	NW 9th St	W Antler Ave	NW Greenwood Ave	Both	Add Sidewalk or Ramps	0.5	$0.5M
P24	NW Dogwood Ave	NW Canyon Dr	NW 10th St	South	Add Sidewalk or Ramps	0.1	$0.1M
P37	SW Highland Ave	SW Indian Cir	SW 27th St	South	Add Sidewalk or Ramps	0.1	$0.1M
P57	SW Canal Blvd	North of SW Salmon Ave	South of SW Obsidian Ave	West	Add Sidewalk or Ramps	0.4	$0.4M
P59	SW Salmon Ave	SW 31st St	SW 29th St	South	Add Sidewalk or Ramps	0.1	$0.1M
P66	SW Xero Ln	West of SW 34th St	SW 31st St	Both	Add Sidewalk or Ramps	0.3	$0.3M
P67	SW 31st St	SW 33rd St	SW Savannah Ct	West	Add Sidewalk or Ramps	0.03	<$0.1M
P69	SW 31st St	SW Timber Ct	SW 33rd St	East	Add Sidewalk or Ramps	0.1	$0.1M

Table 9: Priority New Sidewalk Facilities Along ADA Routes (continued)

P70	SW 31st St	SW Xero Ln	SW Volcano Way	Both	Add Sidewalk or Ramps	0.5	$0.5M
P71	SW Canal Blvd	SW 27th St	SW Timber Ave	East	Add Sidewalk or Ramps	0.8	$0.7M
					Total New Sidewalk Facilities		**$5.5M**

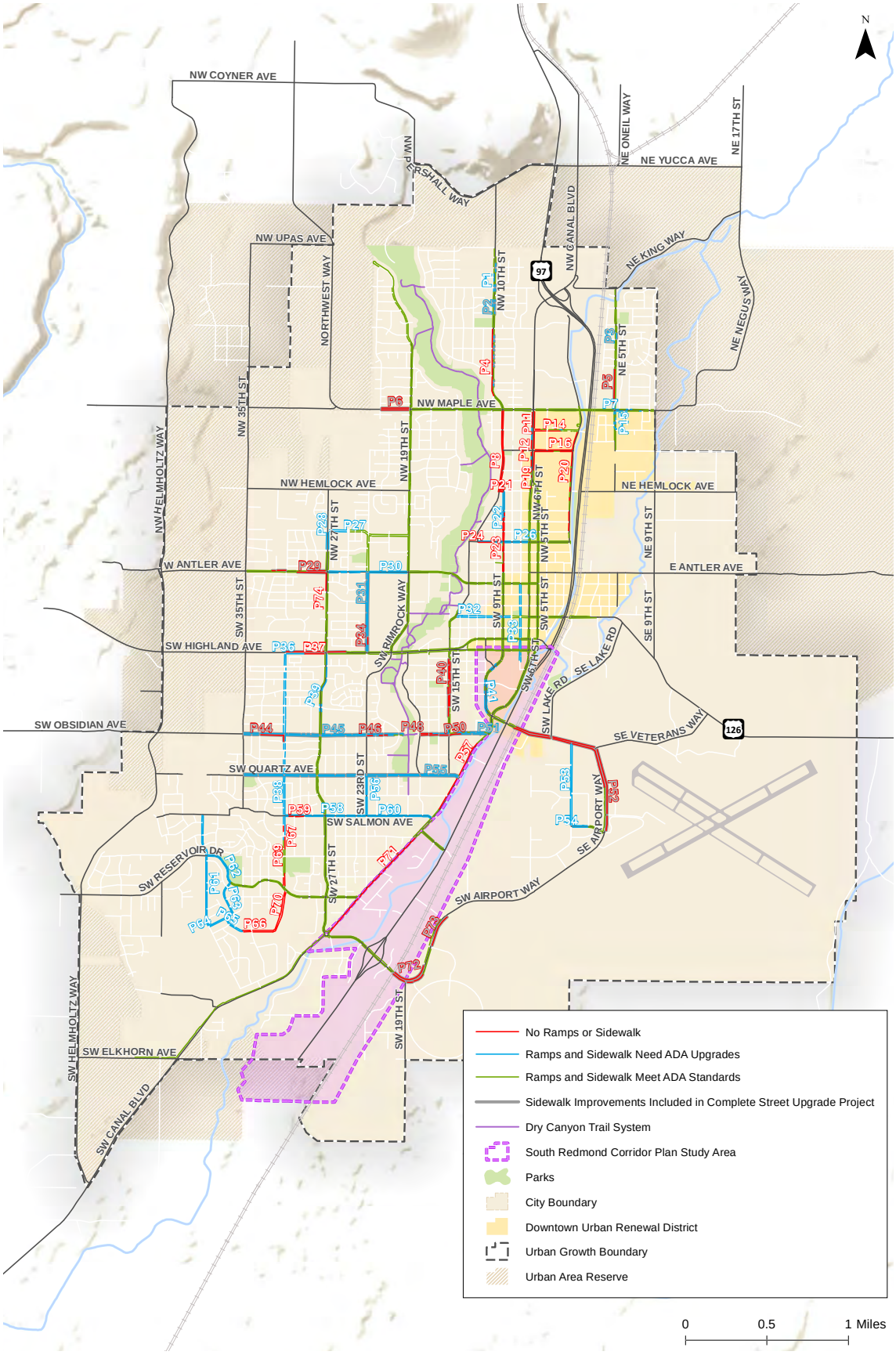
Table 10: Priority New Sidewalk Facilities Along ADA Routes

Map ID	Corridor	S-W Limit	E-N Limit	Street Side	Note	Length (miles)	2020 Cost Estimates
P1	NW 10th St	NW Redwood Ave	NW Teak Ave	West	Upgrade Sidewalk or Ramps	0.1	$0.1M
P7	NE Negus Way	NE 5th St	NE 7th St	Both	Upgrade Sidewalk or Ramps	0.1	$0.1M
P10	NW 6th St	North of NW Kingwood Ave	North of NW Larch Ave	West	Upgrade Sidewalk or Ramps	0.1	$0.1M
P15	NE 5th St	NE Larch Ave	NE Negus Way	Both	Upgrade Sidewalk or Ramps	0.1	$0.1M
P17	NW 6th St	NW Jackpine Ave	NW Kingwood Ave	West	Upgrade Sidewalk or Ramps	0.03	<$0.1M
P22	NW 9th St	NW Fir Ave	NW Hemlock Ave	Both	Upgrade Sidewalk or Ramps	0.3	$0.3M
P25	NW Dogwood Ave	NW Canyon Dr	NW 10th St	North	Upgrade Sidewalk or Ramps	0.1	$0.1M
P26	NW Dogwood Ave	NW 10th St	NW 6th St	Both	Upgrade Sidewalk or Ramps	0.3	$0.3M
P27	NW Elm Ave	NW 27th St	NW 25th St	Both	Upgrade Sidewalk or Ramps	0.2	$0.2M
P28	NW 27th St	NW Cedar Ave	NW Elm Ave	Both	Upgrade Sidewalk or Ramps	0.2	$0.2M
P30	W Antler Ave	SW 27th St	SW Rimrock Way	Both	Upgrade Sidewalk or Ramps	0.8	$0.8M
P32	W Evergreen Ave	SW Canyon Dr	SW 8th St	Both	Upgrade Sidewalk or Ramps	0.6	$0.5M
P33	SW 7th St	SW Indian Ave	SW Black Butte Blvd	Both	Upgrade Sidewalk or Ramps	0.7	$0.7M
P36	SW Highland Ave	SW 31st St	SW Indian Cir	South	Upgrade Sidewalk or Ramps	0.1	$0.1M
P38	SW 31st St	SW Savanna Ct	SW Highland Ave	Both	Upgrade Sidewalk or Ramps	1.6	$1.6M
P39	SW 27th St	SW Metolius Ave	SW Highland Ave	East	Upgrade Sidewalk or Ramps	0.3	$0.3M
P41	SW Veterans Way	SW Canal Blvd	SW Indian Ave	Both	Upgrade Sidewalk or Ramps	0.4	$0.4M
P53	S 1st St	SE Salmon Dr	SW Veterans Way	Both	Upgrade Sidewalk or Ramps	0.9	$0.9M
P54	SE Salmon Dr	S 1st St	West of Timber Ave	Both	Upgrade Sidewalk or Ramps	0.2	$0.2M
P56	SW 23rd St	SW Salmon Ave	SW Quartz Ave	Both	Upgrade Sidewalk or Ramps	0.5	$0.4M
P58	SW Salmon Ave	SW 31st St	SW Canal Blvd	North	Upgrade Sidewalk or Ramps	0.8	$0.7M

Table 10: Priority New Sidewalk Facilities Along ADA Routes (continued)

P60	SW Salmon Ave	SW 29th St	SW Canal Blvd	South	Upgrade Sidewalk or Ramps	0.7	$0.6M
P61	SW 39th St	SW 35th St	SW Salmon Ave	Both	Upgrade Sidewalk or Ramps	1.2	$1.2M
P62	SW Reservoir Dr	SW 39th St	SW 36th St	Both	Upgrade Sidewalk or Ramps	0.5	$0.5M
P63	SW 36th St	SW 35th St	SW Reservoir Dr	Both	Upgrade Sidewalk or Ramps	0.4	$0.4M
P64	SW 35th St	SW Cascade Vista Dr	SW 36th St	Both	Upgrade Sidewalk or Ramps	0.2	$0.2M
P65	SW Xero Ln	SW 35th St	West of SW 34th St	Both	Upgrade Sidewalk or Ramps	0.2	$0.2M
					Total Sidewalk and ADA Ramp Upgrades		**$11.3M**

Figure 11: Priority Pedestrian Routes and Projects



South Redmond Transportation Needs

The Oregon Department of State Lands (DSL), in partnership with the City, Deschutes County, and the Oregon Military Department, pursued an amendment to the City's UGB to allow annexation of 949 acres for expansion of the Deschutes County Fairgrounds, potential National Guard and military maintenance facilities, and 789 acres of future large lot industrial uses. To support development of these lands, the following transportation improvements were identified for implementation within the TSP:

- SW 19th Street/Airport Way – installation of a roundabout; this improvement is included in the list of prioritized intersection improvements identified in the above section of priority improvements.
- OR 126/Veterans Way – installation of a traffic signal or roundabout; this improvement is included in the list of prioritized intersection improvements identified in the above section of priority improvements.
- SE 9th Street Extension
- Airport Way extended north to connect with OR 126/SE 9th Street; this improvement is included in the above section of priority projects.
- Veterans Way/Airport Way/SE 9th Street – installation of a roundabout; this improvement is included in the improvement is included in the above section of priority projects.
- OR 126/SE 9th Street – installation of a traffic signal; this improvement is included in the list of prioritized intersection improvements.
- A future northbound connection at OR 126/ Veterans Way to provide access to industrial lands; this improvement is included in the list of prioritized new street improvements identified above.
- SW 21st Avenue/SE Airport Way – construction of a raised median to limit movements SW 21st Street to right-in-right-out; the construction of a median at this location will need to consider how local properties are provided access and the timing of roundabout construction at SW 19th Avenue/SE Airport Way.
- Canal Boulevard/Yew Avenue – potential expansion of this roundabout; the operational benefits of an improvement should be balanced against the cost and potential impacts to adjacent properties.

US 97 South Redmond Corridor Facility Plan

The City, ODOT and Deschutes County adopted the US 97 South Redmond Corridor Facility Plan to address traffic congestion, safety, local access needs, and noted pedestrian and bicycle needs adjacent to US 97 between Yew Avenue and Highland Avenue. The City of Redmond adopted the plan in 2019. The adopted plan concept is included in Appendix I and includes the improvements outlined below.

- New roadway connections that cross the COID canal and connect US 97 with neighborhoods to the west via Quartz Avenue, a new roadway south of Reindeer Avenue, and Volcano Avenue.
- New access roadways and alleys to provide alternative access to parcels adjacent to US 97.
- A center median with new signals along US 97 to facilitate protected left-turn movements and U-turns at existing signalized intersections to support the new connections.
- Pedestrian refuge islands on US 97.
- New sidewalks and cycle tracks along US 97 and the east-west streets connecting to the highway
- A new multi-use path along Canal Boulevard and the COID canal.
- Roundabouts at Quartz Avenue/Canal Boulevard, the new roadway south of Reindeer Avenue/Canal Boulevard, Volcano Avenue/Canal Boulevard.
- Gateway and streetscape treatments to improve the aesthetics and the comfort and convenience of pedestrians and cyclists along the corridor.

The Facility Plan recommended concept is estimated to cost $55 million–$60 million. Current estimates are based on the adopted conceptual plan. The conceptual plan is a generalized look at possible improvement needs and will be refined before final design. The refinement of the plan, including additional citizen outreach on the details of the final plan will occur before the right of way needs, easements, detailed design, and associated cost estimates are approved by the City engineer and/or City Council. Subsequent to the adoption of the TSP, ODOT anticipates forwarding the Facility Plan to the OTC for state adoption.

Source: US Bureau of Land Management

US 97/QUARRY AVENUE INTERCHANGE

To serve the urbanization of lands in the south part of the existing Urban Growth Boundary (UGB) and to alleviate travel demands at the Yew Avenue/US 97 interchange, the City, County and ODOT have explored the need to replace the existing at-grade SW Quarry Avenue/US 97 intersection with a new interchange. SW Canal Boulevard and the extension of SW 19th Street could connect this new interchange with the existing UGB.

The new interchange and the north-south connections into the UGB can help:

- Serve future development areas, especially the large lot industrial lands located near the Fairgrounds;
- Provide alternative grade-separated access to US 97, especially for travelers between Redmond and Bend and other destinations to the south; and
- Increase access to the Airport and provide alternative travel routes to US 97 in accordance with TSP Policy 2.2 and the Oregon Resilience Plan.

Providing an interchange at SW Quarry Avenue and extending SW 19th Street to the south would occur outside of the UGB; because these roadways would serve land uses within the City, Oregon's Transportation Planning Rule (TPR) Section 660-012-0070 requires approval of an "Exception for Transportation Improvements on Rural Lands." Accordingly, the City, County and ODOT will monitor the need for planning, designing and constructing a SW Quarry Avenue as part of TSP implementation. This interchange is not part of the 20-year list of projects considered to be reasonably likely to be funded within the TSP.

To assist with future monitoring efforts, the potential for a US 97/Quarry Avenue interchange and the associated roadway extensions/upgrades was evaluated as part of the update of this TSP. The key findings from that analysis are included in Appendix K and revealed a new interchange:

- Will not measurably reduce traffic volumes anticipated on the arterial and collector streets in the south part of the City or at the US 97/Yew Avenue Interchange;
- Can provide an alternative connection to US 97 for the large lot industrial lands near the Fairgrounds; however, the majority of the traffic anticipated from these lands over the next 20 years is anticipated to use the Yew Avenue Interchange; and
- The SW Quarry Avenue Interchange is not needed to meet the identified transportation needs within the TSP and would therefore be considered part of a "illustrative list" of potential projects for the City to consider at a future date.

Based on these findings, it does not appear that the requirements of a "Goal Exception" per the TPR is warranted at this time nor should the SW Quarry Avenue/US 97 Interchange be included in the list of reasonably funded TSP projects.

6

Transportation Funding & Implementation

In This Chapter

- What resources are available to fund Redmond's transportation projects?

6

Transportation Funding & Implementation

The TSP includes projects under the jurisdiction and ownership of ODOT, Deschutes County, the City of Redmond, and Cascade East Transit (CET), as well as projects that will be implemented by private developers. Individual TSP projects will be funded through a different combination of federal, state, City, county, SDC revenue, and or private sources. This chapter discusses current and possible new funding mechanisms that may be available to implement projects during the life of the TSP. A complete list of the multimodal projects and planning level cost estimates is provided in Chapter 5.

Today's fiscal environment is beset by uncertainty about future federal, state, and local funding for transportation projects. This uncertainty provides challenges to accurately forecast the amount of funding available for transportation investments and what projects or programs will receive funding. In this context, the TSP provides a prudent and conservative list of capital construction projects, an emphasis on lower cost methods of improving personal mobility within the City, and an increased reliance on technologies that can improve the efficiencies of our streets.

Further, the City policies and priorities seek to include strategic investments that support mixed-use, pedestrian-friendly neighborhoods, increase use of active modes of transportation, and reduce reliance on travel by single-occupant automobile. These priorities include improved convenience and safety for walking and biking, and continued support for the economic health and prosperity of the region.

The highest priority projects for strategic investments are those that (1) protect the existing system and (2) improve the efficiency and safety of existing multimodal facilities. These projects are to be implemented first unless a lower priority measure is demonstrated to be more cost-effective or is one that better supports safety, growth management, or other livability and economic considerations. Further, the list of projects identified above are intended to make streets safer for all users as well as more efficient with use of emerging technologies.

The timing of project implementation will depend on future policy direction and funding availability at the federal, state, or local level; changes in local development priorities; or the formation of public-private or public-public partnerships.

Transportation Revenue

Revenue forecasts from the City provided a basis for extrapolating an estimate of revenues that might be available for transportation projects over the next twenty years. Table 11 summarizes the potential revenue forecast and sources for the identified list of strategic priorities.

Table 11: Forecast Revenue Sources

Revenue Source	Average Annual Income	20-Year Revenue Forecast
SDC Improvement Sub-Fund	$1.02M	$20.35M
SDC Reimbursement Sub-Fund	$0.12M	$2.35M
Capital Projects Sub-Fund	$0.85M	$17.07M
Total Revenue	$1.99M	$39.77M

Summary Of Transportation System Costs

Table 12 summarizes the total cost by category of recommended multimodal transportation projects.

Table 12: Project Costs

Revenue Source	Average Annual Income
Strategic Street Capacity Investment Corridors	$54.1M
New Planned Streets	$114.1M
Intersection Capacity Improvements	$35.4M to $70.5M depending on intersection control type selected
Other Priority Intersection Capacity Improvements	$1.7M to $4.4M depending on intersection control type selected
Grade-Separated Intersection Improvements	$42.9M
Key Multi-Use Pathways	$104.7M
Key Bicycle Corridors	$17.4M
New Sidewalk Facilities along ADA Routes	$5.5M
Sidewalk and ADA Ramp Upgrades	$11.3M
US 97 South Redmond Concept Facility Plan	$55 - $60M
Total Cost	**$442.1M to $484.9M depending on intersection control type selected**

Funding Gap

Comparing Tables 11 and 12 demonstrate that City funding alone is insufficient to address the TSP needs. As such, the City will need to partner with other agencies, the private development community and pursue alternative funding sources to address the 20-year list of prioritized projects.

Potential Funding Sources

While highway user taxes and fees, including Oregon State fuel taxes, licensing, and registration fees, as well as local fuel taxes, are available to fund transportation-related projects in the City, per local policy these sources have increasingly been devoted to operations, maintenance, and preservation. This practice diverts funds away from capacity development or expansion projects. The City will need to develop a strategy to fund the improvements identified in the TSP. Possible elements of this strategy are outlined below.

Local Funding Mechanisms

Table 13 outlines potential funding sources at the local level that either can currently be used to fund future projects or that the City Council may want to consider adopting as a new funding source. The City has used some of these funding mechanisms in the past; others would be new. Inclusion of this table in the TSP does not create a new funding source but rather is intended to the various funding sources that local governments throughout Oregon utilized. In general, local funding sources are more flexible than funding obtained from state or federal grant sources.

Table 13: Potential Local Funding Mechanisms

Funding Source	Description	Potential Application
Street Utility Fees (also called road maintenance fees)	A fee based on the number of automobile trips a particular land use generates; usually collected through a regular utility bill. Fees can also be tied to the annual registration of a vehicle to pay for improvements, expansion, and maintenance of the street system.	System-wide transportation facilities including streets, sidewalks, bike lanes, and shared use paths.
Transportation Systems Development Charge (SDC)	SDCs are impact fees assessed to development for the capacity demand it creates on public infrastructure systems. SDCs may be an improvement fee, a reimbursement fee, or a combination thereof. Reimbursement fee revenues are dedicated to capital projects that increase capacity to meet the needs of growth. SDC credits are provided to developers for public improvements they construct which add capacity to the system beyond that required to serve their development. SDC credits may also be given for development provisions that reduce vehicular capacity demand on the transportation system, such as providing end-of-trip bike facilities within the new development.	The City currently has an SDC program. They may update the SDC to reflect the adoption of projects included in the updated TSP after adoption.
Stormwater SDCs, grants, and loans	SDCs, grants, loans, and stormwater improvement fees can be obtained for improving stormwater management facilities constructed as part of transportation system improvements.	SDCs may only be used for that portion of transportation improvements which generate additional stormwater management capacity related to growth.
Local gas tax	A local tax can be assessed on the purchase of gas within the City. This tax is added to the cost of gasoline at the pump, along with the state and federal gas taxes.	System-wide transportation facilities including streets, sidewalks, and bike lanes.

Table 13: Potential Local Funding Mechanisms (continued)

Parking in-lieu fees	Parking in-lieu fees are developer fees paid if they cannot or do not want to provide on-site parking for the development. The idea behind these fees is to decrease the amount of off-street, private parking and consolidating parking supplies on-street or in parking garages as a way to decrease parking demand on the development site. In-lieu fees may benefit developers by reducing costs and allowing more intensive development on a site.	System-wide transportation facilities including streets, sidewalks, bike lanes, shared use paths, and transit.
Incentives	The City provides enticements such as bonus densities and flexibility in design in exchange for a public benefit. Examples might include a commute trip reduction (CTR) program or transit facilities in exchange for bonus densities. Incentives may be used with SDC methods to reduce transportation impacts from new development.	System-wide transportation facilities including streets, sidewalks, bike lanes, shared use paths, and transit.
Public/private partnerships	Public/private partnerships have been used around the country to provide public transportation amenities within the public right-of-way in exchange for operational revenue from the facilities. These partnerships could be used to provide services such as vehicle charging stations, public parking lots, bicycle lockers, or car share facilities.	System-wide transportation facilities including streets, sidewalks, bike lanes, shared use paths, and transit.
Tax Increment Financing (TIF)	TIF is a tool that cities may use to create special districts (tax increment areas) where public improvements are made to generate private-sector development. During a defined period, the City freezes the tax base at the pre-development level. Property taxes for that period can be waived or paid, but taxes derived from increases in assessed values (the tax increment) resulting from new development can go into a special fund created to retire bonds issued to originate the development or leverage future improvements. A number of small-to-medium sized communities in Oregon have implemented, or are considering implementing, urban renewal districts that will result in a TIF revenue stream.	System-wide transportation facilities including streets, sidewalks, bike lanes, shared use paths, and transit.
Streets District	Oregon state law (Oregon Revised Statute [ORS] 371) allows for the formation of special streets taxing districts for purposes of constructing and maintaining streets within the taxing district boundaries. A Streets District would be a separate entity from the City of Redmond, with its own property tax levy rate and an elected board of commissioners. Those within the potential district boundaries must vote on the creation of a Streets District.	Roadway improvement projects.
Revenue and general obligation bonds	Bonding allows municipal and county government to finance construction projects by borrowing money and paying it back over time, with interest. Financing requires smaller regular payments over time compared to paying the full cost at once, but financing increases the total cost of the project by adding interest. General obligation bonds are often used to pay for construction of large capital improvements and must be approved by a public vote. These bonds add the cost of the improvement to property taxes over time.	Construction of major capital improvement projects within the city, street maintenance and incidental improvements.
Reimbursement Districts	Also called Zones of Benefit or Advance Financed Districts, a city determines the boundary of the district. Property owners of new development or large redevelopment permits pay a fee for the installation of public improvements. They then recover some portion of the cost over a period of years (often 15).	Construction of major capital improvement projects within the city (possibly in Study Areas).

State and Federal Grants

In addition to local funding sources, the City can seek to leverage opportunities for funding from grants at the state and federal levels for specific projects. Table 14 outlines state and federal sources and their potential applications.

Potential state funding sources are extremely limited, with some having significant competition. Any future improvements that rely on state funding may require City and regional consensus that these improvements are more important than transportation needs elsewhere in the region and the state. It will likely be necessary to combine multiple funding sources to pay for a single improvement project (e.g., combining state, regional, or City bicycle and pedestrian funds to pay for new bike lanes and sidewalks).

Table 14: Potential State and Federal Grants

Funding Source	Description	Potential Application
Statewide Transportation Improvement Program (STIP)	STIP is the State of Oregon's four-year transportation capital improvement program. ODOT's system for distributing these funds has varied over recent years. Generally, local agencies apply in advance for projects to be funded in each four-year cycle.	Projects on any facility that meet the benefit categories of the STIP.
Statewide Transportation Improvement **Program-Urban (STIP-U)**	STIP-U is the State of Oregon's four-year transportation capital improvement program for urban areas. ODOT's system for distributing these funds has varied over recent years. Generally, local agencies apply in advance for projects to be funded in each four-year cycle.	Projects on any facility that meet the benefit categories of the STIP-U.
Transportation and Growth Management (TGM) Grants	TGM Grants are planning grants administered by ODOT and awarded on an annual basis. The TGM grants are generally awarded to projects that will lead to more livable, economically vital, transportation efficient, sustainable, and pedestrian-friendly communities. The grants are awarded in two categories: transportation system planning and integrated land use/transportation planning.	Refinement of any identified study projects.
Transportation Alternatives Program (TAP)	TAP is a federal program that provides funding for pedestrian and bicycle facilities, projects for improving public transit access, safe routes to schools, and recreational trails. Local governments, regional transportation authorities, transit agencies, school districts or schools, natural resource or public land agencies, and tribal governments are all eligible to receive TAP funds.	Bicycle and pedestrian facilities, shared use paths.
All Roads Transportation Safety Program (ARTS)	The federal Highway Safety Improvement Program is administered as ARTS in Oregon. ARTS provides funding to infrastructure and non-infrastructure projects that improve safety on all public roads. ARTS requires a data-driven approach and prioritizes projects in demonstrated problem areas.	Areas of safety concerns within the city, consistent with Oregon's Transportation Safety Action Plan.
Immediate Opportunity Fund (IOF)	This fund is discretionary and provides funding for transportation projects essential for supporting site-specific economic development projects. These funds are distributed on a case-by-case basis in cooperation with the Oregon Economic and Community Development Department. These funds can only be used when other sources of financial support are insufficient or unavailable. These funds are reserved for projects where a documented transportation problem exists or where private firm location decisions hinge on the immediate commitment of road construction. A minimum 50 percent match is required from project applications.	Any identified projects that would improve economic development in the city and where there are documented transportation problems.

Table 14: Potential State and Federal Grants (continued)

Connect Oregon	Lottery-backed bonds distributed to air, marine, rail, transit, and pedestrian and bicycle projects statewide. No less than 10 percent of Connect Oregon IV funds must be distributed to each of the five regions of the state, if there are qualified projects in the region. The objective is to improve the connections between the highway system and other modes of transportation.	System-wide transportation facilities.
Oregon Parks and Recreation Local Government Grants	Oregon Parks and Recreation Department administers this program using Oregon Lottery revenues. These grants can fund acquisition, development, and major rehabilitation of public outdoor parks and recreation facilities. A match of at least 20 percent is required.	Trails and other recreational facility development or rehabilitation.
Oregon Transportation Infrastructure Bank (OTIB)	A statewide revolving loan fund is available to local governments for many transportation infrastructure improvements, including highway, transit, and non-motorized projects. Most funds made available through this program are federal; streets must be functionally classified as a major collector or higher to be eligible for loan funding.	Infrastructure improvements to major collectors or higher classified roads for vehicle, transit, and non-motorized travel.
State highway gas tax increase or user fee	ODOT is currently researching a state user fee for drivers to address steady or declining state gas tax revenues. An increase in the state gas tax or a user fee would need to pass through state legislation and would increase the state's transportation funds.	System-wide transportation facilities including streets, sidewalks, bike lanes, and transit.
Oregon Statewide Transportation Improvement Fund (STIF)	HB 2017 established a new dedicated source of funding for improving or expanding public transportation service in Oregon. New revenue from this source is allocated across four programs, three of which apply to public transportation service in Redmond; Formula program, Discretionary program, and Intercommunity Discretionary program.	Public transportation facilities and services.

2040 Transportation System Plan
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Appendix A Public Involvement Plan

Date:	December 11, 2017
To:	Project Management Team
From:	Anne George, Facilitation, Mediation + Public Involvement Matt Kittelson & Julia Kuhn, Kittelson & Associates, Inc.
Subject:	Final Public Involvement Plan

INTRODUCTION

The current City of Redmond Transportation System Plan (TSP) was adopted in 2008. This project will update the current TSP to reflect changes that have occurred since 2008 and provide a transportation plan to the meet the needs of the City for the next 20 years.

The focus on this TSP update will be to achieve the following outcomes:

- Adopt an updated TSP that provides for a safe, efficient, multi-modal transportation network, based on the needs of existing and future land uses;
- Provide a data driven safety plan that focuses on reducing or eliminating fatal and serious injury crashes;
- Improve circulation and connectivity through the City for all modes;
- Provide parallel routes to support the long-term function of highways and major roadways, particularly in the South Redmond corridor;
- Identify short and long-term transportation solutions that support economic development and redevelopment including Transportation System Management and Operations (TSMO);
- Evaluate the potential transportation needs to support economic development including industrial, mixed use and business districts, and identify solutions that will support the development of these sites;
- Determine the appropriate means for managing the state highways and major arterials to meet both local access and through traffic needs as well as improving safety and mobility for all users (auto, transit, bicyclists, pedestrians and motor carriers);
- Evaluate intermodal safety and access for all types of users;

- Consider the needs of disadvantaged travelers in assessing both transportation needs and solutions;
- Review recent changes to the Transportation Planning Rule (TPR) and Oregon Administrative Rules (OAR) related to access management and alternative mobility standards to identify potential opportunities to employ the use of alternative/local standards;
- Integrate concurrent, parallel planning efforts related to the US 97 Redmond South Corridor and the Downtown Transportation Plan into the TSP; and
- Develop TSP implementation policies which support a safe, convenient, and economical transportation system.

COORDINATION ACROSS TRANSPORTATION PROJECT TEAMS

Community engagement will be an essential component the TSP Update's success. The City of Redmond is currently conducting a number of transportation and livability projects that will help to shape the future vision and economic prosperity of the community. To better serve the community and increase the value of the input provided, the City, ODOT and the consultant teams working on the various planning efforts will work in partnership on the various community engagement efforts and share information received on individual projects. To this end, we recommend that:

- the City maximize public engagement efforts by centralizing information about each project on a City of Redmond planning projects web page and;
- the individual project teams encourage community input on all of the projects underway, work together on public engagement efforts, and share such input across project teams.

KEY PUBLIC ENGAGEMENT MESSAGES

The TSP Update is an important project for the community of Redmond. As the project team engages the community, consistent messaging will be important for community comprehension and the success of the project. Key messages include:

- The TSP Update will plot a course for the transportation system needed to support continued economic prosperity in the community for the **next 20 years**.
- Transportation planning **focuses on the safety and mobility of all users** from community members' ability to easily access schools, shopping, parks, and medical facilities to the needs of commercial and industrial users to safely and efficiently transporting goods to and from Redmond.

- The **last TSP Update was completed in 2008**. Since that time Redmond and the surrounding area has changed and grown substantially and a TSP Update is needed to support these changes.
- A **number of transportation and livability projects are underway** to enhance and improve the community of Redmond. The City and its project teams will collaborate to share information about how the TSP Update complement and relies upon other efforts. Examples of these efforts include the Redmond Neighborhood Revitalization Project, Airport Master Plan Update, and the US 97 South Corridor Project. Community members are invited to share their input with any of the project teams who will in turn work to share such input across project teams.
- The community will have a **number of opportunities to share their experiences, ideas, and concerns** as well as weigh in on project alternatives. Public input is invited via the project website, attendance at advisory committee meetings, participation in public open houses, and direct communication with the project team.

PUBLIC ENGAGEMENT GOALS

The City of Redmond seeks a community-supported TSP Update that meets the needs of its residents and supports continued economic growth. Stakeholder engagement will be central to understanding local needs and expectations. The goals of the public involvement plan include the following:

- Inform the community about the project and foster the exchange of ideas;
- Document community interests, ideas, and concerns;
- Involve affected or interested stakeholders in the development and evaluation of alternatives considered;
- Maximize public engagement effectiveness by sharing public input received in this project with other transportation projects underway in the City and, when feasible, coordinate with other project teams on public engagement events; and
- Develop a community-supported Transportation System Plan that will enhance the vitality of Redmond and the surrounding area.

KEY AUDIENCES

City of Redmond

The Consultant Team will be directed by selected **City staff, working in collaboration with ODOT and Deschutes County staff**. The **Redmond City Council** has ultimate decision-making authority on the adoption of a TSP Update for the City.

Project Management Team

The PMT will provide the day-to-day guidance for the consultant team. The PMT includes two City staff members, one ODOT staff, and one Deschutes County staff. Each member of the PMT is responsible for engaging other staff from his/her agency at appropriate times throughout the project to solicit input/review on deliverables, technical analyses and feasibility of solutions being considered.

Oregon Department of Transportation (ODOT) and Deschutes County

ODOT and Deschutes County will be key partners in the project. The project team will plan and incorporate ODOT and Deschutes County feedback and needs into the effort and work with these agencies on the findings and outcomes of the TSP Update process. Re

Technical and Public Advisory Committee (TAC and PAC)

Public engagement will be an important component of the success of the project. The technical and public advisory committee will comprise a cross section of stakeholders, appointed by the City Council, and tasked with advising the project team. This group will be relied on to represent the public interest in the analyses of community needs and the development and identification of preferred alternatives. In general, the technical advisory committee is comprised of representative agency stakeholders while the public advisory committee is comprised of representative community members.

Redmond Community

The project team seeks engagement from stakeholders and interested parties in meaningful ways throughout the project. With an eye on engaging communities affected by the outcomes of the project, the project will specifically target the following groups for their participation:

- **Community members** and the general public across the project area.
- **Community organizations** including non-profit organizations, youth organizations, and organizations representing older adults and people with disabilities, as well as culturally-specific organizations.
- **Economic development partners** such as the Redmond Chamber of Commerce, Economic Development for Central Oregon, Redmond Economic Development, Inc., and the local business community.
- **Property owners and renters** in the City and surrounding area.
- **Local representatives and other government partners** including the Redmond City Council, Redmond Planning Commission, fire department, local law enforcement, Department of State Lanes, Deschutes County representatives, and Central Oregon Intergovernmental Council.

- **Transportation partners** including Cascades East Transit, bicycle and pedestrian advocates (Deschutes Count Bicycle and Pedestrian Committee, and regional freight industry representatives.
- **Educational, recreational, and health partners** including the Redmond School District, Central Oregon Community College, Redmond Area Park & Recreation District, St. Charles Health System, and Deschutes County Health Services.
- **Local news** media outlets.

Equity

Appendix A presents an overview of Redmond's demographics and identifies concentrations of low-income, minority, and limited-English proficient residents. The analysis of demographics will be used to refine the public involvement program (PI program) as needed. However, regardless of concentration, members of all of these groups will be invited to participate in the planning process and accommodations will be made (e.g. translation services as provided by the City of Redmond) to encourage their participation. The project will also compile a Title VI report at the end of the project. This report will compile all Title VI activities, document project process and outreach for all low income, race, gender, and age groups.

To engage these traditionally underrepresented communities, the project team will employ the following strategies:

- **Advisory Committee meetings:** The advisory committee includes interested citizens, property and business owners and groups. The PAC also includes groups that advocate for, or serve as networking places for, these traditionally under-served communities. All PAC meetings are open to the public.
- **Community workshops and events:** As possible, the team will identify partner organizations that can co-host or promote open house events to traditionally underserved communities. Demographic information (anonymously) will be collected at all public events to be added to the final report and for City's use for Title VI reporting requirements.
- **Articles in local papers:** The City will distribute short media releases or articles will be written at key milestones and sent to local media outlets. City staff will also conduct interviews with media outlets to increase the likelihood of an article running in the paper or on the radio. These outlets reach a wide audience.
- **Translation, special accommodations, and graphics:** translation services and other special accommodations will be provided at all meetings upon request (provided through City or partner agencies). All public materials will be presented in "easy to understand" language with "jargon" words removed or fully explained. Graphics will also be used to convey information, as a way to reduce the need to translate materials and to accommodate multiple learning styles.

DECISION MAKING

As noted, the Redmond City Council holds ultimate decision-making authority on the adoption of an updated TSP. The Council will work with the Redmond Planning Commission, the Oregon Department of Transportation, the community, and other partners throughout this process.

PUBLIC INVOLVEMENT PROCESS

Coordination with Other Transportation and Livability Projects

As noted, the City has a number of transportation and livability projects underway. Coordinating the public involvement efforts of these various projects will contribute to effective community engagement. For community members, it may be helpful for the project team, and other transportation project teams working in Redmond currently, to adopt a "one-stop shopping" approach when interacting with the public. In other words, community members should feel welcome to share their input with the TSP Update project team about any transportation-related project underway in Redmond and feel confident that information will be shared with the appropriate project team.

Where possible, it will be valuable to plan public involvement meetings that incorporate the findings and analysis of other projects from the US 97 South Corridor Project, the Redmond Neighborhood Revitalization Project, the Downtown Transportation Plan, and any other relevant projects.

The city will provide a central location on its website for quick access to all transportation projects' web pages.

Website

The consultant team will develop and maintain a project website that will serve to provide a project overview, key input opportunities for the community, project materials and meeting notes, community meetings information, and an on-line mapping tool that allows the public to provide input and pinpoint issues, ideas, and comments directly on a map of the Project Area.

The project team will include links to other transportation projects underway, as well as websites of the City and ODOT, and updates on other ongoing projects at the TSP Update project website.

Stakeholder Interviews

The project team will work with the City of Redmond to identify key stakeholders to interview in the early stages of the TSP update. These interviews are intended to help the TSP update process understand and learn about key transportation issues and opportunities from the perspective of different groups, sectors, and communities. City and consultant staff will conduct the interviews.

Community Open Houses

While the larger community will be encouraged to be involved throughout the process, two community open houses will serve to solicit important direct community input early in the process and then again when alternatives are developed.

Open House #1: Existing and Future Transportation Needs

The first Community Open House will take place in late fall/early winter 2017 to provide the community with information about the project, including existing and future transportation conditions data. Emphasis will be placed on why and how transportation planning impacts the daily lives of community members. Community members will be asked to share their experiences living and working in Redmond, as they pertain to their transportation needs in Redmond and the surrounding area. Community input will help to shape the process as it moves forward.

During this Open House, the US 97 South Corridor Project and Redmond Neighborhood Revitalization Project teams may be asked to present information about those projects, including how they relate to the TSP Update. US 97 South Corridor Project team leads may also be asked to have a table or display at the event to inform community members about that project and ways for the community to become involved. The TSP Update team will also come prepared to answer basic questions about these other projects and how community members can contribute.

Open House #2: TSP Alternatives

The second Community Open House will take place in early 2018 and will focus on sharing project alternatives from the TSP Update. The project team may elect to conduct a shared open house event with the US 97 South Corridor Project, which may also be ready to share project alternatives at this date. Such partnerships are likely to garner increased community participation, as well as enhanced community understanding of the various transportation projects underway and how they are interconnected and vital to the continued success of Redmond.

Group Presentations (City staff to conduct as needed)

Community engagement is enhanced when project leaders seek out involved and affected parties. Agency staff is encouraged to seek out community groups, especially those who do not traditionally engage in community projects or public meetings on their transportation needs. Informal presentations and discussions with community groups are likely to be effective in gathering community input. In addition, many of the groups listed below can help inform the project team on the best ways to engage their membership, perhaps by attending an already existing meeting, providing articles or data for a group's newsletter or website, or meeting specifically with members to update them and solicit input.

The following groups, while not exhaustive, are recommended for direct engagement:

- Redmond Chamber of Commerce
- Economic Development for Central Oregon (EDCO)
- Redmond Economic Development, Inc. (REDI)
- St. Charles Redmond
- Redmond School District (and Parent Teacher Associations)
- Redmond neighborhood groups and homeowners' associations
- Bicycle-Pedestrian Advisory Committee (BPAC)
- Latino Community Association of Central Oregon
- Central Oregon Council on Aging (COCOA)
- Central Oregon Veterans Outreach
- Central Oregon Visitors Association (COVA)
- Redmond Library
- Freight and rail trade groups

OUTREACH

The City of Redmond is adept at community outreach. In addition to soliciting input from the groups named above for their advice on reaching their membership, the project team will share information with media outlets, community newsletters, and an interested parties list at key milestones and before community events. In addition, a social media campaign that involves regular updates and information sharing via the City's social media platforms, as well as those of the members of the advisory committees, will contribute to community awareness and participation in the project.

PUBLIC INVOLVEMENT TIMELINE

A public open house to discuss existing conditions and future needs will be held in early February 2018. This open house will be a joint effort with the South Redmond Corridor Study. A second open house to discuss the Draft Transportation System Plan will be held in late Summer 2018.

ONGOING PUBLIC INVOLVEMENT EVALUATION

The PMT will regularly discuss and debrief ongoing community involvement efforts and seek feedback from City staff, advisory committee members, and the community-at-large. Responses from questionnaires or surveys from participants at in-person and online will be compiled and utilized to refine public engagement.

Appendix B Plans and Policy Review

REDMOND
Transportation System Plan

Date:	February 21, 2018	Project #: 17720 ODOT PA #27456
To:	Redmond TSP Project Management Team (PMT)	
Subject:	Plans and Policy Review (Task 2.2)	

This memorandum provides a review of current transportation related plans, standards, rules, regulations and policies in place by the state, county, and local jurisdictions that pertain to the update of the Redmond Transportation System Plan (TSP). This summary serves as a reference for the Project Management Team (PMT) and the Project Advisory Committee (PAC) and identifies key issues for consideration as part of the TSP Update.

Some documents reviewed herein document existing transportation-related standards, targets, and guidelines with which the TSP shall coordinate and be consistent; others documents contain identified transportation improvements to include in the year 2040 analyses of potential projects. Some City policy and regulatory documents described in this review may require amendments following the adoption of the TSP to ensure implementation of the identified TSP policies and projects as well as compliance with Oregon's Transportation Planning Rule (TPR). These amendments will be identified as part of Task 6.2. Table 1 provides a summary of the documents reviewed and summarized as part of this memorandum.

Table 1. Summary of Documents Reviewed and Relevance to TSP

Document/Policy	Relevance to TSP	Page
Statewide Planning Documents		
OAR Chapter 734 Division 051	Projects, policies, and regulations identified as part of TSP Update will reflect the policies of the statewide modal plans and policies and will comply with or move in the direction of meeting the standards and targets established in the OHP and ODM related to safety, access, and mobility.	3
Oregon Highway Plan (as amended)		4
Oregon Freight Plan		7
Oregon Public Transportation Plan		7
Oregon Rail Plan		8
Oregon Aviation Plan		8
Oregon Bicycle/Pedestrian Plan		9
Oregon Transportation Safety Action Plan		10
ODOT Highway Design Manual		11
Oregon Roadway Departure Safety Implementation Plan		12
Transit in Small Cities: A Primer for Planning, Siting and Designing Transit Facilities in Oregon		14
Oregon Intersection Safety Implementation Plan		13
Oregon Bicycle and Pedestrian Safety Implementation Plan		13
ODOT Region 4 Active Transportation Needs Inventory		14

Table 1. Summary of Documents Reviewed and Relevance to TSP (continued)

Document/Policy	Relevance to TSP	Page
Statewide Planning Documents		
Statewide Planning Goals (OAR chapter 660 division 012, known as the Transportation Planning Rule or TPR)		11
Statewide Transportation Improvement Program	This TSP update will incorporate projects programmed in the STIP. An expected implementation task for this TSP is to recommend updates to STIP, as appropriate.	12
Oregon Resilience Plan	Projects, policies, and regulations identified as part of this TSP Update will incorporate applicable transportation system elements included in the Resilience Plan. An expected implementation task for this TSP is to maintain key inter-agency coordination on Resilience Plan and make periodic updates to TSP, as appropriate.	13
Regional and Local Planning Documents		
Deschutes County 2012 TSP	Projects, policies, and regulations identified as part of this TSP Update will reflect the policies and projects in the County's TSP.	15
North Redmond Interchange Area Management Plan	The TSP Update will integrate the findings and recommendations of the IAMP into the policy direction and prioritization of future projects.	15
City of Redmond Transit Master Plan (July 2009 Draft Final Plan)	The TSP update will integrate the City's previously identified transit improvements as well as regional transit and transportation demand management strategies.	16
Redmond Service Alternatives (April 23, 2013 revised draft)		16
Redmond Comprehensive Plan	The TSP update will be adopted as an element of the Comprehensive Plan and replace the 2008 TSP. More specific policy direction and detailed system planning and project prioritization will be included in Update	17
Redmond 2008 TSP		18
Ongoing amendments or updates to 2008 TSP project lists and costs		18
Redmond Airport Master Plan	The TSP update will consider how to preserve and enhance access to airport infrastructure. Coordination between ongoing Airport Master Plan efforts and TSP will be maintained throughout update process.	18
Redmond Development Code	Amendments to RDC provisions related to transportation improvements and policies may be recommended as part implementation tasks of TSP update to ensure consistency between Development Code and TSP, and to strengthen compliance with the TPR.	
City Buildable Lands Inventory	The TSP update will integrate economic development policies and priorities into transportation policies and project prioritization.	19

Table 1. Summary of Documents Reviewed and Relevance to TSP (continued)

Document/Policy	Relevance to TSP	Page
Statewide Planning Documents		
City's current and past budget for transportation	The TSP Update consider the City's current revenue levels, planned expenditures, and potential future revenue sources to develop a funding plan.	20
City's current and historic funding and sources		
City Parks and Recreation District Master Plan	The TSP Update will integrate the findings and recommendations of the Park Master Plan into the policy direction and prioritization of future projects.	20

STATEWIDE PLANS AND POLICIES

OAR Chapter 734 Division 051

Commonly referred to as Division 51, ODOT adopted OAR 734-051 to establish procedures and criteria to govern highway approaches, access control, spacing standards, medians and restriction of turning movements. The application of these criteria to changes to the state highway are intended to comply with statewide planning goals, acknowledged comprehensive plans, state law, and the Oregon Transportation Plan (OTP).

The 2008 TSP outlines the guiding principles used in the adoption of new access management standards consistent with OAR 734-051 and the Oregon Highway Plan (OHP). The TSP Update will incorporate the amendments to OAR 734-051 through the adoption of Senate Bill 264 when establishing revised street design guidelines.

Within Redmond, three state facilities connect the city's residents, employees, and visitors with other areas in Central Oregon as well as through the state. These highways also provide connections between areas within the city and at the same time, can present a barrier to walking and cycling. In addition, per the Oregon Resilience Plan, US 97 is a Tier I, Phase I Lifeline Route that would serve as a critical statewide route in the event of a catastrophic emergency, such as a Cascadia Subduction Zone earthquake. A summary of the three facilities and the applicable standards are shown in Table 2.

Table 2. ODOT Access Management Spacing Standards

Route Name	Facility Extents	Facility Designation	2015 ADT	Posted Speed Limit (mph)	Access Spacing Standard (feet)
OR 126	Entire Section within City Limits	Statewide Highway	>5,000	25/35/45/50	350/500/800/1320
US 97	Entire Section within City Limits	Statewide Highway	>5,000	40/50/55	800/1100/1320
O'Neil Highway	Entire Section within City Limits	District Highway	<5,000	35	250/360/425/650 (30/40/50/55)

Oregon Highway Plan (OHP)

The OHP is the modal plan of the Oregon Transportation Plan (OTP) to guide ODOT in the planning, operations, and financing of its highway system. Policies in the OHP emphasize the efficient management of the highway system to increase safety, partner with local and regional jurisdictions, and employ new techniques to improve the capacity of the existing system before expanding capacity. The OHP's policies provide an essential link between land use and transportation, provide standards and targets for highway performance, design, and access management, and emphasize the multimodal relationship between state highways, local and regional streets, bicycle, pedestrian, transit, rail, and air systems.

The following are examples of OHP policies that are relevant to Redmond's TSP update.

Policy 1A: State Highway Classification

ODOT classifies its highways into four levels of importance: Interstate, Statewide, Regional, and District. This classification system guides ODOT's management of and decisions regarding the investment in the highway system as well as the development of facility plans and the agency's review of local plan and zoning amendments and facility management decisions, such as road approach permits.

As noted above, there are three ODOT highways within Redmond City limits, including US 97, OR 126, and the O'Neil Highway. The purpose and management objectives of these highways are provided in Policy 1A, as summarized below.

- *Statewide highways* (US 126 and US 97) are intended to provide inter-urban and inter-regional mobility and to connect larger urban areas, ports, and major recreation areas that are not directly served by Interstate Highways. A secondary function is to connect regional

trips. ODOT's management objective of these highways is to provide safe and efficient operations with minimal interruptions to flow within urban areas.

- *District highways* (O'Neil Highway) typically function as county and city arterials and collectors. These facilities link urban and rural areas within a region. ODOT's management objective of these highways is to provide for safe and efficient operations in an environment that reflects the urban character and multimodal modes of the highway.

Within the City Limits, US 97 has both an expressway and non-expressway designation. Both US 97 and OR 126 have a freight route designation.

Policy 1B: Land Use and Transportation

Policy 1B provides clarification on ODOT will work with other agencies to establish the linkage between land use and transportation in transportation plans, facility and corridor plans, plan amendments, access permitting and project development. Policy 1B also recognizes that state highways can serve as the main street in some communities, and as such, this policy provides for a balance between serving a local community's needs and through traffic.

Policy 1C: State Highway Freight System

To support the continued vitality of local and state economies, the designated state's freight system facilitates efficient and reliable interstate, intrastate, and regional truck movement. This freight system includes routes that carry significant tonnage by truck and serve as the primary interstate and intrastate highway connections to ports, intermodal terminals, and urban areas. Highways included in this designation have higher highway mobility standards than other statewide highways. Within the city, both US 97 and US 126 are designated freight routes.

Policy 1F: Highway Mobility Policy

This policy establishes mobility targets that implement the objectives of the OTP and other OHP policies. The policy, as revised, offers the flexibility to the state and local jurisdictions to collaboratively implement mobility targets that support and reflect land use, transportation and economic development priorities.

The mobility targets are a measure of state highway performance based on a volume to capacity (v/c) ratio. The targets are intended to make initial assessment of measures needed to maintain acceptable and reliable mobility but also to recognize that alternative mobility targets (including measures that are not v/c-based) can be effective in identifying solutions that "better balance state and local community needs and objectives."

Within Redmond, the following targets are applicable:

- Statewide Expressway outside of a MPO area (US 97 and OR 126): 0.85 if the speeds are less than or equal to 35 miles per hour and 0.80 for speeds greater than 35 miles per hour.

- District Highway outside of a MPO area (O'Neill Highway): 0.95 if the speeds are less than or equal to 35 miles per hour and 0.90 for speeds greater than 35 miles per hour.

As part of the passage of Senate Bill 1544, ODOT and the City adopted alternative mobility targets for the US 97/Evergreen, US 97/Highland, and US 97/Veteran's Way intersections.

Policy 1G: Major Improvements

This policy establishes a three-tier process related to evaluating major improvements to the state highway system. The first priority is to improve the safety and management of the existing system prior to adding roadway capacity. Transportation system management (TSM) and transportation demand management (TDM) measures (including land use changes) can be used to evaluated to determine ways to better manage the efficiency of the existing system. The second priority is to make minor improvements to the state highway system and/or improvements to the local street network. The third priority is to add lanes to increase capacity or make other major improvements. The City will work with ODOT to determine TSP improvement projects and policies that support this policy.

Policy 2B: Off-System Improvements

This policy allows ODOT to make financial contributions to local street improvements that support the state highway system and are consistent with Policy 1G. As part of the Redmond TSP, the City, ODOT and other affected stakeholders will collaboratively identify projects that support this policy and are consistent with local policies and priorities.

Policy 2F: Traffic Safety

This policy priorities improvements to enhance the safety of all users of the highway system. Action 2F.4 provides for the implementation of the Safety Management System to allocate resources to areas with the most significant safety issues.

Policy 3A: Classification and Spacing Standards

As discussed above, ODOT manages location, spacing, and intersections along state highways to ensure the safe and efficient operations for the traveling public. These management tools recognize the intended function and classification of the highways (as discussed in Action 3A.2). The applicable access management spacing standards, as established in the OHP, for the City are implemented by access management rules in OAR 734, Division 51 and highlighted in the above section.

Policy 4A: Efficiency of Freight Movement

The City is bisected by two important statewide freight routes: US 97 and US 126. Policy 4A recognizes the need to maintain and improve the efficiency of freight movement on the state system. The City and ODOT will work together to identify needed improvements to each highway, consistent with this policy.

Policy 4B: Alternative Passenger Modes

This policy supports the development and enhancement of "alternative passenger services and systems" that help preserve the performance and function of the state highway system. As part of the TSP, ODOT, the City and the Central Oregon Intergovernmental Council (COIC) will work together to identify potential improvements to support the Cascades East Transit (CET) service within the City.

Oregon Freight Plan (2011)

The OPF is the modal plan of the OTP that supports the movement of goods and commodities in the state. Per this policy, it the state's intent "to improve freight connections to local, Native American, state, regional, national and global markets in order to increase trade-related jobs and income for workers and businesses." This plan prioritizes strategic investments in existing freight facilities (including rail, marine, air, and pipeline infrastructure).

Within the City, US 97 and OR 126 are part of the state's freight network. The following policies in the Freight Plan can help shape the projects evaluated as part of the TSP.

- Strategy 1.2: Strive to support freight access to the Strategic Freight System. This includes proactively protecting and preserving corridors designated as strategic.
- Action 1.2.1. Preserve freight facilities included as part of the Strategic Freight System from changes that would significantly reduce the ability of these facilities to operate as efficient components of the freight system unless alternate facilities are identified or a safety-related need arises.
- Strategy 2.4: Coordinate freight improvements and system management plans on corridors comprising the Strategic Freight System with the intent to improve supply chain performance.

In addition, the City has established the following goal as part of the TSP update related to freight movement:

- *TSP Goal 6*. Ensure that efficient and effective freight transportation infrastructure is developed and maintained to support local and regional economic expansion and diversification consistent with City and Regional economic plans and policies.

Oregon Public Transportation Plan

The OPTP provides guidance to the development and maintenance of public transportation systems. The vision that guides this element of the OTP is summarized below.

- *"A comprehensive, interconnected and dependable public transportation system, with stable funding, that provides access and mobility in and between communities of Oregon in a convenient, reliable, and safe manner that encourages people to ride.*

- *A public transportation system that provides appropriate service in each area of the state, including service in urban areas that is an attractive alternative to the single-occupant vehicle, and high-quality, dependable service in suburban, rural, and frontier (remote) areas.*
- *A system that enables those who do not drive to meet their daily needs.*
- *A public transportation system that plays a critical role in improving the livability and economic prosperity for Oregonians."*

For Redmond, the OPTP Implementation Plan would encourage the collaboration between ODOT, CET and the City to enhance the city and regional transit service. The OPTP is currently being updated.

In addition, the City has established the following goal as part of the TSP update related to public transit:

- *TSP Goal 5.* Provide reliable and convenient transit service to Redmond residents and businesses as well as special transit options for the City's elderly and disabled residents.

Oregon State Rail Plan (2014)

This modal plan addresses long-term freight and passenger rail planning in the state and includes policies and planning processes to maintain and enhance rail service, integrate freight and passenger elements into the land use and transportation planning processes (like the TSP), and provide for collaboration between state, regional and local jurisdictions.

The BNSF Railway in Redmond is a significant driver of economic opportunity for the community. This system interfaces with the community between US 97 and the industrial area near the airport. Within the city, BNSF carries a wide variety of commodities. Today, there are seven at-grade crossings of the railroad within the city. The TSP will include policies and projects to improve rail safety and mobility within the City. In addition, the Project Advisory Committee (PAC) includes ODOT representatives that will advise on rail and freight interests.

Oregon Aviation Plan (OAP, 2007)

The OAP provides strategies and policies for investment in the maintenance and enhancement of the state public aviation system. The plan provides for collaboration between the Oregon Department of Aviation, other state and local agencies (like the City) and the Federal Aviation Administration (FAA).

The Redmond Municipal Airport is a Category I – Commercial Service Airport. This categorization applies to airports that provide scheduled commercial passenger service in addition to general aviation aircraft. The Airport serves as the primary facility for commercial aviation passenger travel in the region. The Airport, in collaboration with the City, County and ODOT, is currently updating its Master Plan. The TSP will incorporate the findings of that update, including offsite transportation improvements necessary to support future growth at the airport.

Oregon Bicycle and Pedestrian Plan (OBPP, 2016)

The vision of the OBPP is that "*In Oregon, people of all ages, incomes, and abilities can access destinations in urban and rural areas on comfortable, safe, well connected biking and walking routes. People can enjoy Oregon's scenic beauty by walking and biking on a transportation system that respects the needs of its users and their sense of safety. Bicycle and pedestrian networks are recognized as integral, interconnected elements of the Oregon transportation system that contribute to our diverse and vibrant communities and the health and quality of life enjoyed by Oregonians."*

The Plan recognizes that walking and biking support economic growth, health, environmental quality, and mobility. The Plan outlines the following goals that are applicable to Redmond:

Goal 1: Safety. Eliminate pedestrian and bicyclist fatalities and serious injuries and improve the overall sense of safety of those who bike or walk.

Goal 2: Accessibility and Connectivity. Provide a complete bicycling and pedestrian network that reliably and easily connects to destinations and other transportation modes.

Goal 3: Mobility and Efficiency. Improve the mobility and efficiency of the entire transportation system by providing high quality walking and biking options for trips of short and moderate distances. Support the ability of people who bike, walk or use mobility devices to move easily on the system.

Goal 4: Community and Economic Vitality. Enhance community and economic vitality through walking and biking networks that improve people's ability to access jobs, businesses, and other destinations, and to attract visitors and tourists, new residents, and new business to the state, opening new opportunities for Oregonians.

Goal 5: Equity. Provide opportunities and choices for people of all ages, abilities, races, ethnicities, and incomes in urban, suburban, and rural areas across the state to bike or walk to reach their destinations and to access transportation options, assuring transportation disadvantaged communities are served and included in decision making.

Goal 6: Health. Provide Oregonians opportunities to become more active and healthy by walking and biking to meet their daily needs.

Goal 7: Sustainability. Help to meet federal, state, and local sustainability and environmental goals by providing zero emission transportation options like walking and biking.

Goal 8: Strategic Investment. Recognize Oregon's strategic investments in walking and biking as crucial components of the transportation system that provide essential options for travel, and can help reduce system costs, and achieve other important benefits.

> Goal 9: Coordination, Cooperation, and Collaboration. Work actively and collaboratively with federal, state, regional, local, and private partners to provide consistent and seamless walking and biking networks that are integral to the transportation system.

The City and ODOT will work together to identify policies and projects in support of these goals. Further, the City has established the following-related goals for the TSP update:

- *Redmond TSP Goal 3.* Provide transportation choices and address the needs and safety of all travelers, including people of all ages, abilities, ethnicities, and incomes.
- *Redmond TSP Goal 4.* Provide comfortable, convenient and safe pedestrian and bicycle facilities for all users.

Finally, the ODOT Bicycle and Pedestrian Design Guide supports the OBPP and the Highway Design Manual and guides the design and management of bicycle and pedestrian facilities on state-owned facilities.

Oregon Transportation Safety Action Plan (TSAP, 2016)

The TSAP establishes goals to achieve the vision that there will be "no deaths or life-changing injuries on Oregon's transportation system by 2035." These goals foster a safety culture, provide infrastructure to enhance safety, support healthy communities, leverage technology, and coordinate agencies and stakeholders to work together. The TSAP prioritizes improvements related to four areas:

- Risky behaviors, such as impaired driving, distracted driving, unbelted driving, speeding.
- Infrastructure such as intersection improvements.
- Protections for vulnerable users, such as pedestrians, bicyclists, and older road users.
- Improved facility management, including data collection, training, enforcement, licensing and emergency response.

The TSAP identifies several actions in support of these priorities. Some of these action items that are relevant to Redmond include:

- Action 6.3.2: Continue work between ODOT, cities, and counties to consider and revise, as appropriate, regulations and programs for establishing speed limits to achieve safety goals, improve balance among multimodal interests, and support community objectives.
- Action 6.3.6: Focus facility design and redesign to achieve operating speeds consistent with safety goals, context, users, and land use.
- Action 6.5.1: Implement design treatments to achieve appropriate speeds and manage sight distance consistent with context, users, and community goals.

- Action 6.5.3: Support multimodal safety considerations during local Transportation System Plan development, and other planning efforts (e.g., local Transportation Safety Action Plans) to guide project planning, operations and maintenance for safer transportation facilities.
- Action 6.6.1: Implement low-cost systemic safety improvements at intersections.
- Action 6.8.1: Evaluate the safety performance of innovative pedestrian facilities. Continue implementing the most effective.
- Action 6.8.2: Provide safe facilities and crossings in areas where pedestrians are present or access is needed. Prioritize transit corridors, school areas, multilane streets and highways and other high risk areas and facilities.
- Action 6.10.1: Evaluate the safety impacts of innovative bicycle facilities. Continue implementing the most effective.

The City has established the following goal related to safety as part of the TSP update:

- *TSP Goal 1.* Provide a safe and efficient transportation network that complements key economic development priority areas, the comprehensive plan, and adopted state, regional and local plans and policies.

ODOT Highway Design Manual (HDM)

The HDM establishes design standards and procedures for the state highway system. The HDM has been coordinated with the American Association of State Highway and Transportation Officials' (AASHTO) policies. The HDM provides guidance on the location and design of new construction, major reconstruction, and resurfacing, restoration or rehabilitation (3R) projects. The standards in the HDM are specified by functional classification. Therefore, the standards relevant to US 97 and OR 126 (statewide freight facilities) are different than for the O'Neill Highway (a district highway).

Transportation Planning Rule (OAR 660-012)

Oregon defines 19 statewide planning goals; of which Goal 12 is *Transportation*. The Transportation Planning Rule (TPR), OAR Division 12, defines how to implement this goal and requires, amongst other areas, that counties and cities work with ODOT to prepare local TSPs that are consistent with the OTP.

The TPR recognizes the role that a safe, convenient, and economical transportation system plays in supporting local and state economic vitality. It also requires the integration of comprehensive land use planning with transportation needs and the promotion of multi-modal systems that make it more convenient for people to walk, bicycle, use transit and drive less.

In compliance with the TPR, Redmond will need to adopt and/or amend land use regulations consistent with state and federal requirements "to protect transportation facilities, corridors and sites for their identified functions (OAR 660-012-0045(2))." These may include:

- Standards to protect future operations of roads;
- A process for coordinated review of future land use decisions affecting transportation facilities, corridors or sites;
- A process to apply conditions to development proposals to minimize impacts and protect transportation facilities, corridors or sites;
- Regulations to provide notice to ODOT of land use applications that require public hearings, involve land divisions, or affect private access to roads; and,
- Regulations assuring that amendments to land use designations, densities and design standards are consistent with the functions, capacities and performance standards of facilities identified in the TSP. (See OAR 660-012-0060.)

The TPR, as amended, allows local governments to exempt a zone change from the “significant effect” determination if the proposed zoning is consistent with the comprehensive plan map designation and the TSP as well as a “balancing test” to weigh land use amendments that will create industrial or traded-sector jobs and/or provide other benefits.

The Redmond TSP includes goals that are consistent with and support the TPR. Further, the development of the TSP will follow the TPR provisions summarized in OAR 660-012.

Statewide Transportation Improvement Program (STIP, 2018 – 2021)

The STIP serves as the state’s four-year capital improvement program for multimodal projects as well as for projects in the National Parks, National Forests and Native American tribal lands. The STIP is updated every two years in accordance with federal requirements. The 2018 – 2021 STIP identifies one project in Redmond:

- Project 21166 US 97: Yew Avenue – Veteran’s Way: $1 million to develop engineering plans for grinding and overlaying the pavement

In addition, there are STIP projects that enable maintenance activities for CET but do not represent any changes to CET’s service to Redmond.

Oregon Roadway Departure Safety Implementation Plan (RDSIP)

The RDSIP was developed in conjunction with the TSAP (described in the above sections). Per the TSAP vision and priority areas, the objective of the RDSIP is to reduce statewide roadway departure fatalities by 20 percent. None of the facilities in Redmond are identified in the RDSIP as high roadway departure

crash locations. However, as described above, one of the key goals of the TSP is to provide a safe and efficient transportation system for all users.

Oregon Intersection Safety Implementation Plan (ISIP)

The ISIP was also developed in conjunction with the TSAP and provides for intersection-related safety measures to reduce fatal crashes. The ISIP requires an analysis of crash trends, cost effective countermeasures and for pairing low cost improvements with education and enforcement. As part of the TSP update, Redmond will work in collaboration with ODOT and Deschutes County to identify specific projects to enhance the safety of intersections with identified crash deficiencies.

Oregon Bicycle and Pedestrian Safety Implementation Plan (BPSIP)

The BPSIP was also developed in conjunction with the TSAP with the intent of reducing the frequency and severity of pedestrian and bicycle related crashes. Like the ISIP, the BPSIP identifies priority locations and countermeasure options. The BPSIP identifies the US 97 corridor for improved cyclist travel. As part of the TSP update, Redmond will work in collaboration with ODOT and Deschutes County to identify specific projects to enhance the safety of pedestrian and bicycle facilities with identified crash deficiencies.

Oregon Resilience Plan (ORP)

The ORP was developed in 2013 in response to a House Resolution that directed the Oregon Seismic Safety Policy Advisory Commission to prepare a plan that "reviews policy options, summarizes relevant reports and studies by state agencies and makes recommendations on policy direction to protect lives and keep commerce flowing during and after a Cascadia earthquake and tsunami". The plan's goal is to improve the infrastructure reliability to reduce the social and economic impact associated with these events.

Redmond plays a key role in the implementation of the ORP. The Redmond Municipal Airport is identified as the primary state FEMA emergency response airport in Central Oregon. In addition, US 97 is identified as a primary corridor for statewide connectivity during a Cascadia event. In recognition of the city's important role, the TSP includes the following goal:

- *TSP Goal 2.* Advance community and statewide emergency preparedness efforts through support of the Oregon Resiliency Plan.

Transit in Small Cities: A Primer for Planning, Siting and Designing Transit Facilities in Oregon

This report provides guidance for implementing local transit systems. The primer outlines recommended coordination and planning activities, transit design considerations, community involvement and livability, and case studies of past successful small city transit plans.

As part of the TSP update, Redmond will collaborate with CET and ODOT to identify needed transit improvements within the city.

REGIONAL AND LOCAL PLANS AND POLICIES

ODOT Region 4 Active Transportation Needs Inventory

ODOT Region 4 working to create "safer, more walkable and bikeable networks in and between communities across Central Oregon, in alignment with the direction recently set out in ODOT's Statewide Bicycle and Pedestrian Plan." The Region has completed an initial phase of project to understand pedestrian and bicycle-related needs. To date, three steps have been completed including:

- Step 1. An inventory of the existing shared-use paths, bike lanes, sidewalks, and paved shoulders on ODOT highways;
- Step 2. An assessment of these existing facilities with respect to ODOT's current design standards, to understand areas with gaps and deficiencies; and,
- Step 3. An evaluation of the gaps and deficiencies in the system using a range of evaluation criteria to help classify and prioritize the bicycle and pedestrian needs on the system.

The evaluation of the gaps and deficiencies is intended to be used in project scoping, future project selection, project design, and identifying locations most in need of dedicated pedestrian or bicycle projects. ODOT will be working on "*Volume 1: Near Term Actions of the Implementation Work Plan for the Statewide Bicycle and Pedestrian Plan"*.

As part of the TSP, Redmond will work collaboratively with ODOT to identify pedestrian and bicycle-related improvements in support of the ATNI.

Deschutes County 2012 TSP

The Deschutes County TSP identifies policies and improvements that support the County's transportation system through the year 2030. The TSP highlights the importance of providing a safe and efficient system for all users and recognizes the role of the highways that provide statewide roles in providing for regional and statewide freight movement. Key goals from the TSP include:

- Coordinating with the plans and policies established by adjacent counties and the State.
- Providing a safe and efficient network for residential and non-residential mobility.
- Enhancing the opportunity for intermodal connections and public transportation throughout the County.
- Support a safe and convenient bicycle and pedestrian system that is integrated within the transportation system.
- Maintain the existing level and intensity of freight and rail activity throughout the County and encourage the expansion of private industry.

The TSP identified the following projects within the City:

- An interchange at the US 97/O'Neil Highway intersection;
- Evaluation of a rerouting of US 97 within Redmond (this has been superseded); and
- Developing a concept for an interchange at US 97/Quarry Road including the regional connections to Quarry Road.

The City, ODOT and County are working together on the Redmond TSP development and will ensure consistency of the plans and policies.

North Redmond Interchange Area Management Plan (IAMP)

The North Redmond IAMP provides recommendations management of US 97 near the O'Neil Highway intersection. The IAMP identifies several near and long-term transportation and land use strategies to support a future interchange at this location. Some of the key recommendations from the IAMP include:

- Access management;
- Limiting the US 97/O'Neil Highway intersection to right-in-right-out movements only.
- Constructing "High-Priority" public streets according to the City's Local Connectivity Plan.
- Constructing left-turn lanes at the Kingwood Avenue/US 97 intersection and installing a traffic signal.
- Constructing left-turn lanes at the Maple Avenue/9th Street intersection and installing a traffic signal.

- Constructing left-turn lanes at the Quince Avenue/ US 97 intersection and installing a traffic signal.
- Providing grade-separated improvements at the 97/O'Neil Highway intersection.
- Providing a grade-separated crossing over BNSF through the realignment of King Way.

The City will continue to collaborate with ODOT on the implementation and/or recommended modifications to the IAMP as part of the TSP.

City of Redmond Transit Master Plan (TMP, 2009)

The TMP was developed with the goal of exploring the feasibility of a fixed-route transit system within the city and to provide a "conceptual service plan" that outlines implementation steps. The primary purposes of the TMP were to:

- *Prepare for future community growth and economic and demographic changes*
- *Anticipate the need for new transit facilities so that future development plans can integrate with these needs*
- *Promote multi-modal transportation options that help to reduce reliance on single-occupant vehicles*
- *Allow for a system that is fully accessible for persons with disabilities and that is in compliance with the Americans with Disabilities Act (ADA)*
- *Identify partner opportunities*

The TMP was intended to be integrated into the City's TSP update. The City will work in collaboration with CET and ODOT to continue to explore the feasibility of providing fixed route transit in the future.

Redmond Service Alternatives (2013)

Recommended service alternatives were developed for Central Oregon communities as part of the 2013 COIC Regional Transit Plan update, including the City of Redmond. The City is currently served through dial-a-ride service and the Community Connector System.

The following highlights recommendations from the preferred Redmond service plan. Alternatives are categorized by Short-Term (1-3 years), Mid-Term (3-10 years), and Long-Term (beyond 10 years) options. Specific recommendations are included in the Service Plan.

- Short-Term:
    - Provide improvements and efficiencies to the Community Connector System
    - Implement a basic fixed-route service network

- Mid-Term:
    - Provide continued improvements and enhancements to the Community Connector System, including additional time of day service
    - Implement a complete fixed-route service network
- Long-term
    - Consider more expanded service for the Community Connector System, including Sunday service.
    - Implement an additional service route to the fixed-route service system.

The Service Alternative is strong in its finding that a fixed-route service would be beneficial for the City of Redmond and its residents. This TSP update will work with CET and the City of Redmond on a recommended service plan for the City of Redmond.

Redmond Comprehensive Plan

The city's Comprehensive Plan includes goals and policies that "support good jobs and affordable homes, protects natural resources, and preserves historic buildings." These goals and policies are intended to guide city decision making on programs, major capital projects and other funding decisions for the future. Chapter 12 includes goals and policies related to transportation. The four primary goals identified in this chapter include:

- Reduce through traffic, congestion, and improve circulation along Highway 97, especially along the 5th and 6th Street couplet.
- Enhance east-west circulation
- Identify roadway system needs to serve undeveloped areas so that steps can be taken to preserve rights-of-ways and maintain adequate traffic circulation.
- Increase the use of alternative travel modes through improved safety and service.

The Comprehensive Plan includes 55 policies in support of these goals as well as the 2008 Transportation System Plan map. The TSP be consistent with the overall goals of all elements of the Comprehensive Plan and will recommend changes to implementation of the Plan, including the adoption of a new Transportation Map consistent with the TSP update.

Redmond Development Code (RDC)

The Development Code is located within Chapter 8 of the Redmond City Code. It establishes the zoning standards and land use procedures for the City. The following sections, amongst others, will be reviewed as part of the TSP update for compliance with the TPR as well as to help implement the TSP:

- Sections 8.0500 – 8.0515: off-street parking and loading requirements;
- Section 8.07: variances and amendments, including zone changes.
- Section 8.1: processes for legislative procedures, development actions, land use actions, appeals, and declaratory rulings.

Redmond 2008 Transportation System Plan

The City updated its TSP in 2008 in recognition of key changes that had occurred since the 1999 TSP was adopted. The 2008's primary focus was to:

- Addressing how the new Re-Route of US 97 north of Highland Avenue will affect city street circulation and related access to growing industrial areas to the east.
- Confirm that the plan is consist with latest Statewide Plans and Policies.
- Ensure that multimodal system could adequately serve Redmond growth to nearly 60,000 people as well as additional development outside the City's limits that influence local conditions (e.g., rural lands and destination resorts).

The TSP includes a Master Plan project map and Action Plans to support the City's transportation goals and policies through the year 2030.

The updated TSP will guide future multimodal system needs and decision-making regarding priorities, policies and projects through the year 2040. As part of the evaluation of potential projects to address identified deficiencies, the updated TSP will include those projects previously recommended within the Action Plans of the 2008 TSP.

Ongoing Amendments or Updates to 2008 TSP Project Lists and Costs

The City maintains a Capital Improvement Program (CIP) that prioritizes five-year funding related to transportation system investments. The TSP will incorporate the five-year CIP projects into the "No Build" scenario evaluation.

Redmond Airport Master Plan

In 2017, the City began updating its Airport Master Plan to assess facility and service needs of the Redmond Municipal Airport ("the Airport") throughout the next 20 years. The Plan will provide strategic direction regarding the Airport's 20-year capital development plan and investment of resources related to airfield, airspace, terminal area, and landside facilities.

The key questions that the Master Plan seeks to address include:

- *How will Central Oregon's growth continue in the future, and what will the impact be on aviation activity?*
- *What role will General Aviation (GA) and United States Forest Service (USFS) activities play in the future?*
- *Is a runway extension justified, and if so, how long should it be, and in what direction?*
- *What is the viability of runway and terminal improvements previously depicted on the ALP?*
- *How can the passenger terminal and associated facilities accommodate continued passenger growth and additional carriers?*
- *What are the opportunities for increased airport revenue generation?*
- *How much property will be needed to satisfy the demand for future aviation use?*
- *What future changes in critical aircraft should the Airport plan for?*
- *Are aviation facilities adequate to meet the needs of the growing community?*

The TSP Project Management Team (PMT) also includes members of the Airport Master Planning team to ensure collaboration between the two efforts. The TSP will incorporate key recommendation for adoption related to the Airport Master Plan update.

City of Redmond Urbanization Report (2005)

To support the 2005 update to its Comprehensive Plan, the City, in collaboration with DLCD, prepared an analysis to (1) evaluate population and growth forecasts, (2) inventory how much buildable land the City has, (3) identify housing needs, (4) identify economic development strategies, and (5) determine how much land the City will need to accommodate growth between 2003 – 2025.

The report's key issues are listed below.

- 1,985 acres were recommended for inclusion into the UGB but also recommended that the city should evaluate internal efficiency measures first.
- A phased approach to UGB expansion was recommended. The first priority area was for lands in northwest Redmond to support needed housing.
- Redmond has a surplus of industrial land but should maintain the lands designated for industrial uses.
- The overall commercial land supply was adequate but several changes to zoning designations and to establish mixed use zoning and neighborhood centers within the UGB were recommended.

Consistent with the Comprehensive Plan, City staff has provided household and employment forecasts for use in the TSP.

City's Current and Past Budget for Transportation

For the fiscal year 2017/2018, the city anticipated a beginning fund balance of $46.9 million. Of this, $13.2 million was in the Transportation Fund. The budget notes that are number of capital improvement projects are being funded by the System Development Charge and other capital project dollars, such as the general fund and STIP program. The budget report notes that the S Canal Boulevard Reconstruction project and maintenance activities as significant priorities for transportation.

The budget includes an increase in the annual investment in road maintenance at $850,000, particularly to support improving roadway pavement conditions. It also notes that the Airport is undertaking major runway rehabilitation for its secondary runway (11-29) to help ensure continuity and safety of air travel for Central Oregon over the next several decades.

City Parks and Recreation District Master Plan Update (2018)

The City updated its 2008 Master Plan to reflect current community choices and opportunities related to renewed economic development and downtown revitalization efforts, including the development of Centennial Park. This Master Plan creates a vision for "an innovative, inclusive and interconnected system of parks, trails and open spaces that promotes outdoor recreation, health and environmental conservation as integral elements of a thriving, livable Redmond."

The Parks Master Plan Update provides updated inventories of park resources, demographic conditions, a needs analysis, management considerations and capital project phasing, including an implementation plan for developing, conserving and maintaining high-quality parks, trails, facilities and open spaces across the City.

The TSP will incorporate, by reference, the recommendations from the Parks Master Plan Update and integrate key recommendations into the pedestrian and bicycle modal plans.

Appendix C Analysis and Assumptions Methodology

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FINAL Technical Memorandum #2

Date:	September 7, 2017	Project #:17720
To:	Redmond TSP PMT	
From:	Julia Kuhn, PE, Matt Kittelson, PE and Jacqueline Gulczynski	
Project:	Redmond Transportation System Plan Update	
Subject:	Analysis Methodology and Assumptions Methodology	

This memorandum documents the methodology and key assumptions that we propose to use as part of the existing and future conditions analyses for the Redmond Transportation System Plan (TSP) Update. The methodologies included in this memorandum are based on guidance provided in the Oregon Department of Transportation (ODOT) *Transportation System Plan Guidelines (2008)* and the *Analysis Procedures Manual* (APM), Versions 1 and 2 as they relate to the City of Redmond. This memorandum serves as the Consultant Task 2.3 Deliverable per the approved ODOT scope (PA #27456; WOC#66) for the TSP Update.

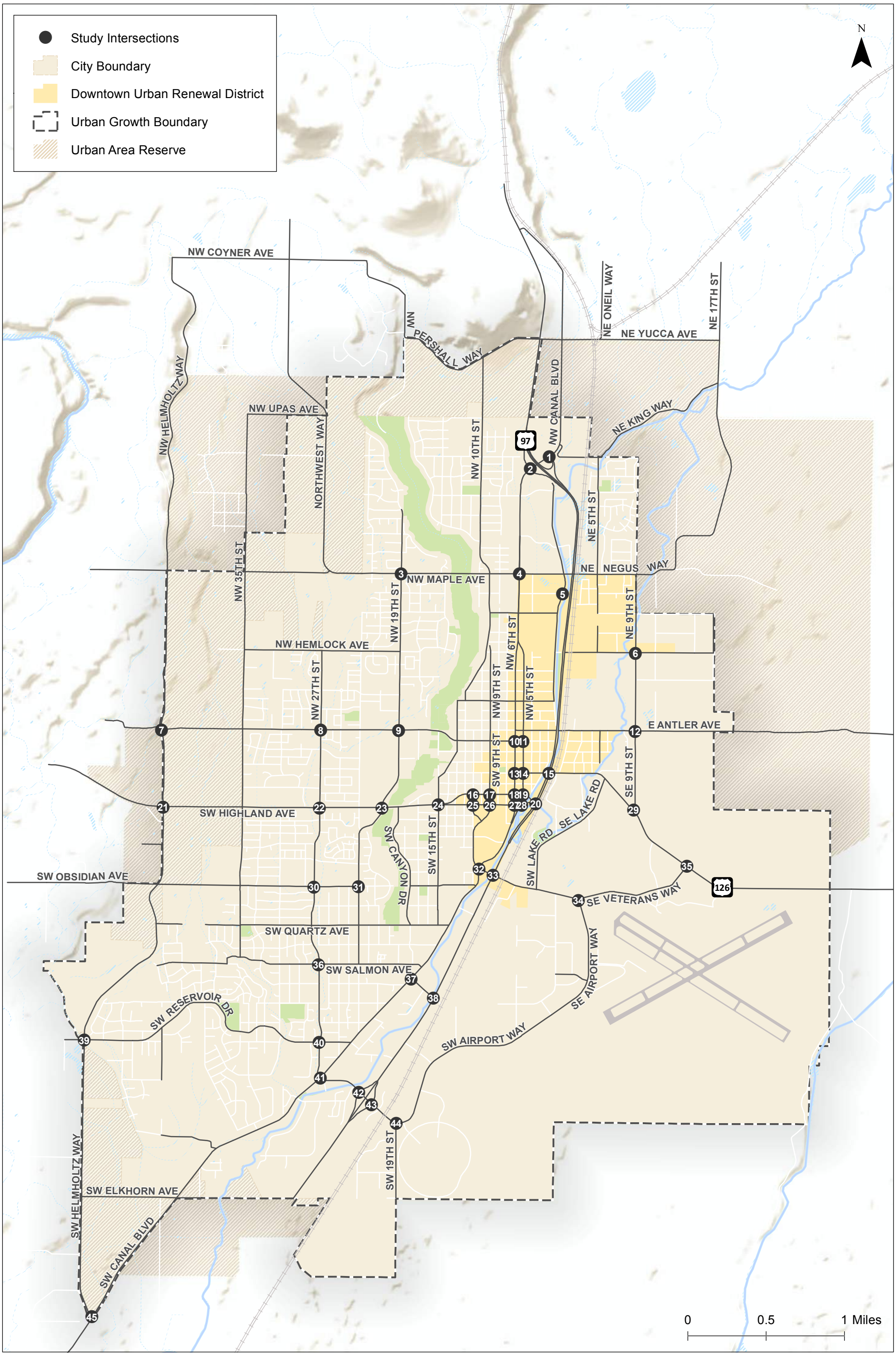
STUDY INTERSECTIONS

Figure 1 identifies the locations where four-hour traffic counts (2:00-6:00 PM) were collected in April 2017 to help guide the TSP update. The counts were collected Tuesday, April 18th and Wednesday, April 19th and include vehicle turning movements, pedestrian volumes, bicycle volumes, truck volumes and passenger car volumes.

In addition to the turning movement counts, 48-hour tube counts were collected at the following locations in June 2017 while school was still in-session:

- US 97 south of Yew Avenue
- US 97 south of Highland Avenue
- US 97 north of Canal Boulevard
- OR 126 east of 35th Street
- OR 126 west of Veterans Way
- Canal Boulevard north of Badger Avenue

The data collected includes vehicle speed, classification, and total volume. Figure 1 illustrates the location of the identified study intersections. Both the turning movement counts and the tube counts were collected consistent with Task 3.1.B.1 of the ODOT scope. A list of the study intersections is provided in Appendix A.



Study Intersections
Redmond, Oregon

Figure **1**

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KITTELSON & ASSOCIATES

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

INTERSECTION OPERATIONAL STANDARDS

Per Task 3.1.B.2, we will present the following information for each study intersection, regardless of jurisdictional control:

- Volume-to-capacity (v/c) ratio;
- Level-of-service (LOS);
- Delay;
- 95th Percentile queuing (not-simulation based); and
- Turning movement counts.

This information will be provided in tables, figures, and/or technical appendices, but where possible will be provided in figures to give the general public a more clear and relatable understanding of the analysis results.

ODOT Mobility Targets

ODOT assess intersections operations based on established mobility targets (as defined by the volume-to-capacity (v/c) ratio). Table 6 of the *Oregon Highway Plan* (OHP) provides the mobility targets for facilities outside the Portland Metro area. The OHP targets will be used to evaluate existing and future no-build conditions. (Note that Highway Design Manual standards will be used to evaluate potential solutions in TM #7, Identification of Alternatives, unless alternative standards are established.) There are two state facilities within the City of Redmond: US 97 (The Dalles-California Highway) and OR 126 (Ochoco Highway). Both facilities are designated by the OHP as Statewide Freight Routes. US 97 is further classified as an expressway north of Veteran's Way and south of Yew Avenue. US 26 is designated as an expressway west of Helmholtz and east of the city limits.

Table 1 includes the mobility targets for expressways and statewide freight routes based on the posted speed. Both US 97 and OR 126 bisect the city center, where the posted speed is below 45 miles per hour (mph). Action 1F.1 of the OHP states that:

> *For unsignalized intersections, achieving the volume to capacity ratios in Tables 6 and 7 for the state highway approaches indicates that state mobility targets are being met. In order to maintain safe operation of the intersection,* ***non-state highway approaches*** *are expected to meet or not to exceed the volume to capacity ratios for District/Local Interest Roads in Table 6.(Emphasis added)*

These ratios are identified under the "Unsignalized" column in Table 1. The OHP acknowledges the unique characteristics of an interchange opposed to an intersection directly on the state facility. The OHP states that the maximum v/c ratio for the interchange ramp termini should be designated as 0.85 unless the intersection v/c ratio target is less than 0.85. In which case, the intersection v/c ratio should be applied to the interchange.

Table 1. Volume to Capacity Ratio for State Freight Routes (US 97 and OR 126)

	Speed (Miles Per Hour)	Signalized	Unsignalized
Freight Route on a Statewide Highway	<=35mph	0.85	0.95
	40mph	0.80	0.90
	>=45mph	0.80	0.90
Statewide Expressway	>=45mph	0.85	0.80

The City of Redmond has adopted a performance standard based on Level of Service. The City requires an intersection to operate at a Level of Service E or better during the peak 15 minute period of the peak hour. For unsignalized intersections with a low minor street volume, the City may presume the intersection to operate acceptably with a v/c ratio less than 0.90 and a 95th percentile queue of less than 4 vehicles during the peak hour.

Table 2 shows the intersection control and mobility targets for the study intersections.

Table 2. Study Intersection Control and Mobility Target

Study Int. #	Intersection	Classification/ Jurisdiction	Intersection Control	Mobility Target
1	NW Canal Blvd/ US 97 NB Ramps	ODOT	Signalized	v/c<0.85
2	NW Canal Blvd/ US 97 SB Ramps	ODOT	Signalized	v/c<0.85
3	NW Maple Ave/ NW 19th St	City	Unsignalized	LOS E, v/c<0.90
4	NW Maple Ave/ NW 6th St	City	Signalized	LOS E
5	NW Larch Ave/ NW Canal Blvd	City	Unsignalized	LOS E, v/c<0.90
6	NE Hemlock Ave/ NE 9th St	City	Unsignalized	LOS E, v/c<0.90
7	W Antler Ave/ SW Helmholtz Way	City	Unsignalized	LOS E, v/c<0.90
8	W Antler Ave/ SW 27th St	City	Signalized	LOS E
9	W Antler Ave/ SW Rimrock Way	City	Signalized	LOS E
10	SW Black Butte Blvd/ SW 6th St	City	Unsignalized	LOS E, v/c<0.90
11	SW Black Butte Blvd/ SW 5th St	City	Unsignalized	LOS E, v/c<0.90
12	E Antler Ave/ NE 9th St	City	Unsignalized	LOS E, v/c<0.90
13	SW Evergreen Ave/ SW 6th St	City	Signalized	LOS E
14	SW Evergreen Ave/ SW 5th St	City	Signalized	LOS E
15	SW Evergreen Ave/ US 97	ODOT	Signalized	Alternative Mobility Standard
16	OR 126 (SW Glacier Ave)/ SW 11th St	ODOT	Signalized	v/c<0.85
17	OR 126 (SW Glacier Ave)/ SW 9th St	ODOT	Signalized	v/c<0.85
18	OR 126 (SW Glacier Ave)/ SW 6th St	ODOT	Signalized	v/c<0.85
19	OR 126 (SW Glacier Ave)/ SW 5th St	ODOT	Signalized	v/c<0.85
20	OR 126 (SW Glacier/Highland Ave)/ US 97	ODOT	Signalized	v/c<0.85
21	OR 126 (SW Highland Ave) / SW Helmholtz Way	ODOT	Unsignalized	v/c<0.80/0.90
22	OR 126 (SW Highland Ave)/ SW 27th St	ODOT	Signalized	v/c<0.80

Study Int. #	Intersection	Classification/ Jurisdiction	Intersection Control	Mobility Target
23	OR 126 (SW Highland Ave)/ SW Rimrock Way	ODOT	Signalized	v/c<0.80
24	OR 126 (SW Highland Ave)/ SW 15th St	ODOT	Signalized	v/c<0.85
25	OR 126 (SW Highland Ave)/ SW 11th St	ODOT	Signalized	v/c<0.85
26	OR 126 (SW Highland Ave)/ SW 9th St	ODOT	Signalized	v/c<0.85
27	OR 126 (SW Highland Ave)/ SW 6th St	ODOT	Signalized	v/c<0.85
28	OR 126 (SW Highland Ave)/ SW 5th St	ODOT	Signalized	v/c<0.85
29	OR 126/ SE 9th St (McCaffrey Rd)	ODOT	Unsignalized	v/c<0.80
30	SW Obsidian Ave/ SW 27th St	City	Unsignalized	LOS E, v/c<0.90
31	SW Obsidian Ave/ SW 23rd St	City	Unsignalized	LOS E, v/c<0.90
32	SW Veterans Way/ SW Canal Blvd	City	Signalized	LOS E
33	SW Veterans Way/ US 97	ODOT	Signalized	v/c<0.80
34	SW Veterans Way/ SE Airport Way	City	Unsignalized	LOS E, v/c<0.90
35	SW Veterans Way/ OR 126	ODOT	Unsignalized	Alternative Mobility Standard
36	SW Salmon Ave/ SW 27th St	City	Unsignalized	LOS E, v/c<0.90
37	SW Odem Medo Way/ SW Canal Blvd	City	Signalized	LOS E
38	SW Odem Medo Way/ US 97	ODOT	Signalized	v/c<0.80
39	SW Wickiup Ave/ SW 51st St (SW Helmholtz Way)	City	Unsignalized	LOS E, v/c<0.90
40	SW Wickiup Ave(Forked Horn Rd)/ SW 27th St	City	Unsignalized	LOS E, v/c<0.90
41	SW Canal Blvd/ SW 27th St	City	Unsignalized	LOS E, v/c<0.90
42	SW Yew Ave/ US 97 SB Ramps	ODOT	Signalized	v/c<0.80
43	SE Airport Way/ US 97 NB Ramps	ODOT	Signalized	v/c<0.80
44	SE Airport Way/ SW 19th St	City	Unsignalized	LOS E, v/c<0.90
45	S Canal Blvd / SW Helmholtz Way	City	Unsignalized	LOS E, v/c<0.90

SEASONAL ADJUSTMENT FACTOR

Per Task 3.1.B.1, we will adjust all traffic counts along the state routes to reflect 30th highest hour conditions. Version 2 of the APM identifies three methods for identifying seasonal adjustment factors for highway traffic volumes, of which the on-site Automatic Traffic Recorders (ATR) have been identified by ODOT as the most accurate method of use There are five on-site ATR stations located within or near the Redmond city limits, as shown in Figure 2.

- ATR 09-020: Located on US 97, The Dalles-California Highway, Mile Post (MP) 124.40
- ATR 09-021: Located on OR 126, McKenzie Highway, MP 108.27
- ATR 09-022: Located on US 97, The Dalles-California Highway, MP 120.94
- ATR 09-023: Located on US 97, The Dalles-California Highway, MP 119.09
- ATR 07-002: Located on OR 126, McKenzie Highway, MP 3.23

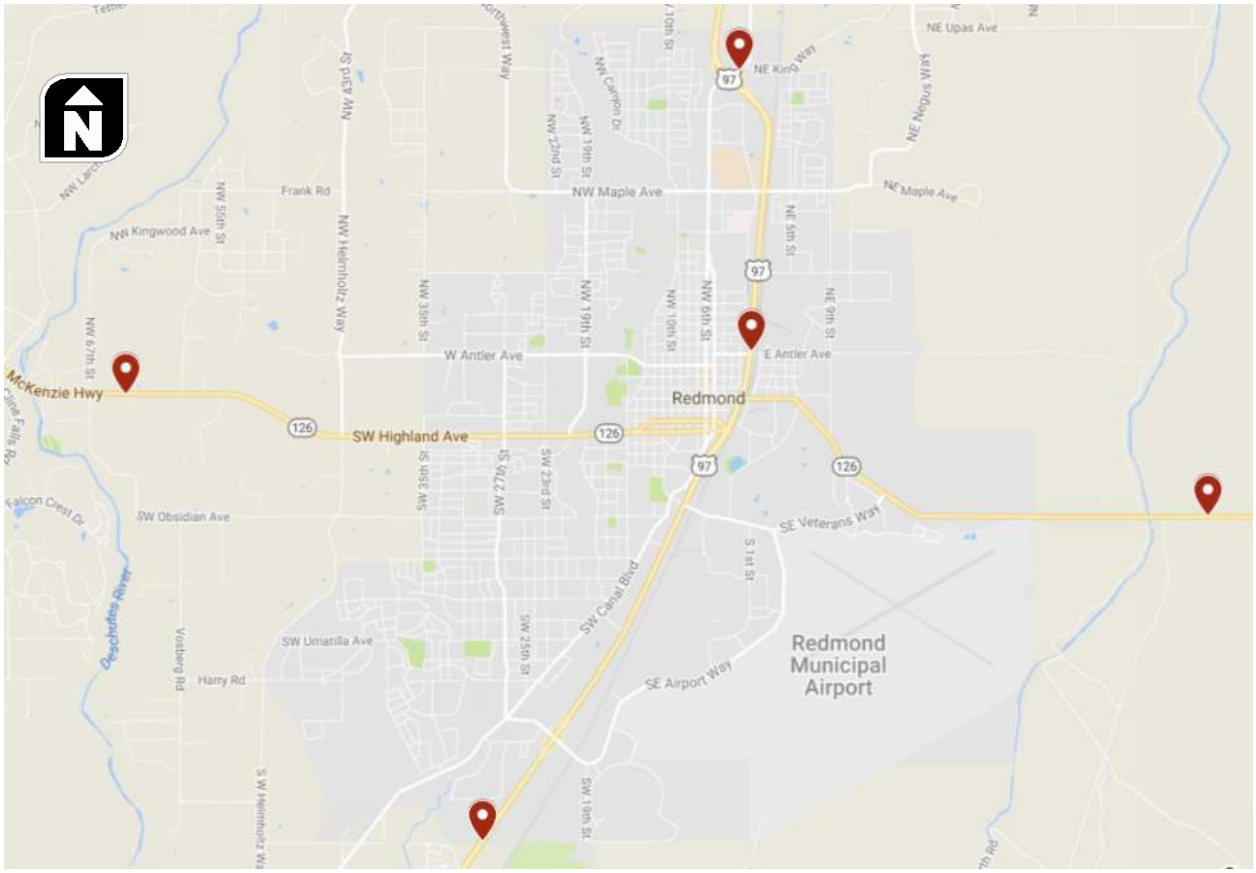


Figure 2. ATR Locations in and near City of Redmond

On-Site ATR Method

As stated within section 5.4.1 of the APM,

"The On-Site ATR Method is used when an ATR is within or near the project area. If located outside of the project area, there should be no major intersections between the ATR and the project area, and it should be within a minimal distance so that the traffic characteristics are comparable".

Per the on-site ATR method, we calculated the applicable seasonal adjustment factors. These calculations are provided in Appendix B and summarized in Table 3.

Table 3: On-Site ATR Method Seasonal Adjustment Method

ATR Station	ATR Location	Seasonal Adjustment Factor	Applied Area
ATR 07-002	OR 126 0.35 miles west of Deschutes/Crook County line	1.10	OR 126 east of US 97
ATR 09-020	US 97 0.79 miles south of Yew Avenue	1.10	US 97 south of Highland Avenue
ATR 09-021	OR 126 1.38 miles west of SW Helmholtz Way	1.29	OR 126 west of US 97
ATR 09-022	US 97 0.04 miles north of Antler Avenue	1.13	Between Antler Avenue and Highland Avenue
ATR 09-023	US 97 0.57 miles south of O'Neil Highway	1.16	US 97 north of Antler Avenue

A significant number of study intersections in Redmond are located on state facilities. With five On-site ATR locations, seasonal adjustment factors were assigned based on proximity and roadway characteristics.

Table 4 summarizes ODOT intersections to be analyzed as part of the TSP and corresponding seasonal adjustment factors. As shown in Table 4, US 97 was used as the bisector on OR 126 to separate the seasonal adjustment factors on OR 126. Intersections on OR 126 west of US 97 apply the adjustment factor associated with ATR 09-021, and intersections east US 97 apply the seasonal adjustment factor associated with ATR 07-002. The seasonal adjustment factors at intersection along the US 97 corridor were applied based on location, average ADT, and roadway characteristics. No seasonal adjustment factors are proposed for intersections on the City of Redmond transportation system.

Table 4. Summary of Intersection Standards and Adjustment Factors

Study Int. #	Intersection	Classification/ Jurisdiction	Seasonal Adjustment Factor
1	NW Canal Blvd/ US 97 NB Ramps	ODOT	1.16
2	NW Canal Blvd/ US 97 SB Ramps	ODOT	1.16
15	SW Evergreen Ave/ US 97	ODOT	1.13
16	OR 126 (SW Glacier Ave)/ SW 11th St	ODOT	1.29
17	OR 126 (SW Glacier Ave)/ SW 9th St	ODOT	1.29
18	OR 126 (SW Glacier Ave)/ SW 6th St	ODOT	1.29
19	OR 126 (SW Glacier Ave)/ SW 5th St	ODOT	1.29
20	OR 126 (SW Glacier/Highland Ave)/ US 97	ODOT	1.29
21	OR 126 (SW Highland Ave) / SW Helmholtz Way	ODOT	1.29
22	OR 126 (SW Highland Ave)/ SW 27th St	ODOT	1.29
23	OR 126 (SW Highland Ave)/ SW Rimrock Way	ODOT	1.29
24	OR 126 (SW Highland Ave)/ SW 15th St	ODOT	1.29
25	OR 126 (SW Highland Ave)/ SW 11th St	ODOT	1.29
26	OR 126 (SW Highland Ave)/ SW 9th St	ODOT	1.29
27	OR 126 (SW Highland Ave)/ SW 6th St	ODOT	1.29
28	OR 126 (SW Highland Ave)/ SW 5th St	ODOT	1.29
29	OR 126/ SE 9th St (McCaffrey Rd)	ODOT	1.10
33	SW Veterans Way/ US 97	ODOT	1.10
35	SW Veterans Way/ OR 126	ODOT	1.10
38	SW Odem Medo Way/ US 97	ODOT	1.10
42	SW Yew Ave/ US 97 SB Ramps	ODOT	1.10
43	SE Airport Way/ US 97 NB Ramps	ODOT	1.10

ANALYSIS MODEL PARAMETERS

The bullets below identify the proposed sources of data and methodologies to be used to analyze traffic conditions in Redmond. Analyses of all state facilities will be conducted according to the most-recent version of the APM, unless otherwise agreed upon by both ODOT's Transportation Planning and Analysis Unit (TPAU) and the consultant team.

1. *Intersection/Roadway Geometry* (lane numbers and arrangements, cross-section elements, signal phasing, etc.) will be reviewed through aerial photography and confirmed through a field review. Available as-built data may also be used to verify existing roadway geometry. The analysis models will be built on scaled roadway line work from GIS or aerial photography in Synchro analysis software.

2. *Operational Data* (such as posted speeds, intersection control, parking, right-turn on red, etc.) will be field verified. Data will be reviewed during a field visit and supplemented by available GIS data, aerials, photos, and the ODOT Video Log.

3. *Peak Hour Factors* (PHF) will be calculated for each intersection and applied to the existing conditions analyses. Where applicable, corridor or regional PHFs may be developed. PHFs of 0.95 will be used for the future analysis for high-order facilities (arterials), with 0.90 applied to

medium-order facilities (collectors) and 0.85 applied to local roads. If the existing PHF is greater than these default future values, the existing PHF will be applied.

4. Traffic Operations
    a. Highway Capacity Manual (HCM) methodology shall be used for intersection analyses of the design hour conditions. Signalized intersection analysis will be based on HCM methods. The existing and future no-build analysis will utilize Synchro software for all study intersections. Level-of-service, delay, and volume-to-capacity ratios will be reported at each of the study intersections regardless of roadway jurisdiction.

    b. Queuing analysis methodology will be based on Synchro 95th percentile queue lengths as appropriate; ODOT's two-way stop-controlled intersection calculator tool will be used to estimate queue lengths for two-way stop-controlled intersections. Microsimulation is not proposed as part of the long-range planning effort.

SYNCHRO INPUT ASSUMPTIONS

Synchro software will be used for the intersection analyses. This analysis will be consistent with the HCM procedures. Table 5 lists the proposed input parameters.

Table 5. Synchro Operations Parameters/Assumptions

Arterial Intersection Parameters	Existing Conditions
Peak Hour Factor	From traffic counts
Conflicting Bikes and Pedestrian per Hour	From traffic counts, as available
Ideal Saturation Flow Rate (for all movements)	1,750 passenger cars per hour green per lane
Lane Width	12 feet unless field observations suggest otherwise
Percent Heavy Vehicles	From traffic counts by movement, as available
95th percentile vehicle queues	Synchro HCM summary output

CRASH ANALYSES

Per Task 3.1.B.4, we will review most recent five years of crash data, as provided by ODOT, at the study intersections and study segments (where tube count data was collected). Any intersections or roadway segments that are identified as a Top 5% and 10% Safety Priority Index System (SPIS) site will be included in the crash data.

Intersection crash rates at each location will be compared to the 90th percentile rates and critical crash rates, per the APM. Crash rates will also be compared to the ODOT Crash Tables II and IV severe injury and fatal crash rates. Any locations where the rates are exceeded, we will identify potential countermeasures using the ODOT All Roads Transportation Safety (ARTS) crash reduction factors.

FORECAST YEAR VOLUME DEVELOPMENT

To assist in the development of traffic volumes for the Future Scenario Conditions (per Task 4 of the scope), we will obtain 2040 Bend Redmond travel demand data from ODOT's Transportation Planning Analysis Unit (TPAU). The model output data will be post-processed using NCHRP Report 255 methodologies.

ACTIVE TRANSPORTATION ANALYSIS

Per Task 3.1.B.3, the scope of work, we will identify existing gaps in the sidewalks, bicycle network, and transit network along the city's collector and arterial roadways. The Bicycle Level of Traffic Stress (LTS) and pedestrian methodology will reference the Redmond Neighborhood Revitalization Plan as it has recently been completed as part of that project.

Quantitative and qualitative analysis of active transportation facilities be performed consistent with APM version 2 and include:

1. Qualitative (multimodal) assessment for transit modes;
2. A qualitative assessment of transit service and identification of underserved areas.
3. Gaps in intermodal connectivity.

NEXT STEPS

We look forward to your review of the assumptions and parameters to be used as part of the Redmond TSP Existing and Future conditions analyses.

Appendix A- Study Intersections

Study Intersection Locations

Study Intersection	East-West Road Name	North-South Road Name
1	NW Canal Blvd	US 97 NB Ramps
2	NW Canal Blvd	US 97 SB Ramps
3	NW Maple Ave	NW 19th St
4	NW Maple Ave	NW 6th St
5	NW Larch Ave	NW Canal Blvd
6	NE Hemlock Ave	NE 9th St
7	W Antler Ave	SW Helmholtz Way
8	W Antler Ave	SW 27th St
9	W Antler Ave	SW Rimrock Way
10	SW Black Butte Blvd	SW 6th St
11	SW Black Butte Blvd	SW 5th St
12	E Antler Ave	NE 9th St
13	SW Evergreen Ave	SW 6th St
14	SW Evergreen Ave	SW 5th St
15	SW Evergreen Ave	US 97
16	OR 126 (SW Glacier Ave)	SW 11th St
17	OR 126 (SW Glacier Ave)	SW 9th St
18	OR 126 (SW Glacier Ave)	SW 6th St
19	OR 126 (SW Glacier Ave)	SW 5th St
20	OR 126 (SW Glacier/Highland Ave)	US 97
21	OR 126 (SW Highland Ave)	SW Helmholtz Way
22	OR 126 (SW Highland Ave)	SW 27th St
23	OR 126 (SW Highland Ave)	SW Rimrock Way
24	OR 126 (SW Highland Ave)	SW 15th St
25	OR 126 (SW Highland Ave)	SW 11th St
26	OR 126 (SW Highland Ave)	SW 9th St
27	OR 126 (SW Highland Ave)	SW 6th St
28	OR 126 (SW Highland Ave)	SW 5th St
29	OR 126	SE 9th St (McCaffrey Rd)
30	SW Obsidian Ave	SW 27th St
31	SW Obsidian Ave	SW 23rd St
32	SW Veterans Way	SW Canal Blvd
33	SW Veterans Way	US 97
34	SW Veterans Way	SE Airport Way
35	SW Veterans Way	OR 126
36	SW Salmon Ave	SW 27th St
37	SW Odem Medo Way	SW Canal Blvd
38	SW Odem Medo Way	US 97
39	Harry Rd/SW Wickiup Ave	SW 51st St (SW Helmholtz Way)
40	SW Wickiup Ave/Forked Horn Rd	SW 27th St
41	SW Canal Blvd	SW 27th St
42	SW Yew Ave	US 97 SB Ramps
43	SE Airport Way	US 97 NB Ramps
44	SE Airport Way	SW 19th St
45	S Canal Blvd	SW Helmholtz Way

Appendix B – Seasonal Adjustment Factor Data

ODOT ATR 09-020, US97; MP 124.39; THE DALLES-CALIFORNIA HIGHWAY NO. 4; 0.79 mile south of Yew Avenue												
Year	**15-Jan**	**15-Feb**	**15-Mar**	**15-Apr**	**15-May**	**15-Jun**	**15-Jul**	**15-Aug**	**15-Sep**	**15-Oct**	**15-Nov**	**15-Dec**
2015	92	98	102	108	108	115	122	116	113	113	101	102
2014	97	96	104	105	107	117	120	119	112	112	101	97
2013	92	100	102	107	108	114	115	117	111	111	104	100
2012	92	99	99	107	110	116	112	119	112	110	104	97
2011	99	99	103	107	109	113	115	117	109	108	102	101
Average	93.7	98.7	102.3	107.0	108.3	115.0	116.7	117.7	111.7	111.0	102.3	99.3
Count Adj	**1.26**	**1.19**	**1.15**	**1.10**	**1.09**	**1.02**	**1.01**	**1.00**	**1.05**	**1.06**	**1.15**	**1.18**

ODOT ATR 09-021, OR126; MP 108.27; MCKENZIE HIGHWAY NO. 15; 1.38 miles west of S.W. Helmholtz Way (S.W. 43rd Street)												
Year	**15-Jan**	**15-Feb**	**15-Mar**	**15-Apr**	**15-May**	**15-Jun**	**15-Jul**	**15-Aug**	**15-Sep**	**15-Oct**	**15-Nov**	**15-Dec**
2015	79	83	92	97	105	118	122	116	109	103	86	86
2014	79	75	91	100	109	117	125	121	109	103	87	83
2013	81	78	84	95	104	114	123	119	113	100	92	88
2012	81	81	86	95	106	113	122	123	110	101	90	85
2011	82	81	87	95	104	114	124	122	110	103	88	86
Average	80.3	80.0	88.0	95.7	105.0	115.0	123.0	120.7	109.7	102.3	88.3	85.7
Count Adj	**1.53**	**1.54**	**1.40**	**1.29**	**1.17**	**1.07**	**1.00**	**1.02**	**1.12**	**1.20**	**1.39**	**1.44**

ODOT ATR 09-022, US97; MP 120.92; THE DALLES-CALIFORNIA HIGHWAY NO. 4; 0.04 mile north of S.W. Antler Avenue												
Year	**15-Jan**	**15-Feb**	**15-Mar**	**15-Apr**	**15-May**	**15-Jun**	**15-Jul**	**15-Aug**	**15-Sep**	**15-Oct**	**15-Nov**	**15-Dec**
2015	88	95	99	104	107	113	118	113	109	108	94	93
2014	90	88	100	106	110	114	118	116	110	108	94	90
2013	84	92	97	105	110	113	116	115	109	107	99	93
2012	87	92	94	102	107	112	115	116	108	106	100	93
2011	92	91	97	102	107	113	116	116	108	104	97	97
Average	88.3	91.7	97.7	103.7	108.0	113.0	116.7	115.7	108.7	107.0	96.7	93.0
Count Adj	**1.32**	**1.27**	**1.19**	**1.13**	**1.08**	**1.03**	**1.00**	**1.01**	**1.07**	**1.09**	**1.21**	**1.25**

ODOT ATR 09-023, US97; MP 119.09; THE DALLES-CALIFORNIA HIGHWAY NO. 4; 0.57 mile south of O'Neil Highway No. 370												
Year	**15-Jan**	**15-Feb**	**15-Mar**	**15-Apr**	**15-May**	**15-Jun**	**15-Jul**	**15-Aug**	**15-Sep**	**15-Oct**	**15-Nov**	**15-Dec**
2015	84	91	97	101	105	111	117	112	108	105	92	90
2014	85	84	97	103	108	113	117	115	109	105	91	87
2013	83	91	95	100	105	110	114	114	108	103	96	91
2012	84	90	92	99	105	111	115	116	109	103	96	89
2011	89	90	95	99	105	112	116	115	107	102	92	95
Average	84.3	90.3	95.7	100.0	105.0	111.3	116.0	114.7	108.3	103.7	93.3	90.0
Count Adj	**1.38**	**1.28**	**1.21**	**1.16**	**1.10**	**1.04**	**1.00**	**1.01**	**1.07**	**1.12**	**1.24**	**1.29**

ODOT ATR 07-002, OR126; MP 3.23; OCHOCO HIGHWAY NO. 41; 0.35 mile west of Deschutes-Crook County Line												
Year	**15-Jan**	**15-Feb**	**15-Mar**	**15-Apr**	**15-May**	**15-Jun**	**15-Jul**	**15-Aug**	**15-Sep**	**15-Oct**	**15-Nov**	**15-Dec**
2015	91	96	103	105	108	114	119	113	112	113	101	101
2014	90	91	98	107	109	114	118	117	113	112	103	97
2013	92	100	102	108	110	114	115	114	110	108	99	96
2012	90	90	93	105	109	116	118	119	112	114	106	95
2011	93	97	100	106	110	114	115	115	110	107	99	98
Average	91.0	94.7	100.0	106.0	109.3	114.0	117.0	115.3	111.3	111.0	101.0	97.0
Count Adj	**1.29**	**1.24**	**1.17**	**1.10**	**1.07**	**1.03**	**1.00**	**1.01**	**1.05**	**1.05**	**1.16**	**1.21**

Peak month

Min/Max removed from average

Appendix D Existing Conditions Analysis

Final Technical Memorandum #4

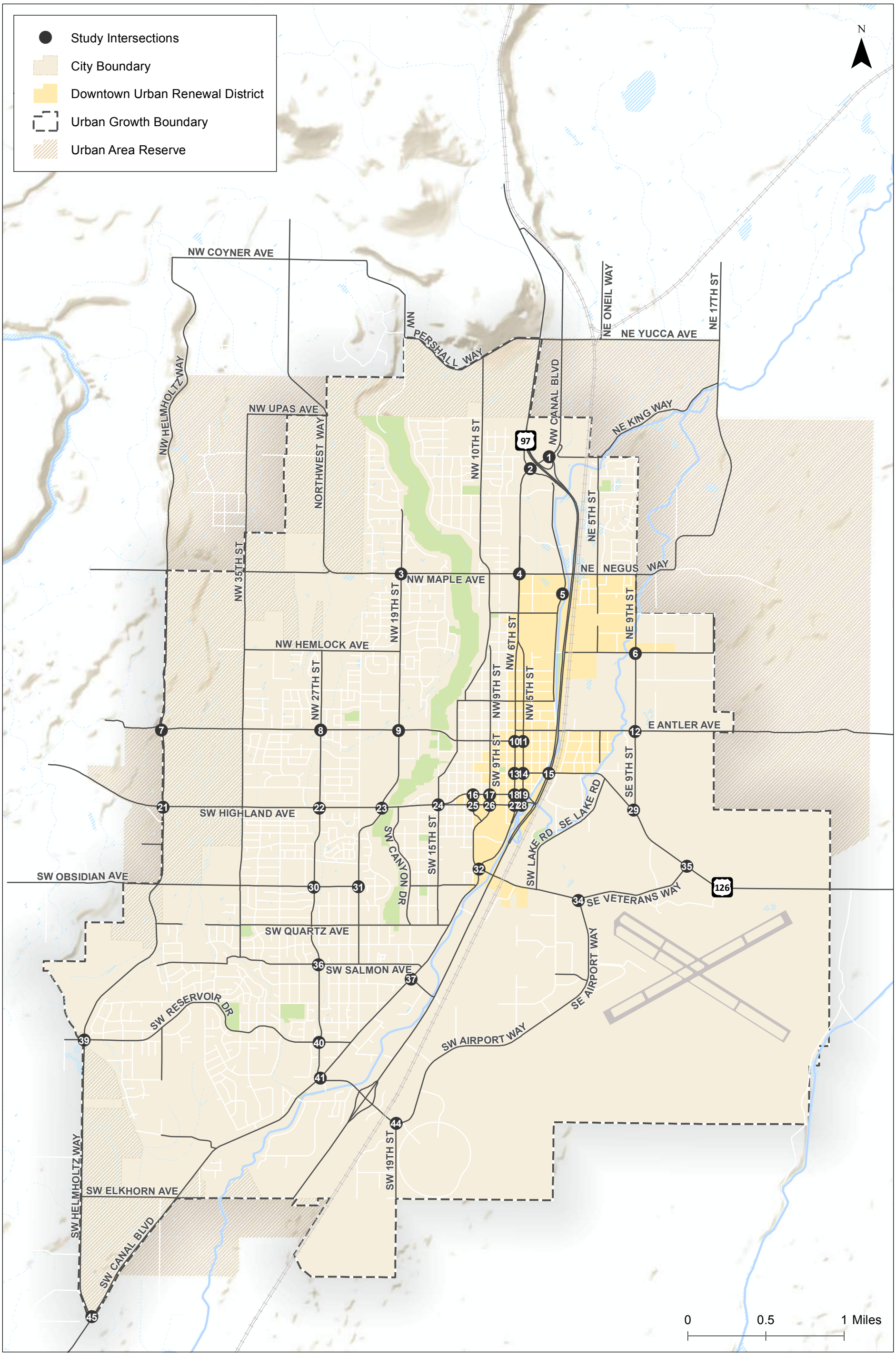
Date:	April 12, 2018
To:	Project Management Team
From:	Julia Kuhn, PE, Matt Kittelson, PE, Miranda Barrus, & Jacqueline Gulczynski
Subject:	Existing Conditions Analysis

This memorandum summarizes the transportation inventory and identification of existing needs in support of the Redmond Transportation System Plan (TSP) Update. The majority of the inventory and analysis results are presented in figures and tables, with supplemental text provided to explain the illustrated information and more detailed information provided in the supporting appendices. The memorandum is organized into the following sections:

TSP Study Area 1
Land Use and Population 2
Roadway System Inventory 7
Access Spacing and Access Management 17
Existing intersection and street operations 18
Historic Crash Analysis 24
Active Transportation Analysis 30
Bridge Conditions 36
Rail System 36
Air Transportation System 40
Truck Freight Routes 40
Summary of Existing Conditions 42

TSP STUDY AREA

The existing transportation needs, opportunities and constraints reflect an inventory of the multimodal transportation system characteristics conducted in the Spring and Fall of 2017. This inventory included all major transportation-related facilities and services within the City of Redmond Urban Growth Boundary (UGB). Key roadway features, traffic and safety conditions at forty five intersections and seven roadway segments, bicycle facilities, pedestrian facilities, transit service, and air, rail and pipeline facilities are analyzed. The transportation facilities within the UGB are shown in Figure 1. The intersections and segments are summarized in Appendix A.



Study Area
Redmond, Oregon

Figure **1**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

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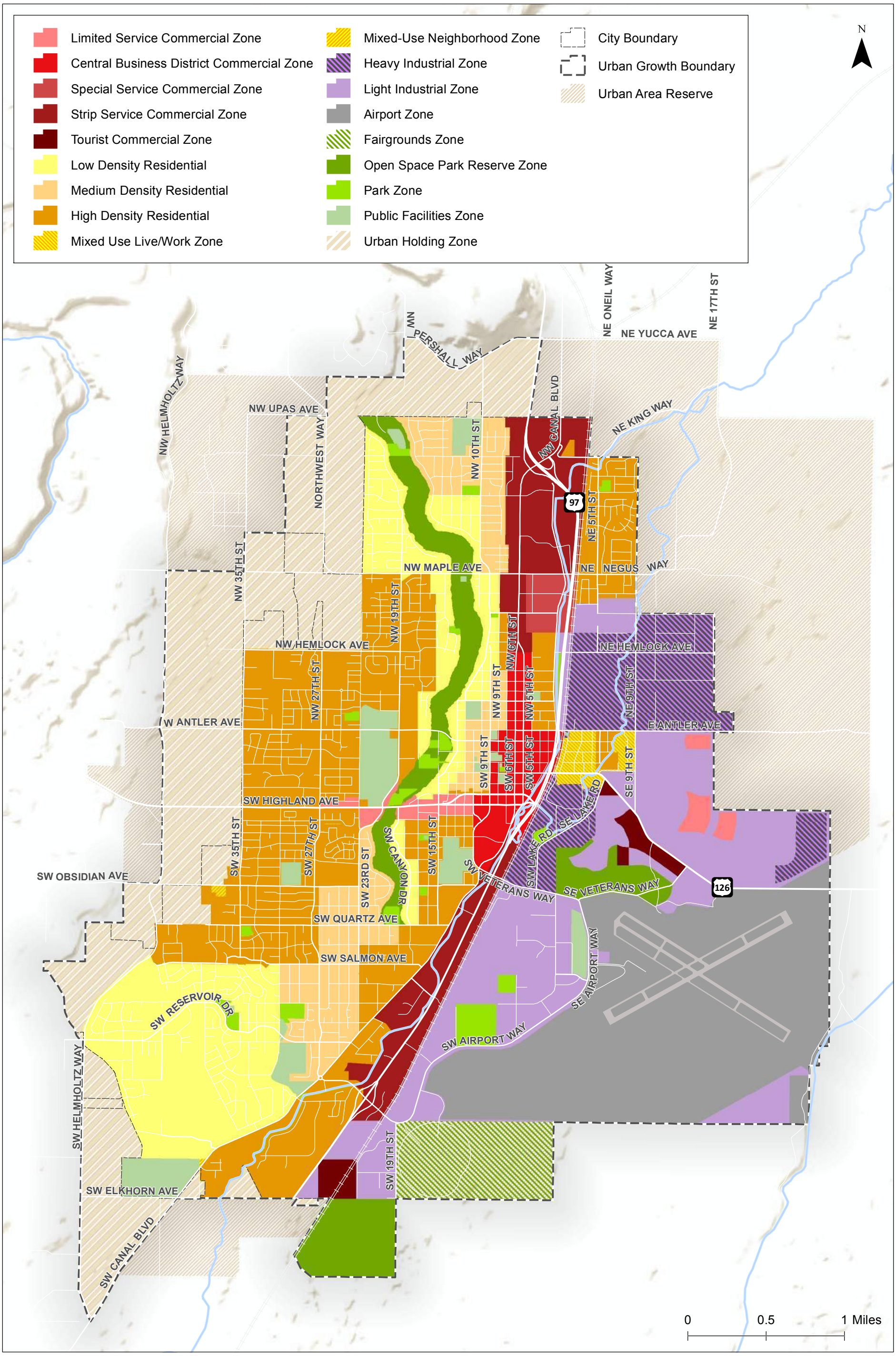
Land Use and Population

To help inform the analysis of year 2040 transportation system needs, existing land use patterns, economic development opportunities and population and job forecasts were inventoried. This information can also help the community and project team develop future alternatives that address transportation system deficiencies, capture the City's vision for an enhanced multimodal network, and identify the projects, programs and policies needed to support economic development in the city and region in a manner consistent with the existing Comprehensive Plan and Zoning. For illustrative purposes for this memorandum, the City's current zoning map is shown in Figure 2.

Key Activity Centers

Providing pedestrian, bicycle, transit and vehicular connections to and between key activity centers and destinations is a key goal in achieving the City's Comprehensive Plan vision. Examples of these priority areas are illustrated in Figure 3.



Zoning
Redmond, Oregon

Figure
2

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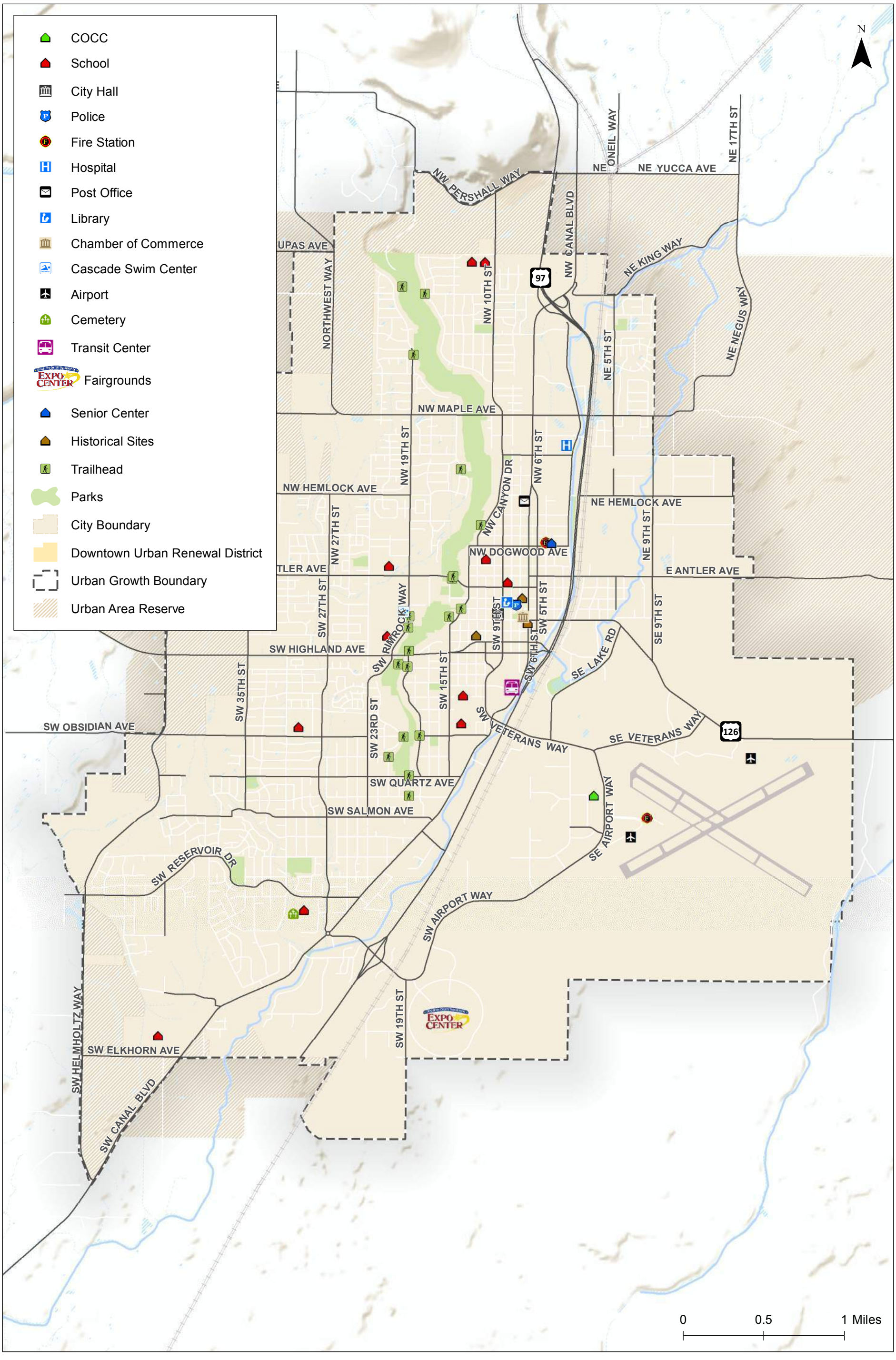
Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl



Activity Centers
Redmond, Oregon

Figure **3**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

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Population Inventory

According to the Population Research Center at Portland State University (PSU), the coordinated year 2015 population estimate for the Redmond Urban Growth Boundary (UGB) is 27,715 people. Redmond represents approximately 16 percent of Deschutes County's total population. Tables 1-4 identify information related to the coordinated population forecasts within the County through the year 2040.

Table 1: Deschutes County Projected Population

Population	2015	2020	2025	2030	2035	2040
Deschutes County	170,605	186,068	206,338	226,410	249,037	267,797
Bend UGB	85,737	97,699	109,546	121,091	132,209	143,596
Redmond UGB	**27,715**	**30,334**	**33,282**	**36,486**	**39,812**	**43,399**
La Pine UGB	1,687	1,924	2,263	2,625	3,014	3,432
Sisters UGB	2,315	2,960	3,431	3,903	4,375	4,847
Outside UGBs	53,151	57,816	62,305	66,309	69,627	72,523

Table 2. Deschutes County Projected Population Growth

Population Growth (Annual)	2015	2020	2025	2030	2035	2040
Deschutes County	-	2.23%	2.00%	1.78%	1.55%	1.45%
Bend UGB	-	2.61%	2.29%	2.00%	1.76%	1.65%
Redmond UGB	**-**	**1.81%**	**1.85%**	**1.84%**	**1.74%**	**1.73%**
La Pine UGB	-	2.63%	3.25%	2.97%	2.76%	2.60%
Sisters UGB	-	4.92%	2.95%	2.58%	2.28%	2.05%
Outside UGBs	-	1.68%	1.50%	1.25%	0.98%	0.82%

Table 3. Percent Population of County

Population	2015	2020	2025	2030	2035	2040
Bend UGB	50%	51%	52%	53%	53%	54%
Redmond UGB	**16%**	**16%**	**16%**	**16%**	**16%**	**16%**
La Pine UGB	1%	1%	1%	1%	1%	1%
Sisters UGB	1%	2%	2%	2%	2%	2%
Outside UGBs	31%	30%	30%	29%	28%	27%

Table 4. Percent Projected Growth of County

Percent Growth of County	2015	2020	2025	2030	2035	2040
Bend UGB	-	59%	59%	59%	60%	61%
Redmond UGB	**-**	**13%**	**15%**	**16%**	**18%**	**19%**
La Pine UGB		1%	2%	2%	2%	2%
Sisters UGB	-	3%	2%	2%	3%	3%
Outside UGBs	-	23%	22%	20%	18%	15%

Note: 2015-2065 population projections source: Population Research Center, PSU (www.pdx.edu/prc/region-1-documents)

Demographics and Disadvantaged Populations

The City's transportation system should be designed and operated with the needs and safety of all travelers in mind, including people of all ages and abilities, especially the most vulnerable. To help shape the future bicycle, pedestrian, transit and street system plans, the City has assembled

information related to key geographic areas serving the minority, elderly, disabled, youth and low-income residents. Each of these key population segments are identified in detail in the figures provided in Appendix B.

As illustrated in Appendix B, there are a number of key corridors and areas for consideration for the future TSP alternatives evaluation, such as:

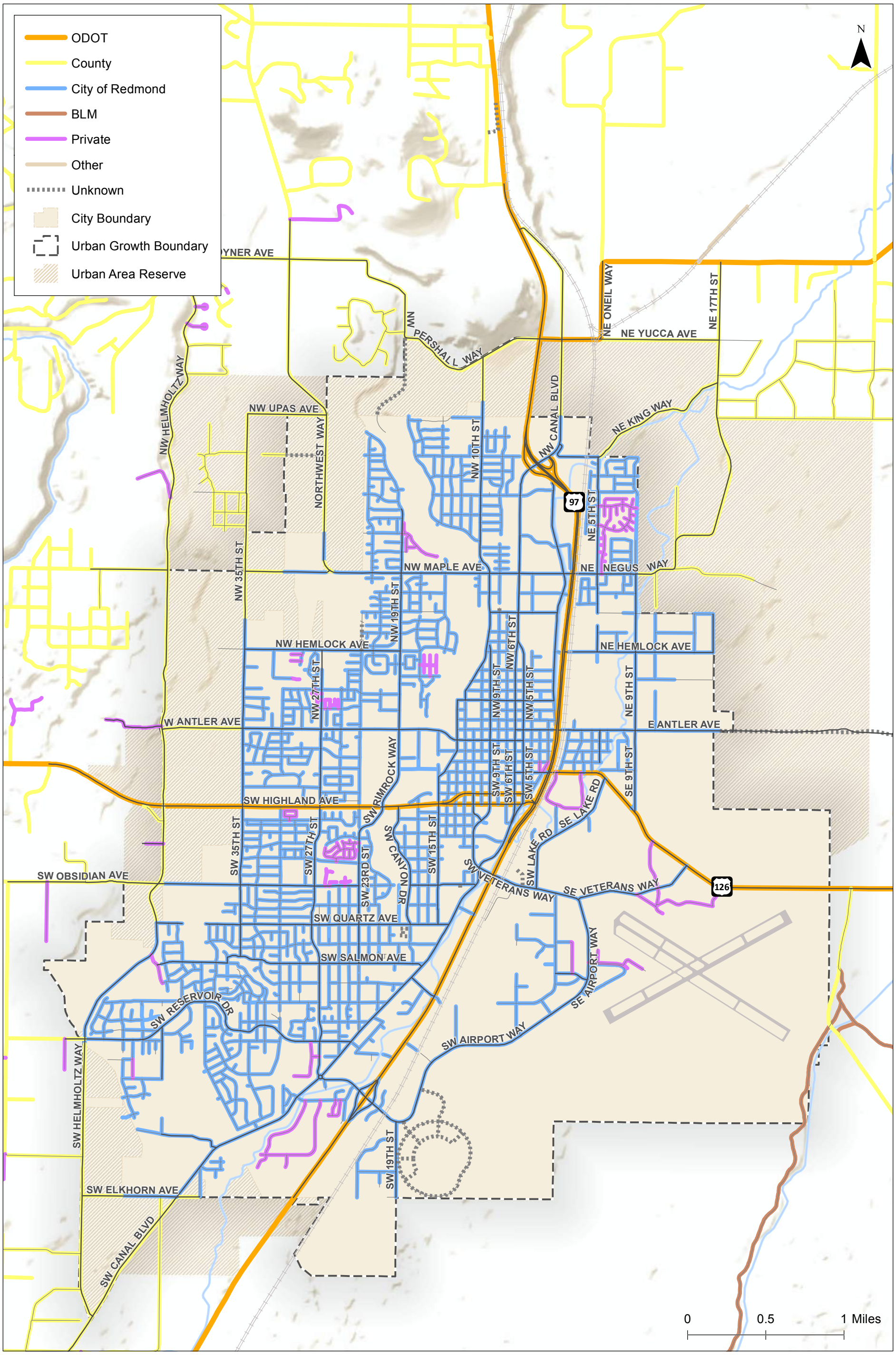
- The residential areas generally to the south of Highland Avenue and Veterans Way are home to more than 10 percent non-English speakers. Providing for transportation choices to single occupancy vehicle travel and for easy-to-understand wayfinding information in these areas should be further evaluated;
- The city is home to a diverse population of people of all ages. The elderly population (often considered more vulnerable when evaluating transportation mode choice options) is spread throughout the city but several senior living centers and senior communities are located on the west side of US 97, particularly outside the city limits and in the southwest area of the city; providing comfortable sidewalks and future transit options in this area, in particular, needs to be further reviewed;
- The residential areas generally to the south of NE Hemlock and to the east of NW 6th and S Canal Boulevard are home to more than 30 percent disabled residents. The evaluation of transit service to this area, in particular, will need further consideration as part of the TSP to ensure options are provided to single occupancy vehicle travel;
- The youth population resides in neighborhoods throughout the city, with no significant grouping in any particular geographic area; as such, providing bicycle and connectivity between neighborhoods throughout the city and schools and parks will be a priority for the TSP; and,
- The city is home to a population with a diverse range of incomes and a fairly high percentage of low income residents. As noted in the above bullets, the evaluation of future transit service options will be of particular importance to providing choices to this segment of the population.

ROADWAY SYSTEM INVENTORY

The evolution of the City's arterial, collector and local streets has been shaped, in large part, by the presence of the railroad, US 97, OR 126, several significant canals and drainage sheds, and Roberts Field. The street system is an important conveyance of personal travel, freight, public transit, and emergency response.

The City, County, and ODOT organize the streets into a functional classification based on a hierarchy of multimodal mobility and access to, through and between different land use types. The TSP inventory focused on those streets classified as collectors and arterials. The TSP does not address specific local

street needs. Primary arterial and collector streets, their characteristics, and existing operational performance and safety are summarized below. The Redmond roadway jurisdiction map is shown in Figure 4.



Roadway Jurisdiction
Redmond, Oregon

Figure **4**

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Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

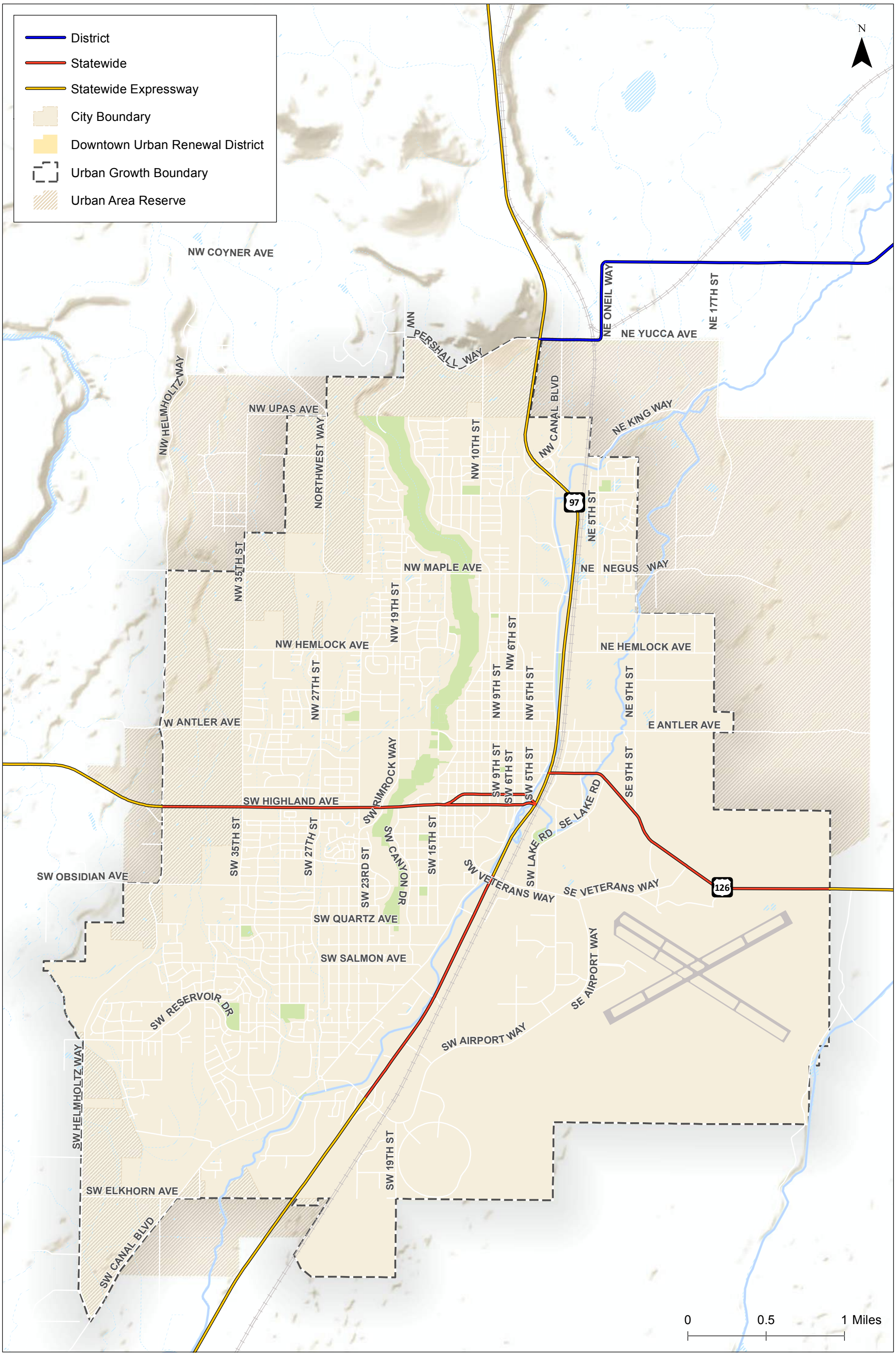
State Roadways

The state highways connect the city's residents, employees, and visitors with other areas in Central Oregon as well as through the state. These highways also provide connections between areas within the city and at the same time, can present a barrier to walking and cycling. In addition, per the Oregon Resilience Plan, US 97 is a Tier I, Phase I Lifeline Route that would serve as a critical statewide route in the event of a catastrophic emergency, such as a Cascadia Subduction Zone earthquake.

Figure 5 shows the ODOT Highway Plan functional classification for state facilities in Redmond. Table 5 summarizes the characteristics of each of these facilities.

Table 5: Redmond State Highway Characteristics

Route Name	Facility Extents	Posted Speed Limit (mph)	Number of Lanes	Travel Lane Width	Minimum ROW Available
OR 126	Entire Section within City Limits	25-55, depending on location	2-5	11-12 feet	60 feet
US 97	Entire Section within City Limits	40-55 mph, depending on location	5-7 (some areas center medians where others have center left lanes)	11-12 feet	98 feet



OHP Highway Classification and Expressways
Redmond, Oregon

Figure **5**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

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County Roadways

The County has jurisdiction over 9.1 miles of roadways that within the UGB but outside of city limits.

Table 6 gives a brief description of the County's functional classification descriptions that apply to streets within Redmond.

Table 6: Deschutes County Functional Classification

Functional Classification	Description	Example Roadway Applied To
Principal Arterial	Statewide highways that serve major activity centers in an urban area. Carry the highest portion of traffic entering, leaving, and bypassing the urban area.	State Highways
Arterial	Distributes vehicles to areas without penetrating specific neighborhoods. Provides services within urban area at a lower mobility.	Helmholtz Way
Collector	Primarily serves residential neighborhoods, commercial districts and industrial areas to distribute trips to their final destinations.	Quartz Avenue Extension, Elkhorn Avenue
Local	Lowest level of travel mobility to provide access to individual properties and developments.	Antler Avenue

Source: Deschutes County Transportation System Plan (2012)

City of Redmond Roadways

City residents, employees, and visitors are served by more than 162 miles of roadways that facilitate both local and regional connectivity. The majority of the city-owned and -operated streets are paved with asphalt or concrete. Table 7 gives a brief description of the City's street classifications in accordance with the functional role they serve within the city's transportation system whereas Table 8 provides design standards related to how each of the roadways are intended to "look and feel" to the users. Figure 6 illustrates the functional classification of each roadway within the city.

Table 7: City of Redmond Functional Classification

Functional Classification	Description
Arterial	Long roadways serving high volume of traffic intended to connect the city. Typically spaced about one mile apart to deter regional use of collector and local roadways. Access is intentionally controlled to improve the flow of through traffic.
Major Collector	Roadways commonly 0.5 to 1.0 miles in length that provides access and circulation to residential, commercial, and industrial areas. Distribute trips to and from the regional network to the local network.
Minor Collector	As known as neighborhood routes, the main function of a minor collector is to provide connectivity from local streets to collectors and arterials. These roadways have more traffic than local roadways but may have traffic calming measures to retain neighborhood characteristics.
Local	Solely provide access to immediate adjacent land uses.

Source: Redmond Transportation System Plan (2008)

Table 8: Redmond Functional Classification Standards

Functional Classification	Cross Section	Minimum ROW[1]	Min. Pavement Width	Bike Lane	Sidewalks	On-Street Parking
Minor Arterial	5 lanes	100 feet	72 feet	6 feet	7 feet	No
Minor Arterial	3 lanes	100 feet	48 feet	6 feet	7 feet	No
Major Collector	2 lanes	80 feet	36 feet	6 feet	5 feet	No
Minor Collector	2 lanes	60 feet	36 feet	Shared	5 feet	Both Sides (8 ft)
Collector (Industrial)	2 lanes	80 feet	38 feet	6 feet	5 feet	No
Local (Industrial)	2 lanes	60 feet	38 feet	Shared	5 feet	Optional
Local (Residential)	2 lanes	60 feet	28/32 feet[2]	Shared	5 feet	Both Sides (unstriped)

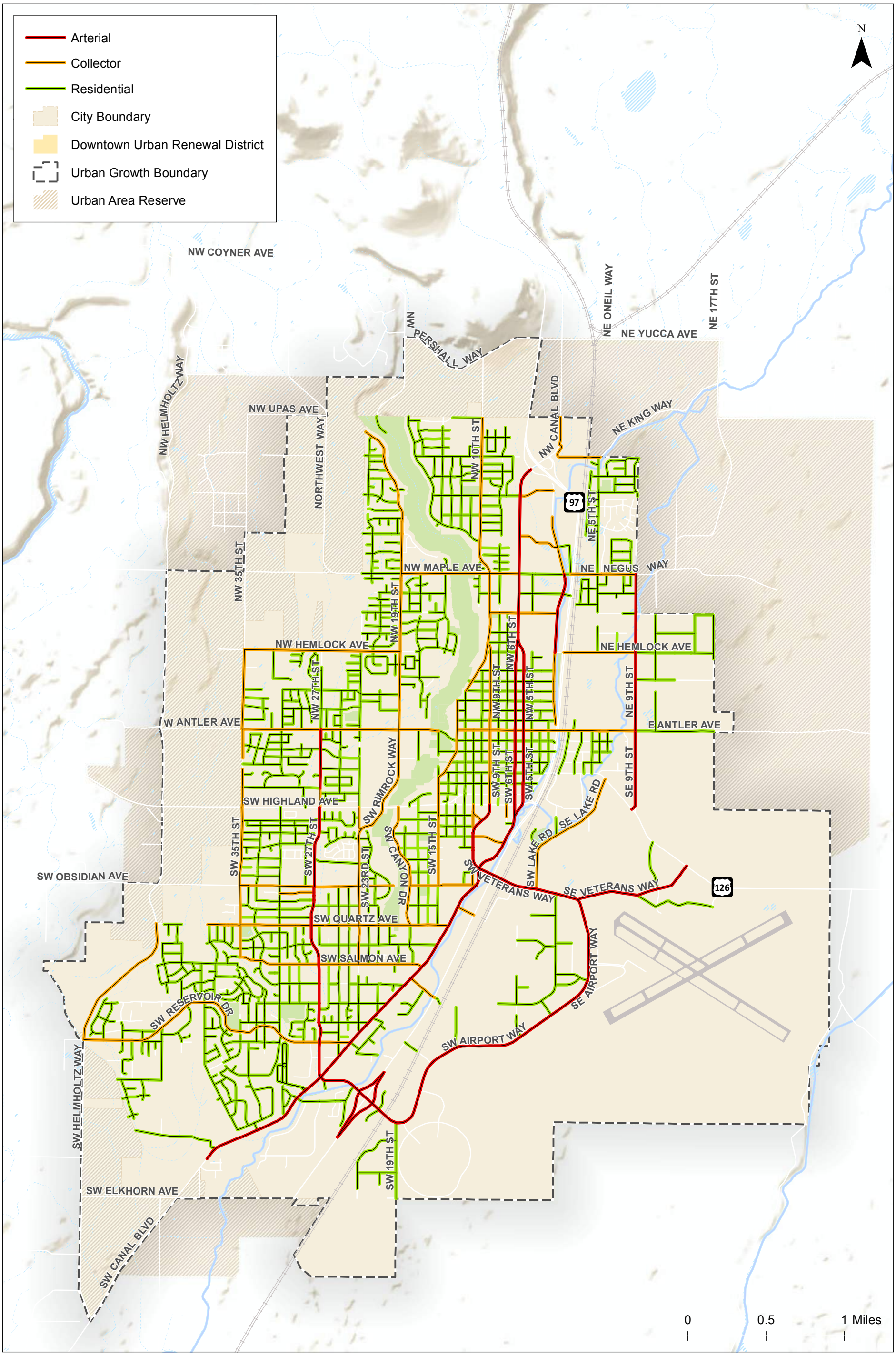
[1] ROW = Right-of-way

[2] Local 1: 32′ in 50′ ROW (with 5′ utility easements)
Local 2: 28′ in 40′ ROW (with 10′ utility easements-used in conjunction with alleys adjacent to single family homes only

The inventory also includes an assessment of current pavement conditions of city streets based on information obtained from the Redmond Geographic Information System (GIS). Figure 7 illustrates a pavement condition index based on the quality of city roadways. As shown, there is a high portion of poor to fair pavement conditions concentrated in the downtown district and throughout many areas of the city.

Signalized Intersections

Within the UGB, ODOT has ownership of the signalized intersections along OR 126 and US 97 and the City owns all other signals, though ODOT typically maintains the signals. Figure 8 shows the signalized intersections within the UGB and indicates ownership. A majority of the signalized intersections are located within and near the downtown area.



Redmond Functional Roadway Classifications
Redmond, Oregon

Figure **6**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

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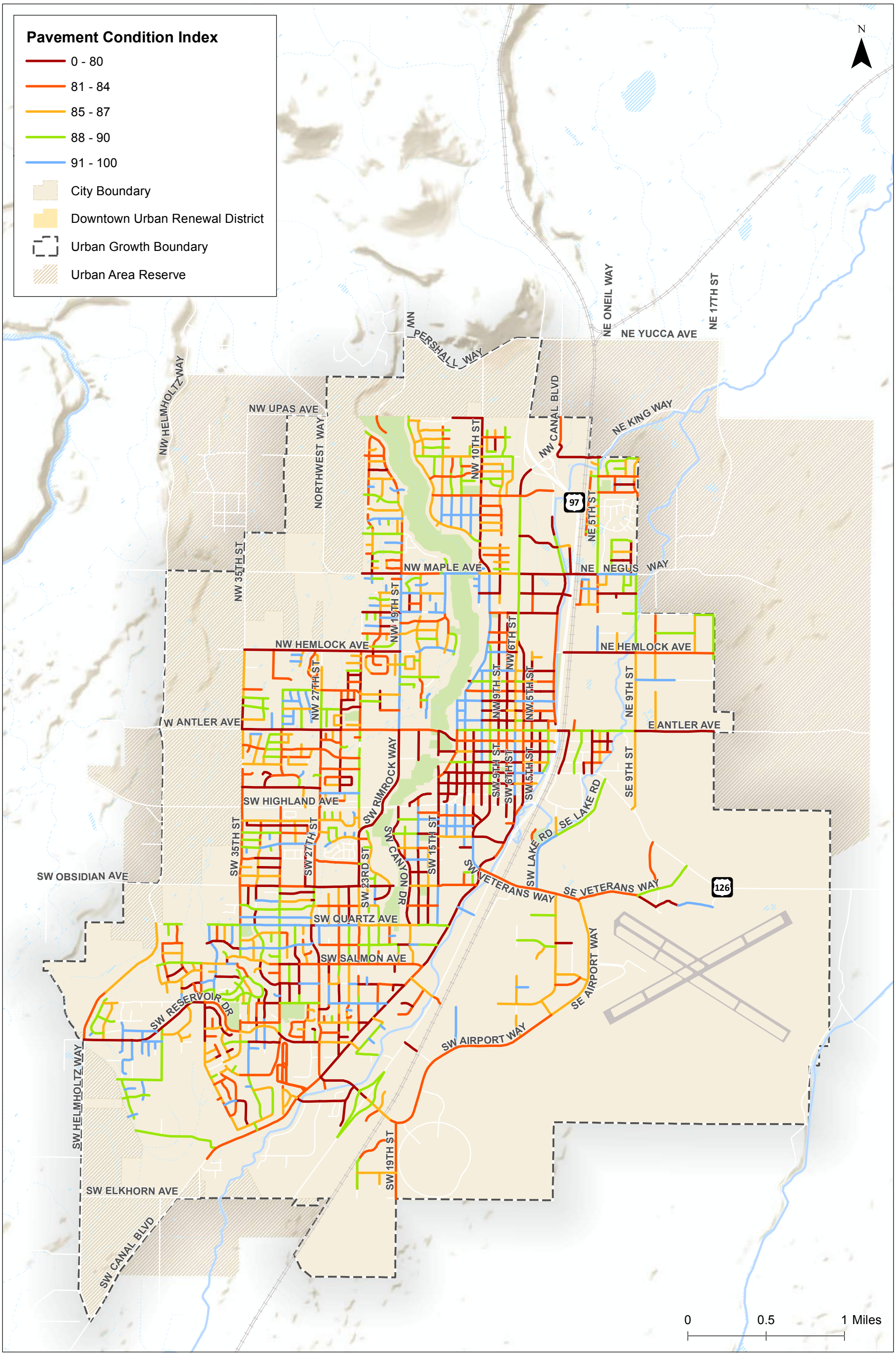

Exisiting Pavement Conditions
Redmond, Oregon

Figure
7

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

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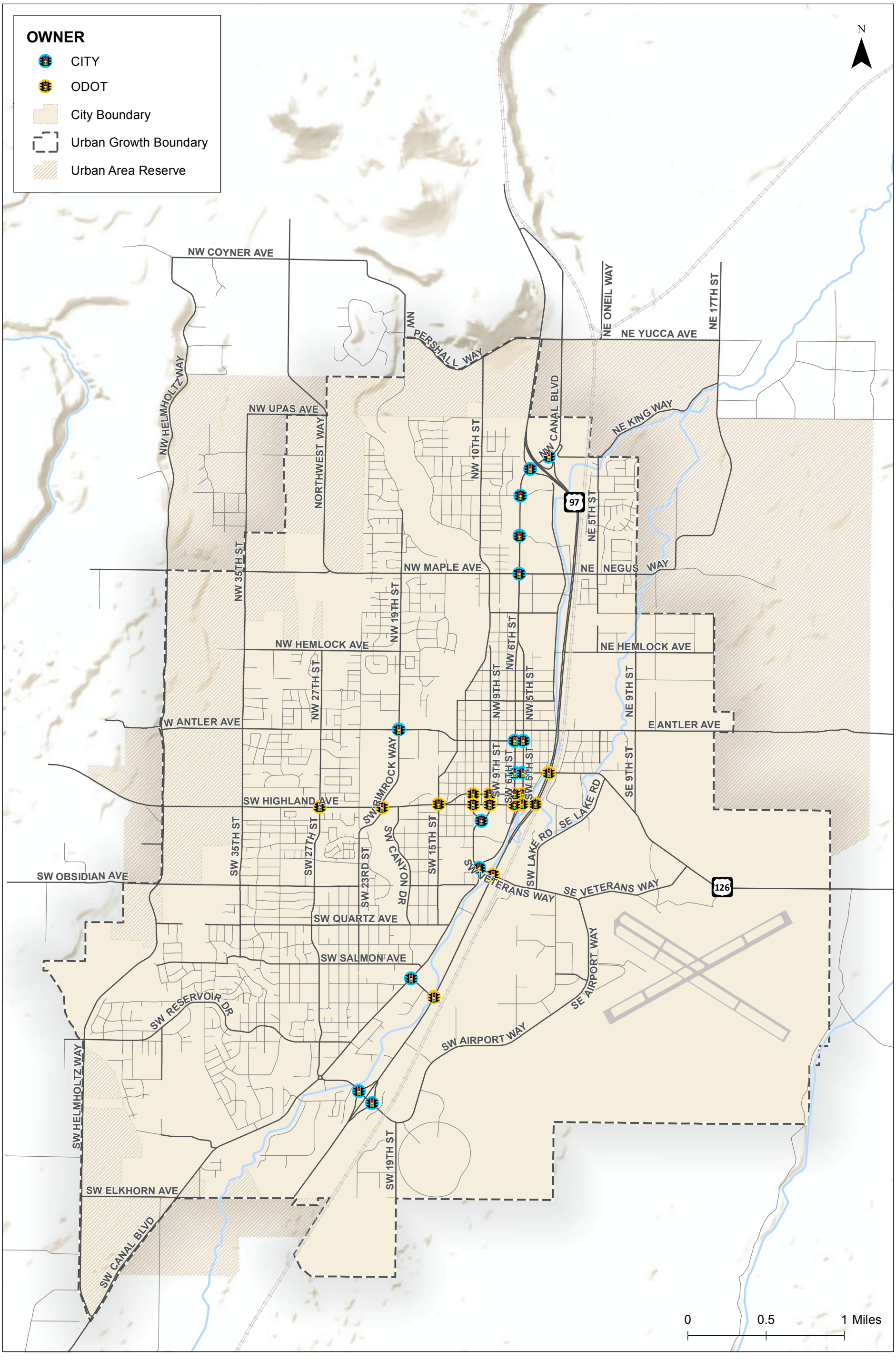


Signalized Intersections
Redmond, Oregon

Figure **8**

H:\17\17720 - Redmond Transportation System Plan\gis\Traffic Signals.mxd - mbarrus - 11:15 AM 10/23/2017

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

ACCESS SPACING AND ACCESS MANAGEMENT

Providing adequate access to streets, land uses, and key destinations is a critical part of operating and planning for an effective transportation system for all users. ODOT, the County, and the City all maintain standards to help balance the needs for both "through travelers" (including freight and public transportation) as well as serving the needs of area residents, employees and visitors. The following subsections identify current standards for streets within Redmond.

State Highways

ODOT specifies access management spacing standards in the Oregon Highway Plan (OHP) and OAR 734-051-4020(8). The applicable access management spacing standards for state facilities within the Redmond UGB are summarized in Table 9. These standards are based on the 2015 AADT (Annual Average Daily Traffic volume), posted speed limit, and functional classification.

Table 9: ODOT Access Management Spacing Standards for Highway Segments

Route Name	Facility Extents	Facility Designation	2015 ADDT	Posted Speed Limit (mph)	Access Spacing Standard (feet)
OR 126	Entire Section within UGB	Statewide Freight Route	>5,000	25/30/35/45/55	350/500 (for 30 & 35 mph)/800/1320
US 97	Entire Section within UGB	Statewide Freight Route; Expressway designation from North UGB to Veteran's Way	>5,000	40/45/50/55	800 (for 40 and 45 mph)/1100/1320
O'Neil Highway	Entire Section without UGB	District Highway	<5,000	35	250/360/425/650 (30/40/50/55)

AADT = Average Annual Daily Traffic
MPH = miles per hour
Source: Oregon Highway Plan, Appendix C Revisions to Address Senate Bill 264 (2011) Table 14

City of Redmond & Deschutes County Streets

The City of Redmond's access management spacing standards are summarized in Table 10 and vary based on functional classification. In cases where physical constraints or characteristics limit the ability to achieve the access spacing standards, the City of Redmond retains the right to grant an access spacing variance. Within the UGB, Deschutes County applies the City's access management standards as well.

Table 10: Redmond Minimum Intersection Spacing Standards

Functional Classifications	Minimum Spacing[1] between Driveways	Minimum Spacing between Intersections	Maximum Spacing between Intersections
Major Arterial	800 feet	½ mile	1 mile
Minor Arterial (Downtown)	165 feet	330 feet	660 feet
Minor Arterial (Other Areas)	330 feet	¼ mile	½ mile
Major Collector	165 feet	330 feet	660 feet
Minor Collector	80 feet	330 feet	660 feet
Industrial Collector	165 feet	330 feet	1,320 feet
Local Industrial	Access to each lot	330 feet	1,320 feet
Local Residential	Access to each lot	330 feet	660 feet

[1] Minimum spacing intended for future development.

EXISTING INTERSECTION AND STREET OPERATIONS

As part of the inventory, existing operations at 45 key intersections were compared to the established performance standards. This analysis can help identify where strategic capital improvements can be focused within the existing system as well as where new roadways may be needed to serve future economic development and associated multimodal travel.

Analysis Methodology and Performance Standards

All operations analysis described herein are in conformance with State, County, and City methodologies. More details on the analysis methodology can be found in Appendix C.

The operational results for the intersections and segments were compared with applicable City, State and/or County performance standards to identify existing deficiencies. These standards are shown in Table 11. ODOT defines intersection performance standards by “mobility targets” that are represented by a volume-to-capacity ratio. The City defines performance standards by “level-of-service”, which is a rating from A to F to describe the experience of the user.

Redmond South US 97 Corridor Plan

ODOT and the City of Redmond are engaged in an ongoing evaluation of the US 97 corridor between Glacier/Highland/OR 126 in the north and to just beyond the Redmond UGB in the south. Because of the in-depth analysis being conducted as part of that effort, this TSP update will incorporate findings from that project’s study area into this analysis as it becomes available.

Table 11: Study Intersection Control and Mobility Target

Study Int. #	Intersection	Classification/ Jurisdiction	Intersection Control	Performance Standard
1	NW Canal Blvd/ US 97 NB Ramps	ODOT	Signalized	v/c<0.85
2	NW Canal Blvd/ US 97 SB Ramps	ODOT	Signalized	v/c<0.85
3	NW Maple Ave/ NW 19th St	City	Unsignalized	LOS E, v/c<0.90
4	NW Maple Ave/ NW 6th St	City	Signalized	LOS E
5	NW Larch Ave/ NW Canal Blvd	City	Unsignalized	LOS E, v/c<0.90
6	NE Hemlock Ave/ NE 9th St	City	Unsignalized	LOS E, v/c<0.90
7	W Antler Ave/ SW Helmholtz Way	City	Unsignalized	LOS E, v/c<0.90
8	W Antler Ave/ SW 27th St	City	Signalized	LOS E
9	W Antler Ave/ SW Rimrock Way	City	Signalized	LOS E
10	SW Black Butte Blvd/ SW 6th St	City	Signalized	LOS E
11	SW Black Butte Blvd/ SW 5th St	City	Signalized	LOS E
12	E Antler Ave/ NE 9th St	City	Unsignalized	LOS E, v/c<0.90
13	SW Evergreen Ave/ SW 6th St	City	Signalized	LOS E
14	SW Evergreen Ave/ SW 5th St	City	Signalized	LOS E
15	SW Evergreen Ave/ US 97	ODOT	Signalized	Alternative Mobility Target
16	OR 126 (SW Glacier Ave)/ SW 11th St	ODOT	Signalized	v/c<0.85
17	OR 126 (SW Glacier Ave)/ SW 9th St	ODOT	Signalized	v/c<0.85
18	OR 126 (SW Glacier Ave)/ SW 6th St	ODOT	Signalized	v/c<0.85
19	OR 126 (SW Glacier Ave)/ SW 5th St	ODOT	Signalized	v/c<0.85
20	OR 126 (SW Glacier/Highland Ave)/ US 97	ODOT	Signalized	v/c<0.80
21	OR 126 (SW Highland Ave) / SW Helmholtz Way	ODOT	Unsignalized	v/c<0.80
22	OR 126 (SW Highland Ave)/ SW 27th St	ODOT	Signalized	v/c<0.80
23	OR 126 (SW Highland Ave)/ SW Rimrock Way	ODOT	Signalized	v/c<0.80
24	OR 126 (SW Highland Ave)/ SW 15th St	ODOT	Signalized	v/c<0.85
25	OR 126 (SW Highland Ave)/ SW 11th St	ODOT	Signalized	v/c<0.85
26	OR 126 (SW Highland Ave)/ SW 9th St	ODOT	Signalized	v/c<0.85
27	OR 126 (SW Highland Ave)/ SW 6th St	ODOT	Signalized	v/c<0.85
28	OR 126 (SW Highland Ave)/ SW 5th St	ODOT	Signalized	v/c<0.85
29	OR 126/ SE 9th St (McCaffrey Rd)	ODOT	Unsignalized	v/c<0.80
30	SW Obsidian Ave/ SW 27th St	City	Unsignalized	LOS E, v/c<0.90
31	SW Obsidian Ave/ SW 23rd St	City	Unsignalized	LOS E, v/c<0.90
32	SW Veterans Way/ SW Canal Blvd	City	Signalized	LOS E
33	SW Veterans Way/ US 97	ODOT	Signalized	v/c<0.80
34	SW Veterans Way/ SE Airport Way	City	Unsignalized	LOS E, v/c<0.90
35	SW Veterans Way/ OR 126	ODOT	Unsignalized	Alternative Mobility Target
36	SW Salmon Ave/ SW 27th St	City	Unsignalized	LOS E, v/c<0.90
37	SW Odem Medo Way/ SW Canal Blvd	City	Signalized	LOS E
38	SW Odem Medo Way/ US 97	ODOT	Signalized	v/c<0.80

Study Int. #	Intersection	Classification/ Jurisdiction	Intersection Control	Performance Standard
39	SW Wickiup Ave/ SW 51st St (SW Helmholtz Way)	City	Unsignalized	LOS E, v/c<0.90
40	SW Wickiup Ave (Forked Horn Rd)/ SW 27th St	City	Unsignalized	LOS E, v/c<0.90
41	SW Canal Blvd/ SW 27th St	City	Unsignalized	LOS E, v/c<0.90
42	SW Yew Ave/ US 97 SB Ramps	ODOT	Signalized	v/c<0.80
43	SE Airport Way/ US 97 NB Ramps	ODOT	Signalized	v/c<0.80
44	SE Airport Way/ SW 19th St	City	Unsignalized	LOS E, v/c<0.90
45	S Canal Blvd / SW Helmholtz Way	City	Unsignalized	LOS E, v/c<0.90

As shown in Table 11, ODOT and the City have adopted alternative mobility targets at the Evergreen Avenue/US 97 and Veterans Way/OR 126 intersections. These alternative targets are documented in Intergovernmental Agreement Number 28621 and established for the Senate Bill 1544 lands. As allowed by ODOT policy, the following steps were taken to establish the targets at these locations:

- Identify all feasible improvements (based on reasonable expectations of funding likely through the planning horizon).
- If the intersection meets the mobility target with improvements, no changes are needed.
- If the intersection is greater than the mobility target but less than a v/c ratio of 1.0, establish the standard based on the projected performance.
- Identify whether the overall hour (versus the 15-minute peak) can remain below a v/c ratio of 1.0.
- Consider the average annual v/c ratio rather than the 30th highest design hour.
- Consider an alternative analysis period (such as second highest hour).
- All changes to highway mobility targets need to request adoption from the OTC.

Roadway Segment Analyses

To help identify future needs along key corridors in the city, the existing volume-to-capacity ratio of six roadway segments was calculated. Table 12 summarizes the measured peak period traffic volumes, as recorded in Spring 2017, and the resultant volume-to-capacity ratio. As shown, this analysis revealed that all of the corridors operate under capacity and in accordance with agency performance expectations with the exception of both directions of OR 126 to the east of 35th Street. As part of the needs analysis, corridor alternatives that consider the travel needs of Redmond's residents, employees and visitors as well as regional and state travel in vicinity of the western portion of OR 126 should be considered.

Table 12: Study Segment Analysis Results

Roadway Segment	2017 Daily Traffic Volumes	Peak Hour from 2017 Traffic Counts	Peak Hour Traffic Volumes	Capacity Estimate (vphpl)	Calculated V/C Ratio
US 97, south of Yew Avenue, NB	*Included in Redmond South US 97 Corridor Plan*				
US 97, south of Yew Avenue, SB	*Included in Redmond South US 97 Corridor Plan*				
US 97 south of Highland Avenue, NB	*Included in Redmond South US 97 Corridor Plan*				
US 97 south of Highland Avenue, SB	*Included in Redmond South US 97 Corridor Plan*				
US 97 north of Canal Boulevard, NB	12,378	4:30-5:30PM	1,256	1,700	0.38
US 97 north of Canal Boulevard, SB	12,250	3:45-4:45PM	1,067	1,700	0.32
OR 126 east of 35th Street, EB	6,608	4:45-5:45PM	643	1,700	0.41
OR 126 east of 35th Street, WB	6,765	4:15-5:15PM	822	1,700	0.49
OR 126 west of Veterans Way, EB	3,721	3:30-4:30PM	348	1,700	0.21
OR 126 west of Veterans Way, WB	3,559	4:00-5:00PM	359	1,700	0.22
Canal Blvd north of Badger Avenue, NB	3,507	5:00-6:00PM	423	700	0.62
Canal Blvd north of Badger Avenue, NB	2,986	6:45-7:45AM	390	700	0.57

Note: Vehicles per hour per plan (vphpl)

Intersection Traffic Operations Analysis Results

To understand where investments in traffic signals or roundabouts may be merited, as well as consideration of alternative performance standards, the intersection operations at 45 locations within the city were evaluated. Details on this analysis are provided in Appendix F. Figure 9 illustrates the existing peak hour traffic volumes and lane configurations and Figure 10 illustrates the results of the peak hour intersection operations. As shown, three locations do not meet state mobility targets, including:

1. OR 126 (SW Highland Ave) at SW Helmholtz Way
2. OR 126 (SW Highland Ave) at SW 27th St
3. OR 126 (SW Highland Ave) at SW Rimrock Way

These intersections are within the roadway segment of OR 126 also shown to exceed performance targets.

Appendix F also contains detailed information about intersection queuing under existing conditions. This information will also help to inform future corridor and intersection needs. As shown in the appendix, US 97 and SW Evergreen currently experience long queues during the peak hour.

1 NW Canal Blvd/US 97 NB Ramps
4:30-5:30
159 → 166
398 ↘ 7
LOS=B
Del=10.1
V/C=0.45
261 74

2 NW Canal Blvd/US 97 SB Ramps
4:30-5:30
216 0 8
549 → 369
107 ↘ 57
LOS=A
Del=8.7
V/C=0.43

3 NW Maple Ave/NW 19th St
4:55-5:55
6 44 47
6 ↘ 88
115 → 170
53 ↘ 315
LOS=C
Del=16.2
V/C=0.66
74 69 258

4 NW Maple Ave/NW 6th St
4:30-5:30
148 282 40
106 ↘ 27
163 → 197
152 ↘ 156
LOS=B
Del=18.8
V/C=0.62
221 421 226

5 NW Canal Blvd/ NW Larch Ave
4:30-5:30
25 19 76
17 ↘ 2
137 → 19
20 ↘ 8
LOS=B
Del=6.1
V/C=0.23
13 26 30

6 NE 9th St/ NE Hemlock Ave
4:30-5:30
8 71 5
38 ↘ 35
9 → 12
95 ↘ 34
LOS=A
Del=9.1
V/C=0.28
22 139 5

7 NW Helmholtz Way/ W Antler Ave
4:55-5:55
0 39 40
0 ↘ 56
0 → 0
0 ↘ 42
LOS=B
Del=10.4
V/C=0.15
0 82 71

8 SW 27th St/ W Antler Ave
4:55-5:55
2 53 15
2 ↘ 24
74 → 76
42 ↘ 114
LOS=B
Del=10.4
V/C=0.34
36 90 108

9 NW 19th St/ W Antler Ave
4:55-5:55
104 289 57
104 ↘ 177
121 → 184
44 ↘ 55
LOS=C
Del=21.1
V/C=0.57
70 371 50

10 SW 6th St/ SW Black Butte Blvd
4:30-5:30
114 597 14
58 → 101
62 ↘ 19
LOS=A
Del=7.7
V/C=0.43

11 SW 5th St/ SW Black Butte Blvd
4:30-5:30
58 ↘ 8
16 → 26
LOS=A
Del=5.8
V/C=0.48
110 771 6

12 NE 9th St/ E Antler Ave
4:30-5:30
24 230 4
23 ↘ 8
4 → 3
7 ↘ 12
LOS=B
Del=12.6
V/C=0.08
6 146 2

13 SW 6th St/ SW Evergreen Ave
4:30-5:30
29 621 86
54 → 59
15 ↘ 94
LOS=A
Del=8.9
V/C=0.51

14 SW 5th St/ SW Evergreen Ave
4:30-5:30
35 ↘ 235
108 → 121
LOS=B
Del=11.1
V/C=0.58
28 645 28

15 US 97/ SW Evergreen Ave
4:30-5:30
28 922 86
50 ↘ 105
87 → 233
76 ↘ 262
LOS=E
Del=56.6
V/C=0.94
251 1053 185

16 SW 11th St/ SW Glacier Ave
4:30-5:30
18 31
LOS=A
Del=3.6
V/C=0.54
1202 ← 65

17 SW 9th St/ SW Glacier Ave
4:30-5:30
LOS=A
Del=10.2
V/C=0.52
14 ← 832
404 133

18 SW 6th St/ SW Glacier Ave
4:30-5:30
290 662
LOS=B
Del=12.3
V/C=0.59
458 ← 106

19 SW 5th St/ SW Glacier Ave
4:30-5:30
LOS=A
Del=9.7
V/C=0.48
243 ← 481
62 631

20 US 97/ Glacier Highland Ave
4:30-5:30
280 980
381 ↘ LOS=C
243 → Del=23.4
V/C=0.71
454 1109

21 SW Helmholtz Way/ SW Highland Ave
4:30-5:30
45 34 21
57 ↘ LOS=F 44
473 → Del>300 ← 463
27 ↘ V/C=1.51 84
23 123 95

22 SW 6th St/ SW Highland Ave
4:30-5:30
37 218 147
81 ↘ LOS=D 139
531 → Del=48.8 ← 587
39 ↘ V/C=0.97 228
52 215 125

23 SW 5th St/ SW Highland Ave
4:30-5:30
83 179 212
110 ↘ LOS=D 293
664 → Del=53.2 ← 845
9 ↘ V/C=1.05 283
18 190 177

24 OR 126/ McCaffrey Rd
4:30-5:30
77 35 36
45 ↘ LOS=B 49
854 → Del=18.4 ← 1090
54 ↘ V/C=0.78 48
206 84 68

25 SW 23rd St/ SW Obsidian Ave
4:30-5:30
85 12
659 → LOS=A
341 ↘ Del=4.7
V/C=0.45

26 SW Canal Blvd/ SW Veterans Way
4:30-5:30
34 ↘ LOS=A
663 → Del=9.6
V/C=0.50
501 126

27 US 97/ SW Veterans Way
4:30-5:30
577 179
779 → LOS=B
55 ↘ Del=10.6
V/C=0.52

28 SE Airport Way/ SE Veterans Way
4:30-5:30
386 ↘ LOS=A
575 → Del=7.9
V/C=0.44
323 48

29 SE Veterans Way/ OR 126
4:30-5:30
100 108
57 ↘ LOS=C 102
281 → Del=18.1 ← 240
V/C=0.46

30 SW 27th St/ SW Salmon Ave
5:00-6:00
69 182 6
37 ↘ LOS=B 3
46 → Del=11.9 ← 50
25 ↘ V/C=0.51 21
60 285 18

31 SW Canal Blvd/ SW Odem Medo Way
5:00-6:00
58 205 8
49 ↘ LOS=B 8
3 → Del=14.2 ← 3
24 ↘ V/C=0.17 0
21 256 10

32 US 97/ SW Odem Medo Way
4:30-5:30
10 344 168
9 ↘ LOS=C 189
185 → Del=22.4 ← 321
116 ↘ V/C=0.56 117
127 278 82

33 SW Helmholtz Way/ SW Wickiup Ave
4:30-5:30
61 1080 83
76 ↘ LOS=D 163
131 → Del=43.0 ← 301
228 ↘ V/C=0.92 195
265 1324 110

34 SW 27th St/ SW Wickiup Ave
4:30-5:30
111 ↘ LOS=B 125
56 → Del=13.2 ← 172
V/C=0.48
183 111

35 SW 27th St/ SW Yew Ave
4:30-5:30
330 → LOS=C 285
6 ↘ Del=15.0 ← 219
V/C=0.46
275 4

36 US 97 SB Ramps/ SW Yew Ave
5:00-6:00
4 165 34
10 ↘ LOS=C 72
66 → Del=21.3 ← 141
24 ↘ V/C=0.72 89
56 271 84

37 SW Canal Blvd/ SW Odem Medo Way
4:30-5:30
0 258 221
0 ↘ 366
0 → LOS=B 0
0 ↘ Del=12.7 171
V/C=0.55
0 291 154

38 US 97/ SW Odem Medo Way
4:30-5:30
260 1111 9
252 ↘ LOS=C 15
14 → Del=21.4 ← 22
157 ↘ V/C=0.73 9
266 1406 9

39 SW Helmholtz Way/ SW Wickiup Ave
5:00-6:00
8 77 35
4 ↘ LOS=B 33
13 → Del=11.1 ← 10
1 ↘ V/C=0.10 18
6 202 48

40 SW 27th St/ SW Wickiup Ave
5:00-6:00
29 159 3
36 ↘ LOS=C 7
71 → Del=16.8 ← 97
33 ↘ V/C=0.65 4
96 380 5

41 SW 27th St/ SW Yew Ave
5:00-6:00
36 126 66
9 ↘ LOS=A 109
147 → Del=9.9 ← 354
34 ↘ V/C=0.64 83
100 153 92

42 US 97 SB Ramps/ SW Yew Ave
4:30-5:30
151 0 88
180 → LOS=A
174 ↘ Del=8.9
V/C=0.66
552
274

43 US 97 NB Ramps/ SE Airport Way
4:30-5:30
87 ↘ LOS=C 124
180 → Del=21.3 ← 479
V/C=0.78
348 1 175

44 SW 19th St/ SE Airport Way
4:30-5:30
249 → LOS=C 395
25 ↘ Del=15.1 ← 5
V/C=0.15
48 12

45 SW Canal Blvd/ SW Helmholtz Way
5:00-6:00
4 141
6 ↘ LOS=A
76 → Del=4.1
V/C=0.21
251 249

Intersection Peak Hours, Peak Hour Volumes, and Lane Configurations
Redmond, Oregon

Figure **9**

H:\17\17720 - Redmond Transportation System Plan\dwgs\figs\17720_figures.dwg Apr 04, 2018 - 4:21pm - mbarrus Layout Tab: Existing 2017 TMCs

KITTELSON & ASSOCIATES

Mobility Targets

- Meets
- Does Not Meet
- No Count Data
- City Boundary
- Downtown Urban Renewal District
- Urban Growth Boundary
- Urban Area Reserve

N

NW COYNER AVE
NW PERSHALL WAY
NE ONEIL WAY
NE 17TH ST
NE YUCCA AVE
NW HELMHOLTZ WAY
NW UPAS AVE
NORTHWEST WAY
NW CANAL BLVD
NE KING WAY
NW 10TH ST
97
NE 5TH ST
NW 35TH ST
NW MAPLE AVE
NW 19TH ST
NE NEGUS WAY
NE 9TH ST
NW HEMLOCK AVE
NW 27TH ST
NW 9TH ST
NW 6TH ST
NW 5TH ST
E ANTLER AVE
SW 9TH ST
SE 9TH ST
SW HIGHLAND AVE
SW 15TH ST
SW CANYON DR
SW LAKE RD
SE LAKE RD
SW OBSIDIAN AVE
SE VETERANS WAY
126
SW QUARTZ AVE
SW SALMON AVE
SW RESERVOIR DR
SW AIRPORT WAY
SE AIRPORT WAY
SW 19TH ST
SW HELMHOLTZ WAY
SW ELKHORN AVE
SW CANAL BLVD

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 21 22 23 24 25 26 27 28 29 30 31 32 34 35 36 37 39 40 41 44 45

0 0.5 1 Miles

Existing Conditions (2017) Intersection Operational Analysis
Redmond, Oregon

Figure **10**

H:\17\17720 - Redmond Transportation System Plan\gis\Study Intersections_MKB.mxd - mbarrus - 11:23 AM 10/23/2017

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

HISTORIC CRASH ANALYSIS

Reported crash data was analyzed at all the 45 key intersections in effort to identify patterns and trends that may indicate an opportunity to reduce crash frequency and severity. The data was obtained from ODOT for the five-year period from January 1, 2011 through December 31, 2015 and includes information about crash location, type, weather, roadway surface conditions, traffic control, and vehicle information. A summary of reported crashes by study segment is provided in Appendix G.

Figures 11 – 13 provide details on the location and type of crashes recorded during the most recent five-year period. As shown, six fatalities, three of which involved pedestrians, occurred during the analysis period. Five of the six fatalities and all of the reported bicycle and pedestrian crashes occurred on the collectors or arterials. Appendix H includes a table that summarizes the location, type, severity, and number of crashes that were reported at the study intersections.

Fatal Crashes Discussion

During this period, there were six fatal crashes, five of which occurred on a major roadway (collector or arterial). One of the crashes occurred approximately a quarter of a mile south of Canal Boulevard on US 97. This collision happened during icy roadway conditions in February of 2012 when a vehicle crossed over the median and crashed into an oncoming vehicle. Two fatalities and several injuries resulted from the crash.

There were three nighttime pedestrian related fatalities that occurred during the study period: one at the intersection of Canal Boulevard/Odem Medo Way, one just north of Yew Avenue on US 97, and one at NW 6th Street/Kingwood Avenue. In two scenarios the pedestrians were wearing dark clothing and were reportedly illegally in the roadway. Alcohol was indicated in two of the pedestrian fatalities.

The remaining two collisions involved a motorcycle animal crash and a sideswipe-overtaking crash. The motorcycle crash occurred on NW Poplar Avenue and alcohol was indicated in the crash report. The sideswipe crash occurred on US 97 just south of Yew Avenue. The crash report indicated a vehicle improperly changed lanes and overtook another vehicle.

Half of the fatal crashes were pedestrian related and half of the fatal crashes occurred on US 97, however, there does not appear to be a trend for fatal crashes associated with location, crash type, time of day, or weather conditions.

Statewide Crash Performance Standards

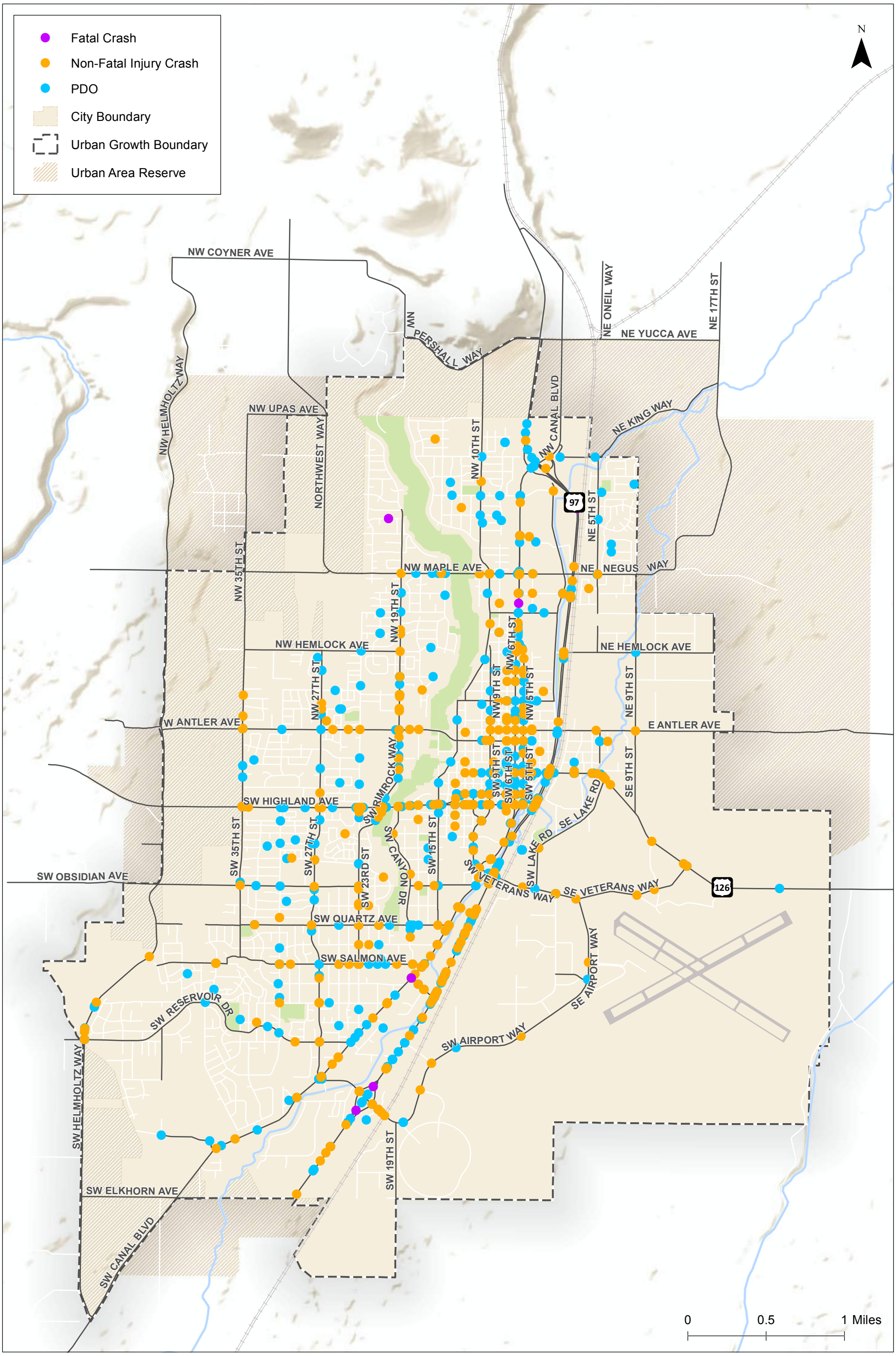
Table 13 identifies the study intersections that exceed ODOT crash performance standards and the study intersection locations identified in the table are shown in Figure 14. Appendices I - K provide additional information and a summary of key observations at study intersections and study segments.

Table 13. Summary of Study Intersections that Exceed ODOT Crash Performance Standards

Intersection	90th Percentile Crash Rate	Critical Crash Rate	Top 85% SPIS Site
NW Maple Ave/NW 6th St	Does not Exceed	Exceeds	Does not Exceed
NW Larch Ave/NW Canal Blvd	Exceeds	Exceeds	Does not Exceed
SW Evergreen Ave/US 97	Does not Exceed	Does not Exceed	Exceeds
OR 126 (SW Glacier Ave)/SW 6th St	Exceeds	Exceeds	Exceeds
OR 126 (SW Glacier Ave)/SW 5th St	Does not Exceed	Does not Exceed	Exceeds
OR 126 (SW Glacier/Highland Ave)/US 97	Exceeds	Does not Exceed	Does not Exceed
OR 126 (SW Highland Ave)/SW Rimrock Way	Does not Exceed	Exceeds	Does not Exceed
OR 126 (SW Highland Ave)/SW 5th St	Does not Exceed	Does not Exceed	Exceeds
OR 126 (SW Highland Ave)/SW 6th St	Exceeds	Exceeds	Exceeds
SW Salmon Ave/SW 27th St	Exceeds	Do not Exceed	Does not Exceed
SW Wickiup Ave/SW Helmholtz Way	Exceeds	Exceeds	Does not Exceed
SW Canal Blvd/SW 27th St	Exceeds	Exceeds	Does not Exceed
S Canal Blvd/SW Helmholtz Way	Exceeds	Exceeds	Does not Exceed

Key Trends and Findings

Table 13 and the corresponding figures show nearly half of the intersections identified as exceeding the ODOT crash performance standards are occurring along the OR 126 corridor. This corridor is the highest east-west connection throughout the city and experiences a high level of demand. The majority of the study intersections along OR 126 are signalized intersections. There are a high proportion of rear-end, turning movement, and angle crashes at these intersections; typical of in urban environment. All locations will be evaluated as part of the future needs analysis to determine if safety treatments may be implemented to help reduce crash risks or crash frequency/severity.

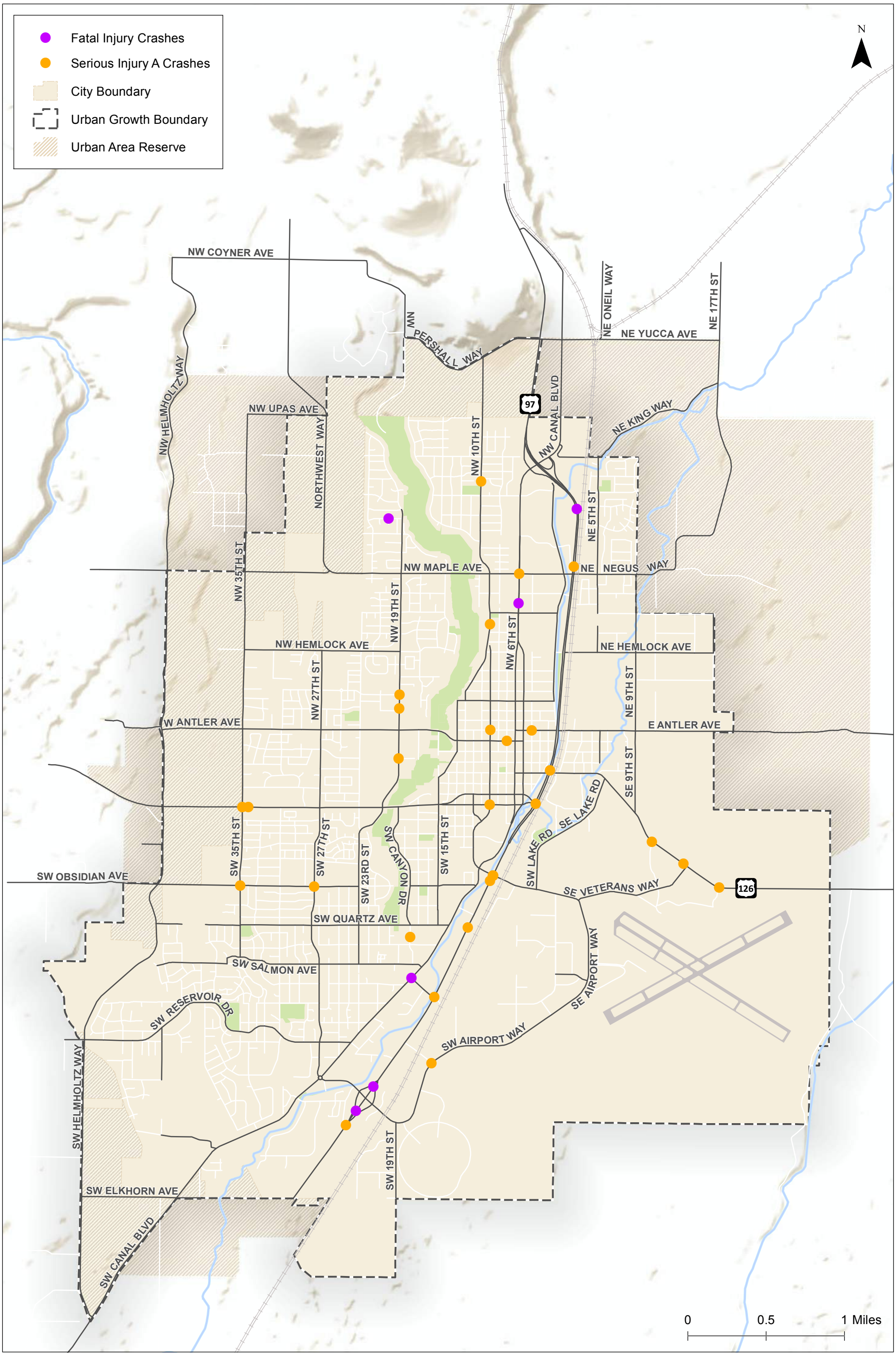


2011-2015 Crashes by Severity
Redmond, Oregon

Figure **11**

H:\17\17720 - Redmond Transportation System Plan\gis\Crash Severity.mxd - mbarrus - 11:32 AM 10/23/2017

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

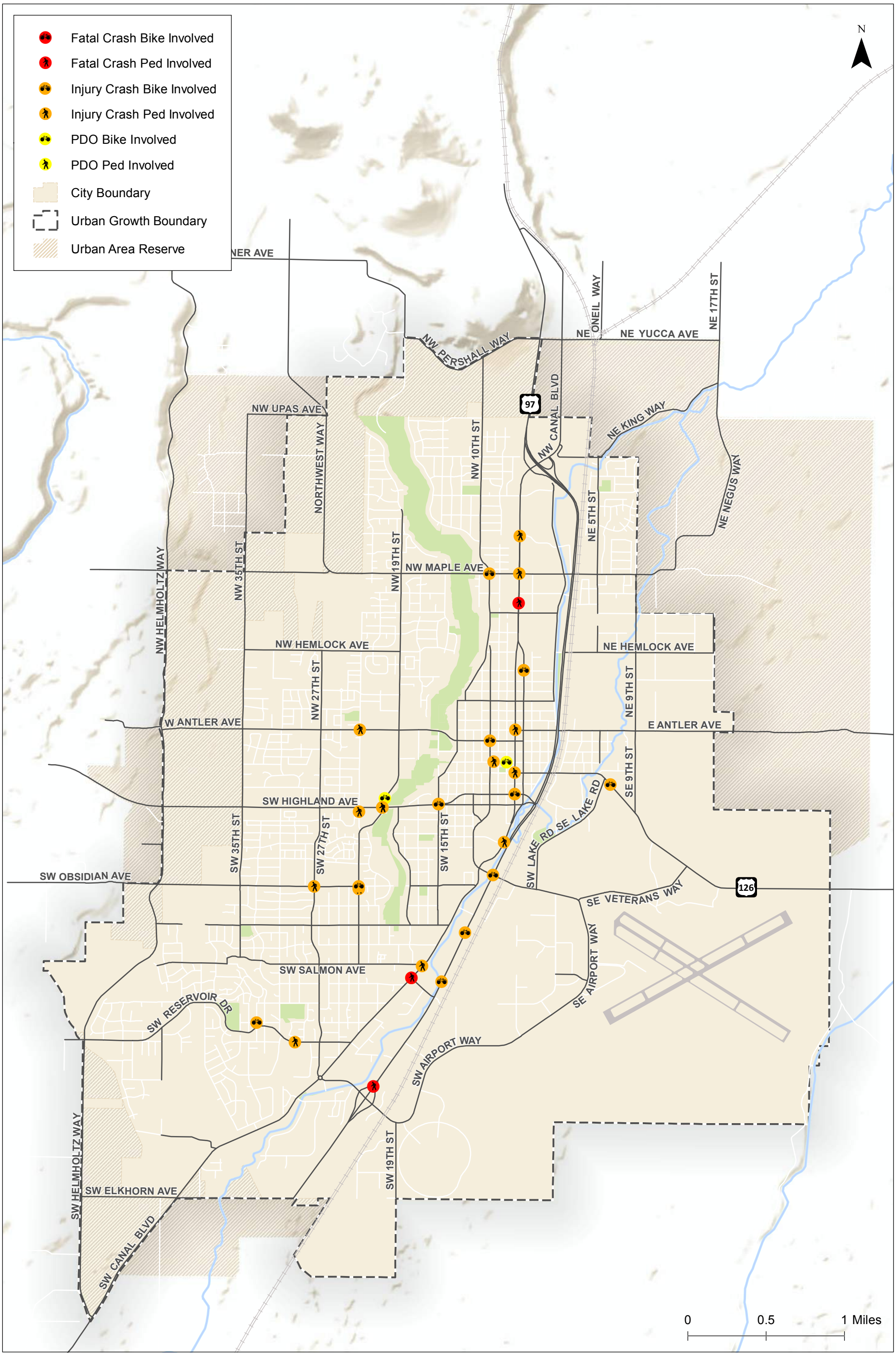


Fatal and Serious Injury Crashes
Redmond, Oregon

Figure **12**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

H:\17\17720 - Redmond Transportation System Plan\gis\Crashes Fatal Severe Injury only Map.mxd - mbarrus - 11:35 AM 10/23/2017

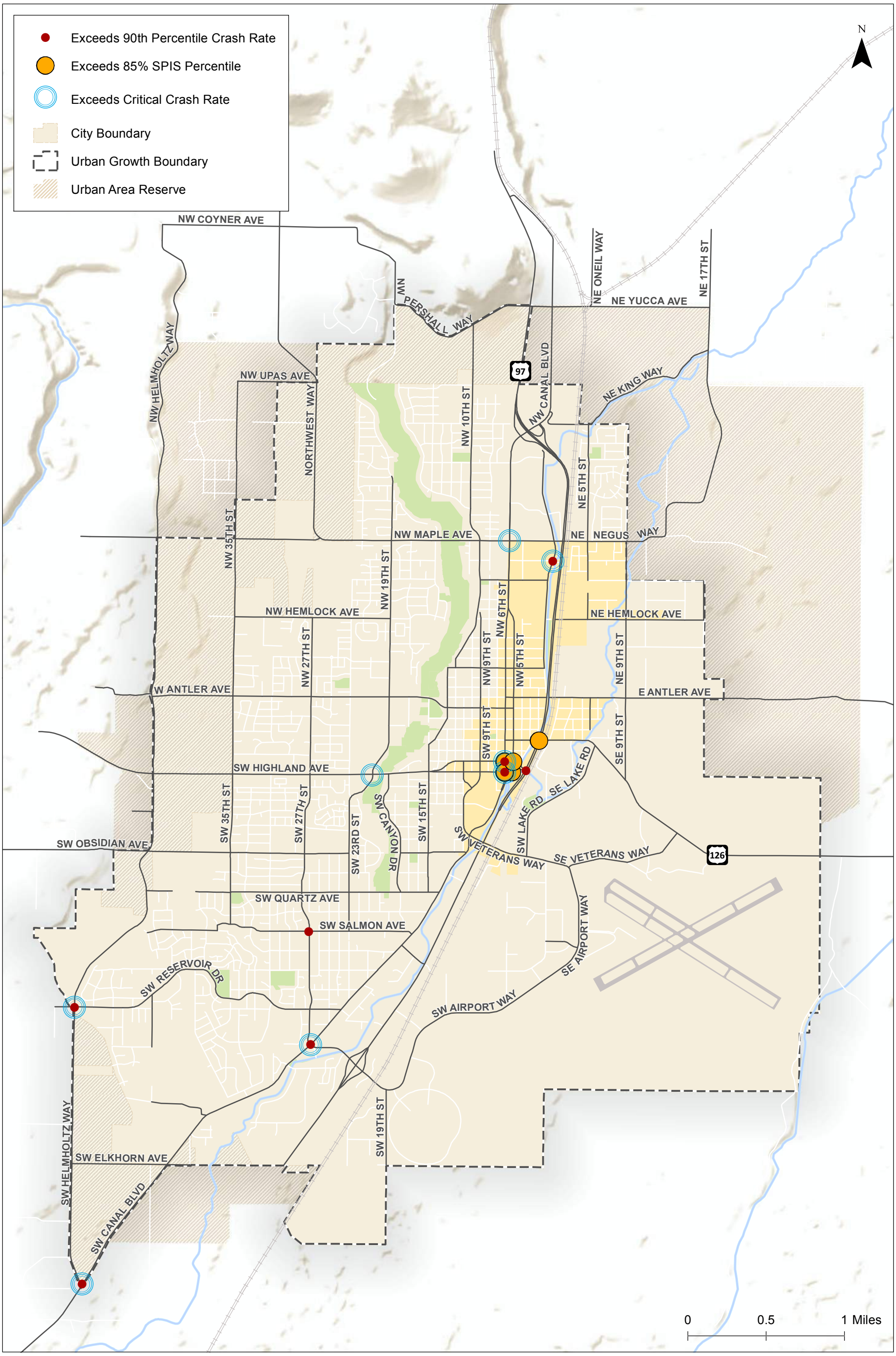


Bicycle and Pedestrian 2011-2015 Crashes by Severity
Redmond, Oregon

Figure **13**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

H:\17\17720 - Redmond Transportation System Plan\gis\Crash Bike Ped only.mxd - mbarrus - 4:07 PM 4/5/2018



Statewide Crash Performance Standards
Redmond, Oregon

Figure **14**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

H:\17\17720 - Redmond Transportation System Plan\gis\Crash Rates Per Intersection.mxd - mbarrus - 11:51 AM 10/23/2017

ACTIVE TRANSPORTATION ANALYSIS

Pedestrian System

The City's sidewalk and multi-use pathways contribute to support an economically vital, healthy and equitable community. Area residents enjoy the Dry Canyon Trail system for recreation as well as to provide access to several parks, community facilities and the Redmond High School.

Figure 15 illustrates the location of sidewalks and the trail system. The figure also includes the location of ADA accessible ramps throughout the city. As shown, many of the streets north of OR 126 have sidewalks whereas a number of gaps in the sidewalk system are present to the south. As future alternatives are considered, the potential to prioritize sidewalks that connect neighborhoods with key destinations in the city will be analyzed. The findings of the ongoing Redmond Neighborhood Revitalization Plan will also be incorporated into the TSP Update to help inform priority locations.

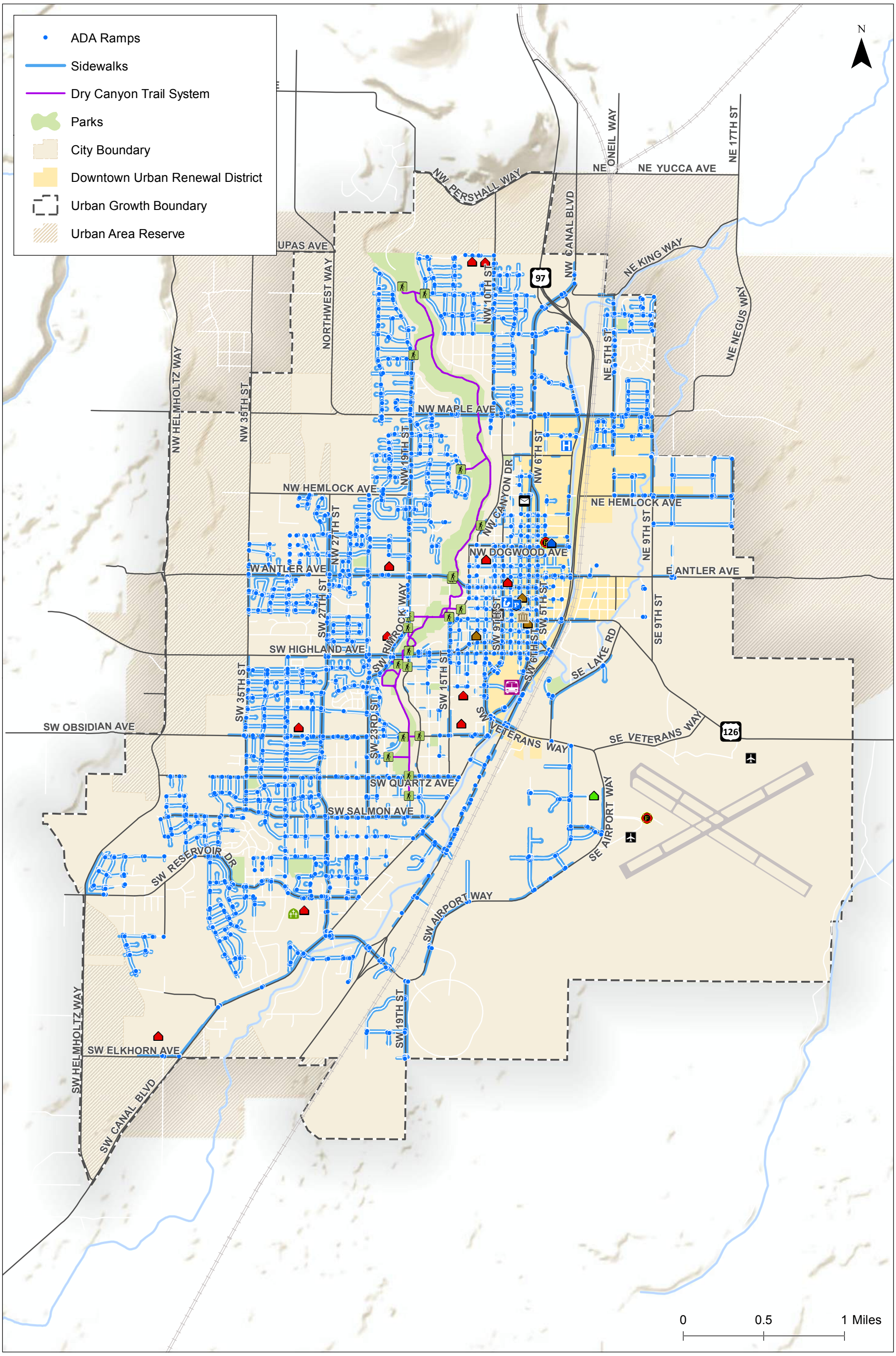
American With Disabilities Act (ADA) Access Plan

Figure 16 shows the network of ADA routes throughout the UGB, as identified by other City planning efforts. The routes highlight locations where sidewalk and ramps meet ADA standards, do not meet ADA standards, or are non-existent. Much of the street network has sidewalk and ramps and many of those facilities meet ADA standards. The City does not maintain information on pedestrian push buttons. There are sections within the UGB, primarily surrounding the downtown region, where the sidewalk and ramps need to be improved and where they need to be installed.

Pedestrian Level of Stress

Pedestrian "Level of Traffic Stress" (PLTS) is a measure often used as part of planning projects to communicate the level of comfort pedestrians experience while using specific facilities. The PTLS takes into account the presence and condition of sidewalks and ADA ramps, the nature of crossings, and the characteristics of the adjacent roadway. The City's Neighborhood Revitalization Project rated several key pedestrian facilities in the city and identified the following deficiencies:

- Citywide sidewalk coverage is largely limited and incomplete.
- The majority of city sidewalks are classified as PLTS 3 (medium stress).
- The only low stress facilities (PTLS 1) throughout the city are separate multiuse paths such as the Dry Canyon Trail.
- Overall, the high stress scores citywide are predominately a result of sidewalk width and condition. Other characteristics affecting the scores included proximity to high speed vehicle corridors, curb ramp conditions and high-stress crossings.



Existing Pedestrian Facilities
Redmond, Oregon

Figure **15**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

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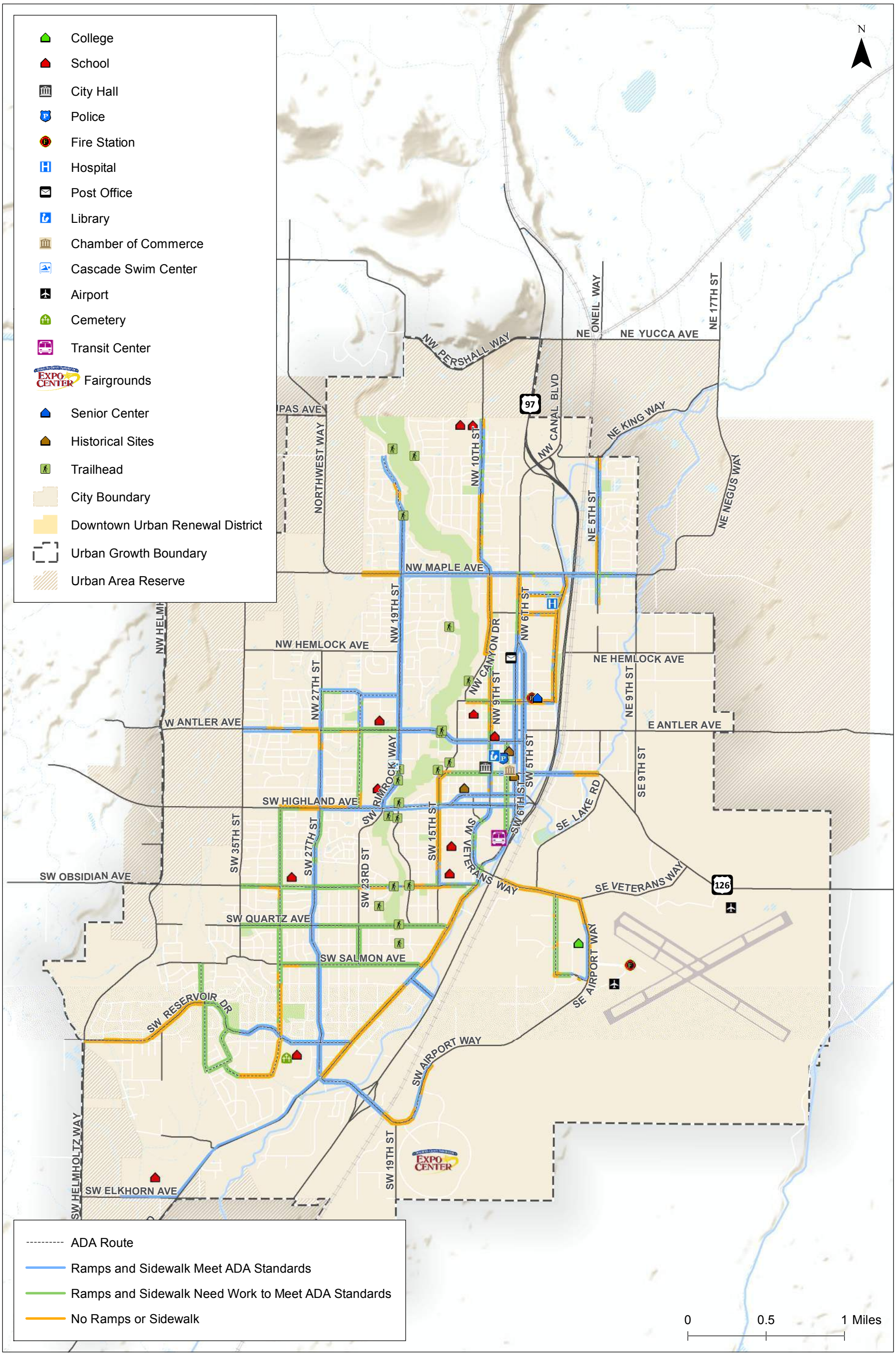

ADA Access Plan
Redmond, Oregon

Figure **16**

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Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

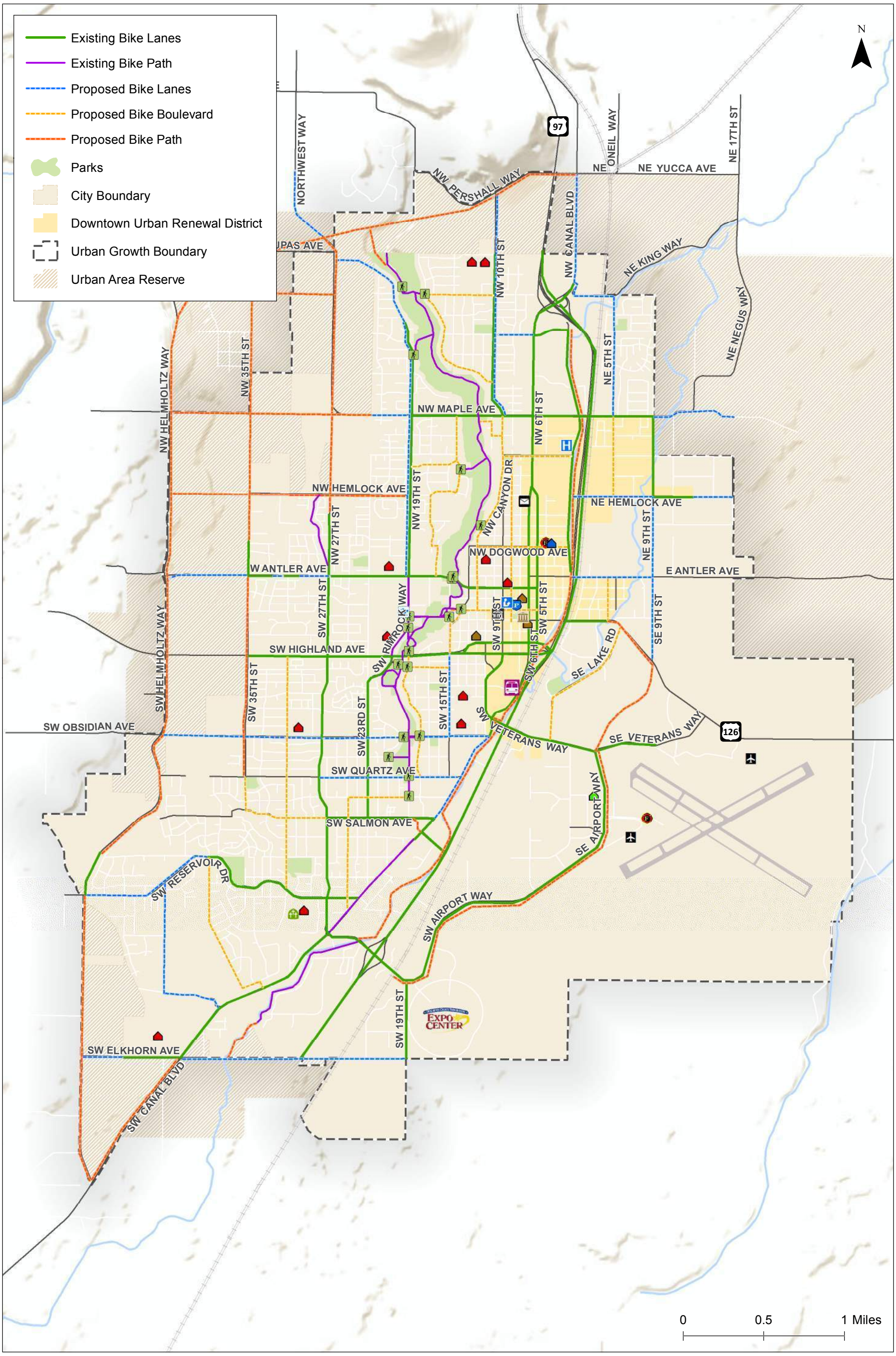
Bicycle System

Today, two types of bicycle facilities are generally provided along key streets within the city, including:

- **Shared Roadway** – On a shared roadway, bicyclists and motorists share the same travel lanes. A motorist will usually have to cross over into the adjacent travel lane to pass a bicyclist. Shared roadways are common on neighborhood streets and on low volume rural roads and highways and may, or may not, include "sharrows" (pavement marking that indicate the shared use of the roadway).
- **Dedicated bike Facilities** – Some roadways dedicate a portion of the roadway (or off-street location) for preferential use by bicyclists. These type of facilities are used to provide high-quality, low-stress riding experiences and are appropriate for roadways that carry higher traffic volumes and speeds then local streets and minor/neighborhood collector streets. Dedicated bike facilities can be constructed as bike lanes, buffered bike lanes, cycle tracks and separated pathways, and must always be well-marked to call attention to their preferential use by bicyclists.

Today, the City primarily has a limited number of on-street bike lanes and off-street pathways. The City is also planning to implement Bicycle Boulevards in the future, in which the typical operation of a local street is modified to function as a through street for bicyclist while maintaining local access for motor vehicles. Traffic calming devices reduce motor vehicle speeds and through trips and traffic controls limit the potential for conflicts between bicyclists and motorists.

As shown in Figure 17, most of the collector streets within the city are planned to include bike lanes or bike boulevards in the future but very few do today. As part of future alternatives, the need for additional bike facilities to support commuting, recreational and personal travel will be identified.



Existing and Planned Bicycle Facilities
Redmond, Oregon

Figure **17**

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Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

Bicycle Level of Traffic Stress

ODOT uses a "Bicycle Level of Traffic Stress" to help communities prioritize future investments in bike facilities for users of all ages and abilities. This analytical approach is based on the premise that as much as 60 percent of the population is "interested, but concerned" about cycling as a mode of transportation. The City's Neighborhood Revitalization Project used this methodology to identify the following deficiencies:

- Neighborhood communities provide a low-stress environment for bicycles, but are generally isolated by high-stress collector and arterial roadways
- Nearly all higher order roadways that provide continuous north-south and east-west connectivity scored as LTS 3 (medium stress) or LTS 4 (high stress)
- Where on-street bike lanes are provided, high posted speeds often reduce the benefit of the dedicated bike facility
- The eastern portion of the city has large areas connected by low stress bicycle environments
- The western portion of the city has frequent instances of high stress roadways acting as barriers between destinations and residential areas
- The Dry Canyon Trail provides a low stress north-south facility through the city, but has limited east-west crossings, causing significant out of direction travel for east-west travelers

These findings will help to identify potential key areas of bicycle priority projects as part of the TSP update.

Public Transit System

According to the *2013 Central Oregon Regional Transit Master Plan*, approximately 57% of Redmond's population consists of demographic groups related to age, disabilities and income that typically rely on public transportation in other communities. Within the City of Redmond, less than one percent of the population (0.4%) utilizes public transportation. Today, the city is served by "dial-a-ride" demand response service and community connector shuttles but does not have fixed route transit. The local dial-a-ride and community connector shuttles are operated through Cascades East Transit (CET) with funding from several state and federal sources. The community connector service provides weekday service between Redmond and other Central Oregon cities. Redmond residents also have access to the Central Oregon Breeze, which provides a transit route from Central Oregon to the Portland area.

In 2013, 41% of riders using the local bus were traveling to work. The remaining riders were traveling for reasons related to medical needs, school, shopping, and "other" trips, which primarily consist of connections to community connector shuttles. These shuttles include:

- Prineville – Redmond: six round trips per day;
- Madras – Redmond: five round trips per day;

- Sisters – Redmond: three round trips per day;
- Redmond – Bend: eight round trips per day.

Of the four, the Redmond-Bend shuttle serves the highest ridership.

BRIDGE CONDITIONS

The City's UGB contains 11 bridges owned and maintained by various agencies[1]. These locations are identified in Figure 18. A more detailed listing of the bridge identification numbers and owners/maintainers is provided in Appendix L.

A bridge sufficiency rating is calculated by the Federal Highway Administration (FHWA) based on factors such as condition, materials, load capacity, and geometry (i.e., dimensions). FHWA uses the rating as a tool to prioritize the allocation of funds for bridge repairs. In general, bridges with a sufficiency rating of less than 50 (on a scale of 0 to 100) are given priority. In reviewing the ratings, it is important to note that a low rating may be an indication of an older bridge that is narrow and not designed to the same width or height clearance of today's standards; a low sufficiency rating does not necessarily indicate a structural issue.

According to the 2016 ODOT Bridge Condition Report, there are no bridges in the Redmond UGB with sufficiency ratings below 50 or classified as "structurally deficient."

RAIL SYSTEM

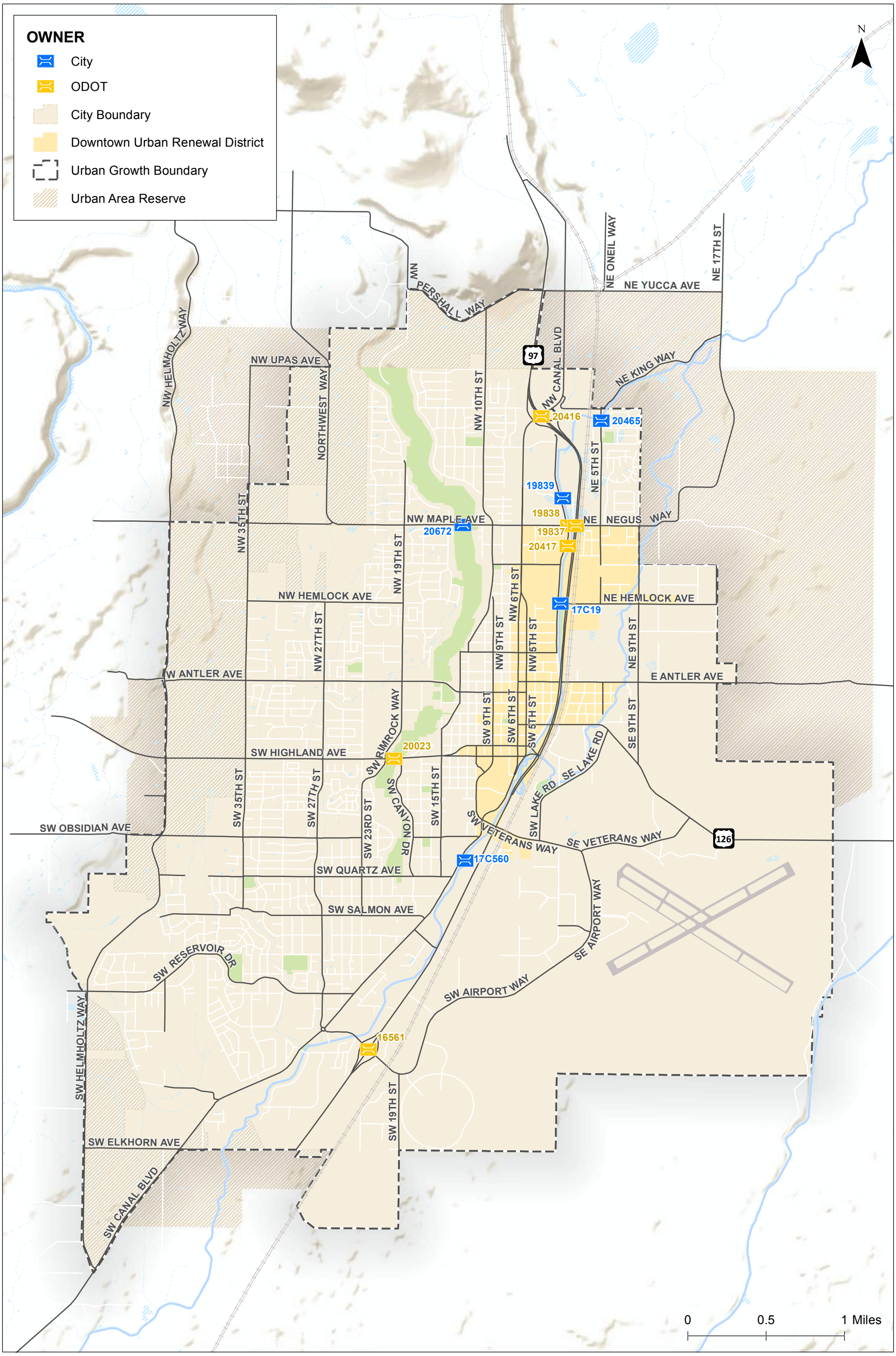
The BNSF Railway and Union Pacific Railroad are significant drivers of economic opportunity for Redmond. The two companies share use of track through Redmond although in recent years UP has relied upon BNSF to serve customers on UP's behalf. Nevertheless, the ability of Redmond freight shippers and receivers to use either carrier is a competitive privilege infrequently found elsewhere. The rail line interfaces with the Redmond community between US 97 and the industrial area near the airport, which is near OR 126 and southeast of the Redmond city core. The freight-only line, directly east of US 97 and running parallel to the highway through Redmond, is a segment of an interstate route between the Pacific Northwest and California. As such, freight trains running over the line carry a wide variety of commodities.

Just northeast of Redmond the City of Prineville Railway maintains a connection with BNSF and UP at Prineville Jct. Municipally-owned since construction in 1918, this 18-mile short line links Prineville to the national rail system. In 2014 the short line completed a 13-acre bulk transfer facility at Prineville Jct., featuring 5,000 feet of track equipped with facilities for unloading both liquid and dry bulk commodities. A boiler was recently added for heating tank cars with steam or hot water to improve the

[1] Source: ODOT Transgis, *https://gis.odot.state.or.us/transgis/*

viscosity of certain liquids for transfer from rail to truck. The facility is paved and recently an office was established there with a full-time staff person. Commodities off-loaded have included hazardous chemicals, seasonal golf course sand, dried distillers grains and magnesium chloride used by the Department of Transportation as a road deicer.

Today, there are seven at-grade crossings of the railroad within the city. Figure 19 shows the existing railroad facilities in the Redmond UGB.



Bridge Inventory
Redmond, Oregon

Figure
18

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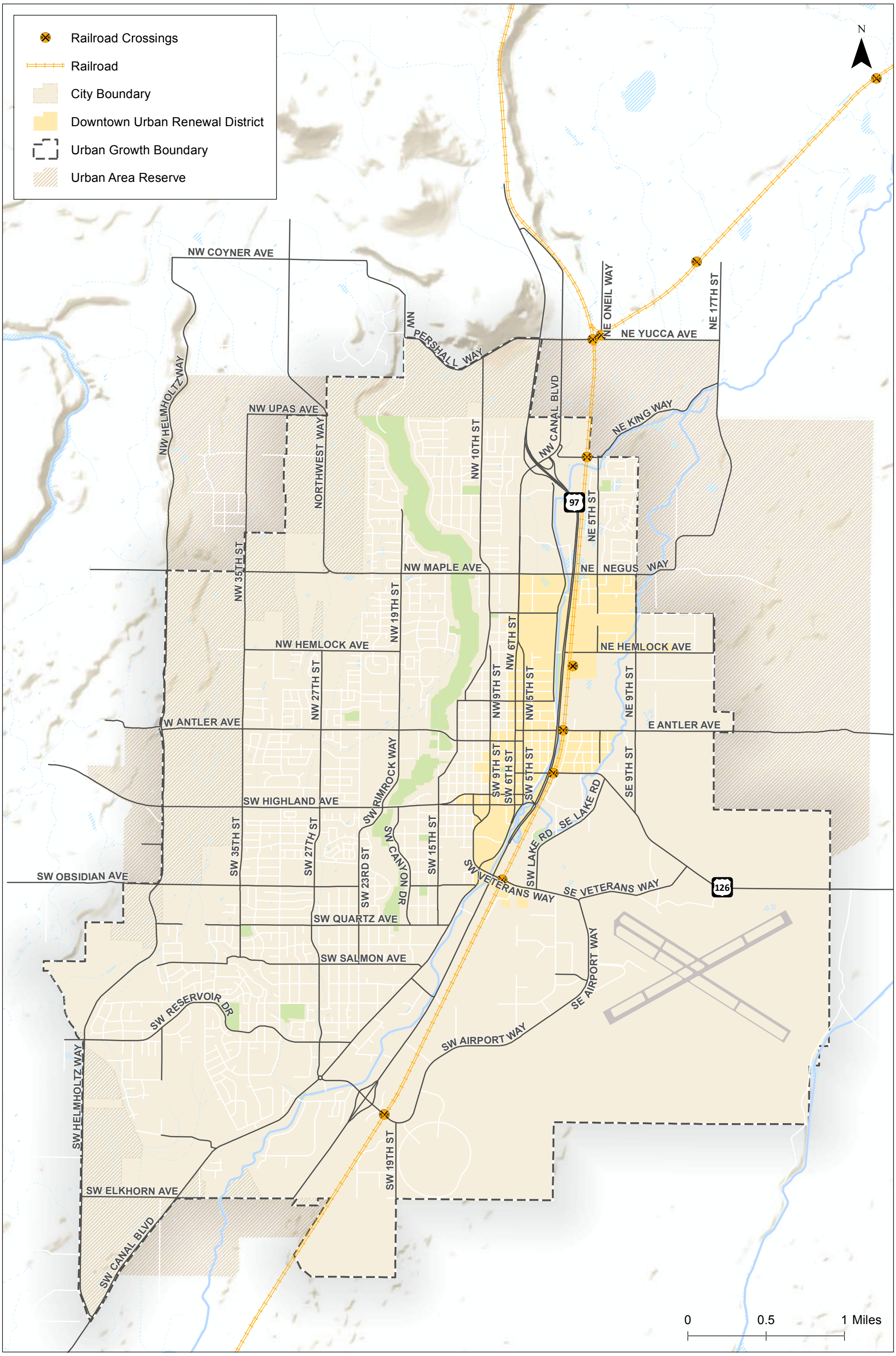
Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl



Railroad Facilities
Redmond, Oregon

Figure
19

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

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AIR TRANSPORTATION SYSTEM

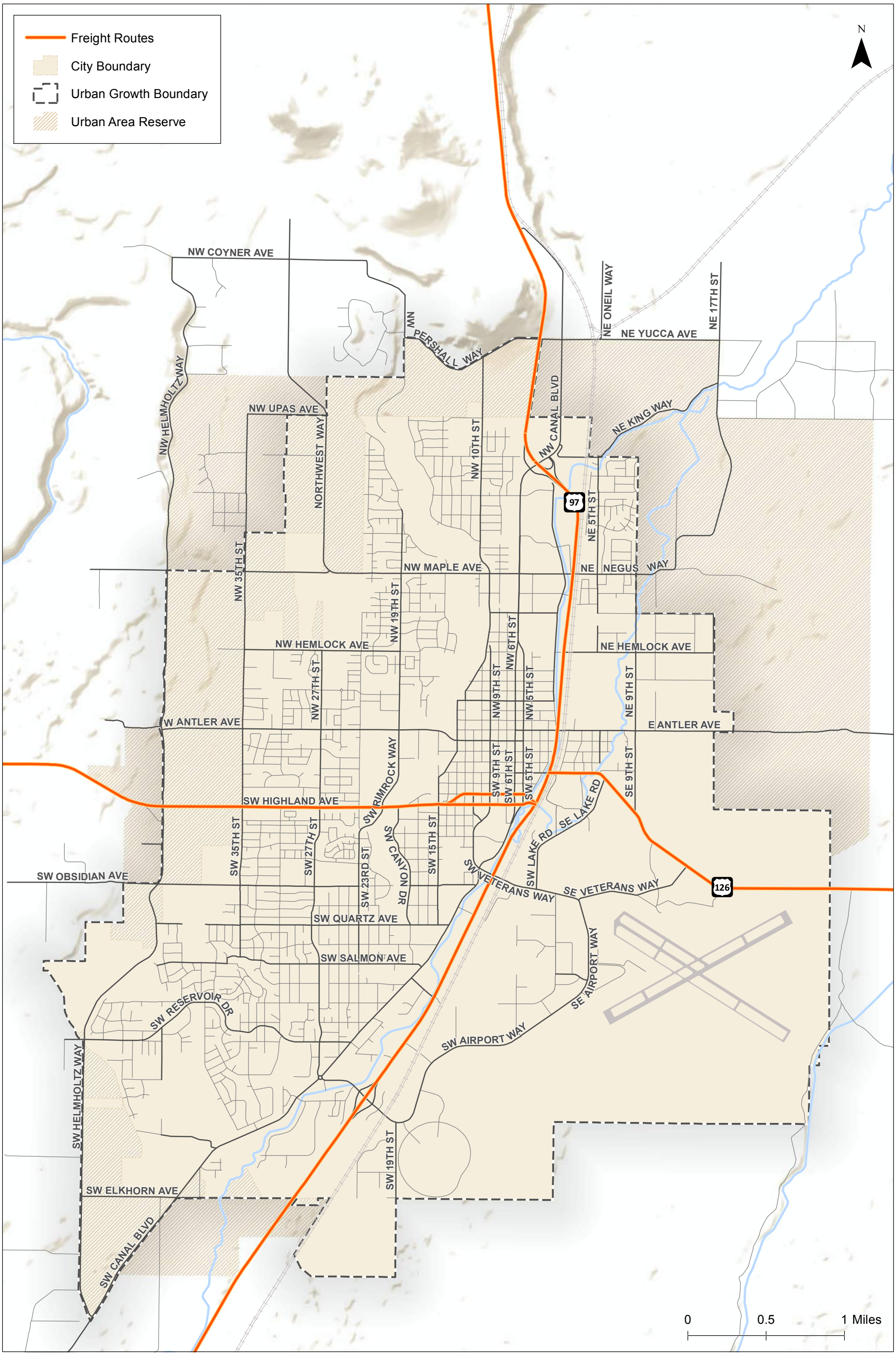
The City of Redmond owns and operates Redmond Municipal Airport/Roberts Field for the tri-county area. It is located two miles southeast of downtown Redmond and provides passenger and commercial service, air cargo and general aviation. The airport has two asphalt paved runways – 7,040 by 150 feet and 7,006 by 100 feet. The facility is designated as Category I (Commercial Service Airport) according to the *Oregon Aviation Plan* and the *Redmond Municipal Airport Master Plan.* The *Oregon Aviation Plan* defines Category I airports as airports that "support some level of scheduled commercial airline service in addition to a full range of general aviation aircraft." The flight destinations can be domestic and international.

Airport development is governed by its own Master Plan, which is currently being updated. This TSP will incorporate the findings of that update, including offsite transportation improvements necessary to support future growth at the airport.

FREIGHT GENERATORS

Redmond contains sections of two freight routes. Figure 20 depicts the freight routes in the city. Both highways, US 97 and OR 126, are part of the State Highway Freight System and are federally designated Truck Routes. US 97 is also designated as a strategic corridor in the *Oregon Freight Plan.*

Freight is a critical component of the Redmond and regional economy. Several significant employers within Redmond rely on freight access, particularly within the eastern area of the city. Also, large areas of land on the east side are zoned for industrial uses, which will likely increase the demand for freight access in the area of town in the future.



Freight Routes
Redmond, Oregon

Figure
20

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

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SUMMARY OF EXISTING CONDITIONS

The assessment of the existing transportation system conditions and the transportation network inventory identified the following:

- Approximately 57% of Redmond's population consists of demographic groups related to age, disabilities and income that typically rely on public transportation in other communities; however, less than one percent of the population (0.4%) utilizes public transportation.
- Three study intersections locations do not meet state mobility targets, including:
    - OR 126 (SW Highland Ave) at SW Helmholtz Way
    - OR 126 (SW Highland Ave) at SW 27th St
    - OR 126 (SW Highland Ave) at SW Rimrock Way
- OR 126 east of 35th Street in the westbound direction exceeds segment capacity during the PM peak hour.
- No operational deficiencies were identified on the local Redmond system.
- The South Redmond US 97 Corridor Plan is identifying safety and operation conditions on US 97 and Canal Boulevard between Veterans Way and the southern UGB. This TSP update will incorporate finding and recommendations from that study as they become available.
- Six fatal crashes occurred in the Redmond UGB from 2011-2015. Five of these crashes occurred on a major roadway facility and three fatal crashes involved a pedestrian.
- Thirteen intersections exceed the at least one of the ODOT crash performance standards nearly half of which are along the OR 126 corridor.
- The City's Neighborhood Revitalization Project identified deficiencies in the bicycle and pedestrian network that can be used to help inform upcoming TSP efforts.
    - Nearly all higher order roadways that provide continuous north-south and east-west connectivity scored as LTS 3 (medium stress) or LTS 4 (high stress).
    - Citywide sidewalk coverage is largely limited and incomplete.
- No bridges in the Redmond UGB were identified as having a low sufficiency rating or classified as "structurally deficient/distressed".
- Freight access, particularly on the east side of town, is a critical component of the Redmond economy.

Appendix A – Study Intersections

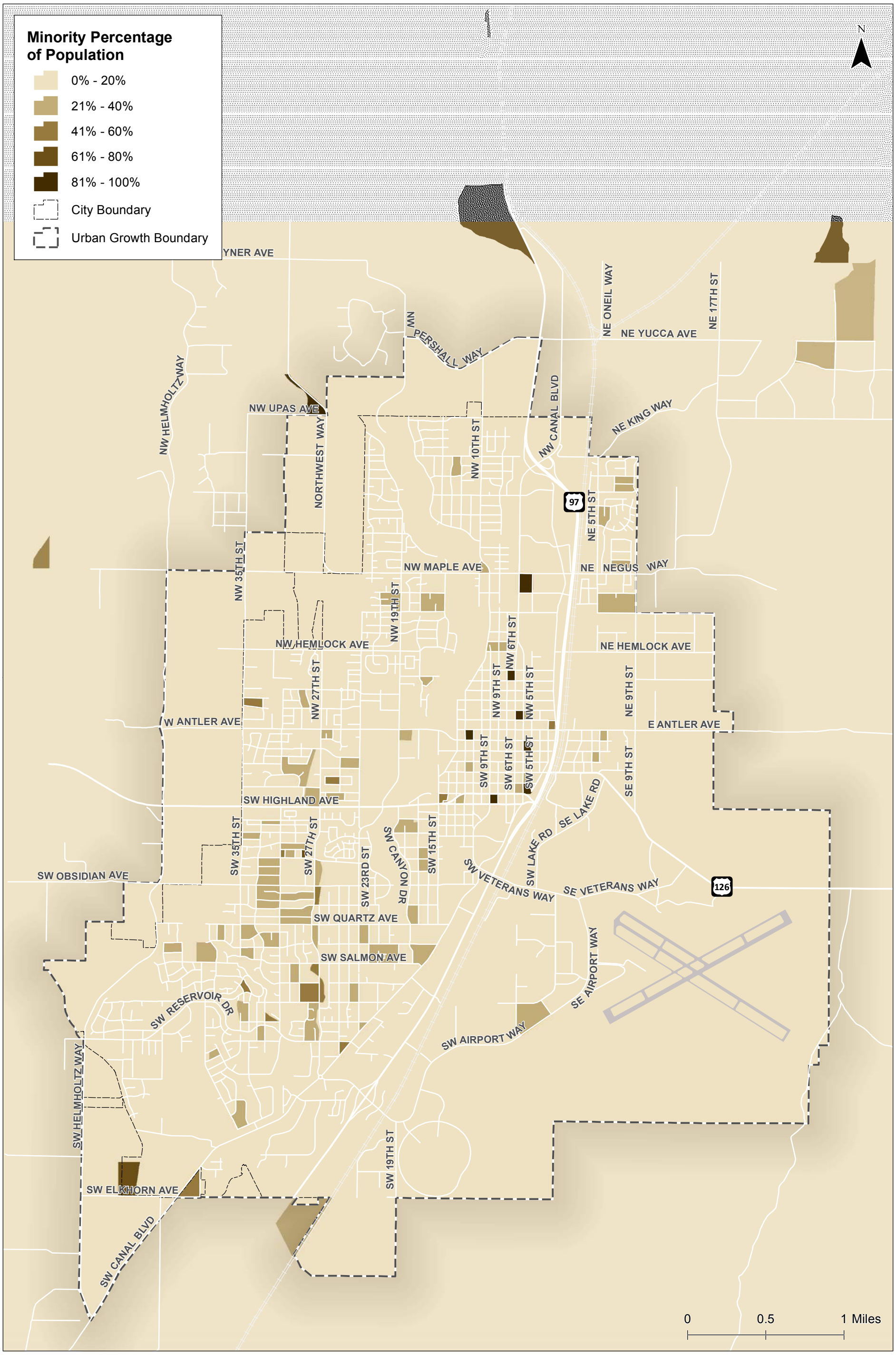
Midweek 4-hour (2-6PM) Intersection Counts

Study Intersection	East-West Road Name	North-South Road Name
1	NW Canal Blvd	US 97 NB Ramps
2	NW Canal Blvd	US 97 SB Ramps
3	NW Maple Ave	NW 19th St
4	NW Maple Ave	NW 6th St
5	NW Larch Ave	NW Canal Blvd
6	NE Hemlock Ave	NE 9th St
7	W Antler Ave	SW Helmholtz Way
8	W Antler Ave	SW 27th St
9	W Antler Ave	SW Rimrock Way
10	SW Black Butte Blvd	SW 6th St
11	SW Black Butte Blvd	SW 5th St
12	E Antler Ave	NE 9th St
13	SW Evergreen Ave	SW 6th St
14	SW Evergreen Ave	SW 5th St
15	SW Evergreen Ave	US 97
16	OR 126 (SW Glacier Ave)	SW 11th St
17	OR 126 (SW Glacier Ave)	SW 9th St
18	OR 126 (SW Glacier Ave)	SW 6th St
19	OR 126 (SW Glacier Ave)	SW 5th St
20	OR 126 (SW Glacier/Highland Ave)	US 97
21	OR 126 (SW Highland Ave)	SW Helmholtz Way
22	OR 126 (SW Highland Ave)	SW 27th St
23	OR 126 (SW Highland Ave)	SW Rimrock Way
24	OR 126 (SW Highland Ave)	SW 15th St
25	OR 126 (SW Highland Ave)	SW 11th St
26	OR 126 (SW Highland Ave)	SW 9th St
27	OR 126 (SW Highland Ave)	SW 6th St
28	OR 126 (SW Highland Ave)	SW 5th St
29	OR 126	SE 9th St (McCaffrey Rd)
30	SW Obsidian Ave	SW 27th St
31	SW Obsidian Ave	SW 23rd St
32	SW Veterans Way	SW Canal Blvd
33	SW Veterans Way	US 97
34	SW Veterans Way	SE Airport Way
35	OR 126	SW Veterans Way
36	SW Salmon Ave	SW 27th St
37	SW Odem Medo Way	SW Canal Blvd
38	SW Odem Medo Way	US 97
39	Harry Rd/SW Wickiup Ave	SW 51st St (SW Helmholtz Way)
40	SW Wickiup Ave/Forked Horn Rd	SW 27th St
41	SW 27th St	SW Canal Blvd
42	SW Yew Ave	US 97 SB Ramps
43	SE Airport Way	US 97 NB Ramps
44	SE Airport Way	SW 19th St
45	SW Helmholtz Way	S Canal Blvd

48-Hour Tube Segment Counts

Study Segment	Segment Mainline and Cross Street
1	US 97 near Yew Avenue
2	US 97 near Highland/Glacier
3	US 97 near Canal Boulevard
4	OR 126 near SW 35th Street
5	OR 126 near Veterans Way
6	Canal Boulevard near Badger Avenue

Appendix B –
Demographic Figures



Minority Population
Redmond, Oregon

Figure
B1

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl
Data Source: US Census Table DEC_10_PL_P1

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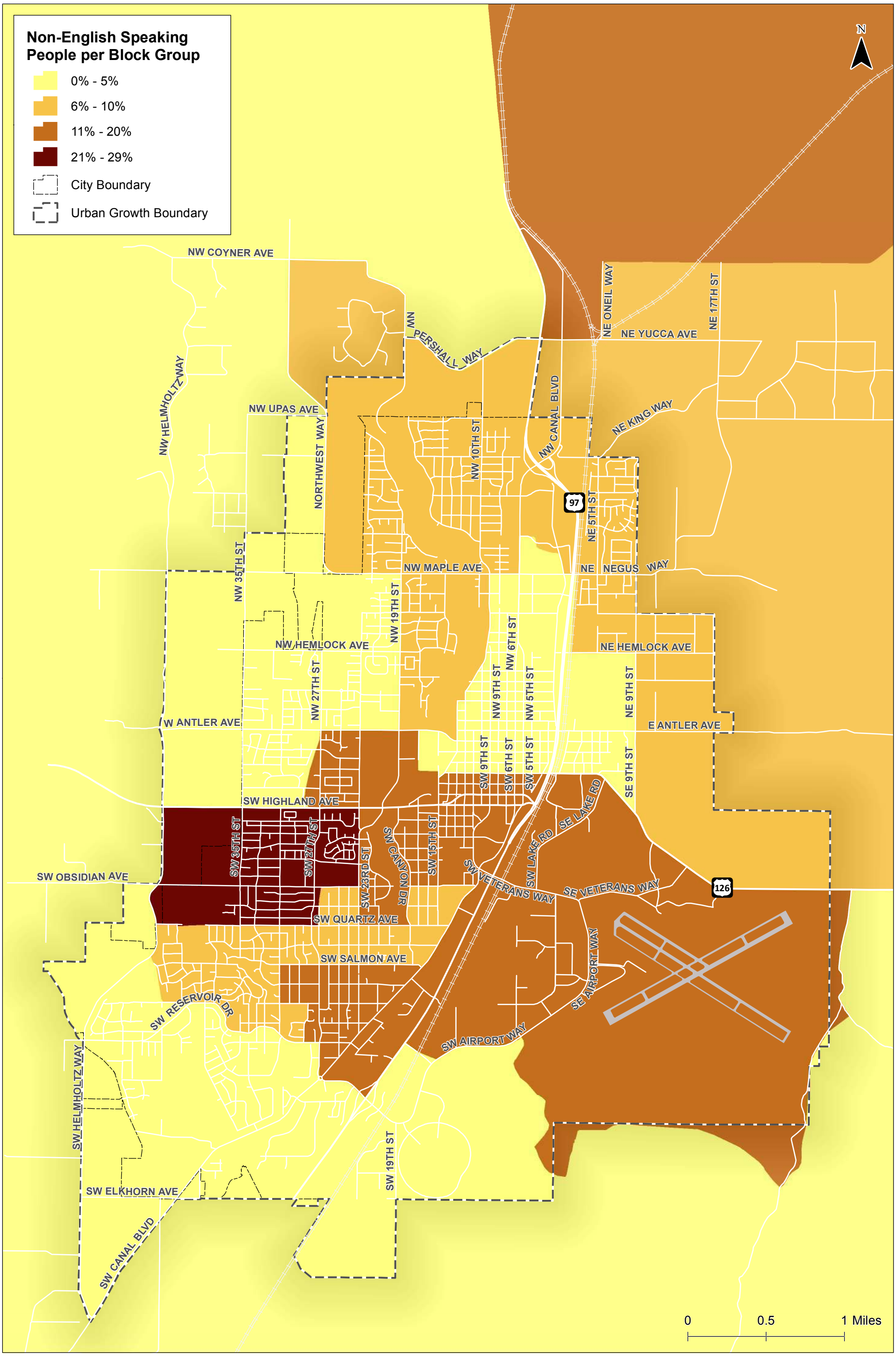

Non-English Speaking Population
Redmond, Oregon

Figure
B2

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl
Data Source: US Census Table ACS_15_5YR_B99163

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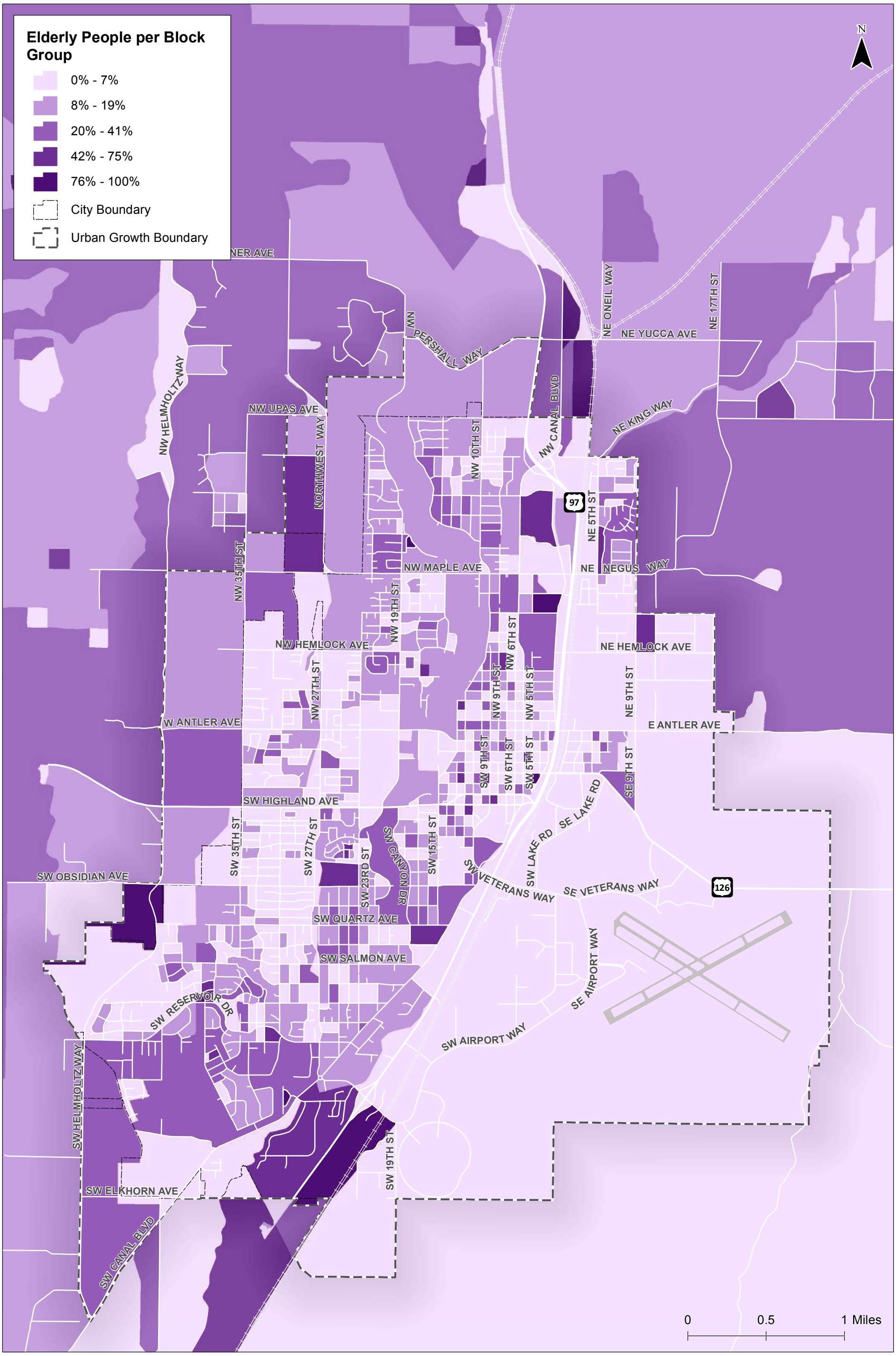

Elderly Population
Redmond, Oregon

Figure
B3

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl
Data Source: US Census Table DEC_10_SF1_P12

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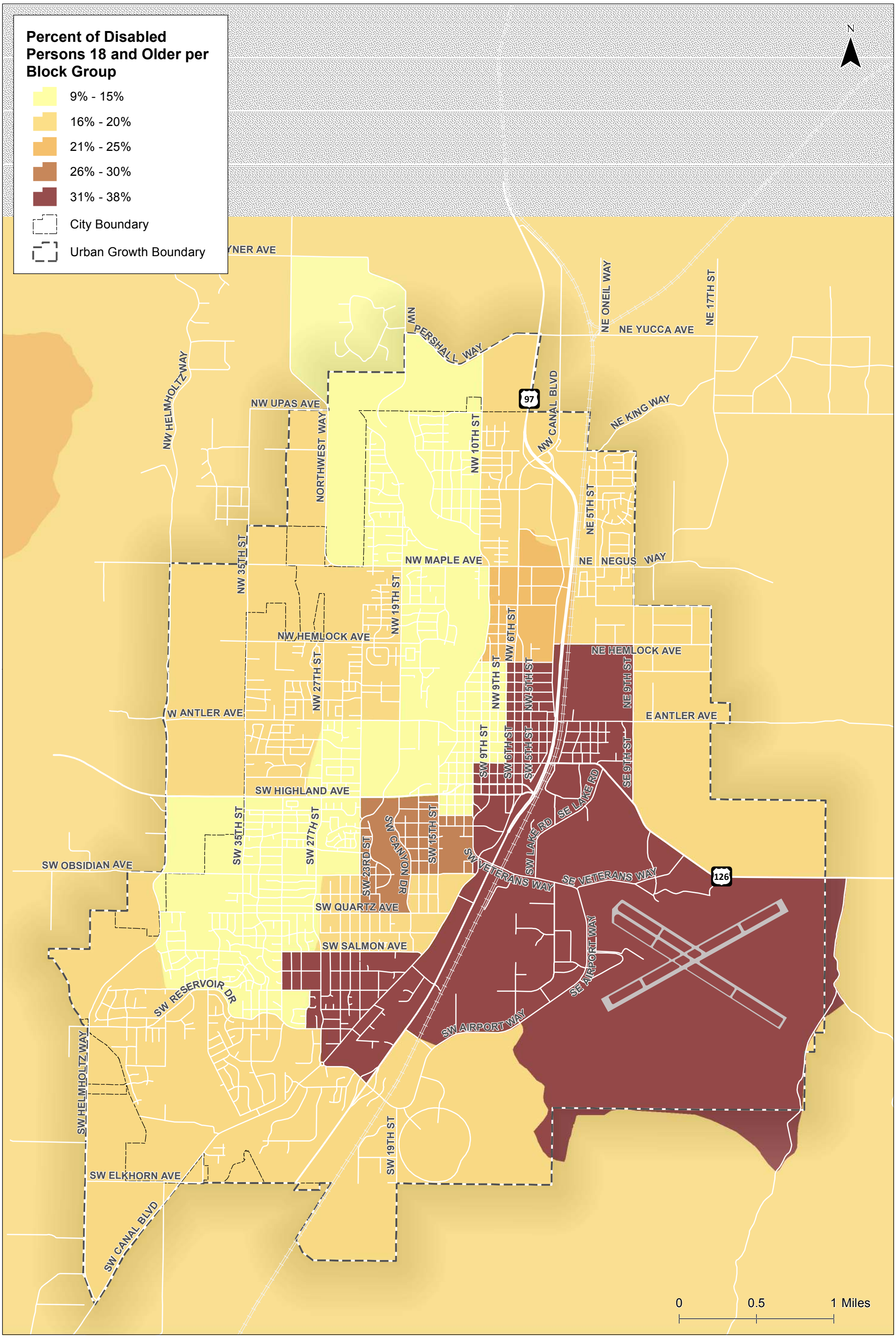

Disabled Population
Redmond, Oregon

Figure
B4

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl
Data Source: US Census Table ACS_15_5YR_C21007

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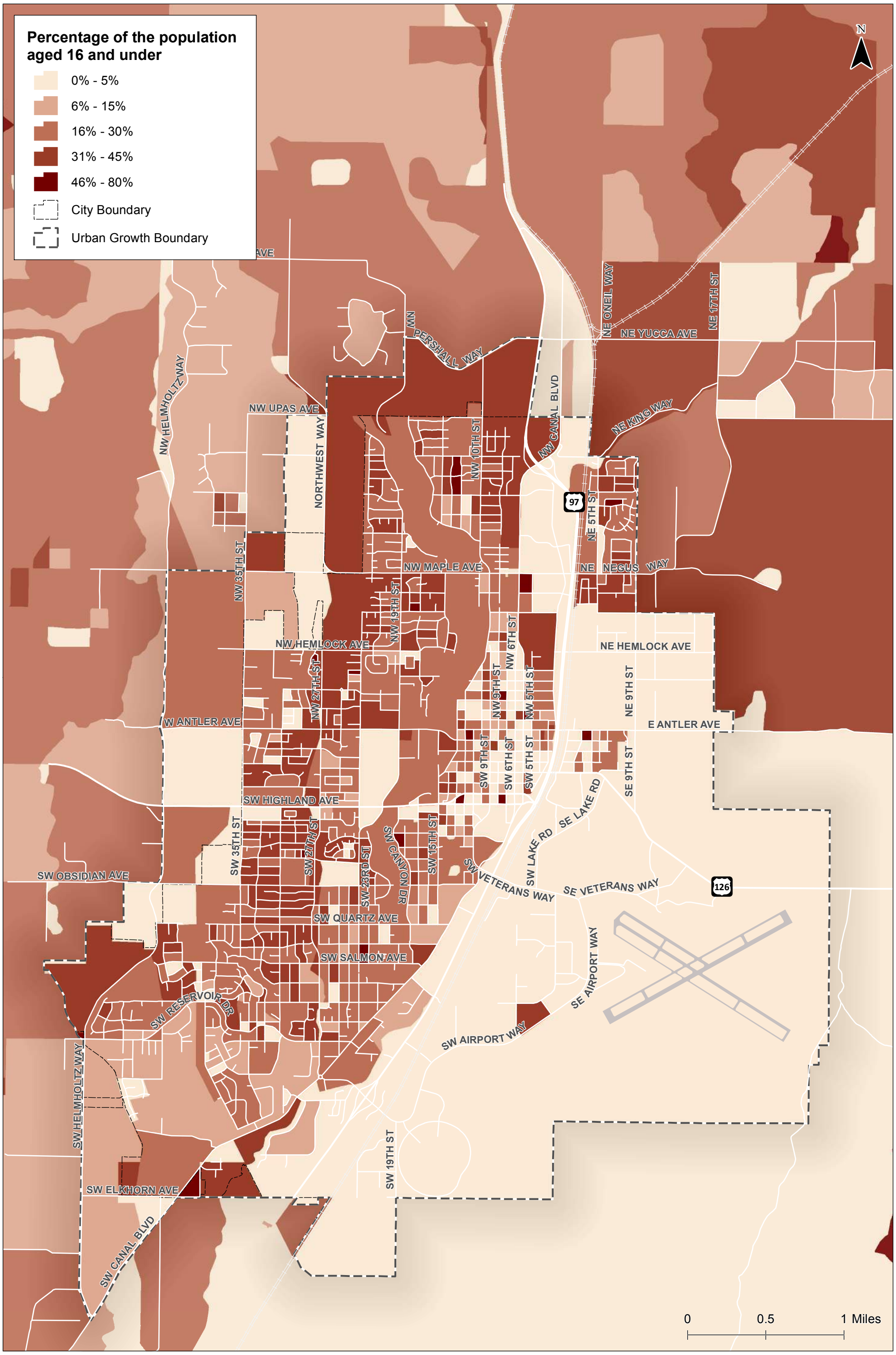

Youth Population
Redmond, Oregon

Figure
B5

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl
Data Source: US Census Table DEC_10_SF1_P12 & DEC_10_SF1_P14

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Percent of the population that earned between 0 and 1.99 times the federal poverty level in 1999

- 12% - 20%
- 21% - 30%
- 31% - 40%
- 41% - 50%
- 51% - 60%
- City Boundary
- Urban Growth Boundary

N

NER AVE
NW PERSHALL WAY
NE ONEIL WAY
NE 17TH ST
NE YUCCA AVE
NW HELMHOLTZ WAY
NW UPAS AVE
NORTHWEST WAY
NW 10TH ST
NW CANAL BLVD
NE KING WAY
97
NE 5TH ST
NW 35TH ST
NW MAPLE AVE
NE NEGUS WAY
NW 19TH ST
NW HEMLOCK AVE
NW 27TH ST
NW 9TH ST
NW 6TH ST
NW 5TH ST
NE HEMLOCK AVE
NE 9TH ST
W ANTLER AVE
E ANTLER AVE
SW 9TH ST
SW 6TH ST
SW 5TH ST
SE 9TH ST
SW HIGHLAND AVE
SE LAKE RD
SW 35TH ST
SW 27TH ST
SW 23RD ST
SW CANYON DR
SW 15TH ST
SW LAKE RD
SW OBSIDIAN AVE
SW VETERANS WAY
SE VETERANS WAY
126
SW QUARTZ AVE
SW SALMON AVE
SE AIRPORT WAY
SW RESERVOIR DR
SW AIRPORT WAY
SW HELMHOLTZ WAY
SW 19TH ST
SW ELKHORN AVE
SW CANAL BLVD

0 0.5 1 Miles

Low-Income Population
Redmond, Oregon

Figure **B6**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl
Data Source: US Census Table DEC_00_SF3_P088

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Appendix C – Methodology Memo

KITTELSON & ASSOCIATES
354 SW UPPER TERRACE DRIVE, SUITE 101
BEND, OR 97702
P 541.312.8300

FINAL Technical Memorandum #2

Date:	September 7, 2017	Project #:17720
To:	Redmond TSP PMT	
From:	Julia Kuhn, PE, Matt Kittelson, PE and Jacqueline Gulczynski	
Project:	Redmond Transportation System Plan Update	
Subject:	Analysis Methodology and Assumptions Methodology	

This memorandum documents the methodology and key assumptions that we propose to use as part of the existing and future conditions analyses for the Redmond Transportation System Plan (TSP) Update. The methodologies included in this memorandum are based on guidance provided in the Oregon Department of Transportation (ODOT) *Transportation System Plan Guidelines (2008)* and the *Analysis Procedures Manual* (APM), Versions 1 and 2 as they relate to the City of Redmond. This memorandum serves as the Consultant Task 2.3 Deliverable per the approved ODOT scope (PA #27456; WOC#66) for the TSP Update.

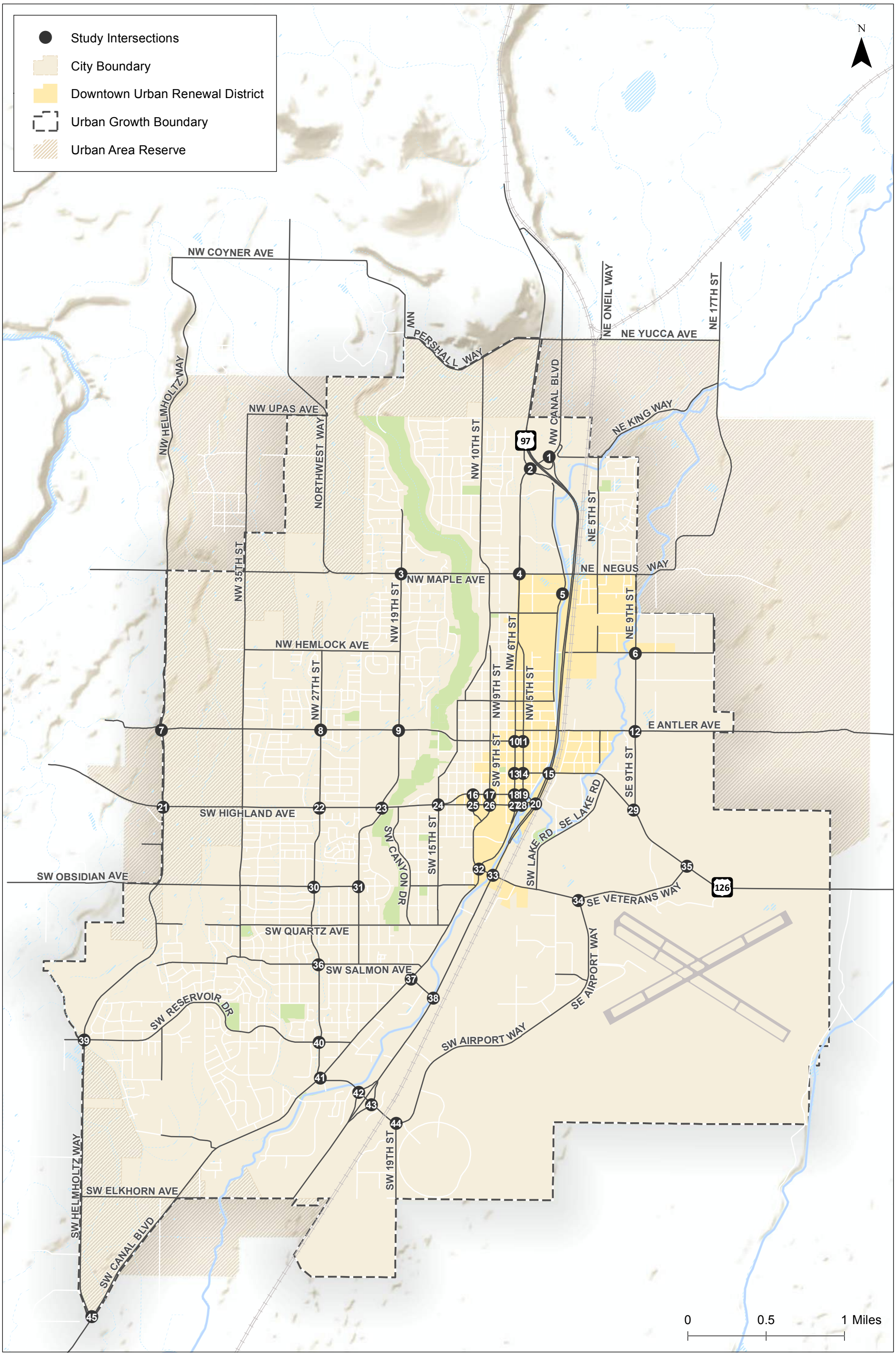
STUDY INTERSECTIONS

Figure 1 identifies the locations where four-hour traffic counts (2:00-6:00 PM) were collected in April 2017 to help guide the TSP update. The counts were collected Tuesday, April 18th and Wednesday, April 19th and include vehicle turning movements, pedestrian volumes, bicycle volumes, truck volumes and passenger car volumes.

In addition to the turning movement counts, 48-hour tube counts were collected at the following locations in June 2017 while school was still in-session:

- US 97 south of Yew Avenue
- US 97 south of Highland Avenue
- US 97 north of Canal Boulevard
- OR 126 east of 35th Street
- OR 126 west of Veterans Way
- Canal Boulevard north of Badger Avenue

The data collected includes vehicle speed, classification, and total volume. Figure 1 illustrates the location of the identified study intersections. Both the turning movement counts and the tube counts were collected consistent with Task 3.1.B.1 of the ODOT scope. A list of the study intersections is provided in Appendix A.



Study Intersections
Redmond, Oregon

Figure
1

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KITTELSON & ASSOCIATES

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

INTERSECTION OPERATIONAL STANDARDS

Per Task 3.1.B.2, we will present the following information for each study intersection, regardless of jurisdictional control:

- Volume-to-capacity (v/c) ratio;
- Level-of-service (LOS);
- Delay;
- 95th Percentile queuing (not-simulation based); and
- Turning movement counts.

This information will be provided in tables, figures, and/or technical appendices, but where possible will be provided in figures to give the general public a more clear and relatable understanding of the analysis results.

ODOT Mobility Targets

ODOT assess intersections operations based on established mobility targets (as defined by the volume-to-capacity (v/c) ratio). Table 6 of the *Oregon Highway Plan* (OHP) provides the mobility targets for facilities outside the Portland Metro area. The OHP targets will be used to evaluate existing and future no-build conditions. (Note that Highway Design Manual standards will be used to evaluate potential solutions in TM #7, Identification of Alternatives, unless alternative standards are established.) There are two state facilities within the City of Redmond: US 97 (The Dalles-California Highway) and OR 126 (Ochoco Highway). Both facilities are designated by the OHP as Statewide Freight Routes. US 97 is further classified as an expressway north of Veteran's Way and south of Yew Avenue. US 26 is designated as an expressway west of Helmholtz and east of the city limits.

Table 1 includes the mobility targets for expressways and statewide freight routes based on the posted speed. Both US 97 and OR 126 bisect the city center, where the posted speed is below 45 miles per hour (mph). Action 1F.1 of the OHP states that:

> *For unsignalized intersections, achieving the volume to capacity ratios in Tables 6 and 7 for the state highway approaches indicates that state mobility targets are being met. In order to maintain safe operation of the intersection,* ***non-state highway approaches*** *are expected to meet or not to exceed the volume to capacity ratios for District/Local Interest Roads in Table 6.(Emphasis added)*

These ratios are identified under the "Unsignalized" column in Table 1. The OHP acknowledges the unique characteristics of an interchange opposed to an intersection directly on the state facility. The OHP states that the maximum v/c ratio for the interchange ramp termini should be designated as 0.85 unless the intersection v/c ratio target is less than 0.85. In which case, the intersection v/c ratio should be applied to the interchange.

Table 1. Volume to Capacity Ratio for State Freight Routes (US 97 and OR 126)

	Speed (Miles Per Hour)	Signalized	Unsignalized
Freight Route on a Statewide Highway	<=35mph	0.85	0.95
	40mph	0.80	0.90
	>=45mph	0.80	0.90
Statewide Expressway	>=45mph	0.85	0.80

The City of Redmond has adopted a performance standard based on Level of Service. The City requires an intersection to operate at a Level of Service E or better during the peak 15 minute period of the peak hour. For unsignalized intersections with a low minor street volume, the City may presume the intersection to operate acceptably with a v/c ratio less than 0.90 and a 95th percentile queue of less than 4 vehicles during the peak hour.

Table 2 shows the intersection control and mobility targets for the study intersections.

Table 2. Study Intersection Control and Mobility Target

Study Int. #	Intersection	Classification/ Jurisdiction	Intersection Control	Mobility Target
1	NW Canal Blvd/ US 97 NB Ramps	ODOT	Signalized	v/c<0.85
2	NW Canal Blvd/ US 97 SB Ramps	ODOT	Signalized	v/c<0.85
3	NW Maple Ave/ NW 19th St	City	Unsignalized	LOS E, v/c<0.90
4	NW Maple Ave/ NW 6th St	City	Signalized	LOS E
5	NW Larch Ave/ NW Canal Blvd	City	Unsignalized	LOS E, v/c<0.90
6	NE Hemlock Ave/ NE 9th St	City	Unsignalized	LOS E, v/c<0.90
7	W Antler Ave/ SW Helmholtz Way	City	Unsignalized	LOS E, v/c<0.90
8	W Antler Ave/ SW 27th St	City	Signalized	LOS E
9	W Antler Ave/ SW Rimrock Way	City	Signalized	LOS E
10	SW Black Butte Blvd/ SW 6th St	City	Unsignalized	LOS E, v/c<0.90
11	SW Black Butte Blvd/ SW 5th St	City	Unsignalized	LOS E, v/c<0.90
12	E Antler Ave/ NE 9th St	City	Unsignalized	LOS E, v/c<0.90
13	SW Evergreen Ave/ SW 6th St	City	Signalized	LOS E
14	SW Evergreen Ave/ SW 5th St	City	Signalized	LOS E
15	SW Evergreen Ave/ US 97	ODOT	Signalized	Alternative Mobility Standard
16	OR 126 (SW Glacier Ave)/ SW 11th St	ODOT	Signalized	v/c<0.85
17	OR 126 (SW Glacier Ave)/ SW 9th St	ODOT	Signalized	v/c<0.85
18	OR 126 (SW Glacier Ave)/ SW 6th St	ODOT	Signalized	v/c<0.85
19	OR 126 (SW Glacier Ave)/ SW 5th St	ODOT	Signalized	v/c<0.85
20	OR 126 (SW Glacier/Highland Ave)/ US 97	ODOT	Signalized	v/c<0.85
21	OR 126 (SW Highland Ave) / SW Helmholtz Way	ODOT	Unsignalized	v/c<0.80/0.90
22	OR 126 (SW Highland Ave)/ SW 27th St	ODOT	Signalized	v/c<0.80

Study Int. #	Intersection	Classification/ Jurisdiction	Intersection Control	Mobility Target
23	OR 126 (SW Highland Ave)/ SW Rimrock Way	ODOT	Signalized	v/c<0.80
24	OR 126 (SW Highland Ave)/ SW 15th St	ODOT	Signalized	v/c<0.85
25	OR 126 (SW Highland Ave)/ SW 11th St	ODOT	Signalized	v/c<0.85
26	OR 126 (SW Highland Ave)/ SW 9th St	ODOT	Signalized	v/c<0.85
27	OR 126 (SW Highland Ave)/ SW 6th St	ODOT	Signalized	v/c<0.85
28	OR 126 (SW Highland Ave)/ SW 5th St	ODOT	Signalized	v/c<0.85
29	OR 126/ SE 9th St (McCaffrey Rd)	ODOT	Unsignalized	v/c<0.80
30	SW Obsidian Ave/ SW 27th St	City	Unsignalized	LOS E, v/c<0.90
31	SW Obsidian Ave/ SW 23rd St	City	Unsignalized	LOS E, v/c<0.90
32	SW Veterans Way/ SW Canal Blvd	City	Signalized	LOS E
33	SW Veterans Way/ US 97	ODOT	Signalized	v/c<0.80
34	SW Veterans Way/ SE Airport Way	City	Unsignalized	LOS E, v/c<0.90
35	SW Veterans Way/ OR 126	ODOT	Unsignalized	Alternative Mobility Standard
36	SW Salmon Ave/ SW 27th St	City	Unsignalized	LOS E, v/c<0.90
37	SW Odem Medo Way/ SW Canal Blvd	City	Signalized	LOS E
38	SW Odem Medo Way/ US 97	ODOT	Signalized	v/c<0.80
39	SW Wickiup Ave/ SW 51st St (SW Helmholtz Way)	City	Unsignalized	LOS E, v/c<0.90
40	SW Wickiup Ave(Forked Horn Rd)/ SW 27th St	City	Unsignalized	LOS E, v/c<0.90
41	SW Canal Blvd/ SW 27th St	City	Unsignalized	LOS E, v/c<0.90
42	SW Yew Ave/ US 97 SB Ramps	ODOT	Signalized	v/c<0.80
43	SE Airport Way/ US 97 NB Ramps	ODOT	Signalized	v/c<0.80
44	SE Airport Way/ SW 19th St	City	Unsignalized	LOS E, v/c<0.90
45	S Canal Blvd / SW Helmholtz Way	City	Unsignalized	LOS E, v/c<0.90

SEASONAL ADJUSTMENT FACTOR

Per Task 3.1.B.1, we will adjust all traffic counts along the state routes to reflect 30th highest hour conditions. Version 2 of the APM identifies three methods for identifying seasonal adjustment factors for highway traffic volumes, of which the on-site Automatic Traffic Recorders (ATR) have been identified by ODOT as the most accurate method of use There are five on-site ATR stations located within or near the Redmond city limits, as shown in Figure 2.

- ATR 09-020: Located on US 97, The Dalles-California Highway, Mile Post (MP) 124.40
- ATR 09-021: Located on OR 126, McKenzie Highway, MP 108.27
- ATR 09-022: Located on US 97, The Dalles-California Highway, MP 120.94
- ATR 09-023: Located on US 97, The Dalles-California Highway, MP 119.09
- ATR 07-002: Located on OR 126, McKenzie Highway, MP 3.23

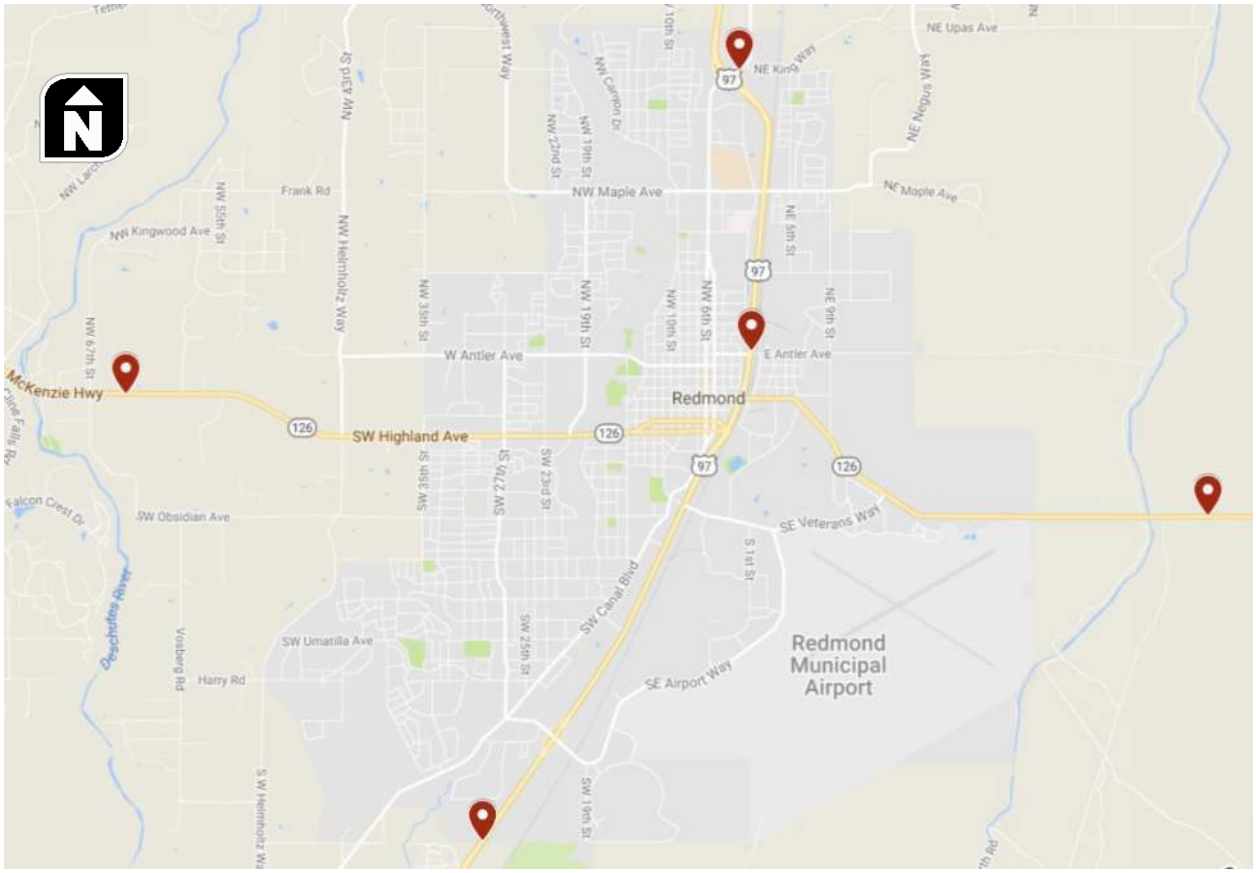


Figure 2. ATR Locations in and near City of Redmond

On-Site ATR Method

As stated within section 5.4.1 of the APM,

"The On-Site ATR Method is used when an ATR is within or near the project area. If located outside of the project area, there should be no major intersections between the ATR and the project area, and it should be within a minimal distance so that the traffic characteristics are comparable".

Per the on-site ATR method, we calculated the applicable seasonal adjustment factors. These calculations are provided in Appendix B and summarized in Table 3.

Table 3: On-Site ATR Method Seasonal Adjustment Method

ATR Station	ATR Location	Seasonal Adjustment Factor	Applied Area
ATR 07-002	OR 126 0.35 miles west of Deschutes/Crook County line	1.10	OR 126 east of US 97
ATR 09-020	US 97 0.79 miles south of Yew Avenue	1.10	US 97 south of Highland Avenue
ATR 09-021	OR 126 1.38 miles west of SW Helmholtz Way	1.29	OR 126 west of US 97
ATR 09-022	US 97 0.04 miles north of Antler Avenue	1.13	Between Antler Avenue and Highland Avenue
ATR 09-023	US 97 0.57 miles south of O'Neil Highway	1.16	US 97 north of Antler Avenue

A significant number of study intersections in Redmond are located on state facilities. With five On-site ATR locations, seasonal adjustment factors were assigned based on proximity and roadway characteristics.

Table 4 summarizes ODOT intersections to be analyzed as part of the TSP and corresponding seasonal adjustment factors. As shown in Table 4, US 97 was used as the bisector on OR 126 to separate the seasonal adjustment factors on OR 126. Intersections on OR 126 west of US 97 apply the adjustment factor associated with ATR 09-021, and intersections east US 97 apply the seasonal adjustment factor associated with ATR 07-002. The seasonal adjustment factors at intersection along the US 97 corridor were applied based on location, average ADT, and roadway characteristics. No seasonal adjustment factors are proposed for intersections on the City of Redmond transportation system.

Table 4. Summary of Intersection Standards and Adjustment Factors

Study Int. #	Intersection	Classification/ Jurisdiction	Seasonal Adjustment Factor
1	NW Canal Blvd/ US 97 NB Ramps	ODOT	1.16
2	NW Canal Blvd/ US 97 SB Ramps	ODOT	1.16
15	SW Evergreen Ave/ US 97	ODOT	1.13
16	OR 126 (SW Glacier Ave)/ SW 11th St	ODOT	1.29
17	OR 126 (SW Glacier Ave)/ SW 9th St	ODOT	1.29
18	OR 126 (SW Glacier Ave)/ SW 6th St	ODOT	1.29
19	OR 126 (SW Glacier Ave)/ SW 5th St	ODOT	1.29
20	OR 126 (SW Glacier/Highland Ave)/ US 97	ODOT	1.29
21	OR 126 (SW Highland Ave) / SW Helmholtz Way	ODOT	1.29
22	OR 126 (SW Highland Ave)/ SW 27th St	ODOT	1.29
23	OR 126 (SW Highland Ave)/ SW Rimrock Way	ODOT	1.29
24	OR 126 (SW Highland Ave)/ SW 15th St	ODOT	1.29
25	OR 126 (SW Highland Ave)/ SW 11th St	ODOT	1.29
26	OR 126 (SW Highland Ave)/ SW 9th St	ODOT	1.29
27	OR 126 (SW Highland Ave)/ SW 6th St	ODOT	1.29
28	OR 126 (SW Highland Ave)/ SW 5th St	ODOT	1.29
29	OR 126/ SE 9th St (McCaffrey Rd)	ODOT	1.10
33	SW Veterans Way/ US 97	ODOT	1.10
35	SW Veterans Way/ OR 126	ODOT	1.10
38	SW Odem Medo Way/ US 97	ODOT	1.10
42	SW Yew Ave/ US 97 SB Ramps	ODOT	1.10
43	SE Airport Way/ US 97 NB Ramps	ODOT	1.10

ANALYSIS MODEL PARAMETERS

The bullets below identify the proposed sources of data and methodologies to be used to analyze traffic conditions in Redmond. Analyses of all state facilities will be conducted according to the most-recent version of the APM, unless otherwise agreed upon by both ODOT's Transportation Planning and Analysis Unit (TPAU) and the consultant team.

1. *Intersection/Roadway Geometry* (lane numbers and arrangements, cross-section elements, signal phasing, etc.) will be reviewed through aerial photography and confirmed through a field review. Available as-built data may also be used to verify existing roadway geometry. The analysis models will be built on scaled roadway line work from GIS or aerial photography in Synchro analysis software.

2. *Operational Data* (such as posted speeds, intersection control, parking, right-turn on red, etc.) will be field verified. Data will be reviewed during a field visit and supplemented by available GIS data, aerials, photos, and the ODOT Video Log.

3. *Peak Hour Factors* (PHF) will be calculated for each intersection and applied to the existing conditions analyses. Where applicable, corridor or regional PHFs may be developed. PHFs of 0.95 will be used for the future analysis for high-order facilities (arterials), with 0.90 applied to

medium-order facilities (collectors) and 0.85 applied to local roads. If the existing PHF is greater than these default future values, the existing PHF will be applied.

4. Traffic Operations
    a. Highway Capacity Manual (HCM) methodology shall be used for intersection analyses of the design hour conditions. Signalized intersection analysis will be based on HCM methods. The existing and future no-build analysis will utilize Synchro software for all study intersections. Level-of-service, delay, and volume-to-capacity ratios will be reported at each of the study intersections regardless of roadway jurisdiction.

    b. Queuing analysis methodology will be based on Synchro 95th percentile queue lengths as appropriate; ODOT's two-way stop-controlled intersection calculator tool will be used to estimate queue lengths for two-way stop-controlled intersections. Microsimulation is not proposed as part of the long-range planning effort.

SYNCHRO INPUT ASSUMPTIONS

Synchro software will be used for the intersection analyses. This analysis will be consistent with the HCM procedures. Table 5 lists the proposed input parameters.

Table 5. Synchro Operations Parameters/Assumptions

Arterial Intersection Parameters	Existing Conditions
Peak Hour Factor	From traffic counts
Conflicting Bikes and Pedestrian per Hour	From traffic counts, as available
Ideal Saturation Flow Rate (for all movements)	1,750 passenger cars per hour green per lane
Lane Width	12 feet unless field observations suggest otherwise
Percent Heavy Vehicles	From traffic counts by movement, as available
95th percentile vehicle queues	Synchro HCM summary output

CRASH ANALYSES

Per Task 3.1.B.4, we will review most recent five years of crash data, as provided by ODOT, at the study intersections and study segments (where tube count data was collected). Any intersections or roadway segments that are identified as a Top 5% and 10% Safety Priority Index System (SPIS) site will be included in the crash data.

Intersection crash rates at each location will be compared to the 90th percentile rates and critical crash rates, per the APM. Crash rates will also be compared to the ODOT Crash Tables II and IV severe injury and fatal crash rates. Any locations where the rates are exceeded, we will identify potential countermeasures using the ODOT All Roads Transportation Safety (ARTS) crash reduction factors.

FORECAST YEAR VOLUME DEVELOPMENT

To assist in the development of traffic volumes for the Future Scenario Conditions (per Task 4 of the scope), we will obtain 2040 Bend Redmond travel demand data from ODOT's Transportation Planning Analysis Unit (TPAU). The model output data will be post-processed using NCHRP Report 255 methodologies.

ACTIVE TRANSPORTATION ANALYSIS

Per Task 3.1.B.3, the scope of work, we will identify existing gaps in the sidewalks, bicycle network, and transit network along the city's collector and arterial roadways. The Bicycle Level of Traffic Stress (LTS) and pedestrian methodology will reference the Redmond Neighborhood Revitalization Plan as it has recently been completed as part of that project.

Quantitative and qualitative analysis of active transportation facilities be performed consistent with APM version 2 and include:

1. Qualitative (multimodal) assessment for transit modes;
2. A qualitative assessment of transit service and identification of underserved areas.
3. Gaps in intermodal connectivity.

NEXT STEPS

We look forward to your review of the assumptions and parameters to be used as part of the Redmond TSP Existing and Future conditions analyses.

Appendix A- Study Intersections

Study Intersection Locations

Study Intersection	East-West Road Name	North-South Road Name
1	NW Canal Blvd	US 97 NB Ramps
2	NW Canal Blvd	US 97 SB Ramps
3	NW Maple Ave	NW 19th St
4	NW Maple Ave	NW 6th St
5	NW Larch Ave	NW Canal Blvd
6	NE Hemlock Ave	NE 9th St
7	W Antler Ave	SW Helmholtz Way
8	W Antler Ave	SW 27th St
9	W Antler Ave	SW Rimrock Way
10	SW Black Butte Blvd	SW 6th St
11	SW Black Butte Blvd	SW 5th St
12	E Antler Ave	NE 9th St
13	SW Evergreen Ave	SW 6th St
14	SW Evergreen Ave	SW 5th St
15	SW Evergreen Ave	US 97
16	OR 126 (SW Glacier Ave)	SW 11th St
17	OR 126 (SW Glacier Ave)	SW 9th St
18	OR 126 (SW Glacier Ave)	SW 6th St
19	OR 126 (SW Glacier Ave)	SW 5th St
20	OR 126 (SW Glacier/Highland Ave)	US 97
21	OR 126 (SW Highland Ave)	SW Helmholtz Way
22	OR 126 (SW Highland Ave)	SW 27th St
23	OR 126 (SW Highland Ave)	SW Rimrock Way
24	OR 126 (SW Highland Ave)	SW 15th St
25	OR 126 (SW Highland Ave)	SW 11th St
26	OR 126 (SW Highland Ave)	SW 9th St
27	OR 126 (SW Highland Ave)	SW 6th St
28	OR 126 (SW Highland Ave)	SW 5th St
29	OR 126	SE 9th St (McCaffrey Rd)
30	SW Obsidian Ave	SW 27th St
31	SW Obsidian Ave	SW 23rd St
32	SW Veterans Way	SW Canal Blvd
33	SW Veterans Way	US 97
34	SW Veterans Way	SE Airport Way
35	SW Veterans Way	OR 126
36	SW Salmon Ave	SW 27th St
37	SW Odem Medo Way	SW Canal Blvd
38	SW Odem Medo Way	US 97
39	Harry Rd/SW Wickiup Ave	SW 51st St (SW Helmholtz Way)
40	SW Wickiup Ave/Forked Horn Rd	SW 27th St
41	SW Canal Blvd	SW 27th St
42	SW Yew Ave	US 97 SB Ramps
43	SE Airport Way	US 97 NB Ramps
44	SE Airport Way	SW 19th St
45	S Canal Blvd	SW Helmholtz Way

Appendix B – Seasonal Adjustment Factor Data

ODOT ATR 09-020, US97; MP 124.39; THE DALLES-CALIFORNIA HIGHWAY NO. 4; 0.79 mile south of Yew Avenue												
Year	**15-Jan**	**15-Feb**	**15-Mar**	**15-Apr**	**15-May**	**15-Jun**	**15-Jul**	**15-Aug**	**15-Sep**	**15-Oct**	**15-Nov**	**15-Dec**
2015	92	98	102	108	108	115	122	116	113	113	101	102
2014	97	96	104	105	107	117	120	119	112	112	101	97
2013	92	100	102	107	108	114	115	117	111	111	104	100
2012	92	99	99	107	110	116	112	119	112	110	104	97
2011	99	99	103	107	109	113	115	117	109	108	102	101
Average	93.7	98.7	102.3	107.0	108.3	115.0	116.7	117.7	111.7	111.0	102.3	99.3
Count Adj	**1.26**	**1.19**	**1.15**	**1.10**	**1.09**	**1.02**	**1.01**	**1.00**	**1.05**	**1.06**	**1.15**	**1.18**

ODOT ATR 09-021, OR126; MP 108.27; MCKENZIE HIGHWAY NO. 15; 1.38 miles west of S.W. Helmholtz Way (S.W. 43rd Street)												
Year	**15-Jan**	**15-Feb**	**15-Mar**	**15-Apr**	**15-May**	**15-Jun**	**15-Jul**	**15-Aug**	**15-Sep**	**15-Oct**	**15-Nov**	**15-Dec**
2015	79	83	92	97	105	118	122	116	109	103	86	86
2014	79	75	91	100	109	117	125	121	109	103	87	83
2013	81	78	84	95	104	114	123	119	113	100	92	88
2012	81	81	86	95	106	113	122	123	110	101	90	85
2011	82	81	87	95	104	114	124	122	110	103	88	86
Average	80.3	80.0	88.0	95.7	105.0	115.0	123.0	120.7	109.7	102.3	88.3	85.7
Count Adj	**1.53**	**1.54**	**1.40**	**1.29**	**1.17**	**1.07**	**1.00**	**1.02**	**1.12**	**1.20**	**1.39**	**1.44**

ODOT ATR 09-022, US97; MP 120.92; THE DALLES-CALIFORNIA HIGHWAY NO. 4; 0.04 mile north of S.W. Antler Avenue												
Year	**15-Jan**	**15-Feb**	**15-Mar**	**15-Apr**	**15-May**	**15-Jun**	**15-Jul**	**15-Aug**	**15-Sep**	**15-Oct**	**15-Nov**	**15-Dec**
2015	88	95	99	104	107	113	118	113	109	108	94	93
2014	90	88	100	106	110	114	118	116	110	108	94	90
2013	84	92	97	105	110	113	116	115	109	107	99	93
2012	87	92	94	102	107	112	115	116	108	106	100	93
2011	92	91	97	102	107	113	116	116	108	104	97	97
Average	88.3	91.7	97.7	103.7	108.0	113.0	116.7	115.7	108.7	107.0	96.7	93.0
Count Adj	**1.32**	**1.27**	**1.19**	**1.13**	**1.08**	**1.03**	**1.00**	**1.01**	**1.07**	**1.09**	**1.21**	**1.25**

ODOT ATR 09-023, US97; MP 119.09; THE DALLES-CALIFORNIA HIGHWAY NO. 4; 0.57 mile south of O'Neil Highway No. 370												
Year	**15-Jan**	**15-Feb**	**15-Mar**	**15-Apr**	**15-May**	**15-Jun**	**15-Jul**	**15-Aug**	**15-Sep**	**15-Oct**	**15-Nov**	**15-Dec**
2015	84	91	97	101	105	111	117	112	108	105	92	90
2014	85	84	97	103	108	113	117	115	109	105	91	87
2013	83	91	95	100	105	110	114	114	108	103	96	91
2012	84	90	92	99	105	111	115	116	109	103	96	89
2011	89	90	95	99	105	112	116	115	107	102	92	95
Average	84.3	90.3	95.7	100.0	105.0	111.3	116.0	114.7	108.3	103.7	93.3	90.0
Count Adj	**1.38**	**1.28**	**1.21**	**1.16**	**1.10**	**1.04**	**1.00**	**1.01**	**1.07**	**1.12**	**1.24**	**1.29**

ODOT ATR 07-002, OR126; MP 3.23; OCHOCO HIGHWAY NO. 41; 0.35 mile west of Deschutes-Crook County Line												
Year	**15-Jan**	**15-Feb**	**15-Mar**	**15-Apr**	**15-May**	**15-Jun**	**15-Jul**	**15-Aug**	**15-Sep**	**15-Oct**	**15-Nov**	**15-Dec**
2015	91	96	103	105	108	114	119	113	112	113	101	101
2014	90	91	98	107	109	114	118	117	113	112	103	97
2013	92	100	102	108	110	114	115	114	110	108	99	96
2012	90	90	93	105	109	116	118	119	112	114	106	95
2011	93	97	100	106	110	114	115	115	110	107	99	98
Average	91.0	94.7	100.0	106.0	109.3	114.0	117.0	115.3	111.3	111.0	101.0	97.0
Count Adj	**1.29**	**1.24**	**1.17**	**1.10**	**1.07**	**1.03**	**1.00**	**1.01**	**1.05**	**1.05**	**1.16**	**1.21**

Peak month

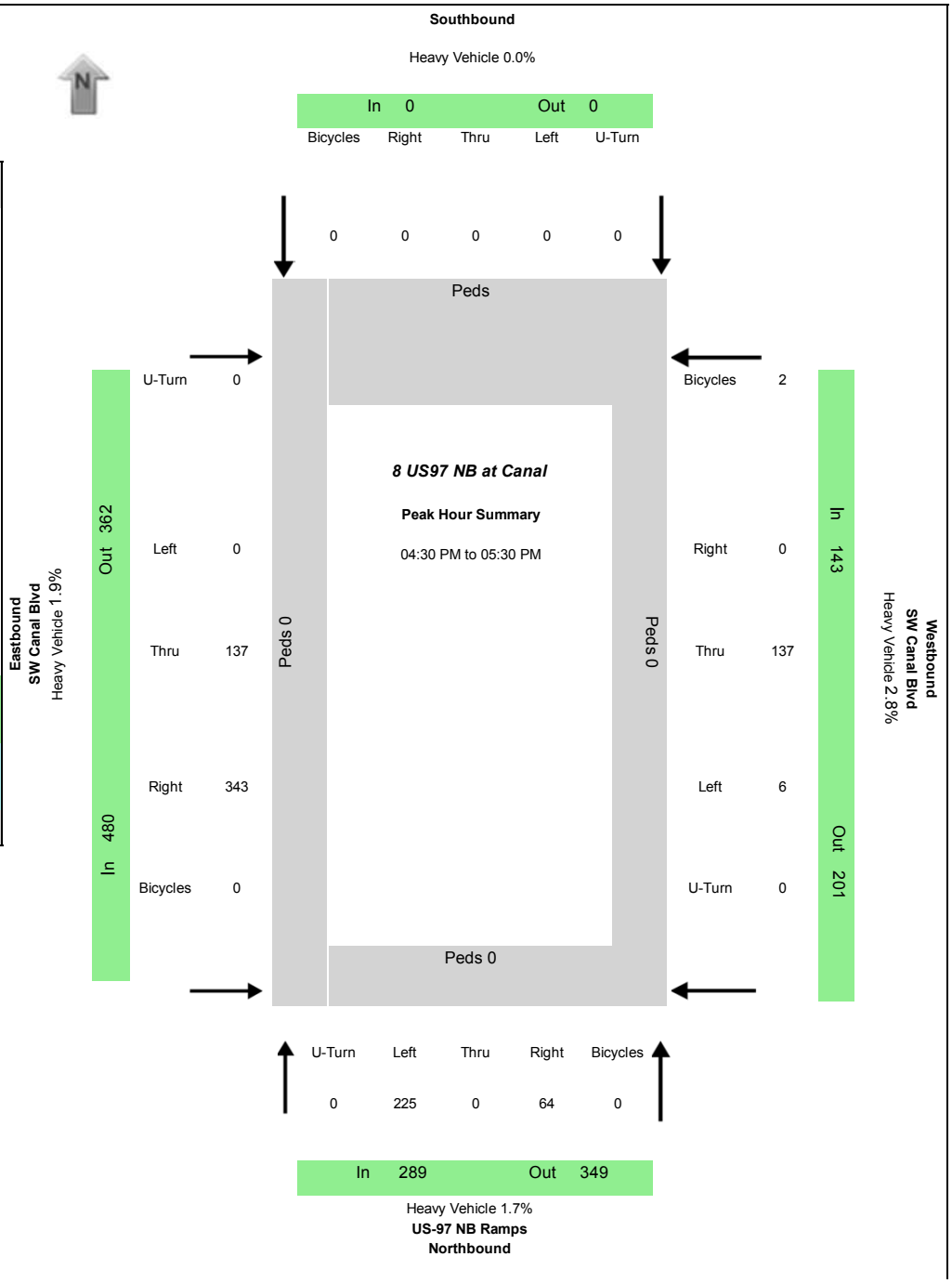
Min/Max removed from average

Appendix D – Traffic Counts

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*US-97 NB Ramps*
E/W street	*SW Canal Blvd*
City, State	Redmond OR
Site Notes	
Location	44.301879 - -121.17016
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	8

Peak Hour Start	04:30:00 PM
Peak 15 Min Start	05:05:00 PM
PHF (15-Min Int)	0.92



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
225	0	64	0	0	0	0	0	0	137	343	0	6	137	0	0	289	0	480	143	349	0	362	201
Percent Heavy Vehicles																							
1.8%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	2.0%	0.0%	16.7%	2.2%	0.0%	0.0%	1.7%	0.0%	1.9%	2.8%	2.3%	0.0%	1.9%	1.5%

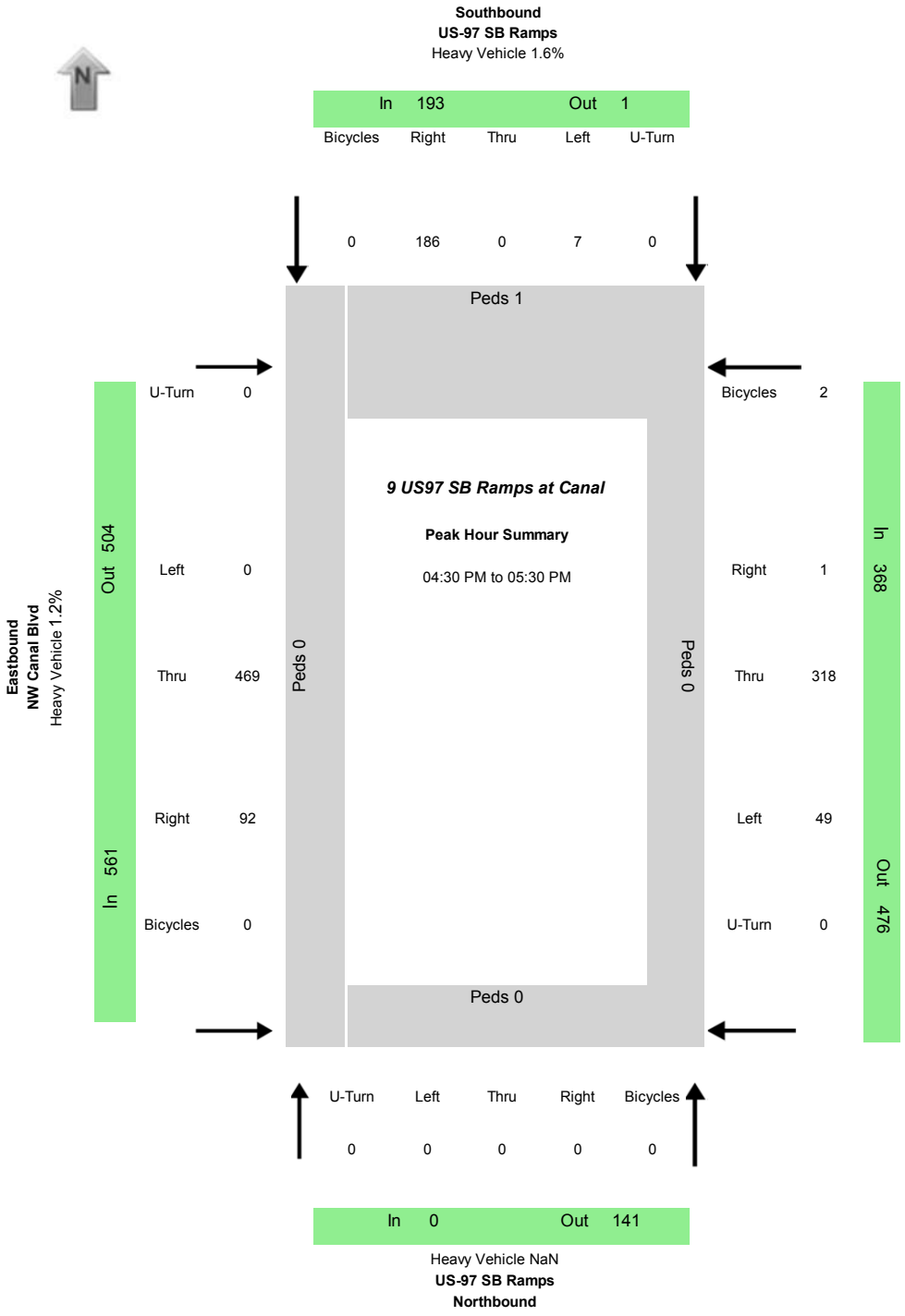
PHV- Bicycles																PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0		0	0						0	0	0	0	2		0	2	0		0	0	0

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	US-97 NB Ramps								SW Canal Blvd				SW Canal Blvd				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	14		4	0						10	28	0	0	7		0		
02:05:00 PM	15		3	0						9	23	0	2	12		0		
02:10:00 PM	15		4	0						5	27	0	0	6		0	184	
02:15:00 PM	8		1	0						14	19	0	0	7		0	170	
02:20:00 PM	8		4	0						7	27	0	0	10		0	162	
02:25:00 PM	12		7	0						9	16	0	2	7		0	158	
02:30:00 PM	12		3	0						7	18	0	3	4		0	156	
02:35:00 PM	9		5	0						9	24	0	0	7		0	154	
02:40:00 PM	14		8	0						9	17	0	0	6		0	155	
02:45:00 PM	18		7	0						3	25	0	0	16		0	177	
02:50:00 PM	12		5	0						10	22	0	0	9		0	181	
02:55:00 PM	19		5	0						7	35	0	0	13		0	206	703
03:00:00 PM	9		2	0						13	27	0	0	11		0	199	702
03:05:00 PM	19		2	0						7	31	0	1	16		0	217	714
03:10:00 PM	26		1	0						8	28	0	0	14		0	215	734
03:15:00 PM	18		3	0						10	26	0	1	14		0	225	757
03:20:00 PM	12		4	0						9	33	0	1	9		0	217	769
03:25:00 PM	11		5	0						11	17	0	1	9		0	194	770
03:30:00 PM	25		4	0						10	19	0	0	16		0	196	797
03:35:00 PM	23		5	0						5	22	0	0	15		0	198	813
03:40:00 PM	12		3	0						12	16	0	1	6		0	194	809
03:45:00 PM	16		6	0						13	32	0	1	8		0	196	816
03:50:00 PM	19		5	0						9	23	0	1	7		0	190	822
03:55:00 PM	16		9	0						7	30	0	0	6		0	208	811
04:00:00 PM	16		2	0						12	14	0	0	17		0	193	810
04:05:00 PM	24		2	0						12	21	0	0	9		0	197	802
04:10:00 PM	18		5	0						6	18	0	1	12		0	189	785
04:15:00 PM	18		4	0						9	25	0	1	13		0	198	783
04:20:00 PM	14		0	0						13	27	0	0	10		0	194	779
04:25:00 PM	12		4	0						7	21	0	0	8		0	186	777
04:30:00 PM	19		2	0						7	38	0	1	7		0	190	777
04:35:00 PM	28		4	0						11	18	0	0	15		0	202	783
04:40:00 PM	12		4	0						16	31	0	0	18		0	231	814
04:45:00 PM	14		7	0						10	19	0	0	11		0	218	799
04:50:00 PM	21		4	0						11	29	0	0	14		0	221	814
04:55:00 PM	17		3	0						16	26	0	0	12		0	214	820
05:00:00 PM	22		9	0						3	31	0	0	10		0	228	834
05:05:00 PM	16		3	0						12	35	0	1	14		0	230	847
05:10:00 PM	18		10	0						12	28	0	2	7		0	233	864
05:15:00 PM	24		6	0						14	30	0	2	14		0	248	884
05:20:00 PM	12		9	0						15	25	0	0	8		0	236	889
05:25:00 PM	22		3	0						10	33	0	0	7		0	234	912
05:30:00 PM	17		5	0						13	25	0	0	11		0	215	909
05:35:00 PM	16		2	0						12	23	0	1	11		0	211	898
05:40:00 PM	17		8	0						4	25	0	0	7		0	197	878
05:45:00 PM	14		5	0						13	24	0	2	14		0	198	889
05:50:00 PM	19		12	0						16	31	0	0	7		0	218	895
05:55:00 PM	11		6	0						7	18	0	0	8		0	207	871

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	***US-97 SB Ramps***
E/W street	***NW Canal Blvd***
City, State	Redmond OR
Site Notes	
Location	44.30071 - -121.17246
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	9
Peak Hour Start	04:30:00 PM
Peak 15 Min Start	04:30:00 PM
PHF (15-Min Int)	0.92



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	0	0	7	0	186	0	0	469	92	0	49	318	1	0	0	193	561	368	141	1	504	476
Percent Heavy Vehicles																							
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%	1.5%	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%	#DIV/0!	1.6%	1.2%	1.4%	0.0%	0.0%	1.6%	1.5%

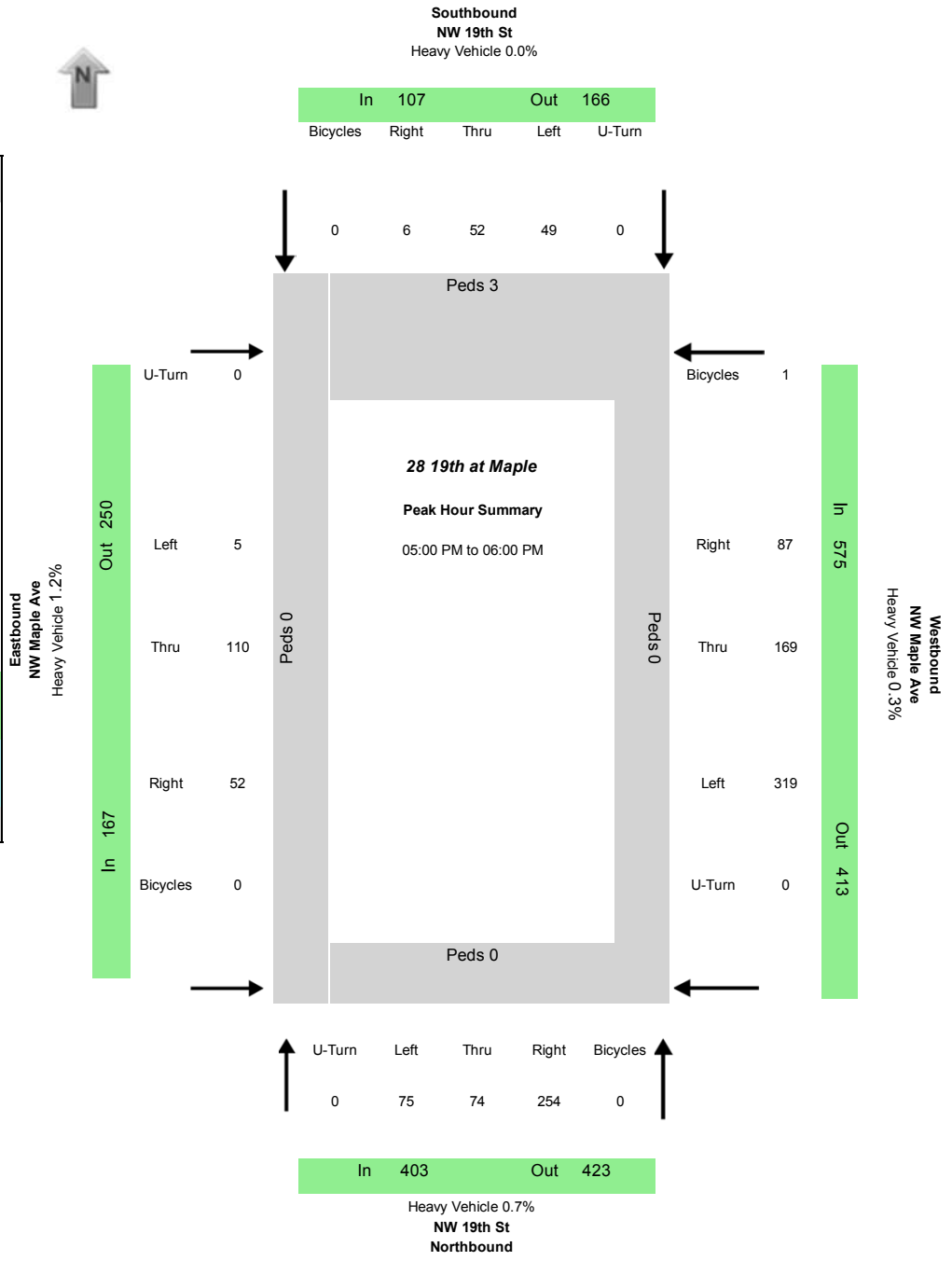
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	1	0	0	1

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	US-97 SB Ramps				US-97 SB Ramps				NW Canal Blvd				NW Canal Blvd				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0	0	0	0	0	1	17	0	0	37	5	0	4	17	0	0		
02:05:00 PM	0	0	0	0	0	0	15	0	0	32	7	0	2	24	0	0		
02:10:00 PM	0	0	0	0	2	0	19	0	0	32	7	0	6	13	0	0	240	
02:15:00 PM	0	0	0	0	0	0	13	0	0	34	7	0	3	16	0	0	232	
02:20:00 PM	0	0	0	0	0	0	17	0	0	31	11	0	6	10	0	0	227	
02:25:00 PM	0	0	0	0	0	0	10	0	0	29	4	0	4	17	0	0	212	
02:30:00 PM	0	0	0	0	0	0	15	0	0	24	12	0	2	14	0	0	206	
02:35:00 PM	0	0	0	0	0	0	16	0	0	30	3	0	1	14	0	0	195	
02:40:00 PM	0	0	0	0	1	0	21	0	0	26	9	0	5	14	0	0	207	
02:45:00 PM	0	0	0	0	0	0	23	0	0	28	7	0	7	28	0	0	233	
02:50:00 PM	0	0	0	0	1	0	12	0	0	32	5	0	1	20	0	0	240	
02:55:00 PM	0	0	0	0	0	0	18	0	0	39	6	0	1	29	0	0	257	916
03:00:00 PM	0	0	0	0	0	0	13	0	0	44	4	0	4	17	0	0	246	917
03:05:00 PM	0	0	0	0	0	0	16	0	0	36	10	0	11	21	0	0	269	931
03:10:00 PM	0	0	0	0	0	0	12	0	0	35	9	0	4	39	0	0	275	951
03:15:00 PM	0	0	0	0	1	0	16	0	0	35	6	0	5	27	0	0	283	968
03:20:00 PM	0	0	0	0	0	0	17	0	0	45	12	0	4	15	0	0	282	986
03:25:00 PM	0	0	0	0	0	0	17	0	0	27	3	0	1	23	0	0	254	993
03:30:00 PM	0	0	0	0	1	0	27	0	0	28	8	0	4	37	0	0	269	1031
03:35:00 PM	0	0	0	0	1	0	24	0	0	26	9	0	3	30	0	0	269	1060
03:40:00 PM	0	0	0	0	2	0	19	0	0	25	8	0	2	20	0	0	274	1060
03:45:00 PM	0	0	0	0	1	0	26	0	0	45	7	0	4	18	0	0	270	1068
03:50:00 PM	0	0	0	0	0	0	22	0	0	33	10	0	2	23	0	0	267	1087
03:55:00 PM	0	0	0	0	0	0	15	0	0	35	10	0	3	18	0	0	272	1075
04:00:00 PM	0	0	0	0	0	1	19	0	0	26	8	0	6	29	0	0	260	1082
04:05:00 PM	0	0	0	0	1	0	24	0	0	34	9	0	4	25	0	0	267	1085
04:10:00 PM	0	0	0	0	0	0	27	0	0	22	4	0	6	28	0	0	273	1073
04:15:00 PM	0	0	0	0	0	0	27	0	0	37	7	0	6	29	0	0	290	1089
04:20:00 PM	0	0	0	0	0	0	23	0	0	36	10	0	3	22	0	0	287	1090
04:25:00 PM	0	0	0	0	0	0	14	0	0	28	2	0	1	16	0	0	261	1080
04:30:00 PM	0	0	0	0	0	0	16	0	0	45	10	0	2	26	0	0	254	1074
04:35:00 PM	0	0	0	0	1	0	14	0	0	28	7	0	9	36	0	0	255	1076
04:40:00 PM	0	0	0	0	1	0	19	0	0	48	8	0	2	32	1	0	305	1111
04:45:00 PM	0	0	0	0	0	0	21	0	0	31	6	0	7	18	0	0	289	1093
04:50:00 PM	0	0	0	0	0	0	15	0	0	35	9	0	4	28	0	0	285	1094
04:55:00 PM	0	0	0	0	1	0	18	0	0	38	6	0	3	26	0	0	266	1105
05:00:00 PM	0	0	0	0	0	0	16	0	0	34	9	0	2	31	0	0	275	1108
05:05:00 PM	0	0	0	0	1	0	14	0	0	47	8	0	5	25	0	0	284	1111
05:10:00 PM	0	0	0	0	0	0	12	0	0	44	11	0	1	20	0	0	280	1112
05:15:00 PM	0	0	0	0	2	0	17	0	0	38	5	0	6	34	0	0	290	1108
05:20:00 PM	0	0	0	0	0	0	11	0	0	38	9	0	2	18	0	0	268	1092
05:25:00 PM	0	0	0	0	1	0	13	0	0	43	4	0	6	24	0	0	271	1122
05:30:00 PM	0	0	0	0	1	0	24	0	0	38	6	0	5	23	0	0	266	1120
05:35:00 PM	0	0	0	0	0	0	17	0	0	33	7	0	5	20	1	0	271	1108
05:40:00 PM	0	0	0	0	0	0	15	0	0	29	10	0	5	20	0	0	259	1076
05:45:00 PM	0	0	0	0	0	0	7	0	0	35	16	0	9	19	0	0	248	1079
05:50:00 PM	0	0	0	0	0	0	18	0	0	46	6	0	2	24	0	0	261	1084
05:55:00 PM	0	0	0	0	0	0	11	0	0	26	8	0	1	19	0	0	247	1057

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*NW 19th St*
E/W street	*NW Maple Ave*
City, State	Redmond OR
Site Notes	
Location	44.290964 - -121.189143
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	28
Peak Hour Start	05:00:00 PM
Peak 15 Min Start	05:45:00 PM
PHF (15-Min Int)	0.93



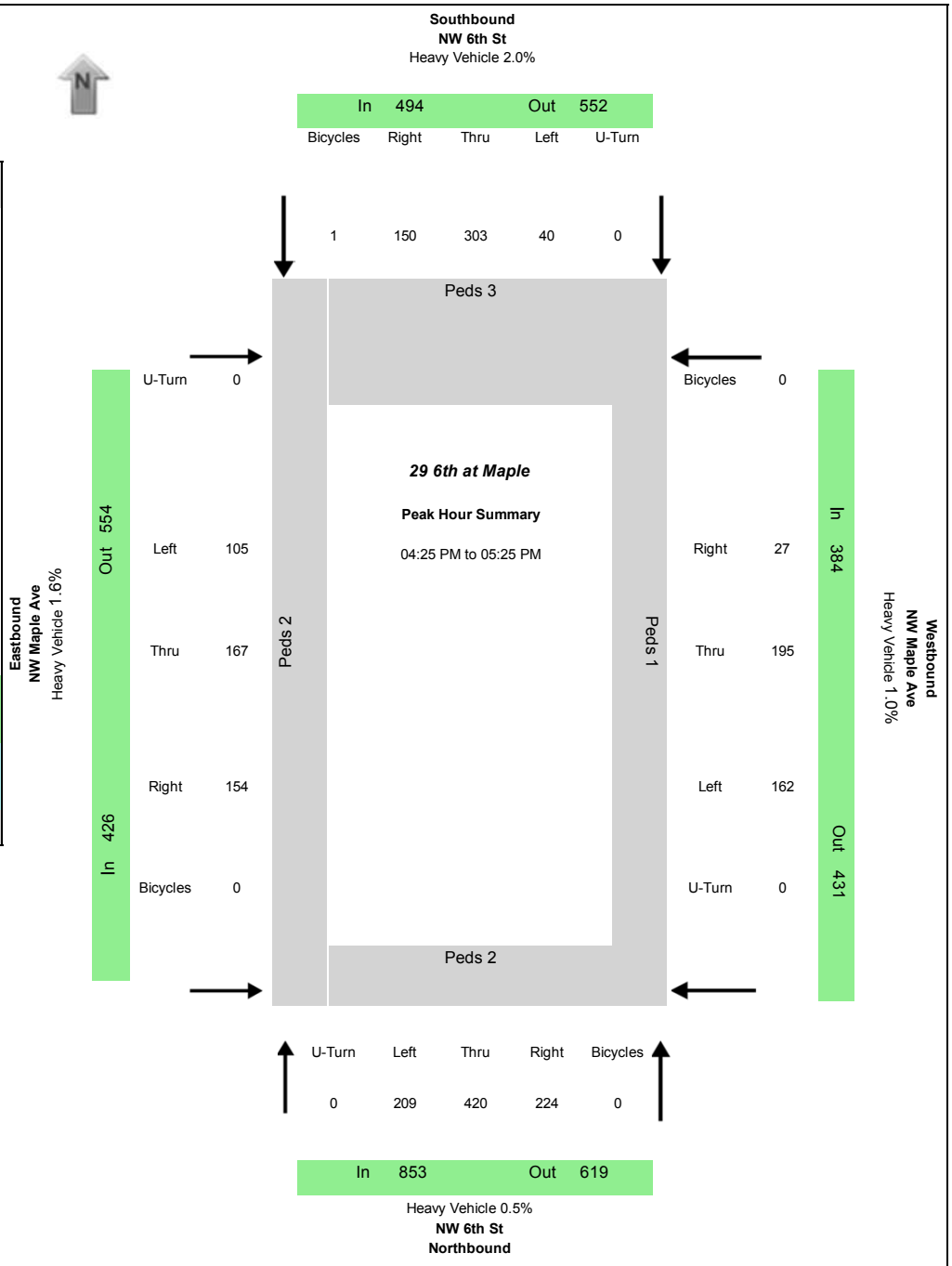
Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
75	74	254	0	49	52	6	0	5	110	52	0	319	169	87	0	403	107	167	575	423	166	250	413
Percent Heavy Vehicles																							
0.0%	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.7%	0.0%	1.2%	0.3%	0.5%	0.0%	0.0%	1.2%

PHV- Bicycles																PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	3	0	0	3

All Vehicle Volumes																		
	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	NW 19th St				NW 19th St				NW Maple Ave				NW Maple Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	6	1	20	0	2	1	0	0	1	11	2	0	14	10	0	0		
02:05:00 PM	3	3	22	0	6	0	0	0	1	9	2	0	9	9	4	0		
02:10:00 PM	4	3	23	0	5	3	1	0	0	11	2	0	8	15	5	0	216	
02:15:00 PM	11	2	18	0	4	4	1	0	0	7	4	0	14	6	4	0	223	
02:20:00 PM	3	1	21	0	5	6	0	0	0	9	6	0	14	12	4	0	236	
02:25:00 PM	1	2	18	0	4	2	1	0	1	5	7	0	33	9	11	0	250	
02:30:00 PM	0	2	8	0	1	5	0	0	0	6	7	0	23	16	4	0	247	
02:35:00 PM	1	7	25	0	3	3	0	0	0	6	3	0	12	12	5	0	243	
02:40:00 PM	7	7	25	0	3	1	0	0	1	6	6	0	19	7	7	0	238	
02:45:00 PM	6	4	27	0	7	2	2	0	0	10	2	0	21	13	5	0	265	
02:50:00 PM	6	4	28	0	1	4	0	0	0	9	5	0	16	11	6	0	278	
02:55:00 PM	7	4	27	0	3	1	1	0	0	8	5	0	24	7	3	0	279	983
03:00:00 PM	5	2	26	0	4	3	0	0	2	6	8	0	21	12	4	0	273	1008
03:05:00 PM	6	5	26	0	7	0	0	0	0	12	3	0	18	11	3	0	274	1031
03:10:00 PM	8	3	22	0	1	2	0	0	0	11	2	0	24	12	7	0	276	1043
03:15:00 PM	10	6	18	0	4	3	0	0	0	9	1	0	16	10	7	0	267	1052
03:20:00 PM	3	7	31	0	5	3	0	0	4	8	4	0	15	15	5	0	276	1071
03:25:00 PM	6	9	25	0	8	0	1	0	2	6	3	0	13	10	12	0	279	1072
03:30:00 PM	2	3	24	0	6	2	0	0	1	9	3	0	11	13	10	0	279	1084
03:35:00 PM	4	1	22	0	10	7	5	0	0	9	3	0	16	12	7	0	275	1103
03:40:00 PM	4	4	12	0	4	6	1	0	0	10	3	0	20	11	4	0	259	1093
03:45:00 PM	2	7	16	0	1	1	0	0	0	15	4	0	25	24	9	0	279	1098
03:50:00 PM	3	5	19	0	2	0	0	0	0	6	6	0	33	9	8	0	274	1099
03:55:00 PM	9	3	15	0	3	2	0	0	0	4	4	0	20	18	6	0	279	1093
04:00:00 PM	5	1	15	0	3	1	0	0	0	6	7	0	27	11	5	0	256	1081
04:05:00 PM	6	2	15	0	5	4	1	0	0	10	3	0	13	21	6	0	251	1076
04:10:00 PM	1	3	21	0	7	1	0	0	1	7	6	0	18	13	5	0	250	1067
04:15:00 PM	4	3	15	0	8	4	0	0	1	19	4	0	20	12	5	0	264	1078
04:20:00 PM	6	8	19	0	2	2	0	0	1	9	6	0	24	15	9	0	279	1079
04:25:00 PM	6	11	19	0	5	4	0	0	3	9	6	0	19	14	7	0	299	1087
04:30:00 PM	3	8	30	0	4	8	0	0	1	14	8	0	10	10	8	0	308	1107
04:35:00 PM	7	11	14	0	4	5	5	0	1	12	4	0	21	11	7	0	309	1113
04:40:00 PM	7	3	11	0	1	5	0	0	0	5	4	0	22	9	3	0	276	1104
04:45:00 PM	6	3	24	0	4	3	1	0	0	17	8	0	24	16	2	0	280	1108
04:50:00 PM	3	7	28	0	4	5	0	0	1	10	6	0	22	16	6	0	286	1125
04:55:00 PM	6	4	28	0	4	2	1	0	1	14	2	0	23	15	7	0	323	1148
05:00:00 PM	4	6	28	0	5	4	0	0	0	9	5	0	27	14	7	0	324	1176
05:05:00 PM	4	6	20	0	4	5	0	0	0	8	2	0	33	16	8	0	322	1196
05:10:00 PM	7	5	16	0	3	4	0	0	0	5	4	0	28	21	6	0	314	1212
05:15:00 PM	6	4	21	0	5	3	0	0	2	9	5	0	26	14	9	0	309	1221
05:20:00 PM	8	4	18	0	5	5	2	0	0	11	3	0	14	14	12	0	299	1216
05:25:00 PM	4	10	13	0	5	1	0	0	2	3	4	0	35	15	4	0	296	1209
05:30:00 PM	12	7	22	0	4	0	2	0	1	10	6	0	23	13	8	0	300	1213
05:35:00 PM	5	7	19	0	2	4	0	0	0	7	3	0	19	19	4	0	293	1200
05:40:00 PM	4	8	26	0	7	2	0	0	0	12	8	0	27	8	8	0	307	1240
05:45:00 PM	4	1	22	0	1	7	1	0	0	11	7	0	30	13	10	0	306	1239
05:50:00 PM	10	7	25	0	2	7	0	0	0	16	4	0	30	8	5	0	331	1245
05:55:00 PM	7	9	24	0	6	10	1	0	0	9	1	0	27	14	6	0	335	1252

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*NW 6th St*
E/W street	*NW Maple Ave*
City, State	Redmond OR
Site Notes	
Location	44.291026 - -121.173973
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	29
Peak Hour Start	04:25:00 PM
Peak 15 Min Start	04:55:00 PM
PHF (15-Min Int)	0.91



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
209	420	224	0	40	303	150	0	105	167	154	0	162	195	27	0	853	493	426	384	619	552	554	431

Percent Heavy Vehicles

1.0%	0.5%	0.0%	0.0%	10.0%	1.3%	1.3%	0.0%	3.8%	0.6%	1.3%	0.0%	0.0%	2.1%	0.0%	0.0%	0.5%	2.0%	1.6%	1.0%	1.0%	1.1%	1.4%	1.2%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum
0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1

PHV - Pedestrians in Crosswalk

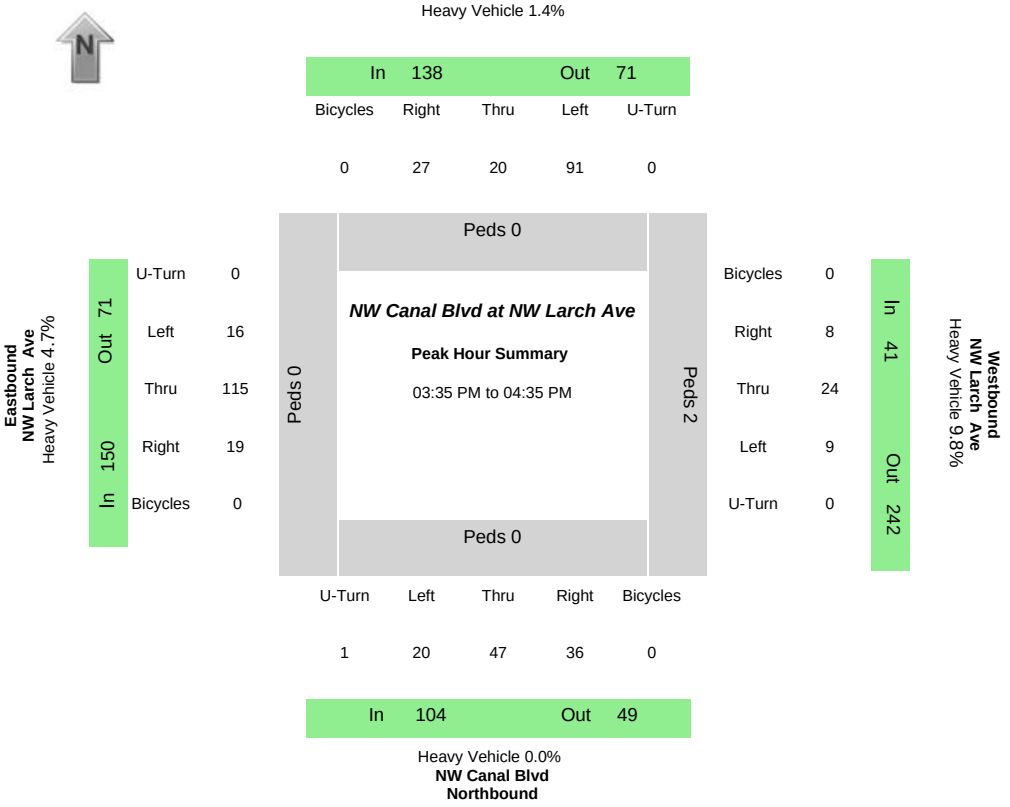
NB	SB	EB	WB	Sum
2	3	2	1	8

All Vehicle Volumes

	Northbound NW 6th St				Southbound NW 6th St				Eastbound NW Maple Ave				Westbound NW Maple Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	11	32	16	0	2	35	11	0	5	17	7	0	6	9	4	0		
02:05:00 PM	11	26	23	0	3	22	8	0	8	13	23	0	15	11	3	0		
02:10:00 PM	16	30	19	0	2	19	7	0	2	12	16	0	10	14	3	0	471	
02:15:00 PM	16	33	19	0	4	31	6	0	5	12	16	0	14	18	5	0	495	
02:20:00 PM	14	35	16	0	3	24	12	0	7	9	24	0	12	5	3	0	493	
02:25:00 PM	17	32	12	0	6	23	3	0	10	14	9	0	13	13	2	0	497	
02:30:00 PM	10	42	8	0	2	20	7	0	7	12	8	0	25	15	1	0	475	
02:35:00 PM	12	32	9	0	2	42	12	0	3	8	18	0	7	10	1	0	467	
02:40:00 PM	9	30	23	0	4	23	3	0	7	11	16	0	10	12	4	0	465	
02:45:00 PM	9	35	25	0	4	36	11	0	4	18	18	0	15	8	3	0	494	
02:50:00 PM	12	30	28	0	6	33	13	0	4	13	15	0	11	8	2	0	513	
02:55:00 PM	8	37	15	0	2	26	6	0	5	11	22	0	17	13	1	0	524	1957
03:00:00 PM	9	32	20	0	4	19	4	0	10	16	13	0	10	17	3	0	495	1959
03:05:00 PM	19	29	20	0	5	33	13	0	3	14	15	0	15	16	1	0	503	1976
03:10:00 PM	11	32	18	0	2	21	8	0	9	12	19	0	9	8	2	0	491	1977
03:15:00 PM	11	27	10	0	3	22	4	0	8	6	16	0	10	14	1	0	466	1930
03:20:00 PM	17	39	18	0	5	26	10	0	8	12	10	0	7	12	2	0	449	1932
03:25:00 PM	13	31	12	0	3	27	10	0	10	11	17	0	10	8	2	0	452	1932
03:30:00 PM	8	38	18	0	4	26	9	0	5	6	13	0	17	12	2	0	478	1933
03:35:00 PM	12	30	24	0	6	30	13	0	10	6	17	0	19	12	2	0	493	1958
03:40:00 PM	17	28	20	0	3	25	10	0	9	7	13	0	16	23	6	0	516	1983
03:45:00 PM	15	40	14	0	5	26	13	0	7	12	11	0	12	21	4	0	538	1977
03:50:00 PM	20	42	16	0	3	21	10	0	4	14	10	0	9	10	0	0	516	1961
03:55:00 PM	18	42	19	0	3	23	13	0	11	7	8	0	13	8	1	0	505	1964
04:00:00 PM	17	27	22	0	5	21	9	0	8	7	11	0	10	15	6	0	483	1965
04:05:00 PM	18	38	24	0	3	29	12	0	8	8	7	0	16	17	1	0	505	1963
04:10:00 PM	12	29	13	0	3	26	9	0	10	13	10	0	24	20	5	0	513	1986
04:15:00 PM	15	27	20	0	4	21	9	0	8	9	11	0	11	5	1	0	496	1995
04:20:00 PM	13	29	16	0	1	22	12	0	6	14	15	0	16	22	5	0	486	2000
04:25:00 PM	13	32	20	0	2	28	10	0	8	15	13	0	14	9	1	0	477	2011
04:30:00 PM	15	37	12	0	3	25	15	0	9	16	13	0	15	15	5	0	516	2033
04:35:00 PM	13	21	20	0	3	29	11	0	12	10	12	0	16	22	0	0	514	2021
04:40:00 PM	16	37	20	0	6	27	12	0	5	9	10	0	8	17	1	0	517	2012
04:45:00 PM	13	29	14	0	1	28	11	0	12	14	16	0	22	12	4	0	513	2008
04:50:00 PM	17	25	19	0	2	26	21	0	12	12	9	0	11	12	3	0	513	2018
04:55:00 PM	31	37	21	0	3	21	13	0	8	15	11	0	13	13	3	0	534	2041
05:00:00 PM	15	38	16	0	5	17	10	0	14	24	12	0	14	15	4	0	542	2067
05:05:00 PM	22	62	29	0	5	23	9	0	3	13	16	0	10	24	1	0	590	2103
05:10:00 PM	18	30	18	0	5	24	14	0	5	11	10	0	12	20	4	0	572	2100
05:15:00 PM	15	36	19	0	3	30	15	0	7	11	14	0	14	15	1	0	568	2139
05:20:00 PM	21	36	16	0	2	25	9	0	10	17	18	0	13	21	0	0	539	2156
05:25:00 PM	25	33	22	0	2	17	8	0	9	11	11	0	8	11	1	0	526	2149
05:30:00 PM	22	27	12	0	4	23	7	0	3	11	9	0	6	15	1	0	486	2109
05:35:00 PM	21	39	11	0	1	18	25	0	8	19	13	0	9	12	2	0	476	2118
05:40:00 PM	16	33	24	0	2	23	8	0	7	7	13	0	16	13	1	0	481	2113
05:45:00 PM	21	19	20	0	7	22	15	0	7	18	5	0	10	18	3	0	506	2102
05:50:00 PM	16	22	16	0	1	16	9	0	12	15	16	0	14	21	6	0	492	2097
05:55:00 PM	17	30	13	0	4	17	15	0	6	6	10	0	11	21	1	0	480	2059

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*NW Canal Blvd*
E/W street	*NW Larch Ave*
City, State	Redmond OR
Site Notes	
Location	44.289197 - -121.16834
Start Date	Wednesday, October 11, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	03:35:00 PM
Peak 15 Min Start	03:55:00 PM
PHF (15-Min Int)	0.88



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
20	47	36	1	91	20	27	0	16	115	19	0	9	24	8	0	104	138	150	41	49	71	71	242

Percent Heavy Vehicles

0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	0.0%	0.0%	0.0%	5.2%	5.3%	0.0%	0.0%	16.7%	0.0%	0.0%	0.0%	1.4%	4.7%	9.8%	2.0%	0.0%	5.6%	3.3%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHV - Pedestrians

in Crosswalk				
NB	SB	EB	WB	Sum
0	0	0	2	2

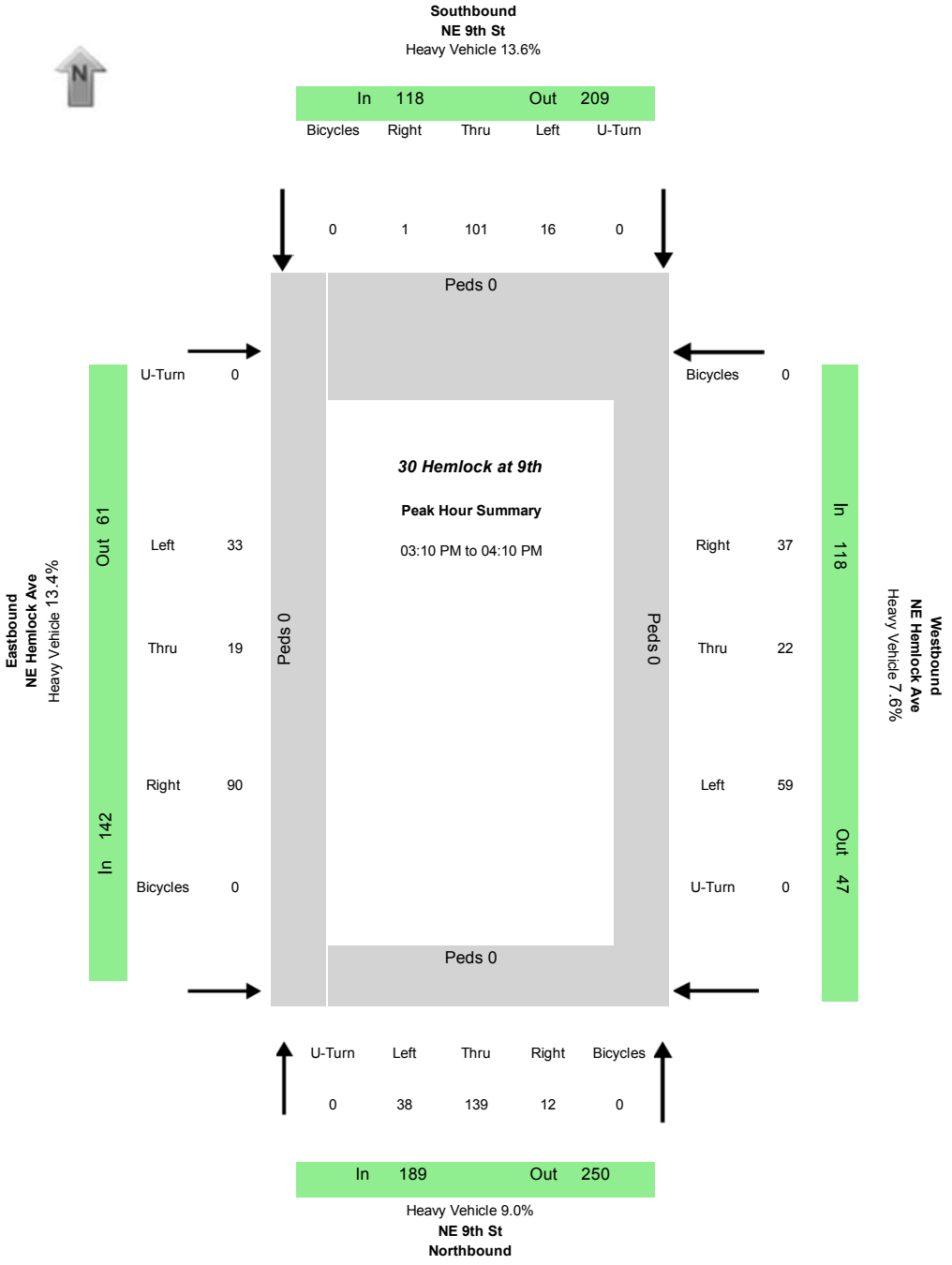
All Vehicle Volumes

	Northbound NW Canal Blvd				Southbound NW Canal Blvd				Eastbound NW Larch Ave				Westbound NW Larch Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	2	3	2	0	9	4	6	0	3	2	2	0	0	1	1	0		
02:05:00 PM	0	3	2	0	5	4	5	0	3	6	0	0	0	4	1	0		
02:10:00 PM	0	4	1	0	1	2	7	0	3	11	3	0	2	2	0	0	104	
02:15:00 PM	5	5	1	0	6	1	1	0	3	11	1	0	0	5	3	0	111	
02:20:00 PM	1	7	2	0	5	3	0	0	3	16	2	0	4	2	1	0	124	
02:25:00 PM	3	5	2	0	8	3	5	0	2	10	1	0	0	3	1	0	131	
02:30:00 PM	4	3	4	0	6	1	0	0	1	6	1	0	1	1	0	0	117	
02:35:00 PM	3	3	4	0	4	2	2	0	6	5	0	0	3	2	1	0	106	
02:40:00 PM	2	5	3	0	4	3	2	0	2	8	0	0	1	1	1	0	95	
02:45:00 PM	3	3	0	0	6	1	3	0	2	9	1	0	0	4	0	0	99	
02:50:00 PM	0	6	2	0	6	1	4	0	5	6	1	0	1	3	0	0	99	
02:55:00 PM	0	2	1	0	5	3	2	0	1	6	1	0	1	2	2	0	93	423
03:00:00 PM	1	3	2	0	7	2	0	0	1	16	1	0	1	7	0	0	102	429
03:05:00 PM	0	4	6	0	7	4	0	0	0	6	4	0	0	1	0	0	99	428
03:10:00 PM	2	2	2	0	6	4	4	0	2	6	1	0	1	2	3	0	108	427
03:15:00 PM	1	2	1	0	6	4	2	0	4	3	3	0	1	1	2	0	97	415
03:20:00 PM	0	0	2	0	6	3	5	0	3	11	0	0	0	2	2	0	99	403
03:25:00 PM	0	1	4	0	3	2	0	0	3	9	2	0	2	1	0	0	91	387
03:30:00 PM	1	3	1	0	6	2	3	0	2	4	2	0	0	3	0	0	88	386
03:35:00 PM	3	6	3	1	5	1	1	0	1	12	4	0	0	2	0	0	93	390
03:40:00 PM	4	6	4	0	8	1	1	0	0	8	0	0	0	1	0	0	99	391
03:45:00 PM	3	5	2	0	10	1	0	0	0	10	1	0	0	1	0	0	105	392
03:50:00 PM	0	3	0	0	4	0	2	0	2	12	1	0	1	3	0	0	94	385
03:55:00 PM	1	1	4	0	11	1	3	0	4	11	2	0	1	6	0	0	106	404

04:00:00 PM	5	7	4	0	9	3	1	0	1	6	1	0	1	2	1	0	114	404
04:05:00 PM	0	3	3	0	11	2	4	0	2	7	2	0	0	2	1	0	123	409
04:10:00 PM	0	3	1	0	7	3	2	0	1	11	0	0	0	1	1	0	108	404
04:15:00 PM	1	3	5	0	8	5	2	0	1	8	2	0	1	3	2	0	108	415
04:20:00 PM	3	6	2	0	5	0	1	0	2	9	0	0	3	1	0	0	103	413
04:25:00 PM	0	1	4	0	9	2	4	0	1	10	1	0	0	1	3	0	109	422
04:30:00 PM	0	3	4	0	4	1	6	0	1	11	5	0	2	1	0	0	106	433
04:35:00 PM	1	3	3	0	5	3	0	0	1	4	0	0	0	0	0	0	94	414
04:40:00 PM	1	1	2	0	6	0	1	0	0	6	1	0	0	1	0	0	77	400
04:45:00 PM	1	1	2	0	7	1	4	0	1	11	0	0	2	3	0	0	72	400
04:50:00 PM	1	2	4	0	6	1	1	0	2	12	1	0	0	3	0	0	85	405
04:55:00 PM	1	1	5	0	7	2	1	0	1	9	0	0	0	0	0	0	93	387
05:00:00 PM	1	3	5	0	5	1	4	0	2	10	0	0	1	1	0	0	93	379
05:05:00 PM	0	3	2	0	6	1	2	0	2	21	2	0	0	4	0	0	103	385
05:10:00 PM	0	4	0	0	2	2	2	0	5	16	3	0	0	2	0	0	112	391
05:15:00 PM	3	4	1	0	8	2	2	0	2	18	2	0	1	1	0	0	123	394
05:20:00 PM	1	1	2	0	12	2	2	0	0	15	3	0	0	2	1	0	121	403
05:25:00 PM	3	0	0	0	8	3	0	0	0	4	3	0	2	1	1	0	110	392
05:30:00 PM	3	3	1	0	9	1	1	0	1	7	2	0	0	0	1	0	95	383
05:35:00 PM	0	5	1	0	6	0	1	0	0	10	2	0	0	2	2	0	83	392
05:40:00 PM	3	4	2	0	11	4	0	0	0	14	1	0	1	1	0	0	99	414
05:45:00 PM	1	4	3	0	7	1	0	0	1	10	2	0	1	1	0	0	101	412
05:50:00 PM	2	1	1	0	4	3	0	0	1	11	5	0	0	1	0	0	101	408
05:55:00 PM	1	2	2	0	4	1	0	0	0	10	4	0	1	1	0	0	86	407

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*NE 9th St*
E/W street	*NE Hemlock Ave*
City, State	Redmond OR
Site Notes	
Location	44.283804 - -121.158847
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	30
Peak Hour Start	03:10:00 PM
Peak 15 Min Start	03:30:00 PM
PHF (15-Min Int)	0.76



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
38	139	12	0	16	101	1	0	33	19	90	0	59	22	37	0	189	118	142	118	250	209	61	47
Percent Heavy Vehicles																							
21.1%	5.0%	16.7%	0.0%	18.8%	12.9%	0.0%	0.0%	6.1%	21.1%	14.4%	0.0%	5.1%	22.7%	2.7%	0.0%	9.0%	13.6%	13.4%	7.6%	11.6%	4.8%	21.3%	19.1%

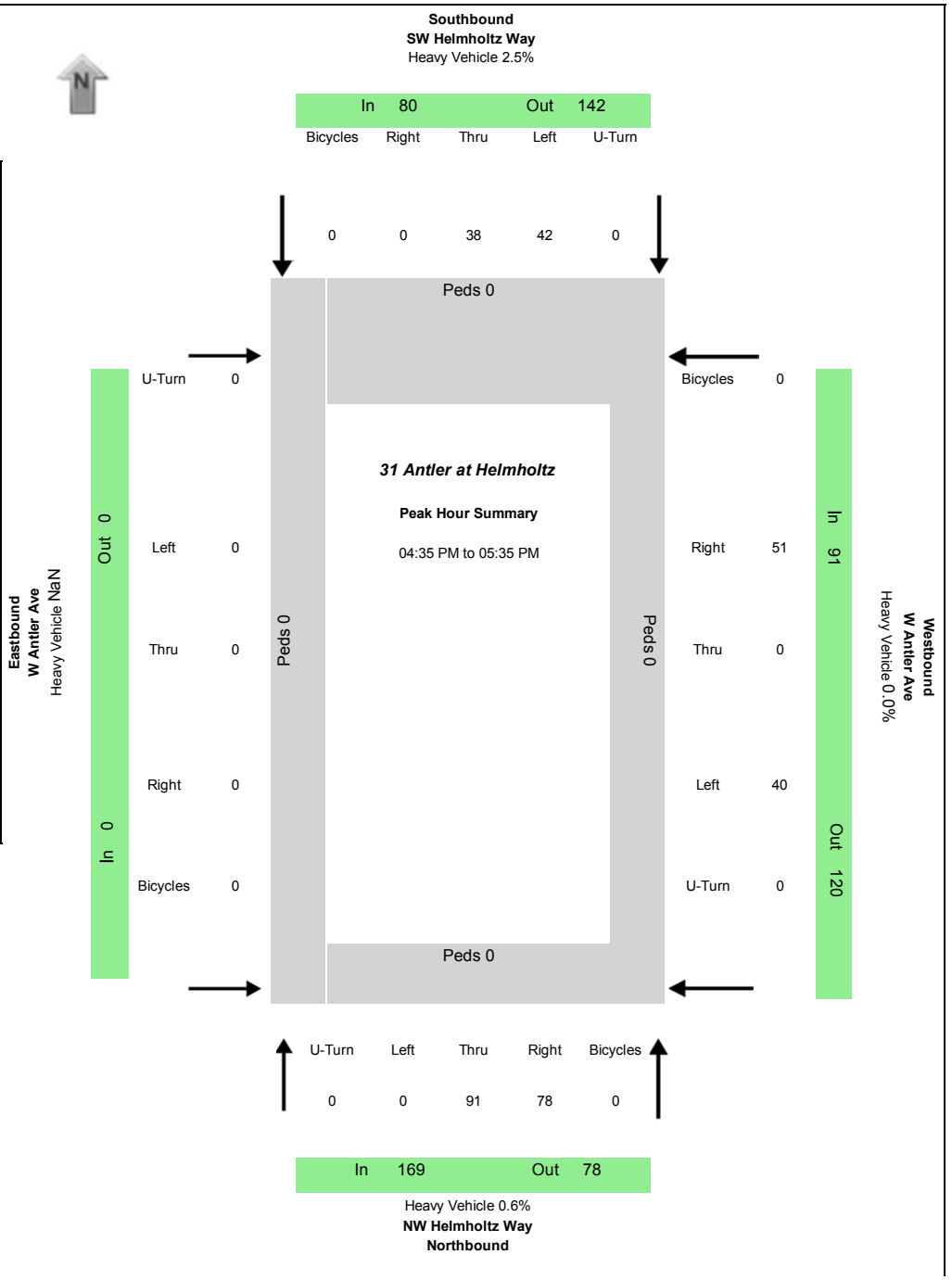
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	NE 9th St				NE 9th St				NE Hemlock Ave				NE Hemlock Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	1	13	0	0	0	6	1	0	0	0	6	0	1	3	1	0		
02:05:00 PM	2	6	3	0	1	2	0	0	0	0	8	0	3	1	1	0		
02:10:00 PM	0	4	2	0	2	6	0	0	2	2	1	0	0	1	1	0	80	
02:15:00 PM	4	7	0	0	4	11	0	0	1	1	7	0	0	2	4	0	89	
02:20:00 PM	4	12	0	0	1	11	1	0	2	2	1	0	1	3	2	0	102	
02:25:00 PM	2	4	4	0	1	9	0	0	6	0	3	0	3	1	0	0	114	
02:30:00 PM	3	7	2	0	1	14	1	0	2	3	7	0	4	1	6	0	124	
02:35:00 PM	9	13	1	0	1	9	1	0	3	1	8	0	3	2	5	0	140	
02:40:00 PM	2	10	3	0	2	6	1	0	2	3	10	0	1	1	1	0	149	
02:45:00 PM	3	11	0	0	3	14	0	0	2	3	4	0	2	3	0	0	143	
02:50:00 PM	3	6	2	0	3	6	0	0	3	1	2	0	1	6	2	0	122	
02:55:00 PM	1	11	2	0	0	10	1	0	2	3	3	0	3	2	2	0	120	463
03:00:00 PM	5	9	1	0	3	10	2	0	3	2	5	0	3	1	0	0	119	475
03:05:00 PM	3	9	1	0	1	8	0	0	2	2	9	0	2	4	2	0	127	491
03:10:00 PM	2	12	1	0	3	14	0	0	0	1	3	0	4	0	1	0	128	511
03:15:00 PM	1	13	3	0	1	8	1	0	3	1	4	0	2	0	1	0	122	508
03:20:00 PM	7	9	0	0	1	7	0	0	2	4	10	0	1	3	1	0	124	513
03:25:00 PM	3	3	0	0	0	5	0	0	2	1	14	0	4	3	0	0	118	515
03:30:00 PM	6	13	2	0	3	7	0	0	1	2	3	0	12	3	9	0	141	525
03:35:00 PM	3	13	2	0	1	14	0	0	4	3	10	0	8	3	6	0	163	536
03:40:00 PM	4	14	1	0	1	7	0	0	3	0	15	0	6	3	4	0	186	552
03:45:00 PM	2	13	1	0	0	8	0	0	2	0	9	0	3	1	0	0	164	546
03:50:00 PM	3	12	0	0	1	5	0	0	4	2	4	0	2	2	2	0	134	548
03:55:00 PM	2	9	2	0	3	7	0	0	3	1	2	0	3	2	1	0	111	543
04:00:00 PM	2	14	0	0	0	12	0	0	5	3	6	0	7	1	9	0	131	558
04:05:00 PM	3	14	0	0	2	7	0	0	4	1	10	0	7	1	3	0	146	567
04:10:00 PM	3	12	1	0	0	7	0	0	2	1	4	0	4	1	2	0	148	563
04:15:00 PM	2	8	0	0	0	8	0	0	1	2	8	0	1	3	2	0	124	560
04:20:00 PM	4	11	1	0	2	8	0	0	0	2	7	0	3	2	2	0	114	557
04:25:00 PM	5	10	2	0	1	7	1	0	3	1	7	0	4	1	2	0	121	566
04:30:00 PM	2	12	0	0	1	5	0	0	2	2	6	0	8	0	6	0	130	549
04:35:00 PM	4	10	0	0	1	7	0	0	5	3	5	0	3	2	3	0	131	525
04:40:00 PM	2	12	0	0	0	7	2	0	0	0	9	0	5	2	7	0	133	513
04:45:00 PM	2	11	0	0	1	1	0	0	2	0	9	0	5	4	3	0	127	512
04:50:00 PM	0	10	1	0	1	6	0	0	4	1	5	0	1	0	3	0	116	507
04:55:00 PM	0	7	0	0	0	3	1	0	4	0	8	0	2	0	1	0	96	498
05:00:00 PM	2	9	0	0	0	7	1	0	4	0	8	0	2	1	1	0	93	474
05:05:00 PM	2	16	0	0	0	9	1	0	2	0	17	0	3	0	2	0	113	474
05:10:00 PM	2	17	0	0	1	2	0	0	2	1	11	0	2	0	4	0	129	479
05:15:00 PM	3	16	3	0	0	11	0	0	4	0	5	0	0	0	2	0	138	488
05:20:00 PM	2	12	1	0	0	10	3	0	6	2	6	0	3	1	3	0	135	495
05:25:00 PM	1	7	0	0	0	3	0	0	3	0	6	0	0	2	0	0	115	473
05:30:00 PM	1	7	1	0	1	5	0	0	0	1	7	0	1	1	0	0	96	454
05:35:00 PM	0	12	0	0	0	8	1	0	4	1	3	0	2	0	4	0	82	446
05:40:00 PM	1	8	0	0	1	2	0	0	5	0	6	0	0	0	1	0	84	424
05:45:00 PM	3	7	0	0	0	3	0	0	2	0	1	0	0	0	0	0	75	402
05:50:00 PM	1	8	0	0	0	3	0	0	3	0	2	0	1	0	1	0	59	389
05:55:00 PM	1	6	1	0	0	2	0	0	3	0	3	0	0	0	1	0	52	380

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*NW Helmholtz Way*
E/W street	*W Antler Ave*
City, State	Redmond OR
Site Notes	
Location	44.276304 - -121.219811
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	31
Peak Hour Start	04:35:00 PM
Peak 15 Min Start	05:20:00 PM
PHF (15-Min Int)	0.86



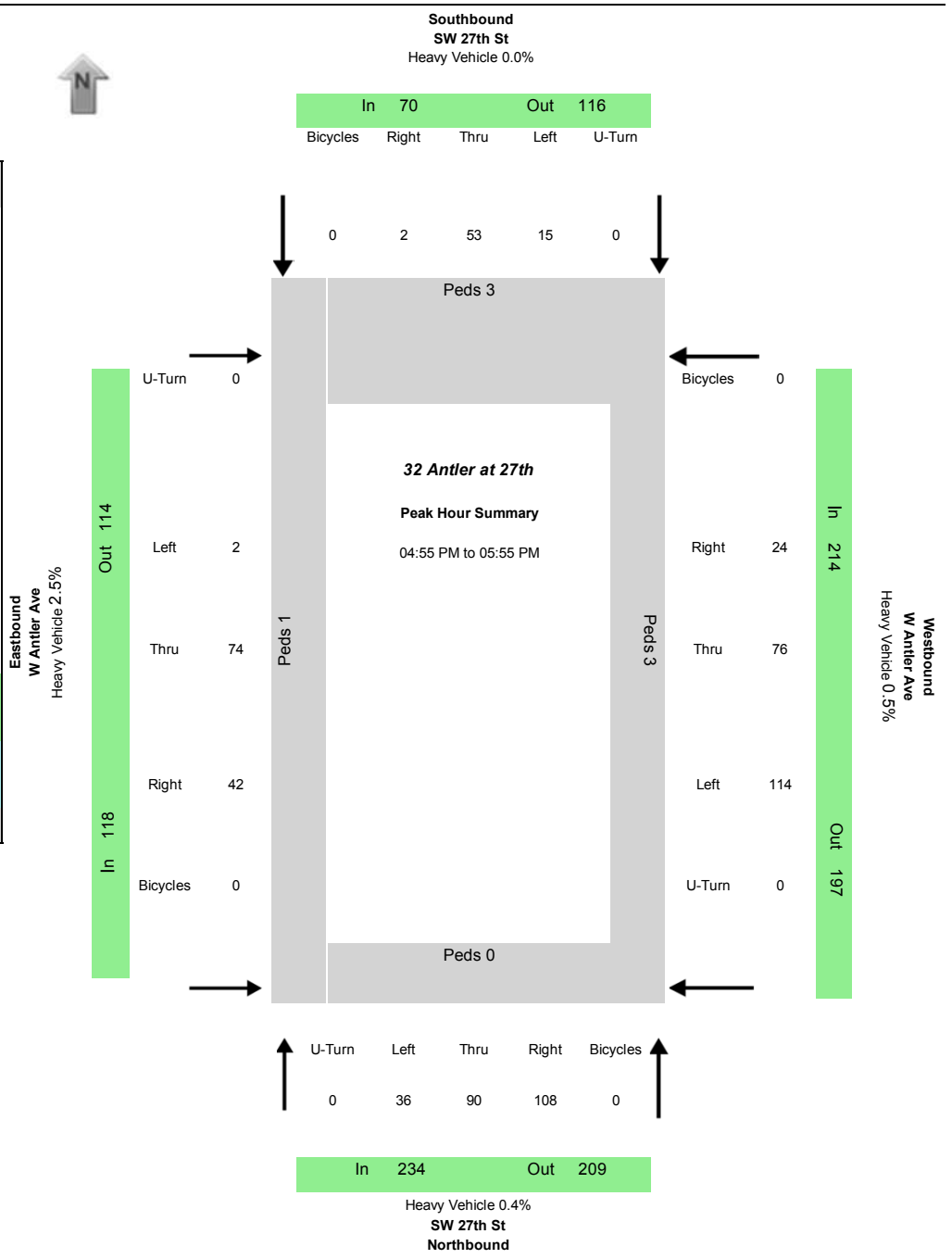
Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	91	78	0	42	38	0	0	0	0	0	0	40	0	51	0	169	80	0	91	78	142	0	120
Percent Heavy Vehicles																							
0.0%	0.0%	1.3%	0.0%	0.0%	5.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	2.5%	#DIV/0!	0.0%	2.6%	0.0%	#DIV/0!	0.8%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

All Vehicle Volumes																		
	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	NW Helmholtz Way				SW Helmholtz Way				W Antler Ave				W Antler Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0	3	1	0	1	3	0	0	1	0	0	0	2	0	3	0		
02:05:00 PM	0	2	1	0	5	6	0	0	0	0	0	0	1	0	0	0		
02:10:00 PM	0	2	1	0	3	5	0	0	0	0	0	0	4	0	5	0	49	
02:15:00 PM	0	2	3	0	1	5	0	0	0	0	0	0	2	0	2	0	50	
02:20:00 PM	0	2	3	0	3	3	0	0	0	0	0	0	2	0	2	0	50	
02:25:00 PM	0	3	2	0	4	2	0	0	0	0	0	0	8	0	1	0	50	
02:30:00 PM	0	9	2	0	2	2	0	0	0	0	0	0	1	0	3	0	54	
02:35:00 PM	0	4	5	0	4	1	0	0	0	0	0	0	5	0	2	0	60	
02:40:00 PM	0	9	3	0	2	1	0	0	0	0	0	0	1	0	2	0	58	
02:45:00 PM	0	7	6	0	1	3	0	0	0	0	0	0	4	0	4	0	64	
02:50:00 PM	0	5	3	0	1	0	0	0	0	0	0	0	5	0	0	0	57	
02:55:00 PM	0	6	5	0	3	3	0	0	0	0	0	0	1	0	3	0	60	217
03:00:00 PM	0	5	5	0	4	4	0	0	0	0	0	0	0	0	1	0	54	222
03:05:00 PM	0	1	5	0	0	3	0	0	0	0	0	0	5	0	2	0	56	223
03:10:00 PM	0	1	3	0	1	2	0	0	0	0	0	0	4	0	2	0	48	216
03:15:00 PM	0	9	9	0	3	1	0	0	0	0	0	0	4	0	2	0	57	229
03:20:00 PM	0	6	8	0	0	5	0	0	0	0	0	0	2	0	1	0	63	236
03:25:00 PM	0	4	2	0	3	2	0	0	0	0	0	0	1	0	0	0	62	228
03:30:00 PM	0	2	4	0	4	3	0	0	0	0	0	0	2	0	0	0	49	224
03:35:00 PM	0	4	2	0	0	4	0	0	0	0	0	0	1	0	1	0	39	215
03:40:00 PM	0	5	5	0	2	3	0	0	0	0	0	0	3	0	5	0	50	220
03:45:00 PM	0	3	3	0	1	4	0	0	0	0	0	0	5	0	2	0	53	213
03:50:00 PM	0	6	3	0	3	1	0	0	0	0	0	0	5	0	3	0	62	220
03:55:00 PM	0	9	5	0	2	5	0	0	0	0	0	0	4	0	5	0	69	229
04:00:00 PM	0	7	6	0	2	3	0	0	0	0	0	0	4	0	4	0	77	236
04:05:00 PM	0	4	7	0	2	5	0	0	0	0	0	0	2	0	5	0	81	245
04:10:00 PM	0	3	9	0	2	1	0	0	0	0	0	0	2	0	7	0	75	256
04:15:00 PM	0	12	4	0	3	4	0	0	0	0	0	0	2	0	2	0	76	255
04:20:00 PM	0	4	7	0	3	3	0	0	0	0	0	0	1	0	4	0	73	255
04:25:00 PM	0	6	11	0	2	2	0	0	0	0	0	0	2	0	2	0	74	268
04:30:00 PM	0	10	10	0	3	1	0	0	0	0	0	0	3	0	3	0	77	283
04:35:00 PM	0	5	6	0	3	7	0	0	0	0	0	0	1	0	3	0	80	296
04:40:00 PM	0	5	1	0	3	1	0	0	0	0	0	0	5	0	2	0	72	290
04:45:00 PM	0	5	10	0	4	4	0	0	0	0	0	0	2	0	0	0	67	297
04:50:00 PM	0	9	11	0	4	2	0	0	0	0	0	0	2	0	4	0	74	308
04:55:00 PM	0	6	5	0	3	2	0	0	0	0	0	0	4	0	3	0	80	301
05:00:00 PM	0	4	7	0	1	1	0	0	0	0	0	0	3	0	8	0	79	299
05:05:00 PM	0	10	8	0	2	5	0	0	0	0	0	0	3	0	4	0	79	306
05:10:00 PM	0	6	8	0	1	5	0	0	0	0	0	0	6	0	7	0	89	315
05:15:00 PM	0	6	7	0	6	2	0	0	0	0	0	0	2	0	7	0	95	318
05:20:00 PM	0	6	7	0	3	0	0	0	0	0	0	0	3	0	6	0	88	321
05:25:00 PM	0	13	5	0	6	6	0	0	0	0	0	0	4	0	3	0	92	333
05:30:00 PM	0	16	3	0	6	3	0	0	0	0	0	0	5	0	4	0	99	340
05:35:00 PM	0	4	5	0	2	1	0	0	0	0	0	0	2	0	3	0	91	332
05:40:00 PM	0	1	4	0	2	5	0	0	0	0	0	0	6	0	2	0	74	335
05:45:00 PM	0	5	5	0	4	4	0	0	0	0	0	0	2	0	3	0	60	333
05:50:00 PM	0	5	7	0	4	5	0	0	0	0	0	0	2	0	6	0	72	330
05:55:00 PM	0	8	7	0	2	1	0	0	0	0	0	0	3	0	1	0	74	329

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW 27th St*
E/W street	*W Antler Ave*
City, State	Redmond OR
Site Notes	
Location	44.276414 - -121.19928
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	32
Peak Hour Start	04:55:00 PM
Peak 15 Min Start	05:05:00 PM
PHF (15-Min Int)	0.87



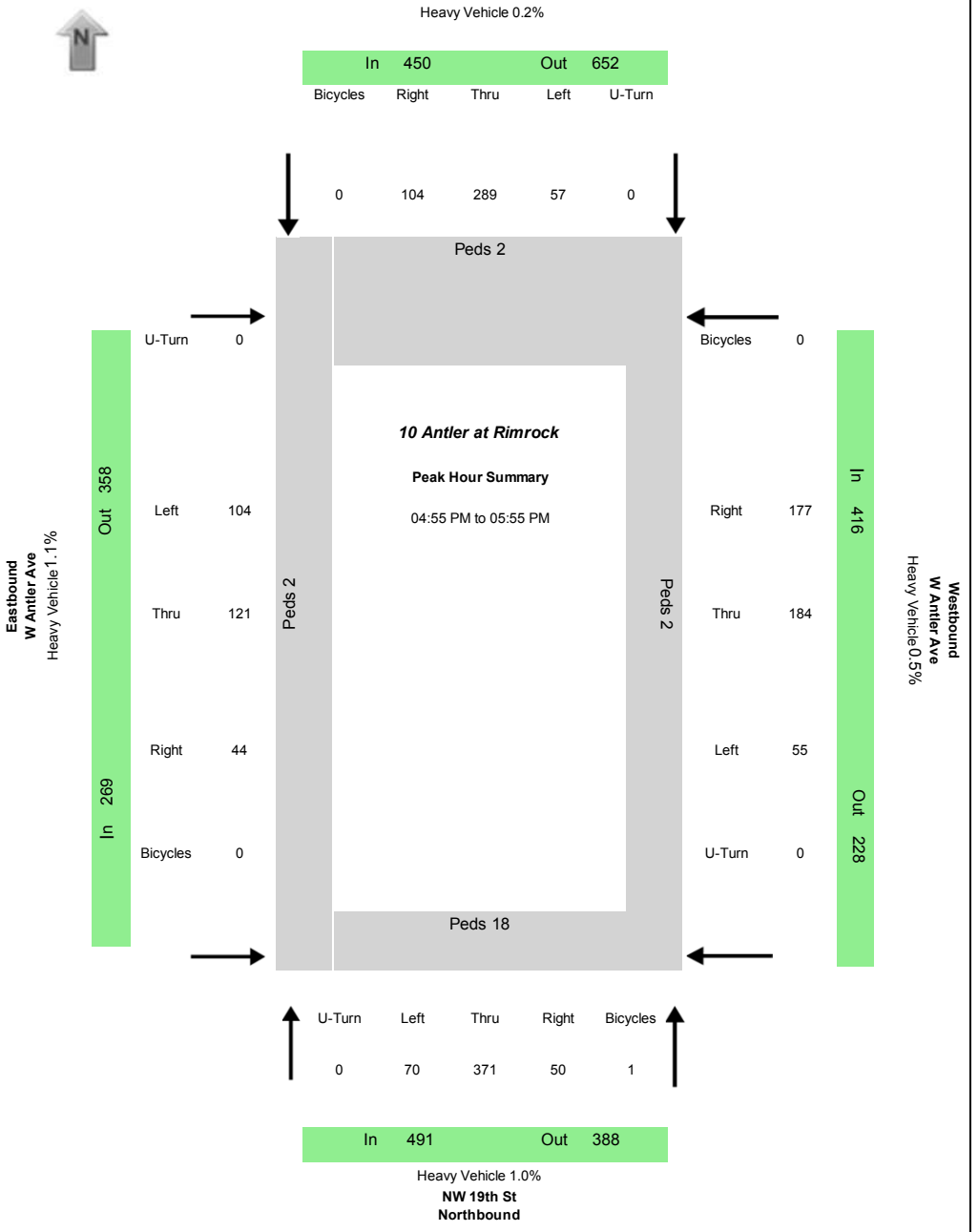
Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
36	90	108	0	15	53	2	0	2	74	42	0	114	76	24	0	234	70	118	214	209	116	114	197
Percent Heavy Vehicles																							
0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%	2.4%	0.0%	0.9%	0.0%	0.0%	0.0%	0.4%	0.0%	2.5%	0.5%	1.0%	0.0%	0.0%	1.5%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	3	7

All Vehicle Volumes																		
	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW 27th St				SW 27th St				W Antler Ave				W Antler Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	3	5	2	0	1	0	0	0	0	1	0	0	3	3	2	0		
02:05:00 PM	1	4	6	0	1	1	0	0	0	3	5	0	5	4	2	0		
02:10:00 PM	2	3	6	0	0	1	0	0	0	3	4	0	4	4	0	0	79	
02:15:00 PM	1	5	4	0	0	4	0	0	0	3	4	0	3	3	1	0	87	
02:20:00 PM	3	6	10	0	0	5	0	0	0	1	3	0	6	2	0	0	91	
02:25:00 PM	3	1	4	0	1	2	1	0	0	5	4	0	4	3	2	0	94	
02:30:00 PM	1	0	9	0	2	3	0	0	0	0	2	0	6	4	1	0	94	
02:35:00 PM	1	4	7	0	1	4	0	0	0	4	2	0	5	6	0	0	92	
02:40:00 PM	4	3	8	0	2	3	0	0	1	5	3	0	9	7	1	0	108	
02:45:00 PM	1	7	6	0	0	3	0	0	0	3	3	0	11	5	3	0	122	
02:50:00 PM	2	3	5	0	2	10	0	0	0	7	0	0	4	4	1	0	126	
02:55:00 PM	2	3	12	0	0	0	0	0	0	5	2	0	0	2	1	0	107	388
03:00:00 PM	4	9	8	0	3	1	0	0	0	8	3	0	6	4	2	0	113	416
03:05:00 PM	2	4	12	0	0	4	1	0	0	4	0	0	7	3	0	0	112	421
03:10:00 PM	3	5	7	0	0	4	1	0	0	6	1	0	5	5	3	0	125	434
03:15:00 PM	3	6	9	0	0	6	0	0	0	4	2	0	14	9	3	0	133	462
03:20:00 PM	4	6	12	0	1	2	0	0	0	4	2	0	12	7	0	0	146	476
03:25:00 PM	2	2	9	0	2	5	0	0	0	4	1	0	8	3	0	0	142	482
03:30:00 PM	1	2	9	0	0	1	1	0	0	4	3	0	8	1	0	0	116	484
03:35:00 PM	2	7	4	0	2	2	0	0	1	4	1	0	9	3	2	0	103	487
03:40:00 PM	2	7	14	0	2	4	0	0	0	1	2	0	7	5	3	0	114	488
03:45:00 PM	3	10	5	0	1	4	0	0	0	5	2	0	12	10	6	0	142	504
03:50:00 PM	4	3	5	0	2	4	0	0	0	3	2	0	6	7	2	0	143	504
03:55:00 PM	1	6	6	0	0	3	0	0	0	6	2	0	5	4	0	0	129	510
04:00:00 PM	5	5	10	0	2	7	0	0	1	2	4	0	7	15	1	0	130	521
04:05:00 PM	3	4	8	0	0	3	0	0	0	3	2	0	4	4	2	0	125	517
04:10:00 PM	2	8	11	0	0	3	0	0	1	4	1	0	4	5	0	0	131	516
04:15:00 PM	0	6	8	0	1	5	0	0	1	2	3	0	7	8	3	0	116	504
04:20:00 PM	0	6	8	0	2	3	0	0	0	5	0	0	4	4	2	0	117	488
04:25:00 PM	1	4	9	0	0	4	0	0	0	4	5	0	10	2	2	0	119	493
04:30:00 PM	4	1	13	0	1	3	0	0	1	8	3	0	9	4	1	0	123	511
04:35:00 PM	3	9	5	0	1	1	0	0	0	3	1	0	7	5	0	0	124	509
04:40:00 PM	0	9	10	0	3	3	0	0	1	4	1	0	6	3	0	0	123	502
04:45:00 PM	2	6	15	0	2	1	0	0	1	7	3	0	9	6	2	0	129	498
04:50:00 PM	1	4	15	0	2	5	0	0	1	4	1	0	7	5	2	0	141	507
04:55:00 PM	2	5	9	0	0	4	0	0	0	8	3	0	9	5	0	0	146	519
05:00:00 PM	1	9	12	0	2	1	1	0	0	2	2	0	7	3	3	0	135	503
05:05:00 PM	6	8	7	0	3	3	0	0	0	7	5	0	17	10	2	0	156	538
05:10:00 PM	1	7	11	0	1	4	0	0	0	3	4	0	13	10	3	0	168	556
05:15:00 PM	6	4	7	0	2	8	0	0	1	11	2	0	8	7	1	0	182	569
05:20:00 PM	5	6	6	0	0	3	1	0	0	6	7	0	9	7	5	0	169	590
05:25:00 PM	4	10	11	0	0	5	0	0	1	9	3	0	2	7	1	0	165	602
05:30:00 PM	3	9	6	0	0	8	0	0	0	2	5	0	10	4	0	0	155	601
05:35:00 PM	2	11	8	0	0	3	0	0	0	3	3	0	8	4	3	0	145	611
05:40:00 PM	1	8	9	0	4	8	0	0	0	6	4	0	9	5	2	0	148	627
05:45:00 PM	3	8	15	0	1	0	0	0	0	9	1	0	13	7	1	0	159	631
05:50:00 PM	2	5	7	0	2	6	0	0	0	8	3	0	9	7	3	0	166	636
05:55:00 PM	3	1	7	0	0	6	0	0	0	4	0	0	8	6	1	0	146	627

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*NW 19th St*
E/W street	*W Antler Ave*
City, State	Redmond OR
Site Notes	
Location	44.276463 - -121.189272
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	10
Peak Hour Start	04:55:00 PM
Peak 15 Min Start	05:05:00 PM
PHF (15-Min Int)	0.93



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
70	371	50	0	57	289	104	0	104	121	44	0	55	184	177	0	491	450	269	416	388	652	358	228
Percent Heavy Vehicles																							
0.0%	1.1%	2.0%	0.0%	0.0%	0.3%	0.0%	0.0%	1.9%	0.8%	0.0%	0.0%	1.8%	0.5%	0.0%	0.0%	1.0%	0.2%	1.1%	0.5%	0.5%	0.9%	0.3%	0.9%

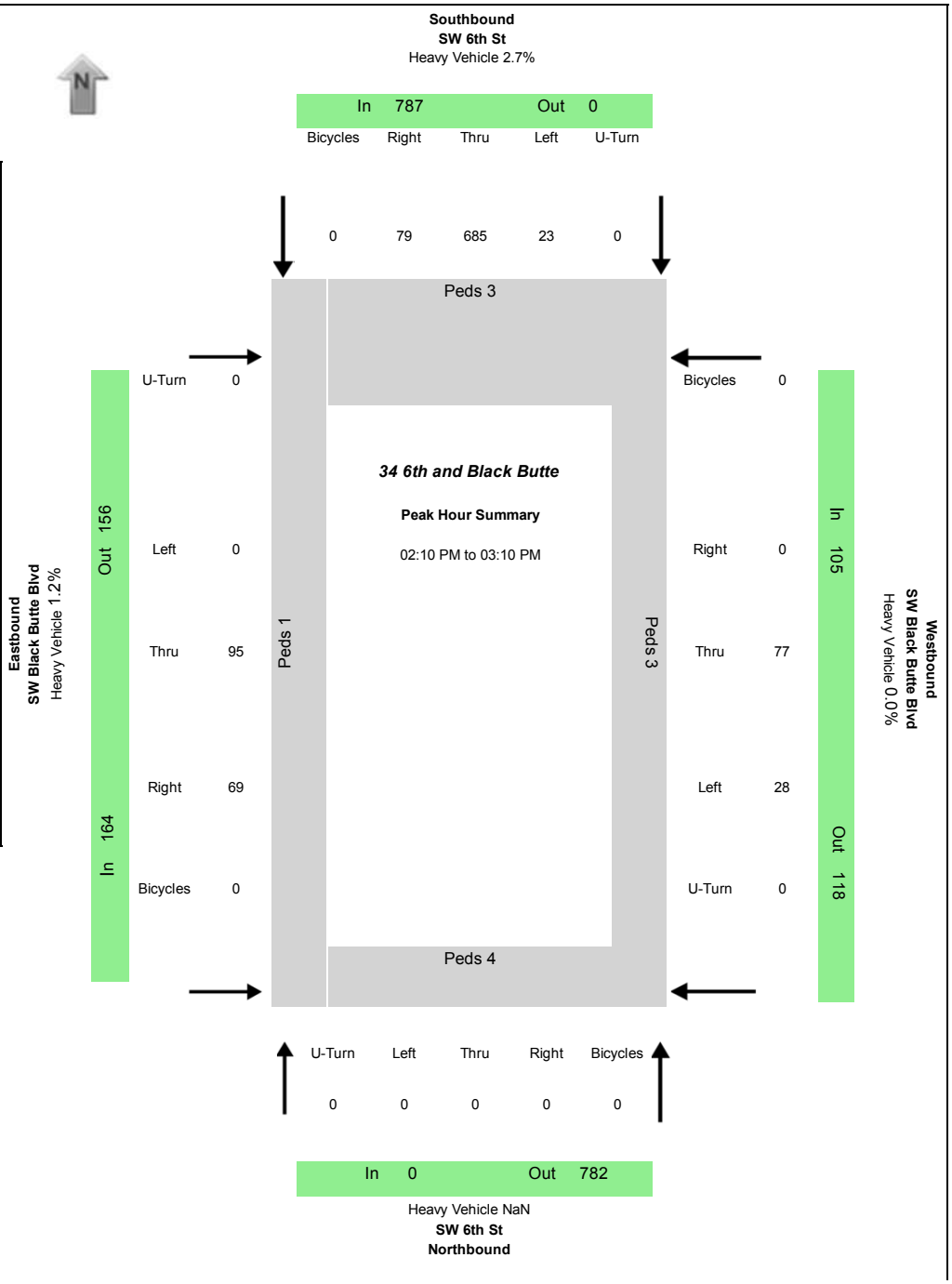
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	18	2	2	2	24

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	NW 19th St				SW Rimrock Dr				W Antler Ave				W Antler Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	2	23	5	0	6	10	2	0	8	12	3	0	2	6	5	0		
02:05:00 PM	3	16	5	0	2	15	3	0	3	7	2	0	4	7	11	0		
02:10:00 PM	1	21	4	0	6	12	2	0	4	10	3	0	7	6	5	0	243	
02:15:00 PM	1	16	4	0	6	14	4	0	5	7	3	0	2	9	7	0	237	
02:20:00 PM	1	17	4	0	5	20	3	0	6	5	3	0	5	10	7	0	245	
02:25:00 PM	0	9	3	0	8	15	2	0	4	7	6	0	3	9	11	0	241	
02:30:00 PM	2	25	7	0	5	31	18	0	3	5	1	0	2	9	10	0	281	
02:35:00 PM	5	31	4	0	9	6	3	0	8	3	3	0	5	12	8	0	292	
02:40:00 PM	2	47	9	0	5	20	8	0	11	10	3	0	5	4	6	0	345	
02:45:00 PM	10	29	10	0	9	20	2	0	5	6	4	0	3	16	11	0	352	
02:50:00 PM	6	33	8	0	4	22	2	0	10	16	2	0	1	6	11	0	376	
02:55:00 PM	2	26	2	0	4	22	4	0	14	11	3	0	4	11	7	0	356	1185
03:00:00 PM	4	32	6	0	4	15	3	0	8	7	9	0	2	8	14	0	343	1213
03:05:00 PM	1	25	2	0	5	21	6	0	12	12	2	0	3	10	19	0	340	1253
03:10:00 PM	3	29	7	0	6	14	7	0	8	10	4	0	3	14	11	0	346	1288
03:15:00 PM	2	18	2	0	15	25	7	0	6	7	7	0	2	9	12	0	346	1322
03:20:00 PM	7	29	4	0	11	21	7	0	13	11	13	0	0	8	3	0	355	1363
03:25:00 PM	2	21	8	0	10	15	3	0	11	14	5	0	1	4	11	0	344	1391
03:30:00 PM	3	17	1	0	7	17	5	0	11	9	3	0	2	9	10	0	326	1367
03:35:00 PM	3	16	3	0	12	14	6	0	6	6	3	0	4	13	17	0	302	1373
03:40:00 PM	4	21	7	0	10	16	2	0	8	3	1	0	13	17	24	0	323	1369
03:45:00 PM	5	14	4	0	8	21	5	0	4	5	6	0	3	28	20	0	352	1367
03:50:00 PM	2	23	6	0	4	27	6	0	1	9	0	0	6	5	15	0	353	1350
03:55:00 PM	4	21	1	0	9	16	4	0	4	10	2	0	3	8	13	0	322	1335
04:00:00 PM	7	19	5	0	4	26	8	0	7	5	7	0	7	13	8	0	315	1339
04:05:00 PM	5	25	6	0	6	22	5	0	7	6	4	0	2	6	10	0	315	1325
04:10:00 PM	5	26	4	0	7	20	4	0	3	8	5	0	4	12	14	0	332	1321
04:15:00 PM	2	19	5	0	3	22	8	0	8	5	0	0	1	11	13	0	313	1306
04:20:00 PM	3	21	1	0	4	27	3	0	12	3	5	0	2	9	10	0	309	1279
04:25:00 PM	6	33	5	0	6	24	9	0	10	7	2	0	1	11	9	0	320	1297
04:30:00 PM	5	28	3	0	2	26	6	0	14	9	2	0	2	8	9	0	337	1317
04:35:00 PM	3	25	4	0	7	23	4	0	3	7	5	0	1	12	12	0	343	1320
04:40:00 PM	4	21	4	0	5	27	8	0	5	15	3	0	4	12	10	0	338	1312
04:45:00 PM	8	27	1	0	5	21	10	0	11	10	4	0	1	2	14	0	338	1303
04:50:00 PM	5	25	3	0	5	13	12	0	12	18	4	0	2	12	12	0	355	1322
04:55:00 PM	5	26	4	0	12	29	8	0	6	6	3	0	6	14	12	0	368	1358
05:00:00 PM	7	25	3	0	6	10	11	0	10	9	3	0	2	21	12	0	373	1361
05:05:00 PM	7	31	6	0	7	24	8	0	7	10	4	0	3	16	26	0	399	1406
05:10:00 PM	8	38	3	0	6	27	10	0	10	11	2	0	2	22	10	0	417	1443
05:15:00 PM	5	33	4	0	6	24	12	0	8	5	7	0	1	21	13	0	437	1485
05:20:00 PM	1	28	6	0	2	26	7	0	5	11	3	0	9	18	24	0	428	1525
05:25:00 PM	9	20	3	0	4	28	3	0	4	15	1	0	9	11	18	0	404	1527
05:30:00 PM	9	31	5	0	3	24	11	0	15	7	4	0	3	8	13	0	398	1546
05:35:00 PM	3	44	3	0	4	20	12	0	9	8	4	0	6	9	15	0	395	1577
05:40:00 PM	5	26	3	0	0	25	10	0	10	10	4	0	5	22	14	0	404	1593
05:45:00 PM	4	29	5	0	2	27	8	0	10	10	3	0	4	9	10	0	392	1600
05:50:00 PM	7	40	5	0	5	25	4	0	10	19	6	0	5	13	10	0	404	1626
05:55:00 PM	4	30	9	0	5	20	7	0	8	9	5	0	4	9	10	0	390	1615

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW 6th St*
E/W street	*SW Black Butte Blvd*
City, State	Redmond OR
Site Notes	
Location	44.275514 - -121.174284
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	02:10:00 PM
Peak 15 Min Start	02:20:00 PM
PHF (15-Min Int)	0.89



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	0	0	23	685	79	0	0	95	69	0	28	77	0	0	0	787	164	105	782	0	156	118

Percent Heavy Vehicles

0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	1.3%	0.0%	0.0%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	#DIV/0!	2.7%	1.2%	0.0%	2.6%	0.0%	0.6%	1.7%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHV - Pedestrians

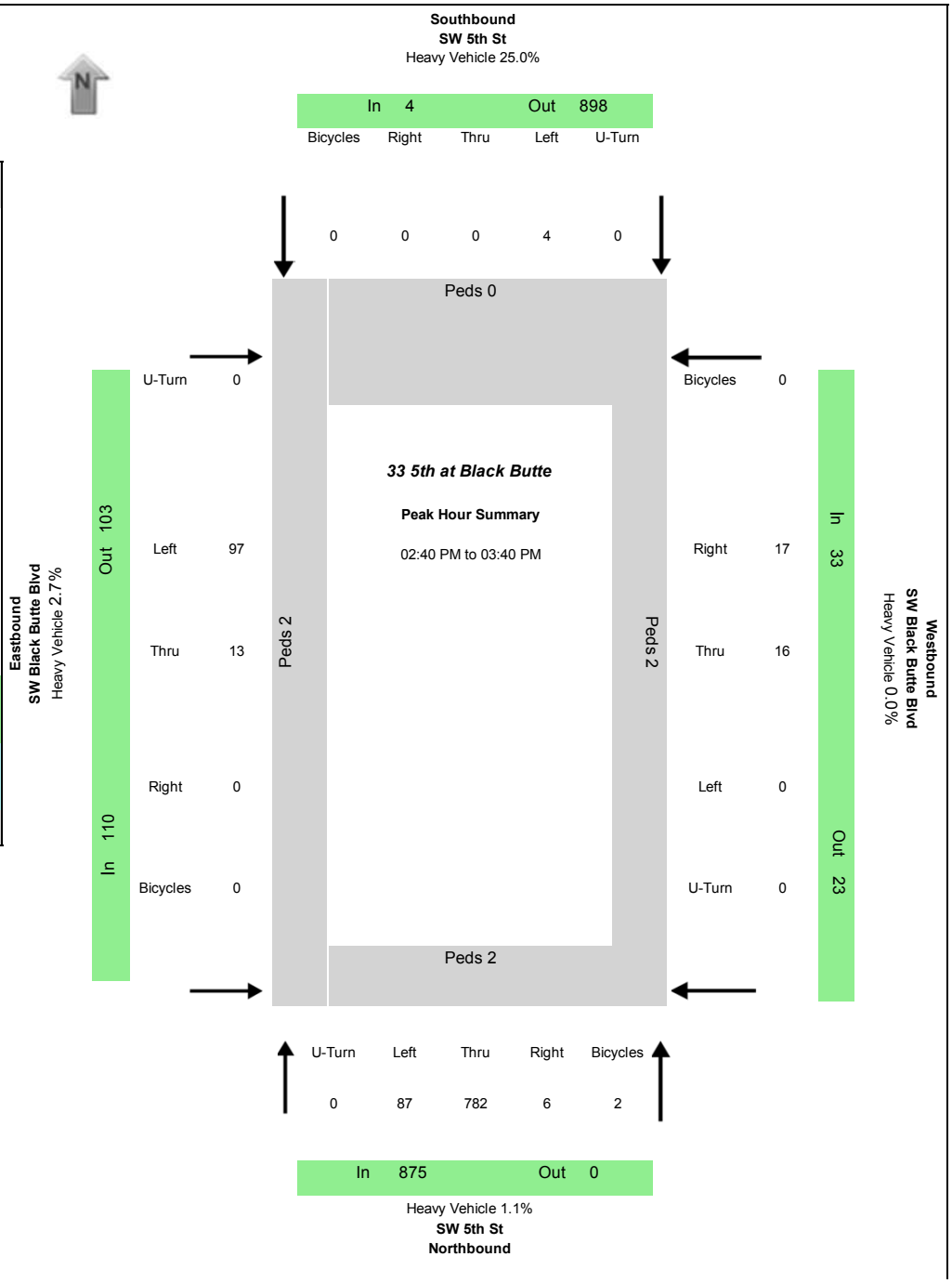
in Crosswalk				
NB	SB	EB	WB	**Sum**
4	3	1	3	11

All Vehicle Volumes

	Northbound SW 6th St				Southbound SW 6th St				Eastbound SW Black Butte Blvd				Westbound SW Black Butte Blvd				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0	0	0	0	3	63	8	0	0	8	4	0	5	5	0	0		
02:05:00 PM	0	0	0	0	2	45	9	0	0	8	5	0	2	10	0	0		
02:10:00 PM	0	0	0	0	1	48	4	0	0	5	7	0	2	5	0	0	249	
02:15:00 PM	0	0	0	0	0	56	12	0	0	7	5	0	1	3	0	0	237	
02:20:00 PM	0	0	0	0	4	65	8	0	0	12	6	0	3	10	0	0	264	
02:25:00 PM	0	0	0	0	2	73	5	0	0	7	2	0	6	3	0	0	290	
02:30:00 PM	0	0	0	0	1	60	8	0	0	4	8	0	2	8	0	0	297	
02:35:00 PM	0	0	0	0	0	49	7	0	0	4	7	0	1	5	0	0	262	
02:40:00 PM	0	0	0	0	1	51	7	0	0	10	10	0	3	5	0	0	251	
02:45:00 PM	0	0	0	0	1	47	4	0	0	7	3	0	2	10	0	0	234	
02:50:00 PM	0	0	0	0	4	60	8	0	0	10	2	0	2	9	0	0	256	
02:55:00 PM	0	0	0	0	3	57	6	0	0	10	5	0	1	7	0	0	258	1048
03:00:00 PM	0	0	0	0	3	63	4	0	0	8	8	0	2	5	0	0	277	1045
03:05:00 PM	0	0	0	0	3	56	6	0	0	11	6	0	3	7	0	0	274	1056
03:10:00 PM	0	0	0	0	4	51	3	0	0	8	2	0	1	3	0	0	257	1056
03:15:00 PM	0	0	0	0	0	36	5	0	0	8	4	0	4	6	0	0	227	1035
03:20:00 PM	0	0	0	0	4	47	6	0	0	11	5	0	0	3	0	0	211	1003
03:25:00 PM	0	0	0	0	0	46	3	0	0	10	4	0	2	10	0	0	214	980
03:30:00 PM	0	0	0	0	1	55	6	0	0	4	3	0	1	8	0	0	229	967
03:35:00 PM	0	0	0	0	2	49	11	0	0	1	6	0	2	4	0	0	228	969
03:40:00 PM	0	0	0	0	3	41	7	0	0	7	3	0	2	7	0	0	223	952
03:45:00 PM	0	0	0	0	2	53	7	0	0	5	4	0	2	3	0	0	221	954
03:50:00 PM	0	0	0	0	3	52	8	0	0	7	11	0	1	6	0	0	234	947
03:55:00 PM	0	0	0	0	3	43	7	0	0	6	9	0	2	5	0	0	239	933
04:00:00 PM	0	0	0	0	3	50	5	0	0	4	7	0	3	7	0	0	242	919
04:05:00 PM	0	0	0	0	5	52	11	0	0	3	5	0	2	3	0	0	235	908
04:10:00 PM	0	0	0	0	4	58	8	0	0	5	6	0	3	4	0	0	248	924
04:15:00 PM	0	0	0	0	1	36	10	0	0	1	7	0	4	7	0	0	235	927
04:20:00 PM	0	0	0	0	4	59	6	0	0	3	6	0	1	5	0	0	238	935
04:25:00 PM	0	0	0	0	2	52	9	0	0	5	3	0	3	7	0	0	231	941
04:30:00 PM	0	0	0	0	1	52	11	0	0	7	3	0	1	5	0	0	245	943
04:35:00 PM	0	0	0	0	0	73	7	0	0	6	6	0	3	7	0	0	263	970
04:40:00 PM	0	0	0	0	2	44	7	0	0	3	2	0	1	8	0	0	249	967
04:45:00 PM	0	0	0	0	1	52	6	0	0	10	8	0	2	6	0	0	254	976
04:50:00 PM	0	0	0	0	2	51	14	0	0	3	9	0	1	7	0	0	239	975
04:55:00 PM	0	0	0	0	4	48	11	0	0	2	4	0	2	11	0	0	254	982
05:00:00 PM	0	0	0	0	0	43	15	0	0	3	6	0	3	13	0	0	252	986
05:05:00 PM	0	0	0	0	0	45	8	0	0	7	8	0	3	8	0	0	244	984
05:10:00 PM	0	0	0	0	1	49	10	0	0	6	2	0	1	10	0	0	241	975
05:15:00 PM	0	0	0	0	1	44	9	0	0	4	5	0	2	12	0	0	235	986
05:20:00 PM	0	0	0	0	0	46	9	0	0	4	4	0	0	3	0	0	222	968
05:25:00 PM	0	0	0	0	2	50	7	0	0	3	5	0	0	11	0	0	221	965
05:30:00 PM	0	0	0	0	1	29	6	0	0	6	1	0	3	13	0	0	203	944
05:35:00 PM	0	0	0	0	0	50	5	0	0	4	7	0	1	5	0	0	209	914
05:40:00 PM	0	0	0	0	0	42	9	0	0	1	2	0	2	8	0	0	195	911
05:45:00 PM	0	0	0	0	0	29	3	0	0	3	6	0	1	9	0	0	187	877
05:50:00 PM	0	0	0	0	0	45	5	0	0	3	8	0	2	4	0	0	182	857
05:55:00 PM	0	0	0	0	0	33	7	0	0	7	5	0	0	7	0	0	177	834

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW 5th St*
E/W street	*SW Black Butte Blvd*
City, State	Redmond OR
Site Notes	
Location	44.275527 - -121.17322
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	33
Peak Hour Start	02:40:00 PM
Peak 15 Min Start	02:40:00 PM
PHF (15-Min Int)	0.88



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
87	782	6	0	4	0	0	0	97	13	0	0	0	16	17	0	875	4	110	33	0	896	103	23
Percent Heavy Vehicles																							
2.3%	1.0%	0.0%	0.0%	25.0%	0.0%	0.0%	0.0%	2.1%	7.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	25.0%	2.7%	0.0%	#DIV/0!	1.1%	1.9%	8.7%

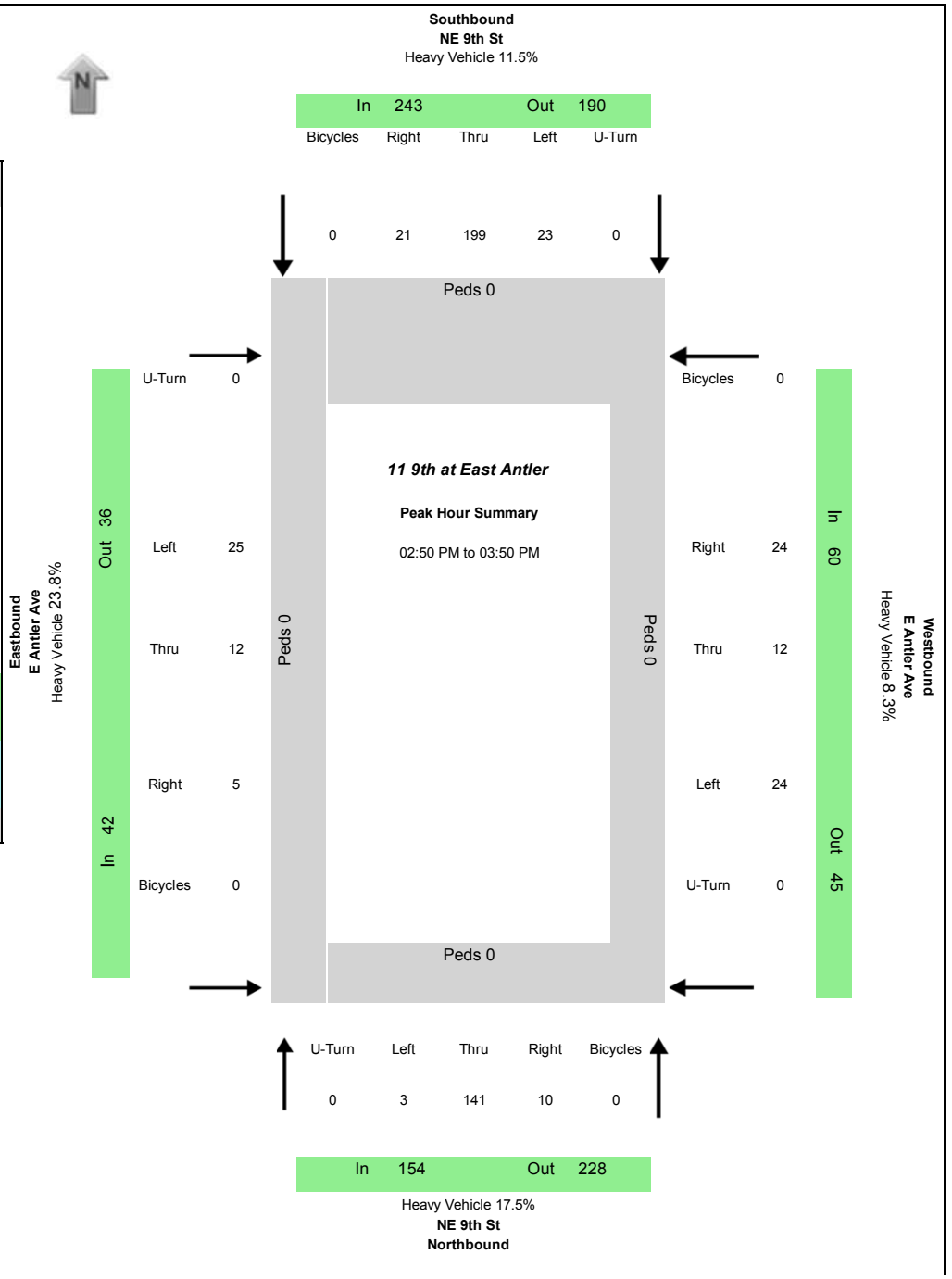
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2	2	6

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW 5th St				SW 5th St				SW Black Butte Blvd				SW Black Butte Blvd				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	10	54	0	0	0	0	0	0	7	2	0	0	0	0	0	0		
02:05:00 PM	10	81	0	0	0	0	0	0	7	3	0	0	0	3	0	0		
02:10:00 PM	7	52	0	0	0	0	0	0	7	0	0	0	0	1	0	0	244	
02:15:00 PM	4	70	0	0	0	0	0	0	6	0	0	0	0	0	2	0	253	
02:20:00 PM	7	52	0	0	0	0	0	0	12	2	0	0	0	5	1	0	228	
02:25:00 PM	6	52	0	0	0	0	0	0	8	1	0	0	0	1	1	0	230	
02:30:00 PM	10	58	0	0	0	0	0	0	3	1	0	0	0	2	0	0	222	
02:35:00 PM	5	56	0	0	0	0	0	0	4	0	0	0	0	0	0	0	208	
02:40:00 PM	5	81	0	0	0	0	0	0	5	1	0	0	0	3	3	0	237	
02:45:00 PM	11	75	0	0	0	0	0	0	9	2	0	0	0	0	1	0	261	
02:50:00 PM	7	67	0	0	0	0	0	0	11	2	0	0	0	4	2	0	289	
02:55:00 PM	9	55	1	0	0	0	0	0	12	0	0	0	0	0	1	0	269	980
03:00:00 PM	4	74	1	0	0	0	0	0	8	2	0	0	0	1	0	0	261	997
03:05:00 PM	8	63	2	0	0	0	0	0	8	2	0	0	0	2	0	0	253	978
03:10:00 PM	4	65	0	0	0	0	0	0	11	1	0	0	0	0	1	0	257	993
03:15:00 PM	9	63	0	0	0	0	0	0	8	0	0	0	0	2	2	0	251	995
03:20:00 PM	4	48	0	0	0	0	0	0	11	0	0	0	0	0	1	0	230	980
03:25:00 PM	13	60	2	0	1	0	0	0	8	1	0	0	0	0	1	0	234	997
03:30:00 PM	8	61	0	0	3	0	0	0	3	2	0	0	0	2	3	0	232	1005
03:35:00 PM	5	70	0	0	0	0	0	0	3	0	0	0	0	2	2	0	250	1022
03:40:00 PM	8	60	4	0	0	0	0	0	8	1	0	0	0	2	0	0	247	1007
03:45:00 PM	7	59	0	0	0	0	0	0	7	0	0	0	0	2	0	0	240	984
03:50:00 PM	4	61	0	0	0	0	0	0	6	1	0	0	0	3	1	0	234	967
03:55:00 PM	9	74	1	0	0	0	0	0	10	1	0	0	0	0	3	0	249	987
04:00:00 PM	8	74	0	0	0	0	0	0	4	1	0	0	0	4	1	0	266	989
04:05:00 PM	8	53	1	0	0	0	0	0	7	1	0	0	0	2	1	0	263	977
04:10:00 PM	6	62	0	0	0	0	0	0	7	1	0	0	0	0	1	0	242	972
04:15:00 PM	11	57	2	0	0	0	0	0	3	0	0	0	0	1	0	0	224	962
04:20:00 PM	9	67	0	0	0	0	0	0	4	0	0	0	0	0	0	0	231	978
04:25:00 PM	8	55	0	0	0	0	0	0	4	2	0	0	0	0	2	0	225	963
04:30:00 PM	7	63	2	0	0	0	0	0	4	3	0	0	0	1	1	0	232	962
04:35:00 PM	10	65	1	0	0	0	0	0	6	1	0	0	0	2	1	0	238	966
04:40:00 PM	12	60	0	0	0	0	0	0	3	1	0	0	0	1	1	0	245	961
04:45:00 PM	4	54	1	0	0	0	0	0	8	2	0	0	0	4	0	0	237	959
04:50:00 PM	10	66	0	0	0	0	0	0	6	1	0	0	0	1	0	0	235	967
04:55:00 PM	13	69	1	0	0	0	0	0	5	1	0	0	0	0	2	0	248	960
05:00:00 PM	12	86	0	0	0	0	0	0	3	0	0	0	0	4	1	0	281	974
05:05:00 PM	9	66	0	0	0	0	0	0	6	1	0	0	0	3	0	0	282	986
05:10:00 PM	6	60	0	0	0	0	0	0	6	1	0	0	0	6	0	0	270	988
05:15:00 PM	14	51	0	0	0	0	0	0	4	2	0	0	0	2	0	0	237	987
05:20:00 PM	3	74	0	0	0	0	0	0	2	1	0	0	0	0	0	0	232	987
05:25:00 PM	10	57	1	0	0	0	0	0	5	2	0	0	0	2	2	0	232	995
05:30:00 PM	12	66	0	0	0	0	0	0	7	0	0	0	0	3	0	0	247	1002
05:35:00 PM	4	68	1	0	0	0	0	0	3	0	0	0	0	2	1	0	246	995
05:40:00 PM	7	49	1	0	0	0	0	0	7	0	0	0	0	2	0	0	233	983
05:45:00 PM	8	53	0	0	0	0	0	0	2	0	0	0	0	1	0	0	209	974
05:50:00 PM	6	63	1	0	0	0	0	0	1	0	0	0	0	1	1	0	203	963
05:55:00 PM	7	52	0	0	0	0	0	0	5	1	0	0	0	1	0	0	203	938

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*NE 9th St*
E/W street	*E Antler Ave*
City, State	Redmond OR
Site Notes	
Location	44.276554 - -121.15882
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	11
Peak Hour Start	02:50:00 PM
Peak 15 Min Start	02:55:00 PM
PHF (15-Min Int)	0.90



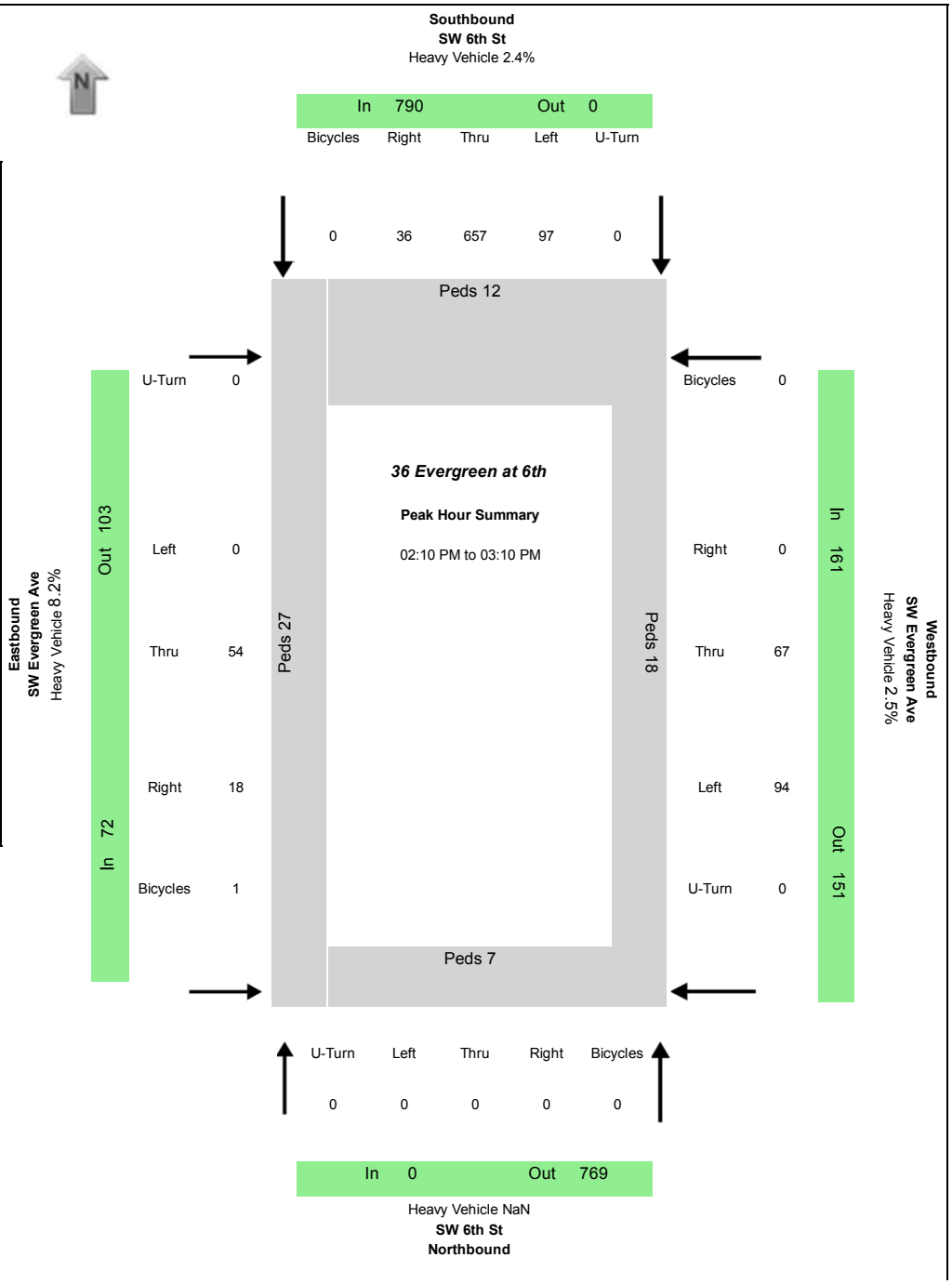
Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
3	141	10	0	23	199	21	0	25	12	5	0	24	12	24	0	154	243	42	60	228	190	36	45
Percent Heavy Vehicles																							
66.7%	17.7%	0.0%	0.0%	13.0%	10.1%	23.8%	0.0%	32.0%	8.3%	20.0%	0.0%	8.3%	0.0%	12.5%	0.0%	17.5%	11.5%	23.8%	8.3%	10.1%	18.9%	19.4%	8.9%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

All Vehicle Volumes																		
	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	NE 9th St				NE 9th St				E Antler Ave				E Antler Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	1	6	0	0	0	17	0	0	0	0	0	0	0	0	1	0		
02:05:00 PM	0	8	0	0	1	10	1	0	2	1	0	0	0	0	0	0		
02:10:00 PM	0	11	1	0	0	14	1	0	2	0	0	0	0	0	0	0	77	
02:15:00 PM	0	8	3	0	0	14	1	0	3	0	0	0	1	1	1	0	84	
02:20:00 PM	0	7	0	0	2	12	2	0	2	1	1	0	1	0	2	0	91	
02:25:00 PM	0	7	0	0	2	16	3	0	2	1	2	0	0	1	3	0	99	
02:30:00 PM	0	9	1	0	1	26	0	0	0	0	2	0	2	0	2	0	110	
02:35:00 PM	0	8	2	0	1	24	3	0	2	2	1	0	0	0	1	0	124	
02:40:00 PM	1	10	0	0	3	14	3	0	0	0	3	0	1	1	0	0	123	
02:45:00 PM	2	11	2	0	1	11	1	0	3	0	1	0	0	0	2	0	114	
02:50:00 PM	0	8	2	0	1	17	3	0	1	0	0	0	0	1	1	0	104	
02:55:00 PM	1	10	1	0	2	20	2	0	4	0	0	0	2	0	3	0	113	412
03:00:00 PM	0	10	0	0	3	16	2	0	3	2	1	0	4	2	1	0	123	431
03:05:00 PM	0	17	2	0	1	14	1	0	4	3	1	0	3	0	3	0	138	457
03:10:00 PM	1	8	1	0	2	13	0	0	2	2	0	0	3	3	2	0	130	465
03:15:00 PM	0	12	1	0	3	11	2	0	3	2	1	0	2	1	1	0	125	472
03:20:00 PM	0	11	2	0	2	14	1	0	0	0	0	0	5	1	4	0	116	482
03:25:00 PM	1	15	0	0	4	15	5	0	2	0	1	0	0	2	2	0	126	492
03:30:00 PM	0	8	1	0	1	24	1	0	4	2	1	0	1	0	1	0	131	493
03:35:00 PM	0	10	0	0	2	26	2	0	1	0	0	0	2	0	3	0	137	495
03:40:00 PM	0	16	0	0	1	19	2	0	0	0	0	0	0	0	1	0	129	498
03:45:00 PM	0	16	0	0	1	10	0	0	1	1	0	0	2	2	2	0	120	499
03:50:00 PM	0	11	0	0	2	14	0	0	2	0	0	0	2	1	2	0	108	499
03:55:00 PM	0	12	0	0	2	18	0	0	2	1	0	0	0	1	2	0	107	492
04:00:00 PM	0	14	0	0	1	12	1	0	1	0	1	0	2	1	1	0	106	482
04:05:00 PM	0	12	0	0	1	28	2	0	0	1	0	0	2	1	0	0	119	480
04:10:00 PM	1	11	2	0	1	18	1	0	0	0	0	0	1	0	0	0	116	478
04:15:00 PM	2	11	0	0	0	12	0	0	1	2	2	0	1	2	0	0	115	472
04:20:00 PM	0	9	0	0	1	20	1	0	2	0	0	0	1	3	3	0	108	472
04:25:00 PM	1	9	0	0	0	20	3	0	3	0	0	0	0	1	1	0	111	463
04:30:00 PM	0	16	0	0	1	16	2	0	1	0	1	0	0	0	0	0	115	456
04:35:00 PM	0	21	1	0	0	30	2	0	2	1	0	0	1	0	1	0	134	469
04:40:00 PM	0	12	0	0	1	19	1	0	1	1	1	0	1	2	3	0	138	472
04:45:00 PM	0	12	0	0	0	17	3	0	1	0	0	0	2	0	1	0	137	473
04:50:00 PM	0	9	0	0	0	19	0	0	1	0	1	0	1	1	0	0	110	471
04:55:00 PM	0	9	0	0	0	15	3	0	3	1	0	0	2	0	0	0	101	466
05:00:00 PM	0	16	0	0	0	16	2	0	4	0	1	0	1	0	1	0	106	473
05:05:00 PM	2	12	0	0	1	23	2	0	5	0	0	0	2	0	0	0	121	473
05:10:00 PM	0	10	0	0	1	17	2	0	1	0	1	0	0	0	0	0	120	470
05:15:00 PM	0	7	1	0	0	27	0	0	3	1	1	0	0	0	1	0	120	478
05:20:00 PM	1	15	0	0	0	15	2	0	1	0	1	0	1	0	1	0	110	475
05:25:00 PM	3	7	0	0	0	16	5	0	0	0	0	0	1	0	0	0	110	469
05:30:00 PM	0	9	0	0	1	13	1	0	8	1	1	0	0	0	0	0	103	466
05:35:00 PM	0	6	0	0	0	13	0	0	3	1	0	0	1	0	0	0	90	431
05:40:00 PM	1	14	1	0	0	7	1	0	3	0	1	1	0	0	0	0	87	418
05:45:00 PM	1	9	0	0	2	6	2	0	1	0	0	0	0	0	1	0	75	404
05:50:00 PM	0	6	1	0	0	10	0	0	2	0	1	0	0	0	1	0	72	393
05:55:00 PM	0	7	0	0	1	10	0	0	2	0	0	0	0	1	0	0	64	381

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	***SW 6th St***
E/W street	***SW Evergreen Ave***
City, State	Redmond OR
Site Notes	
Location	44.27256 - -121.174282
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	02:10:00 PM
Peak 15 Min Start	02:20:00 PM
PHF (15-Min Int)	0.91



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	0	0	97	657	36	0	0	54	18	0	94	67	0	0	0	790	72	161	769	0	103	151
Percent Heavy Vehicles																							
0.0%	0.0%	0.0%	0.0%	4.1%	2.1%	2.8%	0.0%	0.0%	11.1%	0.0%	0.0%	1.1%	4.5%	0.0%	0.0%	#DIV/0!	2.4%	8.3%	2.5%	2.0%	0.0%	3.9%	6.6%

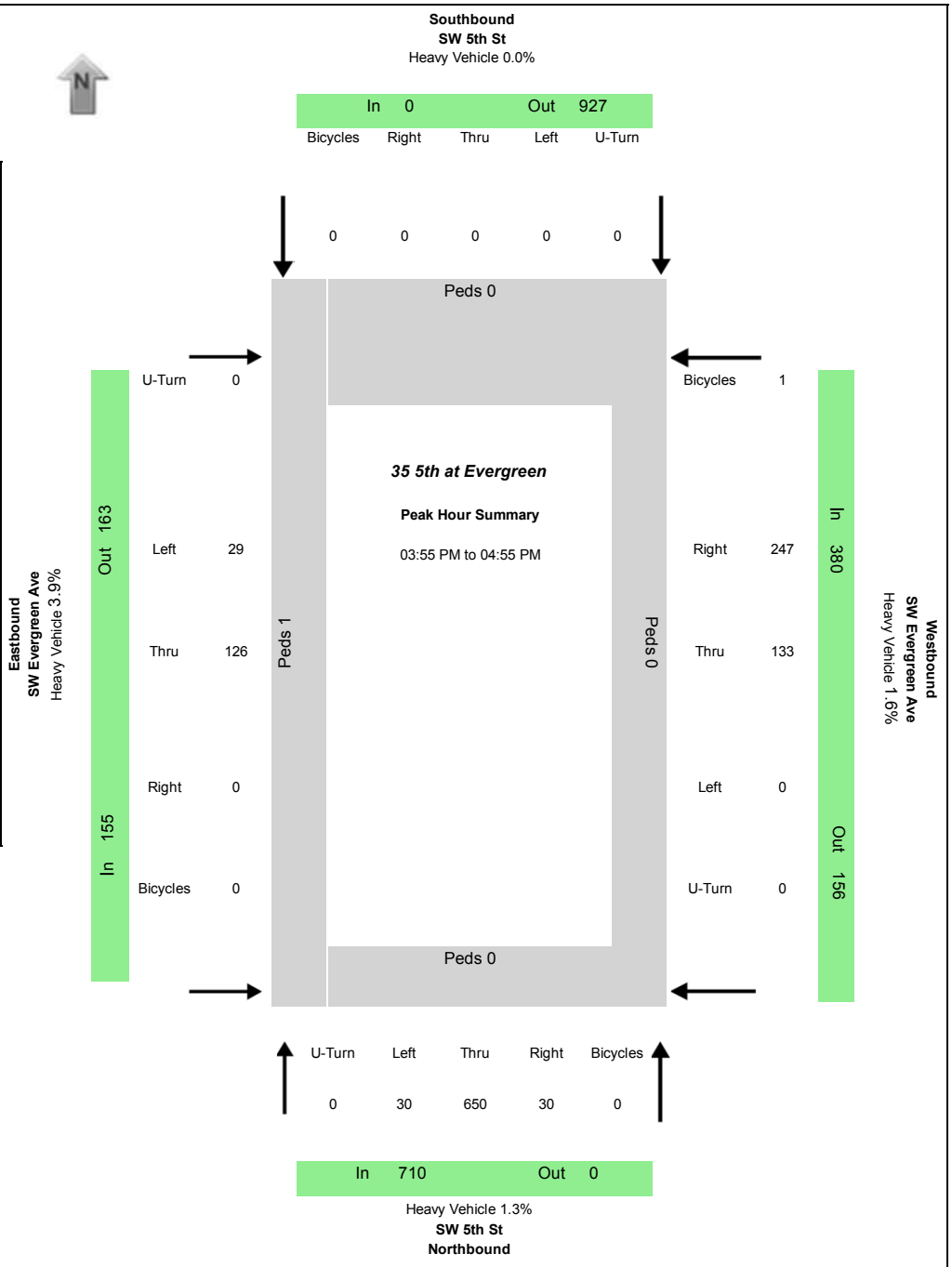
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	7	12	27	18	64

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW 6th St				SW 6th St				SW Evergreen Ave				SW Evergreen Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0	0	0	0	3	72	3	0	0	3	1	0	11	7	0	0		
02:05:00 PM	0	0	0	0	7	45	2	0	0	7	1	0	8	9	0	0		
02:10:00 PM	0	0	0	0	11	47	1	0	0	5	0	0	8	4	0	0	255	
02:15:00 PM	0	0	0	0	12	52	0	0	0	6	3	0	3	6	0	0	237	
02:20:00 PM	0	0	0	0	7	62	3	0	0	3	1	0	8	3	0	0	245	
02:25:00 PM	0	0	0	0	4	62	6	0	0	5	4	0	12	4	0	0	266	
02:30:00 PM	0	0	0	0	6	66	6	0	0	4	0	0	9	7	0	0	282	
02:35:00 PM	0	0	0	0	2	51	1	0	0	5	1	0	7	8	0	0	270	
02:40:00 PM	0	0	0	0	11	52	2	0	0	5	2	0	9	6	0	0	260	
02:45:00 PM	0	0	0	0	8	47	2	0	0	5	1	0	7	7	0	0	239	
02:50:00 PM	0	0	0	0	14	56	7	0	0	1	1	0	6	6	0	0	255	
02:55:00 PM	0	0	0	0	9	39	3	0	0	6	1	0	8	7	0	0	241	1022
03:00:00 PM	0	0	0	0	7	63	2	0	0	7	2	0	6	4	0	0	255	1013
03:05:00 PM	0	0	0	0	6	60	3	0	0	2	2	0	11	5	0	0	253	1023
03:10:00 PM	0	0	0	0	4	46	3	0	0	7	0	0	6	6	0	0	252	1019
03:15:00 PM	0	0	0	0	4	34	1	0	0	7	3	0	13	5	0	0	228	1004
03:20:00 PM	0	0	0	0	8	50	3	0	0	3	1	0	5	6	0	0	215	993
03:25:00 PM	0	0	0	0	6	46	1	0	0	6	1	0	5	5	0	0	213	966
03:30:00 PM	0	0	0	0	6	46	2	0	0	3	2	0	17	7	0	0	229	951
03:35:00 PM	0	0	0	0	7	50	3	0	0	4	1	0	6	3	0	0	227	950
03:40:00 PM	0	0	0	0	5	35	0	0	0	2	0	0	6	7	0	0	212	918
03:45:00 PM	0	0	0	0	5	53	2	0	0	6	3	0	5	4	0	0	207	919
03:50:00 PM	0	0	0	0	4	55	4	0	0	5	2	0	8	4	0	0	215	910
03:55:00 PM	0	0	0	0	6	50	4	0	0	3	0	0	9	6	0	0	238	915
04:00:00 PM	0	0	0	0	7	52	3	0	0	6	5	0	3	6	0	0	242	906
04:05:00 PM	0	0	0	0	6	54	0	0	0	4	1	0	11	10	0	0	246	903
04:10:00 PM	0	0	0	0	9	58	0	0	0	8	1	0	6	6	0	0	256	919
04:15:00 PM	0	0	0	0	11	47	5	0	0	2	0	0	7	4	0	0	250	928
04:20:00 PM	0	0	0	0	9	49	2	0	0	3	2	0	3	2	0	0	234	922
04:25:00 PM	0	0	0	0	12	52	1	0	0	5	0	0	9	6	0	0	231	937
04:30:00 PM	0	0	0	0	7	54	7	0	0	6	2	0	2	5	0	0	238	937
04:35:00 PM	0	0	0	0	10	64	2	0	0	5	2	0	12	5	0	0	268	963
04:40:00 PM	0	0	0	0	5	53	3	0	0	2	2	0	12	8	0	0	268	993
04:45:00 PM	0	0	0	0	8	49	4	0	0	10	2	0	6	5	0	0	269	999
04:50:00 PM	0	0	0	0	13	43	0	0	0	2	0	0	12	7	0	0	246	994
04:55:00 PM	0	0	0	0	6	50	1	0	0	4	0	0	4	4	0	0	230	985
05:00:00 PM	0	0	0	0	9	59	1	0	0	4	0	0	10	3	0	0	232	989
05:05:00 PM	0	0	0	0	5	52	2	0	0	6	1	0	6	3	0	0	230	978
05:10:00 PM	0	0	0	0	4	50	1	0	0	8	1	0	5	3	0	0	233	962
05:15:00 PM	0	0	0	0	6	47	3	0	0	3	1	0	8	4	0	0	219	958
05:20:00 PM	0	0	0	0	5	48	1	0	0	2	3	0	7	3	0	0	213	957
05:25:00 PM	0	0	0	0	8	52	4	0	0	2	1	0	10	9	0	0	227	958
05:30:00 PM	0	0	0	0	6	27	1	0	0	9	5	0	4	4	0	0	211	931
05:35:00 PM	0	0	0	0	11	45	6	0	0	3	1	0	1	9	0	0	218	907
05:40:00 PM	0	0	0	0	11	36	3	0	0	6	2	0	7	6	0	0	203	893
05:45:00 PM	0	0	0	0	4	38	5	0	0	7	2	0	10	2	0	0	215	877
05:50:00 PM	0	0	0	0	7	42	5	0	0	3	1	0	7	6	0	0	210	871
05:55:00 PM	0	0	0	0	7	43	1	0	0	6	0	0	3	4	0	0	203	866

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW 5th St*
E/W street	*SW Evergreen Ave*
City, State	Redmond OR
Site Notes	
Location	44.272561 - -121.173206
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	03:55:00 PM
Peak 15 Min Start	03:55:00 PM
PHF (15-Min Int)	0.96



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
30	650	30	0	0	0	0	0	29	126	0	0	0	133	247	0	710	0	155	380	0	926	163	156

Percent Heavy Vehicles

3.3%	1.1%	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	3.4%	4.0%	0.0%	0.0%	0.0%	2.3%	1.2%	0.0%	1.3%	0.0%	3.9%	1.6%	#DIV/0!	1.2%	2.5%	3.8%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1

PHV - Pedestrians

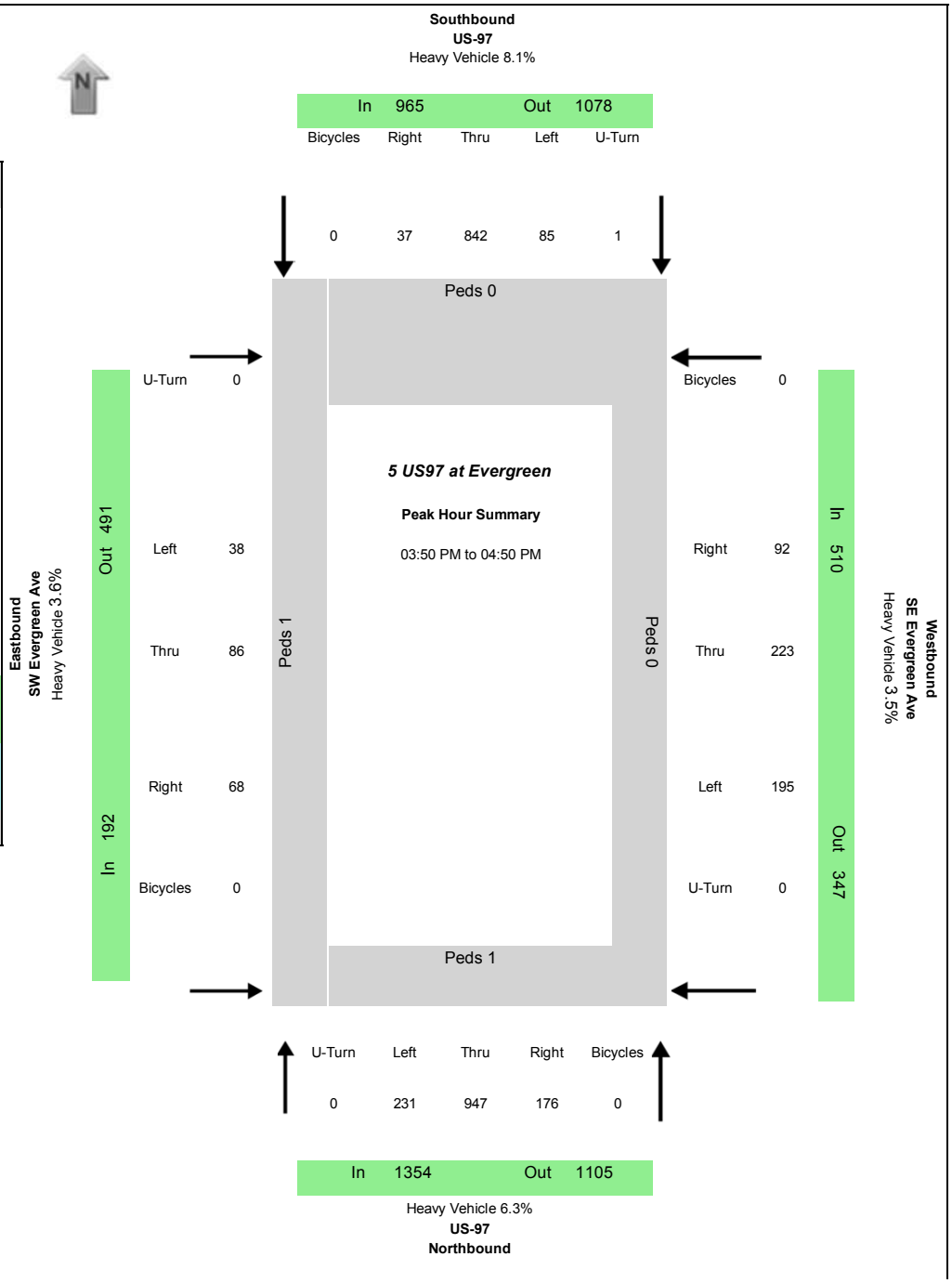
in Crosswalk				
NB	SB	EB	WB	Sum
0	0	1	0	1

All Vehicle Volumes

	Northbound				Southbound				Eastbound				Westbound					
	SW 5th St				SW 5th St				SW Evergreen Ave				SW Evergreen Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	6	51	3	0	0	0	0	0	4	7	0	0	0	11	14	0		
02:05:00 PM	7	47	2	0	0	0	0	0	3	11	0	0	0	8	31	0		
02:10:00 PM	2	56	0	0	0	0	0	0	0	15	0	0	0	10	17	0	305	
02:15:00 PM	1	42	1	0	0	0	0	0	3	13	0	0	0	8	23	0	300	
02:20:00 PM	3	50	4	0	0	0	0	0	2	11	0	0	0	7	10	0	278	
02:25:00 PM	1	38	2	0	0	0	0	0	2	11	0	0	0	15	14	0	261	
02:30:00 PM	2	45	6	0	0	0	0	0	1	8	0	0	0	16	14	0	262	
02:35:00 PM	1	49	1	0	0	0	0	0	2	5	0	0	0	13	13	0	259	
02:40:00 PM	3	71	5	0	0	0	0	0	2	14	0	0	0	12	17	0	300	
02:45:00 PM	1	64	2	0	0	0	0	0	2	13	0	0	0	12	19	0	321	
02:50:00 PM	1	55	4	0	0	0	0	0	3	12	0	0	0	11	11	0	334	
02:55:00 PM	3	59	0	0	0	0	0	0	2	12	0	0	0	11	17	0	314	1180
03:00:00 PM	0	52	1	0	0	0	0	0	4	10	0	0	0	10	15	0	293	1176
03:05:00 PM	4	46	3	0	0	0	0	0	1	8	0	0	0	12	22	0	292	1163
03:10:00 PM	0	51	2	0	0	0	0	0	2	9	0	0	0	9	18	0	279	1154
03:15:00 PM	3	50	4	0	0	0	0	0	2	7	0	0	0	14	23	0	290	1166
03:20:00 PM	2	37	3	0	0	0	0	0	0	12	0	0	0	8	15	0	271	1156
03:25:00 PM	1	59	2	0	0	0	0	0	2	9	0	0	0	10	28	0	291	1184
03:30:00 PM	5	50	0	0	0	0	0	0	1	9	0	0	0	17	16	0	286	1190
03:35:00 PM	2	58	5	0	0	0	0	0	4	5	0	0	0	6	13	0	302	1199
03:40:00 PM	3	61	3	0	0	0	0	0	2	7	0	0	0	11	16	0	294	1178
03:45:00 PM	3	50	2	0	0	0	0	0	1	9	0	0	0	6	17	0	284	1153
03:50:00 PM	4	45	3	0	0	0	0	0	1	8	0	0	0	9	17	0	278	1143
03:55:00 PM	3	71	2	0	0	0	0	0	1	10	0	0	0	13	24	0	299	1163
04:00:00 PM	3	59	3	0	0	0	0	0	1	10	0	0	0	7	19	0	313	1173
04:05:00 PM	1	42	0	0	0	0	0	0	4	8	0	0	0	20	22	0	323	1174
04:10:00 PM	0	53	3	0	0	0	0	0	0	11	0	0	0	13	23	0	302	1186
04:15:00 PM	2	55	4	0	0	0	0	0	2	13	0	0	0	9	20	0	305	1188
04:20:00 PM	3	51	0	0	0	0	0	0	1	9	0	0	0	4	21	0	297	1200
04:25:00 PM	1	60	7	0	0	0	0	0	2	14	0	0	0	12	17	0	307	1202
04:30:00 PM	4	56	1	0	0	0	0	0	3	12	0	0	0	5	15	0	298	1200
04:35:00 PM	4	52	4	0	0	0	0	0	3	9	0	0	0	14	24	0	319	1217
04:40:00 PM	5	35	0	0	0	0	0	0	3	7	0	0	0	13	35	0	304	1212
04:45:00 PM	3	50	3	0	0	0	0	0	6	11	0	0	0	7	11	0	299	1215
04:50:00 PM	1	66	3	0	0	0	0	0	3	12	0	0	0	16	16	0	306	1245
04:55:00 PM	1	55	2	0	0	0	0	0	4	7	0	0	0	7	22	0	306	1219
05:00:00 PM	3	68	3	0	0	0	0	0	3	9	0	0	0	10	23	0	334	1236
05:05:00 PM	0	46	2	0	0	0	0	0	0	8	0	0	0	9	22	0	304	1226
05:10:00 PM	0	44	2	0	0	0	0	0	4	11	0	0	0	8	26	0	301	1218
05:15:00 PM	1	62	2	0	0	0	0	0	2	9	0	0	0	8	11	0	277	1208
05:20:00 PM	4	61	6	0	0	0	0	0	1	7	0	0	0	7	13	0	289	1218
05:25:00 PM	2	50	0	0	0	0	0	0	3	6	0	0	0	17	17	0	289	1200
05:30:00 PM	0	42	1	0	0	0	0	0	5	8	0	0	0	10	24	0	284	1194
05:35:00 PM	2	55	3	0	0	0	0	0	2	13	0	0	0	9	15	0	284	1183
05:40:00 PM	0	46	1	0	0	0	0	0	5	7	0	0	0	14	13	0	275	1171
05:45:00 PM	2	27	6	0	0	0	0	0	2	10	0	0	0	9	23	0	264	1159
05:50:00 PM	1	58	2	0	0	0	0	0	4	9	0	0	0	10	10	0	259	1136
05:55:00 PM	0	46	1	0	0	0	0	0	2	10	0	0	0	6	14	0	252	1117

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	***US-97***
E/W street	***SW Evergreen Ave***
City, State	Redmond OR
Site Notes	
Location	44.272584 - -121.169952
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	5
Peak Hour Start	03:50:00 PM
Peak 15 Min Start	04:35:00 PM
PHF (15-Min Int)	0.94



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
231	947	176	0	85	842	37	1	38	86	68	0	195	223	92	0	1354	965	192	510	1105	1078	491	347
Percent Heavy Vehicles																							
0.9%	6.5%	11.9%	0.0%	4.7%	8.8%	0.0%	0.0%	5.3%	2.3%	4.4%	0.0%	4.6%	1.8%	5.4%	0.0%	6.3%	8.1%	3.6%	3.5%	7.8%	6.4%	1.2%	7.8%

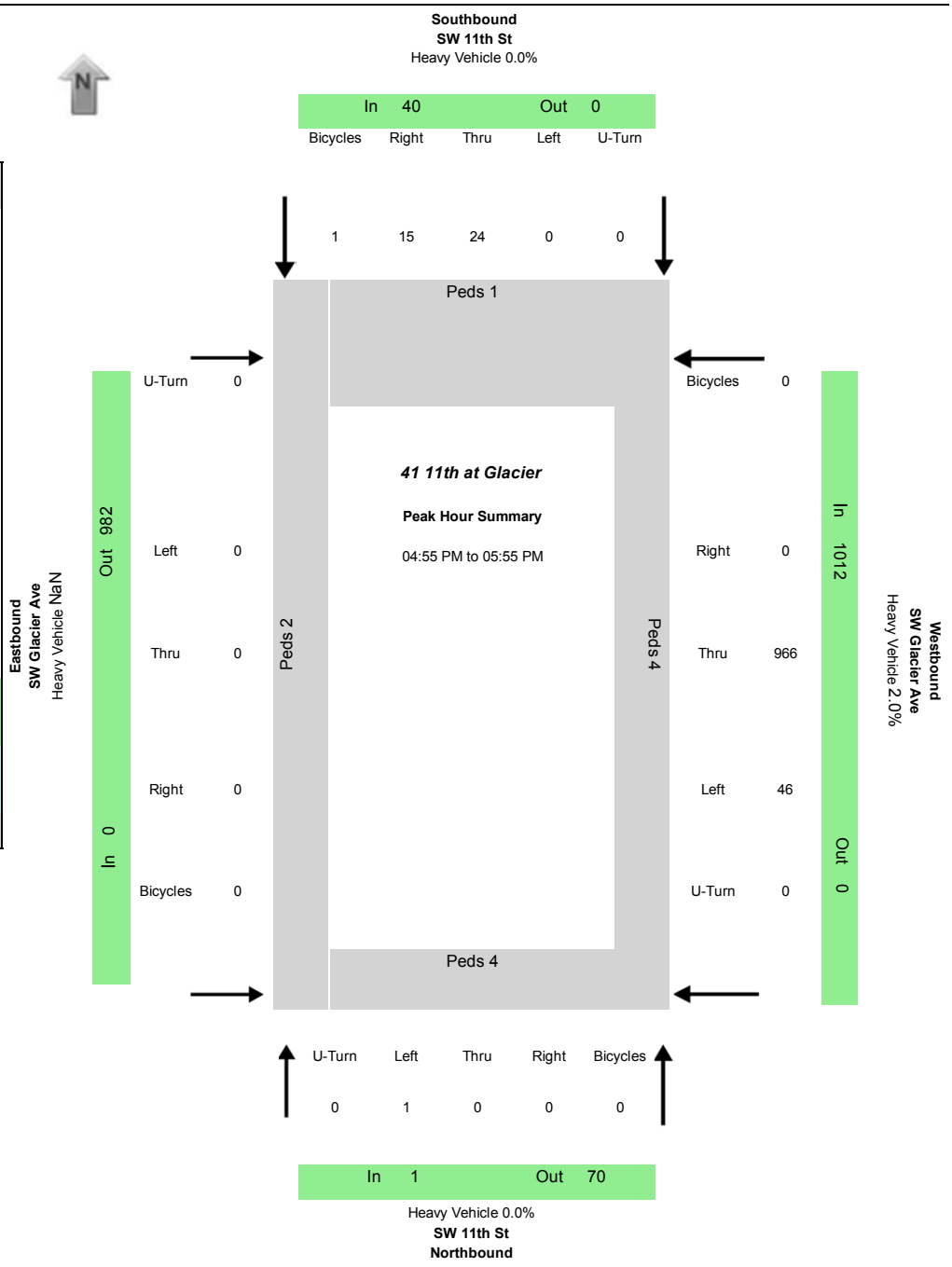
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2

All Vehicle Volumes

	Northbound US-97				**Southbound** US-97				**Eastbound** SW Evergreen Ave				**Westbound** SE Evergreen Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	11	60	14	0	4	76	5	0	5	7	5	0	11	12	3	0		
02:05:00 PM	26	56	14	0	2	50	3	0	3	6	7	0	15	24	6	0		
02:10:00 PM	13	87	14	0	10	70	2	0	2	7	6	0	10	12	2	0	660	
02:15:00 PM	22	55	13	0	3	46	4	0	3	11	5	0	13	16	7	0	645	
02:20:00 PM	10	86	11	0	9	68	1	0	3	10	4	0	11	7	2	0	655	
02:25:00 PM	19	57	14	0	8	48	0	0	4	9	1	0	11	26	7	0	624	
02:30:00 PM	7	90	18	0	3	68	0	0	3	4	4	0	17	11	1	0	652	
02:35:00 PM	18	55	14	0	0	59	3	0	3	0	4	0	18	14	4	0	622	
02:40:00 PM	8	62	16	0	12	75	2	0	4	11	8	0	16	22	11	0	665	
02:45:00 PM	16	48	13	0	13	48	5	0	7	7	7	0	14	22	0	0	639	
02:50:00 PM	14	81	19	0	5	84	4	0	4	6	9	0	13	8	3	0	697	
02:55:00 PM	23	49	14	0	11	60	4	0	0	9	8	0	14	12	6	0	660	2609
03:00:00 PM	19	69	12	0	7	81	1	0	6	1	4	0	16	10	7	0	693	2629
03:05:00 PM	14	79	25	0	2	59	5	0	4	11	5	0	13	12	3	0	675	2649
03:10:00 PM	23	63	9	0	2	82	0	0	2	6	4	0	13	19	5	0	693	2642
03:15:00 PM	13	91	15	0	9	67	3	0	2	5	4	0	9	13	7	0	698	2682
03:20:00 PM	10	69	21	0	4	42	3	0	6	13	6	0	13	18	6	0	677	2671
03:25:00 PM	23	62	10	0	5	68	3	0	5	5	2	0	15	26	1	0	674	2692
03:30:00 PM	12	87	6	0	10	82	6	0	1	6	6	0	17	19	7	0	695	2725
03:35:00 PM	12	68	14	0	5	57	2	1	0	6	6	0	30	26	13	0	724	2773
03:40:00 PM	7	36	18	0	8	56	4	0	2	12	4	0	25	18	7	0	696	2723
03:45:00 PM	16	102	12	0	5	88	4	0	1	3	6	0	16	9	7	0	706	2792
03:50:00 PM	23	70	13	0	5	54	3	0	6	4	3	0	13	24	4	0	688	2764
03:55:00 PM	14	72	23	0	13	75	4	0	2	8	4	0	16	13	11	0	746	2809
04:00:00 PM	19	75	18	0	10	89	6	0	1	3	6	0	13	16	6	0	739	2838
04:05:00 PM	28	58	18	0	5	60	5	0	4	7	6	0	26	33	5	0	772	2861
04:10:00 PM	17	96	16	0	7	81	3	0	3	10	4	0	14	16	7	0	791	2907
04:15:00 PM	16	65	10	0	8	73	0	0	4	7	5	0	17	20	6	0	760	2900
04:20:00 PM	26	68	13	0	3	55	2	0	3	5	6	0	18	22	4	0	730	2914
04:25:00 PM	8	111	11	0	10	86	3	0	4	7	7	0	8	10	5	0	726	2959
04:30:00 PM	24	68	15	0	5	40	3	0	1	12	7	0	22	15	11	0	718	2923
04:35:00 PM	9	97	17	0	3	95	2	0	2	10	8	0	16	21	13	0	786	2976
04:40:00 PM	35	53	6	0	12	54	4	1	4	8	6	0	18	25	13	0	755	3018
04:45:00 PM	12	114	16	0	4	80	2	0	4	5	6	0	14	8	7	0	804	3021
04:50:00 PM	25	56	12	0	3	49	1	0	2	7	8	0	27	20	8	0	729	3017
04:55:00 PM	12	79	13	0	12	57	2	0	6	7	2	0	12	19	4	0	715	2987
05:00:00 PM	22	60	10	0	9	58	0	0	3	6	3	0	22	19	6	0	661	2943
05:05:00 PM	16	104	24	0	5	78	2	0	4	8	7	0	19	15	8	0	733	2978
05:10:00 PM	22	84	8	0	6	61	4	0	7	3	5	0	24	20	8	0	760	2956
05:15:00 PM	11	76	12	0	2	76	1	0	3	6	4	0	25	10	5	0	773	2956
05:20:00 PM	13	60	19	0	9	72	1	0	5	4	6	0	11	15	5	0	703	2951
05:25:00 PM	21	81	12	0	5	96	3	0	3	1	5	0	22	19	5	0	724	2954
05:30:00 PM	16	79	19	0	10	55	2	0	0	1	5	0	15	18	7	0	720	2958
05:35:00 PM	25	81	9	0	4	61	3	0	7	6	6	0	17	11	2	0	732	2897
05:40:00 PM	15	93	11	0	9	54	3	0	2	4	3	0	18	9	2	0	682	2881
05:45:00 PM	20	73	12	0	6	56	1	0	2	7	13	0	8	13	4	0	670	2824
05:50:00 PM	15	69	9	0	5	67	2	0	3	6	5	0	6	6	3	0	634	2802
05:55:00 PM	14	72	13	0	2	62	0	0	6	4	4	0	17	6	1	0	612	2778

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW 11th St*
E/W street	*SW Glacier Ave*
City, State	Redmond OR
Site Notes	
Location	44.270579 - -121.179634
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	41
Peak Hour Start	04:55:00 PM
Peak 15 Min Start	05:00:00 PM
PHF (15-Min Int)	0.90



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
1	0	0	0	0	24	15	0	0	0	0	0	46	966	0	0	1	39	0	1012	70	0	982	0

Percent Heavy Vehicles

0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.1%	0.0%	0.0%	0.0%	0.0%	#DIV/0!	2.0%	0.0%	0.0%	2.0%	0.0%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum
0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1

PHV - Pedestrians

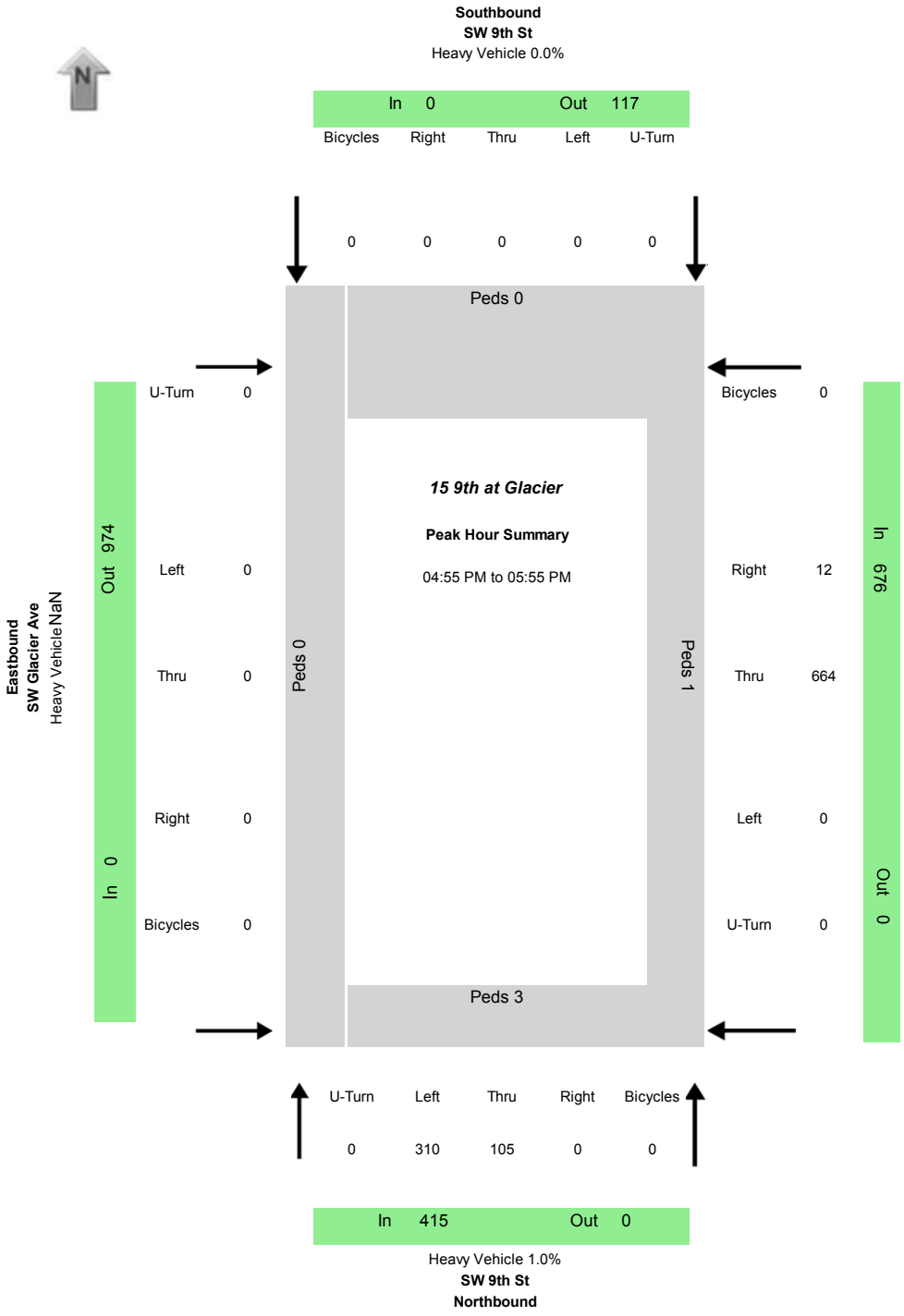
in Crosswalk				
NB	SB	EB	WB	Sum
4	1	2	4	11

All Vehicle Volumes

	Northbound SW 11th St				Southbound SW 11th St				Eastbound SW Glacier Ave				Westbound SW Glacier Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	82	0	0		
02:05:00 PM	0	0	0	0	0	1	2	0	0	0	0	0	4	64	0	0		
02:10:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	5	65	0	0	226	
02:15:00 PM	0	0	0	0	0	3	2	0	0	0	0	0	9	61	0	0	217	
02:20:00 PM	0	0	0	0	0	1	2	0	0	0	0	0	4	57	0	0	210	
02:25:00 PM	0	0	0	0	0	6	1	0	0	0	0	0	5	63	0	0	214	
02:30:00 PM	0	0	0	0	0	4	0	0	0	0	0	0	3	66	0	0	212	
02:35:00 PM	0	0	0	0	0	4	2	0	0	0	0	0	5	71	0	0	230	
02:40:00 PM	0	0	0	0	0	2	2	0	0	0	0	0	4	62	0	0	225	
02:45:00 PM	0	0	0	0	0	3	1	0	0	0	0	0	3	48	0	0	207	
02:50:00 PM	0	0	0	0	0	2	1	0	0	0	0	0	6	65	0	0	199	
02:55:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	4	66	0	0	200	865
03:00:00 PM	0	0	0	0	0	2	2	0	0	0	0	0	6	70	0	0	225	861
03:05:00 PM	0	0	0	0	0	4	1	0	0	0	0	0	7	63	0	0	226	865
03:10:00 PM	0	0	0	0	0	7	1	0	0	0	0	0	6	56	0	0	225	864
03:15:00 PM	0	0	0	0	0	5	1	0	0	0	0	0	10	55	0	0	216	860
03:20:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	4	67	0	0	214	869
03:25:00 PM	0	0	0	0	0	6	2	0	0	0	0	0	8	58	0	0	218	868
03:30:00 PM	0	0	0	0	0	4	2	0	0	0	0	0	3	67	0	0	223	871
03:35:00 PM	0	0	0	0	0	2	1	0	0	0	0	0	7	87	0	0	247	886
03:40:00 PM	0	0	0	0	0	3	2	0	0	0	0	0	2	64	0	0	244	887
03:45:00 PM	0	0	0	0	0	3	1	0	0	0	0	0	2	80	0	0	254	918
03:50:00 PM	0	0	0	0	0	1	1	0	0	0	0	0	3	59	0	0	221	908
03:55:00 PM	0	0	0	0	0	6	1	0	0	0	0	0	4	66	0	0	227	914
04:00:00 PM	0	0	0	0	0	1	1	0	0	0	0	0	4	75	0	0	222	915
04:05:00 PM	0	0	0	0	0	4	0	0	0	0	0	0	7	81	0	0	250	932
04:10:00 PM	0	0	0	0	0	4	0	0	0	0	0	0	6	77	0	0	260	949
04:15:00 PM	0	0	0	0	0	3	0	0	0	0	0	0	7	64	0	0	253	952
04:20:00 PM	0	0	0	0	0	7	0	0	0	0	0	0	4	63	0	0	235	953
04:25:00 PM	0	0	0	0	0	9	2	0	0	0	0	0	7	64	0	0	230	961
04:30:00 PM	0	0	0	0	0	3	0	0	0	0	0	0	3	77	0	0	239	968
04:35:00 PM	0	0	0	0	0	3	1	0	0	0	0	0	2	83	0	0	254	960
04:40:00 PM	0	0	0	0	0	2	2	0	0	0	0	0	6	57	0	0	239	956
04:45:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	5	70	0	0	233	947
04:50:00 PM	0	0	0	0	0	3	1	0	0	0	0	0	3	74	0	0	225	964
04:55:00 PM	0	0	0	0	0	1	1	0	0	0	0	0	3	73	0	0	236	965
05:00:00 PM	0	0	0	0	0	1	4	0	0	0	0	0	4	86	0	0	254	979
05:05:00 PM	0	0	0	0	0	4	0	0	0	0	0	0	5	83	0	0	265	979
05:10:00 PM	0	0	0	0	0	1	1	0	0	0	0	0	7	97	0	0	293	998
05:15:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	80	0	0	280	1006
05:20:00 PM	0	0	0	0	0	1	2	0	0	0	0	0	8	73	0	0	272	1016
05:25:00 PM	0	0	0	0	0	1	2	0	0	0	0	0	4	79	0	0	252	1020
05:30:00 PM	1	0	0	0	0	1	2	0	0	0	0	0	3	68	0	0	245	1012
05:35:00 PM	0	0	0	0	0	3	0	0	0	0	0	0	3	79	0	0	246	1008
05:40:00 PM	0	0	0	0	0	3	2	0	0	0	0	0	4	77	0	0	246	1027
05:45:00 PM	0	0	0	0	0	4	1	0	0	0	0	0	2	77	0	0	255	1034
05:50:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	3	94	0	0	269	1052
05:55:00 PM	0	0	0	0	0	4	0	0	0	0	0	0	2	66	0	0	255	1046

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	***SW 9th St***
E/W street	***SW Glacier Ave***
City, State	Redmond OR
Site Notes	
Location	44.27058 - -121.177472
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:55:00 PM
Peak 15 Min Start	05:00:00 PM
PHF (15-Min Int)	0.86



Peak-Hour Volumes (PHV)																							
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
310	105	0	0	0	0	0	0	0	0	0	0	0	664	12	0	415	0	0	676	0	117	974	0
Percent Heavy Vehicles																							
1.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.0%	0.0%	1.0%	0.0%	#DIV/0!	1.9%	#DIV/0!	0.9%	1.6%	0.0%

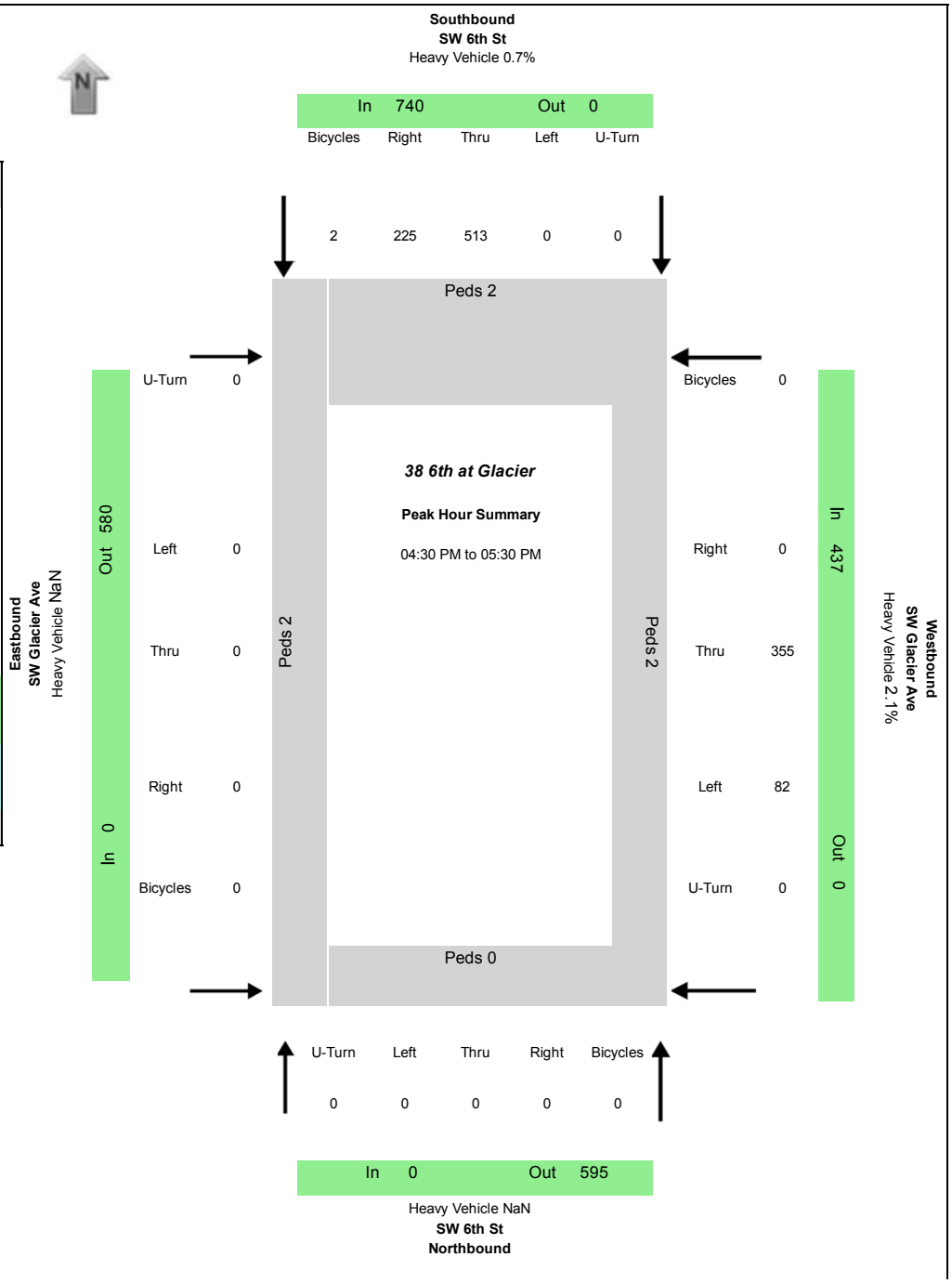
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	4

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW 9th St				SW 9th St				SW Glacier Ave				SW Glacier Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	25	9	0	0	0	0	0	0	0	0	0	0	0	54	1	0		
02:05:00 PM	25	5	0	0	0	0	0	0	0	0	0	0	0	42	0	0		
02:10:00 PM	29	13	0	0	0	0	0	0	0	0	0	0	0	44	0	0	247	
02:15:00 PM	23	9	0	0	0	0	0	0	0	0	0	0	0	43	2	0	235	
02:20:00 PM	17	6	0	0	0	0	0	0	0	0	0	0	0	47	0	0	233	
02:25:00 PM	13	6	0	0	0	0	0	0	0	0	0	0	0	60	0	0	226	
02:30:00 PM	25	8	0	0	0	0	0	0	0	0	0	0	0	45	0	0	227	
02:35:00 PM	20	8	0	0	0	0	0	0	0	0	0	0	0	52	0	0	237	
02:40:00 PM	25	15	0	0	0	0	0	0	0	0	0	0	0	44	0	0	242	
02:45:00 PM	13	6	0	0	0	0	0	0	0	0	0	0	0	33	0	0	216	
02:50:00 PM	26	7	0	0	0	0	0	0	0	0	0	0	0	44	0	0	213	
02:55:00 PM	21	6	0	0	0	0	0	0	0	0	0	0	0	48	0	0	204	919
03:00:00 PM	20	7	0	0	0	0	0	0	0	0	0	0	0	51	0	0	230	908
03:05:00 PM	18	8	0	0	0	0	0	0	0	0	0	0	0	57	0	0	236	919
03:10:00 PM	20	10	0	0	0	0	0	0	0	0	0	0	0	41	1	0	233	905
03:15:00 PM	25	5	0	0	0	0	0	0	0	0	0	0	0	43	1	0	229	902
03:20:00 PM	43	4	0	0	0	0	0	0	0	0	0	0	0	34	0	0	227	913
03:25:00 PM	24	10	0	0	0	0	0	0	0	0	0	0	0	41	2	0	232	911
03:30:00 PM	22	6	0	0	0	0	0	0	0	0	0	0	0	45	0	0	231	906
03:35:00 PM	28	9	0	0	0	0	0	0	0	0	0	0	0	64	0	0	251	927
03:40:00 PM	22	3	0	0	0	0	0	0	0	0	0	0	0	41	0	0	240	909
03:45:00 PM	32	7	0	0	0	0	0	0	0	0	0	0	0	48	0	0	254	944
03:50:00 PM	16	7	0	0	0	0	0	0	0	0	0	0	0	50	0	0	226	940
03:55:00 PM	22	9	0	0	0	0	0	0	0	0	0	0	0	46	0	0	237	942
04:00:00 PM	27	3	0	0	0	0	0	0	0	0	0	0	0	51	2	0	233	947
04:05:00 PM	29	5	0	0	1	0	0	0	0	0	0	0	0	56	1	0	252	956
04:10:00 PM	32	13	0	0	0	0	0	0	0	0	0	0	0	56	0	0	276	985
04:15:00 PM	21	12	0	0	0	0	0	0	0	0	0	0	0	44	1	0	271	989
04:20:00 PM	30	8	0	0	0	0	0	0	0	0	0	0	0	42	0	0	259	988
04:25:00 PM	20	14	0	0	0	0	0	0	0	0	0	0	0	43	0	0	235	988
04:30:00 PM	24	4	0	0	0	0	0	0	0	0	0	0	0	57	0	0	242	1000
04:35:00 PM	29	9	0	0	0	0	0	0	0	0	0	0	0	57	0	0	257	994
04:40:00 PM	24	8	0	0	0	0	0	0	0	0	0	0	0	36	0	0	248	996
04:45:00 PM	24	5	0	0	0	0	0	0	0	0	0	0	0	53	1	0	246	992
04:50:00 PM	30	11	0	0	0	0	0	0	0	0	0	0	0	47	0	0	239	1007
04:55:00 PM	23	12	0	0	0	0	0	0	0	0	0	0	0	49	1	0	256	1015
05:00:00 PM	27	9	0	0	0	0	0	0	0	0	0	0	0	58	0	0	267	1026
05:05:00 PM	32	18	0	0	0	0	0	0	0	0	0	0	0	57	3	0	289	1044
05:10:00 PM	33	9	0	0	0	0	0	0	0	0	0	0	0	69	4	0	319	1058
05:15:00 PM	23	7	0	0	0	0	0	0	0	0	0	0	0	48	1	0	304	1059
05:20:00 PM	24	5	0	0	0	0	0	0	0	0	0	0	0	52	1	0	276	1061
05:25:00 PM	20	6	0	0	0	0	0	0	0	0	0	0	0	62	0	0	249	1072
05:30:00 PM	20	7	0	0	0	0	0	0	0	0	0	0	0	50	0	0	247	1064
05:35:00 PM	26	8	0	0	0	0	0	0	0	0	0	0	0	65	1	0	265	1069
05:40:00 PM	25	7	0	0	0	0	0	0	0	0	0	0	0	44	1	0	254	1078
05:45:00 PM	22	9	0	0	0	0	0	0	0	0	0	0	0	57	0	0	265	1083
05:50:00 PM	35	8	0	0	0	0	0	0	0	0	0	0	0	53	0	0	261	1091
05:55:00 PM	22	8	0	0	0	0	0	0	0	0	0	0	0	41	0	0	255	1077

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW 6th St*
E/W street	*SW Glacier Ave*
City, State	Redmond OR
Site Notes	
Location	44.270592 - -121.174265
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	38
Peak Hour Start	04:30:00 PM
Peak 15 Min Start	05:00:00 PM
PHF (15-Min Int)	0.93



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	0	0	0	513	225	0	0	0	0	0	82	355	0	0	0	738	0	437	595	0	580	0

Percent Heavy Vehicles

0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%	0.0%	0.0%	#DIV/0!	0.7%	#DIV/0!	2.1%	0.7%	0.0%	1.7%	0.0%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum
0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2

PHV - Pedestrians

in Crosswalk				
NB	SB	EB	WB	Sum
0	2	2	2	6

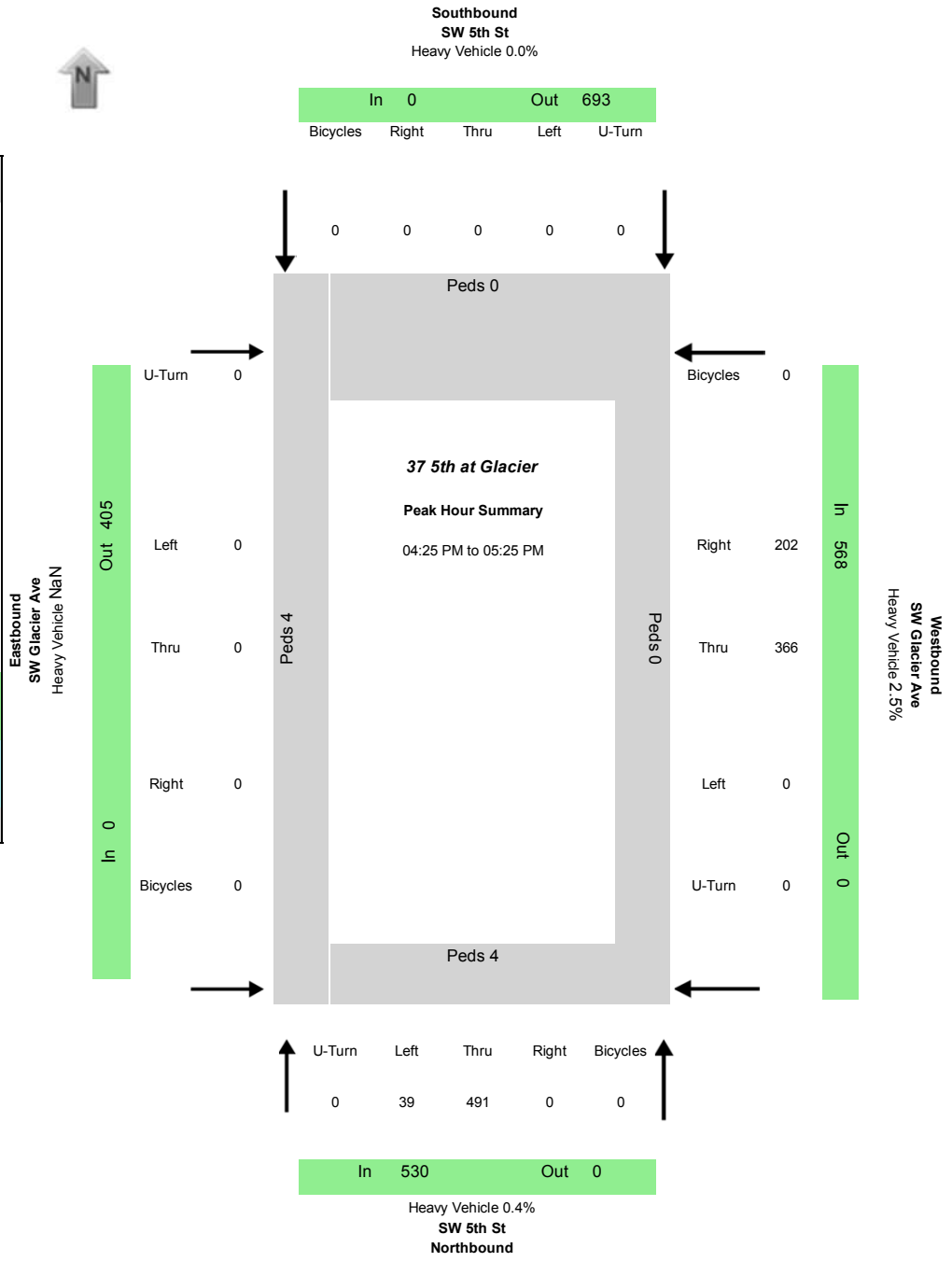
All Vehicle Volumes

	Northbound				Southbound				Eastbound				Westbound					
	SW 6th St				SW 6th St				SW Glacier Ave				SW Glacier Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0	0	0	0	0	49	18	0	0	0	0	0	3	25	0	0		
02:05:00 PM	0	0	0	0	0	41	14	0	0	0	0	0	7	23	0	0		
02:10:00 PM	0	0	0	0	0	39	16	0	0	0	0	0	6	22	0	0	263	
02:15:00 PM	0	0	0	0	0	49	14	0	0	0	0	0	6	20	0	0	257	
02:20:00 PM	0	0	0	0	0	53	18	0	0	0	0	0	5	27	0	0	275	
02:25:00 PM	0	0	0	0	0	49	24	0	0	0	0	0	6	24	0	0	295	
02:30:00 PM	0	0	0	0	0	53	25	0	0	0	0	0	7	16	0	0	307	
02:35:00 PM	0	0	0	0	0	43	18	0	0	0	0	0	5	21	0	0	291	
02:40:00 PM	0	0	0	0	0	43	17	0	0	0	0	0	5	23	0	0	276	
02:45:00 PM	0	0	0	0	0	45	13	0	0	0	0	0	5	14	0	0	252	
02:50:00 PM	0	0	0	0	0	50	22	0	0	0	0	0	4	20	0	0	261	
02:55:00 PM	0	0	0	0	0	32	15	0	0	0	0	0	5	29	0	0	254	1088
03:00:00 PM	0	0	0	0	0	51	19	0	0	0	0	0	4	27	0	0	278	1094
03:05:00 PM	0	0	0	0	0	42	32	0	0	0	0	0	6	23	0	0	285	1112
03:10:00 PM	0	0	0	0	0	46	17	0	0	0	0	0	7	20	0	0	294	1119
03:15:00 PM	0	0	0	0	0	32	15	0	0	0	0	0	9	16	0	0	265	1102
03:20:00 PM	0	0	0	0	0	41	13	0	0	0	0	0	8	14	0	0	238	1075
03:25:00 PM	0	0	0	0	0	44	19	0	0	0	0	0	3	25	0	0	239	1063
03:30:00 PM	0	0	0	0	0	36	21	0	0	0	0	0	7	24	0	0	255	1050
03:35:00 PM	0	0	0	0	0	37	27	0	0	0	0	0	5	27	0	0	275	1059
03:40:00 PM	0	0	0	0	0	27	18	0	0	0	0	0	9	23	0	0	261	1048
03:45:00 PM	0	0	0	0	0	44	13	0	0	0	0	0	7	24	0	0	261	1059
03:50:00 PM	0	0	0	0	0	48	15	0	0	0	0	0	8	28	0	0	264	1062
03:55:00 PM	0	0	0	0	0	37	20	0	0	0	0	0	3	26	0	0	273	1067
04:00:00 PM	0	0	0	0	0	43	18	0	0	0	0	0	5	28	0	0	279	1060
04:05:00 PM	0	0	0	0	0	49	20	0	0	0	0	0	7	25	0	0	281	1058
04:10:00 PM	0	0	0	0	0	46	21	0	0	0	0	0	8	30	0	0	300	1073
04:15:00 PM	0	0	0	0	0	33	23	0	0	0	0	0	8	21	0	0	291	1086
04:20:00 PM	0	0	0	0	0	49	9	0	0	0	0	0	11	19	0	0	278	1098
04:25:00 PM	0	0	0	0	0	33	17	0	0	0	0	0	4	25	0	0	252	1086
04:30:00 PM	0	0	0	0	0	39	22	0	0	0	0	0	7	20	0	0	255	1086
04:35:00 PM	0	0	0	0	0	49	22	0	0	0	0	0	8	31	0	0	277	1100
04:40:00 PM	0	0	0	0	0	53	11	0	0	0	0	0	7	23	0	0	292	1117
04:45:00 PM	0	0	0	0	0	44	15	0	0	0	0	0	1	35	0	0	299	1124
04:50:00 PM	0	0	0	0	0	35	22	0	0	0	0	0	8	16	0	0	270	1106
04:55:00 PM	0	0	0	0	0	39	11	0	0	0	0	0	5	34	0	0	265	1109
05:00:00 PM	0	0	0	0	0	46	25	0	0	0	0	0	8	28	0	0	277	1122
05:05:00 PM	0	0	0	0	0	48	17	0	0	0	0	0	7	33	0	0	301	1126
05:10:00 PM	0	0	0	0	0	35	25	0	0	0	0	0	7	36	0	0	315	1124
05:15:00 PM	0	0	0	0	0	38	19	0	0	0	0	0	6	32	0	0	303	1134
05:20:00 PM	0	0	0	0	0	44	16	0	0	0	0	0	8	27	0	0	293	1141
05:25:00 PM	0	0	0	0	0	43	20	0	0	0	0	0	10	40	0	0	303	1175
05:30:00 PM	0	0	0	0	0	19	19	0	0	0	0	0	5	23	0	0	274	1153
05:35:00 PM	0	0	0	0	0	31	23	0	0	0	0	0	6	35	0	0	274	1138
05:40:00 PM	0	0	0	0	0	23	19	0	0	0	0	0	6	20	0	0	229	1112
05:45:00 PM	0	0	0	0	0	29	25	0	0	0	0	0	2	35	0	0	254	1108
05:50:00 PM	0	0	0	0	0	34	15	0	0	0	0	0	5	33	0	0	246	1114
05:55:00 PM	0	0	0	0	0	34	10	0	0	0	0	0	9	24	0	0	255	1102

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW 5th St*
E/W street	*SW Glacier Ave*
City, State	Redmond OR
Site Notes	
Location	44.270603 - -121.173197
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	37

Peak Hour Start	04:25:00 PM
Peak 15 Min Start	04:50:00 PM
PHF (15-Min Int)	0.92



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
39	491	0	0	0	0	0	0	0	0	0	0	0	366	202	0	530	0	0	568	0	693	405	0

Percent Heavy Vehicles

0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%	2.0%	0.0%	0.4%	0.0%	#DIV/0!	2.5%	#DIV/0!	0.9%	2.5%	0.0%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHV - Pedestrians

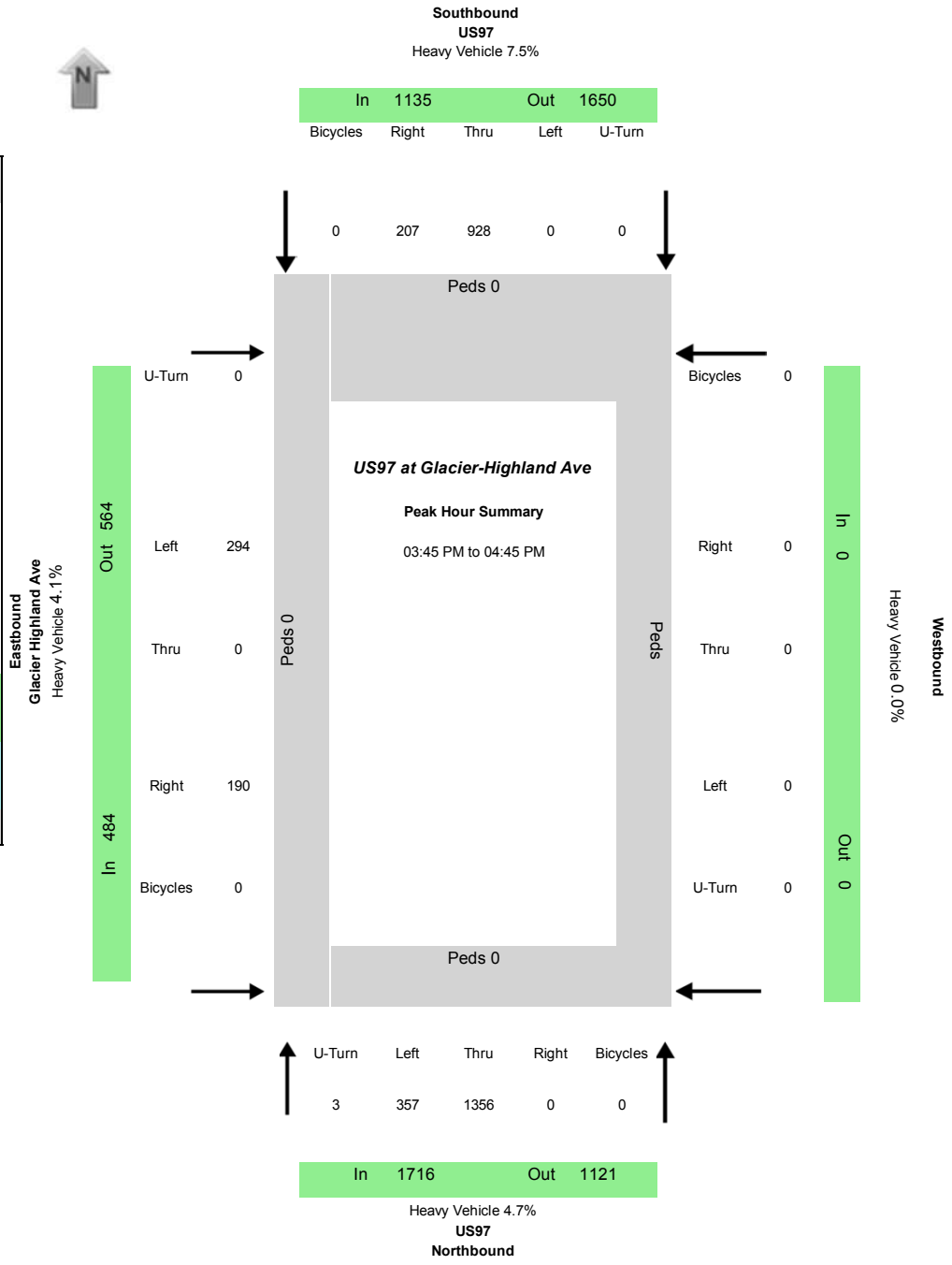
in Crosswalk				
NB	SB	EB	WB	**Sum**
4	0	4	0	8

All Vehicle Volumes

	Northbound				Southbound				Eastbound				Westbound					
	SW 5th St				SW 5th St				SW Glacier Ave				SW Glacier Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	3	40	0	0	0	0	0	0	0	0	0	0	0	22	12	0		
02:05:00 PM	4	44	0	0	0	0	0	0	0	0	0	0	0	24	12	0		
02:10:00 PM	3	44	0	0	0	0	0	0	0	0	0	0	0	24	10	0	242	
02:15:00 PM	4	34	0	0	0	0	0	0	0	0	0	0	0	22	10	0	235	
02:20:00 PM	5	44	0	0	0	0	0	0	0	0	0	0	0	22	10	0	232	
02:25:00 PM	2	29	0	0	0	0	0	0	0	0	0	0	0	29	10	0	221	
02:30:00 PM	3	35	0	0	0	0	0	0	0	0	0	0	0	19	14	0	222	
02:35:00 PM	5	39	0	0	0	0	0	0	0	0	0	0	0	19	14	0	218	
02:40:00 PM	2	65	0	0	0	0	0	0	0	0	0	0	0	22	17	0	254	
02:45:00 PM	1	48	0	0	0	0	0	0	0	0	0	0	0	22	23	0	277	
02:50:00 PM	6	41	0	0	0	0	0	0	0	0	0	0	0	18	10	0	275	
02:55:00 PM	1	50	0	0	0	0	0	0	0	0	0	0	0	32	23	0	275	992
03:00:00 PM	3	30	0	0	0	0	0	0	0	0	0	0	0	26	9	0	249	983
03:05:00 PM	4	41	0	0	0	0	0	0	0	0	0	0	0	28	17	0	264	989
03:10:00 PM	7	44	0	0	0	0	0	0	0	0	0	0	0	14	7	0	230	980
03:15:00 PM	2	40	0	0	0	0	0	0	0	0	0	0	0	23	12	0	239	987
03:20:00 PM	2	31	0	0	0	0	0	0	0	0	0	0	0	27	19	0	228	985
03:25:00 PM	2	45	0	0	0	0	0	0	0	0	0	0	0	17	11	0	231	990
03:30:00 PM	1	40	0	0	0	0	0	0	0	0	0	0	0	31	18	0	244	1009
03:35:00 PM	5	41	0	0	0	0	0	0	0	0	0	0	0	27	18	0	256	1023
03:40:00 PM	4	51	0	0	0	0	0	0	0	0	0	0	0	32	19	0	287	1023
03:45:00 PM	5	34	0	0	0	0	0	0	0	0	0	0	0	22	12	0	270	1002
03:50:00 PM	6	42	0	0	0	0	0	0	0	0	0	0	0	31	14	0	272	1020
03:55:00 PM	1	43	0	0	0	0	0	0	0	0	0	0	0	30	38	0	278	1026
04:00:00 PM	3	42	0	0	0	0	0	0	0	0	0	0	0	25	12	0	287	1040
04:05:00 PM	3	34	0	0	0	0	0	0	0	0	0	0	0	23	12	0	266	1022
04:10:00 PM	4	40	0	0	0	0	0	0	0	0	0	0	0	35	18	0	251	1047
04:15:00 PM	0	43	0	0	0	0	0	0	0	0	0	0	0	25	13	0	250	1051
04:20:00 PM	5	32	0	0	0	0	0	0	0	0	0	0	0	32	25	0	272	1066
04:25:00 PM	1	41	0	0	0	0	0	0	0	0	0	0	0	22	27	0	266	1082
04:30:00 PM	2	40	0	0	0	0	0	0	0	0	0	0	0	21	18	0	266	1073
04:35:00 PM	6	53	0	0	0	0	0	0	0	0	0	0	0	38	13	0	282	1092
04:40:00 PM	3	23	0	0	0	0	0	0	0	0	0	0	0	21	18	0	256	1051
04:45:00 PM	4	38	0	0	0	0	0	0	0	0	0	0	0	26	12	0	255	1058
04:50:00 PM	5	50	0	0	0	0	0	0	0	0	0	0	0	24	14	0	238	1058
04:55:00 PM	3	38	0	0	0	0	0	0	0	0	0	0	0	38	22	0	274	1047
05:00:00 PM	2	56	0	0	0	0	0	0	0	0	0	0	0	34	14	0	300	1071
05:05:00 PM	6	27	0	0	0	0	0	0	0	0	0	0	0	28	14	0	282	1074
05:10:00 PM	3	30	0	0	0	0	0	0	0	0	0	0	0	43	18	0	275	1071
05:15:00 PM	1	44	0	0	0	0	0	0	0	0	0	0	0	32	18	0	264	1085
05:20:00 PM	3	51	0	0	0	0	0	0	0	0	0	0	0	39	14	0	296	1098
05:25:00 PM	10	39	0	0	0	0	0	0	0	0	0	0	0	29	13	0	293	1098
05:30:00 PM	1	27	0	0	0	0	0	0	0	0	0	0	0	33	14	0	273	1092
05:35:00 PM	4	35	0	0	0	0	0	0	0	0	0	0	0	29	10	0	244	1060
05:40:00 PM	3	32	0	0	0	0	0	0	0	0	0	0	0	23	16	0	227	1069
05:45:00 PM	3	22	0	0	0	0	0	0	0	0	0	0	0	35	17	0	229	1066
05:50:00 PM	4	45	0	0	0	0	0	0	0	0	0	0	0	35	13	0	248	1070
05:55:00 PM	6	32	0	0	0	0	0	0	0	0	0	0	0	21	9	0	242	1037

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	***US97***
E/W street	***Glacier Highland Ave***
City, State	Redmond OR
Site Notes	
Location	44.270985 - -121.170617
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	03:45:00 PM
Peak 15 Min Start	04:25:00 PM
PHF (15-Min Int)	0.96



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
357	1356	0	3	0	928	207	0	294	0	190	0	0	0	0	0	1716	1135	484	0	1121	1650	564	0
Percent Heavy Vehicles																							
2.2%	5.4%	0.0%	0.0%	0.0%	8.5%	2.9%	0.0%	5.8%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	4.7%	7.5%	4.1%	0.0%	7.3%	5.5%	2.5%	0.0%

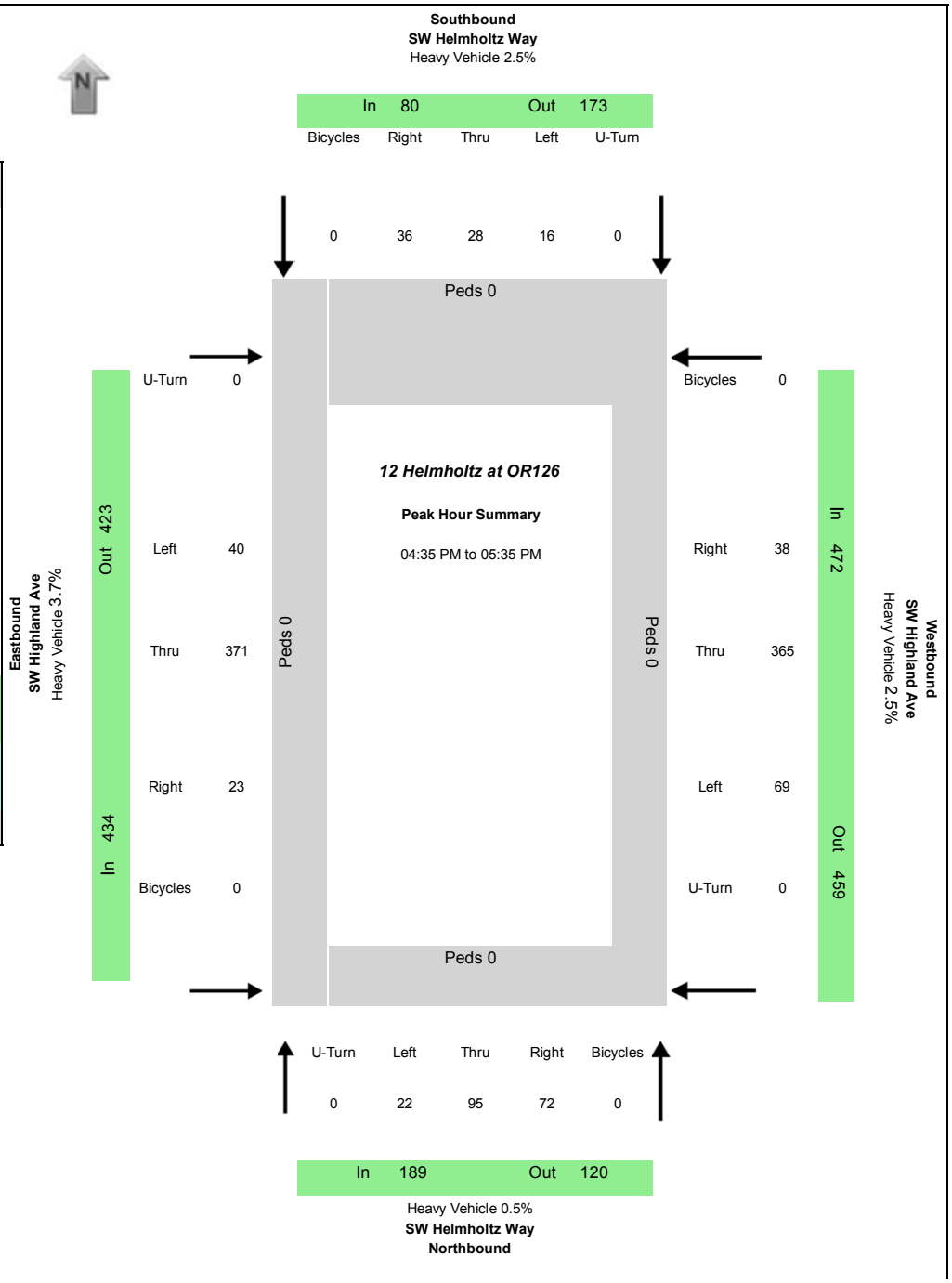
PHV- Bicycles																	PHV - Pedestrians				
Northbound				Southbound				Eastbound				Westbound					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
0	0		0		0	0	0	0		0	0					0	0	0	0		0

All Vehicle Volumes

	Northbound US97				Southbound US97				Eastbound Glacier Highland Ave				Westbound				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	29	98		0		71	13	0	27		18	0						
02:05:00 PM	25	105		2		55	9	0	29		18	0						
02:10:00 PM	32	103		0		88	7	0	18		10	0					757	
02:15:00 PM	19	89		1		58	11	0	13		16	0					708	
02:20:00 PM	36	111		0		72	17	0	17		20	0					738	
02:25:00 PM	22	95		1		44	15	0	25		21	0					703	
02:30:00 PM	24	106		0		89	10	0	21		16	0					762	
02:35:00 PM	19	97		0		60	15	0	28		22	0					730	
02:40:00 PM	33	89		0		90	13	0	25		17	0					774	
02:45:00 PM	20	84		0		62	12	0	17		28	1					732	
02:50:00 PM	30	115		0		87	9	0	21		19	0					772	
02:55:00 PM	21	81		0		76	21	0	22		16	0					742	2976
03:00:00 PM	27	103		0		70	16	0	26		25	0					785	2987
03:05:00 PM	26	113		1		79	19	0	34		12	0					788	3028
03:10:00 PM	13	99		0		67	13	0	31		18	0					792	3011
03:15:00 PM	25	114		0		70	14	0	33		15	0					796	3075
03:20:00 PM	26	92		0		57	15	0	20		8	0					730	3020
03:25:00 PM	28	115		0		62	10	0	22		19	0					745	3053
03:30:00 PM	33	98		0		105	14	0	15		16	0					755	3068
03:35:00 PM	24	103		0		49	25	0	39		23	0					800	3090
03:40:00 PM	24	81		1		75	14	0	12		16	0					767	3046
03:45:00 PM	33	116		0		98	16	0	25		15	0					789	3125
03:50:00 PM	25	101		0		47	19	0	25		14	0					757	3075
03:55:00 PM	51	112		0		94	15	0	19		13	0					838	3142
04:00:00 PM	26	128		0		78	17	0	31		19	0					834	3174
04:05:00 PM	19	96		0		70	21	0	25		14	0					848	3135
04:10:00 PM	31	134		1		100	20	0	21		12	0					863	3213
04:15:00 PM	24	95		0		54	18	0	17		27	0					799	3177
04:20:00 PM	33	107		0		89	17	0	14		19	0					833	3238
04:25:00 PM	39	124		0		78	13	0	30		14	0					812	3280
04:30:00 PM	22	112		1		52	16	0	29		12	0					821	3243
04:35:00 PM	26	135		0		101	24	0	27		15	0					870	3308
04:40:00 PM	28	96		1		67	11	0	31		16	0					822	3335
04:45:00 PM	32	124		0		87	13	0	24		13	0					871	3325
04:50:00 PM	24	105		0		64	12	0	21		15	0					784	3335
04:55:00 PM	45	110		0		77	17	0	26		19	0					828	3325
05:00:00 PM	24	100		0		51	14	0	27		17	0					768	3259
05:05:00 PM	27	137		0		85	25	0	31		14	0					846	3333
05:10:00 PM	35	107		0		75	22	0	17		17	0					825	3287
05:15:00 PM	33	109		0		76	19	0	29		16	0					874	3334
05:20:00 PM	27	107		1		89	24	0	12		15	0					830	3330
05:25:00 PM	26	112		0		84	20	0	21		19	0					839	3314
05:30:00 PM	25	118		1		73	11	0	21		11	0					817	3330
05:35:00 PM	32	107		0		58	18	0	23		12	0					792	3252
05:40:00 PM	25	118		0		64	15	0	22		7	0					761	3253
05:45:00 PM	37	93		0		73	15	0	18		9	0					746	3205
05:50:00 PM	14	90		0		58	18	0	10		13	0					699	3167
05:55:00 PM	25	107		0		58	15	0	30		24	0					707	3132

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW Helmholtz Way*
E/W street	*SW Highland Ave*
City, State	Redmond OR
Site Notes	
Location	44.269211 - -121.219527
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:35:00 PM
Peak 15 Min Start	05:20:00 PM
PHF (15-Min Int)	0.92



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
22	95	72	0	16	28	36	0	40	371	23	0	69	365	38	0	189	80	434	472	120	173	423	459
Percent Heavy Vehicles																							
0.0%	0.0%	1.4%	0.0%	0.0%	7.1%	0.0%	0.0%	0.0%	4.0%	4.3%	0.0%	2.9%	2.7%	0.0%	0.0%	0.5%	2.5%	3.7%	2.5%	4.2%	0.0%	2.4%	3.5%

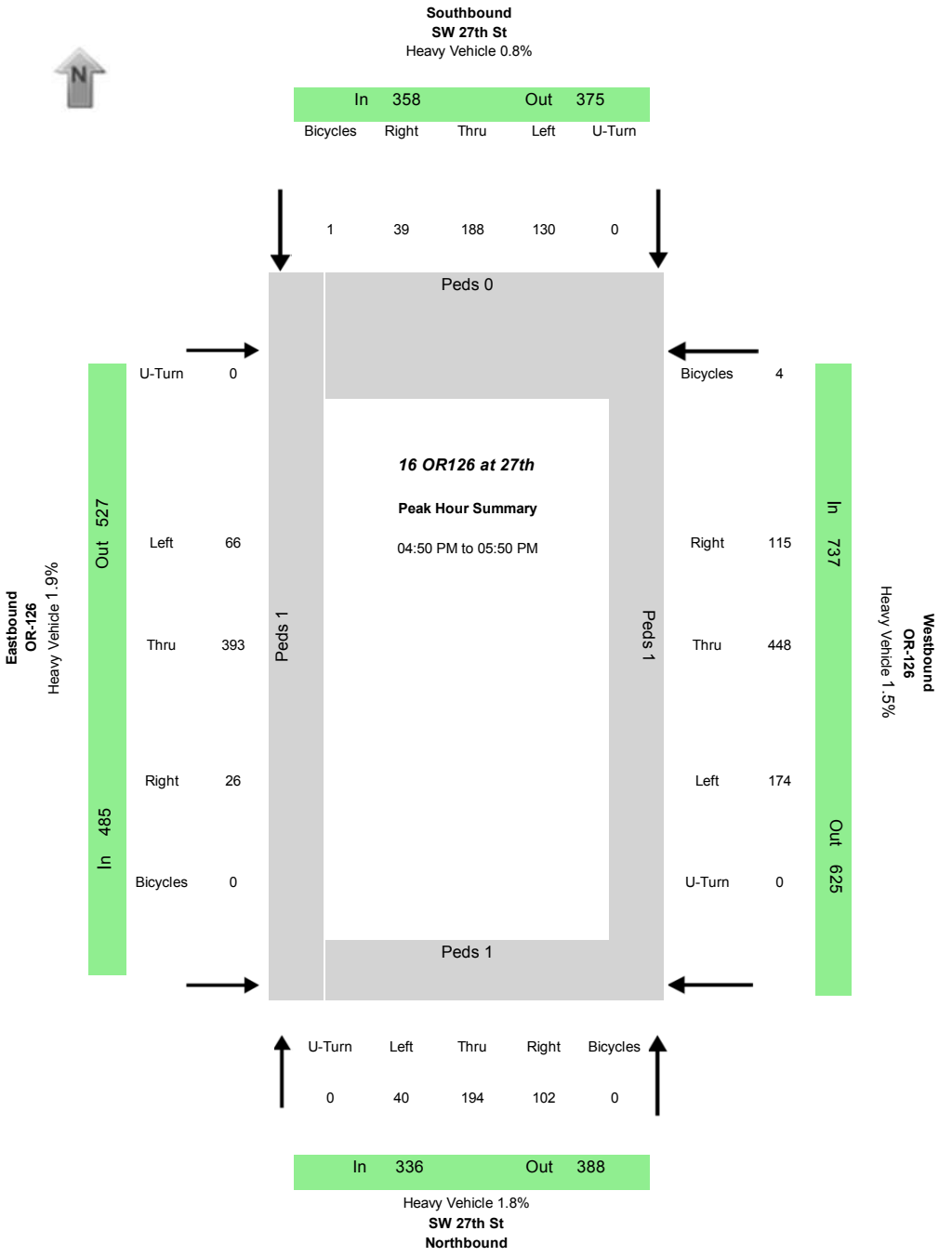
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW Helmholtz Way				SW Helmholtz Way				SW Highland Ave				SW Highland Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	1	0	2	0	3	3	1	0	3	26	2	0	1	24	1	0		
02:05:00 PM	0	1	6	0	4	2	1	0	3	24	2	0	3	21	1	0		
02:10:00 PM	1	3	6	0	0	5	3	0	0	32	4	0	5	36	0	0	230	
02:15:00 PM	0	1	4	0	0	2	3	0	2	30	2	0	8	32	0	0	247	
02:20:00 PM	1	2	2	0	1	1	2	0	2	21	1	0	4	21	2	0	239	
02:25:00 PM	0	2	2	0	1	2	7	0	1	26	1	0	5	20	1	0	212	
02:30:00 PM	2	3	6	0	1	1	1	0	4	26	0	0	5	27	5	0	209	
02:35:00 PM	1	3	9	0	2	1	4	0	2	31	1	0	10	28	5	0	246	
02:40:00 PM	1	8	13	0	2	1	0	0	0	25	3	0	3	18	2	0	254	
02:45:00 PM	1	10	9	0	2	1	2	0	2	26	1	0	5	38	2	0	272	
02:50:00 PM	4	3	3	0	1	2	3	0	3	32	0	0	4	25	2	0	257	
02:55:00 PM	2	6	3	0	1	2	2	0	2	35	9	0	6	23	3	0	275	971
03:00:00 PM	2	4	2	0	0	4	0	0	3	23	3	0	7	24	2	0	250	978
03:05:00 PM	2	0	1	0	0	0	7	0	4	30	1	0	6	22	0	0	241	983
03:10:00 PM	3	1	5	0	2	3	2	0	4	30	4	0	7	40	2	0	250	991
03:15:00 PM	1	6	6	0	1	0	1	0	4	31	1	0	7	36	5	0	275	1006
03:20:00 PM	0	7	8	0	2	4	4	0	4	31	1	0	4	30	1	0	298	1042
03:25:00 PM	2	4	1	0	1	1	0	0	2	26	2	0	6	36	2	0	278	1057
03:30:00 PM	1	2	5	0	0	2	4	0	4	32	0	0	10	34	1	0	274	1071
03:35:00 PM	3	2	4	0	1	1	3	0	2	36	0	0	4	29	1	0	264	1060
03:40:00 PM	0	4	5	0	0	4	0	0	2	29	2	0	6	32	4	0	269	1072
03:45:00 PM	5	2	10	0	0	1	6	0	2	30	2	0	7	34	4	0	277	1076
03:50:00 PM	2	7	2	0	0	5	4	0	1	29	2	0	9	40	2	0	294	1097
03:55:00 PM	4	5	7	0	0	7	3	0	2	29	1	0	3	33	5	0	305	1102
04:00:00 PM	3	12	4	0	1	2	3	0	2	29	6	0	3	32	1	0	300	1126
04:05:00 PM	1	4	0	0	0	3	3	0	5	28	5	0	5	22	2	0	275	1131
04:10:00 PM	2	7	6	0	1	1	2	0	3	19	0	0	4	24	1	0	246	1098
04:15:00 PM	0	9	9	0	0	1	1	0	3	28	1	0	5	46	5	0	256	1107
04:20:00 PM	0	4	3	0	1	5	2	0	3	27	4	0	9	35	2	0	273	1106
04:25:00 PM	3	12	8	0	0	1	1	0	5	37	2	0	3	26	2	0	303	1123
04:30:00 PM	0	10	9	0	0	1	4	0	5	32	1	0	5	25	2	0	289	1122
04:35:00 PM	0	10	3	0	1	2	2	0	1	37	2	0	5	34	3	0	294	1136
04:40:00 PM	2	1	8	0	3	2	3	0	0	23	0	0	5	21	3	0	265	1119
04:45:00 PM	3	9	4	0	2	4	1	0	6	33	0	0	5	27	4	0	269	1114
04:50:00 PM	1	12	11	0	2	0	1	0	5	33	1	0	6	34	2	0	277	1119
04:55:00 PM	0	8	4	0	1	3	2	0	2	30	3	0	3	30	2	0	294	1108
05:00:00 PM	1	5	4	0	1	2	1	0	3	22	3	0	3	36	2	0	279	1093
05:05:00 PM	1	9	9	0	1	3	3	0	3	27	4	0	6	39	3	0	279	1123
05:10:00 PM	4	3	2	0	2	3	7	0	8	30	2	0	8	34	5	0	299	1161
05:15:00 PM	1	8	3	0	0	4	4	0	1	31	1	0	7	29	2	0	307	1144
05:20:00 PM	4	7	8	0	1	0	2	0	4	36	1	0	8	25	3	0	298	1148
05:25:00 PM	1	13	9	0	2	2	5	0	6	33	3	0	4	25	3	0	296	1154
05:30:00 PM	4	10	7	0	0	3	5	0	1	36	3	0	9	31	6	0	320	1175
05:35:00 PM	3	1	8	0	0	2	1	0	3	21	3	0	7	21	2	0	293	1147
05:40:00 PM	2	6	9	0	1	3	5	0	0	22	3	0	5	31	1	0	275	1164
05:45:00 PM	2	5	16	0	4	2	3	0	3	24	3	0	5	34	2	0	263	1169
05:50:00 PM	1	6	7	0	2	4	1	0	2	20	3	0	6	30	6	0	279	1149
05:55:00 PM	1	5	8	0	0	1	3	0	3	23	1	0	6	19	4	0	265	1135

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW 27th St*
E/W street	*OR-126*
City, State	Redmond OR
Site Notes	
Location	44.269237 - -121.199367
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:50:00 PM
Peak 15 Min Start	05:35:00 PM
PHF (15-Min Int)	0.97



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
40	194	102	0	130	188	39	0	66	393	26	0	174	448	115	0	336	357	485	737	388	375	527	625
Percent Heavy Vehicles																							
5.0%	1.0%	2.0%	0.0%	0.8%	0.5%	2.6%	0.0%	0.0%	2.3%	0.0%	0.0%	0.6%	2.2%	0.0%	0.0%	1.8%	0.8%	1.9%	1.5%	0.5%	0.5%	2.5%	1.9%

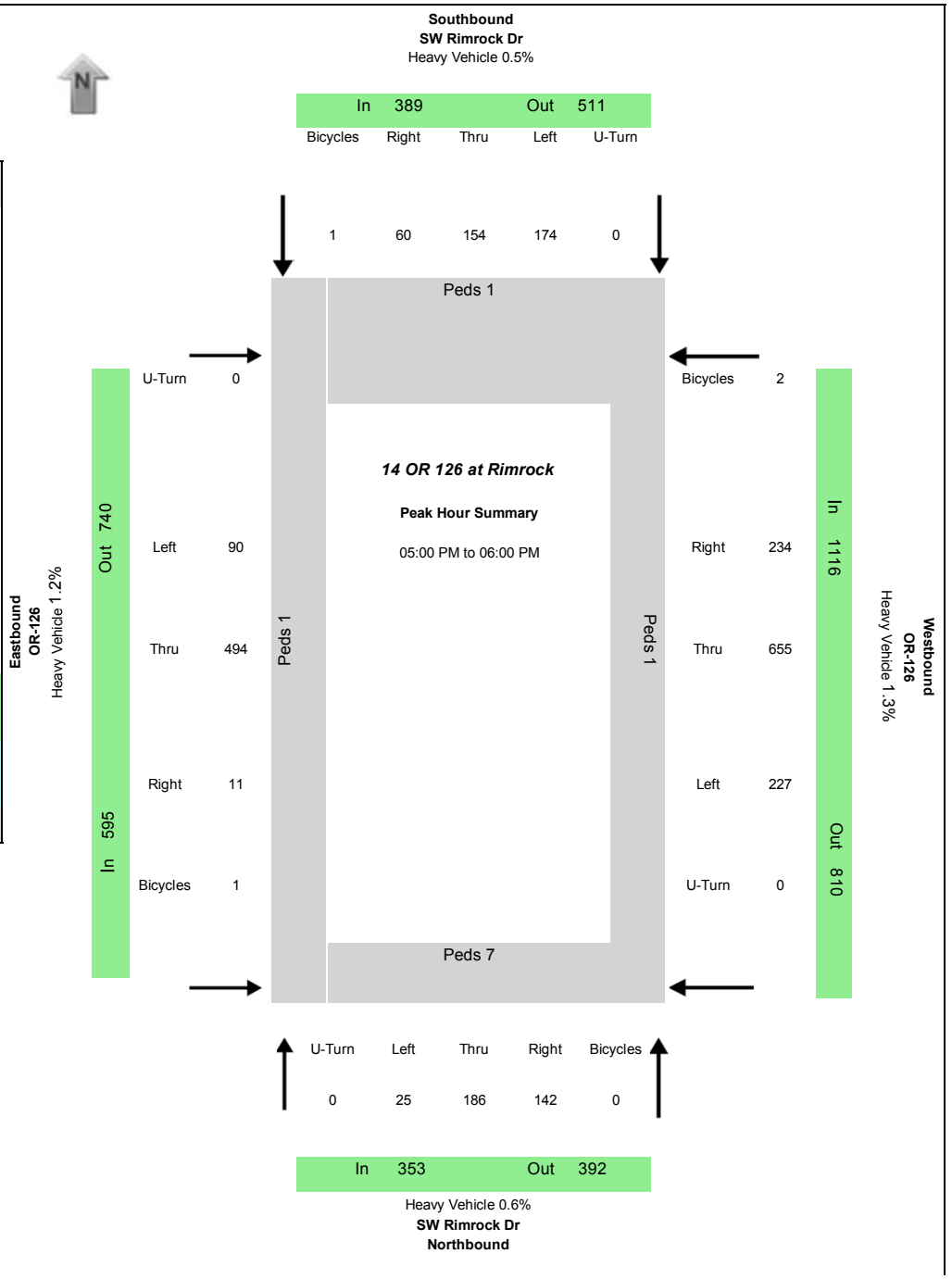
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	1	0	0	0	0	0	0	0	4	0	0	5	1	0	1	1	3

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW 27th St				SW 27th St				OR-126				OR-126				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	3	10	5	0	4	4	1	0	1	30	0	0	6	25	5	0		
02:05:00 PM	4	6	3	0	9	8	4	0	4	32	1	0	6	18	4	0		
02:10:00 PM	2	7	6	0	5	4	1	0	3	44	2	0	7	53	8	0	335	
02:15:00 PM	4	6	8	0	9	8	1	0	2	28	2	0	7	29	3	0	348	
02:20:00 PM	2	10	12	0	7	13	0	0	2	24	1	0	9	24	7	0	360	
02:25:00 PM	3	4	11	0	10	4	0	0	2	29	4	0	13	33	6	0	337	
02:30:00 PM	4	7	7	0	4	7	1	0	5	22	3	0	5	27	2	0	324	
02:35:00 PM	2	7	7	0	9	3	4	0	4	35	3	0	8	37	4	0	336	
02:40:00 PM	0	9	4	0	7	8	2	0	5	40	3	0	14	33	9	0	351	
02:45:00 PM	1	6	8	0	7	14	5	0	7	36	6	0	14	38	7	0	406	
02:50:00 PM	2	8	11	0	11	10	3	0	5	31	5	0	13	24	7	0	413	
02:55:00 PM	3	13	8	0	10	4	1	0	4	25	3	0	6	35	7	0	398	1421
03:00:00 PM	0	13	12	0	8	9	2	0	3	38	2	0	9	34	12	0	391	1469
03:05:00 PM	3	9	5	0	9	10	0	0	5	36	7	0	12	40	4	0	401	1510
03:10:00 PM	6	13	12	0	9	6	0	0	3	27	4	0	9	40	4	0	415	1501
03:15:00 PM	1	9	6	0	18	11	2	0	3	22	3	0	11	44	9	0	412	1533
03:20:00 PM	4	18	7	0	5	16	1	0	3	48	0	0	9	37	11	0	431	1581
03:25:00 PM	5	6	4	0	8	13	2	0	3	33	3	0	8	42	4	0	429	1593
03:30:00 PM	1	12	9	0	11	11	1	0	5	34	1	0	8	32	7	0	422	1631
03:35:00 PM	3	11	7	0	7	12	2	0	3	33	4	0	11	29	3	0	388	1633
03:40:00 PM	4	22	11	0	7	11	0	0	3	42	2	0	10	38	11	0	418	1660
03:45:00 PM	3	11	9	0	3	13	0	0	5	35	4	0	13	34	9	0	425	1650
03:50:00 PM	2	11	9	0	6	11	2	0	3	41	0	0	19	44	10	0	458	1678
03:55:00 PM	5	13	13	0	8	8	2	0	3	29	0	0	17	41	5	0	441	1703
04:00:00 PM	2	7	11	0	4	12	0	0	3	40	6	0	11	38	11	0	447	1706
04:05:00 PM	2	12	5	0	9	6	1	0	4	37	1	0	14	31	11	0	422	1699
04:10:00 PM	1	12	9	0	3	7	1	0	1	25	1	0	7	36	9	0	390	1678
04:15:00 PM	8	10	5	0	9	7	4	0	4	34	2	0	14	37	10	0	389	1683
04:20:00 PM	3	15	2	0	13	9	1	0	6	31	1	0	10	47	8	0	402	1670
04:25:00 PM	5	10	7	0	7	19	0	0	7	37	1	0	6	32	9	0	430	1679
04:30:00 PM	2	12	8	0	8	14	1	0	5	42	3	0	17	38	3	0	439	1700
04:35:00 PM	4	9	8	0	6	8	1	0	4	37	5	0	26	38	8	0	447	1729
04:40:00 PM	1	15	9	0	7	11	0	0	0	29	1	0	11	37	13	0	441	1702
04:45:00 PM	5	14	7	0	5	9	1	0	12	40	4	0	15	35	10	0	445	1720
04:50:00 PM	1	18	9	0	14	15	2	0	5	33	2	0	9	44	7	0	450	1721
04:55:00 PM	1	14	4	0	14	15	3	0	5	37	2	0	10	36	9	0	466	1727
05:00:00 PM	6	18	8	0	13	13	1	0	5	29	4	0	12	35	5	0	458	1731
05:05:00 PM	6	16	13	0	7	18	3	0	3	33	2	0	12	45	12	0	469	1768
05:10:00 PM	3	11	8	0	14	19	7	0	3	23	0	0	19	43	6	0	475	1812
05:15:00 PM	6	18	8	0	13	14	3	0	4	30	1	0	10	34	13	0	480	1822
05:20:00 PM	2	10	9	0	7	21	6	0	8	36	3	0	20	45	11	0	488	1854
05:25:00 PM	3	12	6	0	6	12	1	0	9	43	3	0	16	25	11	0	479	1861
05:30:00 PM	4	15	7	0	9	12	1	0	5	40	2	0	19	35	8	0	482	1865
05:35:00 PM	3	16	9	0	13	16	6	0	5	29	1	0	14	38	12	0	466	1873
05:40:00 PM	1	24	7	0	10	18	2	0	7	35	4	0	15	35	9	0	486	1906
05:45:00 PM	4	22	14	0	10	15	4	0	7	25	2	0	18	33	12	0	495	1915
05:50:00 PM	1	6	8	0	11	14	4	0	5	36	1	0	11	44	14	0	488	1911
05:55:00 PM	1	7	4	0	8	7	3	0	4	32	0	0	12	31	12	0	442	1882

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW Rimrock Dr*
E/W street	*OR-126*
City, State	Redmond OR
Site Notes	
Location	44.269288 - -121.191311
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	05:00:00 PM
Peak 15 Min Start	05:10:00 PM
PHF (15-Min Int)	0.97



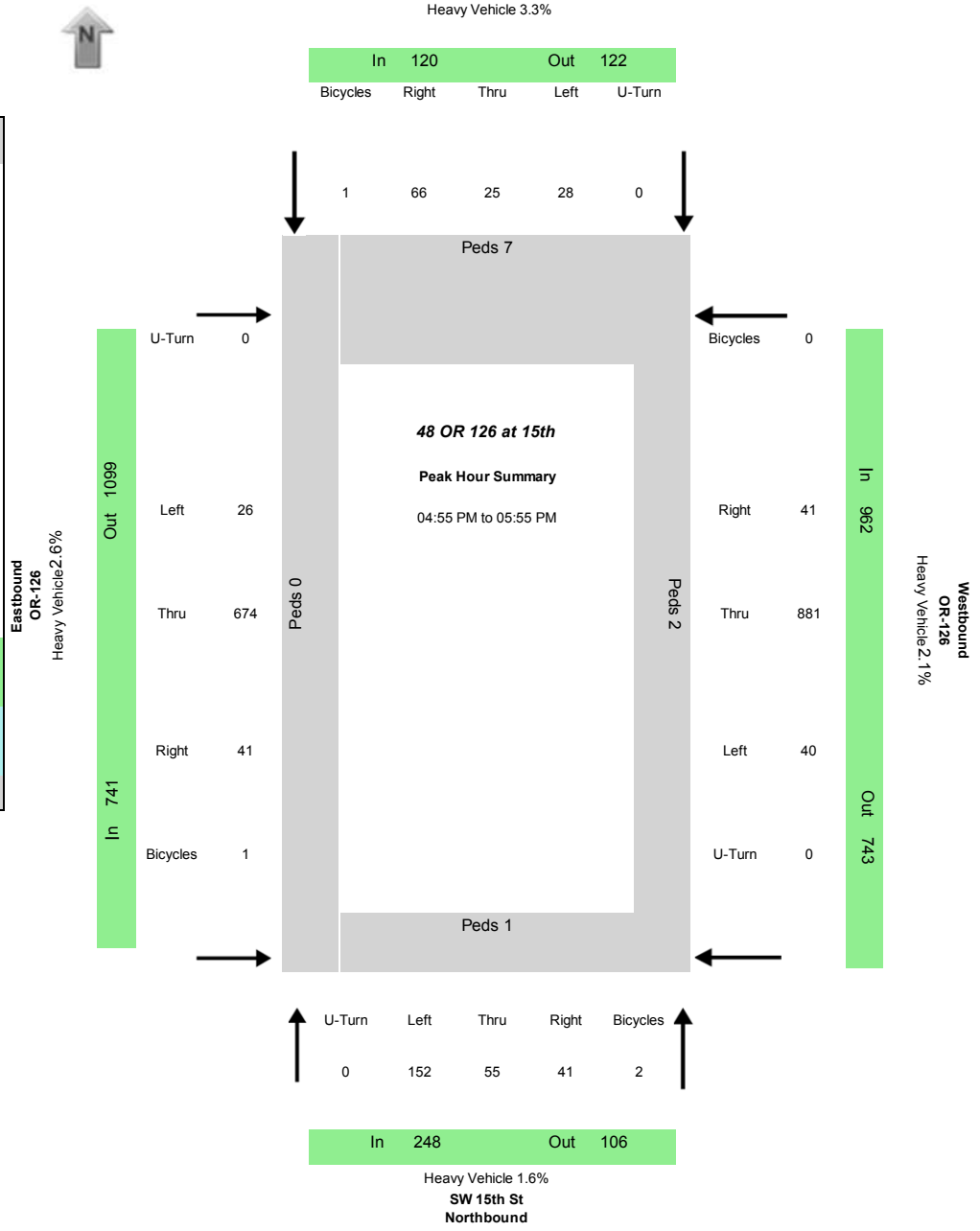
Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
25	186	142	0	174	154	60	0	90	494	11	0	227	655	234	0	353	388	595	1116	392	510	740	810
Percent Heavy Vehicles																							
0.0%	1.1%	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%	1.1%	1.2%	0.0%	0.0%	0.4%	1.7%	0.9%	0.0%	0.6%	0.5%	1.2%	1.3%	0.8%	1.0%	1.5%	0.7%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	1	0	0	1	0	0	0	0	2	0	0	4	7	1	1	1	10

All Vehicle Volumes																		
	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW Rimrock Dr				SW Rimrock Dr				OR-126				OR-126				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	1	5	11	0	7	4	2	0	5	29	0	0	6	35	14	0		
02:05:00 PM	2	8	9	0	17	5	5	0	7	36	2	0	13	30	9	0		
02:10:00 PM	0	10	11	0	6	8	0	0	6	36	0	0	10	43	17	0	409	
02:15:00 PM	1	4	13	0	10	2	0	0	6	48	1	0	9	43	13	0	440	
02:20:00 PM	1	7	13	0	15	13	0	0	3	37	0	0	15	41	14	0	456	
02:25:00 PM	2	8	11	0	10	6	2	0	4	35	2	0	21	31	9	0	450	
02:30:00 PM	1	7	14	0	17	12	7	0	5	33	0	0	11	39	10	0	456	
02:35:00 PM	0	8	21	0	28	21	22	0	5	39	0	0	17	40	17	0	515	
02:40:00 PM	1	11	20	0	31	11	12	0	4	37	1	0	16	39	15	0	572	
02:45:00 PM	3	13	7	0	21	21	9	0	10	27	2	0	13	40	12	0	594	
02:50:00 PM	0	15	11	0	12	14	7	0	8	42	2	0	10	36	18	0	551	
02:55:00 PM	2	6	13	0	13	17	1	0	5	43	1	0	21	57	13	0	545	1976
03:00:00 PM	2	17	18	0	14	10	1	0	6	49	0	0	17	51	14	0	566	2056
03:05:00 PM	1	9	13	0	18	13	5	0	9	36	1	0	15	43	10	0	564	2086
03:10:00 PM	1	12	11	0	7	7	4	0	3	41	0	0	20	49	16	0	543	2110
03:15:00 PM	1	8	20	0	4	12	5	0	5	49	0	0	13	59	6	0	526	2142
03:20:00 PM	2	16	13	0	15	21	5	0	4	49	1	0	13	46	16	0	554	2184
03:25:00 PM	3	8	11	0	19	7	3	0	6	37	1	0	17	32	9	0	536	2196
03:30:00 PM	3	8	14	0	19	12	1	0	3	41	2	0	12	45	16	0	530	2216
03:35:00 PM	1	8	14	0	6	13	4	0	6	46	1	0	13	48	12	0	501	2170
03:40:00 PM	0	6	11	0	14	12	4	0	7	53	0	0	18	61	22	0	556	2180
03:45:00 PM	1	6	15	0	6	14	4	0	7	34	0	0	18	60	15	0	560	2182
03:50:00 PM	1	10	11	0	12	19	5	0	9	42	3	0	17	62	12	0	591	2210
03:55:00 PM	3	11	13	0	14	12	2	0	8	40	0	0	14	64	10	0	574	2209
04:00:00 PM	1	14	7	0	15	15	7	0	3	44	3	0	9	42	14	0	568	2184
04:05:00 PM	2	10	8	0	18	18	3	0	9	36	1	0	17	41	15	0	543	2189
04:10:00 PM	0	7	8	0	16	8	5	0	3	33	0	0	12	47	25	0	516	2182
04:15:00 PM	2	10	12	0	12	9	2	0	5	38	0	0	17	53	12	0	514	2172
04:20:00 PM	1	11	9	0	17	13	2	0	11	39	3	0	21	52	20	0	535	2170
04:25:00 PM	3	9	13	0	21	11	7	0	1	37	1	0	13	47	15	0	549	2195
04:30:00 PM	0	8	7	0	11	12	2	0	11	55	0	0	14	53	18	0	568	2210
04:35:00 PM	1	9	11	0	10	14	5	0	2	45	0	0	23	62	18	0	569	2238
04:40:00 PM	0	9	12	0	17	9	4	0	6	37	1	0	15	53	15	0	569	2208
04:45:00 PM	1	9	17	0	12	11	8	0	11	33	0	0	17	47	18	0	562	2212
04:50:00 PM	0	11	8	0	12	12	5	0	11	53	1	0	13	48	19	0	555	2202
04:55:00 PM	0	9	7	0	19	14	5	0	3	48	0	0	22	46	18	0	568	2202
05:00:00 PM	5	16	14	0	16	6	3	0	11	26	2	0	14	66	15	0	578	2222
05:05:00 PM	1	12	12	0	7	17	5	0	7	42	1	0	19	57	19	0	584	2243
05:10:00 PM	1	15	19	0	9	16	3	0	7	43	1	0	30	57	23	0	617	2303
05:15:00 PM	2	14	10	0	14	10	6	0	4	44	1	0	18	61	19	0	626	2334
05:20:00 PM	2	19	9	0	18	10	9	0	5	39	0	0	15	59	21	0	633	2341
05:25:00 PM	1	16	11	0	19	8	9	0	7	50	0	0	19	46	24	0	619	2373
05:30:00 PM	3	18	11	0	17	16	4	0	12	38	1	0	18	41	17	0	612	2378
05:35:00 PM	3	16	7	0	13	17	4	0	6	49	0	0	19	65	24	0	629	2401
05:40:00 PM	4	14	8	0	14	10	5	0	5	42	2	0	17	67	13	0	620	2424
05:45:00 PM	1	15	12	0	10	12	6	0	10	44	3	0	14	51	19	0	621	2437
05:50:00 PM	0	16	14	0	19	18	3	0	9	41	0	0	19	41	24	0	602	2448
05:55:00 PM	2	15	15	0	18	14	3	0	7	36	0	0	25	44	16	0	596	2452

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	***SW 15th St***
E/W street	***OR-126***
City, State	Redmond OR
Site Notes	
Location	44.26959 - -121.1841
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	48
Peak Hour Start	04:55:00 PM
Peak 15 Min Start	05:00:00 PM
PHF (15-Min Int)	0.93



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
152	55	41	0	28	25	66	0	26	674	41	0	40	881	41	0	248	119	741	962	106	122	1099	743
Percent Heavy Vehicles																							
0.7%	3.6%	2.4%	0.0%	7.1%	0.0%	3.0%	0.0%	0.0%	2.8%	0.0%	0.0%	0.0%	2.2%	2.4%	0.0%	1.6%	3.4%	2.6%	2.1%	0.0%	2.5%	2.0%	3.0%

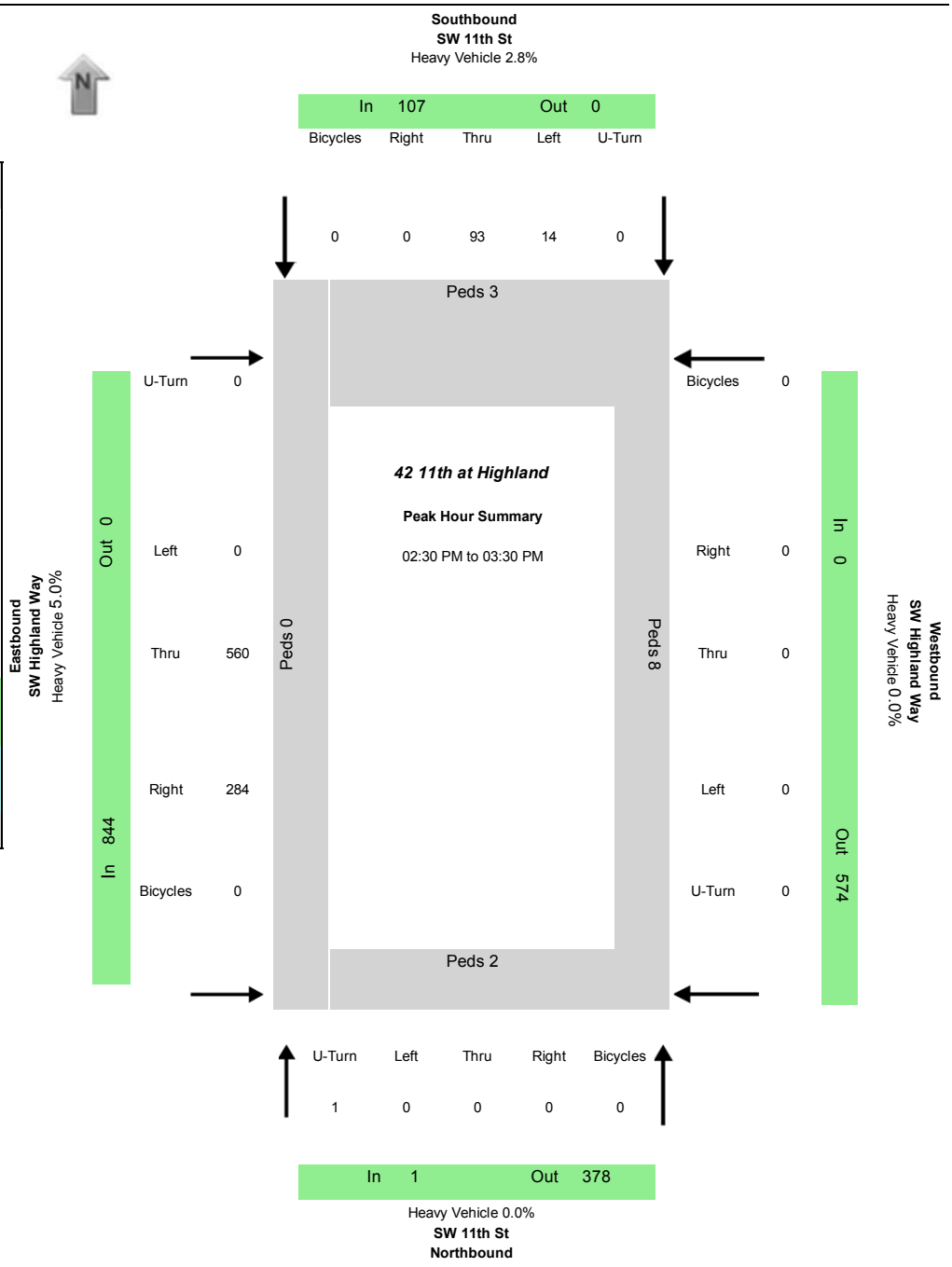
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
2	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	4	1	7	0	2	10

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW 15th St				SW 15th St				OR-126				OR-126				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	7	1	3	0	2	3	5	0	7	66	3	0	2	62	3	0		
02:05:00 PM	8	5	1	0	0	5	2	0	2	63	4	0	3	70	2	0		
02:10:00 PM	9	5	2	0	2	3	5	0	4	46	5	0	2	56	1	0	469	
02:15:00 PM	4	6	1	0	2	0	4	0	3	60	6	0	3	57	1	0	452	
02:20:00 PM	12	3	2	0	2	5	4	0	1	53	11	0	7	48	2	0	437	
02:25:00 PM	11	3	3	0	5	4	5	0	3	46	5	0	5	55	3	0	445	
02:30:00 PM	7	3	1	0	0	6	3	0	0	46	9	0	2	59	1	0	435	
02:35:00 PM	5	9	0	0	0	4	6	0	2	76	2	0	4	57	6	0	456	
02:40:00 PM	21	8	5	0	1	2	5	0	2	66	1	0	3	62	1	0	485	
02:45:00 PM	15	7	4	0	1	0	3	0	1	75	1	0	3	58	2	0	518	
02:50:00 PM	14	1	2	0	1	3	6	0	2	50	1	0	1	58	4	0	490	
02:55:00 PM	13	4	3	0	4	3	6	0	7	68	3	0	5	63	2	0	494	1893
03:00:00 PM	8	2	6	0	3	4	2	0	0	57	1	0	1	55	0	0	463	1868
03:05:00 PM	11	2	3	0	1	0	0	0	0	67	3	0	2	68	3	0	480	1863
03:10:00 PM	8	4	0	0	1	6	4	0	4	67	2	0	4	50	2	0	451	1875
03:15:00 PM	7	3	4	0	3	1	3	0	3	65	1	0	4	43	0	0	449	1865
03:20:00 PM	6	4	0	0	2	0	1	0	2	57	5	0	8	48	2	0	424	1850
03:25:00 PM	16	7	1	0	1	4	0	0	3	56	2	0	1	62	1	0	426	1856
03:30:00 PM	10	5	1	0	0	4	1	0	2	62	2	0	6	56	2	0	440	1870
03:35:00 PM	5	3	0	0	1	2	2	0	3	59	3	0	4	84	1	0	472	1866
03:40:00 PM	13	3	3	0	2	3	1	0	3	43	5	0	3	56	1	0	454	1825
03:45:00 PM	5	4	2	0	2	3	4	0	2	55	3	0	1	64	4	0	452	1804
03:50:00 PM	5	4	4	0	2	2	4	0	2	52	2	0	1	66	0	0	429	1805
03:55:00 PM	9	2	0	0	6	5	3	0	7	60	0	0	6	50	2	0	443	1774
04:00:00 PM	10	5	8	0	5	4	3	0	5	55	4	0	5	64	4	0	466	1807
04:05:00 PM	11	1	5	0	1	3	2	0	1	48	6	0	2	73	3	0	478	1803
04:10:00 PM	5	7	2	0	0	6	4	0	2	52	3	0	6	69	3	0	487	1810
04:15:00 PM	17	3	6	0	4	2	3	0	1	50	2	0	2	65	0	0	470	1828
04:20:00 PM	8	6	5	0	0	2	5	0	3	55	3	0	5	59	1	0	466	1845
04:25:00 PM	12	6	5	0	2	3	3	0	6	45	3	0	6	48	3	0	449	1833
04:30:00 PM	10	4	3	0	7	1	4	0	5	50	3	0	3	65	2	0	451	1839
04:35:00 PM	12	4	4	0	4	2	6	0	4	59	2	0	3	73	2	0	474	1847
04:40:00 PM	19	6	7	0	1	2	4	0	2	48	8	0	4	48	2	0	483	1862
04:45:00 PM	8	6	2	0	1	1	5	0	2	53	4	0	1	61	3	0	473	1860
04:50:00 PM	18	5	4	0	2	4	2	0	0	57	4	0	3	75	1	0	473	1891
04:55:00 PM	6	7	3	0	0	4	6	0	3	69	2	0	3	64	3	0	492	1911
05:00:00 PM	16	6	6	0	2	1	6	0	5	53	2	0	4	76	5	0	527	1921
05:05:00 PM	21	3	4	0	4	2	6	0	4	46	5	0	2	79	4	0	532	1945
05:10:00 PM	8	9	4	0	3	5	10	0	3	51	1	0	8	87	4	0	555	1979
05:15:00 PM	18	1	5	0	1	2	3	0	0	52	3	0	3	70	3	0	534	1985
05:20:00 PM	11	9	9	0	1	1	2	0	2	59	4	0	1	71	8	0	532	2011
05:25:00 PM	13	5	2	0	2	2	6	0	5	65	4	0	2	76	1	0	522	2052
05:30:00 PM	17	3	2	0	5	2	5	0	0	52	4	0	3	61	2	0	517	2051
05:35:00 PM	8	2	1	0	3	3	7	0	2	58	1	0	4	73	2	0	503	2040
05:40:00 PM	16	4	1	0	3	1	3	0	1	55	5	0	2	65	5	0	481	2050
05:45:00 PM	9	2	4	0	1	1	4	0	1	52	6	0	3	74	2	0	484	2062
05:50:00 PM	9	4	0	0	3	1	8	0	0	62	4	0	5	85	2	0	503	2070
05:55:00 PM	14	2	5	0	2	1	2	0	3	47	0	0	3	58	0	0	479	2037

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	***SW 11th St***
E/W street	***SW Highland Way***
City, State	Redmond OR
Site Notes	
Location	44.269611 - -121.179611
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	42
Peak Hour Start	02:30:00 PM
Peak 15 Min Start	03:05:00 PM
PHF (15-Min Int)	0.90



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	0	1	14	93	0	0	0	560	284	0	0	0	0	0	1	107	844	0	378	0	0	574
Percent Heavy Vehicles																							
0.0%	0.0%	0.0%	0.0%	0.0%	3.2%	0.0%	0.0%	0.0%	4.3%	6.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%	5.0%	0.0%	5.6%	0.0%	#DIV/0!	4.2%

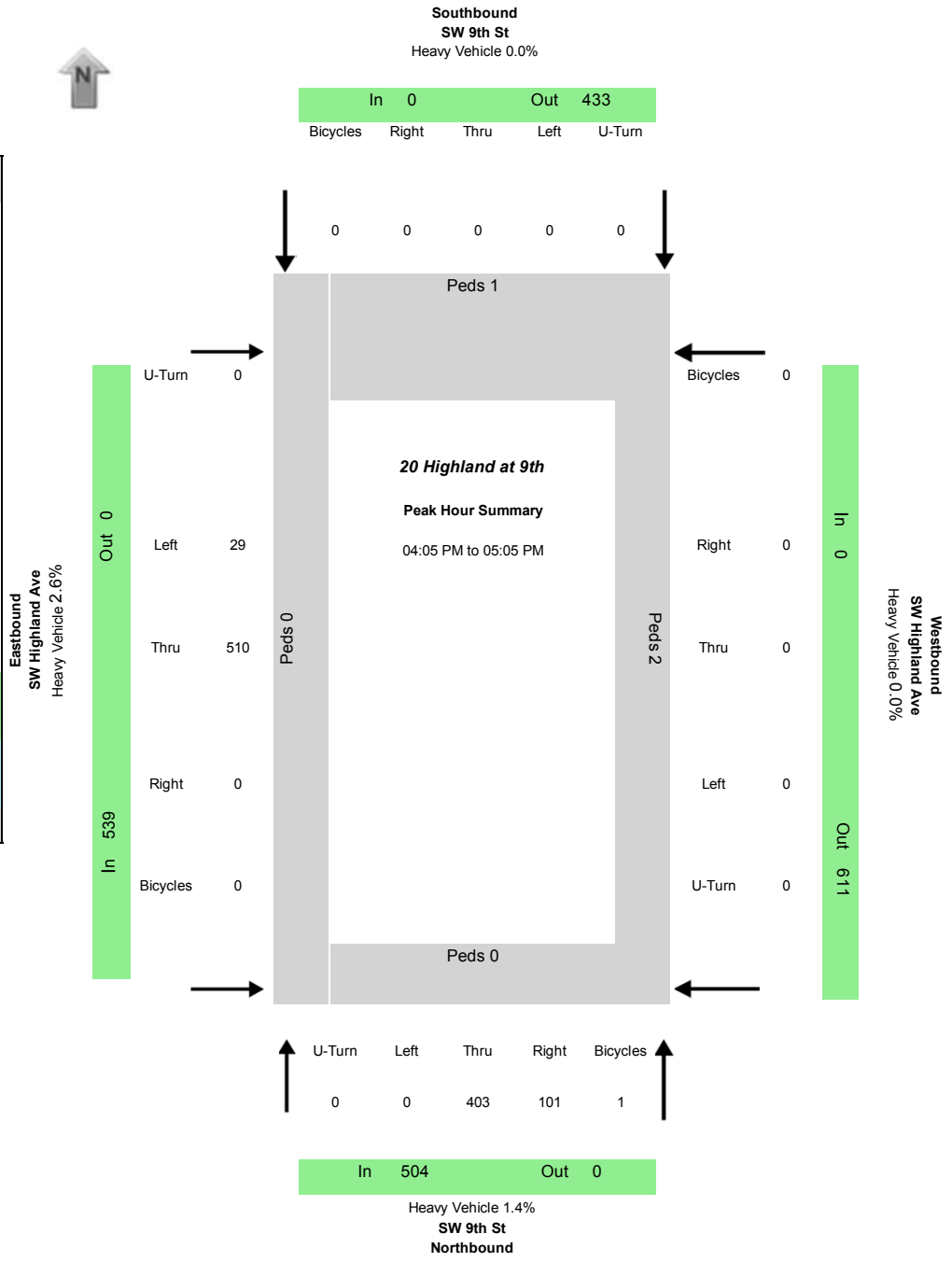
PHV- Bicycles																PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	8	13

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW 11th St				SW 11th St				SW Highland Way				SW Highland Way				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0	0	0	0	2	4	0	0	0	45	26	0	0	0	0	0		
02:05:00 PM	0	0	0	0	0	4	0	0	0	39	23	0	0	0	0	0		
02:10:00 PM	0	0	0	0	0	8	0	0	0	42	20	0	0	0	0	0	213	
02:15:00 PM	0	0	0	0	1	7	0	0	0	34	15	0	0	0	0	0	193	
02:20:00 PM	0	0	0	0	0	6	0	0	0	36	22	0	0	0	0	0	191	
02:25:00 PM	0	0	0	0	0	11	0	0	0	28	23	0	0	0	0	0	183	
02:30:00 PM	0	0	0	0	1	7	0	0	0	41	20	0	0	0	0	0	195	
02:35:00 PM	0	0	0	0	2	8	0	0	0	36	24	0	0	0	0	0	201	
02:40:00 PM	0	0	0	0	0	6	0	0	0	67	25	0	0	0	0	0	237	
02:45:00 PM	0	0	0	0	2	5	0	0	0	53	27	0	0	0	0	0	255	
02:50:00 PM	0	0	0	0	0	7	0	0	0	42	17	0	0	0	0	0	251	
02:55:00 PM	0	0	0	0	1	6	0	0	0	39	23	0	0	0	0	0	222	855
03:00:00 PM	0	0	0	0	0	8	0	0	0	49	26	0	0	0	0	0	218	861
03:05:00 PM	0	0	0	0	0	12	0	0	0	45	27	0	0	0	0	0	236	879
03:10:00 PM	0	0	0	0	2	7	0	0	0	47	20	0	0	0	0	0	243	885
03:15:00 PM	0	0	0	0	1	15	0	0	0	56	31	0	0	0	0	0	263	931
03:20:00 PM	0	0	0	0	1	6	0	0	0	41	26	0	0	0	0	0	253	941
03:25:00 PM	0	0	0	1	4	6	0	0	0	44	18	0	0	0	0	0	250	952
03:30:00 PM	0	0	0	0	1	6	0	0	0	35	20	0	0	0	0	0	209	945
03:35:00 PM	0	0	0	0	2	7	0	0	0	43	18	0	0	0	0	0	205	945
03:40:00 PM	0	0	0	0	2	5	0	0	0	31	21	0	0	0	0	0	191	906
03:45:00 PM	0	0	0	0	1	3	0	0	0	41	23	0	0	0	0	0	197	887
03:50:00 PM	0	0	0	0	1	3	0	0	0	33	20	0	0	0	0	0	184	878
03:55:00 PM	0	0	0	0	1	7	0	0	0	45	27	0	0	0	0	0	205	889
04:00:00 PM	0	0	0	0	0	8	0	0	0	36	20	0	0	0	0	0	201	870
04:05:00 PM	0	0	0	0	3	9	0	0	0	47	20	0	0	0	0	0	223	865
04:10:00 PM	0	0	0	0	1	11	0	0	0	46	12	0	0	0	0	0	213	859
04:15:00 PM	0	0	0	0	2	8	0	0	0	43	21	0	0	0	0	0	223	830
04:20:00 PM	0	0	0	0	1	8	0	0	0	38	22	0	0	0	0	0	213	825
04:25:00 PM	0	0	0	0	1	14	0	0	0	36	13	0	0	0	0	0	207	816
04:30:00 PM	0	0	0	0	1	4	0	0	0	45	20	0	0	0	0	0	203	824
04:35:00 PM	0	0	0	0	0	6	0	0	0	48	26	0	0	0	0	0	214	834
04:40:00 PM	0	0	0	0	1	6	0	0	0	44	18	0	0	0	0	0	219	844
04:45:00 PM	0	0	0	0	1	6	0	0	0	36	18	0	0	0	0	0	210	837
04:50:00 PM	0	0	0	0	1	3	0	0	0	43	27	0	0	0	0	0	204	854
04:55:00 PM	0	0	0	0	0	3	0	0	0	48	26	0	0	0	0	0	212	851
05:00:00 PM	0	0	0	0	1	5	0	0	0	38	23	0	0	0	0	0	218	854
05:05:00 PM	0	0	0	0	1	7	0	0	0	38	22	0	0	0	0	0	212	843
05:10:00 PM	0	0	0	0	0	7	0	0	0	23	24	0	0	0	0	0	189	827
05:15:00 PM	0	0	0	0	0	6	0	0	0	57	22	0	0	0	0	0	207	838
05:20:00 PM	0	0	0	0	1	8	0	0	0	47	17	0	0	0	0	0	212	842
05:25:00 PM	0	0	0	0	2	5	0	0	0	44	21	0	0	0	0	0	230	850
05:30:00 PM	0	0	0	0	1	2	0	0	0	38	26	0	0	0	0	0	212	847
05:35:00 PM	0	0	0	0	1	6	0	0	0	49	21	0	0	0	0	0	216	844
05:40:00 PM	0	0	0	0	1	4	0	0	0	38	24	0	0	0	0	0	211	842
05:45:00 PM	0	0	0	0	0	5	0	0	0	42	16	0	0	0	0	0	207	844
05:50:00 PM	0	0	0	0	0	6	0	0	0	40	24	0	0	0	0	0	200	840
05:55:00 PM	0	0	0	0	0	5	0	0	0	39	14	0	0	0	0	0	191	821

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW 9th St*
E/W street	*SW Highland Ave*
City, State	Redmond OR
Site Notes	
Location	44.269616 - -121.177457
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:05:00 PM
Peak 15 Min Start	04:05:00 PM
PHF (15-Min Int)	0.96



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	403	101	0	0	0	0	0	29	510	0	0	0	0	0	0	504	0	539	0	0	432	0	611
Percent Heavy Vehicles																							
0.0%	1.5%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.4%	2.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	2.6%	0.0%	#DIV/0!	1.6%	#DIV/0!	2.3%

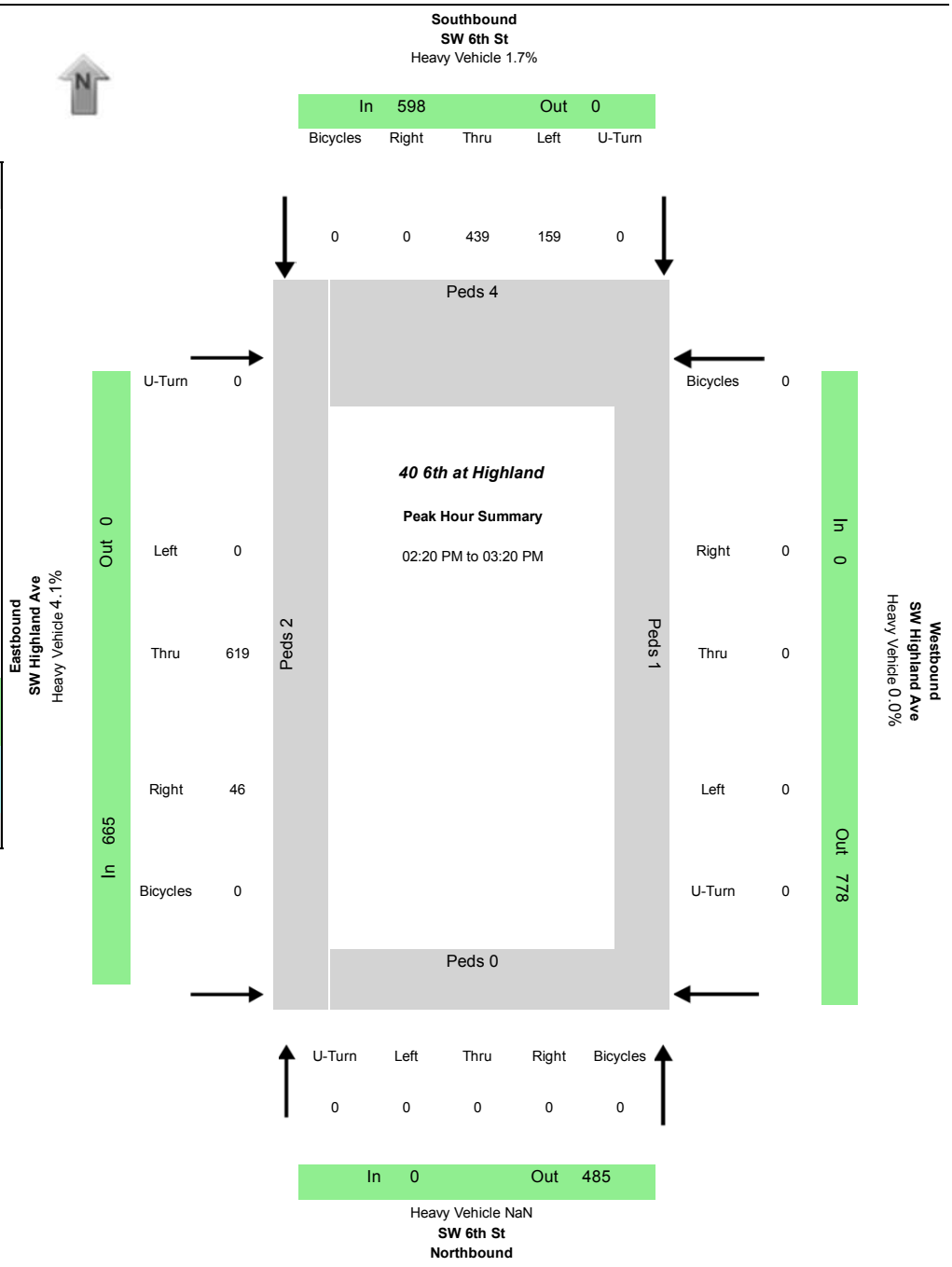
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	3

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW 9th St				SW 9th St				SW Highland Ave				SW Highland Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0	25	9	0	0	0	0	0	3	48	0	0	0	0	0	0		
02:05:00 PM	0	29	6	0	0	0	0	0	1	43	0	0	0	0	0	0		
02:10:00 PM	0	41	8	0	0	0	0	0	4	32	0	0	0	0	0	0	249	
02:15:00 PM	0	25	11	0	0	0	0	0	4	35	0	0	0	0	0	0	239	
02:20:00 PM	0	22	1	0	0	0	0	0	1	36	0	0	0	0	0	0	220	
02:25:00 PM	0	19	6	0	0	0	0	0	2	27	0	0	0	0	0	0	189	
02:30:00 PM	0	31	13	0	0	0	0	0	3	35	0	0	0	0	0	0	196	
02:35:00 PM	0	23	15	0	0	0	0	0	2	37	0	0	0	0	0	0	213	
02:40:00 PM	0	36	11	0	0	0	0	0	5	54	0	0	0	0	0	0	265	
02:45:00 PM	0	19	7	0	0	0	0	0	2	56	0	0	0	0	0	0	267	
02:50:00 PM	0	30	6	0	0	0	0	0	3	43	0	0	0	0	0	0	272	
02:55:00 PM	0	22	9	0	0	0	0	0	4	38	0	0	0	0	0	0	239	942
03:00:00 PM	0	28	8	0	0	0	0	0	2	46	0	0	0	0	0	0	239	941
03:05:00 PM	0	22	11	0	0	0	0	0	5	40	0	0	0	0	0	0	235	940
03:10:00 PM	0	24	14	0	0	0	0	0	1	45	0	0	0	0	0	0	246	939
03:15:00 PM	0	31	8	0	0	0	0	0	2	54	0	0	0	0	0	0	257	959
03:20:00 PM	0	45	5	0	0	0	0	0	3	41	0	0	0	0	0	0	273	993
03:25:00 PM	0	27	3	0	0	0	0	0	4	43	0	0	0	0	0	0	266	1016
03:30:00 PM	0	30	8	0	0	0	0	0	2	39	0	0	0	0	0	0	250	1013
03:35:00 PM	0	32	9	0	0	0	0	0	0	41	0	0	0	0	0	0	238	1018
03:40:00 PM	0	24	4	0	0	0	0	0	1	38	0	0	0	0	0	0	228	979
03:45:00 PM	0	37	7	0	0	0	0	0	3	36	0	0	0	0	0	0	232	978
03:50:00 PM	0	22	9	0	0	0	0	0	3	32	0	0	0	0	0	0	216	962
03:55:00 PM	0	28	9	0	0	0	0	0	0	42	0	0	0	0	0	0	228	968
04:00:00 PM	0	29	5	0	0	0	0	0	1	43	0	0	0	0	0	0	223	962
04:05:00 PM	0	37	9	0	0	0	0	0	1	47	0	0	0	0	0	0	251	978
04:10:00 PM	0	41	8	0	0	0	0	0	3	44	0	0	0	0	0	0	268	990
04:15:00 PM	0	29	6	0	0	0	0	0	2	45	0	0	0	0	0	0	272	977
04:20:00 PM	0	36	10	0	0	0	0	0	3	38	0	0	0	0	0	0	265	970
04:25:00 PM	0	32	6	0	0	0	0	0	3	34	0	0	0	0	0	0	244	968
04:30:00 PM	0	27	7	0	0	0	0	0	4	47	0	0	0	0	0	0	247	974
04:35:00 PM	0	37	11	0	0	0	0	0	1	43	0	0	0	0	0	0	252	984
04:40:00 PM	0	30	11	0	0	0	0	0	1	45	0	0	0	0	0	0	264	1004
04:45:00 PM	0	27	4	0	0	0	0	0	2	42	0	0	0	0	0	0	254	996
04:50:00 PM	0	36	8	0	0	0	0	0	3	38	0	0	0	0	0	0	247	1015
04:55:00 PM	0	33	7	0	0	0	0	0	2	50	0	0	0	0	0	0	252	1028
05:00:00 PM	0	38	14	0	0	0	0	0	4	37	0	0	0	0	0	0	270	1043
05:05:00 PM	0	40	10	0	0	0	0	0	2	38	0	0	0	0	0	0	275	1039
05:10:00 PM	0	42	13	0	0	0	0	0	1	21	0	0	0	0	0	0	260	1020
05:15:00 PM	0	27	4	0	0	0	0	0	2	52	0	0	0	0	0	0	252	1023
05:20:00 PM	0	27	6	0	0	0	0	0	1	49	0	0	0	0	0	0	245	1019
05:25:00 PM	0	24	3	0	0	0	0	0	3	52	0	0	0	0	0	0	250	1026
05:30:00 PM	0	27	13	0	0	0	0	0	3	33	0	0	0	0	0	0	241	1017
05:35:00 PM	0	28	7	0	0	0	0	0	2	41	0	0	0	0	0	0	236	1003
05:40:00 PM	0	28	5	0	0	0	0	0	4	31	0	0	0	0	0	0	222	984
05:45:00 PM	0	31	6	0	0	0	0	0	2	33	0	0	0	0	0	0	218	981
05:50:00 PM	0	44	4	0	0	0	0	0	0	39	0	0	0	0	0	0	227	983
05:55:00 PM	0	27	9	0	0	0	0	0	1	40	0	0	0	0	0	0	236	968

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	***SW 6th St***
E/W street	***SW Highland Ave***
City, State	Redmond OR
Site Notes	
Location	44.26964 - -121.174235
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	40
Peak Hour Start	02:20:00 PM
Peak 15 Min Start	03:00:00 PM
PHF (15-Min Int)	0.94



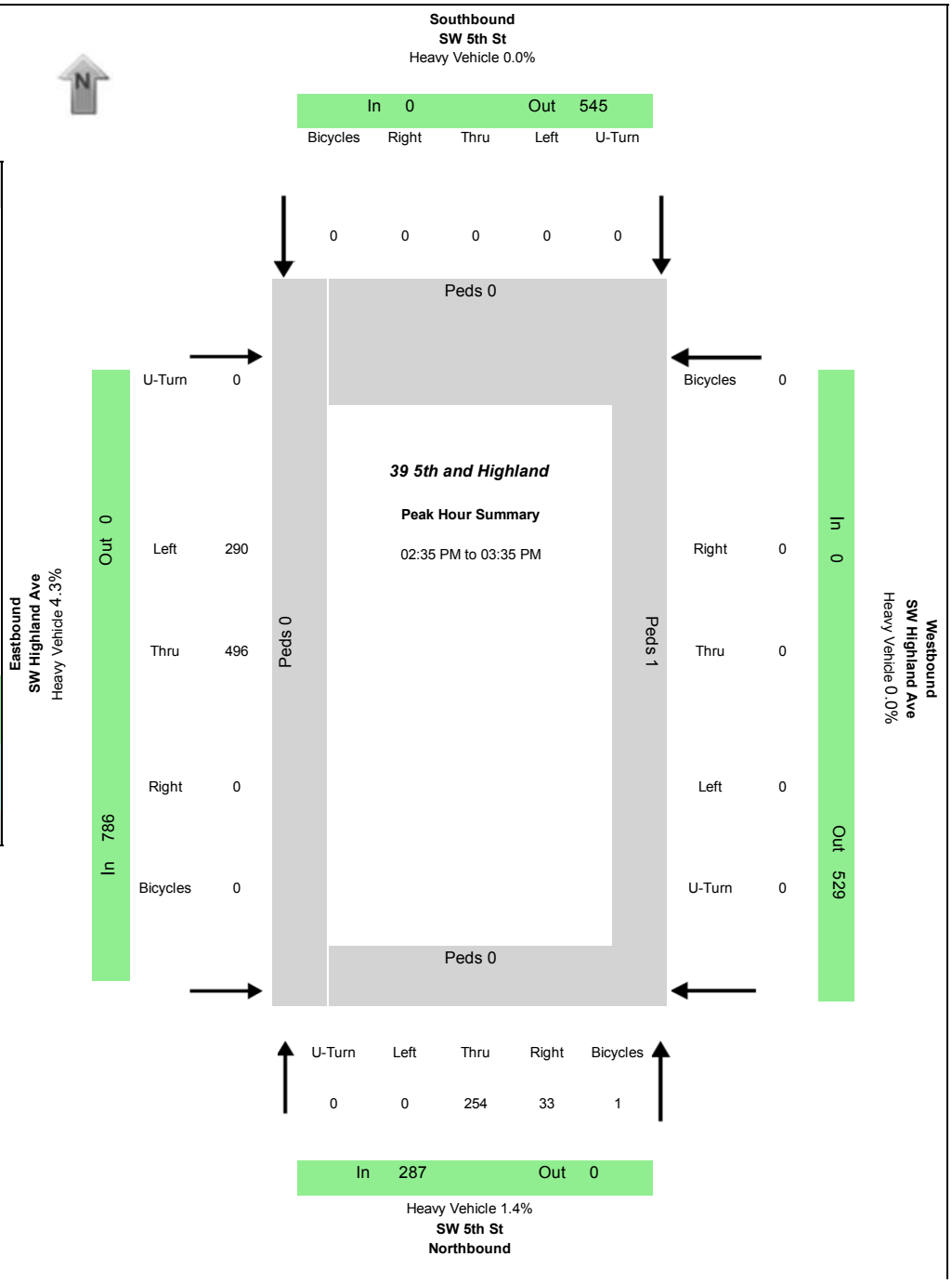
Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	0	0	159	439	0	0	0	619	46	0	0	0	0	0	0	598	665	0	485	0	0	778
Percent Heavy Vehicles																							
0.0%	0.0%	0.0%	0.0%	2.5%	1.4%	0.0%	0.0%	0.0%	4.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	#DIV/0!	1.7%	4.1%	0.0%	1.2%	0.0%	#DIV/0!	4.0%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	1	7

All Vehicle Volumes																		
	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW 6th St				SW 6th St				SW Highland Ave				SW Highland Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0	0	0	0	8	44	0	0	0	55	6	0	0	0	0	0		
02:05:00 PM	0	0	0	0	15	38	0	0	0	51	2	0	0	0	0	0		
02:10:00 PM	0	0	0	0	11	34	0	0	0	35	3	0	0	0	0	0	302	
02:15:00 PM	0	0	0	0	13	41	0	0	0	40	3	0	0	0	0	0	286	
02:20:00 PM	0	0	0	0	14	40	0	0	0	48	3	0	0	0	0	0	285	
02:25:00 PM	0	0	0	0	14	39	0	0	0	35	6	0	0	0	0	0	296	
02:30:00 PM	0	0	0	0	12	46	0	0	0	48	2	0	0	0	0	0	307	
02:35:00 PM	0	0	0	0	18	27	0	0	0	50	3	0	0	0	0	0	300	
02:40:00 PM	0	0	0	0	16	32	0	0	0	59	6	0	0	0	0	0	319	
02:45:00 PM	0	0	0	0	13	35	0	0	0	66	3	0	0	0	0	0	328	
02:50:00 PM	0	0	0	0	13	43	0	0	0	45	0	0	0	0	0	0	331	
02:55:00 PM	0	0	0	0	10	26	0	0	0	52	4	0	0	0	0	0	310	1227
03:00:00 PM	0	0	0	0	16	38	0	0	0	47	2	0	0	0	0	0	296	1217
03:05:00 PM	0	0	0	0	9	41	0	0	0	57	8	0	0	0	0	0	310	1226
03:10:00 PM	0	0	0	0	13	42	0	0	0	57	5	0	0	0	0	0	335	1260
03:15:00 PM	0	0	0	0	11	30	0	0	0	55	4	0	0	0	0	0	332	1263
03:20:00 PM	0	0	0	0	7	41	0	0	0	41	4	0	0	0	0	0	310	1251
03:25:00 PM	0	0	0	0	13	33	0	0	0	48	4	0	0	0	0	0	291	1255
03:30:00 PM	0	0	0	0	11	33	0	0	0	56	2	0	0	0	0	0	293	1249
03:35:00 PM	0	0	0	0	12	30	0	0	0	49	6	0	0	0	0	0	297	1248
03:40:00 PM	0	0	0	0	9	24	0	0	0	46	1	0	0	0	0	0	279	1215
03:45:00 PM	0	0	0	0	16	35	0	0	0	48	5	0	0	0	0	0	281	1202
03:50:00 PM	0	0	0	0	11	46	0	0	0	48	4	0	0	0	0	0	293	1210
03:55:00 PM	0	0	0	0	10	30	0	0	0	51	2	0	0	0	0	0	306	1211
04:00:00 PM	0	0	0	0	10	37	0	0	0	55	5	0	0	0	0	0	309	1215
04:05:00 PM	0	0	0	0	9	43	0	0	0	51	6	0	0	0	0	0	309	1209
04:10:00 PM	0	0	0	0	14	40	0	0	0	51	2	0	0	0	0	0	323	1199
04:15:00 PM	0	0	0	0	10	31	0	0	0	50	6	0	0	0	0	0	313	1196
04:20:00 PM	0	0	0	0	14	45	0	0	0	49	5	0	0	0	0	0	317	1216
04:25:00 PM	0	0	0	0	9	28	0	0	0	41	5	0	0	0	0	0	293	1201
04:30:00 PM	0	0	0	0	11	35	0	0	0	54	5	0	0	0	0	0	301	1204
04:35:00 PM	0	0	0	0	16	37	0	0	0	49	3	0	0	0	0	0	293	1212
04:40:00 PM	0	0	0	0	14	45	0	0	0	48	4	0	0	0	0	0	321	1243
04:45:00 PM	0	0	0	0	10	35	0	0	0	54	5	0	0	0	0	0	320	1243
04:50:00 PM	0	0	0	0	9	34	0	0	0	41	3	0	0	0	0	0	302	1221
04:55:00 PM	0	0	0	0	13	31	0	0	0	64	3	0	0	0	0	0	302	1239
05:00:00 PM	0	0	0	0	13	44	0	0	0	49	1	0	0	0	0	0	305	1239
05:05:00 PM	0	0	0	0	13	42	0	0	0	49	2	0	0	0	0	0	324	1236
05:10:00 PM	0	0	0	0	11	31	0	0	0	43	7	0	0	0	0	0	305	1221
05:15:00 PM	0	0	0	0	11	31	0	0	0	51	4	0	0	0	0	0	295	1221
05:20:00 PM	0	0	0	0	9	41	0	0	0	52	2	0	0	0	0	0	293	1212
05:25:00 PM	0	0	0	0	9	41	0	0	0	50	4	0	0	0	0	0	305	1233
05:30:00 PM	0	0	0	0	4	20	0	0	0	49	7	0	0	0	0	0	288	1208
05:35:00 PM	0	0	0	0	9	29	0	0	0	45	5	0	0	0	0	0	272	1191
05:40:00 PM	0	0	0	0	6	22	0	0	0	44	3	0	0	0	0	0	243	1155
05:45:00 PM	0	0	0	0	8	21	0	0	0	41	4	0	0	0	0	0	237	1125
05:50:00 PM	0	0	0	0	14	24	0	0	0	38	0	0	0	0	0	0	225	1114
05:55:00 PM	0	0	0	0	13	28	0	0	0	50	4	0	0	0	0	0	245	1098

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW 5th St*
E/W street	*SW Highland Ave*
City, State	Redmond OR
Site Notes	
Location	44.269609 - -121.173291
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	39
Peak Hour Start	02:35:00 PM
Peak 15 Min Start	02:35:00 PM
PHF (15-Min Int)	0.92



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	254	33	0	0	0	0	0	290	496	0	0	0	0	0	0	287	0	786	0	0	544	0	529
Percent Heavy Vehicles																							
0.0%	0.8%	6.1%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	6.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	4.3%	0.0%	#DIV/0!	0.9%	#DIV/0!	6.2%

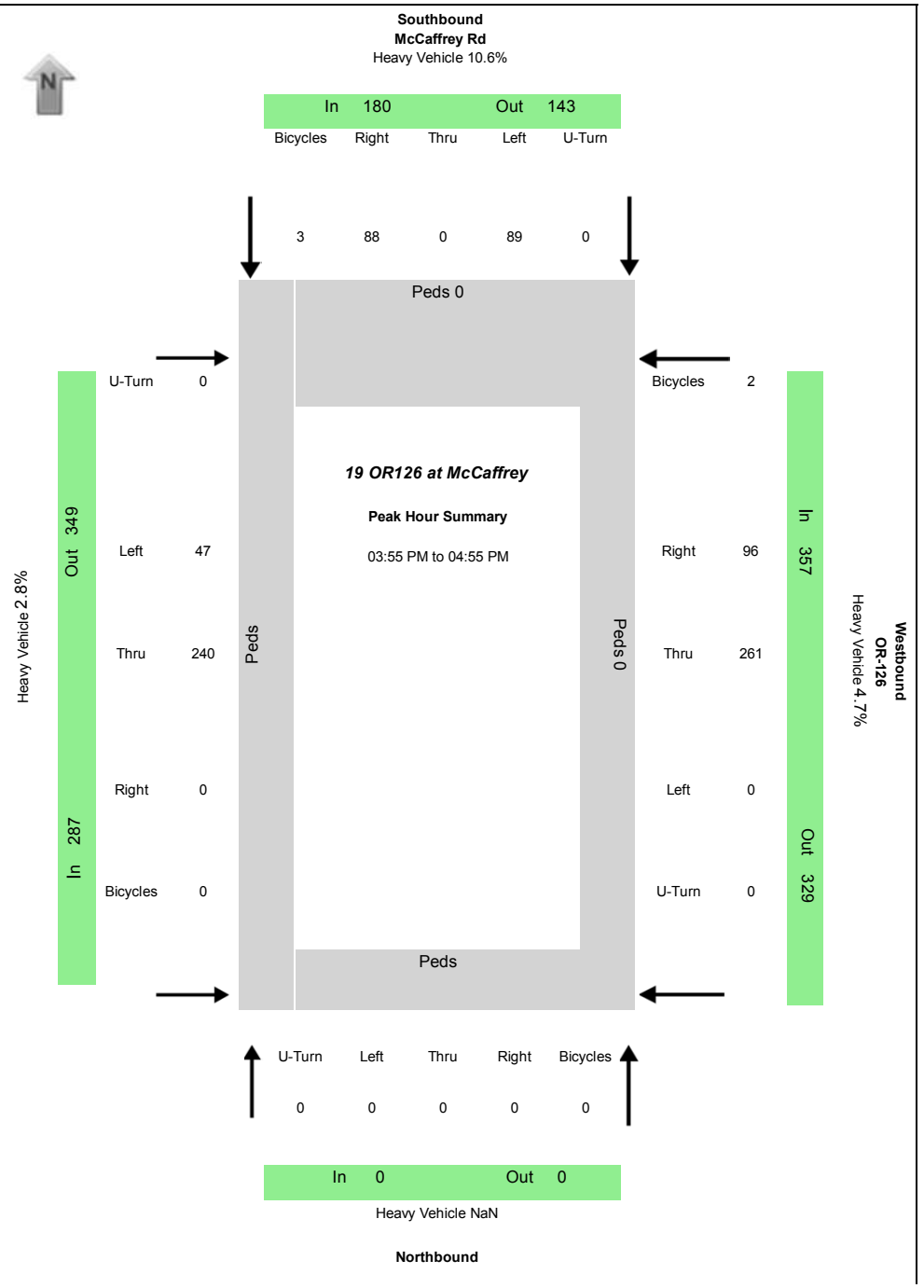
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW 5th St				SW 5th St				SW Highland Ave				SW Highland Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0	18	3	0	0	0	0	0	24	39	0	0	0	0	0	0		
02:05:00 PM	0	23	3	0	0	0	0	0	24	39	0	0	0	0	0	0		
02:10:00 PM	0	30	1	0	0	0	0	0	18	27	0	0	0	0	0	0	249	
02:15:00 PM	0	14	1	0	0	0	0	0	23	31	0	0	0	0	0	0	234	
02:20:00 PM	0	21	3	0	0	0	0	0	25	34	0	0	0	0	0	0	228	
02:25:00 PM	0	18	5	0	0	0	0	0	15	38	0	0	0	0	0	0	228	
02:30:00 PM	0	14	1	0	0	0	0	0	23	38	0	0	0	0	0	0	235	
02:35:00 PM	0	17	5	0	0	0	0	0	24	45	0	0	0	0	0	0	243	
02:40:00 PM	0	30	2	0	0	0	0	0	32	37	0	0	0	0	0	0	268	
02:45:00 PM	0	19	2	0	0	0	0	0	33	47	0	0	0	0	0	0	293	
02:50:00 PM	0	23	3	0	0	0	0	0	23	33	0	0	0	0	0	0	284	
02:55:00 PM	0	34	1	0	0	0	0	0	23	41	0	0	0	0	0	0	282	1027
03:00:00 PM	0	17	1	0	0	0	0	0	16	46	0	0	0	0	0	0	261	1023
03:05:00 PM	0	23	5	0	0	0	0	0	18	52	0	0	0	0	0	0	277	1032
03:10:00 PM	0	19	1	0	0	0	0	0	33	37	0	0	0	0	0	0	268	1046
03:15:00 PM	0	17	4	0	0	0	0	0	24	46	0	0	0	0	0	0	279	1068
03:20:00 PM	0	14	2	0	0	0	0	0	19	28	0	0	0	0	0	0	244	1048
03:25:00 PM	0	23	3	0	0	0	0	0	24	36	0	0	0	0	0	0	240	1058
03:30:00 PM	0	18	4	0	0	0	0	0	21	48	0	0	0	0	0	0	240	1073
03:35:00 PM	0	17	4	0	0	0	0	0	25	37	0	0	0	0	0	0	260	1065
03:40:00 PM	0	29	1	0	0	0	0	0	26	30	0	0	0	0	0	0	260	1050
03:45:00 PM	0	17	3	0	0	0	0	0	22	38	0	0	0	0	0	0	249	1029
03:50:00 PM	0	20	2	0	0	0	0	0	27	35	0	0	0	0	0	0	250	1031
03:55:00 PM	0	22	1	0	0	0	0	0	29	31	0	0	0	0	0	0	247	1015
04:00:00 PM	0	17	5	0	0	0	0	0	27	42	0	0	0	0	0	0	258	1026
04:05:00 PM	0	17	1	0	0	0	0	0	20	39	0	0	0	0	0	0	251	1005
04:10:00 PM	0	15	3	0	0	0	0	0	27	36	0	0	0	0	0	0	249	996
04:15:00 PM	0	16	2	0	0	0	0	0	27	36	0	0	0	0	0	0	239	986
04:20:00 PM	0	13	1	0	0	0	0	0	25	37	0	0	0	0	0	0	238	999
04:25:00 PM	0	23	5	0	0	0	0	0	15	35	0	0	0	0	0	0	235	991
04:30:00 PM	0	24	0	0	0	0	0	0	22	45	0	0	0	0	0	0	245	991
04:35:00 PM	0	27	3	0	0	0	0	0	28	35	0	0	0	0	0	0	262	1001
04:40:00 PM	0	12	6	0	0	0	0	0	15	48	0	0	0	0	0	0	265	996
04:45:00 PM	0	16	8	0	0	0	0	0	28	33	0	0	0	0	0	0	259	1001
04:50:00 PM	0	28	1	0	0	0	0	0	28	24	0	0	0	0	0	0	247	998
04:55:00 PM	0	15	3	0	0	0	0	0	30	47	0	0	0	0	0	0	261	1010
05:00:00 PM	0	34	5	0	0	0	0	0	23	38	0	0	0	0	0	0	276	1019
05:05:00 PM	0	13	1	0	0	0	0	0	22	40	0	0	0	0	0	0	271	1018
05:10:00 PM	0	14	2	0	0	0	0	0	19	35	0	0	0	0	0	0	246	1007
05:15:00 PM	0	23	4	0	0	0	0	0	26	36	0	0	0	0	0	0	235	1015
05:20:00 PM	0	21	3	0	0	0	0	0	32	29	0	0	0	0	0	0	244	1024
05:25:00 PM	0	23	1	0	0	0	0	0	26	35	0	0	0	0	0	0	259	1031
05:30:00 PM	0	15	5	0	0	0	0	0	17	35	0	0	0	0	0	0	242	1012
05:35:00 PM	0	18	0	0	0	0	0	0	27	27	0	0	0	0	0	0	229	991
05:40:00 PM	0	15	2	0	0	0	0	0	24	27	0	0	0	0	0	0	212	978
05:45:00 PM	0	12	1	0	0	0	0	0	19	30	0	0	0	0	0	0	202	955
05:50:00 PM	0	19	1	0	0	0	0	0	25	25	0	0	0	0	0	0	200	944
05:55:00 PM	0	17	6	0	0	0	0	0	21	40	0	0	0	0	0	0	216	933

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*McCaffrey Rd*
E/W street	*OR-126*
City, State	Redmond OR
Site Notes	
Location	44.268926 - -121.158729
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	03:55:00 PM
Peak 15 Min Start	03:55:00 PM
PHF (15-Min Int)	0.91



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	0	0	89	0	88	0	47	240	0	0	0	261	96	0	0	177	287	357	0	143	349	329

Percent Heavy Vehicles

0.0%	0.0%	0.0%	0.0%	11.2%	0.0%	10.2%	0.0%	2.1%	2.9%	0.0%	0.0%	0.0%	2.7%	10.4%	0.0%	#DIV/0!	10.7%	2.8%	4.8%	#DIV/0!	7.7%	4.6%	5.2%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**
				3		0	0	0	0		0		2	0	0	5

PHV - Pedestrians

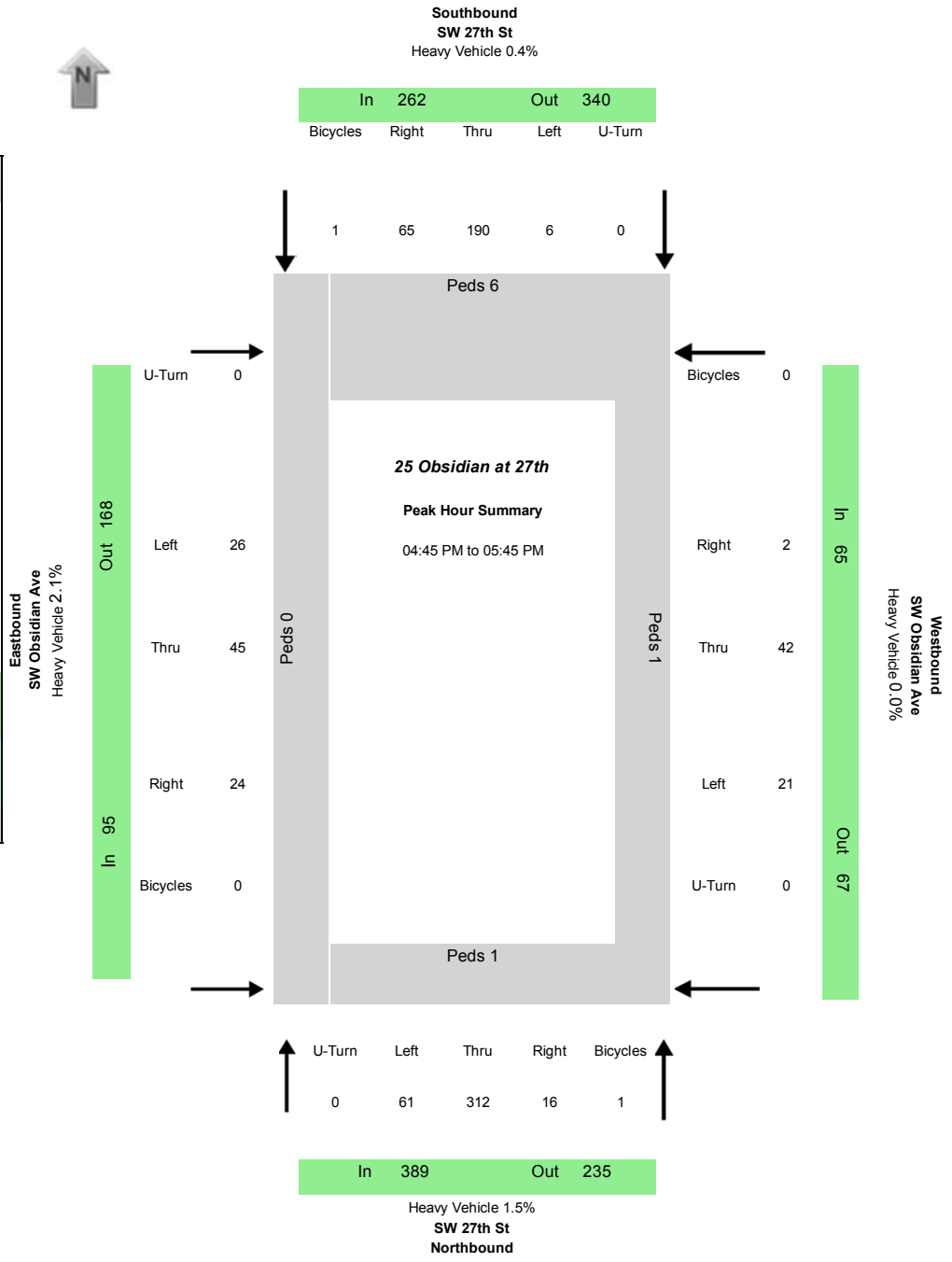
in Crosswalk				
NB	SB	EB	WB	**Sum**
	0		0	0

All Vehicle Volumes

	Northbound				Southbound				Eastbound				Westbound				15 Min	1 HR
					McCaffrey Rd				OR-126				OR-126					
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM					11		8	0	1	14		0		19	4	0		
02:05:00 PM					5		7	0	2	22		0		16	7	0		
02:10:00 PM					3		7	0	5	26		0		14	6	0	177	
02:15:00 PM					7		4	0	3	18		0		6	10	0	168	
02:20:00 PM					7		7	0	3	18		0		9	3	0	156	
02:25:00 PM					10		11	0	4	15		0		17	6	0	158	
02:30:00 PM					6		13	0	1	12		0		17	7	0	166	
02:35:00 PM					9		9	0	1	16		0		19	10	0	183	
02:40:00 PM					5		15	0	5	15		0		22	6	0	188	
02:45:00 PM					5		6	0	3	13		0		21	10	0	190	
02:50:00 PM					9		6	0	1	12		0		10	8	0	172	
02:55:00 PM					6		12	0	4	15		0		16	7	0	164	687
03:00:00 PM					8		10	0	3	22		0		14	7	0	170	694
03:05:00 PM					11		8	0	5	7		0		19	10	0	184	695
03:10:00 PM					6		5	0	3	19		0		18	7	0	182	692
03:15:00 PM					3		9	0	2	15		0		16	11	0	174	700
03:20:00 PM					8		7	0	3	18		0		14	10	0	174	713
03:25:00 PM					7		8	0	3	16		0		12	12	0	174	708
03:30:00 PM					4		6	0	3	20		0		14	6	0	171	705
03:35:00 PM					11		16	0	5	23		0		19	5	0	190	720
03:40:00 PM					4		5	0	6	21		0		27	8	0	203	723
03:45:00 PM					8		6	0	1	17		0		16	14	0	212	727
03:50:00 PM					5		5	0	4	14		0		22	6	0	189	737
03:55:00 PM					6		11	0	2	28		0		28	8	0	201	760
04:00:00 PM					5		5	0	4	20		0		24	10	0	207	764
04:05:00 PM					8		16	0	4	12		0		28	6	0	225	778
04:10:00 PM					2		8	0	4	23		0		13	8	0	200	778
04:15:00 PM					1		1	0	4	22		0		17	8	0	185	775
04:20:00 PM					12		8	0	2	15		0		24	8	0	180	784
04:25:00 PM					9		6	0	4	16		0		22	5	0	184	788
04:30:00 PM					4		4	0	9	22		0		17	10	0	197	801
04:35:00 PM					13		8	0	5	21		0		25	12	0	212	806
04:40:00 PM					13		6	0	5	24		0		20	4	0	222	807
04:45:00 PM					11		5	0	1	18		0		17	12	0	220	809
04:50:00 PM					5		10	0	3	19		0		26	5	0	204	821
04:55:00 PM					4		7	0	5	20		0		22	6	0	196	802
05:00:00 PM					12		6	0	10	24		0		18	3	0	205	807
05:05:00 PM					7		15	0	1	23		0		12	8	0	203	799
05:10:00 PM					6		8	0	5	22		0		12	11	0	203	805
05:15:00 PM					9		7	0	4	30		0		18	1	0	199	821
05:20:00 PM					11		8	0	3	15		0		13	13	0	196	815
05:25:00 PM					3		7	0	1	17		0		18	8	0	186	807
05:30:00 PM					9		7	0	2	27		0		19	6	0	187	811
05:35:00 PM					4		5	0	5	15		1		18	5	0	177	780
05:40:00 PM					7		3	0	4	22		0		15	9	0	183	768
05:45:00 PM					2		1	0	2	13		0		15	8	0	154	745
05:50:00 PM					1		6	0	2	24		0		15	4	0	153	729
05:55:00 PM					3		6	0	4	14		0		12	5	0	137	709

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW 27th St*
E/W street	*SW Obsidian Ave*
City, State	Redmond OR
Site Notes	
Location	44.261881 - -121.199971
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	25
Peak Hour Start	04:45:00 PM
Peak 15 Min Start	05:30:00 PM
PHF (15-Min Int)	0.91



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
61	312	16	0	6	190	65	0	26	45	24	0	21	42	2	0	389	261	95	65	235	340	168	67
Percent Heavy Vehicles																							
3.3%	1.3%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	3.8%	0.0%	4.2%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	0.4%	2.1%	0.0%	0.9%	1.5%	1.2%	0.0%

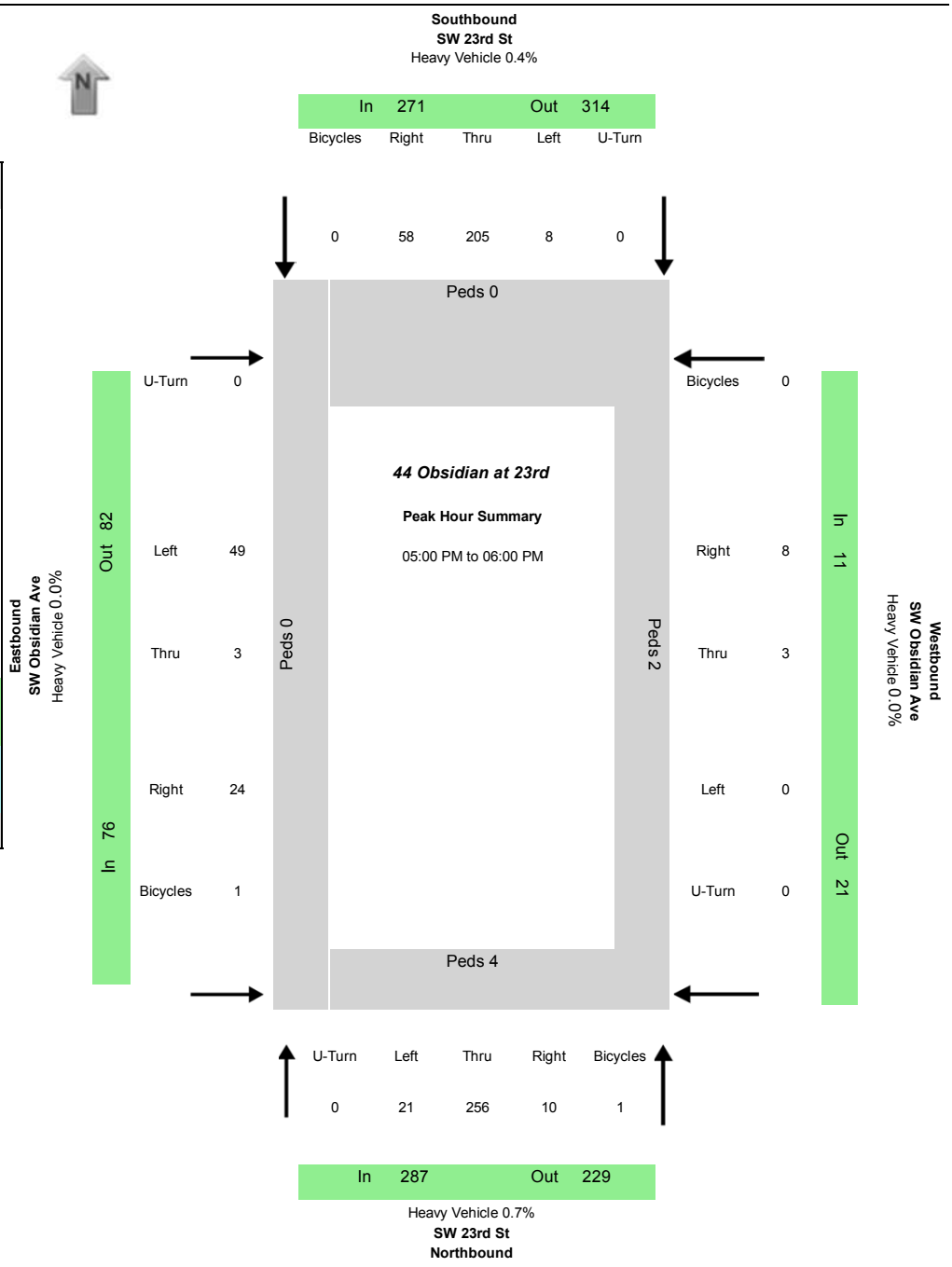
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2	1	6	0	1	8

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW 27th St				SW 27th St				SW Obsidian Ave				SW Obsidian Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0	15	1	0	2	6	1	0	1	0	1	0	0	2	0	0		
02:05:00 PM	3	9	1	0	1	9	1	0	1	0	2	0	0	1	2	0		
02:10:00 PM	1	7	0	0	1	3	1	0	0	3	2	0	0	2	0	0	79	
02:15:00 PM	2	9	0	0	1	13	0	0	2	2	2	0	0	2	1	0	84	
02:20:00 PM	2	22	0	0	3	11	2	0	1	0	0	0	0	1	0	0	96	
02:25:00 PM	3	13	2	0	0	9	3	0	2	1	2	0	1	0	2	0	114	
02:30:00 PM	1	15	0	0	2	6	0	0	2	2	1	0	1	2	0	0	112	
02:35:00 PM	1	7	0	0	0	16	0	0	2	1	0	0	2	3	0	0	102	
02:40:00 PM	1	13	0	0	1	11	3	0	0	0	2	0	2	5	1	0	103	
02:45:00 PM	4	8	0	0	2	20	1	0	3	5	1	0	1	2	1	0	119	
02:50:00 PM	3	21	1	0	0	18	3	0	2	7	0	0	0	2	1	0	145	
02:55:00 PM	2	22	1	0	0	5	2	0	2	1	0	0	1	2	0	0	144	440
03:00:00 PM	3	15	1	0	1	12	0	0	1	1	0	0	1	1	1	0	133	448
03:05:00 PM	3	26	1	0	1	15	7	0	1	2	0	0	2	4	0	0	137	480
03:10:00 PM	5	13	1	0	2	8	5	0	1	0	2	0	0	3	2	0	141	502
03:15:00 PM	2	19	2	0	3	20	3	0	1	2	1	0	1	4	0	0	162	526
03:20:00 PM	5	19	1	0	0	17	8	0	3	0	3	0	1	5	1	0	163	547
03:25:00 PM	5	16	0	0	0	13	5	0	4	0	1	0	0	6	0	0	171	559
03:30:00 PM	7	16	3	0	1	18	4	0	1	3	0	0	0	3	1	0	170	584
03:35:00 PM	5	22	2	0	0	18	1	0	10	3	7	0	1	1	1	0	178	623
03:40:00 PM	1	19	2	0	0	15	4	0	8	3	14	0	1	1	0	0	196	652
03:45:00 PM	4	18	2	0	0	17	3	0	5	5	5	0	3	4	1	0	206	671
03:50:00 PM	2	30	1	0	1	12	6	0	1	1	3	0	0	1	3	0	196	674
03:55:00 PM	0	22	1	0	1	9	2	0	5	2	6	0	1	2	0	0	179	687
04:00:00 PM	3	17	1	0	1	20	3	0	2	1	1	0	2	2	0	0	165	703
04:05:00 PM	7	20	1	0	0	9	1	0	3	3	4	0	0	1	0	0	153	690
04:10:00 PM	3	21	0	0	0	13	2	0	3	4	1	0	1	1	1	0	152	698
04:15:00 PM	0	18	1	0	0	11	1	0	0	3	2	0	3	3	0	0	141	682
04:20:00 PM	2	15	1	0	0	14	2	0	1	1	3	0	0	7	0	0	138	665
04:25:00 PM	2	14	2	0	0	18	1	0	3	1	3	0	0	3	0	0	135	662
04:30:00 PM	5	16	0	0	2	17	2	0	1	1	2	0	0	0	0	0	139	651
04:35:00 PM	1	24	0	0	1	14	4	0	2	7	3	0	3	2	0	0	154	641
04:40:00 PM	3	19	0	0	0	16	1	0	3	3	4	0	2	2	2	0	162	628
04:45:00 PM	2	24	2	0	0	21	3	0	0	7	1	0	1	1	0	0	178	623
04:50:00 PM	3	18	1	0	0	13	6	0	1	3	1	0	1	3	0	0	167	612
04:55:00 PM	5	28	2	0	1	10	2	0	1	2	2	0	1	2	0	0	168	617
05:00:00 PM	8	23	0	0	0	15	7	0	6	3	0	0	1	4	0	0	173	631
05:05:00 PM	4	26	0	0	1	20	6	0	5	4	1	0	5	1	0	0	196	655
05:10:00 PM	11	25	0	0	2	15	5	0	0	4	2	0	4	2	0	0	210	675
05:15:00 PM	4	27	1	0	0	11	8	0	0	4	2	0	0	6	1	0	207	697
05:20:00 PM	4	33	2	0	0	20	6	0	0	3	1	0	1	4	0	0	208	725
05:25:00 PM	6	26	1	0	0	11	8	0	3	6	4	0	1	5	1	0	210	750
05:30:00 PM	6	28	3	0	1	18	4	0	3	2	5	0	0	5	0	0	221	779
05:35:00 PM	4	28	2	0	0	17	3	0	4	4	3	0	4	4	0	0	220	791
05:40:00 PM	4	26	2	0	1	19	7	0	3	3	2	0	2	5	0	0	222	810
05:45:00 PM	5	16	4	0	0	17	3	0	3	2	3	0	0	2	1	0	203	804
05:50:00 PM	2	11	1	0	0	11	8	0	4	5	0	0	1	6	0	0	179	803
05:55:00 PM	2	16	2	0	1	8	4	0	6	6	2	0	2	6	0	0	160	802

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	***SW 23rd St***
E/W street	***SW Obsidian Ave***
City, State	Redmond OR
Site Notes	
Location	44.261959 - -121.194223
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	44
Peak Hour Start	05:00:00 PM
Peak 15 Min Start	05:10:00 PM
PHF (15-Min Int)	0.94



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
21	256	10	0	8	205	58	0	49	3	24	0	0	3	8	0	287	271	76	11	229	313	82	21

Percent Heavy Vehicles

0.0%	0.8%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.4%	0.0%	0.0%	0.4%	0.6%	0.0%	0.0%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum
0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2

PHV - Pedestrians

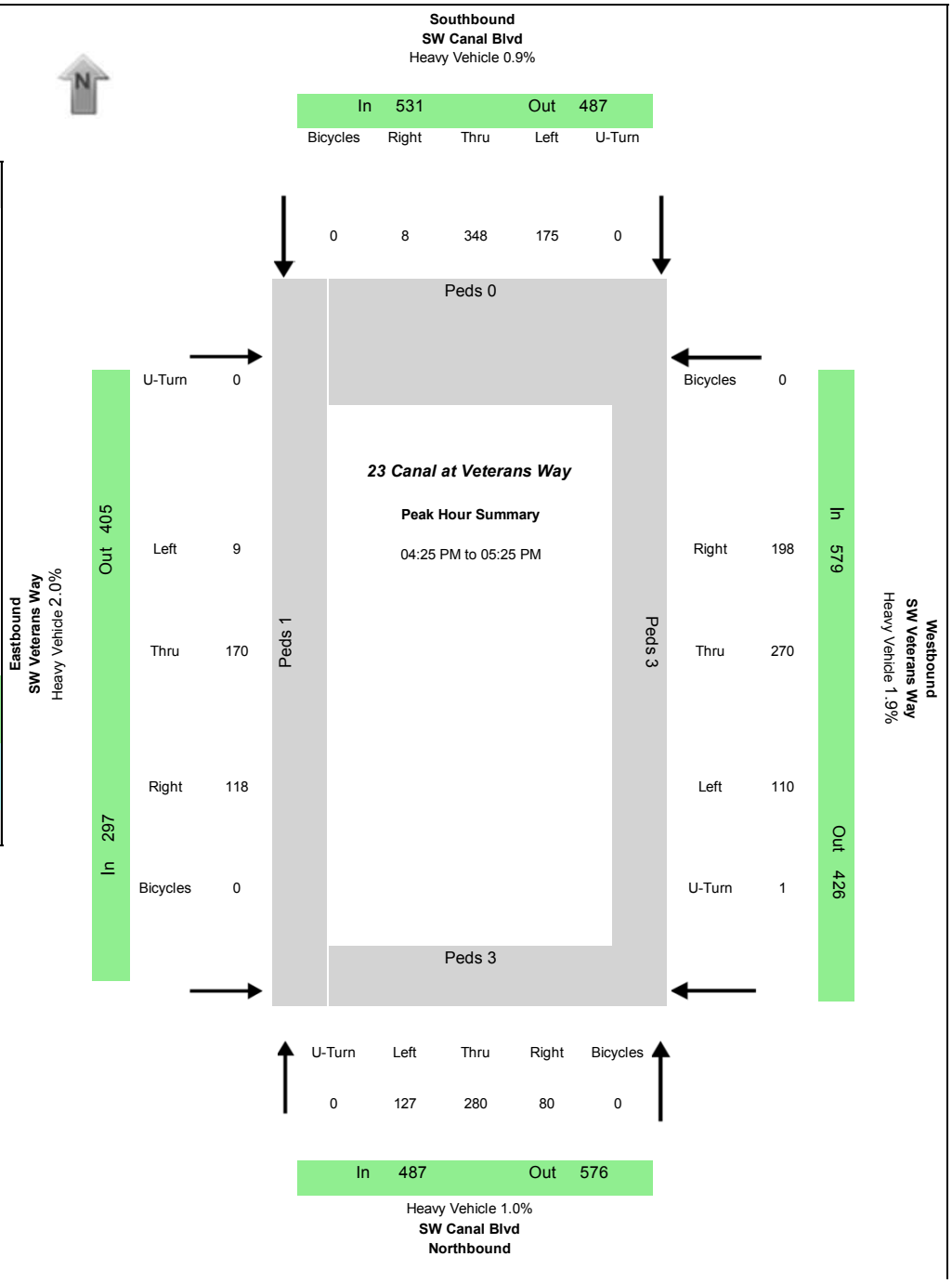
in Crosswalk				
NB	SB	EB	WB	Sum
4	0	0	2	6

All Vehicle Volumes

	Northbound				Southbound				Eastbound				Westbound				15 Min	1 HR
	SW 23rd St				SW 23rd St				SW Obsidian Ave				SW Obsidian Ave					
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0	6	1	0	0	13	2	0	1	0	2	0	0	0	0	0		
02:05:00 PM	0	13	1	0	0	3	2	0	3	0	1	0	0	1	1	0		
02:10:00 PM	0	13	0	0	0	6	2	0	3	0	0	0	0	0	0	0	74	
02:15:00 PM	2	9	0	0	0	8	3	0	4	0	3	0	0	0	1	0	79	
02:20:00 PM	1	10	0	0	0	9	0	0	0	0	0	0	0	0	2	0	76	
02:25:00 PM	0	15	0	0	1	15	0	0	2	0	2	0	0	0	3	0	90	
02:30:00 PM	1	15	0	0	1	15	2	0	2	0	1	0	0	0	0	0	97	
02:35:00 PM	0	12	1	0	0	20	4	0	2	1	2	0	0	1	0	0	118	
02:40:00 PM	2	9	0	0	2	14	4	0	0	0	0	0	0	0	4	0	115	
02:45:00 PM	0	19	0	0	0	9	5	0	1	0	3	0	0	0	0	0	115	
02:50:00 PM	1	14	0	0	0	22	2	0	5	0	3	0	0	0	0	0	119	
02:55:00 PM	1	16	0	0	0	17	5	0	3	0	0	0	1	0	0	0	127	406
03:00:00 PM	2	13	0	0	1	17	3	0	3	0	1	0	0	0	0	0	130	421
03:05:00 PM	2	11	0	0	1	14	2	0	3	0	0	0	0	0	0	0	116	429
03:10:00 PM	1	20	0	0	0	11	5	0	2	0	0	0	0	0	2	0	114	446
03:15:00 PM	0	11	0	0	2	11	4	0	2	1	3	0	0	0	1	0	109	451
03:20:00 PM	2	16	0	0	1	14	4	0	1	0	2	0	0	0	2	0	118	471
03:25:00 PM	2	14	0	0	1	19	7	0	1	0	0	0	0	0	1	0	122	478
03:30:00 PM	3	16	0	0	0	13	1	0	4	0	2	0	0	0	0	0	126	480
03:35:00 PM	1	14	1	0	0	17	2	0	2	0	0	0	0	0	0	0	121	474
03:40:00 PM	0	12	0	0	2	19	3	0	8	0	2	0	0	0	0	0	122	485
03:45:00 PM	1	8	0	0	0	14	7	0	9	0	2	0	0	0	2	0	126	491
03:50:00 PM	4	17	0	0	0	12	3	0	1	0	0	0	0	0	1	0	127	482
03:55:00 PM	0	11	1	0	1	11	3	0	1	0	0	0	0	0	0	0	109	467
04:00:00 PM	0	17	0	0	1	11	5	0	2	0	1	0	0	0	0	0	103	464
04:05:00 PM	1	18	2	0	2	12	1	0	3	0	2	0	0	0	1	0	107	473
04:10:00 PM	2	12	0	0	1	13	0	0	4	0	1	0	0	0	0	0	112	465
04:15:00 PM	1	10	1	0	0	12	7	0	3	1	0	0	0	0	2	0	112	467
04:20:00 PM	2	16	0	0	0	23	2	0	2	0	1	0	0	0	3	0	119	474
04:25:00 PM	1	15	0	0	2	11	3	0	3	0	1	0	0	0	1	0	123	466
04:30:00 PM	1	13	1	0	0	17	1	0	1	1	0	0	0	0	0	0	121	462
04:35:00 PM	1	14	2	0	0	23	4	0	3	1	3	0	0	0	2	0	125	478
04:40:00 PM	0	14	0	0	1	16	4	0	1	0	2	0	1	0	2	0	129	473
04:45:00 PM	0	14	1	0	2	17	2	0	9	0	1	0	0	0	0	0	140	476
04:50:00 PM	2	16	0	0	1	6	4	0	4	1	1	0	0	0	0	0	122	473
04:55:00 PM	1	18	1	0	1	14	3	0	1	0	1	0	0	0	0	0	121	485
05:00:00 PM	2	19	0	0	2	19	4	0	1	0	5	0	0	0	0	0	127	500
05:05:00 PM	2	19	0	0	1	11	7	0	4	0	1	0	0	0	1	0	138	504
05:10:00 PM	0	17	0	0	1	28	5	0	3	0	2	0	0	0	3	0	157	530
05:15:00 PM	4	19	0	0	0	24	5	0	2	0	1	0	0	1	0	0	161	549
05:20:00 PM	4	24	2	0	2	14	5	0	4	0	2	0	0	0	0	0	172	557
05:25:00 PM	3	29	3	0	0	13	1	0	4	0	0	0	0	0	0	0	166	573
05:30:00 PM	1	23	1	0	0	13	5	0	5	0	5	0	0	0	1	0	164	592
05:35:00 PM	2	21	1	0	1	15	6	0	4	1	3	0	0	0	1	0	162	594
05:40:00 PM	0	24	0	0	0	20	3	0	4	0	1	0	0	1	0	0	162	606
05:45:00 PM	0	28	0	0	0	16	4	0	6	0	2	0	0	1	1	0	166	618
05:50:00 PM	0	18	0	0	1	14	7	0	4	0	1	0	0	0	0	0	156	628
05:55:00 PM	3	15	3	0	0	18	6	0	8	2	1	0	0	0	1	0	160	645

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW Canal Blvd*
E/W street	*SW Veterans Way*
City, State	Redmond OR
Site Notes	
Location	44.263726 - -121.178737
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	23
Peak Hour Start	04:25:00 PM
Peak 15 Min Start	04:25:00 PM
PHF (15-Min Int)	0.95



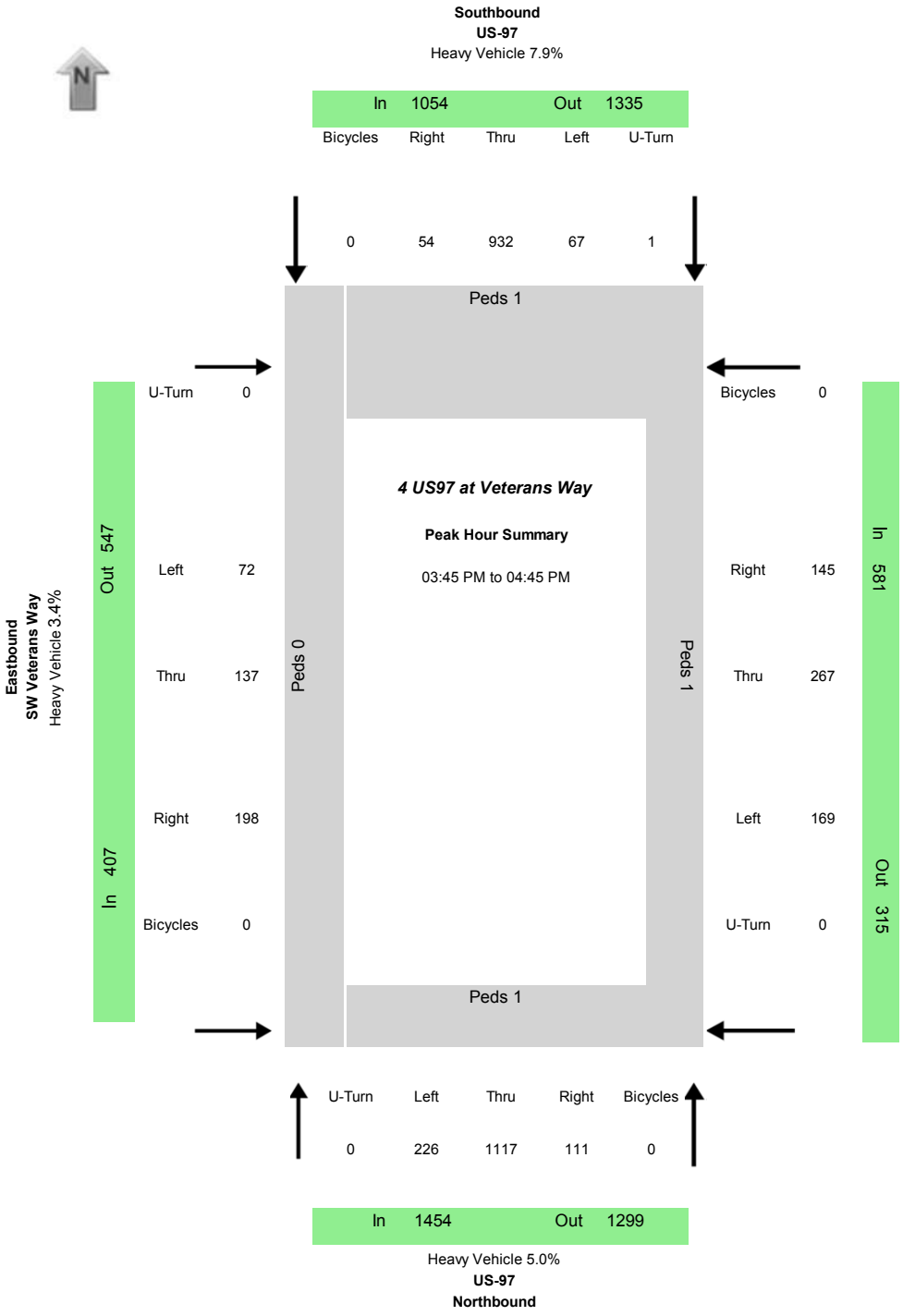
Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
127	280	80	0	175	348	8	0	9	170	118	0	110	270	198	1	487	531	297	579	576	487	405	426
Percent Heavy Vehicles																							
0.8%	0.7%	2.5%	0.0%	1.7%	0.6%	0.0%	0.0%	0.0%	2.9%	0.8%	0.0%	0.9%	3.3%	0.5%	0.0%	1.0%	0.9%	2.0%	1.9%	0.7%	0.6%	2.5%	2.3%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	3	7

All Vehicle Volumes																		
	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW Canal Blvd				SW Canal Blvd				SW Veterans Way				SW Veterans Way				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	7	31	7	0	13	29	2	0	0	13	7	0	9	13	13	0		
02:05:00 PM	18	24	7	0	16	39	1	0	1	8	11	0	9	8	14	0		
02:10:00 PM	7	16	5	0	18	28	0	0	0	8	10	0	7	20	20	0	439	
02:15:00 PM	8	28	9	0	18	34	3	0	1	10	7	0	6	13	16	0	448	
02:20:00 PM	10	26	9	0	11	24	1	0	0	11	15	0	8	11	9	0	427	
02:25:00 PM	7	21	4	0	27	25	1	0	0	11	11	0	3	19	15	0	432	
02:30:00 PM	10	20	3	0	16	20	3	0	0	20	10	0	7	20	9	0	417	
02:35:00 PM	11	32	9	0	18	23	0	0	0	14	6	0	4	26	8	0	433	
02:40:00 PM	5	28	6	0	15	26	1	0	0	16	9	0	4	14	14	0	427	
02:45:00 PM	18	27	8	0	13	15	3	0	1	20	11	0	9	23	15	0	452	
02:50:00 PM	14	43	10	0	11	34	1	0	0	12	8	0	10	11	14	0	469	
02:55:00 PM	8	28	7	0	15	16	1	0	0	14	9	0	13	25	16	0	483	1781
03:00:00 PM	9	25	9	0	23	29	0	0	1	23	10	0	4	19	16	0	488	1805
03:05:00 PM	8	26	11	0	12	31	0	0	1	13	13	0	5	21	12	0	473	1802
03:10:00 PM	8	17	8	0	20	19	1	0	2	13	5	0	4	34	16	0	468	1810
03:15:00 PM	18	22	10	0	15	24	2	0	0	14	11	0	8	15	14	0	453	1810
03:20:00 PM	9	24	9	0	9	24	0	0	1	11	8	0	5	20	12	0	432	1807
03:25:00 PM	7	21	5	0	15	20	0	0	0	22	8	0	5	23	15	0	426	1804
03:30:00 PM	9	22	3	0	21	19	1	0	0	18	9	0	5	30	15	0	425	1818
03:35:00 PM	3	20	7	0	9	30	1	0	1	15	10	0	11	27	16	0	443	1817
03:40:00 PM	6	16	4	0	15	20	0	0	0	21	13	0	11	25	15	0	448	1825
03:45:00 PM	12	31	6	0	13	27	5	0	1	14	12	0	3	26	13	0	459	1825
03:50:00 PM	9	31	11	0	15	29	2	0	0	11	2	0	7	18	14	0	458	1806
03:55:00 PM	4	27	8	0	11	24	0	0	0	10	12	0	17	19	11	0	455	1797
04:00:00 PM	13	26	5	0	10	22	1	0	1	14	10	0	15	14	17	0	440	1777
04:05:00 PM	9	24	4	0	24	27	2	0	0	9	5	0	10	26	12	0	443	1776
04:10:00 PM	9	19	8	0	20	25	0	0	0	8	13	0	13	23	15	0	453	1782
04:15:00 PM	6	21	6	0	9	33	0	0	1	11	5	1	4	25	18	0	445	1769
04:20:00 PM	9	13	6	0	10	18	1	0	0	13	10	0	6	19	14	0	412	1756
04:25:00 PM	10	23	9	0	16	31	0	0	0	18	6	0	5	24	18	0	419	1775
04:30:00 PM	10	29	7	0	21	34	1	0	3	14	9	0	11	18	12	0	448	1792
04:35:00 PM	14	29	3	0	14	29	1	0	0	16	7	0	12	23	18	1	496	1809
04:40:00 PM	8	15	3	0	16	25	0	0	1	10	12	0	10	33	12	0	481	1808
04:45:00 PM	7	22	7	0	11	26	0	0	0	11	12	0	8	26	8	0	450	1783
04:50:00 PM	12	30	9	0	18	28	0	0	0	11	12	0	4	26	12	0	445	1796
04:55:00 PM	12	26	9	0	9	29	1	0	3	14	15	0	10	20	19	0	467	1820
05:00:00 PM	10	27	8	0	10	35	0	0	0	8	9	0	6	16	27	0	485	1828
05:05:00 PM	7	18	9	0	14	25	1	0	1	18	6	0	13	28	18	0	481	1834
05:10:00 PM	16	29	6	0	13	27	3	0	1	15	10	0	12	13	25	0	484	1851
05:15:00 PM	8	15	5	0	13	30	1	0	0	17	10	0	10	14	15	0	466	1849
05:20:00 PM	13	17	5	0	20	29	0	0	0	18	10	0	9	29	14	0	472	1894
05:25:00 PM	10	21	11	0	9	27	2	0	0	3	4	0	11	24	9	0	433	1865
05:30:00 PM	8	20	9	0	11	25	0	0	0	20	9	0	16	17	11	0	441	1842
05:35:00 PM	16	17	5	0	16	17	3	0	0	19	7	0	7	25	24	0	433	1831
05:40:00 PM	8	20	12	0	11	20	0	0	0	11	8	0	8	22	13	0	435	1819
05:45:00 PM	13	17	9	0	13	29	4	0	0	10	7	0	7	20	5	0	423	1815
05:50:00 PM	7	23	9	0	12	23	1	0	0	6	9	0	3	10	9	0	379	1765
05:55:00 PM	15	16	6	0	9	17	0	0	0	13	9	0	4	20	4	0	359	1711

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*US-97*
E/W street	*SW Veterans Way*
City, State	Redmond OR
Site Notes	
Location	44.263112 - -121.176932
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	4
Peak Hour Start	03:45:00 PM
Peak 15 Min Start	04:00:00 PM
PHF (15-Min Int)	0.96



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
226	1117	111	0	67	932	54	1	72	137	198	0	169	267	145	0	1454	1054	407	581	1299	1335	547	315
Percent Heavy Vehicles																							
0.4%	4.7%	17.1%	0.0%	4.5%	8.3%	5.6%	0.0%	2.8%	3.6%	3.5%	0.0%	4.1%	1.9%	4.1%	0.0%	5.0%	7.9%	3.4%	3.1%	7.0%	4.6%	1.6%	8.6%

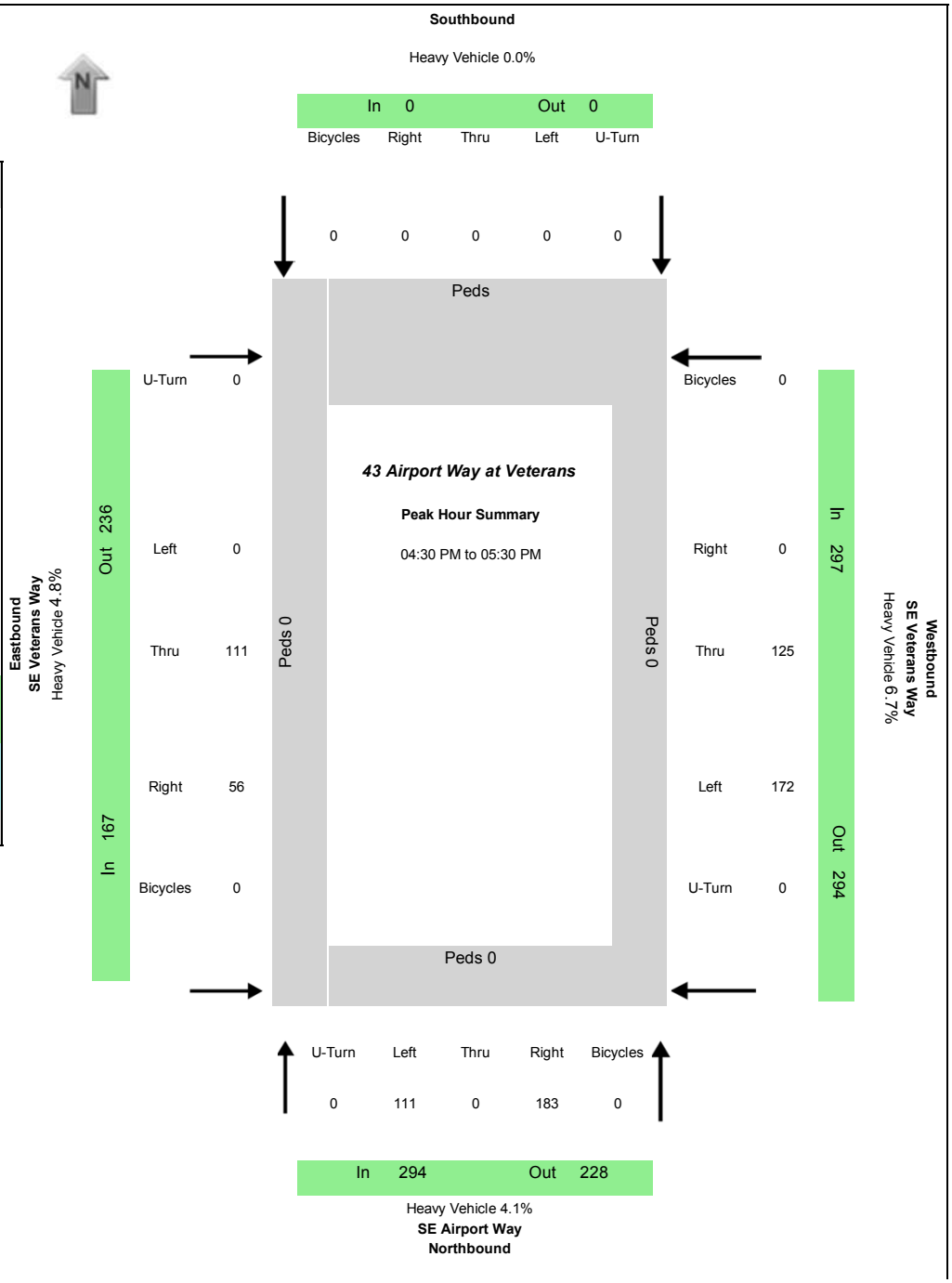
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	3

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	US-97				US-97				SW Veterans Way				SW Veterans Way				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	12	64	6	0	6	44	3	1	6	12	22	0	14	20	18	0		
02:05:00 PM	11	71	16	0	6	87	4	0	6	7	7	0	11	19	9	0		
02:10:00 PM	21	70	11	0	9	49	4	0	2	19	22	0	14	18	17	0	738	
02:15:00 PM	9	60	12	0	9	85	5	0	9	15	14	0	9	25	6	0	768	
02:20:00 PM	15	85	12	0	6	75	5	0	6	9	7	0	9	7	6	0	756	
02:25:00 PM	23	73	8	0	5	63	2	0	7	14	30	0	18	18	10	0	771	
02:30:00 PM	13	75	13	0	6	94	0	0	1	14	14	0	12	16	15	0	786	
02:35:00 PM	15	74	8	0	8	66	6	0	5	21	18	0	19	17	14	0	815	
02:40:00 PM	21	98	9	0	3	69	4	0	5	18	17	0	11	21	14	0	834	
02:45:00 PM	16	87	13	0	6	100	2	0	4	15	8	0	10	15	9	0	846	
02:50:00 PM	16	70	9	0	7	61	4	0	8	20	14	0	20	29	9	0	842	
02:55:00 PM	23	86	10	0	15	74	4	0	6	16	13	0	7	18	12	0	836	3179
03:00:00 PM	15	82	8	0	8	77	1	1	10	14	15	0	9	23	12	0	826	3226
03:05:00 PM	14	87	4	0	5	69	5	0	7	17	22	0	14	27	13	0	843	3256
03:10:00 PM	28	86	11	0	14	70	1	0	4	17	14	0	9	20	14	0	847	3288
03:15:00 PM	11	86	10	0	6	86	3	0	10	13	12	0	11	23	12	0	855	3313
03:20:00 PM	17	83	12	0	5	73	3	0	2	12	14	0	9	18	14	0	833	3333
03:25:00 PM	26	77	9	0	7	52	5	0	7	15	21	0	18	19	18	0	819	3336
03:30:00 PM	21	76	7	0	1	82	2	0	8	14	14	0	16	32	17	0	826	3353
03:35:00 PM	24	65	5	0	6	70	4	0	3	17	24	0	18	25	12	0	837	3355
03:40:00 PM	12	82	8	0	6	67	8	0	6	8	16	0	17	19	12	0	824	3326
03:45:00 PM	21	100	9	0	6	69	4	0	5	20	16	0	15	22	18	0	839	3346
03:50:00 PM	15	84	10	0	5	85	4	0	9	13	19	0	17	31	15	0	873	3386
03:55:00 PM	16	90	10	0	5	73	5	0	8	12	13	0	12	17	4	0	877	3367
04:00:00 PM	15	114	8	0	3	101	10	0	3	7	15	0	10	18	10	0	886	3406
04:05:00 PM	14	92	8	0	2	71	4	0	3	9	23	0	23	35	23	0	886	3429
04:10:00 PM	22	85	12	0	8	78	9	1	7	9	19	0	14	19	11	0	915	3435
04:15:00 PM	20	100	10	0	2	80	3	0	6	8	12	0	15	14	9	0	880	3431
04:20:00 PM	15	99	12	0	5	69	3	0	8	13	12	0	8	22	9	0	848	3444
04:25:00 PM	24	92	6	0	7	83	1	0	7	13	17	0	10	19	9	0	842	3458
04:30:00 PM	22	102	8	0	9	80	5	0	9	10	24	0	13	18	8	0	871	3476
04:35:00 PM	19	70	3	0	10	61	3	0	4	16	18	0	20	33	15	0	868	3475
04:40:00 PM	23	89	15	0	5	82	3	0	3	7	10	0	12	19	14	0	862	3496
04:45:00 PM	24	67	5	0	6	58	5	0	5	11	20	0	16	17	16	0	804	3441
04:50:00 PM	16	104	12	0	4	104	5	0	8	11	12	0	9	14	14	0	845	3447
04:55:00 PM	18	103	4	0	3	66	6	0	9	10	16	0	21	37	12	0	868	3487
05:00:00 PM	25	81	11	0	4	57	1	1	4	8	9	0	17	19	11	0	866	3421
05:05:00 PM	16	107	7	0	8	70	7	0	4	12	23	0	17	27	12	0	863	3424
05:10:00 PM	17	82	10	0	6	72	4	0	4	11	22	0	12	30	12	0	840	3412
05:15:00 PM	13	111	11	0	7	112	7	0	4	6	19	0	15	21	9	0	927	3468
05:20:00 PM	24	100	6	0	6	81	6	0	8	6	20	0	13	17	10	0	914	3490
05:25:00 PM	24	86	8	0	6	42	3	0	7	11	14	0	12	22	15	0	882	3452
05:30:00 PM	16	118	13	0	3	81	9	0	6	9	19	0	10	14	8	0	853	3450
05:35:00 PM	29	74	8	0	3	65	3	0	11	13	17	0	20	26	6	0	831	3453
05:40:00 PM	23	110	15	0	5	74	4	0	2	15	12	0	9	11	7	0	868	3458
05:45:00 PM	21	95	6	0	5	82	3	0	11	7	14	0	16	13	13	0	848	3494
05:50:00 PM	10	76	3	0	6	51	3	0	8	9	12	0	7	4	11	0	773	3381
05:55:00 PM	12	95	6	0	3	71	5	0	7	9	15	0	11	9	14	0	743	3333

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SE Airport Way*
E/W street	*SE Veterans Way*
City, State	Redmond OR
Site Notes	
Location	44.260835 - -121.165926
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	43
Peak Hour Start	04:30:00 PM
Peak 15 Min Start	04:30:00 PM
PHF (15-Min Int)	0.92



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
111	0	183	0	0	0	0	0	0	111	56	0	172	125	0	0	294	0	167	297	228	0	236	294
Percent Heavy Vehicles																							
3.6%	0.0%	4.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%	8.9%	0.0%	5.2%	8.8%	0.0%	0.0%	4.1%	0.0%	4.8%	6.7%	6.1%	0.0%	6.4%	3.7%

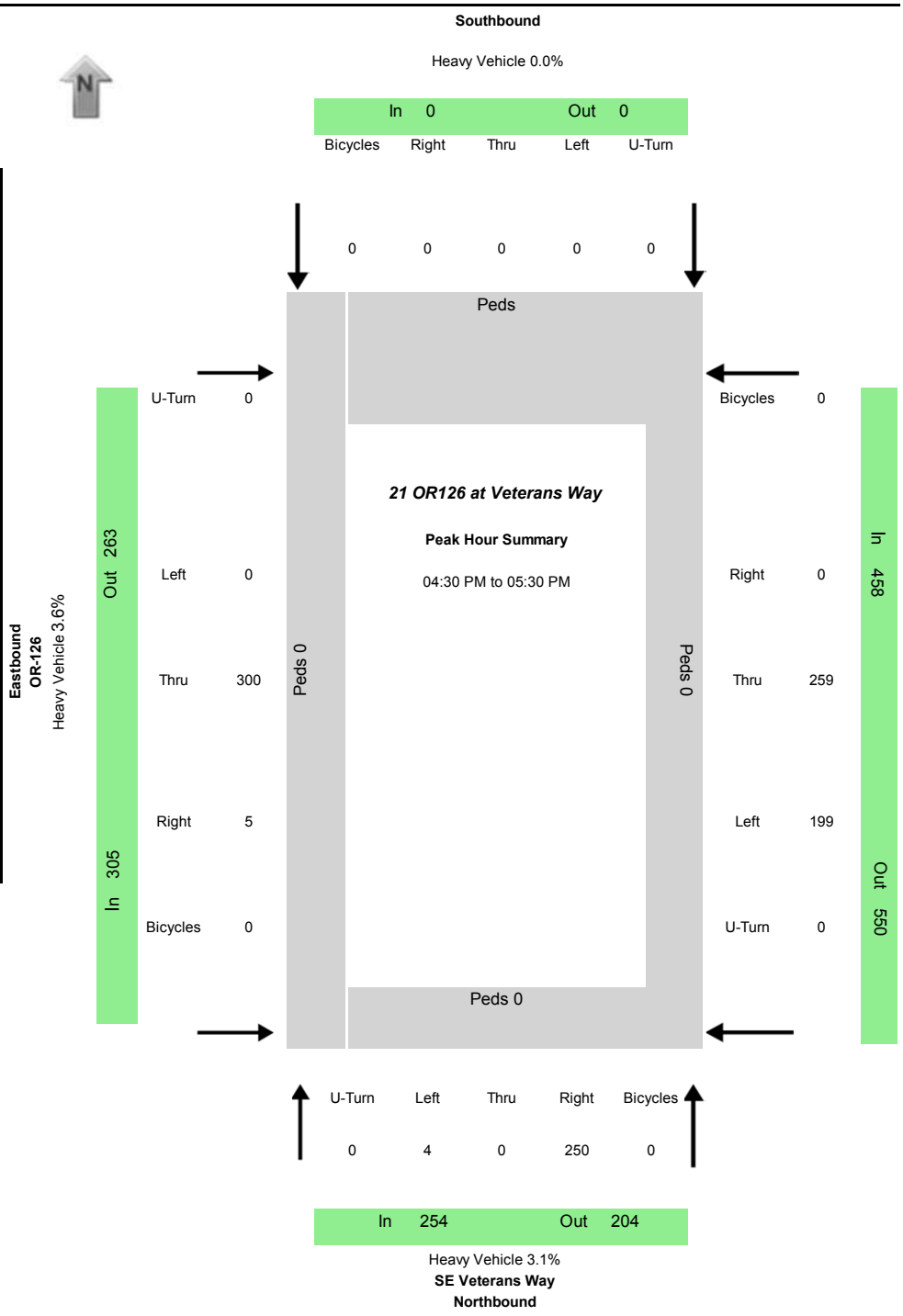
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0		0	0						0	0	0	0	0		0	0	0		0	0	0

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**				15 Min	1 HR
	SE Airport Way								SE Veterans Way				SE Veterans Way					
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	9		6	0						8	4	0	8	1		0		
02:05:00 PM	4		7	0						13	4	0	4	8		0		
02:10:00 PM	11		12	0						5	7	0	8	2		0	121	
02:15:00 PM	8		9	0						9	7	0	15	4		0	137	
02:20:00 PM	4		10	0						4	10	0	10	3		0	138	
02:25:00 PM	12		8	0						8	4	0	7	5		0	137	
02:30:00 PM	14		6	0						5	10	0	6	8		0	134	
02:35:00 PM	14		18	0						3	9	0	11	4		0	152	
02:40:00 PM	10		11	0						2	3	0	8	8		0	150	
02:45:00 PM	4		7	0						10	12	0	10	12		0	156	
02:50:00 PM	9		10	0						8	5	0	10	10		0	149	
02:55:00 PM	12		14	0						6	10	0	9	9		0	167	575
03:00:00 PM	12		9	0						1	11	0	6	7		0	158	585
03:05:00 PM	15		17	0						8	6	0	12	4		0	168	607
03:10:00 PM	23		11	0						9	5	0	9	5		0	170	624
03:15:00 PM	20		6	0						7	12	0	11	8		0	188	636
03:20:00 PM	18		11	0						7	4	0	7	7		0	180	649
03:25:00 PM	13		13	0						10	9	0	13	4		0	180	667
03:30:00 PM	17		15	0						6	4	0	13	6		0	177	679
03:35:00 PM	13		9	0						11	7	0	13	13		0	189	686
03:40:00 PM	11		13	0						7	3	0	9	8		0	178	695
03:45:00 PM	15		13	0						8	4	0	8	6		0	171	694
03:50:00 PM	12		11	0						12	3	0	11	10		0	164	701
03:55:00 PM	9		17	0						11	3	0	13	6		0	172	700
04:00:00 PM	9		10	0						9	3	0	8	10		0	167	703
04:05:00 PM	15		15	0						11	5	0	12	11		0	177	710
04:10:00 PM	8		15	0						11	2	0	8	11		0	173	703
04:15:00 PM	12		14	0						8	2	0	6	2		0	168	683
04:20:00 PM	7		12	0						9	6	0	12	5		0	150	680
04:25:00 PM	7		12	0						6	3	0	11	11		0	145	668
04:30:00 PM	15		18	0						6	7	0	18	10		0	175	681
04:35:00 PM	9		16	0						10	5	0	15	12		0	191	682
04:40:00 PM	9		14	0						9	6	0	18	10		0	207	697
04:45:00 PM	8		13	0						6	5	0	15	9		0	189	699
04:50:00 PM	8		10	0						10	5	0	15	12		0	182	700
04:55:00 PM	11		6	0						5	1	0	12	11		0	162	687
05:00:00 PM	7		13	0						9	6	0	17	13		0	171	703
05:05:00 PM	12		23	0						12	6	0	12	6		0	182	705
05:10:00 PM	12		20	0						14	3	0	7	8		0	200	714
05:15:00 PM	5		19	0						11	7	0	13	11		0	201	736
05:20:00 PM	7		16	0						8	4	0	14	8		0	187	742
05:25:00 PM	8		15	0						11	1	0	16	15		0	189	758
05:30:00 PM	1		15	0						6	5	0	7	13		0	170	731
05:35:00 PM	4		15	0						3	4	0	12	6		0	157	708
05:40:00 PM	8		10	0						6	4	0	9	8		0	136	687
05:45:00 PM	5		9	0						7	4	0	10	11		0	135	677
05:50:00 PM	6		9	0						4	1	0	5	5		0	121	647
05:55:00 PM	4		9	0						7	2	0	12	8		0	118	643

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SE Veterans Way*
E/W street	*OR-126*
City, State	Redmond OR
Site Notes	
Location	44.264071 - -121.152042
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:30:00 PM
Peak 15 Min Start	05:10:00 PM
PHF (15-Min Int)	0.93



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
4	0	250	0	0	0	0	0	0	300	5	0	199	259	0	0	254	0	305	458	204	0	263	550
Percent Heavy Vehicles																							
0.0%	0.0%	3.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.0%	40.0%	0.0%	2.0%	4.6%	0.0%	0.0%	3.1%	0.0%	3.6%	3.5%	2.9%	0.0%	4.6%	3.1%

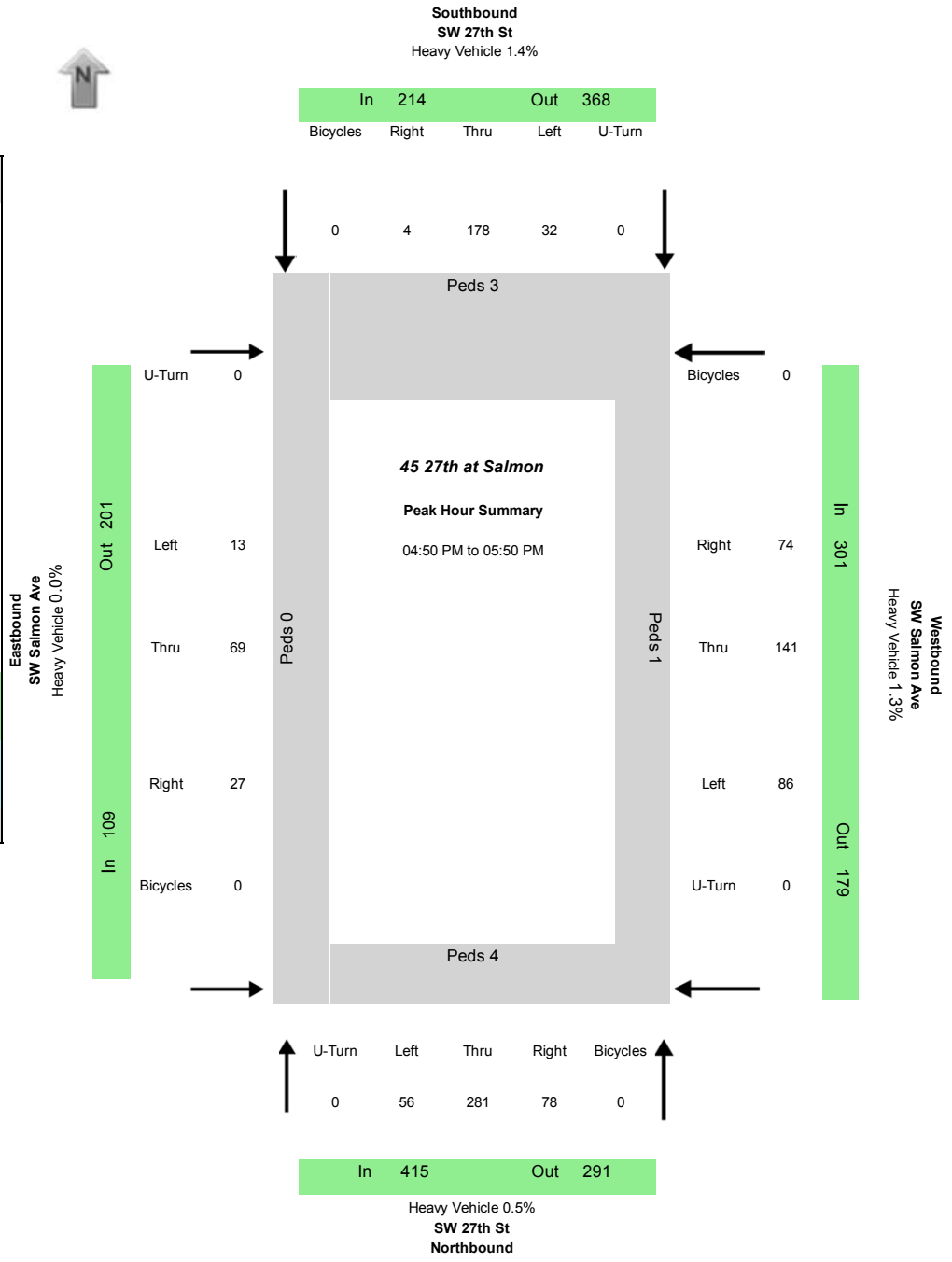
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0		0	0						0	0	0	0	0		0	0	0		0	0	0

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SE Veterans Way								OR-126				OR-126				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0		4	0						8	0	0	0	4		0		
02:05:00 PM	0		15	0						23	0	0	10	21		0		
02:10:00 PM	0		12	0						23	0	0	11	12		0	143	
02:15:00 PM	1		14	0						23	2	0	11	12		0	190	
02:20:00 PM	0		13	0						18	0	0	12	11		0	175	
02:25:00 PM	0		16	0						20	0	0	4	19		0	176	
02:30:00 PM	1		7	0						15	0	0	13	26		0	175	
02:35:00 PM	0		14	0						24	1	0	12	19		0	191	
02:40:00 PM	1		12	0						17	0	0	10	28		0	200	
02:45:00 PM	0		12	0						16	0	0	12	21		0	199	
02:50:00 PM	0		14	0						16	0	0	17	18		0	194	
02:55:00 PM	0		20	0						16	1	0	11	20		0	194	713
03:00:00 PM	0		12	0						21	0	0	4	25		0	195	759
03:05:00 PM	0		18	0						14	2	0	16	23		0	203	763
03:10:00 PM	1		14	0						22	0	0	10	24		0	206	776
03:15:00 PM	0		14	0						18	0	0	16	21		0	213	782
03:20:00 PM	1		11	0						21	0	0	5	18		0	196	784
03:25:00 PM	0		12	0						16	0	0	11	16		0	180	780
03:30:00 PM	1		17	0						25	0	0	14	16		0	184	791
03:35:00 PM	0		17	0						20	0	0	12	31		0	208	801
03:40:00 PM	1		17	0						25	1	0	15	26		0	238	818
03:45:00 PM	1		19	0						23	0	0	16	29		0	253	845
03:50:00 PM	1		18	0						19	0	0	16	24		0	251	858
03:55:00 PM	1		26	0						23	1	0	19	33		0	269	893
04:00:00 PM	1		18	0						27	0	0	11	31		0	269	919
04:05:00 PM	1		11	0						13	1	0	12	24		0	253	908
04:10:00 PM	0		24	0						22	0	0	10	22		0	228	915
04:15:00 PM	2		13	0						27	2	0	4	17		0	205	911
04:20:00 PM	1		16	0						18	1	0	15	27		0	221	933
04:25:00 PM	2		16	0						17	0	0	19	18		0	215	950
04:30:00 PM	0		19	0						22	0	0	17	24		0	232	959
04:35:00 PM	0		24	0						31	1	0	13	28		0	251	976
04:40:00 PM	0		21	0						24	1	0	13	30		0	268	980
04:45:00 PM	0		16	0						28	1	0	21	16		0	268	974
04:50:00 PM	0		19	0						20	0	0	18	30		0	258	983
04:55:00 PM	0		10	0						21	0	0	17	27		0	244	955
05:00:00 PM	0		13	0						26	1	0	22	13		0	237	942
05:05:00 PM	1		24	0						30	0	0	6	13		0	224	954
05:10:00 PM	0		35	0						24	0	0	13	15		0	236	963
05:15:00 PM	2		25	0						31	0	0	13	19		0	251	988
05:20:00 PM	1		26	0						24	1	0	23	20		0	272	1005
05:25:00 PM	0		18	0						19	0	0	23	24		0	269	1017
05:30:00 PM	1		17	0						27	0	0	15	17		0	256	1012
05:35:00 PM	1		20	0						21	0	0	15	20		0	238	992
05:40:00 PM	2		14	0						26	0	0	11	20		0	227	976
05:45:00 PM	0		14	0						15	0	0	13	19		0	211	955
05:50:00 PM	0		12	0						20	0	0	12	18		0	196	930
05:55:00 PM	0		12	0						18	1	0	10	15		0	179	911

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW 27th St*
E/W street	*SW Salmon Ave*
City, State	Redmond OR
Site Notes	
Location	44.254717 - -121.199291
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	45
Peak Hour Start	04:50:00 PM
Peak 15 Min Start	05:10:00 PM
PHF (15-Min Int)	0.89



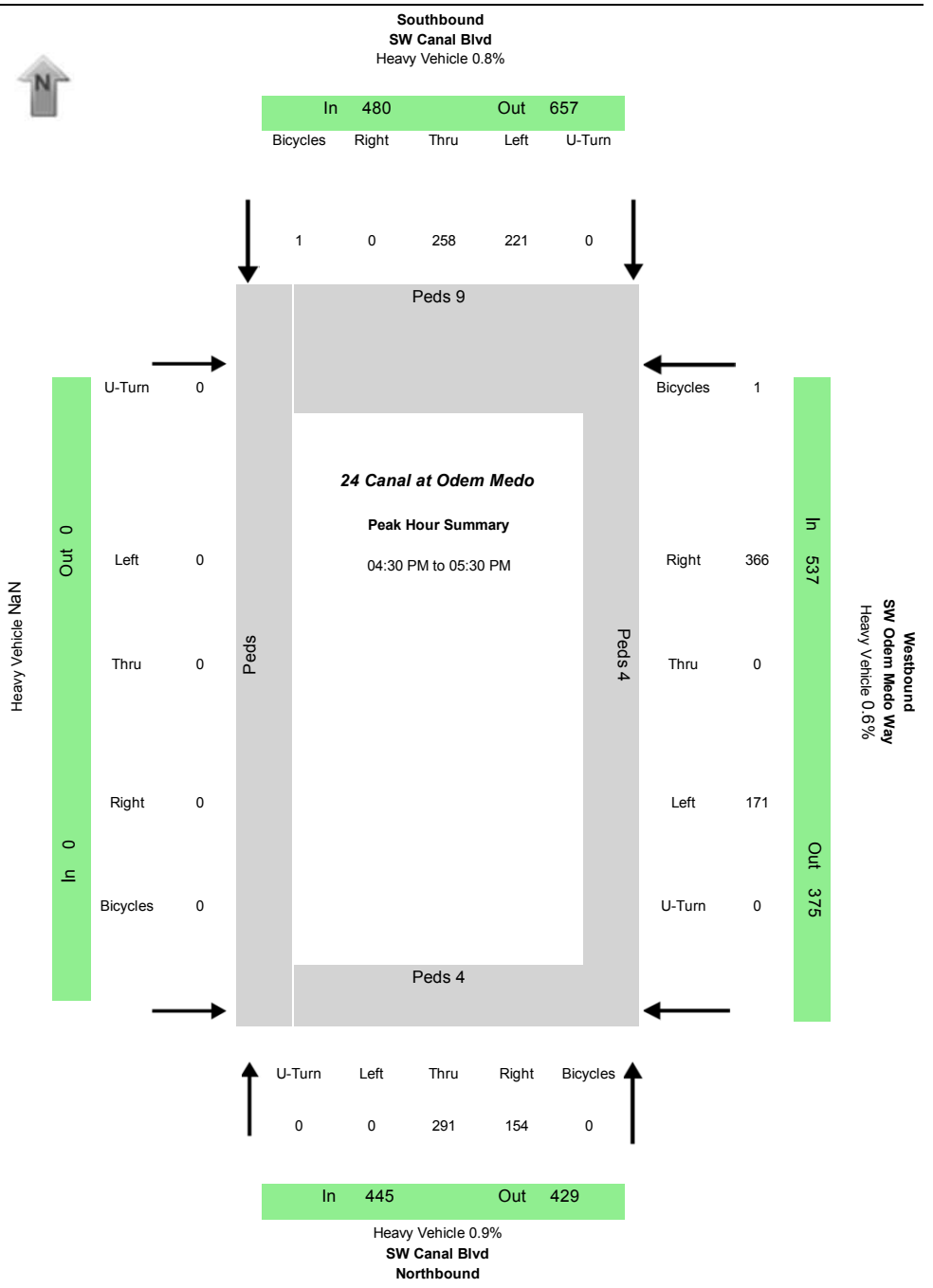
Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
56	281	78	0	32	178	4	0	13	69	27	0	86	141	74	0	415	214	109	301	291	368	201	179
Percent Heavy Vehicles																							
0.0%	0.7%	0.0%	0.0%	0.0%	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	0.7%	2.7%	0.0%	0.5%	1.4%	0.0%	1.3%	1.4%	1.1%	0.5%	0.0%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3	0	1	8

All Vehicle Volumes																		
	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW 27th St				SW 27th St				SW Salmon Ave				SW Salmon Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	1	10	2	0	4	5	0	0	1	8	4	0	5	7	6	0		
02:05:00 PM	0	7	3	0	1	7	2	0	3	2	2	0	6	3	1	0		
02:10:00 PM	2	5	6	0	1	6	0	0	1	3	1	0	1	7	4	0	127	
02:15:00 PM	2	8	1	0	1	6	0	0	1	6	1	0	3	2	6	0	111	
02:20:00 PM	2	11	0	0	1	10	2	0	3	4	3	0	7	5	2	0	124	
02:25:00 PM	0	9	7	0	2	10	2	0	0	5	1	0	6	7	4	0	140	
02:30:00 PM	0	11	4	0	4	8	0	0	0	3	0	0	2	5	2	0	142	
02:35:00 PM	2	11	9	0	2	8	0	0	0	5	1	0	4	10	3	0	147	
02:40:00 PM	7	12	9	0	1	10	1	0	0	4	3	0	8	5	3	0	157	
02:45:00 PM	3	16	12	0	1	12	0	0	1	7	2	0	7	6	3	0	188	
02:50:00 PM	3	14	7	0	5	14	2	0	0	4	2	0	5	11	5	0	205	
02:55:00 PM	2	23	8	0	1	8	0	0	3	5	1	0	15	7	2	0	217	641
03:00:00 PM	2	17	3	0	0	9	0	0	2	6	1	0	7	4	3	0	201	642
03:05:00 PM	0	20	6	0	3	9	2	0	0	7	0	0	10	8	6	0	200	676
03:10:00 PM	3	11	6	0	1	8	0	0	1	6	0	0	7	7	2	0	177	691
03:15:00 PM	1	22	6	0	3	3	1	0	2	7	0	0	4	7	2	0	181	712
03:20:00 PM	2	19	7	0	2	23	0	0	0	11	0	0	6	7	3	0	190	742
03:25:00 PM	6	15	4	0	3	17	1	0	1	6	3	0	6	6	4	0	210	761
03:30:00 PM	6	16	4	0	1	14	1	0	1	7	0	0	2	10	4	0	218	788
03:35:00 PM	2	16	10	0	2	9	2	0	1	4	3	0	9	8	4	0	208	803
03:40:00 PM	4	9	8	0	5	13	2	0	4	4	1	0	8	14	4	0	212	816
03:45:00 PM	3	17	12	0	5	13	2	0	1	4	4	0	10	7	8	0	232	832
03:50:00 PM	0	19	14	0	6	10	2	0	3	5	2	0	3	8	8	0	242	840
03:55:00 PM	3	15	4	0	2	8	2	0	2	8	2	0	8	4	5	0	229	828
04:00:00 PM	3	11	5	0	2	15	1	0	1	7	1	0	4	9	7	0	209	840
04:05:00 PM	4	24	8	0	4	16	0	0	1	7	2	0	9	10	5	0	219	859
04:10:00 PM	4	20	4	0	1	8	0	0	1	5	2	0	6	7	5	0	219	870
04:15:00 PM	2	13	3	0	2	9	0	0	1	6	1	0	6	7	3	0	206	865
04:20:00 PM	2	11	7	0	4	5	1	0	0	9	2	0	2	12	4	0	175	844
04:25:00 PM	4	16	5	0	4	11	0	0	0	6	0	0	5	13	1	0	177	837
04:30:00 PM	5	12	8	0	3	12	2	0	2	5	3	0	4	8	4	0	192	839
04:35:00 PM	5	20	4	0	2	13	1	0	1	7	4	0	6	8	2	0	206	842
04:40:00 PM	2	15	4	0	4	11	0	0	2	5	2	0	11	14	4	0	215	840
04:45:00 PM	3	24	6	0	5	12	0	0	4	5	1	0	7	5	3	0	222	829
04:50:00 PM	5	14	4	0	3	17	0	0	0	8	3	0	7	11	3	0	224	824
04:55:00 PM	3	28	2	0	3	12	0	0	3	3	4	0	3	11	4	0	226	837
05:00:00 PM	2	32	4	0	4	11	0	0	0	7	3	0	9	9	5	0	237	857
05:05:00 PM	4	20	6	0	1	14	0	0	1	9	2	0	10	12	5	0	246	851
05:10:00 PM	8	33	3	0	2	20	1	0	0	4	1	0	12	16	5	0	275	893
05:15:00 PM	3	30	8	0	5	13	0	0	0	5	2	0	6	16	7	0	284	935
05:20:00 PM	9	27	9	0	4	11	1	0	3	4	0	0	6	13	5	0	292	968
05:25:00 PM	4	19	13	0	3	11	0	0	0	8	2	0	6	10	12	0	275	991
05:30:00 PM	8	25	11	0	1	15	0	0	2	9	2	0	6	15	9	0	283	1026
05:35:00 PM	3	19	8	0	1	21	1	0	1	4	0	0	5	9	8	0	271	1033
05:40:00 PM	2	17	4	0	3	13	1	0	2	6	4	0	7	6	5	0	253	1029
05:45:00 PM	5	17	6	0	2	20	0	0	1	2	4	0	9	13	6	0	235	1039
05:50:00 PM	2	9	6	0	6	10	0	0	0	3	0	0	4	16	3	0	214	1023
05:55:00 PM	6	23	6	0	2	6	0	0	0	5	4	0	9	6	2	0	213	1016

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	***SW Canal Blvd***
E/W street	***SW Odem Medo Way***
City, State	Redmond OR
Site Notes	
Location	44.253479 - -121.187406
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	24
Peak Hour Start	04:30:00 PM
Peak 15 Min Start	05:15:00 PM
PHF (15-Min Int)	0.96



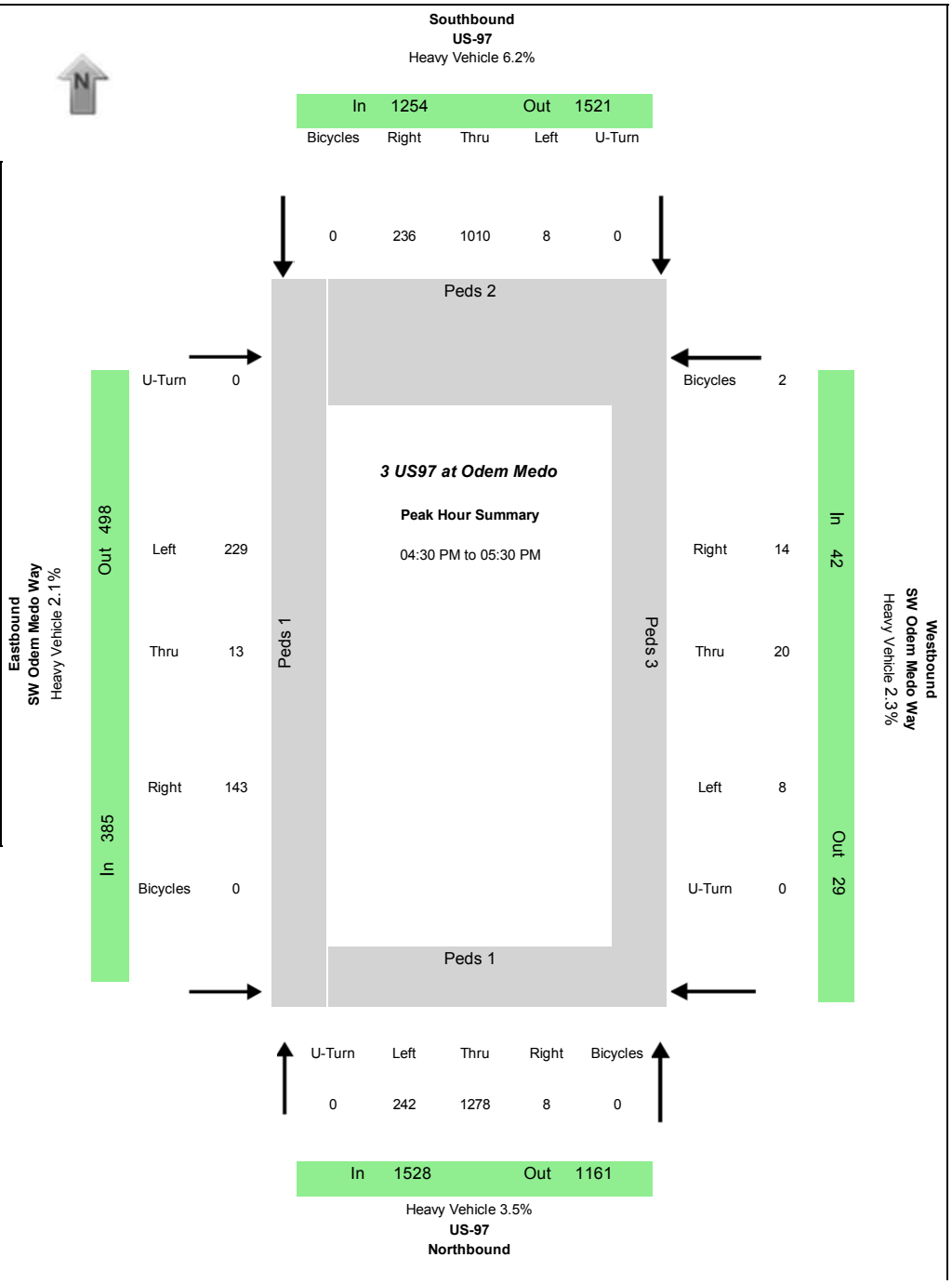
Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	291	154	0	221	258	0	0	0	0	0	0	171	0	366	0	445	479	0	537	429	657	0	375
Percent Heavy Vehicles																							
0.0%	0.7%	1.3%	0.0%	0.5%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.9%	0.8%	#DIV/0!	0.6%	0.7%	0.8%	#DIV/0!	0.8%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
	0	0	0	0	1		0					1		0	0	2	4	9		4	17

All Vehicle Volumes																		
	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW Canal Blvd				SW Canal Blvd								SW Odem Medo Way				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM		23	4	0	19	21		0					5		21	0		
02:05:00 PM		25	8	0	19	16		0					19		25	0		
02:10:00 PM		19	9	0	19	30		0					8		15	0	305	
02:15:00 PM		26	10	0	24	28		0					8		20	0	328	
02:20:00 PM		15	5	0	16	21		0					14		26	0	313	
02:25:00 PM		17	10	0	21	23		0					8		15	0	307	
02:30:00 PM		22	6	0	21	18		0					10		21	0	289	
02:35:00 PM		27	11	0	19	28		0					14		12	0	303	
02:40:00 PM		38	18	0	15	19		0					10		15	0	324	
02:45:00 PM		40	11	0	8	17		0					13		21	0	336	
02:50:00 PM		24	11	0	24	14		0					9		26	0	333	
02:55:00 PM		22	7	0	19	20		0					20		24	0	330	1266
03:00:00 PM		24	13	0	16	24		0					7		20	0	324	1277
03:05:00 PM		17	8	0	30	14		0					12		27	0	324	1273
03:10:00 PM		26	8	0	20	25		0					9		16	0	316	1277
03:15:00 PM		17	9	0	23	20		0					9		17	0	307	1256
03:20:00 PM		24	9	0	21	21		0					14		21	0	309	1269
03:25:00 PM		29	12	0	16	19		0					13		29	0	323	1293
03:30:00 PM		23	8	0	16	16		0					11		26	0	328	1295
03:35:00 PM		12	8	0	13	19		0					8		30	0	308	1274
03:40:00 PM		26	17	0	20	27		0					9		21	0	310	1279
03:45:00 PM		31	10	0	16	20		0					7		20	0	314	1273
03:50:00 PM		26	15	0	23	21		0					13		26	0	348	1289
03:55:00 PM		27	14	0	18	20		0					7		34	0	348	1297
04:00:00 PM		23	12	0	20	14		0					11		30	0	354	1303
04:05:00 PM		18	14	0	21	22		0					13		23	0	341	1306
04:10:00 PM		15	11	0	18	15		0					19		32	0	331	1312
04:15:00 PM		21	11	0	23	28		0					13		27	0	344	1340
04:20:00 PM		21	15	0	19	15		0					20		35	0	358	1355
04:25:00 PM		25	11	0	26	19		0					11		24	0	364	1353
04:30:00 PM		30	14	0	24	22		0					15		36	0	382	1394
04:35:00 PM		27	9	0	21	22		0					15		23	0	374	1421
04:40:00 PM		26	13	0	18	26		0					11		24	0	376	1419
04:45:00 PM		21	13	0	21	10		0					20		26	0	346	1426
04:50:00 PM		21	15	0	18	27		0					13		28	0	351	1424
04:55:00 PM		29	8	0	13	26		0					10		31	0	350	1421
05:00:00 PM		21	12	0	18	20		0					12		32	0	354	1426
05:05:00 PM		30	17	0	12	26		0					14		26	0	357	1440
05:10:00 PM		22	6	0	22	18		0					14		31	0	353	1443
05:15:00 PM		15	18	0	18	19		0					15		36	0	359	1441
05:20:00 PM		23	19	0	24	26		0					16		36	0	378	1460
05:25:00 PM		26	10	0	12	16		0					16		37	0	382	1461
05:30:00 PM		31	8	0	16	16		0					17		33	0	382	1441
05:35:00 PM		21	13	0	18	21		0					22		28	0	361	1447
05:40:00 PM		26	15	0	13	17		0					7		28	0	350	1435
05:45:00 PM		21	7	0	13	16		0					14		24	0	324	1419
05:50:00 PM		26	10	0	14	22		0					7		22	0	302	1398
05:55:00 PM		24	7	0	16	18		0					13		25	0	299	1384

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*US-97*
E/W street	*SW Odem Medo Way*
City, State	Redmond OR
Site Notes	
Location	44.251748 - -121.1844
Start Date	Tuesday, April 18, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	3
Peak Hour Start	04:30:00 PM
Peak 15 Min Start	05:15:00 PM
PHF (15-Min Int)	0.94



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
242	1278	8	0	8	1010	236	0	229	13	143	0	8	20	14	0	1528	1254	385	42	1161	1521	498	29
Percent Heavy Vehicles																							
0.8%	4.1%	0.0%	0.0%	0.0%	7.2%	2.1%	0.0%	1.3%	0.0%	3.5%	0.0%	0.0%	0.0%	7.1%	0.0%	3.5%	6.2%	2.1%	2.4%	6.7%	3.7%	1.4%	0.0%

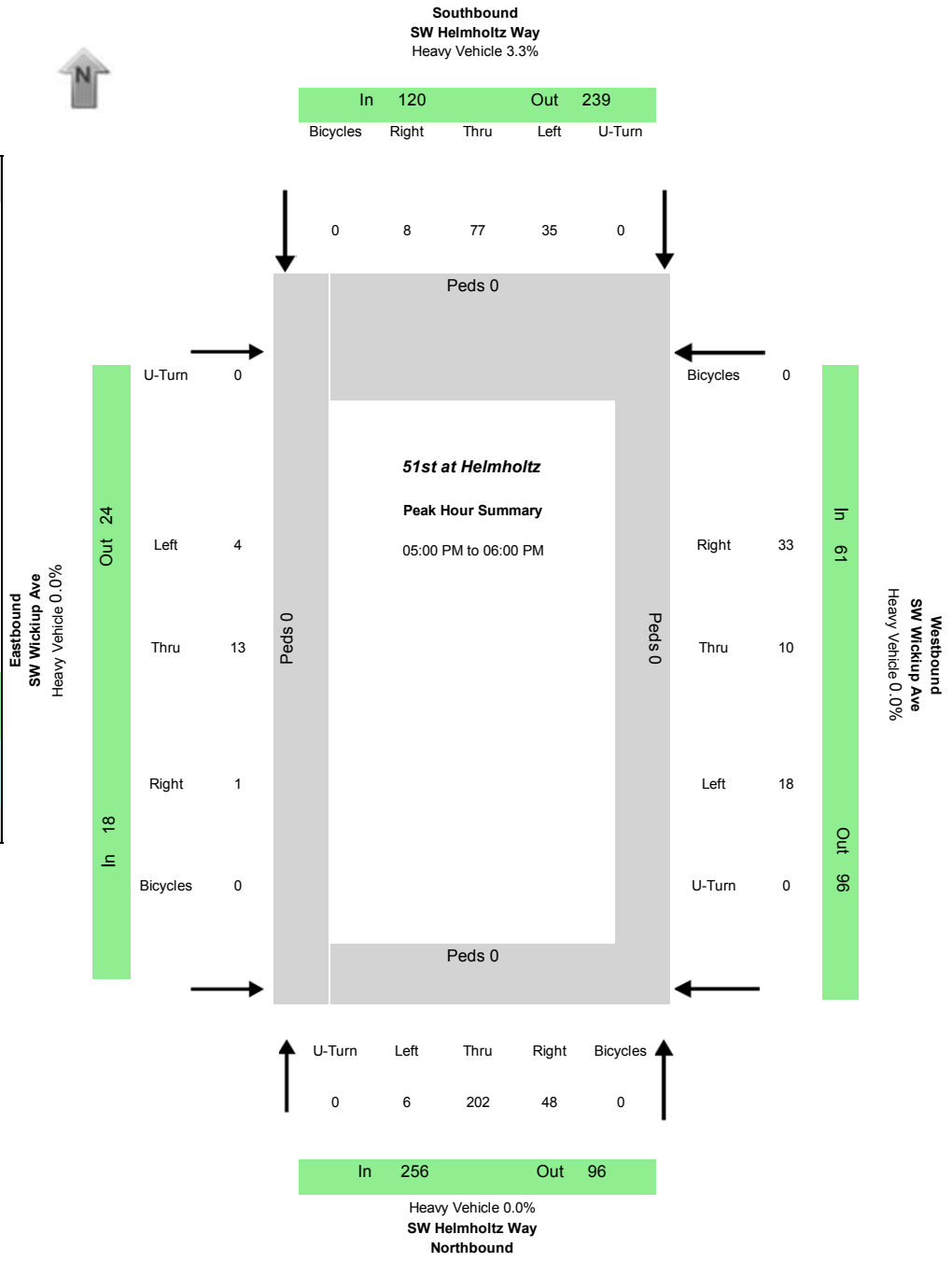
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	1	2	1	3	7

All Vehicle Volumes																		
	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	US-97				US-97				SW Odem Medo Way				SW Odem Medo Way				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	14	74	2	0	0	79	18	0	12	1	9	0	1	2	2	0		
02:05:00 PM	5	66	0	0	0	83	13	0	20	2	12	0	1	1	1	0		
02:10:00 PM	8	71	3	0	0	66	9	0	14	2	6	0	0	0	1	0	598	
02:15:00 PM	18	71	0	0	0	65	17	0	20	0	7	0	2	2	1	0	587	
02:20:00 PM	14	78	0	0	1	84	20	0	19	0	12	0	1	0	0	0	612	
02:25:00 PM	4	96	1	0	0	98	19	0	13	0	10	0	1	1	1	0	676	
02:30:00 PM	13	82	2	0	1	78	11	0	11	0	17	0	1	2	2	0	693	
02:35:00 PM	10	103	1	0	1	102	21	0	15	1	10	0	0	0	2	0	730	
02:40:00 PM	10	89	0	0	0	86	15	0	20	1	10	0	0	1	1	0	719	
02:45:00 PM	13	85	1	0	0	81	11	0	23	1	9	0	0	1	0	0	724	
02:50:00 PM	17	101	1	0	0	79	20	0	21	1	9	0	0	1	2	0	710	
02:55:00 PM	4	99	2	0	2	85	19	0	13	2	7	0	0	1	0	0	711	2704
03:00:00 PM	13	91	0	0	0	59	15	0	15	1	12	0	1	1	3	0	697	2701
03:05:00 PM	11	96	1	0	0	91	12	0	20	0	10	0	1	3	0	0	690	2742
03:10:00 PM	10	92	0	0	2	87	16	0	11	1	12	0	0	0	0	0	687	2793
03:15:00 PM	14	97	1	0	1	65	17	0	15	2	17	0	2	0	2	0	709	2823
03:20:00 PM	12	86	3	0	1	79	18	0	22	0	6	0	0	2	1	0	694	2824
03:25:00 PM	15	88	3	0	2	94	23	0	16	1	7	0	1	2	2	0	717	2834
03:30:00 PM	19	80	0	0	1	74	18	0	16	0	12	0	3	2	2	0	711	2841
03:35:00 PM	11	89	1	0	0	85	21	0	15	0	10	0	0	0	1	0	714	2808
03:40:00 PM	12	93	3	0	0	68	22	0	22	1	17	0	1	1	0	0	700	2815
03:45:00 PM	8	113	2	0	0	75	20	0	12	0	8	0	2	3	1	0	717	2834
03:50:00 PM	21	96	1	0	1	83	11	0	23	0	14	0	2	0	0	0	736	2834
03:55:00 PM	13	108	1	0	0	115	15	0	13	0	13	0	3	1	0	0	778	2882
04:00:00 PM	13	84	0	0	2	80	15	0	16	1	10	0	1	3	2	0	761	2898
04:05:00 PM	14	96	2	0	1	86	19	0	20	7	12	0	1	2	0	0	769	2913
04:10:00 PM	8	128	1	0	0	126	22	0	14	3	8	0	1	0	2	0	800	2995
04:15:00 PM	11	105	0	0	2	81	21	0	18	0	15	0	0	5	2	0	833	3022
04:20:00 PM	24	131	1	0	1	71	17	0	17	2	10	0	0	1	1	0	849	3068
04:25:00 PM	15	91	0	0	2	90	12	0	10	1	10	0	2	6	4	0	779	3057
04:30:00 PM	27	123	1	0	0	67	25	0	27	2	15	0	0	3	2	0	811	3122
04:35:00 PM	19	90	0	0	1	102	16	0	9	0	13	0	0	2	2	0	789	3143
04:40:00 PM	13	74	0	0	1	76	19	0	21	2	19	0	0	3	0	0	774	3131
04:45:00 PM	12	113	0	0	1	72	14	0	18	1	18	0	1	1	0	0	733	3138
04:50:00 PM	20	97	3	0	1	71	22	0	25	2	10	0	2	1	0	0	733	3140
04:55:00 PM	32	129	1	0	0	101	20	0	9	1	9	0	1	0	0	0	808	3161
05:00:00 PM	19	104	2	0	0	80	18	0	22	2	4	0	0	2	1	0	811	3188
05:05:00 PM	18	98	0	0	0	88	18	0	27	1	10	0	1	1	1	0	820	3191
05:10:00 PM	16	110	0	0	1	77	25	0	18	0	10	0	0	3	1	0	778	3139
05:15:00 PM	18	92	0	0	0	75	24	0	24	0	9	0	3	2	4	0	775	3130
05:20:00 PM	19	97	0	0	3	111	18	0	12	1	11	0	0	0	2	0	786	3128
05:25:00 PM	29	151	1	0	0	90	17	0	17	1	15	0	0	2	1	0	849	3209
05:30:00 PM	14	99	0	0	2	53	16	0	19	2	11	0	2	0	1	0	817	3136
05:35:00 PM	23	145	1	0	0	93	12	0	15	0	8	0	2	3	1	0	846	3185
05:40:00 PM	16	93	0	0	0	74	16	0	33	0	6	0	0	4	0	0	764	3199
05:45:00 PM	11	114	1	0	1	85	13	0	14	1	9	0	1	1	0	0	796	3199
05:50:00 PM	16	95	0	0	2	80	16	0	12	0	2	0	0	0	0	0	716	3168
05:55:00 PM	25	92	0	0	1	62	12	0	12	1	4	0	2	2	0	0	687	3078

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW Helmholtz Way*
E/W street	*SW Wickiup Ave*
City, State	Redmond OR
Site Notes	
Location	44.247537 - -121.229331
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	

Peak Hour Start	05:00:00 PM
Peak 15 Min Start	05:35:00 PM
PHF (15-Min Int)	0.97



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
6	202	48	0	35	77	8	0	4	13	1	0	18	10	33	0	256	120	18	61	96	239	24	96

Percent Heavy Vehicles

0.0%	0.0%	0.0%	0.0%	0.0%	5.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.3%	0.0%	0.0%	4.2%	0.0%	0.0%	0.0%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				Southbound				Eastbound				Westbound					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

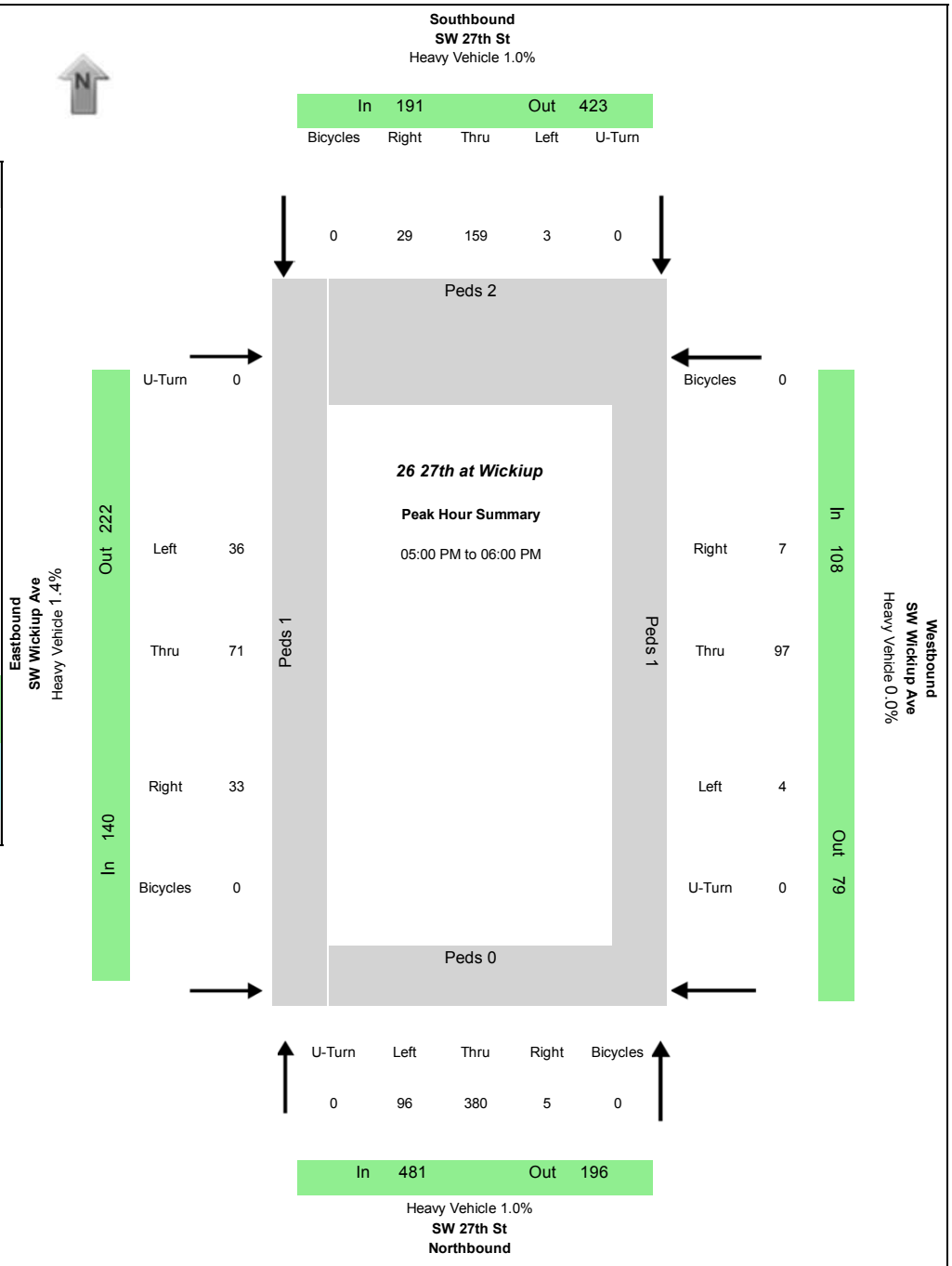
All Vehicle Volumes

	Northbound				Southbound				Eastbound				Westbound					
	SW Helmholtz Way				SW Helmholtz Way				SW Wickiup Ave				SW Wickiup Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0	3	2	0	5	4	0	0	0	0	0	0	2	0	5	0		
02:05:00 PM	0	9	0	0	1	10	0	0	0	0	0	0	2	2	2	0		
02:10:00 PM	0	4	0	0	0	4	0	0	1	3	0	0	2	1	2	0	64	
02:15:00 PM	0	7	0	0	1	5	1	0	1	1	0	0	1	1	4	0	65	
02:20:00 PM	0	9	3	0	2	6	0	0	2	1	0	0	0	3	3	0	68	
02:25:00 PM	0	8	2	0	2	6	0	0	0	0	0	0	0	1	3	0	73	
02:30:00 PM	0	5	0	0	4	6	0	0	0	0	0	0	2	2	0	0	70	
02:35:00 PM	0	12	2	0	1	7	0	0	0	1	0	0	2	1	3	0	70	
02:40:00 PM	0	6	2	0	3	8	1	0	1	0	0	0	2	1	5	0	77	
02:45:00 PM	0	6	4	0	2	3	0	0	1	1	0	0	3	3	2	0	83	
02:50:00 PM	0	8	2	0	0	1	0	0	0	1	0	0	2	2	1	0	71	
02:55:00 PM	1	9	2	0	1	10	0	0	0	0	0	0	0	2	3	0	70	284
03:00:00 PM	0	6	2	0	3	5	1	0	0	1	0	0	0	0	3	0	66	284
03:05:00 PM	2	14	4	0	1	6	0	0	0	1	0	0	1	0	3	0	81	290
03:10:00 PM	0	8	4	0	2	5	3	0	1	2	0	0	0	2	4	0	84	304
03:15:00 PM	0	5	1	0	4	6	1	0	0	1	0	0	3	0	2	0	86	305
03:20:00 PM	1	13	2	0	3	9	0	0	0	2	0	0	1	1	1	0	87	309
03:25:00 PM	0	9	1	0	5	3	0	0	0	0	0	0	0	2	2	0	78	309
03:30:00 PM	0	12	2	0	2	7	1	0	0	0	0	0	3	0	4	0	86	321
03:35:00 PM	0	6	2	0	4	6	3	0	0	0	0	0	2	0	3	0	79	318
03:40:00 PM	0	7	5	0	4	4	2	0	0	1	0	0	3	0	5	0	88	320
03:45:00 PM	0	8	5	0	3	7	1	0	1	0	1	0	1	0	1	0	85	323
03:50:00 PM	0	9	4	0	5	10	0	0	1	0	0	0	0	1	2	0	91	338
03:55:00 PM	0	14	1	0	3	11	0	0	0	0	0	0	4	0	1	0	94	344
04:00:00 PM	0	11	1	0	3	6	2	0	0	0	1	0	1	1	4	0	96	353
04:05:00 PM	0	19	4	0	3	6	1	0	0	2	0	0	1	0	2	0	102	359
04:10:00 PM	0	12	4	0	2	7	1	0	1	1	0	0	2	0	2	0	100	360
04:15:00 PM	0	15	5	0	2	5	2	0	2	2	0	0	0	3	1	0	107	374
04:20:00 PM	2	17	3	0	4	9	3	0	1	2	0	0	2	1	4	0	117	389
04:25:00 PM	0	14	7	0	3	9	0	0	3	2	0	0	1	1	2	0	127	409
04:30:00 PM	1	15	4	0	6	7	2	0	2	1	0	0	2	0	3	0	133	421
04:35:00 PM	0	15	4	0	4	5	0	0	1	1	1	0	2	0	1	0	119	429
04:40:00 PM	1	14	4	0	0	5	1	0	1	1	1	0	1	1	2	0	109	430
04:45:00 PM	0	5	5	0	2	9	0	0	0	3	0	0	2	1	3	0	96	432
04:50:00 PM	1	19	6	0	1	3	1	0	1	0	0	0	2	3	0	0	99	437
04:55:00 PM	0	10	0	0	1	6	2	0	0	1	0	0	2	2	1	0	92	428
05:00:00 PM	0	20	1	0	3	6	2	0	0	2	0	0	1	1	2	0	100	436
05:05:00 PM	3	11	5	0	3	9	2	0	1	2	0	0	1	1	2	0	103	438
05:10:00 PM	0	15	2	0	3	5	0	0	0	0	0	0	1	0	3	0	107	435
05:15:00 PM	1	17	2	0	1	9	0	0	0	1	1	0	1	2	5	0	109	438
05:20:00 PM	0	22	2	0	3	9	0	0	2	1	0	0	1	0	4	0	113	434
05:25:00 PM	0	12	5	0	1	6	1	0	1	1	0	0	1	2	1	0	115	423
05:30:00 PM	0	19	9	0	3	2	0	0	0	1	0	0	1	0	1	0	111	416
05:35:00 PM	0	25	6	0	4	7	0	0	0	0	0	0	1	0	2	0	112	427
05:40:00 PM	2	15	4	0	1	5	0	0	0	1	0	0	1	2	4	0	116	430
05:45:00 PM	0	15	3	0	4	7	1	0	0	2	0	0	2	0	3	0	117	437
05:50:00 PM	0	15	5	0	2	2	1	0	0	2	0	0	4	1	2	0	106	434
05:55:00 PM	0	16	4	0	7	10	1	0	0	0	0	0	3	1	4	0	117	455

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW 27th St*
E/W street	*SW Wickiup Ave*
City, State	Redmond OR
Site Notes	
Location	44.247488 - -121.199159
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	26

Peak Hour Start	05:00:00 PM
Peak 15 Min Start	05:05:00 PM
PHF (15-Min Int)	0.92



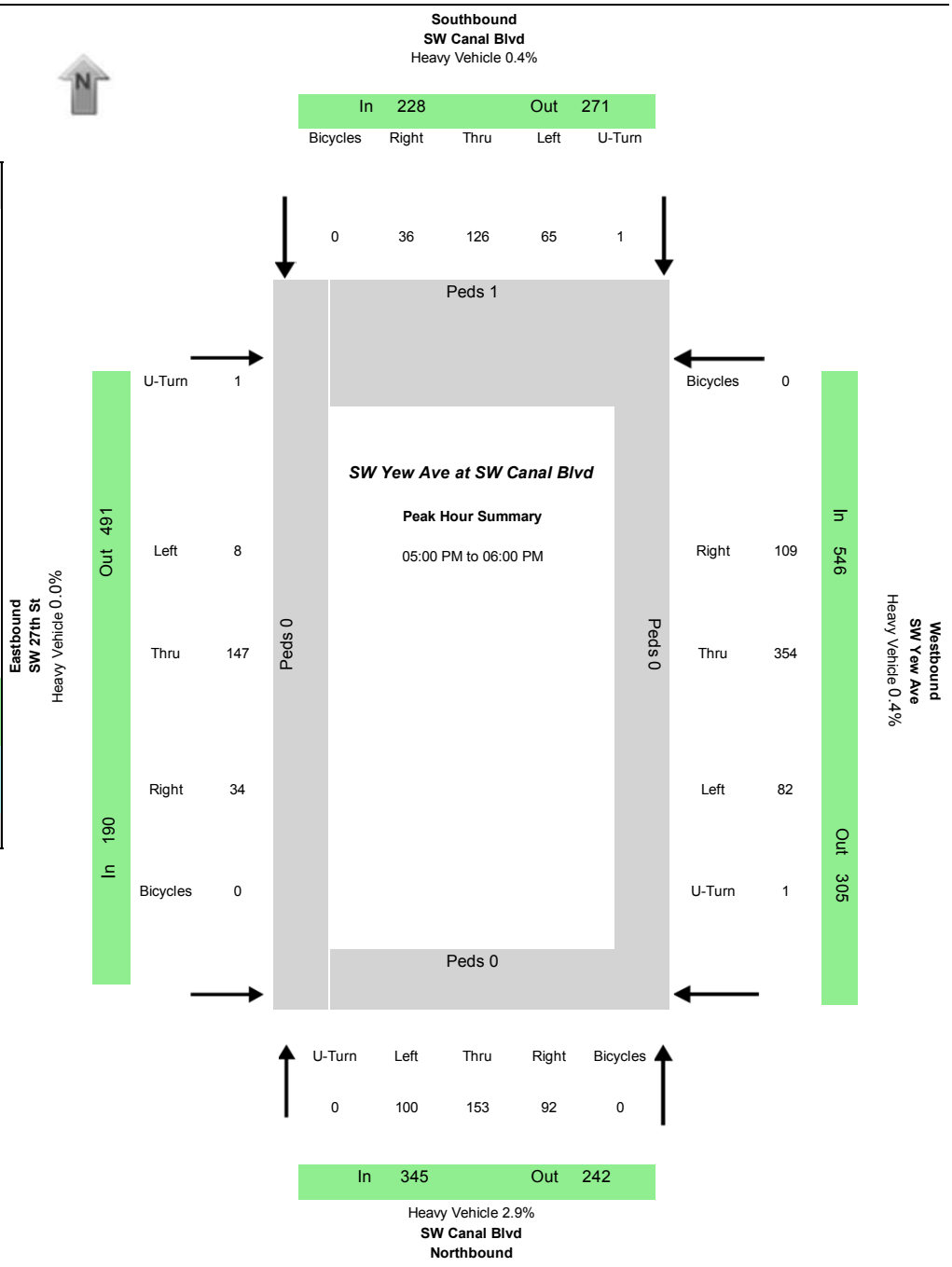
Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
96	380	5	0	3	159	29	0	36	71	33	0	4	97	7	0	481	191	140	108	196	423	222	79
Percent Heavy Vehicles																							
2.1%	0.8%	0.0%	0.0%	0.0%	0.6%	3.4%	0.0%	2.8%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	1.0%	1.4%	0.0%	0.5%	0.9%	1.4%	1.3%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	4

All Vehicle Volumes																		
	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW 27th St				SW 27th St				SW Wickiup Ave				SW Wickiup Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	7	5	0	0	0	12	5	0	3	7	2	0	1	3	1	0		
02:05:00 PM	6	11	0	0	1	13	5	0	3	7	2	0	0	7	0	0		
02:10:00 PM	8	17	0	0	0	8	12	0	5	6	2	0	0	12	0	0	171	
02:15:00 PM	11	10	1	0	0	13	3	0	4	3	0	0	0	12	0	0	182	
02:20:00 PM	8	15	0	0	1	13	5	0	1	6	3	0	0	10	1	0	190	
02:25:00 PM	2	12	0	0	1	22	9	0	2	2	4	0	0	15	1	0	190	
02:30:00 PM	4	14	0	0	0	14	7	0	2	6	3	0	0	6	1	0	190	
02:35:00 PM	10	18	0	0	0	11	3	0	4	12	2	0	1	10	0	0	198	
02:40:00 PM	5	19	0	0	0	9	7	0	16	15	9	0	0	10	0	0	218	
02:45:00 PM	3	18	0	0	2	14	2	0	9	13	7	0	0	9	1	0	239	
02:50:00 PM	0	22	2	0	0	16	4	0	5	12	7	0	1	10	1	0	248	
02:55:00 PM	8	19	1	0	2	9	0	0	2	3	3	0	0	7	1	0	213	792
03:00:00 PM	6	16	1	0	0	7	2	0	2	7	4	0	0	6	1	0	187	798
03:05:00 PM	3	15	1	0	0	7	4	0	2	1	3	0	0	6	0	0	149	785
03:10:00 PM	5	15	0	0	0	9	2	0	1	5	3	0	0	4	0	0	138	759
03:15:00 PM	6	20	0	0	1	9	4	0	2	8	2	0	0	9	1	0	148	764
03:20:00 PM	3	24	1	0	0	6	2	0	4	4	8	0	1	2	1	0	162	757
03:25:00 PM	9	17	0	0	0	15	1	0	1	5	4	0	1	8	0	0	179	748
03:30:00 PM	2	15	1	0	0	15	2	0	1	5	4	0	0	8	1	0	171	745
03:35:00 PM	8	17	0	0	0	5	1	0	1	8	7	0	1	3	2	0	168	727
03:40:00 PM	3	15	0	0	1	12	2	0	2	4	1	0	0	9	1	0	157	687
03:45:00 PM	7	15	2	0	3	11	3	0	2	8	3	0	0	9	0	0	166	672
03:50:00 PM	7	17	1	0	1	11	4	0	1	6	3	0	2	11	1	0	178	657
03:55:00 PM	7	19	2	0	1	15	1	0	5	8	6	0	0	5	0	0	197	671
04:00:00 PM	8	12	0	0	0	12	3	0	2	12	4	0	0	7	0	0	194	679
04:05:00 PM	5	22	0	0	0	9	3	0	4	6	5	0	1	9	0	0	193	701
04:10:00 PM	6	27	1	0	0	19	4	0	3	4	7	0	2	11	0	0	208	741
04:15:00 PM	6	27	0	0	0	15	2	0	1	5	5	0	1	8	0	0	218	749
04:20:00 PM	8	23	0	0	1	12	1	0	2	10	5	0	1	8	3	0	228	767
04:25:00 PM	6	24	0	0	1	8	0	0	2	9	4	0	1	10	1	0	210	772
04:30:00 PM	6	22	0	0	0	15	3	0	0	7	3	0	0	3	0	0	199	777
04:35:00 PM	10	35	0	0	0	13	3	0	3	2	8	0	0	10	0	0	209	808
04:40:00 PM	6	19	0	0	3	13	1	0	6	3	4	0	0	10	0	0	208	823
04:45:00 PM	7	25	2	0	0	13	3	0	2	5	7	0	1	8	0	0	222	833
04:50:00 PM	10	24	1	0	0	10	2	0	3	6	4	0	1	11	0	0	210	840
04:55:00 PM	9	20	0	0	1	12	3	0	2	5	1	0	1	4	0	0	203	829
05:00:00 PM	10	25	1	0	0	20	2	0	2	4	2	0	0	7	0	0	203	842
05:05:00 PM	4	40	2	0	0	18	0	0	3	6	1	0	0	9	0	0	214	861
05:10:00 PM	7	45	0	0	0	15	4	0	2	6	3	0	1	6	0	0	245	866
05:15:00 PM	8	35	0	0	0	18	1	0	2	5	2	0	0	6	0	0	249	873
05:20:00 PM	4	34	1	0	0	9	4	0	5	5	2	0	1	13	2	0	246	879
05:25:00 PM	9	24	0	0	1	18	3	0	0	4	3	0	0	8	0	0	227	883
05:30:00 PM	7	33	0	0	1	10	0	0	3	5	5	0	0	12	0	0	226	900
05:35:00 PM	7	32	0	0	0	8	2	0	1	6	2	0	0	15	0	0	219	889
05:40:00 PM	7	26	0	0	0	9	3	0	3	6	5	0	0	3	2	0	213	888
05:45:00 PM	3	29	0	0	1	14	5	0	4	8	2	0	1	3	0	0	207	885
05:50:00 PM	14	19	1	0	0	10	3	0	6	8	5	0	1	7	1	0	209	888
05:55:00 PM	16	38	0	0	0	10	2	0	5	8	1	0	0	8	2	0	235	920

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	***SW Canal Blvd***
E/W street	***SW 27th St***
City, State	Redmond OR
Site Notes	
Location	44.244219 - -121.199063
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	05:00:00 PM
Peak 15 Min Start	05:05:00 PM
PHF (15-Min Int)	0.86



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
100	153	92	0	65	126	36	1	8	147	34	1	82	354	109	1	345	228	190	546	242	271	491	305
Percent Heavy Vehicles																							
5.0%	1.3%	3.3%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	2.9%	0.4%	0.0%	0.4%	0.4%	0.7%	1.4%	1.0%

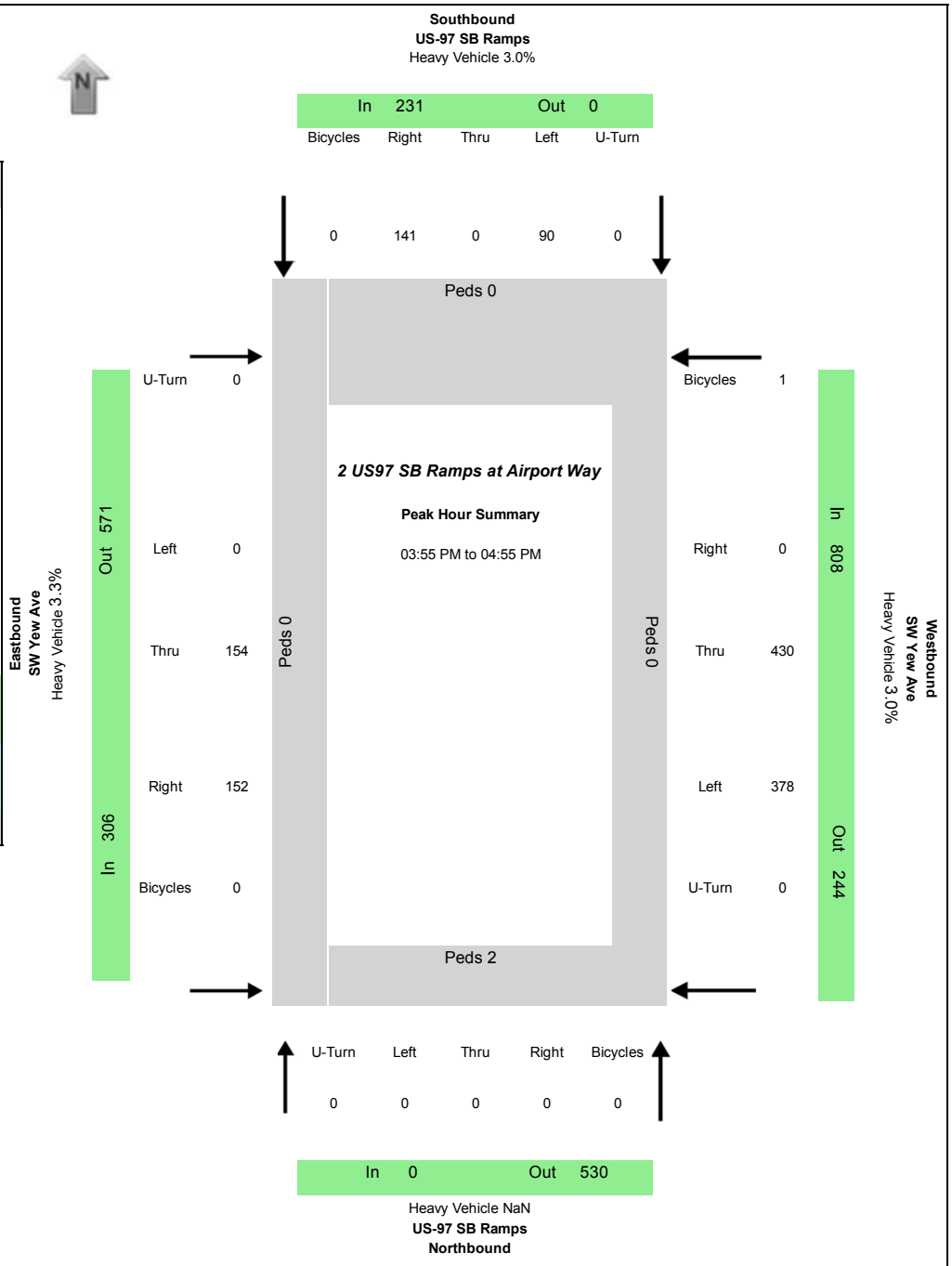
PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1

All Vehicle Volumes																		
	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW Canal Blvd				SW Canal Blvd				SW 27th St				SW Yew Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	2	14	6	0	2	11	2	0	0	7	7	0	5	9	6	0		
02:05:00 PM	3	12	5	0	6	12	2	0	0	11	5	0	3	14	8	0		
02:10:00 PM	2	13	9	0	2	12	2	1	2	10	1	0	5	22	3	0	236	
02:15:00 PM	3	9	8	1	2	8	1	0	0	9	7	0	7	17	4	0	241	
02:20:00 PM	5	8	0	0	1	6	0	0	0	10	5	1	8	19	2	0	225	
02:25:00 PM	2	9	5	2	3	6	0	0	3	13	4	0	2	12	7	0	209	
02:30:00 PM	5	11	4	0	5	10	0	0	0	14	10	0	6	15	8	0	221	
02:35:00 PM	3	8	4	0	4	15	1	0	1	10	1	0	0	24	8	0	235	
02:40:00 PM	4	6	7	0	3	9	0	0	0	14	2	0	5	17	6	0	240	
02:45:00 PM	6	16	5	0	5	11	1	0	1	17	5	0	6	21	11	0	257	
02:50:00 PM	1	5	11	0	5	9	0	0	0	21	2	0	9	24	5	0	270	
02:55:00 PM	4	13	7	0	5	7	0	1	1	10	3	0	2	25	3	1	279	964
03:00:00 PM	2	9	8	0	7	9	0	0	1	10	0	0	4	17	1	0	242	961
03:05:00 PM	2	13	8	0	6	7	2	0	0	9	4	0	9	16	9	0	235	965
03:10:00 PM	1	10	8	1	3	11	1	0	0	9	2	0	7	16	8	0	230	958
03:15:00 PM	4	19	8	0	10	10	1	0	0	10	1	0	5	23	11	0	264	984
03:20:00 PM	4	5	3	1	3	10	0	0	2	13	2	0	9	22	8	1	262	1002
03:25:00 PM	2	12	6	0	7	6	0	0	0	15	3	0	6	24	5	0	271	1020
03:30:00 PM	2	9	1	0	5	13	0	0	0	16	3	0	1	20	6	0	245	1008
03:35:00 PM	3	10	4	0	3	11	0	0	0	13	3	0	8	23	9	0	249	1016
03:40:00 PM	2	6	7	0	3	16	1	0	1	7	4	0	7	13	8	0	238	1018
03:45:00 PM	2	12	4	0	3	11	1	0	1	12	2	0	4	23	4	0	241	992
03:50:00 PM	1	12	5	0	7	20	2	0	2	9	1	0	12	19	13	0	257	1003
03:55:00 PM	5	8	5	0	6	22	0	0	3	10	6	0	12	21	5	1	286	1025
04:00:00 PM	3	13	4	0	6	12	1	0	2	8	9	0	10	16	10	0	301	1051
04:05:00 PM	4	19	5	0	8	7	2	0	1	9	10	0	8	21	16	0	308	1076
04:10:00 PM	4	13	4	0	3	10	1	0	1	12	12	0	13	25	11	0	313	1108
04:15:00 PM	9	12	6	0	7	12	5	0	1	12	5	0	12	20	9	0	329	1116
04:20:00 PM	7	20	8	0	5	13	2	0	1	11	6	0	11	21	11	0	335	1149
04:25:00 PM	5	13	9	0	7	9	3	0	1	10	6	0	8	30	7	0	334	1171
04:30:00 PM	3	13	11	0	3	10	5	0	1	14	5	0	7	23	11	0	330	1201
04:35:00 PM	3	14	5	0	2	18	3	0	1	14	8	0	7	32	13	0	334	1234
04:40:00 PM	7	13	2	0	4	18	2	0	0	13	7	0	9	17	6	0	324	1257
04:45:00 PM	3	18	4	0	2	15	3	1	0	20	8	0	9	28	10	0	339	1299
04:50:00 PM	2	10	4	0	4	17	9	0	1	8	4	0	8	30	13	0	329	1306
04:55:00 PM	0	0	0	0	6	2	3	0	0	0	0	0	0	0	0	0	242	1213
05:00:00 PM	6	13	10	0	2	12	2	0	1	15	1	0	7	31	11	0	232	1230
05:05:00 PM	8	11	7	0	3	13	4	0	1	16	2	0	9	34	17	0	247	1245
05:10:00 PM	9	12	13	0	7	6	0	0	0	15	3	0	7	43	13	0	364	1264
05:15:00 PM	8	13	10	0	7	12	5	0	0	23	2	1	3	37	5	0	379	1280
05:20:00 PM	8	13	13	0	3	19	3	0	1	6	4	0	9	25	8	0	366	1276
05:25:00 PM	7	11	7	0	8	8	3	0	0	11	3	0	12	26	9	0	343	1273
05:30:00 PM	12	11	3	0	6	9	2	0	0	16	3	0	9	27	7	0	322	1272
05:35:00 PM	5	13	10	0	9	5	2	0	0	8	3	0	4	27	10	0	306	1248
05:40:00 PM	6	12	4	0	5	13	1	1	4	7	1	0	2	27	8	0	292	1241
05:45:00 PM	9	15	6	0	8	5	3	0	0	8	5	0	6	28	3	0	283	1216
05:50:00 PM	8	14	4	0	3	11	3	0	0	14	3	0	7	26	8	0	288	1207
05:55:00 PM	14	15	5	0	4	13	8	0	1	8	4	0	7	23	10	1	310	1309

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*US-97 SB Ramps*
E/W street	*SW Yew Ave*
City, State	Redmond OR
Site Notes	
Location	44.242809 - -121.193704
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	2

Peak Hour Start	03:55:00 PM
Peak 15 Min Start	04:00:00 PM
PHF (15-Min Int)	0.84



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	0	0	90	0	141	0	0	154	152	0	378	430	0	0	0	231	306	808	530	0	571	244
Percent Heavy Vehicles																							
0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	3.5%	0.0%	0.0%	5.8%	0.7%	0.0%	4.5%	1.6%	0.0%	0.0%	#DIV/0!	3.0%	3.3%	3.0%	3.4%	0.0%	2.1%	4.5%

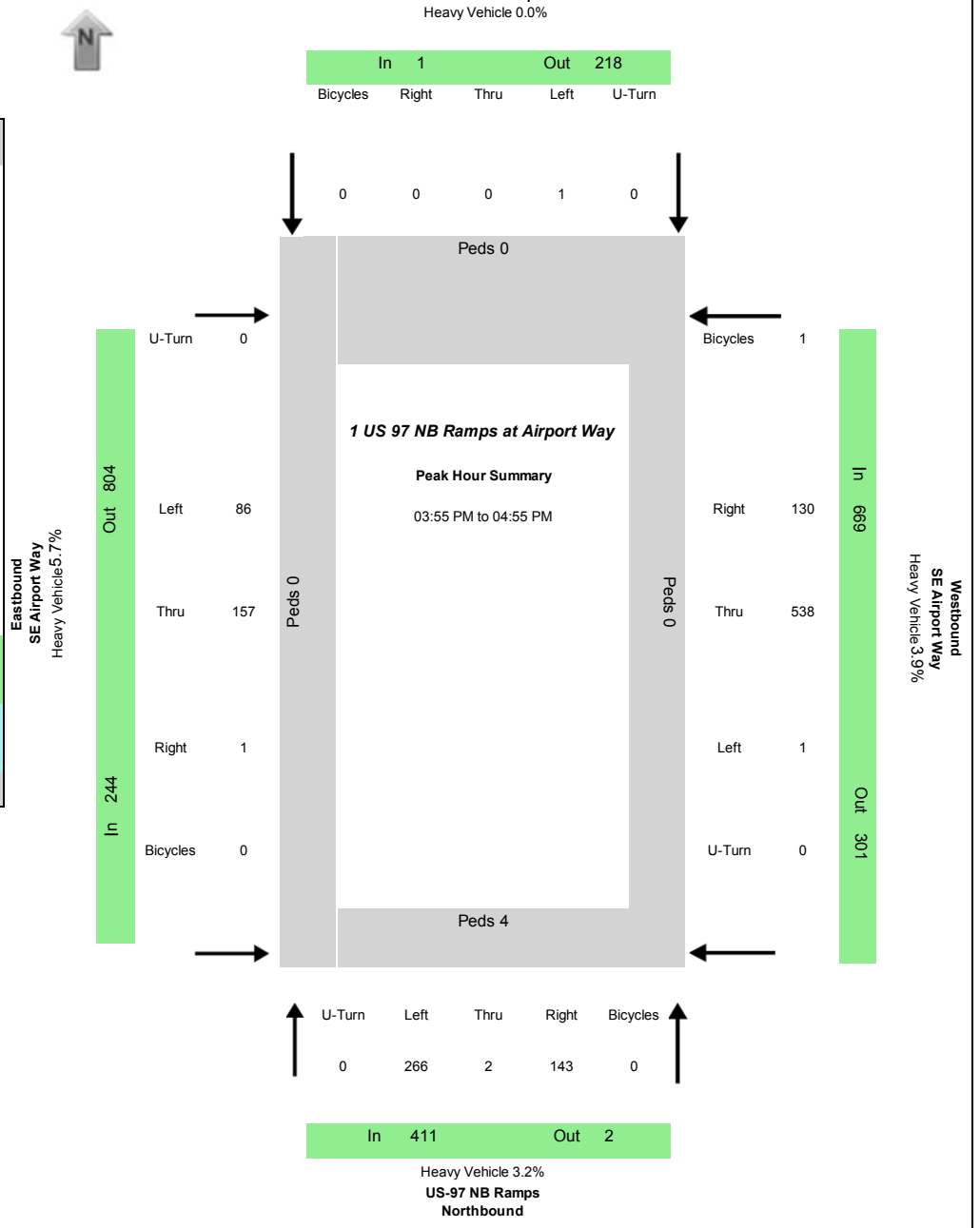
PHV- Bicycles																PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0	2

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	US-97 SB Ramps				US-97 SB Ramps				SW Yew Ave				SW Yew Ave				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	0	0	0	0	12	0	6	0	0	10	6	0	13	10	0	0		
02:05:00 PM	0	0	0	0	13	0	11	0	0	11	13	0	16	21	0	0		
02:10:00 PM	0	0	0	0	8	0	6	0	0	10	13	0	17	31	0	0	227	
02:15:00 PM	0	0	0	0	16	0	14	0	0	9	12	0	7	15	0	0	243	
02:20:00 PM	0	0	0	0	7	0	7	0	0	9	8	0	17	21	0	0	227	
02:25:00 PM	0	0	0	0	5	0	9	0	0	13	12	0	16	20	0	0	217	
02:30:00 PM	0	0	0	0	12	0	7	0	0	19	12	0	18	19	0	0	231	
02:35:00 PM	0	0	0	0	6	0	3	0	0	9	10	0	10	35	0	0	235	
02:40:00 PM	0	0	0	0	9	0	3	0	0	17	11	0	31	29	0	0	260	
02:45:00 PM	0	0	0	0	7	0	10	0	0	13	14	0	22	29	0	0	268	
02:50:00 PM	0	0	0	0	5	0	9	0	0	25	12	0	28	23	0	0	297	
02:55:00 PM	0	0	0	0	11	0	15	0	0	18	6	0	29	24	0	0	300	1004
03:00:00 PM	0	0	0	0	7	0	11	0	0	17	9	0	23	16	0	0	288	1030
03:05:00 PM	0	0	1	0	15	0	9	0	0	15	7	0	17	24	0	0	274	1033
03:10:00 PM	0	0	0	0	12	0	11	0	0	13	12	0	16	27	0	0	262	1039
03:15:00 PM	0	0	0	0	7	0	9	0	0	16	12	0	19	40	0	0	282	1069
03:20:00 PM	0	0	0	0	2	0	7	0	0	8	14	0	20	29	0	0	274	1080
03:25:00 PM	0	0	0	0	2	0	9	0	0	18	11	0	17	24	0	0	264	1086
03:30:00 PM	0	0	0	0	10	0	2	0	0	15	12	0	20	27	0	0	247	1085
03:35:00 PM	0	0	0	0	4	0	13	0	0	11	11	0	32	33	0	0	271	1116
03:40:00 PM	0	0	0	0	5	0	8	0	0	14	6	0	26	19	0	0	268	1094
03:45:00 PM	0	0	0	0	6	0	8	0	0	13	7	0	21	25	0	0	262	1079
03:50:00 PM	0	0	0	0	2	0	12	0	0	15	14	0	26	33	0	0	260	1079
03:55:00 PM	0	0	0	0	6	0	15	0	0	8	13	0	48	30	0	0	302	1096
04:00:00 PM	0	0	0	0	6	0	11	0	0	15	13	0	47	32	0	0	346	1137
04:05:00 PM	0	0	0	0	7	0	16	0	0	13	13	0	53	37	0	0	383	1188
04:10:00 PM	0	0	0	0	8	0	12	0	0	11	16	0	51	40	0	0	401	1235
04:15:00 PM	0	0	0	0	8	0	8	0	0	13	14	0	22	39	0	0	381	1236
04:20:00 PM	0	0	0	0	9	0	14	0	0	18	14	0	12	34	0	0	343	1257
04:25:00 PM	0	0	0	0	11	0	8	0	0	14	12	0	19	29	0	0	298	1269
04:30:00 PM	0	0	0	0	9	0	7	0	0	17	10	0	28	43	0	0	308	1297
04:35:00 PM	0	0	0	0	8	0	13	0	0	9	15	0	23	39	0	0	314	1300
04:40:00 PM	0	0	0	0	6	0	11	0	0	8	12	0	25	31	0	0	314	1315
04:45:00 PM	0	0	0	0	7	0	15	0	0	16	15	0	14	38	0	0	305	1340
04:50:00 PM	0	0	0	0	5	0	11	0	0	12	5	0	36	38	0	0	305	1345
04:55:00 PM	0	0	0	0	6	0	9	0	0	14	12	0	17	42	0	0	312	1325
05:00:00 PM	0	0	0	0	7	0	10	0	0	13	13	1	23	40	0	0	314	1308
05:05:00 PM	0	0	0	0	4	0	12	0	0	14	14	0	28	51	0	0	330	1292
05:10:00 PM	0	0	0	0	10	0	14	0	0	16	14	0	19	59	0	0	362	1286
05:15:00 PM	0	0	0	0	7	0	9	0	0	17	20	0	12	41	0	0	361	1288
05:20:00 PM	0	0	0	0	8	0	12	0	0	15	11	0	10	35	0	0	329	1278
05:25:00 PM	0	0	0	0	3	0	14	0	0	8	17	0	14	45	0	0	298	1286
05:30:00 PM	0	0	0	0	7	0	13	0	0	13	13	0	20	32	0	0	290	1270
05:35:00 PM	0	0	0	0	3	0	4	0	0	15	11	0	12	43	0	0	287	1251
05:40:00 PM	0	0	0	0	7	0	5	0	0	11	6	0	10	32	0	0	257	1229
05:45:00 PM	0	0	0	0	4	0	14	0	0	11	12	0	17	32	0	0	249	1214
05:50:00 PM	0	0	0	0	5	0	11	0	0	14	10	0	19	40	0	0	260	1206
05:55:00 PM	0	0	0	0	2	0	9	0	0	13	10	0	17	35	0	0	275	1192

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*US-97 NB Ramps*
E/W street	*SE Airport Way*
City, State	Redmond OR
Site Notes	
Location	44.241845 - -121.192247
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	1
Peak Hour Start	03:55:00 PM
Peak 15 Min Start	04:00:00 PM
PHF (15-Min Int)	0.83



Peak-Hour Volumes (PHV)																								
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
266	2	143	0	1	0	0	0	86	157	1	0	1	538	130	0	411	1	244	669	2	218	804	301
Percent Heavy Vehicles																							
1.5%	0.0%	6.3%	0.0%	0.0%	0.0%	0.0%	0.0%	4.7%	6.4%	0.0%	0.0%	0.0%	4.1%	3.1%	0.0%	3.2%	0.0%	5.7%	3.9%	0.0%	3.7%	3.2%	6.3%

PHV- Bicycles																	PHV - Pedestrians				
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	4	0	0	0	4

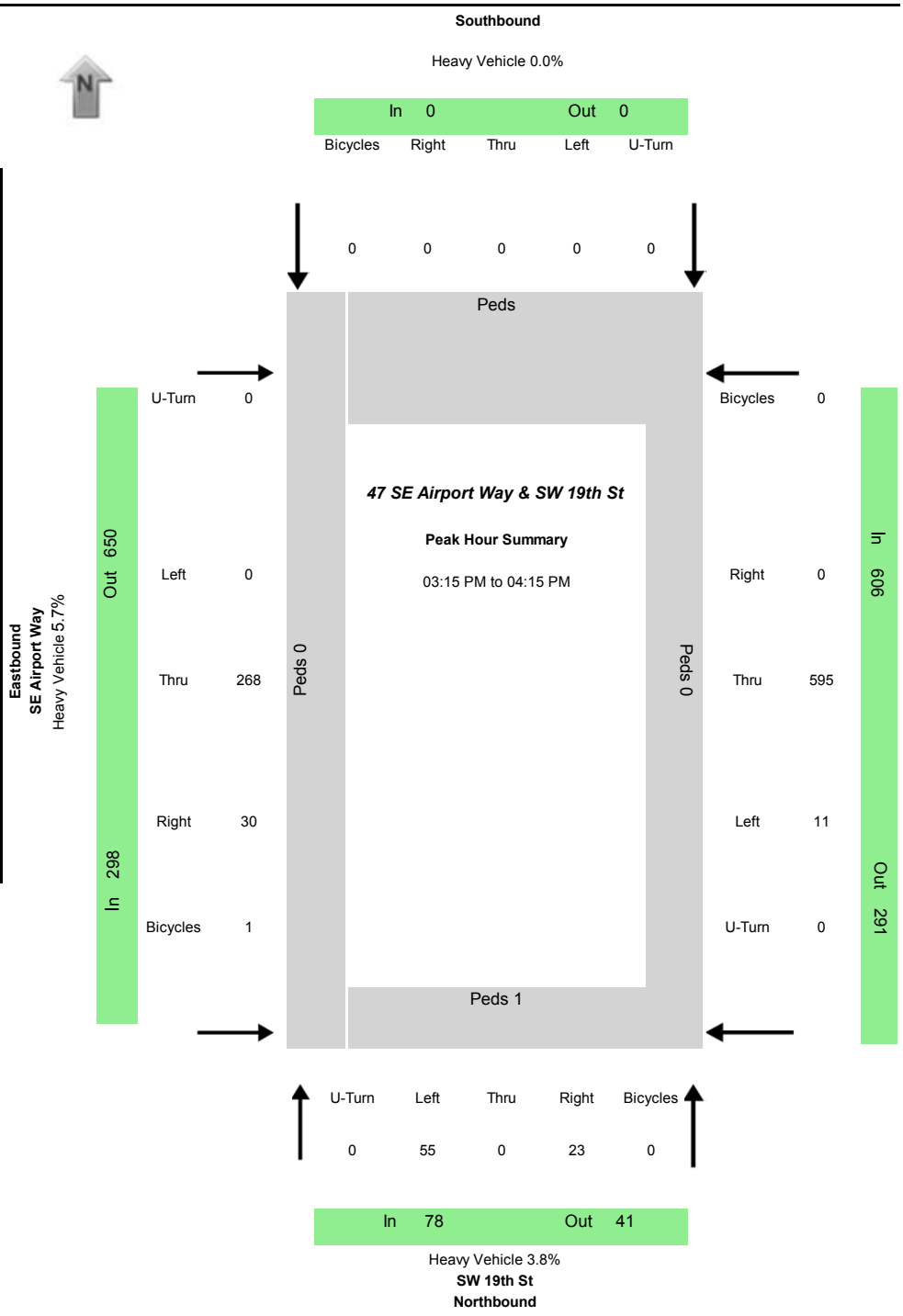
All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	US-97 NB Ramps				US-97 NB Ramps				SE Airport Way				SE Airport Way				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	8	0	26	0	0	0	0	0	8	9	0	0	0	20	7	0		
02:05:00 PM	8	0	32	0	0	0	0	0	9	19	0	0	0	27	10	0		
02:10:00 PM	15	0	17	0	0	0	0	0	4	14	0	0	0	30	11	0	274	
02:15:00 PM	7	0	20	0	0	0	0	0	7	20	0	0	0	14	7	0	271	
02:20:00 PM	13	0	22	0	0	0	0	0	3	11	0	0	0	23	10	0	248	
02:25:00 PM	14	0	19	0	0	0	0	0	6	13	0	0	0	25	12	0	246	
02:30:00 PM	11	0	16	0	0	0	0	0	14	18	0	0	0	23	11	0	264	
02:35:00 PM	17	0	25	0	0	0	0	0	10	10	0	0	0	29	11	0	284	
02:40:00 PM	14	0	17	0	0	0	0	0	7	14	0	0	0	46	12	0	305	
02:45:00 PM	17	0	19	0	0	0	0	0	8	14	0	0	0	34	8	0	312	
02:50:00 PM	15	0	15	0	0	0	0	0	9	22	0	0	0	35	8	0	314	
02:55:00 PM	20	0	19	0	0	0	0	0	9	22	0	0	0	33	8	0	315	1140
03:00:00 PM	13	0	18	0	0	0	0	0	3	19	0	0	0	26	8	0	302	1149
03:05:00 PM	14	0	24	0	0	0	0	0	11	17	0	0	0	24	10	0	298	1144
03:10:00 PM	17	0	11	0	0	0	0	0	10	16	0	0	0	28	16	1	286	1152
03:15:00 PM	27	0	20	0	0	0	0	0	8	14	0	0	0	33	10	0	311	1189
03:20:00 PM	14	0	14	0	0	0	0	0	4	10	0	0	0	33	10	0	296	1192
03:25:00 PM	16	0	18	0	0	0	0	0	6	13	0	0	0	24	15	0	289	1195
03:30:00 PM	15	0	19	0	0	0	0	0	6	15	0	0	0	37	14	0	283	1208
03:35:00 PM	17	0	14	0	0	0	0	0	6	12	0	0	0	41	8	0	296	1204
03:40:00 PM	11	0	7	0	0	0	0	0	7	12	0	0	0	33	9	0	283	1173
03:45:00 PM	20	0	17	0	0	0	0	0	6	15	0	0	0	27	5	0	267	1163
03:50:00 PM	24	0	11	0	0	0	0	0	5	12	0	0	0	38	11	0	270	1160
03:55:00 PM	17	0	16	0	0	0	0	0	4	10	0	0	0	63	8	0	309	1167
04:00:00 PM	16	0	7	0	0	0	0	0	8	12	0	0	0	68	13	0	343	1204
04:05:00 PM	24	1	11	0	1	0	0	0	7	13	1	0	1	63	24	0	388	1250
04:10:00 PM	14	0	8	0	0	0	0	0	8	11	0	0	0	71	16	0	398	1279
04:15:00 PM	28	0	9	0	0	0	0	0	7	16	0	0	0	31	7	0	372	1265
04:20:00 PM	29	0	17	0	0	0	0	0	12	11	0	0	0	21	13	0	329	1283
04:25:00 PM	26	0	20	0	0	0	0	0	7	17	0	0	0	26	6	0	303	1293
04:30:00 PM	24	0	9	0	0	0	0	0	11	15	0	0	0	41	7	0	312	1294
04:35:00 PM	17	0	15	0	0	0	0	0	6	13	0	0	0	42	12	0	314	1301
04:40:00 PM	20	1	6	0	0	0	0	0	4	13	0	0	0	38	8	0	302	1312
04:45:00 PM	24	0	11	0	0	0	0	0	6	13	0	0	0	30	9	0	288	1315
04:50:00 PM	27	0	14	0	0	0	0	0	6	13	0	0	0	44	7	0	294	1325
04:55:00 PM	23	0	12	0	0	0	0	0	5	15	0	0	0	36	11	0	306	1309
05:00:00 PM	27	0	15	0	0	0	0	0	2	16	0	0	0	40	10	0	323	1295
05:05:00 PM	26	0	16	0	0	0	0	0	11	8	0	0	0	48	11	0	332	1269
05:10:00 PM	36	0	20	0	0	0	0	0	7	21	0	0	0	42	13	0	369	1280
05:15:00 PM	30	0	19	0	0	0	0	0	6	17	0	0	0	25	7	0	363	1286
05:20:00 PM	24	0	12	0	0	0	0	0	12	12	0	0	0	16	12	0	331	1271
05:25:00 PM	38	0	10	0	0	0	0	0	3	8	0	0	0	24	6	0	281	1258
05:30:00 PM	18	0	14	0	0	0	0	0	4	16	0	0	0	32	6	0	267	1241
05:35:00 PM	33	0	22	0	0	0	0	0	8	10	0	0	0	23	5	0	280	1237
05:40:00 PM	21	0	15	0	0	0	0	0	4	13	0	0	0	19	10	0	273	1229
05:45:00 PM	28	0	17	0	0	0	0	0	4	12	0	0	0	24	8	0	276	1229
05:50:00 PM	30	0	7	0	0	0	0	0	6	10	0	0	0	32	5	0	265	1208
05:55:00 PM	14	0	7	0	0	0	0	0	1	3	0	0	0	14	4	0	226	1149

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	***SW 19th St***
E/W street	***SE Airport Way***
City, State	Redmond OR
Site Notes	
Location	44.240122 - -121.189137
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	47

Peak Hour Start	03:15:00 PM
Peak 15 Min Start	03:55:00 PM
PHF (15-Min Int)	0.75



Peak-Hour Volumes (PHV)																							
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
55	0	23	0	0	0	0	0	0	268	30	0	11	595	0	0	78	0	298	606	41	0	650	291
Percent Heavy Vehicles																							
3.6%	0.0%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.3%	0.0%	0.0%	27.3%	3.5%	0.0%	0.0%	3.8%	0.0%	5.7%	4.0%	7.3%	0.0%	3.5%	6.2%

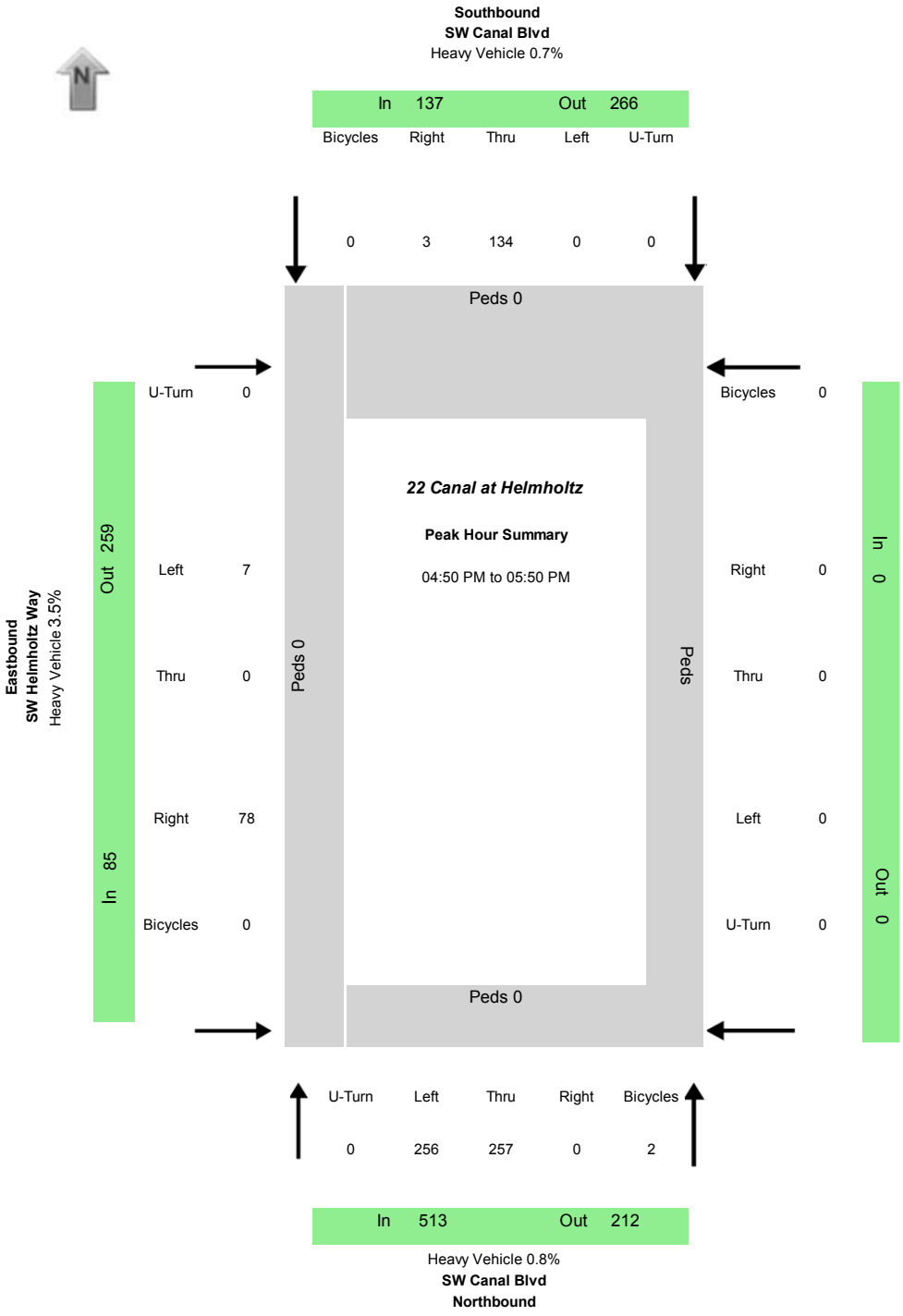
PHV- Bicycles																	PHV - Pedestrians					
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk					
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0		0	0						1	0	0	0	0		0	1	1		0	0	1

All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW 19th St								SE Airport Way				SE Airport Way				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	4		1	0						33	5	0	1	19		0		
02:05:00 PM	4		0	0						43	5	0	0	32		0		
02:10:00 PM	10		0	0						23	5	0	1	35		0	221	
02:15:00 PM	4		6	0						32	7	0	2	12		0	221	
02:20:00 PM	4		1	0						32	4	0	0	26		0	204	
02:25:00 PM	9		0	0						22	4	0	1	25		0	191	
02:30:00 PM	5		0	0						30	4	0	0	21		0	188	
02:35:00 PM	4		1	0						29	5	0	1	29		0	190	
02:40:00 PM	2		2	0						20	2	0	0	44		0	199	
02:45:00 PM	6		1	0						37	1	0	1	33		0	218	
02:50:00 PM	5		2	0						31	1	0	0	29		0	217	
02:55:00 PM	6		2	0						33	3	0	2	36		0	229	840
03:00:00 PM	5		1	0						32	5	0	1	26		0	220	847
03:05:00 PM	3		1	0						26	4	0	0	26		0	212	823
03:10:00 PM	5		1	0						23	3	0	3	30		0	195	814
03:15:00 PM	8		0	0						28	3	0	0	35		0	199	825
03:20:00 PM	4		0	0						18	1	0	1	35		0	198	817
03:25:00 PM	2		3	0						30	0	0	1	34		0	203	826
03:30:00 PM	2		1	0						29	5	0	1	40		0	207	844
03:35:00 PM	4		1	0						24	2	0	1	51		0	231	858
03:40:00 PM	2		0	0						16	5	0	2	33		0	219	846
03:45:00 PM	2		2	0						19	4	0	0	31		0	199	825
03:50:00 PM	8		1	0						27	1	0	0	35		0	188	829
03:55:00 PM	4		5	0						24	2	0	2	69		0	236	853
04:00:00 PM	7		2	0						19	3	0	2	81		0	292	897
04:05:00 PM	4		7	0						20	2	0	1	75		0	329	946
04:10:00 PM	8		1	0						14	2	0	0	76		0	324	982
04:15:00 PM	2		1	0						17	1	0	3	29		0	263	961
04:20:00 PM	1		1	0						22	2	0	0	29		0	209	957
04:25:00 PM	2		0	0						27	3	0	3	26		0	169	948
04:30:00 PM	5		0	0						19	2	1	2	31		0	176	930
04:35:00 PM	6		1	0						27	1	0	0	32		0	188	914
04:40:00 PM	2		0	0						11	1	0	0	36		0	177	906
04:45:00 PM	3		1	0						14	4	0	0	30		0	169	900
04:50:00 PM	3		3	0						22	5	0	0	42		0	177	903
04:55:00 PM	0		2	0						15	5	0	1	40		0	190	860
05:00:00 PM	3		0	0						22	1	0	1	36		0	201	809
05:05:00 PM	5		2	0						15	3	0	0	41		0	192	766
05:10:00 PM	8		0	0						29	2	1	0	40		0	209	745
05:15:00 PM	2		1	0						31	1	0	1	28		0	210	756
05:20:00 PM	8		0	0						25	0	0	0	18		0	195	752
05:25:00 PM	3		2	0						17	0	0	0	21		0	158	734
05:30:00 PM	3		0	0						18	5	0	0	26		0	146	726
05:35:00 PM	5		2	0						22	2	0	0	19		0	145	709
05:40:00 PM	7		0	0						18	1	0	2	17		0	147	704
05:45:00 PM	6		0	0						19	1	0	0	20		0	141	698
05:50:00 PM	2		0	0						13	0	0	1	27		0	134	666
05:55:00 PM	5		0	0						19	1	0	0	21		0	135	649

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*SW Canal Blvd*
E/W street	*SW Helmholtz Way*
City, State	Redmond OR
Site Notes	
Location	44.221881 - -121.228094
Start Date	Wednesday, April 19, 2017
Start Time	02:00:00 PM
Weather	
Study ID #	22
Peak Hour Start	04:50:00 PM
Peak 15 Min Start	05:15:00 PM
PHF (15-Min Int)	0.87



Peak-Hour Volumes (PHV)																							
Northbound				**Southbound**				**Eastbound**				**Westbound**				**Entering**				**Leaving**			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
256	257	0	0	0	134	3	0	7	0	78	0	0	0	0	0	513	137	85	0	212	264	259	0
Percent Heavy Vehicles																							
0.8%	0.8%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	3.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.7%	3.5%	0.0%	1.9%	0.8%	0.8%	0.0%

PHV- Bicycles																PHV - Pedestrians					
Northbound				**Southbound**				**Eastbound**				**Westbound**					in Crosswalk				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**	NB	SB	EB	WB	**Sum**
0	2		0		0	0	0	0		0	0					2	0	0	0		0

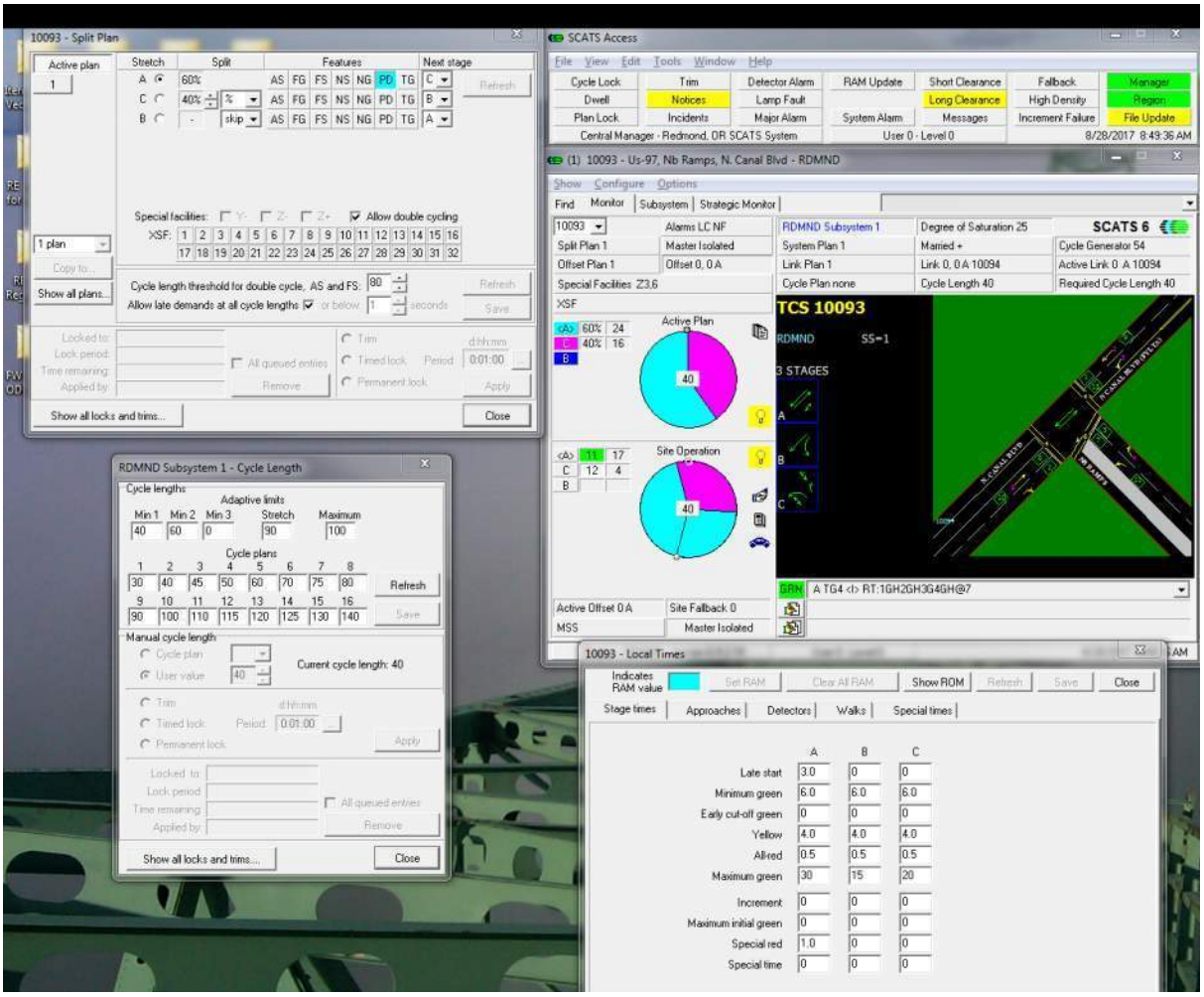
All Vehicle Volumes

	Northbound				**Southbound**				**Eastbound**				**Westbound**					
	SW Canal Blvd				SW Canal Blvd				SW Helmholtz Way								15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
02:00:00 PM	3	12		0		10	0	1	0		3	0						
02:05:00 PM	3	13		0		15	0	0	0		6	0						
02:10:00 PM	4	8		0		12	0	0	1		7	0					98	
02:15:00 PM	9	7		0		10	0	0	0		5	0					100	
02:20:00 PM	9	14		0		9	0	0	0		6	0					101	
02:25:00 PM	7	21		0		11	0	0	1		4	0					113	
02:30:00 PM	5	7		0		9	0	0	1		4	0					108	
02:35:00 PM	13	10		0		9	0	0	0		9	0					111	
02:40:00 PM	2	10		0		9	0	0	0		6	0					94	
02:45:00 PM	6	8		0		20	1	0	1		5	0					109	
02:50:00 PM	13	19		0		8	0	1	0		5	0					114	
02:55:00 PM	8	13		0		10	1	0	1		2	0					122	427
03:00:00 PM	7	14		0		11	1	0	0		7	0					121	438
03:05:00 PM	11	12		0		8	0	0	0		9	0					115	441
03:10:00 PM	4	8		0		12	0	0	5		4	0					113	442
03:15:00 PM	9	10		0		10	0	0	0		9	0					111	449
03:20:00 PM	9	13		0		12	1	0	0		10	0					116	456
03:25:00 PM	7	12		0		18	1	0	0		6	0					127	456
03:30:00 PM	10	14		0		10	0	0	0		7	0					130	471
03:35:00 PM	16	13		0		6	0	0	1		7	0					128	473
03:40:00 PM	7	8		0		14	1	0	1		8	0					123	485
03:45:00 PM	13	20		0		9	0	0	1		7	0					132	494
03:50:00 PM	15	18		0		16	2	0	0		4	0					144	503
03:55:00 PM	11	12		0		16	0	0	0		10	0					154	517
04:00:00 PM	14	19		0		10	1	0	0		3	0					151	524
04:05:00 PM	14	26		0		14	0	0	1		2	0					153	541
04:10:00 PM	16	23		0		12	0	0	0		3	0					158	562
04:15:00 PM	21	25		0		14	1	0	0		5	0					177	590
04:20:00 PM	19	27		0		10	0	0	0		7	0					183	608
04:25:00 PM	17	30		0		9	1	0	0		7	0					193	628
04:30:00 PM	14	23		0		12	0	0	0		4	0					180	640
04:35:00 PM	20	15		0		15	1	0	0		8	0					176	656
04:40:00 PM	15	24		0		9	1	0	0		4	0					165	670
04:45:00 PM	14	12		0		16	0	0	0		5	0					159	667
04:50:00 PM	17	25		0		14	1	0	2		8	0					167	679
04:55:00 PM	15	21		0		7	0	0	0		5	0					162	678
05:00:00 PM	20	17		0		10	0	0	0		5	0					167	683
05:05:00 PM	15	19		0		11	0	0	0		7	0					152	678
05:10:00 PM	16	22		0		10	0	0	0		6	0					158	678
05:15:00 PM	23	30		0		16	0	0	1		3	0					179	685
05:20:00 PM	31	26		0		14	1	0	0		7	0					206	701
05:25:00 PM	23	19		0		10	0	0	1		6	0					211	696
05:30:00 PM	24	21		0		10	1	0	2		6	0					202	707
05:35:00 PM	26	24		0		10	0	0	0		8	0					191	716
05:40:00 PM	24	15		0		10	0	0	0		7	0					188	719
05:45:00 PM	22	18		0		12	0	0	1		10	0					187	735
05:50:00 PM	14	27		0		14	1	0	1		6	0					182	731
05:55:00 PM	13	11		0		14	1	0	0		5	0					170	727

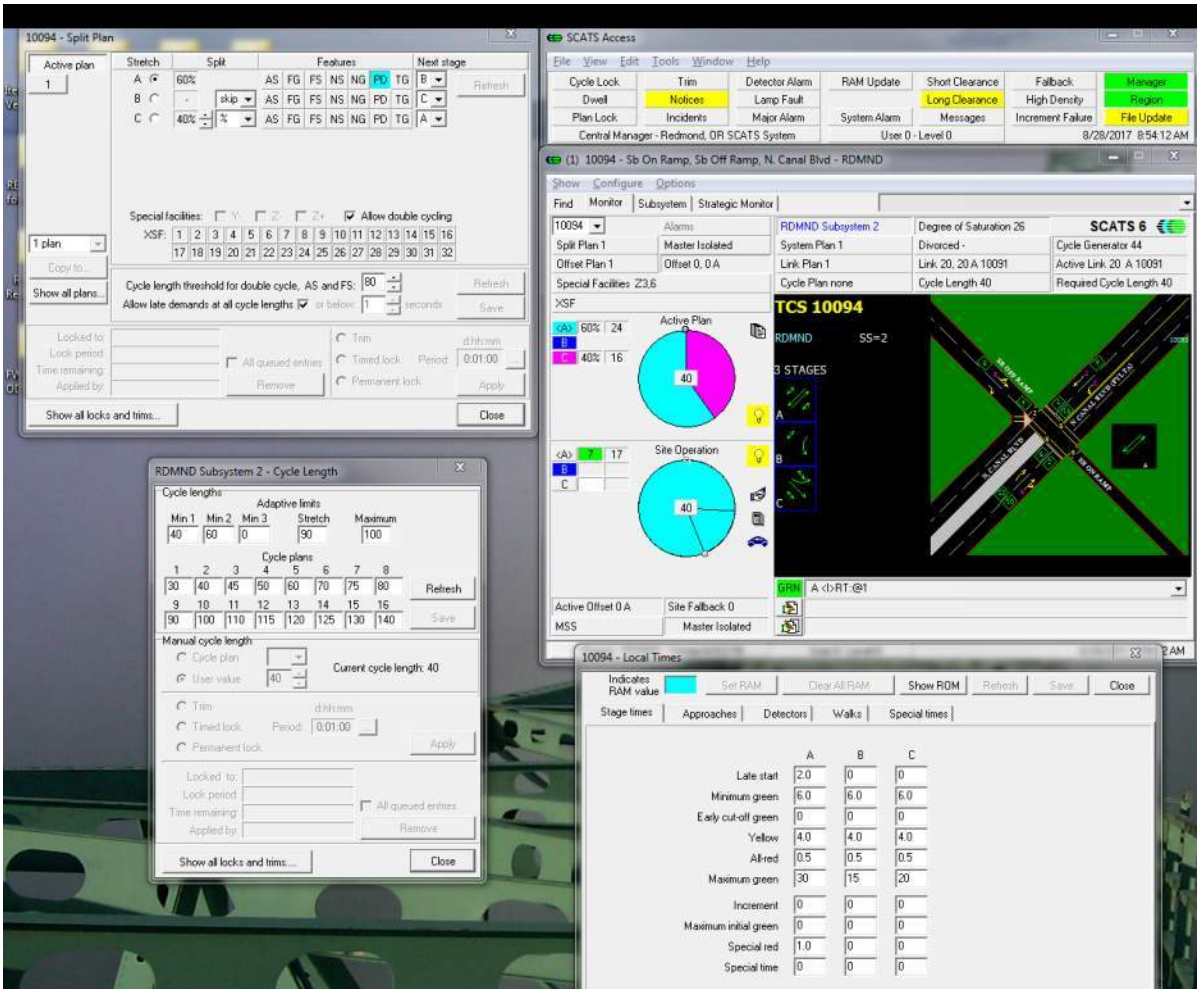
Appendix E – Signal Timing Worksheets

NW Canal Blvd/ US 97 NB Ramps
NW Canal Blvd/ US 97 SB Ramps
NW Maple Ave/ NW 6th St
W Antler Ave/ SW 27th St
W Antler Ave/ SW Rimrock Way
SW Evergreen Ave/ SW 6th St
SW Evergreen Ave/ SW 5th St
SW Evergreen Ave/ US 97
OR 126 (SW Glacier Ave)/ SW 11th St
OR 126 (SW Glacier Ave)/ SW 9th St
OR 126 (SW Glacier Ave)/ SW 6th St
OR 126 (SW Glacier Ave)/ SW 5th St
OR 126 (SW Glacier/Highland Ave)/ US 97
OR 126 (SW Highland Ave)/ SW 27th St
OR 126 (SW Highland Ave)/ SW Rimrock Way
OR 126 (SW Highland Ave)/ SW 15th St
OR 126 (SW Highland Ave)/ SW 11th St
OR 126 (SW Highland Ave)/ SW 9th St
OR 126 (SW Highland Ave)/ SW 6th St
OR 126 (SW Highland Ave)/ SW 5th St
SW Veterans Way/ SW Canal Blvd
SW Veterans Way/ US 97
SW Odem Medo Way/ SW Canal Blvd
SW Odem Medo Way/ US 97

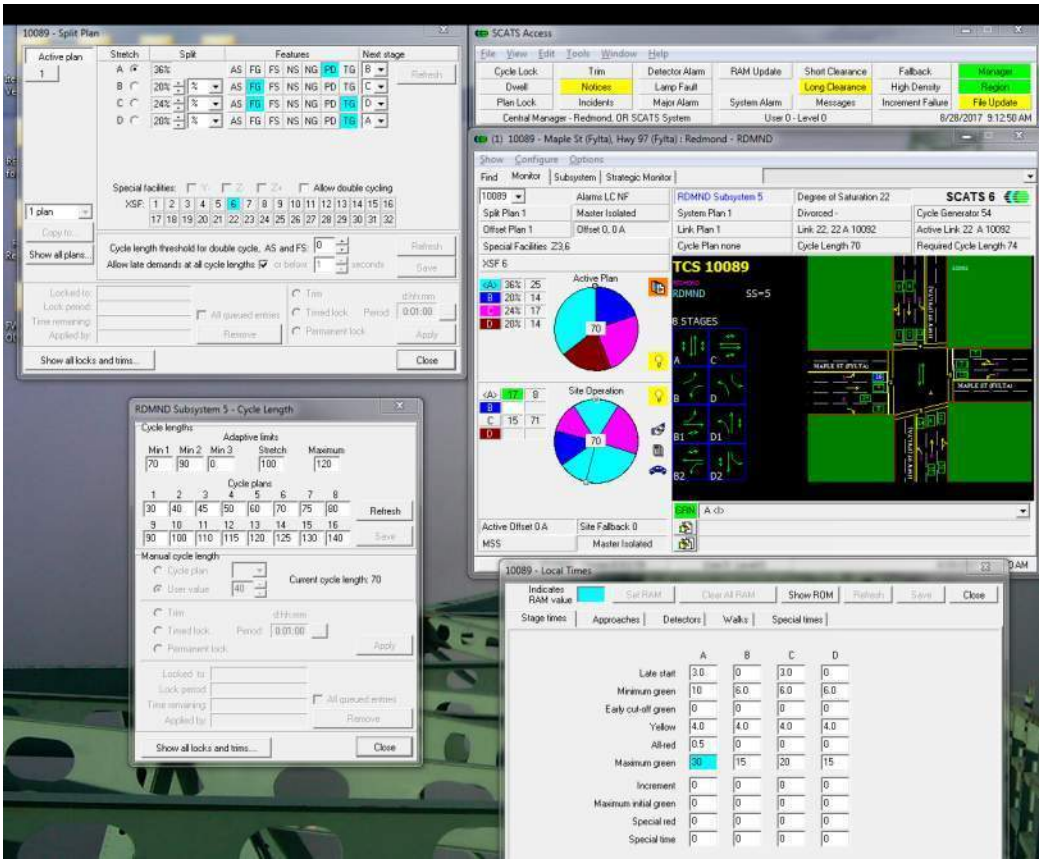
NW Canal Blvd/ US 97 NB Ramps



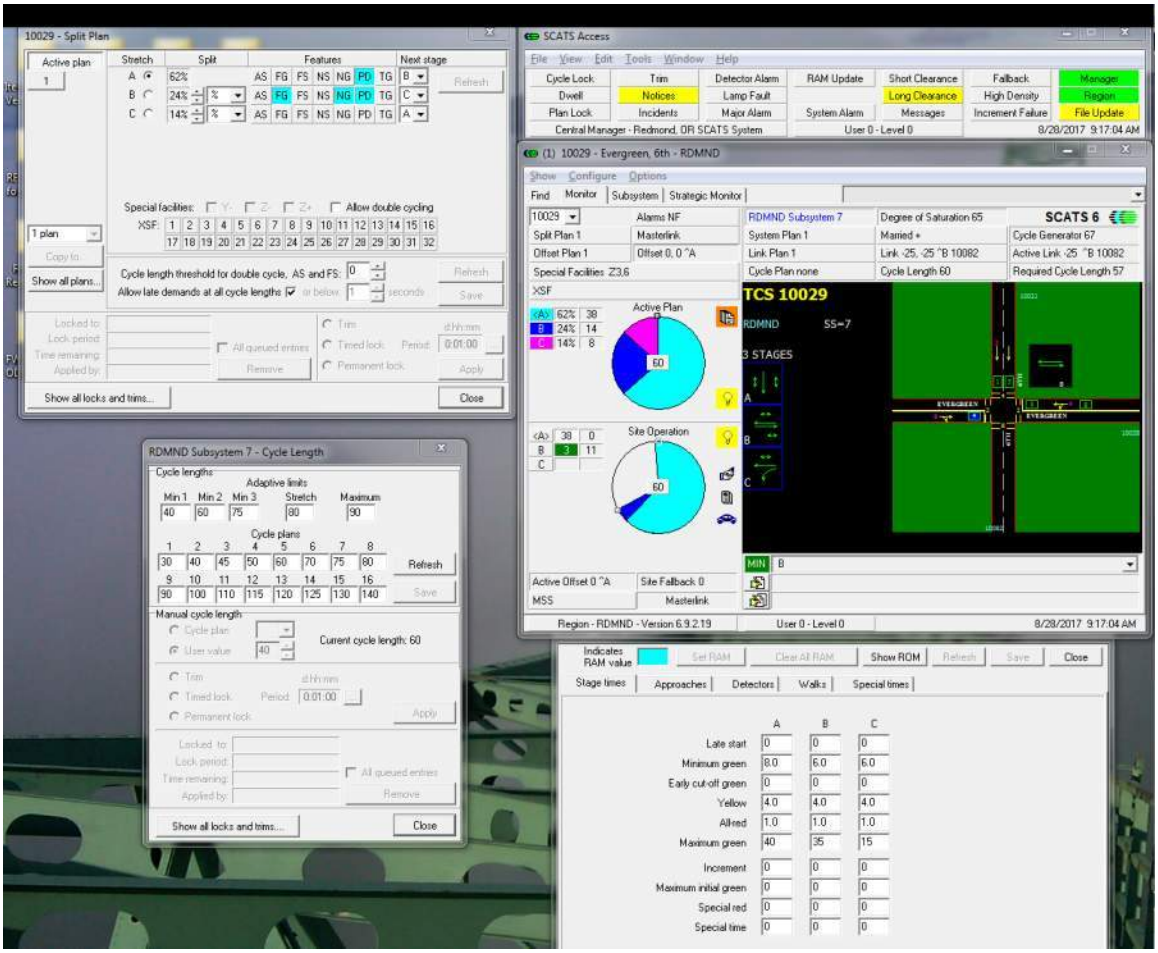
NW Canal Blvd/ US 97 SB Ramps



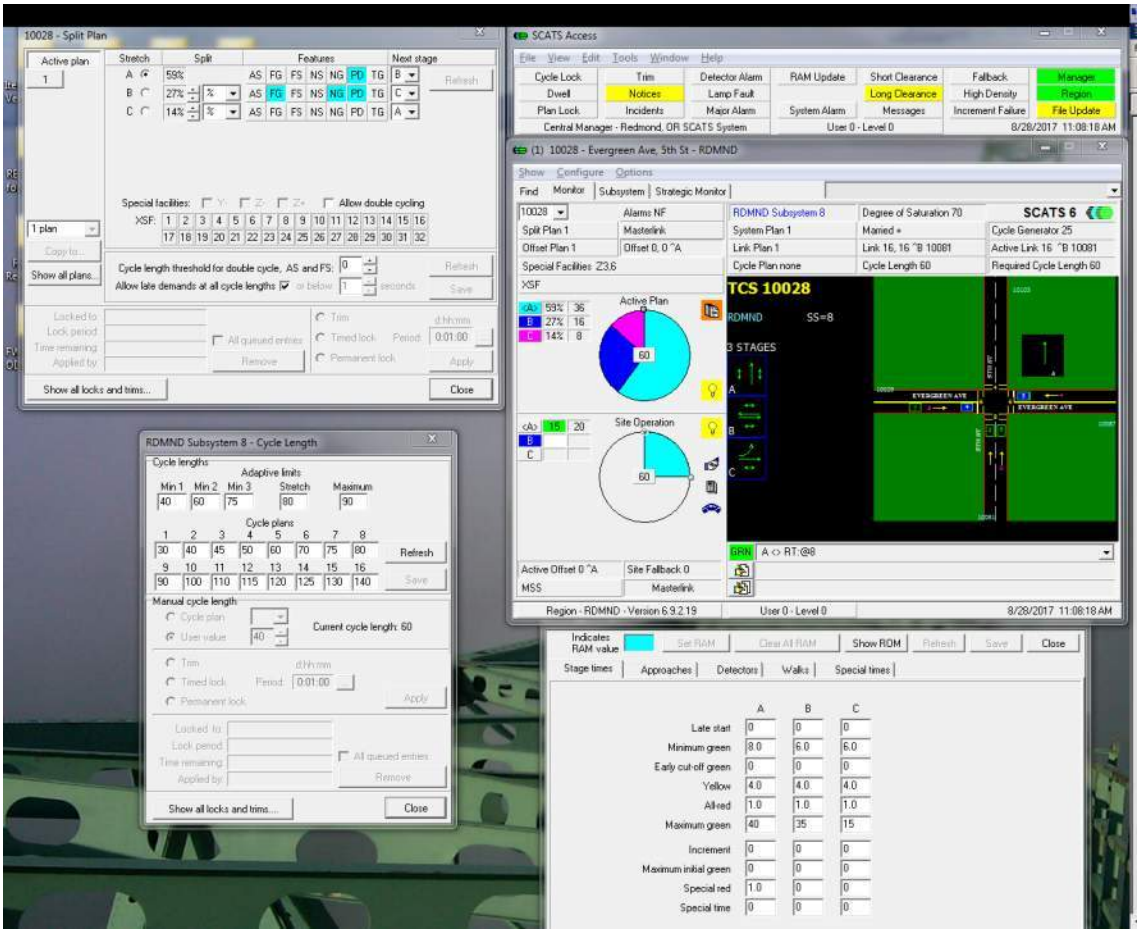
NW Maple/ NW 6th St



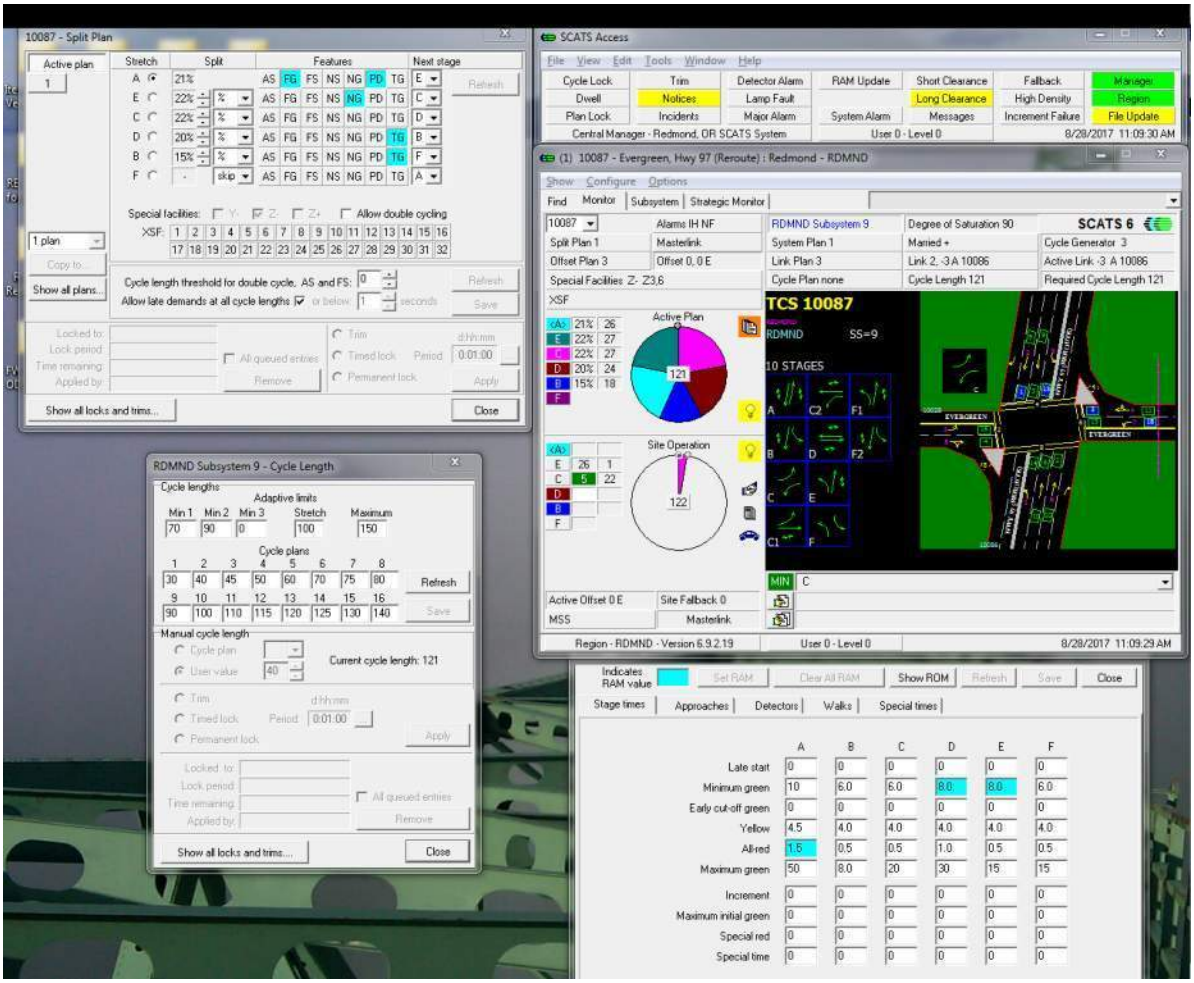
SW Evergreen Ave/SW 6th St



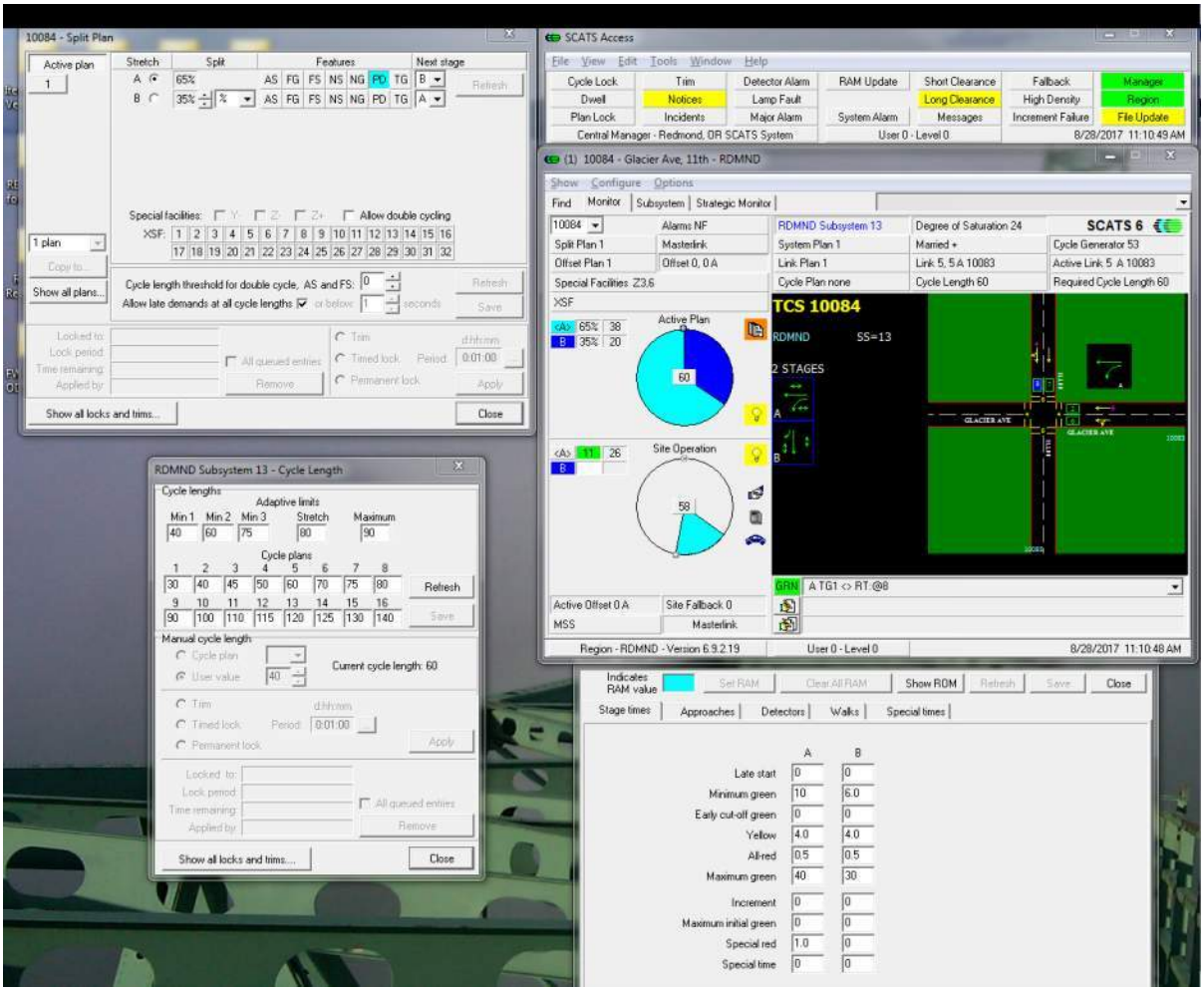
SW Evergreen Ave/SW 5th St



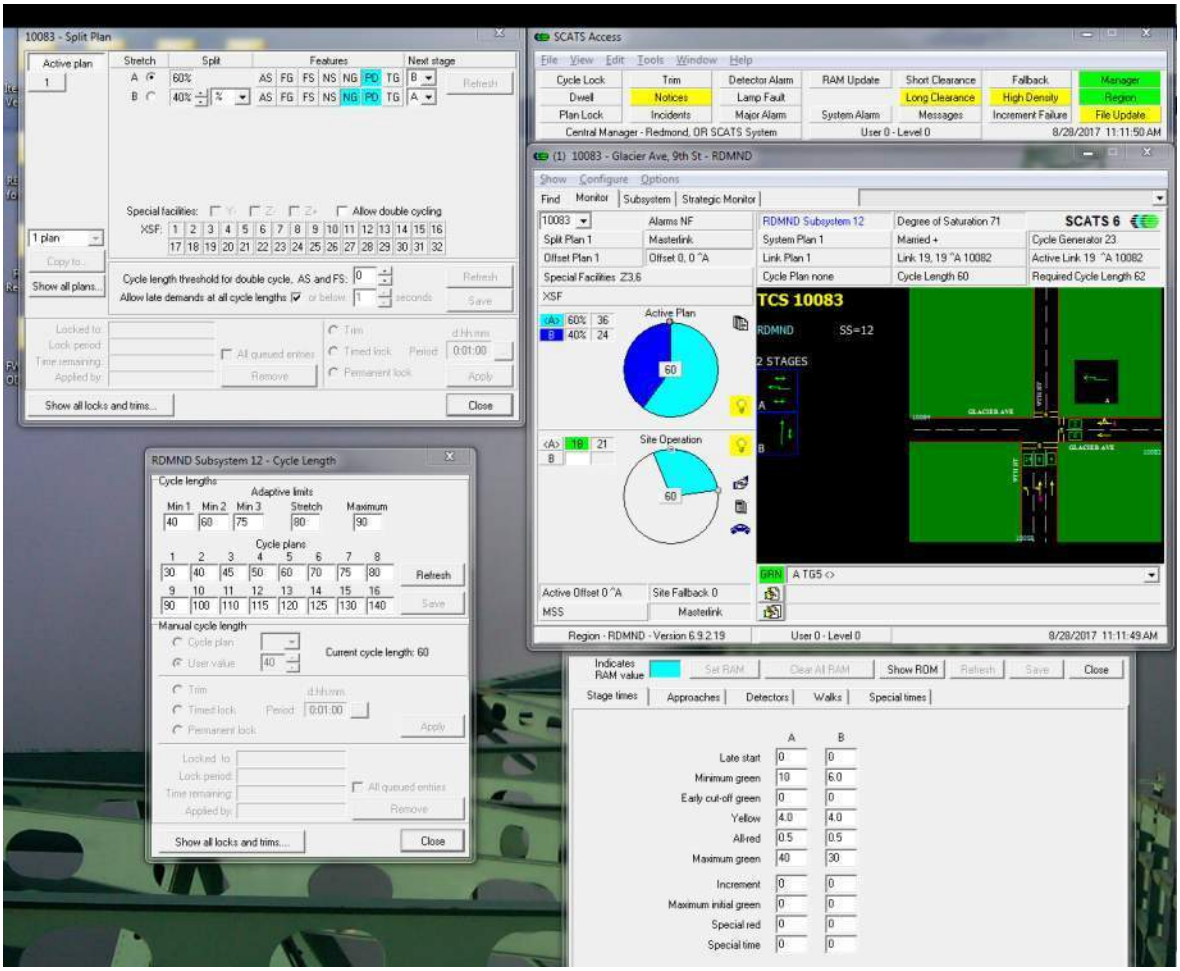
SW Evergreen Ave/US 97



OR 126 (SW Glacier Ave)/SW 11th St



OR 126 (SW Glacier Ave)/SW 9th St



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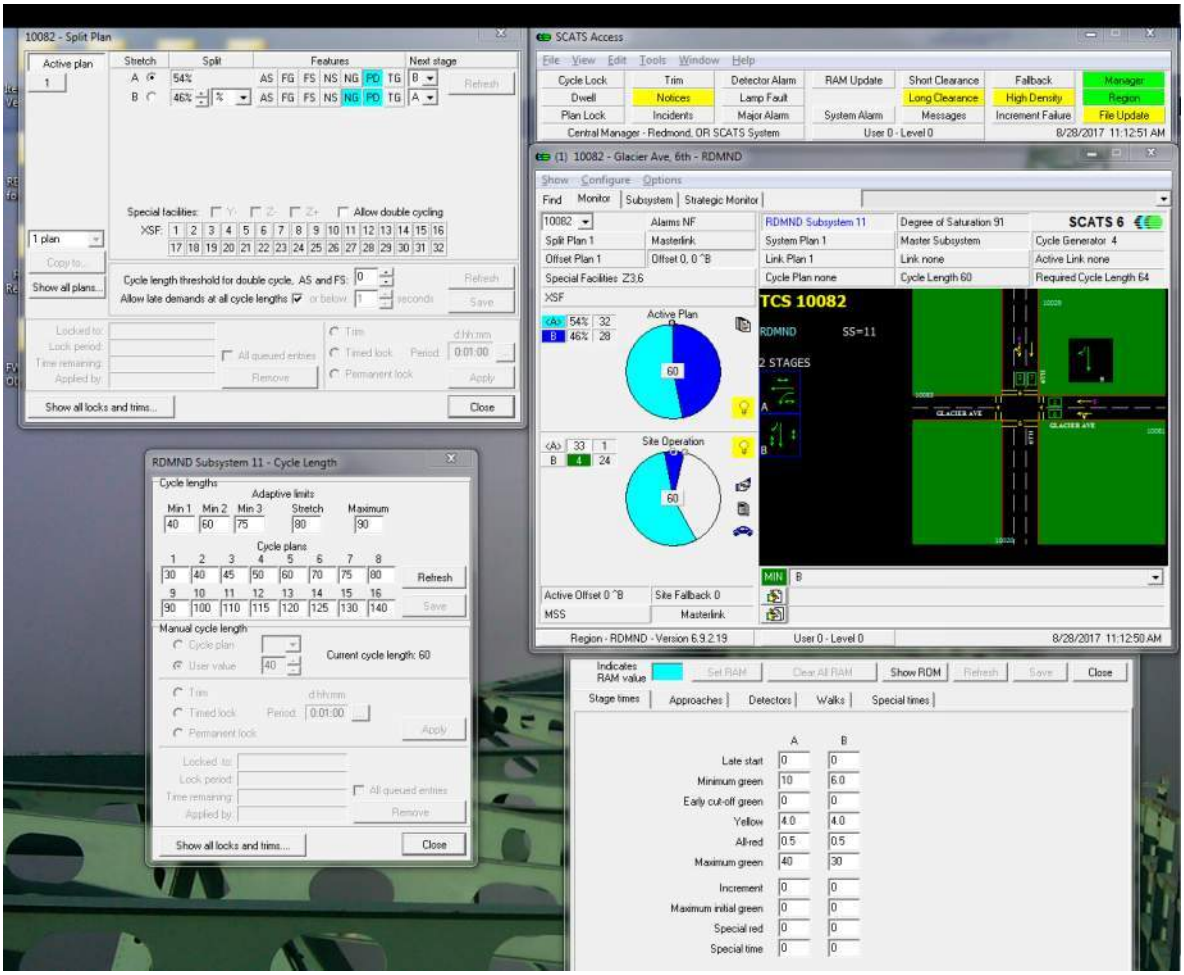

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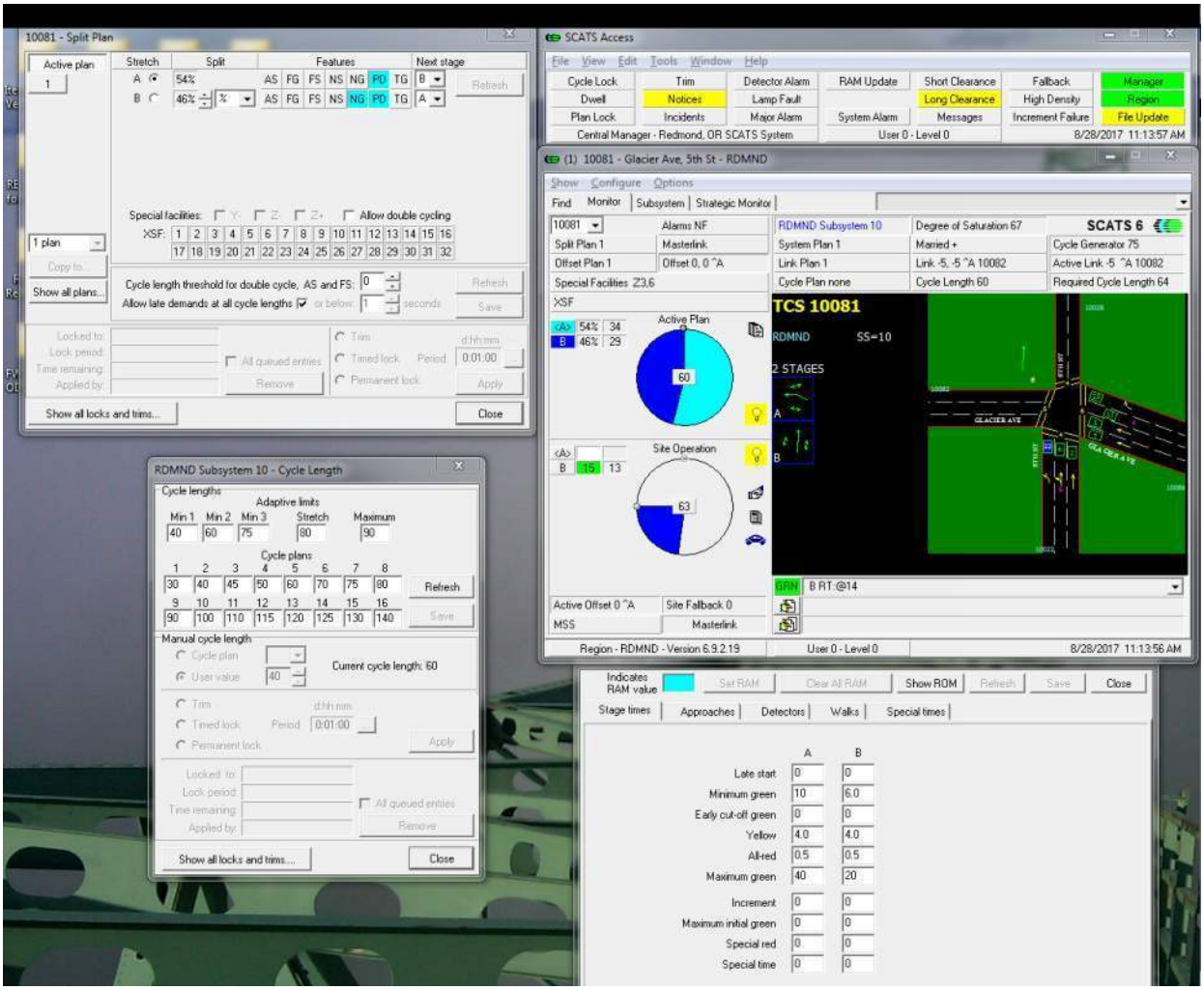
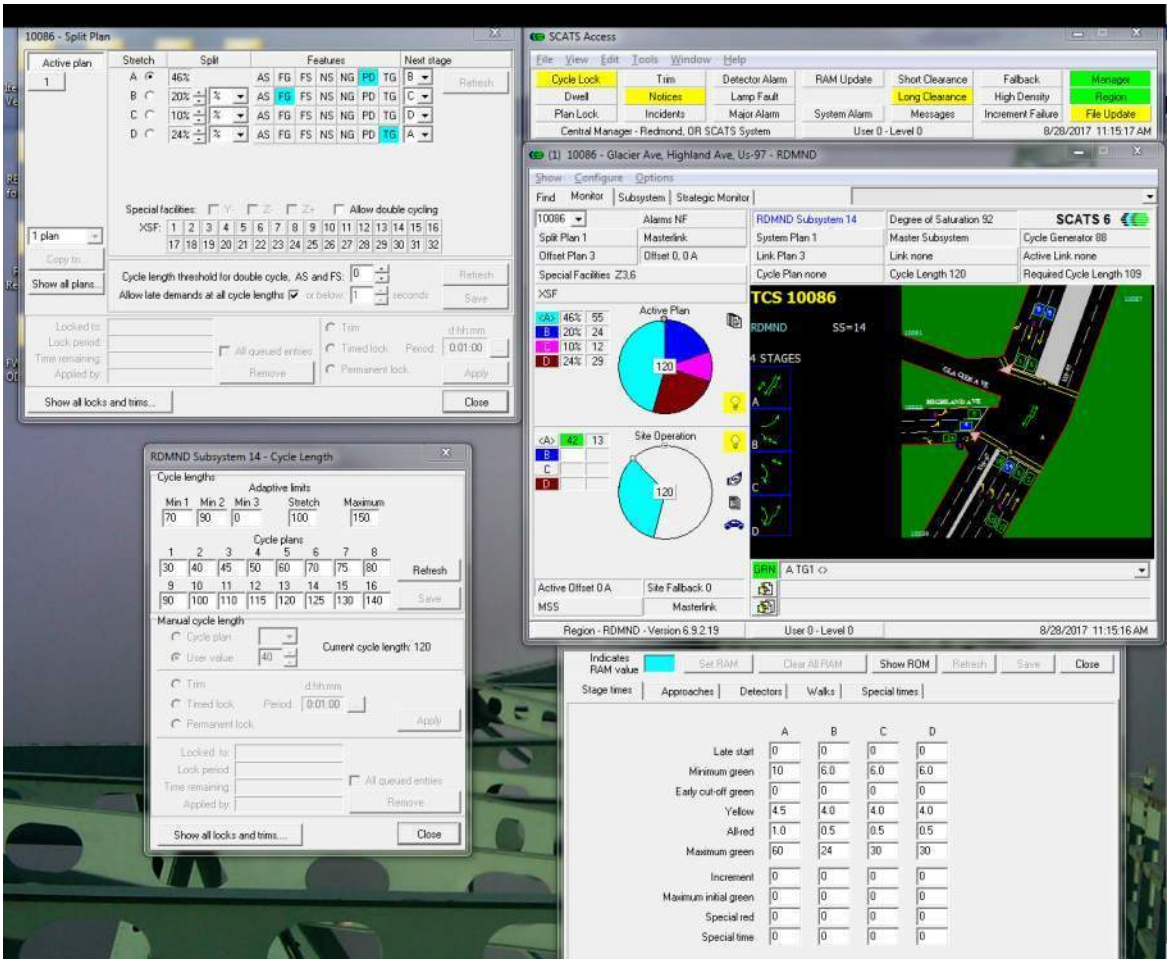
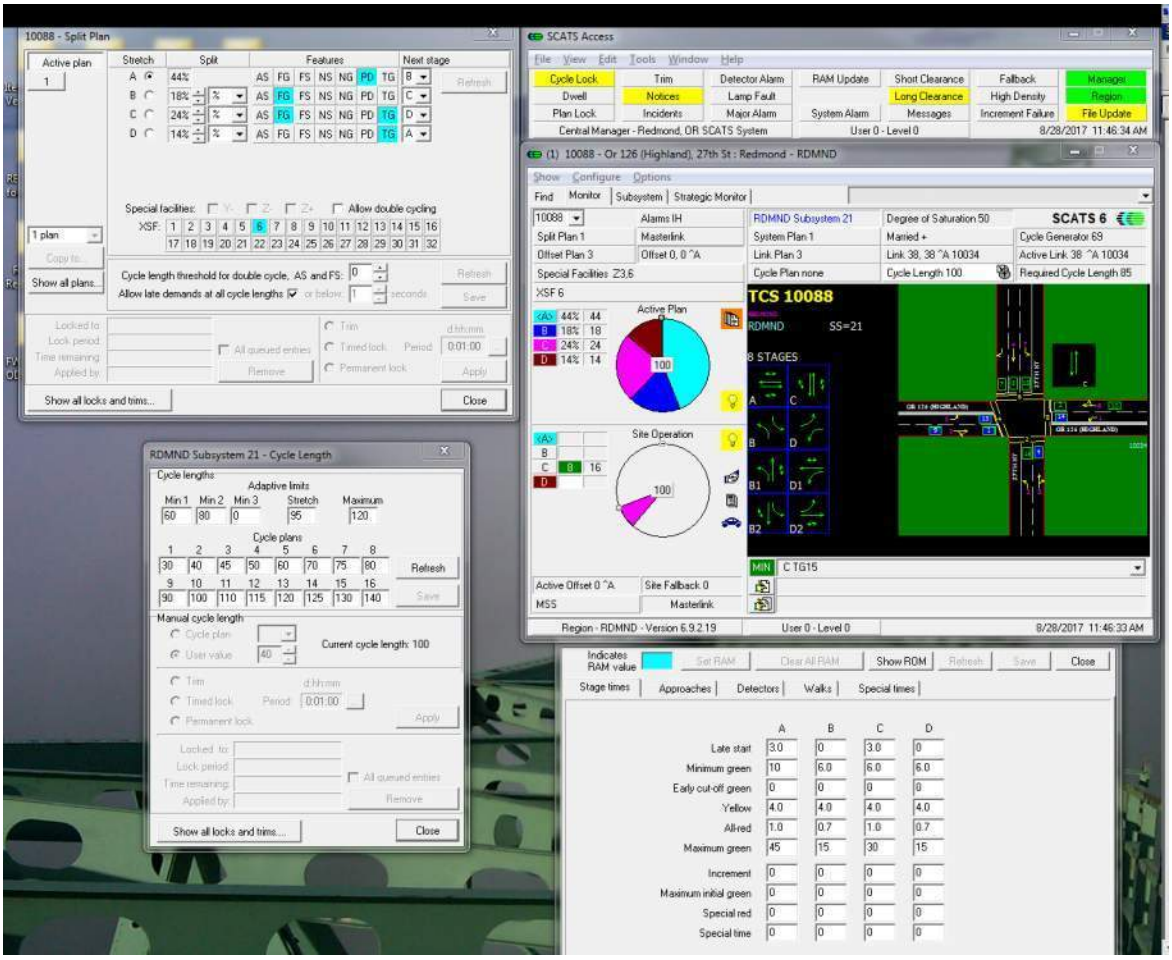


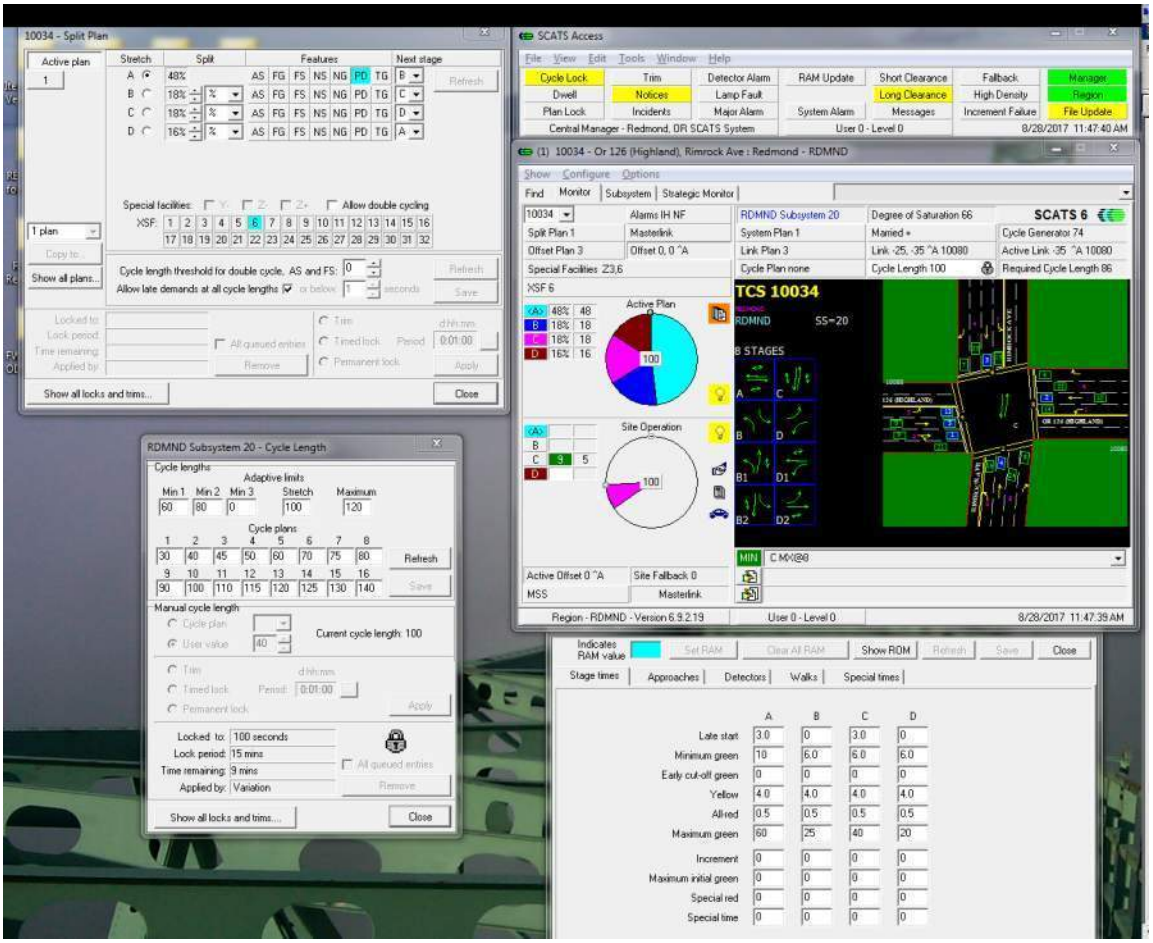
OR 126 (SW Glacier/Highland Ave)/US 97



OR 126 (SW Highland Ave)/SW 27th St



OR 126 (SW Highland Ave)/SW Rimrock Way



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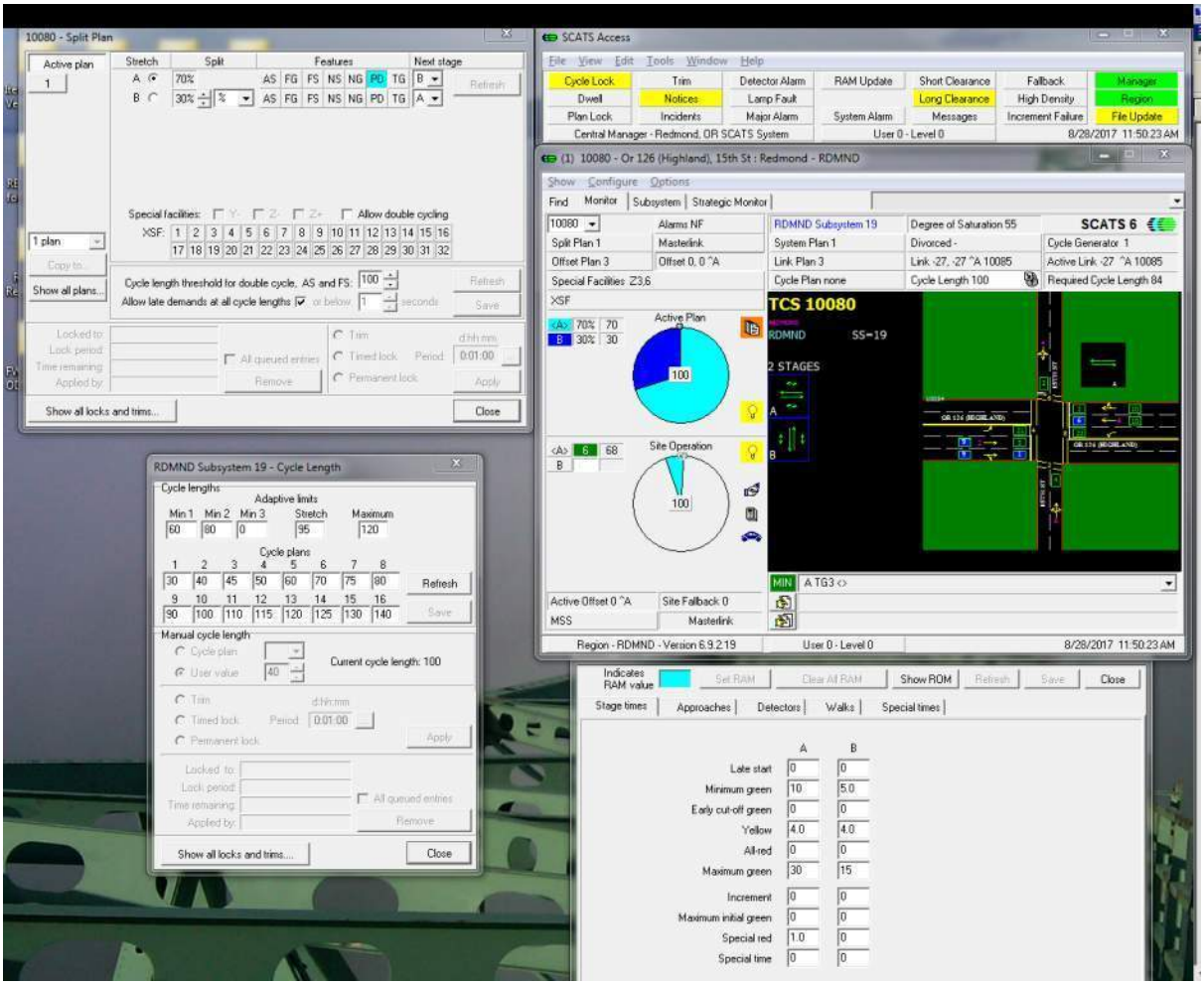
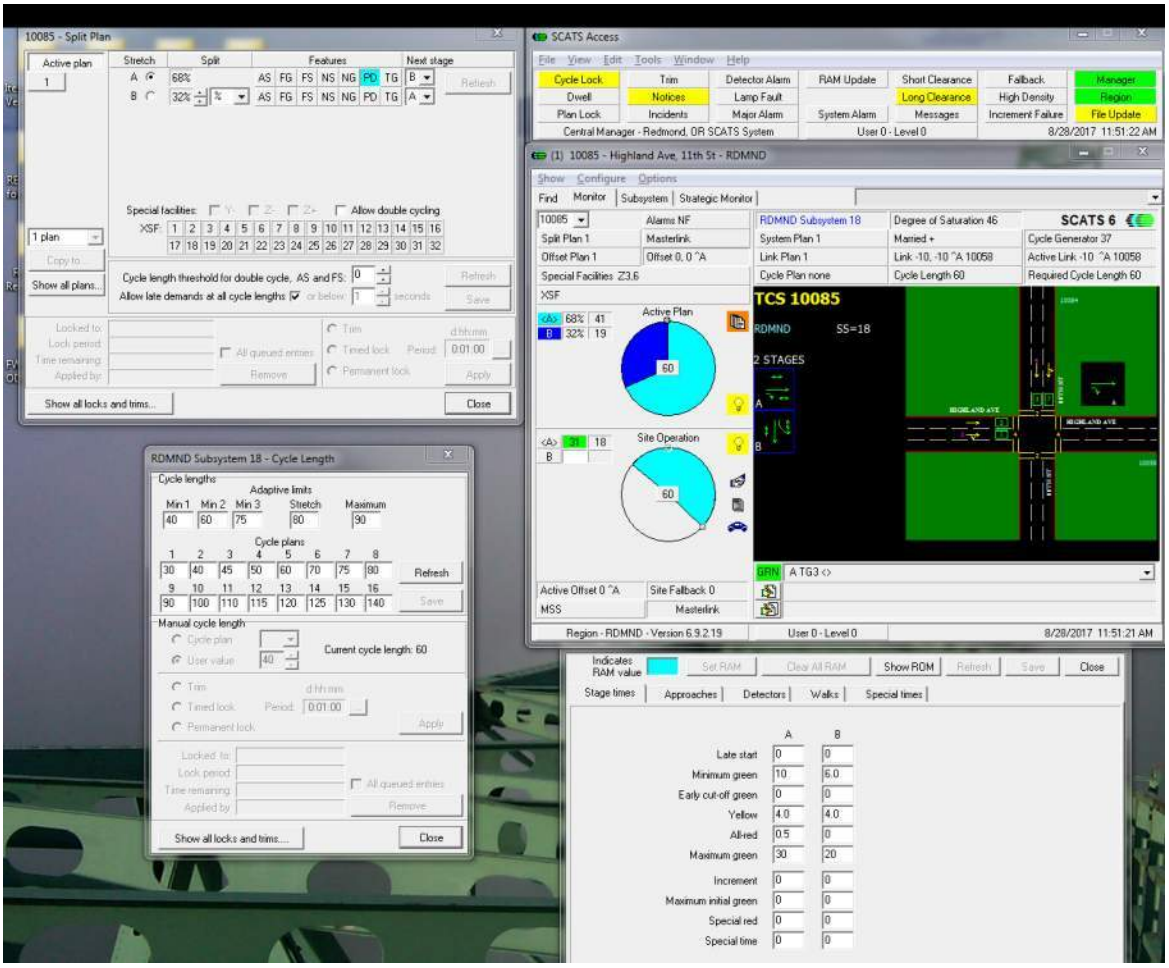
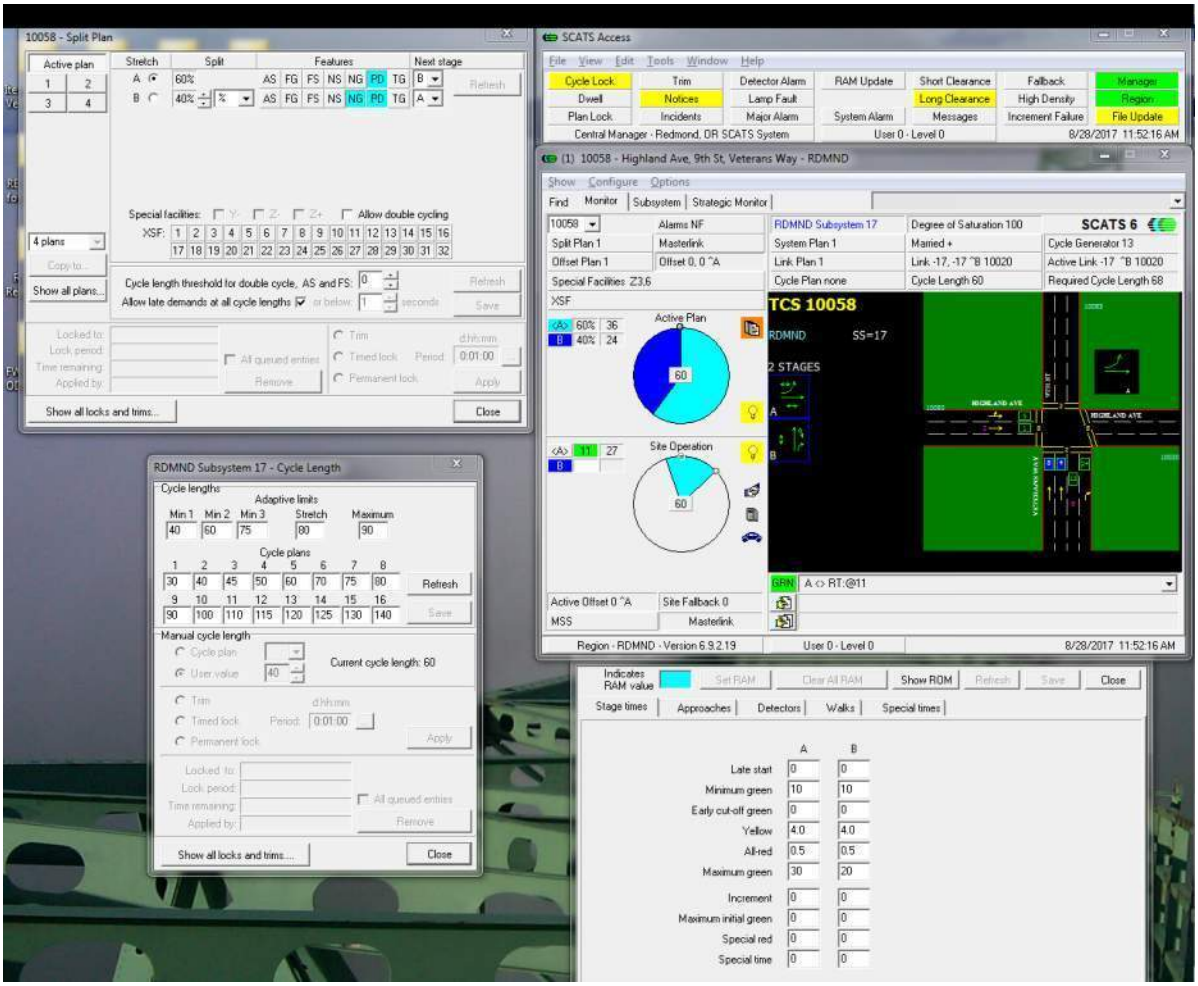


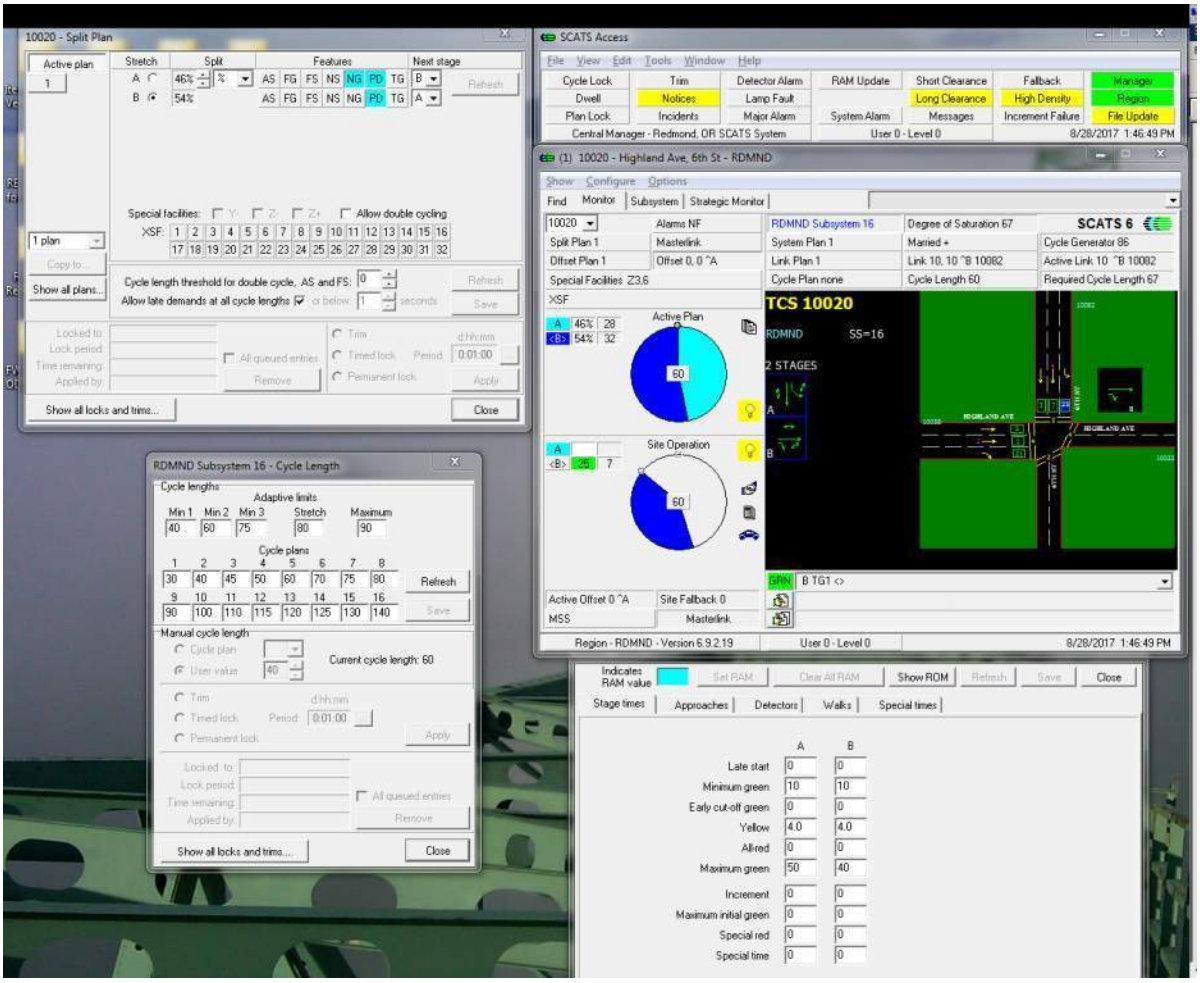
OR 126 (SW Highland Ave)/SW 11th St



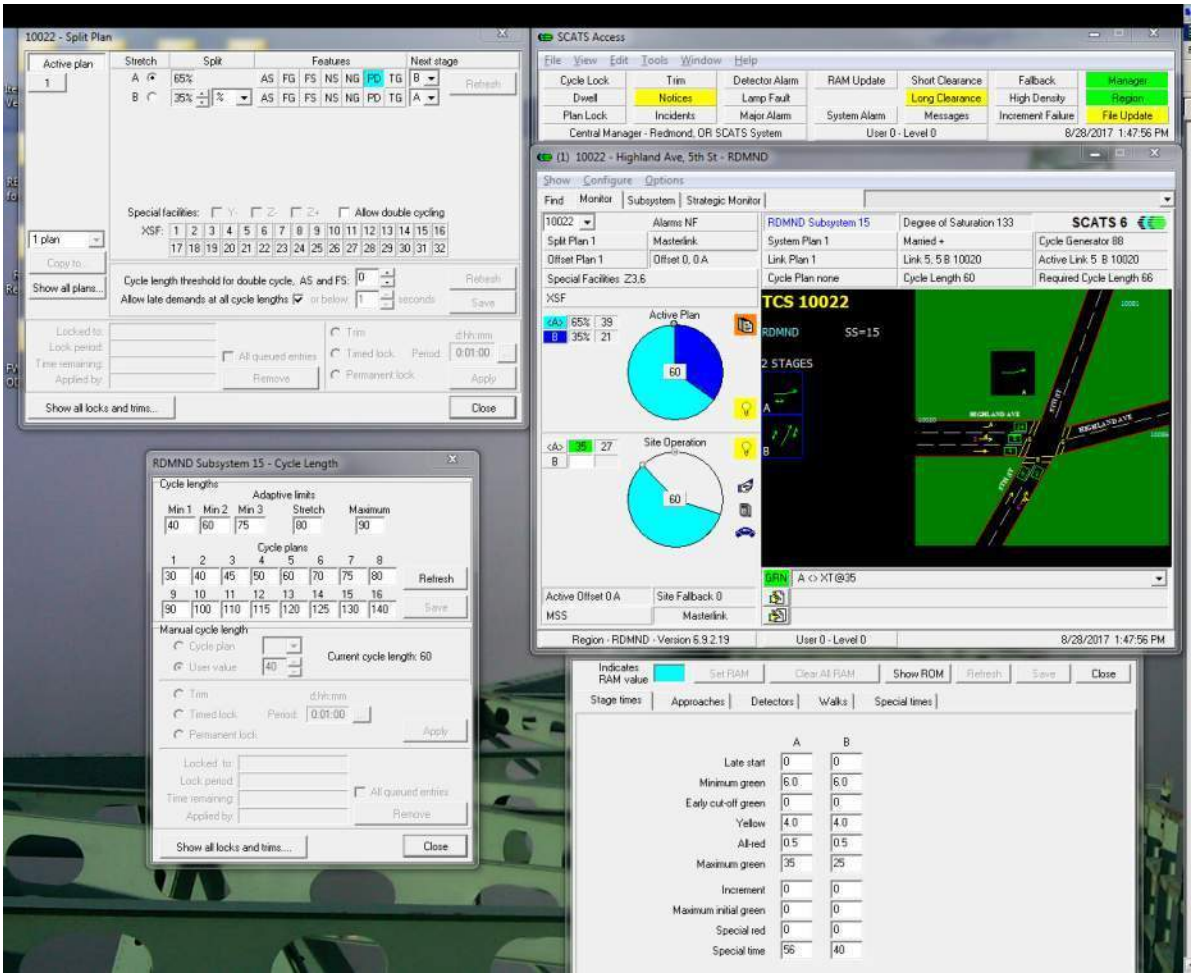
OR 126 (SW Highland Ave)/SW 9th St



OR 126 (SW Highland Ave)/SW 6th St

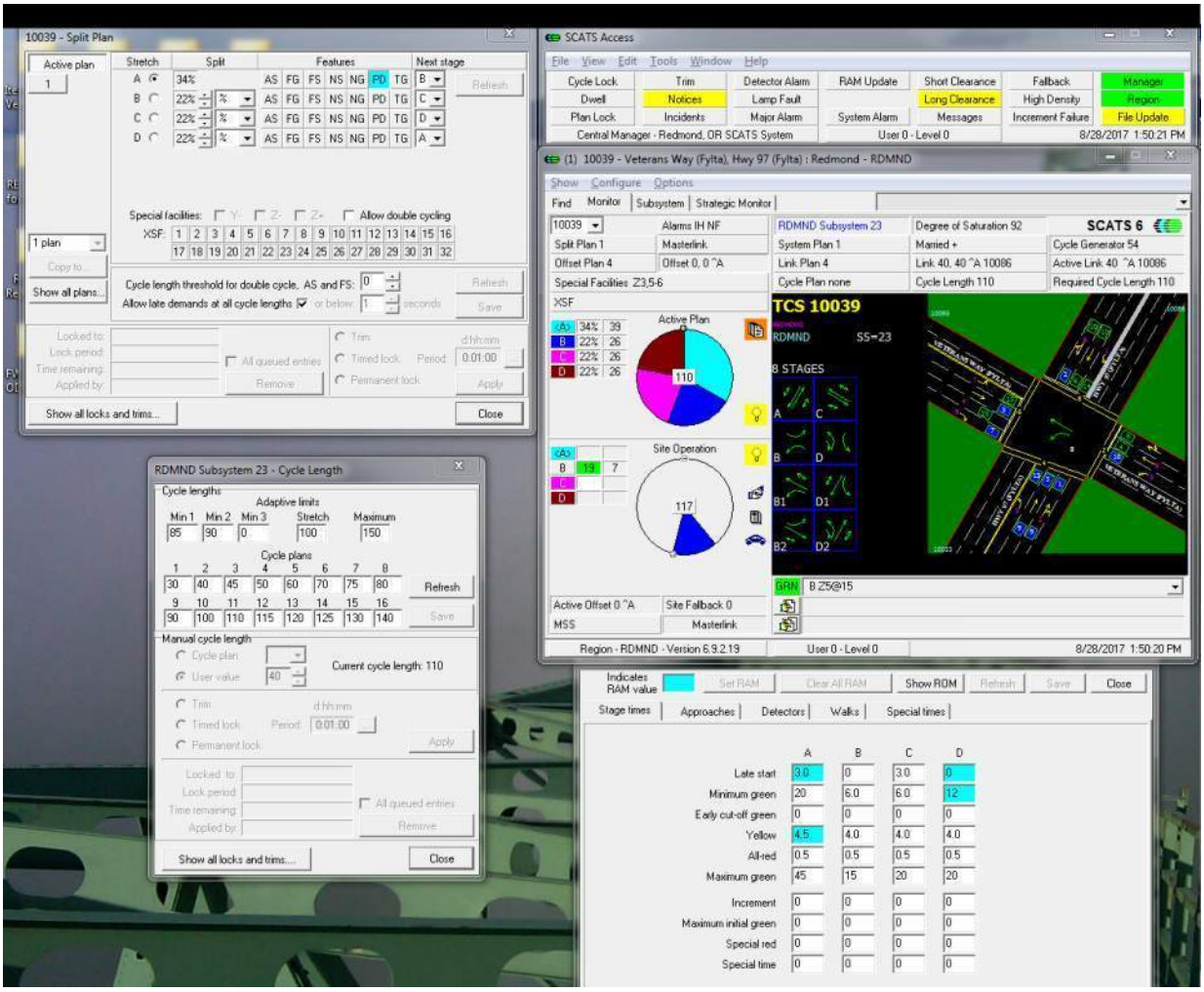


OR 126 (SW Highland Ave)/SW 5th St

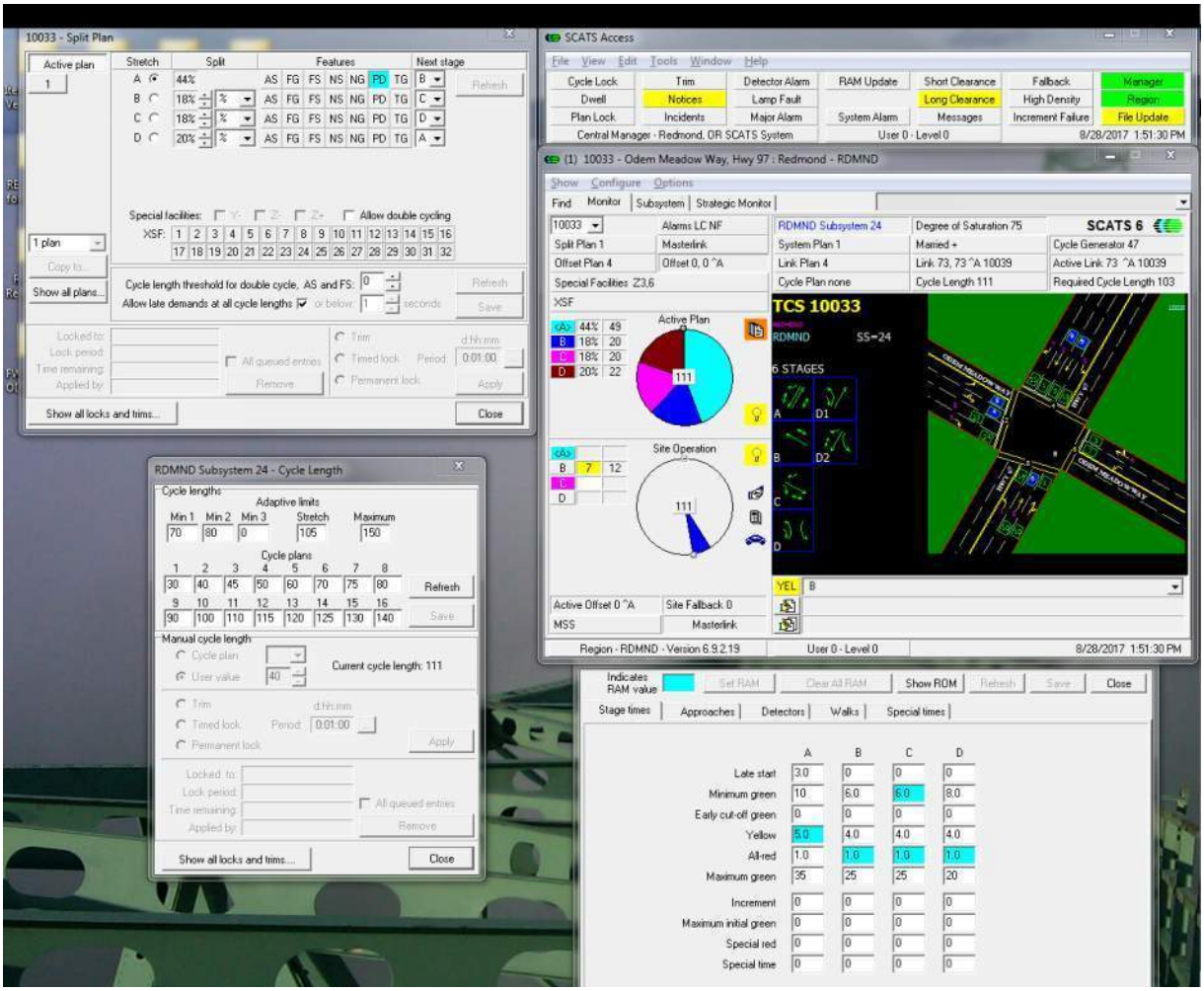


SW Veterans Way/Canal Blvd

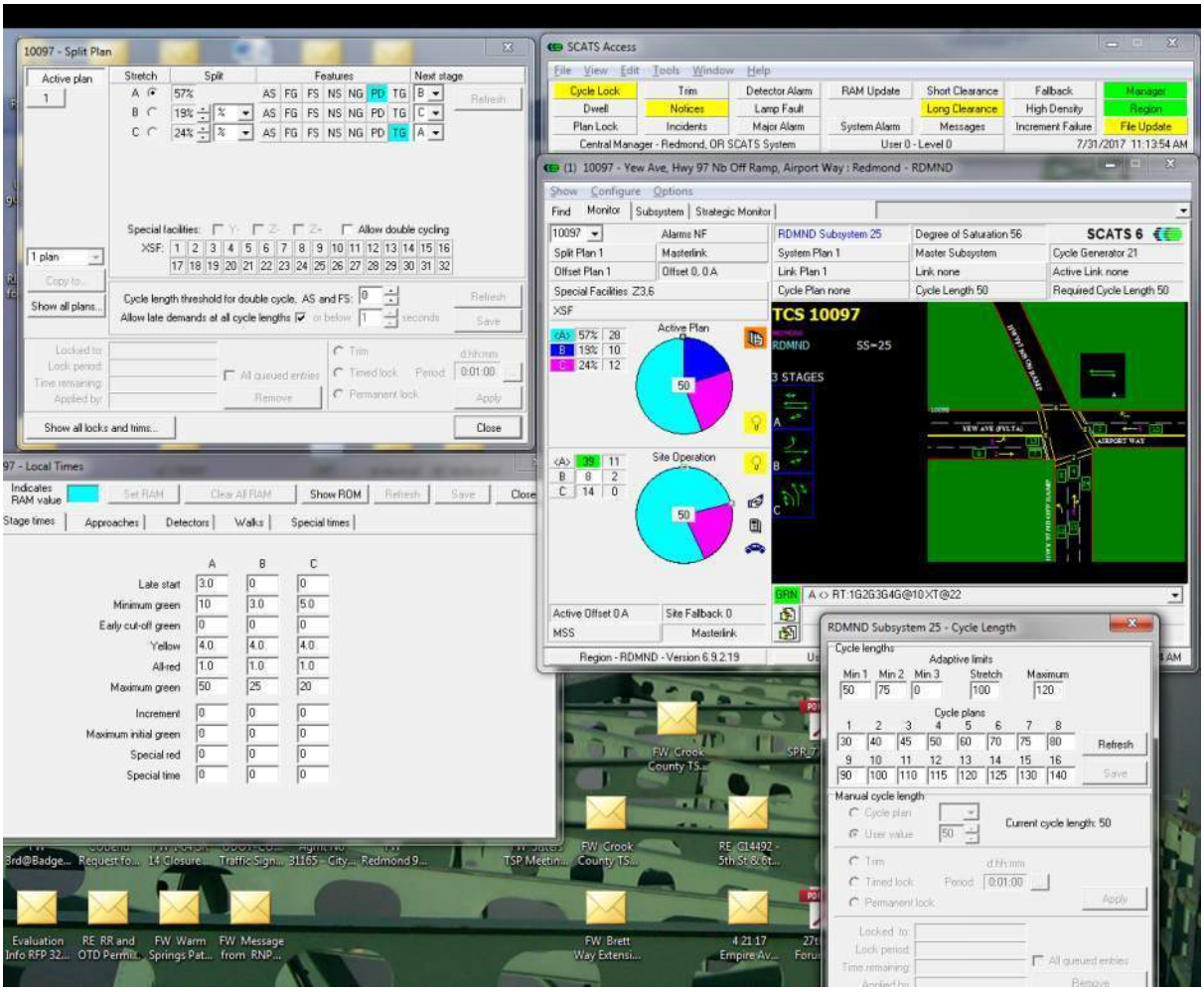
SW Veterans Way/US 97



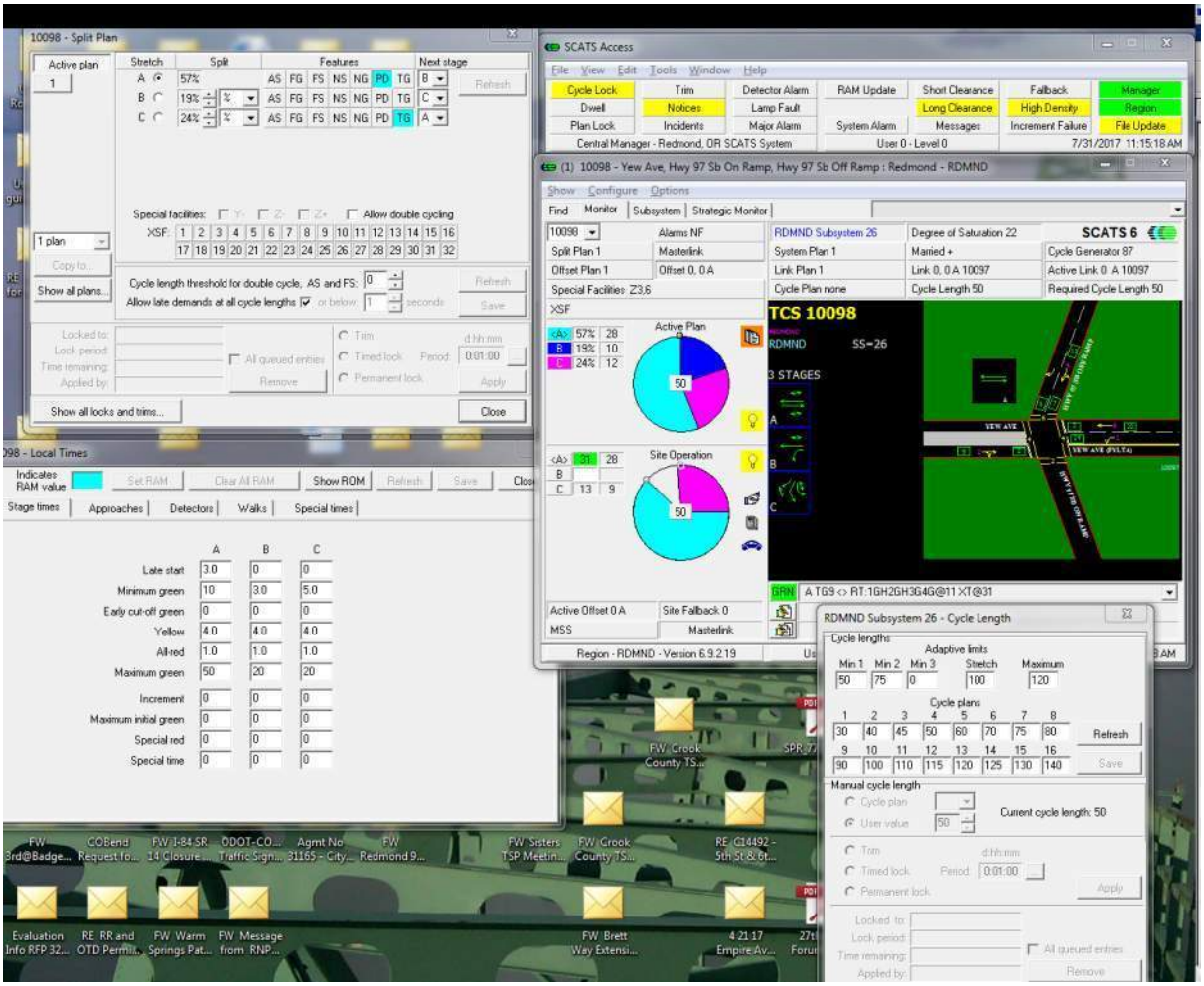
SW Odem Medo Way/US 97



NB US 97 at Yew Avenue



SB US 97 at Yew Avenue



Regio

Monday, August 28, 2017 14:47

Intersection Name	*1 - 19th at Rimrock*	**Local ID**	*1*
Intersection Telephone Number			
System Name	*158 - 19th at Rimrock (Isolated)*	**System ID**	*158*
Controller Type	*Voyage - C1-C11*		
Controller Serial Number		**Installation Date**	
Programmed by		**Programmed Date**	

Graphic Map Background	**Phase Rotation Diagram**

Control Data (next/2/2)

Controller Function and Timing (next/2/1, next/2/2)

Security, Sequence, Initialization

Security Code	****	0 = disabled, or 1000-9999
Sequence	*1*	0 = sequential, 1 = quad left turn, 2-6 = special A-E, 7 = lead lag

Lead Lag (next/2/2/3)			
Phases 1 - 2	**Phases 3 - 4**	**Phases 5 - 6**	**Phases 7 - 8**
0 = no reversal, 1 = reversal, 2 = by coord plan or clock			

Initialization and Flash (next/2/2/5)

	Initialization	**Flash Entry**	**Flash Exit**	
Ring 1 Phase	*1*	*2*	*1*	phase 1-8
Ring 2 Phase	*5*	*6*	*5*	phase 1-8
Interval	*2*	*0*	*0*	0 = red, 1 = yellow, 2 = green

Power up Flash	*0.0*	0.0 - 25.5 seconds		**First All Red**	*6.0*	0.0 - 25.5 seconds

Soft Flash (next/2/2/5)

Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	0 = dark, 1=flash yel WIG, 2 = flash yel WAG, 3 = flash red WIG, 4 = flash red WAG				
	3	*4*	*3*	*4*	*3*	*4*	*3*	*4*					
Overlap	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	
	3	*4*	*3*	*4*	*3*	*4*	*3*	*4*	*3*	*4*	*3*	*4*	same as phase
Internal Logic Output	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = normal, 1 = dark, 2 = flash WIG

Per Phase Functions (next/2/2/3, next/2/2/1)

	1	2	3	4	5	6	7	8	
Phases Used	X	X	X	X	X	X	X	X	X = on
Restricted Phases									X = on (Sequence 2, 6, 7 only)
Exclusive Phases									X = on (Sequence 7 only)
Yellow Lock									
Min Recall		X				X			
Max Recall									
Ped Recall									
Red Lock									
Max Out Recall Inhibit	X		X	X	X		X	X	X = on
Soft Recall		X				X			
Free Walk Rest									
Conditional Ped	X		X		X		X		
Disable Inhibit Max Termination									
Call to Non Act 1									
Call to Non Act 2									

Dual Entry (next/2/2/9/3)

Mode	1	0 = off, 1 = on, 2 = Not Used, 3 = by coord plan, 4 = by time clock circuit 61

Dual Entry Phase -->	1	2	3	4	5	6	7	8	
Phase	0	0	0	8	0	0	0	4	0 = none, 1-8 = phase 1-8

Conditional Service, Five Section Head

Conditional Service (next/2/2/9/3)

	Mode	CS Max Time
Phase 1	0	0
Phase 3	0	0
Phase 5	0	0
Phase 7	0	0

0 = off, 1 = C.S.On. 2 = C.S. on by TOD circuit 57, 3 = N/A, 4 = C.S. and C.R. On, 5 = C.R. on by TOD circuit 57.

5 Section Head Logic (next/2/2/9/4)

X Omits Y		Anti-Trap			Yellow Blanking LT	
		Trap Protected Phase		Next Phase	Phase	
X : Y						
6 : 1	0	1		< (5)	1	
8 : 3	0	3		< (7)	3	
2 : 5	0	5		< (1)	5	X
4 : 7	0	7		< (3)	7	

0=off, 1=side call, 2=no side call

X = On

Phase Times (next/2/2/2, next/2/2/9/5)									
	1	2	3	4	5	6	7	8	
Movement	WBLT	EB	NBLT	SB	EBLT	WB	SBLT	NB	
Minimum Green	6	10	6	6	6	10	6	6	0 - 255 sec
Passage	2.0	3.5	2.0	3.0	2.0	3.5	2.0	3.0	0.0 - 25.5 sec
Yellow	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	0.0 - 25.5 sec
Red Clearance	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0 - 25.5 sec or 0 - 255 sec
Max 1	12	30	15	35	10	30	15	35	0 - 255 sec
Max 2	10	30	12	20	20	30	10	20	0 - 255 sec
Walk	0	7	0	7	0	7	0	7	0 - 255 sec
Ped Clear	0	16	0	16	0	16	0	16	0 - 255 sec
Seconds Per Actuation	0.0	1.5	0.0	0.0	0.0	1.5	0.0	0.0	0.0 - 25.5 sec
Time Before Reduction	6	10	6	6	6	10	6	6	0 - 255 sec
Time to Reduce	6	20	6	6	6	20	6	6	0 - 255 sec
Minimum Gap	1.0	2.5	1.0	2.0	1.5	3.2	1.5	1.5	0.0 - 25.5 sec
Max Variable Initial	7	20	7	7	7	20	7	7	0 - 255 sec
Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Inhibit Min Yellow									X = On
Red Decimal Off									X = On
Advance Walk	0	0	0	0	0	0	0	0	0 - 255 sec

Other Controller Functions (next/2/2/9)									
Phase -->	1	2	3	4	5	6	7	8	
Inhibit Simultaneous Gap Out	X		X	X	X		X	X	X = On
Last Car Passage	2	0 = recall phase, 1 = last car passage, 2 = NOT recall - Not last car passage							
Red Revert (+2 seconds)	3.0	0 - 25.5 sec							
Auto Ped Clear	X	X = On							
Flashing Don't Walk Into Yellow		X = On							
Soft Recall / Red Rest Delay	0.0	0 - 25.5 sec							
Ped Pushbutton	0	0 - 5 sec, 0 = disable							
Advance Flash Rate	0	0 = disable, 1 = 120 FPM							
Change Sequence		X = On (After a download with a power on - off cycle)							
Phase -->	1	2	3	4	5	6	7	8	
Red Clear Extension Detector	0	0	0	0	0	0	0	0	0 = none 1 - 32 = detector 1 - 32
Red Clear Extension Red Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec.

Local Detectors (next/2/2/4)

Detector Data

	Yellow Lock	Detector Inhibit	Call Phase	Extend Phase	Switch Phase	Delay Time	Stretch / Disconnect Time	Delay or Disconnect Mode
*Detector 1 - I1 NBLT**			*1*	*1*	*0*	*0*	*0.0*	*0*
Detector 2 - I9U NBLT			*2*	*2*	*0*	*0*	*0.0*	*0*
*Detector 3 - I5 EBLT**			*3*	*3*	*0*	*0*	*0.0*	*0*
Detector 4 - I9L EBLY			*2*	*2*	*0*	*0*	*0.0*	*0*
*Detector 5 - J1 SBLT**			*5*	*5*	*0*	*0*	*0.0*	*0*
Detector 6 - J9U SBLT			*5*	*5*	*0*	*0*	*0.0*	*0*
*Detector 7 - J5 WBLT**			*7*	*7*	*0*	*0*	*0.0*	*0*
Detector 8 - J9L WBLT			*4*	*4*	*0*	*0*	*0.0*	*0*
*Detector 9 - I2U SBBK**			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 10 - I2L SBFT			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 11 - I3U			*7*	*7*	*0*	*0*	*0.0*	*0*
Detector 12 - I3L			*7*	*7*	*0*	*0*	*0.0*	*0*
Detector 13 - I4			*2*	*2*	*0*	*0*	*0.0*	*0*
*Detector 14 - I6U WBRT**			*0*	*4*	*0*	*0*	*0.0*	*0*
Detector 15 - I6L			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 16 - I7U WBRT			*0*	*4*	*0*	*0*	*0.0*	*0*
Detector 17 - I7L WB			*1*	*1*	*0*	*0*	*0.0*	*0*
Detector 18 - I8			*8*	*8*	*0*	*0*	*0.0*	*0*
*Detector 19 - J2U NBBK**			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 20 - J2L NB			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 21 - J3U			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 22 - J3L			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 23 - J4			*0*	*0*	*0*	*0*	*0.0*	*0*
*Detector 24 - J6U EBBK**			*8*	*8*	*0*	*0*	*0.0*	*0*
Detector 25 - J6L EBBIKE			*0*	*8*	*0*	*0*	*0.0*	*0*
Detector 26 - J7U EB			*8*	*8*	*0*	*0*	*0.0*	*0*
Detector 27 - J7L			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 28 - J8			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 29 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 30 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 31 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 32 -			*0*	*0*	*0*	*0*	*0.0*	*0*

yellow lock, detector inhibit, - X = On; call, extend, phase - 0 = none 1 - 8 = phase 1 - 8 ; delay time - 0 - 255 sec
stretch / disconnect time - 0.0 - 25.5 sec.; delay or disconnect Mode - 0 -13

Detector Plans (next/2/2/4/5)

	Loop Number									
	Plan Detectors	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 32, 0 = none, 1 -3 2 = detectors 1 - 32
Detector Plan 1	**Call Phase**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13
Detector Plan 2	**Call Phase**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13
Detector Plan 3	**Call Phase**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13

Detector Fail Monitor (next/2/2/4/3)					Detectors 33-64 (next/2/2/4/6)		
	Fail Monitor Enable	Recall Phase	Min Counts	Max Counts		Call Phase	Extend Phase
*Detector 1 - I1 NBLT**		*0*	*0*	*0*	Detector 33 -	0	0
Detector 2 - I9U NBLT		*0*	*0*	*0*	Detector 34 -	0	0
*Detector 3 - I5 EBLT**		*0*	*0*	*0*	Detector 35 -	0	0
Detector 4 - I9L EBLY		*0*	*0*	*0*	Detector 36 -	0	0
*Detector 5 - J1 SBLT**		*0*	*0*	*0*	Detector 37 -	0	0
Detector 6 - J9U SBLT		*0*	*0*	*0*	Detector 38 -	0	0
*Detector 7 - J5 WBLT**		*0*	*0*	*0*	Detector 39 -	0	0
Detector 8 - J9L WBLT		*0*	*0*	*0*	Detector 40 -	0	0
*Detector 9 - I2U SBBK**		*0*	*0*	*0*	Detector 41 -	0	0
Detector 10 - I2L SBFT		*0*	*0*	*0*	Detector 42 -	0	0
Detector 11 - I3U		*0*	*0*	*0*	Detector 43 -	0	0
Detector 12 - I3L		*0*	*0*	*0*	Detector 44 -	0	0
Detector 13 - I4		*0*	*0*	*0*	Detector 45 -	0	0
*Detector 14 - I6U WBRT**		*0*	*0*	*0*	Detector 46 -	0	0
Detector 15 - I6L		*0*	*0*	*0*	Detector 47 -	0	0
Detector 16 - I7U WBRT		*0*	*0*	*0*	Detector 48 -	0	0
Detector 17 - I7L WB		*0*	*0*	*0*	Detector 49 -	0	0
Detector 18 - I8		*0*	*0*	*0*	Detector 50 -	0	0
*Detector 19 - J2U NBBK**		*0*	*0*	*0*	Detector 51 -	0	0
Detector 20 - J2L NB		*0*	*0*	*0*	Detector 52 -	0	0
Detector 21 - J3U		*0*	*0*	*0*	Detector 53 -	0	0
Detector 22 - J3L		*0*	*0*	*0*	Detector 54 -	0	0
Detector 23 - J4		*0*	*0*	*0*	Detector 55 -	0	0
*Detector 24 - J6U EBBK**		*0*	*0*	*0*	Detector 56 -	0	0
Detector 25 - J6L EBBIKE		*0*	*0*	*0*	Detector 57 -	0	0
Detector 26 - J7U EB		*0*	*0*	*0*	Detector 58 -	0	0
Detector 27 - J7L		*0*	*0*	*0*	Detector 59 -	0	0
Detector 28 - J8		*0*	*0*	*0*	Detector 60 -	0	0
Detector 29 -		*0*	*0*	*0*	Detector 61 -	0	0
Detector 30 -		*0*	*0*	*0*	Detector 62 -	0	0
Detector 31 -		*0*	*0*	*0*	Detector 63 -	0	0
Detector 32 -		*0*	*0*	*0*	Detector 64 -	0	0
fail monitor enable - X = On, recall phase - 0 = none 1 - 8 = phase 1 - 8, min, max					call / extend phase - 0 = none 1 - 8 = phase 1 - 8		

Detector Fail Sample Period (all detectors)	*0*	0 - 255 minutes

Video Fail Inputs (next/2/2/4/3) -->	1	2	3	4	5	6	7	8	
Phase Recalled	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = none, 1 - 8 = phase 1 - 8

System Detectors (next/2/2/4/4)									
System Detectors -->	1	2	3	4	5	6	7	8	
Local Detector	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = none, 1 - 32 = phase 1 - 32

Overlaps / FYLTA (next/2/2/8)

Vehicle Overlaps		Phase or Movement	Phases 1	2	3	4	5	6	7	8	Extension Green	Clearance Yellow	Clearance Red
Overlaps	A		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	B		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	C		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	D		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	E		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	F		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	G		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	H		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	I		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	J		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	K		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	L		0	0	0	0	0	0	0	0	0.0	0.0	0.0

A - D
0 = none
1 = overlap
2 = 60 FPM
3 = Not ped
4=Comp. Ph.
5=Prevent. Ext.
6=Not Veh.
7=Adv. FF

E - L
0 = no Overlap
1 = Overlap

Green,Yellow Red

Not Ped - Ped Overlaps (next/2/2/8/5)

Ped Overlaps ->		A	B	C	D	E	F	G	H
Overlaps	A								
	B								
	C								
	D								

X = Nor Ped Ped Overlap

Advance Warning (next/2/2/8/3)

	E	F	G	H	I	J	K	L	
Enable	0	0	0	0	0	0	0	0	0 = disabled, 1 = enabled
1st Conditional Overlap	0	0	0	0	0	0	0	0	0 = none, 1 - overlap E, 2 = overlap F, etc.
2nd Conditional Overlap	0	0	0	0	0	0	0	0	
Advance Deactivation Delay	0	0	0	0	0	0	0	0	0 - 99 seconds

Ped Overlaps (next/2/2/8/5)

Phase -->		1	2	3	4	5	6	7	8	Walk	Ped Clear	Ped Recall
Ped Overlap	A									0	0	
	B									0	0	
	C									0	0	
	D									0	0	
	E									0	0	
	F									0	0	
	G									0	0	
	H									0	0	

Phase, Ped Recall: X = on

Walk, Ped Clear: 0 - 255 seconds

Flashing Yellow Left Turn Arrow (FYLTA) (next/2/2/8/6)

Phase Pairs -->	1 - 2	3 - 4	5 - 6	7 - 8	
Enable	4	4	4	4	0 = off, 3 = 3 outputs, 4 = 4 outputs, 5 = 5 outputs
Even Omits Odd	0	0	0	0	0 = off, 1 = on, 2 = on, place call across barrier
Detector Switch Odd / Even					X = on, odd phase must be omitted
Red Transition	3.0	3.0	3.0	3.0	0.0 or 2.0 - 25.5 sec
Red Extension	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
Return to GLTA	0	0	0	0	0 = off, 1 = max out, 2 = yellow lock

Flashing Yellow Left Turn Arrow (FYLTA) - Continued on last page

Service Plans (next/2/2/6)

		1	2	3	4	5	6	7	8	
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 1	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.

		1	2	3	4	5	6	7	8	
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 2	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.

		1	2	3	4	5	6	7	8	
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 3	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.

		1	2	3	4	5	6	7	8	
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 4	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.

		1	2	3	4	5	6	7	8	
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 5	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.

		1	2	3	4	5	6	7	8	
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 6	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.

Service Plans Cont.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 7	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 8	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

Max Plans (next/2/2/7)

	Phase -->	1	2	3	4	5	6	7	8	
Max Plan 1	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 2	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 3	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 4	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 5	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 6	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 7	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 8	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec

Coordination Data (next/2/3)

Coordination Modes (next/2/3/1, next/2/3/4/1, next/2/3/4/3)

Flash Mode	*0*	0=off, 1=on, 33=time clock, 34=comm, 35=hardwire, 36=NWS Set only, 37=AB3418 / NTCIP S
Coordination Plan Mode	*0*	0=free, 1-32 = coord plan 1-32, 33=time clock, 34=comm, 35=hardwire, 36=NWS Set only, 37=
Offset Seeking Mode	*2*	0=add only, 1=dwell, 2=fastway
Late Ped	*0*	0 = off, 1 = on
Coord Walk Rest	*0*	0 = off, 1 = on, 2 = by TOD circuit 160, 3 = end of walk, 4 = coord ped during perms
Repeated Phase Service	*0*	0=off, 1=on (no coord ped), 2=on (beginning green coord ped), 3=on (coord ped always)
Zero Mode (TS2 only)	*1*	0=start of main street, 1=end of main street, 2=by TOD circuit 144

Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	0 = service allowed 1 = service prevented
Omit Phase During Repeated Phase Service	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
Auto Permissive Min Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 seconds

Coordination Plans (next/2/3/2)

Coord Plan	**Coordination Phases**		**Cycle Length**	**Offset Time**	**Min Cycle Length Dwell Time**	**Permissive**	**Service Plan**	**Max Plan**
	Ring 1	**Ring 2**						
1 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
3 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
4 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
5 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
6 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
7 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
8 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
9 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
10 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
11 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
12 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
13 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
14 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
15 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
16 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
17 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
18 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
19 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
20 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
21 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
22 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
23 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
24 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
25 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
26 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
27 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
28 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
29 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
30 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
31 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
32 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0 - 8		0 - 255 sec.				0 - 8	

Coordination Plans cont.

Coord Plan	* = Force Offs / Split Times (TS2)								* = Yield Points / Actuated Times (TS2)	
	1	2	3	4	5	6	7	8	Ring 1	Ring 2
1 -	0	0	0	0	0	0	0	0	0	0
2 -	0	0	0	0	0	0	0	0	0	0
3 -	0	0	0	0	0	0	0	0	0	0
4 -	0	0	0	0	0	0	0	0	0	0
5 -	0	0	0	0	0	0	0	0	0	0
6 -	0	0	0	0	0	0	0	0	0	0
7 -	0	0	0	0	0	0	0	0	0	0
8 -	0	0	0	0	0	0	0	0	0	0
9 -	0	0	0	0	0	0	0	0	0	0
10 -	0	0	0	0	0	0	0	0	0	0
11 -	0	0	0	0	0	0	0	0	0	0
12 -	0	0	0	0	0	0	0	0	0	0
13 -	0	0	0	0	0	0	0	0	0	0
14 -	0	0	0	0	0	0	0	0	0	0
15 -	0	0	0	0	0	0	0	0	0	0
16 -	0	0	0	0	0	0	0	0	0	0
17 -	0	0	0	0	0	0	0	0	0	0
18 -	0	0	0	0	0	0	0	0	0	0
19 -	0	0	0	0	0	0	0	0	0	0
20 -	0	0	0	0	0	0	0	0	0	0
21 -	0	0	0	0	0	0	0	0	0	0
22 -	0	0	0	0	0	0	0	0	0	0
23 -	0	0	0	0	0	0	0	0	0	0
24 -	0	0	0	0	0	0	0	0	0	0
25 -	0	0	0	0	0	0	0	0	0	0
26 -	0	0	0	0	0	0	0	0	0	0
27 -	0	0	0	0	0	0	0	0	0	0
28 -	0	0	0	0	0	0	0	0	0	0
29 -	0	0	0	0	0	0	0	0	0	0
30 -	0	0	0	0	0	0	0	0	0	0
31 -	0	0	0	0	0	0	0	0	0	0
32 -	0	0	0	0	0	0	0	0	0	0
	0 - 255 sec * = force offs and yield points									

Circuit Mapping (next/2/3/3)

Circuit Map	Coord Plan	Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit	
1	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
2	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
3	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
4	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
5	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
6	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
7	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
8	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
9	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
10	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
11	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
12	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
13	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
14	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
15	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
16	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
17	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
18	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
19	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
20	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U

coord plan - 0 = free, 1 - 32 = coord plan 1 - 32, 33 = any, 34 none selected
time clock circuits - 0 = not used, or circuits 6 - 196

Dynamic Phase Length (next/2/3/4/4)

Phase -->		1	2	3	4	5	6	7	8	
Back Detector		0	0	0	0	0	0	0	0	0 = none, 1-32 = detector 1-32
Lane Factor		0	0	0	0	0	0	0	0	0 = none, 1.0 - 5.0
Check Out Detector		0	0	0	0	0	0	0	0	0 = none, 1-32 = detector 1-32
Coord Delta Force Off	Set A	0	0	0	0	0	0	0	0	0 - 255 sec
	Set B	0	0	0	0	0	0	0	0	
	Set C	0	0	0	0	0	0	0	0	
	Set D	0	0	0	0	0	0	0	0	
Free Delta Max	Set A	0	0	0	0	0	0	0	0	
	Set B	0	0	0	0	0	0	0	0	
	Set C	0	0	0	0	0	0	0	0	
	Set D	0	0	0	0	0	0	0	0	

Platoon Progression (next/2/3/4/5)

Entry Local Only			Master Local Only		
Platoon Max	0	0 - 255 sec	Smoothing Factor	0.0	0.0 - 1.0
Min Platoon Green	0	0 - 255 sec			
Entry Detector Gap	0.0	0.0 - 25.5			
Min Platoon Cycle	0	0 - 255 sec			

Inbound			Outbound		
Only for Entry Inbound Local or Master Local			Only for Entry Outbound Local or Master Local		
Entry IB Local also Last OB Local	0	0 - 50	Entry OB Local also Last IB Local	0	0 - 50
Speed	0	0 - 55 mph	Speed	0	0 - 55 mph
Distance from Entry Local	0	0 - 65000 feet	Distance from Entry Local	0	0 - 65000 feet

Entry Local Only				Entry Local Only			
Distance from Entry Local Detector	0	0 - 999 feet		Distance from Entry Local Detector	0	0 - 999 feet	
Entry Local Detector	0	0	0 - 32	Entry Local Detector	0	0	0 - 32

Master Local				Master Local			
Master Mid - System Critical Detectors	0	0	0 - 16	Master Mid - System Critical Detectors	0	0	0 - 16

Force Off Percents

Inbound	1	3	4	5	7	8	Outbound	1	3	4	5	7	8
Split 1	0	0	0	0	0	0	Split 1	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	Split 2	0	0	0	0	0	0
	0 - 100 %							0 - 100 %					

Time of Day Data (next/2/4)

Day Program (next/2/4/1)

	Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off		Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On/Off
1							51						
2							52						
3							53						
4							54						
5							55						
6							56						
7							57						
8							58						
9							59						
10							60						
11							61						
12							62						
13							63						
14							64						
15							65						
16							66						
17							67						
18							68						
19							69						
20							70						
21							71						
22							72						
23							73						
24							74						
25							75						
26							76						
27							77						
28							78						
29							79						
30							80						
31							81						
32							82						
33							83						
34							84						
35							85						
36							86						
37							87						
38							88						
39							89						
40							90						
41							91						
42							92						
43							93						
44							94						
45							95						
46							96						
47							97						
48							98						
49							99						
50							100						
	1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on		1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on

Day Program cont.													
	Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off		Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off
101							151						
102							152						
103							153						
104							154						
105							155						
106							156						
107							157						
108							158						
109							159						
110							160						
111							161						
112							162						
113							163						
114							164						
115							165						
116							166						
117							167						
118							168						
119							169						
120							170						
121							171						
122							172						
123							173						
124							174						
125							175						
126							176						
127							177						
128							178						
129							179						
130							180						
131							181						
132							182						
133							183						
134							184						
135							185						
136							186						
137							187						
138							188						
139							189						
140							190						
141							191						
142							192						
143							193						
144							194						
145							195						
146							196						
147							197						
148							198						
149							199						
150							200						
	1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on		1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on

Week Program (next/2/4/2)

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1

0 = none, 1 - 15 = day plan

Exception Days (next/2/4/6)

	DOW	WOM	DOM	MOY	Day Prog.
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
	0-10	0 - 5	0-31	0-12	0 - 15

Year Program (next/2/4/3)

From Date	To Date	Week Program
01/01/2017	12/31/2017	1

New Years Day - Date - January 1st

Martin Luther King Day - DOW WOM - 3rd Monday of January

President's Day - DOW WOM - 3rd Monday February

Memorial Day - DOW WOM - Last Monday May

Fourth of July - Date - July 4th

Labor Day - DOW WOM - 1st Monday September

Columbus Day - DOW WOM - 2nd Monday October

Veteran's Day - Date - November 11th

Thanksgiving - DOW WOM - 4th Thursday November

Christmas - Date - December 25th

Time Clock References (next/2/4/5)

Synch reference Mode	0	0 = timed, 1 = by event
Synch Reference Time	00:00	00:00 - 23:59
Daylight Savings Enable	X	X = on
Reset Time	00:00	00:00 - 23:59

Exception day headings - DOW = Day of Week, WOM = Week of Month, DOM = Day of Month, MOY = Month of Year

Circuit Overrides (next/2/4/4)							
1 - Coord Line 1	CL1	*TOD*		51 - Ped Omit 3	PO3	*TOD*	
2 - Coord Line 2	CL2	*TOD*		52 - Ped Omit 4	PO4	*TOD*	
3 - Coord Line 4	CL4	*TOD*		53 - Ped Omit 5	PO5	*TOD*	
4 - Coord Line 8	CL8	*TOD*		54 - Ped Omit 6	PO6	*TOD*	
5 - Coord Line 16	C16	*TOD*		55 - Ped Omit 7	PO7	*TOD*	
6 - Coord Operation	CRD	*TOD*		56 - Ped Omit 8	PO8	*TOD*	
7 - Soft Flash	SFL	*TOD*		57 - Conditional Service	CVS	*On*	
8 - Enable System Relays	ESR	*TOD*		58 - Inhibit Simultaneous Gap Out	ISG	*On*	
9 - Call to Non Act 1	CN1	*TOD*		59 - Inhibit Hardwire	HWI	*TOD*	
10 - Call to Non Act 2	CN2	*TOD*		60 - Ped Override Mode	POM	*TOD*	
11 - Walk Rest Modifier	WRM	*TOD*		61 - Dual Entry	DLE	*On*	
12 - Min Recall	MIN	*TOD*		62 - Exclusive Ped	EPD	*TOD*	
13 - Max 2 Both Rings	MX2	*TOD*		63 - Call to Time Clock Mode	CTC	*TOD*	
14 - Coord Inhibit Max Ring 1, 2	IMT	*TOD*		64 - Dual Enhanced Ped	DEP	*TOD*	
15 - Enable Service Log	ESL	*TOD*		65 - Service Plan 1	SP1	*TOD*	
16 - Call to Free	CTF	*TOD*		66 - Service Plan 2	SP2	*TOD*	
17 - TOD Output 1	TO1	*TOD*		67 - Service Plan 3	SP3	*TOD*	
18 - TOD Output 2	TO2	*TOD*		68 - Service Plan 4	SP4	*TOD*	
19 - TOD Output 3	TO3	*TOD*		69 - Service Plan 5	SP5	*TOD*	
20 - TOD Output 4	TO4	*TOD*		70 - Service Plan 6	SP6	*TOD*	
21 - TOD Output 5	TO5	*TOD*		71 - Service Plan 7	SP7	*TOD*	
22 - TOD Output 6	TO6	*TOD*		72 - Service Plan 8	SP8	*TOD*	
23 - TOD Output 7	TO7	*TOD*		73 - Max Plan 1	MP1	*TOD*	
24 - TOD Output 8	TO8	*TOD*		74 - Max Plan 2	MP2	*TOD*	
25 - Vehicle Call Phase 1	VC1	*TOD*	On / Off / TOD	75 - Max Plan 3	MP3	*TOD*	On / Off / TOD
26 - Vehicle Call Phase 2	VC2	*TOD*		76 - Max Plan 4	MP4	*TOD*	
27 - Vehicle Call Phase 3	VC3	*TOD*		77 - Max Plan 5	MP5	*TOD*	
28 - Vehicle Call Phase 4	VC4	*TOD*		78 - Max Plan 6	MP6	*TOD*	
29 - Vehicle Call Phase 5	VC5	*TOD*		79 - Max Plan 7	MP7	*TOD*	
30 - Vehicle Call Phase 6	VC6	*TOD*		80 - Max Plan 8	MP8	*TOD*	
31 - Vehicle Call Phase 7	VC7	*TOD*		81 - Transit Priority Max Group 1	TG1	*TOD*	
32 - Vehicle Call Phase 8	VC8	*TOD*		82 - Transit Priority Max Group 2	TG2	*TOD*	
33 - Ped Call Phase 1	PC1	*TOD*		83 - Transit Priority Max Group 3	TG3	*TOD*	
34 - Ped Call Phase 2	PC2	*TOD*		84 - Transit Priority Max Group 4	TG4	*TOD*	
35 - Ped Call Phase 3	PC3	*TOD*		85 - Transit Priority Max Group 5	TG5	*TOD*	
36 - Ped Call Phase 4	PC4	*TOD*		86 - Transit Priority Max Group 6	TG6	*TOD*	
37 - Ped Call Phase 5	PC5	*TOD*		87 - Transit Priority Max Group 7	TG7	*TOD*	
38 - Ped Call Phase 6	PC6	*TOD*		88 - Transit Priority Max Group 8	TG8	*TOD*	
39 - Ped Call Phase 7	PC7	*TOD*		89 - Inhibit Volume Density 1	IV1	*TOD*	
40 - Ped Call Phase 8	PC8	*TOD*		90 - Inhibit Volume Density 2	IV2	*TOD*	
41 - Vehicle Omit 1	VO1	*TOD*		91 - Inhibit Volume Density 3	Iv3	*TOD*	
42 - Vehicle Omit 2	VO2	*TOD*		92 - Inhibit Volume Density 4	IV4	*TOD*	
43 - Vehicle Omit 3	VO3	*TOD*		93 - Inhibit Volume Density 5	IV5	*TOD*	
44 - Vehicle Omit 4	VO4	*TOD*		94 - Inhibit Volume Density 6	IV6	*TOD*	
45 - Vehicle Omit 5	VO5	*TOD*		95 - Inhibit Volume Density 7	IV7	*TOD*	
46 - Vehicle Omit 6	VO6	*TOD*		96 - Inhibit Volume Density 8	IV8	*TOD*	
47 - Vehicle Omit 7	VO7	*TOD*		97 - Lag 1	LG1	*TOD*	
48 - Vehicle Omit 8	VO8	*TOD*		98 - Lag 3	LG3	*TOD*	
49 - Ped Omit 1	PO1	*TOD*		99 - Lag 5	LG5	*TOD*	
50 - Ped Omit 2	PO2	*TOD*		100 - Lag 7	LG7	*TOD*	

Circuit Overrides cont.							
101 - Inhibit Overlap A	**OLA**	*TOD*		**151 - Coord Hold 7**	**HD7**	*TOD*	
102 - Inhibit Overlap B	**OLB**	*TOD*		**152 - Coord Hold 8**	**HD8**	*TOD*	
103 - Inhibit Overlap C	**OLC**	*TOD*		**153 - PE Priority Return B**	**PRB**	*TOD*	
104 - Inhibit Overlap D	**OLD**	*TOD*		**154 - PE Priority Return C**	**PRC**	*TOD*	
105 - Enable Schedule A Phone 1	**AT1**	*TOD*		**155 - PE Priority Return D**	**PRD**	*TOD*	
106 - Enable Schedule A Phone 2	**AT2**	*TOD*		**156 - PE Priority Return E**	**PRE**	*TOD*	
107 - Enable Schedule B Phone 1	**BT1**	*TOD*		**157 - Platoon Inbound**	**PPI**	*TOD*	
108 - Enable Schedule B Phone 2	**BT2**	*TOD*		**158 - Platoon Outbound**	**PPO**	*TOD*	
109 - Enable Schedule C Phone 1	**CT1**	*TOD*		**159 - Platoon Spl 2**	**PS2**	*TOD*	
110 - Enable Schedule C Phone 2	**CT2**	*TOD*		**160 - Coord Walk Rest**	**CWR**	*TOD*	
111 - Enable Volume to Call Phone 1	**VT1**	*TOD*		**161 - Dynamic Phase Length Short Inhibit 1**	**SI1**	*TOD*	
112 - Enable Volume to Call Phone 2	**VT2**	*TOD*		**162 - Dynamic Phase Length Short Inhibit 2**	**SI2**	*TOD*	
113 - Enable Volume Logging	**EVL**	***On***		**163 - Dynamic Phase Length Short Inhibit 3**	**SI3**	*TOD*	
114 - Enable MOE Logging	**EML**	***On***		**164 - Dynamic Phase Length Short Inhibit 4**	**SI4**	*TOD*	
115 - Detector Low Threshold Inhibit	**DLI**	*TOD*		**165 - Dynamic Phase Length Short Inhibit 5**	**SI5**	*TOD*	
116 - Detector Continue Presence Inhibit	**DPI**	*TOD*		**166 - Dynamic Phase Length Short Inhibit 6**	**SI6**	*TOD*	
117 - Inhibit Detector Based on Programming	**IND**	*TOD*		**167 - Dynamic Phase Length Short Inhibit 7**	**SI7**	*TOD*	
118 - Inhibit Detector Delay	**IDD**	*TOD*		**168 - Dynamic Phase Length Short Inhibit 8**	**SI8**	*TOD*	
119 - Inhibit Conditional Ped	**ICP**	*TOD*		**169 - Coord Late Left Turn 1**	**CT1**	*TOD*	
120 - Inhibit Transit Priority	**ITP**	*TOD*		**170 - Coord Late Left Turn 3**	**CT3**	*TOD*	
121 - Red Rest Ring 1,2	**RRM**	*TOD*		**171 - Coord Late Left Turn 5**	**CT5**	*TOD*	
122 - Enable Transcend	**TRA**	*TOD*		**172 - Coord Late Left Turn 7**	**CT7**	*TOD*	
123 - Omit Red Clear Ring 1,2	**ORC**	*TOD*		**173 - Dynamic Phase Length Enable A**	**DPA**	*TOD*	
124 - Not Used	**N/U**	*TOD*		**174 - Dynamic Phase Length Enable B**	**DPB**	*TOD*	
125 - Ped Recycle Ring 1,2	**PCY**	*TOD*	On / Off / TOD	**175 - Dynamic Phase Length Enable C**	**DPC**	*TOD*	On / Off / TOD
126 - Not Used	**N/U**	*TOD*		**176 - Dynamic Phase Length Enable D**	**DPD**	*TOD*	
127 - Enable MOE Log to Call Phone 1	**MT1**	*TOD*		**177 - Proactive Plan Select Average**	**PSA**	*TOD*	
128 - Enable MOE Log to Call Phone 2	**MT2**	*TOD*		**178 - Proactive Plan Select Inbound**	**PSI**	*TOD*	
129 - Transit Inhibit Short Time 1	**IS1**	*TOD*		**179 - Proactive Plan Select Outbound**	**PSO**	*TOD*	
130 - Transit Inhibit Short Time 2	**IS2**	*TOD*		**180 - Split Variant Inbound**	**SVI**	*TOD*	
131 - Transit Inhibit Short Time 3	**IS3**	*TOD*		**181 - Split Variant Outbound**	**SVO**	*TOD*	
132 - Transit Inhibit Short Time 4	**IS4**	*TOD*		**182 - Disable Coord Walk Rest Ring 1**	**DW1**	*TOD*	
133 - Transit Inhibit Short Time 5	**IS5**	*TOD*		**183 - Disable Coord Walk Rest Ring 2**	**DW2**	*TOD*	
134 - Transit Inhibit Short Time 6	**IS6**	*TOD*		**184 - Proactive Plan Select New Look**	**NLK**	*TOD*	
135 - Transit Inhibit Short Time 7	**IS7**	*TOD*		**185 - Disable Red Clearance Extension**	**DRX**	*TOD*	
136 - Transit Inhibit Short Time 8	**IS8**	*TOD*		**186 - Detector Plan Line 1**	**DL1**	*TOD*	
137 - Enable Transit Priority Logging	**ETL**	*TOD*		**187 - Detector Plan Line 2**	**DL2**	*TOD*	
138 - Disable Flashing Yellow Arrow 1	**DF1**	*TOD*		**188 - Disable LRT 1 Vertical Flashing Bar**	**DV1**	*TOD*	
139 - Disable Flashing Yellow Arrow 3	**DF3**	*TOD*		**189 - Disable LRT 2 Vertical Flashing Bar**	**DV2**	*TOD*	
140 - Disable Flashing Yellow Arrow 5	**DF5**	*TOD*		**190 - Disable LRT 3 Vertical Flashing Bar**	**DV3**	*TOD*	
141 - Disable Flashing Yellow Arrow 7	**DF7**	*TOD*		**191 - Disable LRT 4 Vertical Flashing Bar**	**DV4**	*TOD*	
142 - Disable Auto Max	**DAM**	*TOD*		**192 - Datakey Enable**	**DKE**	*TOD*	
143 - Disable Repeat Phase Service	**DRS**	*TOD*		**193 - Dynamic Phase Reversal Enable 1**	**DR1**	*TOD*	
144 - Coord End of Main Street	**EMS**	*TOD*		**194 - Dynamic Phase Reversal Enable 3**	**DR3**	*TOD*	
145 - Coord Hold 1	**HD1**	*TOD*		**195 - Dynamic Phase Reversal Enable 5**	**DR5**	*TOD*	
146 - Coord Hold 2	**HD2**	*TOD*		**196 - Dynamic Phase Reversal Enable 7**	**DR7**	*TOD*	
147 - Coord Hold 3	**HD3**	*TOD*		**197 - Enable Coord Logging**	**ECL**	***On***	
148 - Coord Hold 4	**HD4**	*TOD*		**198 - Disable Gap FYLTA 1,3,5,7**	**DGF**	*TOD*	
149 - Coord Hold 5	**HD5**	*TOD*		**199 - Coordination Auto Walk**	**CAW**	*TOD*	
150 - Coord Hold 6	**HD6**	*TOD*		**200 - Enable Coordinated Auto Max**	**ECM**	*TOD*	

Preemption Data (next/2/5)

Sequence (next/2/5/1 - 8)

Sequences / Intervals		Instruction	Phases Serviced	Interval Time	Hold On Input	Outputs On	Output Mode
1	1	0	25	1	1		0
	2	98		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
2	1	0	47	1	1		0
	2	98		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
3	1	0	16	1	1		0
	2	98		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
4	1	0	38	1	1		0
	2	98		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
5	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0

Instructions
0 - Service Phases
1-9 = Special Interval 1-9
10 - Preempt Sequence Allows FYLTA
11 - Preempt Interval Disables FYLTA
15 - Alternate Trap Protection
90 - Go to all Red
91 - Soft Flash On
92 - Soft Flash Off
93 - Enable Ped
94 - Disable Peds
95 - Priority Return
96 - Enable Coordination with peds
97 - Enable Coordination without peds
98 - Return with NO Calls
99 - Return with Vehicle Calls
100 - jump to step in Interval Time
101 - Use Interval Time as Resetable Gap Timer
196 - Coord Re-synch with Peds
197 - Coord Re-synch without Peds
200 - Light Rail Train phase without Peds
201 - Light Rail Train phase with Peds
202 - Return to highest queue/delay phase (this uses the Dynamic Phase Length Back Detectors)
216 - Light Rail Train Coord Re-synch with Peds
217 - Light Rail Train Coord Re-synch without Peds

Phases Serviced - phases 1 - 8

Interval Time - 0 - 255 sec or interval 1 - 10

Hold on Input:
0 = Do not hold
1 = Hold
2 = Ped Service to Rest in Walk

Outputs On - output 1 - 8

Output Modes -
0 = all steady on
1 = all flash together
2 = odd flashes WIG, even flashes WAG
3 = 1 - 4 steady on, 5 - 8 all flash together

Sequence cont.							
Sequences / Intervals		Instruction	Phases Serviced	Interval Time	Hold On Input	Outputs On	Output Mode
6	1	0	12345678	0	1		0
	2	98		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
7	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
8	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0

Sequence Timing (next/2/5/0)										
	Sequence -- >	1	2	3	4	5	6	7	8	
	Input Memory									X = on
	Input Priority	6	6	6	6	0	0	0	0	0 = lowest, - 8 = highest
Entry (Transition) Parameters	Min Green	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0 - 25.5 sec
	Walk	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0 would time the normal function time
	Ped Clear	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	
	Overlap Yellow	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0 - 25.5 sec
	Overlap Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Delay to Preempt	0	0	0	0	0	0	0	0	0 - 255 sec
	Delay Ped Omit	0	0	0	0	0	0	0	0	
	Delay Phase Omit	0	0	0	0	0	0	0	0	
	Min Reservice	0	0	0	0	0	0	0	0	0 - 255 min
Overlap Inhibits	A									X = inhibit
	B									
	C									
	D									
Exit Parameters	Exit to Coord Plan Offset by X	0	0	0	0	0	0	0	0	0 - 20
	Exit Coord Plan Time	0	0	0	0	0	0	0	0	0 - 60 min
	Exit to Max Plan	0	0	0	0	0	0	0	0	0 - 8
	Exit Free Time	0	0	0	0	0	0	0	0	0 - 60 min
	Override Time	0	0	0	0	0	0	0	0	
	Fail Time	0	0	0	0	0	0	0	0	
	Exit Mode Time	0	0	0	0	0	0	0	0	

Priority Return and Special Intervals (next/2/5/0/6, next/2/5/9)													
Phase / Overlap -->		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**A**	**B**	**C**	**D**
Priority Return	**Enable**	*0*	0 = disabled, 1 = enabled, 2 = enabled, skip preemption phases on exit										
	A (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 100% of currently used max			
	B (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*				
	C (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*				
	D (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*				
	E (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*				
	Ped Clear	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 100% of currently used ped clearance			
Queue Delay Recovery		*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.			
Special Intervals	**1**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	3	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	4	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	5	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	6	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	7	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	8	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	9	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

0 = Dark
1 = green don't walk
2 = green walk
3 = green flashing don't walk
4 = yellow
5 = red
6 = flashing yellow WIG
7 = flashing yellow WAG
8 = flashing red WIG
9 = flashing red WAG
10 = walk only
11=flashing don't walk only

Light Rail Train (next/2/5/0/7)						
Light Rail Train -->	**1**	**2**	**3**	**4**	
Associated Preempt	*0*	*0*	*0*	*0*	0 = none, preempt 1 - 8
Time to Green	*0*	*0*	*0*	*0*	0 - 255 sec
Horizontal Bar Flash Time	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
Vertical Bar Flash Time	*0.0*	*0.0*	*0.0*	*0.0*	
Min Duration	*0*	*0*	*0*	*0*	0 - 255 sec

Communications Data (next/2/6)

1st Central Phone Number		**2nd Central Phone Number**	
Modem Setup String	*AT&F&N6&W0Y0*	**Intersection Name**	*Rimrock at W. Antler*
Subnet Mask	*0.0.0.0*		
IP (ethernet) Port	*0*		
Central Port	*0*		
System Mode	*0*		
System Port	*0*	**Alternate System Port**	*0*

System ID	*158*	**AB3418e Physical Address**	*0*		**IP Address**	*0.0.0.0*	
Local ID	*1*	**AB3418e Group Address**	*0*		**Gateway Address**	*0.0.0.0*	

Baud Rates		**Flow Control**	**Port Use**
Port 1 (Slot A2 Upper)	*0*	*1*	*Suggested Use - FSK*
Port 2 (Slot A2 Lower)	*0*	*1*	*modem to central*
Port 3 (Slot A1 Upper)	*0*	*0*	*Suggested Use - Modem to Central*
Port 4 (Slot A1 Lower or C50S)	*2*	*N\U*	*Suggested Use - RS232 to Laptop*
0 = 1200, 1 = 2400, 2 = 9600, 3 = 19200 baud		0 = off, 1 = on	

Reports

Volume Log Period	*15*	minutes	**Volume/Occ Log Period**	*0*	second	**MOE Log Period**	*60*	minute

0 = disabled, 1,2,3,4,5,6,10,12,15,20,30,60 minutes

Function Schedule Mapping (next/2/6/7)

Alarm 1	*0*		**Soft Flash**	*2*	
Alarm 2	*0*		**Manual Control Enable (MCE)**	*2*	
Alarm 3	*0*		**Emergency or Railroad Preempt**	*1*	
Alarm 4	*0*		**Not Used**	*0*	
Alarm 5	*0*	0 = none	**Cycle Failure**	*2*	0 = none
Not Used	*0*	1 = schedule A	**Coordination Failure**	*2*	1 = schedule A
Not Used	*0*	2 = schedule B	**Keyboard use / Data Changed**	*2*	2 = schedule B
Not Used	*0*	3 = schedule C	**Coord Running / Free**	*0*	3 = schedule C
Power On / Off	*2*	4 = schedule R	**Cabinet Door**	*2*	4 = schedule R
Checksum Failure	*2*		**Extended Ped Pushbutton**	*0*	
Video / Detector Failure	*2*		**Monitor Status**	*2*	
Master to Local Comm Lost	*0*		**Red Extension**	*0*	

Miscellaneous Data

Transit Priority (next/2/7)

	1	2	3	4	5	6	7	8	
Phases									Phases 1 - 8 (max of 2 compatible phases)
PE Enable (6.25Hz TP call on PE)									X = 6.25 Hz signal will activate TP
Priority	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 8 = highest
Memory									X = on
Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
Minimum Reservice Time (per input)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 min
Override Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
Bus Extend	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
Minimum Reservice Time (all inputs)	*0*	0 - 255 min							
Free Operation Mode	*0*	0 = use shortest of max 1 or 2, 1 - 8 = use max time of group 1 - 8, 9 = use time of day							

Transit Priority Alternate Force Off Plans

Current Coord Plan	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Alternate TP Force Off Plan	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Current Coord Plan	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Alternate TP Force Off Plan	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

0 = none
17 - 32 = coord plan 17 - 32

Group Timing

	Phase -->	1	2	3	4	5	6	7	8
Group 1	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 2	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 3	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 4	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 5	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 6	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 7	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 8	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

0 - 255 sec
0 would time the normal function time

Truck Priority (next/2/7/9)

Truck Priority-->	**1**	**2**	**3**	**4**	
Associated Transit Priority	*0*	*0*	*0*	*0*	0 = none 1 - 8 = transit priority 1 - 8
Leading Detector	*0*	*0*	*0*	*0*	0 = none, 1 - 32 = detector 1 - 32
Trailing Detector	*0*	*0*	*0*	*0*	
Stop Bar Distance	*0*	*0*	*0*	*0*	0 - 999 feet
Trap Distance	*0*	*0*	*0*	*0*	0.0 - 99.9 feet
Minimum Speed	*0*	*0*	*0*	*0*	0 - 100 mph
Minimum Length	*0*	*0*	*0*	*0*	0 - 255 feet
Downhill Grade	*0*	*0*	*0*	*0*	0 - 20 %
Uphill Grade	*0*	*0*	*0*	*0*	
Undersized Vehicle					X = Enabled

Change I/O		X = On (After a download with a power on - off cycle)

Inputs (Non Default I/O is offset to the right) (next/2/8/1)

C1-39	*101*	*VD9*	**C1-55**	*15*	*VD5*	**C1-67**	*22*	*PED2*	**C11-15**	*254*	*N/U*
C1-40	*113*	*VD19*	**C1-56**	*11*	*VD1*	**C1-68**	*26*	*PED6*	**C11-16**	*254*	*N/U*
C1-41	*106*	*VD14*	**C1-57**	*17*	*VD7*	**C1-69**	*24*	*PED4*	**C11-17**	*254*	*N/U*
C1-42	*118*	*VD24*	**C1-58**	*13*	*VD3*	**C1-70**	*28*	*PED8*	**C11-18**	*254*	*N/U*
C1-43	*102*	*VD10*	**C1-59**	*16*	*VD6*	**C1-71**	*151*	*PE1*	**C11-19**	*254*	*N/U*
C1-44	*114*	*VD20*	**C1-60**	*12*	*VD2*	**C1-72**	*152*	*PE2*	**C11-20**	*254*	*N/U*
C1-45	*107*	*VD15*	**C1-61**	*18*	*VD8*	**C1-73**	*153*	*PE3*	**C11-21**	*254*	*N/U*
C1-46	*161*	*VD25*	**C1-62**	*14*	*VD4*	**C1-74**	*154*	*PE4*	**C11-22**	*254*	*N/U*
C1-47	*105*	*VD13*	**C11-10**	*254*	*N/U*	**C1-75**	*254*	*N/U*	**C11-23**	*254*	*N/U*
C1-48	*117*	*VD23*	**C11-11**	*254*	*N/U*	**C1-76**	*104*	*VD12*	**C11-24**	*254*	*N/U*
C1-49	*112*	*VD18*	**C11-12**	*254*	*N/U*	**C1-77**	*116*	*VD22*	**C11-25**	*254*	*N/U*
C1-50	*164*	*VD28*	**C11-13**	*254*	*N/U*	**C1-78**	*111*	*VD17*	**C11-26**	*254*	*N/U*
C1-51	*254*	*N/U*	**C1-63**	*103*	*VD11*	**C1-79**	*163*	*VD27*	**C11-27**	*254*	*N/U*
C1-52	*155*	*PE5*	**C1-64**	*115*	*VD21*	**C1-80**	*82*	*IADV*	**C11-28**	*254*	*N/U*
C1-53	*85*	*MCE*	**C1-65**	*108*	*VD16*	**C1-81**	*137*	*MONS*	**C11-29**	*254*	*N/U*
C1-54	*254*	*N/U*	**C1-66**	*162*	*VD26*	**C1-82**	*62*	*ST1*	**C11-30**	*254*	*N/U*

Outputs (Non Default I/O is offset to the right) (next/2/8/2)

C1-2	*44*	*4DWK*	**C1-19**	*48*	*8DWK*	**C1-35**	*215*	*FYA1*	**C1-91**	*41*	*1DWK*
C1-3	*64*	*4WLK*	**C1-20**	*68*	*8WLK*	**C1-36**	*217*	*FYA5*	**C1-93**	*61*	*1WLK*
C1-4	*14*	*4RED*	**C1-21**	*18*	*8RED*	**C1-37**	*216*	*FYA3*	**C1-94**	*106*	*OLBR*
C1-5	*24*	*4YEL*	**C1-22**	*28*	*8YEL*	**C1-38**	*218*	*FYA7*	**C1-95**	*105*	*OLBY*
C1-6	*34*	*4GRN*	**C1-23**	*38*	*8GRN*	**C1-100**	*53*	*3PCL*	**C1-96**	*104*	*OLBG*
C1-7	*13*	*3RED*	**C1-24**	*17*	*7RED*	**C1-101**	*51*	*1PCL*	**C1-97**	*103*	*OLAR*
C1-8	*222*	*FYC3*	**C1-25**	*224*	*FYC7*	**C1-102**	*187*	*SFL*	**C1-98**	*102*	*OLAY*
C1-9	*33*	*3GRN*	**C1-26**	*37*	*7GRN*	**C1-103**	*147*	*WDOG*	**C1-99**	*101*	*OLAG*
C1-10	*42*	*2DWK*	**C1-27**	*46*	*6DWK*	**C1-83**	*43*	*3DWK*	**C11-1**	*254*	*N/U*
C1-11	*62*	*2WLK*	**C1-28**	*66*	*6WLK*	**C1-84**	*63*	*3WLK*	**C11-2**	*254*	*N/U*
C1-12	*12*	*2RED*	**C1-29**	*16*	*6RED*	**C1-85**	*116*	*OLDR*	**C11-3**	*254*	*N/U*
C1-13	*22*	*2YEL*	**C1-30**	*26*	*6YEL*	**C1-86**	*115*	*OLDY*	**C11-4**	*254*	*N/U*
C1-15	*32*	*2GRN*	**C1-31**	*36*	*6GRN*	**C1-87**	*114*	*OLDG*	**C11-5**	*254*	*N/U*
C1-16	*11*	*1RED*	**C1-32**	*15*	*5RED*	**C1-88**	*113*	*OLCR*	**C11-6**	*254*	*N/U*
C1-17	*221*	*FYC1*	**C1-33**	*223*	*FYC5*	**C1-89**	*112*	*OLCY*	**C11-7**	*254*	*N/U*
C1-18	*31*	*1GRN*	**C1-34**	*35*	*5GRN*	**C1-90**	*111*	*OLCG*	**C11-8**	*254*	*N/U*

Internal Logic (next/2/9)			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	Inst.	Description	Comment
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Internal Logic cont.			
Step	Inst.	Description	Comment
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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FYLTA - Continued (next/2/2/8/6)						
	Phase Pairs -->	**1 - 2**	**3 - 4**	**5 - 6**	**7 - 8**	
Gap-Dependent FYLTA (next/2/2/8/6-A)	**Detector Input**	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Not Ped	*0*	*0*	*0*	*0*	0 - 255 sec

FYLTA Gap-Dependent Plans (next/2/2/8/6)						
	Phase Pairs -->	**1 - 2**	**3 - 4**	**5 - 6**	**7 - 8**	
FYLTA Gap-Dependent Plan A	**Detector Input**	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Not Ped	*0*	*0*	*0*	*0*	0 - 255 sec
FYLTA Gap-Dependent Plan B	**Detector Input**	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Not Ped	*0*	*0*	*0*	*0*	0 - 255 sec
FYLTA Gap-Dependent Plan C	**Detector Input**	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec

	Not Ped	0	0	0	0	0 - 255 sec
FYLTA Gap-Dependent Plan D	Detector Input	0	0	0	0	0 = disable, 1 - 64 detectors
	Min Delay	0	0	0	0	0 - 255 sec
	Detector Gap	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Max Delay	0	0	0	0	0 - 255 sec
	Not Ped	0	0	0	0	0 - 255 sec

Preemption - Continued

Railroad Communications (IEEE 1570) (next/2/5/0/8)

	ATC	Wayside	
Railroad Number	0	0	0 - 999, represents railroad
Railroad Line Number	0	0	0 - 999, represents railroad line
Group Number	0	0	0 - 999, represents physical group of equipment
Subnode Number	0	0	0 - 99, subnode within physical group of equipment
Device Number	0	0	0 - 99, device within physical group of equipment
Associated Preempt	0		0 - 8
Communication Port	0		0 - 4

Reports - Continued

Reports - Service Delay Modes (next/2/6/0)

Phase -->	1	2	3	4	5	6	7	8	
Mode	0	0	0	0	0	0	0	0	0 = disable, 1 = enable, 2 = Ped, 3 = Veh/P

Ped Overlap -->	A	B	C	D	E	F	G	H	
Mode	0	0	0	0	0	0	0	0	0 = disable, 1 = enable

Detector -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detector -->	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detector -->	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detector -->	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Regio

Monday, August 28, 2017 14:48

Intersection Name	*1 - South Canal at Odem Medo*	**Local ID**	*1*
Intersection Telephone Number			
System Name	*154 - Odem Medo*	**System ID**	*154*
Controller Type	*Voyage - C1-C11*		
Controller Serial Number		**Installation Date**	
Programmed by		**Programmed Date**	

Graphic Map Background	**Phase Rotation Diagram**

Control Data (next/2/2)

Controller Function and Timing (next/2/1, next/2/2)

Security, Sequence, Initialization

Security Code	****	0 = disabled, or 1000-9999
Sequence	*2*	0 = sequential, 1 = quad left turn, 2-6 = special A-E, 7 = lead lag

Lead Lag (next/2/2/3)			
Phases 1 - 2	**Phases 3 - 4**	**Phases 5 - 6**	**Phases 7 - 8**
0	*0*	*0*	*0*
0 = no reversal, 1 = reversal, 2 = by coord plan or clock			

Initialization and Flash (next/2/2/5)

	Initialization	**Flash Entry**	**Flash Exit**	
Ring 1 Phase	*1*	*2*	*1*	phase 1-8
Ring 2 Phase	*5*	*6*	*5*	phase 1-8
Interval	*0*	*0*	*0*	0 = red, 1 = yellow, 2 = green

Power up Flash	*0.0*	0.0 - 25.5 seconds		**First All Red**	*6.0*	0.0 - 25.5 seconds

Soft Flash (next/2/2/5)

Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	0 = dark, 1=flash yel WIG, 2 = flash yel WAG, 3 = flash red WIG, 4 = flash red WAG				
	3	*4*	*3*	*4*	*3*	*4*	*3*	*4*					
Overlap	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	
	3	*4*	*3*	*4*	*3*	*4*	*3*	*4*	*3*	*4*	*3*	*4*	same as phase
Internal Logic Output	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = normal, 1 = dark, 2 = flash WIG

Per Phase Functions (next/2/2/3, next/2/2/1)

	1	2	3	4	5	6	7	8	
Phases Used	X	X		X	X	X		X	X = on
Restricted Phases									X = on (Sequence 2, 6, 7 only)
Exclusive Phases									X = on (Sequence 7 only)
Yellow Lock									
Min Recall		X				X			
Max Recall									
Ped Recall									
Red Lock									
Max Out Recall Inhibit	X			X	X			X	X = on
Soft Recall									
Free Walk Rest									
Conditional Ped									
Disable Inhibit Max Termination									
Call to Non Act 1									
Call to Non Act 2									

Dual Entry (next/2/2/9/3)

Mode	0	0 = off, 1 = on, 2 = Not Used, 3 = by coord plan, 4 = by time clock circuit 61

Dual Entry Phase -->	1	2	3	4	5	6	7	8	
Phase	0	0	0	0	0	0	0	0	0 = none, 1-8 = phase 1-8

Conditional Service, Five Section Head

Conditional Service (next/2/2/9/3)			**5 Section Head Logic (next/2/2/9/4)**						
					Anti-Trap			**Yellow Blanking LT**	
	Mode	**CS Max Time**	**X Omits Y**						
Phase 1	0	0	**X : Y**		**Trap Protected Phase**		**Next Phase**	**Phase**	
Phase 3	0	0	**6 : 1**	0	**1**		**< (5)**	**1**	
Phase 5	0	0	**8 : 3**	0	**3**		**< (7)**	**3**	
Phase 7	0	0	**2 : 5**	0	**5**		**< (1)**	**5**	
0 = off, 1 = C.S.On. 2 = C.S. on by TOD circuit 57, 3 = N/A, 4 = C.S. and C.R. On, 5 = C.R. on by TOD circuit 57.			**4 : 7**	0	**7**		**< (3)**	**7**	
			0=off, 1=side call, 2=no side call		X = On				

Phase Times (next/2/2/2, next/2/2/9/5)									
	1	2	3	4	5	6	7	8	
Movement	*SBLT*	*NB*		*EB*	*NBLT*	*SB*		*WB*	
Minimum Green	*6*	*10*	*0*	*8*	*6*	*10*	*0*	*5*	0 - 255 sec
Passage	*2.0*	*3.0*	*0.0*	*2.0*	*2.0*	*3.0*	*0.0*	*2.0*	0.0 - 25.5 sec
Yellow	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*0.0*	*4.0*	0.0 - 25.5 sec
Red Clearance	*1.0*	*1.0*	*0.0*	*1.0*	*1.0*	*1.0*	*0.0*	*1.0*	0.0 - 25.5 sec or 0 - 255 sec
Max 1	*12*	*35*	*0*	*12*	*10*	*35*	*0*	*20*	0 - 255 sec
Max 2	*10*	*20*	*0*	*15*	*10*	*20*	*0*	*15*	0 - 255 sec
Walk	*0*	*7*	*0*	*7*	*0*	*7*	*0*	*7*	0 - 255 sec
Ped Clear	*0*	*15*	*0*	*15*	*0*	*15*	*0*	*15*	0 - 255 sec
Seconds Per Actuation	*0.0*	*1.1*	*0.0*	*0.0*	*0.0*	*1.1*	*0.0*	*0.0*	0.0 - 25.5 sec
Time Before Reduction	*6*	*10*	*0*	*5*	*6*	*10*	*0*	*6*	0 - 255 sec
Time to Reduce	*6*	*20*	*0*	*5*	*6*	*20*	*0*	*6*	0 - 255 sec
Minimum Gap	*1.5*	*2.0*	*0.0*	*1.5*	*1.5*	*2.0*	*0.0*	*1.5*	0.0 - 25.5 sec
Max Variable Initial	*6*	*10*	*0*	*5*	*6*	*10*	*0*	*8*	0 - 255 sec
Auto Max Adjust	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
Auto Max Limit	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
Inhibit Min Yellow									X = On
Red Decimal Off									X = On
Advance Walk	*0*	*4*	*0*	*4*	*0*	*0*	*0*	*4*	0 - 255 sec

Other Controller Functions (next/2/2/9)									
Phase -->	1	2	3	4	5	6	7	8	
Inhibit Simultaneous Gap Out	*X*			*X*	*X*			*X*	X = On
Last Car Passage	*2*	0 = recall phase, 1 = last car passage, 2 = NOT recall - Not last car passage							
Red Revert (+2 seconds)	*3.0*	0 - 25.5 sec							
Auto Ped Clear	*X*	X = On							
Flashing Don't Walk Into Yellow		X = On							
Soft Recall / Red Rest Delay	*0.0*	0 - 25.5 sec							
Ped Pushbutton	*0*	0 - 5 sec, 0 = disable							
Advance Flash Rate	*0*	0 = disable, 1 = 120 FPM							
Change Sequence		X = On (After a download with a power on - off cycle)							
Phase -->	1	2	3	4	5	6	7	8	
Red Clear Extension Detector	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = none 1 - 32 = detector 1 - 32
Red Clear Extension Red Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec.

Local Detectors (next/2/2/4)

Detector Data

	Yellow Lock	Detector Inhibit	Call Phase	Extend Phase	Switch Phase	Delay Time	Stretch / Disconnect Time	Delay or Disconnect Mode
Detector 1 - I1SBLT(11)			*1*	*1*	*0*	*0*	*0.0*	*0*
Detector 2 - I9USB (9)			*1*	*1*	*0*	*0*	*0.0*	*0*
Detector 3 - I5			*3*	*3*	*0*	*0*	*0.0*	*0*
Detector 4 - I9L			*3*	*3*	*0*	*0*	*0.0*	*0*
Detector 5 - J1NBLT (9)			*5*	*5*	*0*	*20*	*0.0*	*0*
Detector 6 - J9U			*5*	*5*	*0*	*0*	*0.0*	*0*
Detector 7 - J5			*7*	*7*	*0*	*0*	*0.0*	*0*
Detector 8 - J9L			*7*	*7*	*0*	*0*	*0.0*	*0*
Detector 9 - I2UNB (3)			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 10 - I2L			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 11 - I3UNBA (1)			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 12 - I3LNBO			*0*	*2*	*0*	*15*	*0.0*	*0*
Detector 13 - I4			*2*	*0*	*0*	*0*	*0.0*	*0*
Detector 14 - I6U			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 15 - I6L			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 16 - I7UEB (1)			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 17 - I7L			*0*	*4*	*0*	*0*	*0.0*	*0*
Detector 18 - I8			*4*	*0*	*0*	*0*	*0.0*	*0*
Detector 19 - J2U			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 20 - J2LSBA (7)			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 21 - J3USB (5)			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 22 - J3LSBbike			*0*	*6*	*0*	*0*	*0.0*	*0*
Detector 23 - J4			*6*	*0*	*0*	*0*	*0.0*	*0*
Detector 24 - J6UWBT(7)			*8*	*8*	*0*	*0*	*0.0*	*0*
Detector 25 - J6LWBTB(8)			*8*	*8*	*0*	*0*	*0.0*	*0*
Detector 26 - J7UWBRTB			*8*	*8*	*0*	*12*	*0.0*	*0*
Detector 27 - J7LWBTHB			*0*	*8*	*0*	*0*	*0.0*	*0*
Detector 28 - J8			*8*	*0*	*0*	*0*	*0.0*	*0*
Detector 29 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 30 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 31 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 32 -			*0*	*0*	*0*	*0*	*0.0*	*0*

yellow lock, detector inhibit, - X = On; call, extend, phase - 0 = none 1 - 8 = phase 1 - 8 ; delay time - 0 - 255 sec
stretch / disconnect time - 0.0 - 25.5 sec.; delay or disconnect Mode - 0 -13

Detector Plans (next/2/2/4/5)

	Loop Number									
	Plan Detectors	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 32, 0 = none, 1 -3 2 = detectors 1 - 32
Detector Plan 1	**Call Phase**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13
Detector Plan 2	**Call Phase**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13
Detector Plan 3	**Call Phase**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13

Detector Fail Monitor (next/2/2/4/3)					Detectors 33-64 (next/2/2/4/6)		
	Fail Monitor Enable	Recall Phase	Min Counts	Max Counts		Call Phase	Extend Phase
Detector 1 - I1SBLT(11)		*0*	*0*	*0*	Detector 33 -	0	0
Detector 2 - I9USB (9)		*0*	*0*	*0*	Detector 34 -	0	0
Detector 3 - I5		*0*	*0*	*0*	Detector 35 -	0	0
Detector 4 - I9L		*0*	*0*	*0*	Detector 36 -	0	0
Detector 5 - J1NBLT (9)		*0*	*0*	*0*	Detector 37 -	0	0
Detector 6 - J9U		*0*	*0*	*0*	Detector 38 -	0	0
Detector 7 - J5		*0*	*0*	*0*	Detector 39 -	0	0
Detector 8 - J9L		*0*	*0*	*0*	Detector 40 -	0	0
Detector 9 - I2UNB (3)		*0*	*0*	*0*	Detector 41 -	0	0
Detector 10 - I2L		*0*	*0*	*0*	Detector 42 -	0	0
Detector 11 - I3UNBA (1)		*0*	*0*	*0*	Detector 43 -	0	0
Detector 12 - I3LNBO		*0*	*0*	*0*	Detector 44 -	0	0
Detector 13 - I4		*0*	*0*	*0*	Detector 45 -	0	0
Detector 14 - I6U		*0*	*0*	*0*	Detector 46 -	0	0
Detector 15 - I6L		*0*	*0*	*0*	Detector 47 -	0	0
Detector 16 - I7UEB (1)		*0*	*0*	*0*	Detector 48 -	0	0
Detector 17 - I7L		*0*	*0*	*0*	Detector 49 -	0	0
Detector 18 - I8		*0*	*0*	*0*	Detector 50 -	0	0
Detector 19 - J2U		*0*	*0*	*0*	Detector 51 -	0	0
Detector 20 - J2LSBA (7)		*0*	*0*	*0*	Detector 52 -	0	0
Detector 21 - J3USB (5)		*0*	*0*	*0*	Detector 53 -	0	0
Detector 22 - J3LSBbike		*0*	*0*	*0*	Detector 54 -	0	0
Detector 23 - J4		*0*	*0*	*0*	Detector 55 -	0	0
Detector 24 - J6UWBT(7)		*0*	*0*	*0*	Detector 56 -	0	0
Detector 25 - J6LWBTB(8)		*0*	*0*	*0*	Detector 57 -	0	0
Detector 26 - J7UWBRTB		*0*	*0*	*0*	Detector 58 -	0	0
Detector 27 - J7LWBTHB		*0*	*0*	*0*	Detector 59 -	0	0
Detector 28 - J8		*0*	*0*	*0*	Detector 60 -	0	0
Detector 29 -		*0*	*0*	*0*	Detector 61 -	0	0
Detector 30 -		*0*	*0*	*0*	Detector 62 -	0	0
Detector 31 -		*0*	*0*	*0*	Detector 63 -	0	0
Detector 32 -		*0*	*0*	*0*	Detector 64 -	0	0
fail monitor enable - X = On, recall phase - 0 = none 1 - 8 = phase 1 - 8, min, max					call / extend phase - 0 = none 1 - 8 = phase 1 - 8		

Detector Fail Sample Period (all detectors)	*0*	0 - 255 minutes

Video Fail Inputs (next/2/2/4/3) -->	1	2	3	4	5	6	7	8	
Phase Recalled	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = none, 1 - 8 = phase 1 - 8

System Detectors (next/2/2/4/4)									
System Detectors -->	1	2	3	4	5	6	7	8	
Local Detector	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = none, 1 - 32 = phase 1 - 32

Overlaps / FYLTA (next/2/2/8)

Vehicle Overlaps		Phase or Movement	Phases 1	2	3	4	5	6	7	8	Extension Green	Clearance Yellow	Clearance Red
Overlaps	A		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	B		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	C		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	D		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	E		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	F		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	G		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	H		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	I		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	J		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	K		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	L		0	0	0	0	0	0	0	0	0.0	0.0	0.0

A - D
0 = none
1 = overlap
2 = 60 FPM
3 = Not ped
4=Comp. Ph.
5=Prevent. Ext.
6=Not Veh.
7=Adv. FF

E - L
0 = no Overlap
1 = Overlap

Green,Yellow Red

Not Ped - Ped Overlaps (next/2/2/8/5)

Ped Overlaps ->		A	B	C	D	E	F	G	H
Overlaps	A								
	B								
	C								
	D								

X = Nor Ped Ped Overlap

Advance Warning (next/2/2/8/3)

	E	F	G	H	I	J	K	L	
Enable	0	0	0	0	0	0	0	0	0 = disabled, 1 = enabled
1st Conditional Overlap	0	0	0	0	0	0	0	0	0 = none, 1 - overlap E, 2 = overlap F, etc.
2nd Conditional Overlap	0	0	0	0	0	0	0	0	
Advance Deactivation Delay	0	0	0	0	0	0	0	0	0 - 99 seconds

Ped Overlaps (next/2/2/8/5)

Phase -->		1	2	3	4	5	6	7	8	Walk	Ped Clear	Ped Recall
Ped Overlap	A				X				X	7	15	
	B									0	0	
	C									0	0	
	D									0	0	
	E									0	0	
	F									0	0	
	G									0	0	
	H									0	0	

Phase, Ped Recall: X = on

Walk, Ped Clear: 0 - 255 seconds

Flashing Yellow Left Turn Arrow (FYLTA) (next/2/2/8/6)

Phase Pairs -->	1 - 2	3 - 4	5 - 6	7 - 8	
Enable	4	0	4	0	0 = off, 3 = 3 outputs, 4 = 4 outputs, 5 = 5 outputs
Even Omits Odd	1	0	1	0	0 = off, 1 = on, 2 = on, place call across barrier
Detector Switch Odd / Even	X	X	X	X	X = on, odd phase must be omitted
Red Transition	3.0	2.0	3.0	2.0	0.0 or 2.0 - 25.5 sec
Red Extension	3.0	0.0	3.0	0.0	0.0 - 25.5 sec
Return to GLTA	0	0	0	0	0 = off, 1 = max out, 2 = yellow lock

Flashing Yellow Left Turn Arrow (FYLTA) - Continued on last page

Service Plans (next/2/2/6)

		1	2	3	4	5	6	7	8	
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 1	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 2	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 3	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 4	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 5	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 6	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.

Service Plans Cont.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 7	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 8	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

Max Plans (next/2/2/7)

	Phase -->	1	2	3	4	5	6	7	8	
Max Plan 1	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 2	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 3	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 4	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 5	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 6	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 7	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 8	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec

Coordination Data (next/2/3)

Coordination Modes (next/2/3/1, next/2/3/4/1, next/2/3/4/3)

Flash Mode	*33*	0=off, 1=on, 33=time clock, 34=comm, 35=hardwire, 36=NWS Set only, 37=AB3418 / NTCIP S
Coordination Plan Mode	*0*	0=free, 1-32 = coord plan 1-32, 33=time clock, 34=comm, 35=hardwire, 36=NWS Set only, 37=
Offset Seeking Mode	*2*	0=add only, 1=dwell, 2=fastway
Late Ped	*0*	0 = off, 1 = on
Coord Walk Rest	*0*	0 = off, 1 = on, 2 = by TOD circuit 160, 3 = end of walk, 4 = coord ped during perms
Repeated Phase Service	*0*	0=off, 1=on (no coord ped), 2=on (beginning green coord ped), 3=on (coord ped always)
Zero Mode (TS2 only)	*1*	0=start of main street, 1=end of main street, 2=by TOD circuit 144

Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	0 = service allowed 1 = service prevented
Omit Phase During Repeated Phase Service	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
Auto Permissive Min Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 seconds

Coordination Plans (next/2/3/2)

Coord Plan	**Coordination Phases**		**Cycle Length**	**Offset Time**	**Min Cycle Length Dwell Time**	**Permissive**	**Service Plan**	**Max Plan**
	Ring 1	**Ring 2**						
1 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
3 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
4 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
5 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
6 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
7 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
8 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
9 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
10 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
11 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
12 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
13 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
14 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
15 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
16 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
17 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
18 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
19 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
20 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
21 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
22 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
23 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
24 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
25 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
26 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
27 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
28 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
29 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
30 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
31 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
32 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0 - 8		0 - 255 sec.				0 - 8	

Coordination Plans cont.

Coord Plan	* = Force Offs / Split Times (TS2)								* = Yield Points / Actuated Times (TS2)	
	1	2	3	4	5	6	7	8	Ring 1	Ring 2
1 -	0	0	0	0	0	0	0	0	0	0
2 -	0	0	0	0	0	0	0	0	0	0
3 -	0	0	0	0	0	0	0	0	0	0
4 -	0	0	0	0	0	0	0	0	0	0
5 -	0	0	0	0	0	0	0	0	0	0
6 -	0	0	0	0	0	0	0	0	0	0
7 -	0	0	0	0	0	0	0	0	0	0
8 -	0	0	0	0	0	0	0	0	0	0
9 -	0	0	0	0	0	0	0	0	0	0
10 -	0	0	0	0	0	0	0	0	0	0
11 -	0	0	0	0	0	0	0	0	0	0
12 -	0	0	0	0	0	0	0	0	0	0
13 -	0	0	0	0	0	0	0	0	0	0
14 -	0	0	0	0	0	0	0	0	0	0
15 -	0	0	0	0	0	0	0	0	0	0
16 -	0	0	0	0	0	0	0	0	0	0
17 -	0	0	0	0	0	0	0	0	0	0
18 -	0	0	0	0	0	0	0	0	0	0
19 -	0	0	0	0	0	0	0	0	0	0
20 -	0	0	0	0	0	0	0	0	0	0
21 -	0	0	0	0	0	0	0	0	0	0
22 -	0	0	0	0	0	0	0	0	0	0
23 -	0	0	0	0	0	0	0	0	0	0
24 -	0	0	0	0	0	0	0	0	0	0
25 -	0	0	0	0	0	0	0	0	0	0
26 -	0	0	0	0	0	0	0	0	0	0
27 -	0	0	0	0	0	0	0	0	0	0
28 -	0	0	0	0	0	0	0	0	0	0
29 -	0	0	0	0	0	0	0	0	0	0
30 -	0	0	0	0	0	0	0	0	0	0
31 -	0	0	0	0	0	0	0	0	0	0
32 -	0	0	0	0	0	0	0	0	0	0
	0 - 255 sec * = force offs and yield points									

Circuit Mapping (next/2/3/3)

Circuit Map	Coord Plan	Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit	
1	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
2	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
3	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
4	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
5	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
6	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
7	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
8	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
9	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
10	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
11	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
12	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
13	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
14	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
15	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
16	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
17	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
18	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
19	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
20	0	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U

coord plan - 0 = free, 1 - 32 = coord plan 1 - 32, 33 = any, 34 none selected
time clock circuits - 0 = not used, or circuits 6 - 196

Dynamic Phase Length (next/2/3/4/4)

Phase -->		1	2	3	4	5	6	7	8	
Back Detector		0	0	0	0	0	0	0	0	0 = none, 1-32 = detector 1-32
Lane Factor		0	0	0	0	0	0	0	0	0 = none, 1.0 - 5.0
Check Out Detector		0	0	0	0	0	0	0	0	0 = none, 1-32 = detector 1-32
Coord Delta Force Off	Set A	0	0	0	0	0	0	0	0	0 - 255 sec
	Set B	0	0	0	0	0	0	0	0	
	Set C	0	0	0	0	0	0	0	0	
	Set D	0	0	0	0	0	0	0	0	
Free Delta Max	Set A	0	0	0	0	0	0	0	0	
	Set B	0	0	0	0	0	0	0	0	
	Set C	0	0	0	0	0	0	0	0	
	Set D	0	0	0	0	0	0	0	0	

Platoon Progression (next/2/3/4/5)

Entry Local Only			Master Local Only		
Platoon Max	0	0 - 255 sec	Smoothing Factor	0.0	0.0 - 1.0
Min Platoon Green	0	0 - 255 sec			
Entry Detector Gap	0.0	0.0 - 25.5			
Min Platoon Cycle	0	0 - 255 sec			

Inbound			Outbound		
Only for Entry Inbound Local or Master Local			Only for Entry Outbound Local or Master Local		
Entry IB Local also Last OB Local	0	0 - 50	Entry OB Local also Last IB Local	0	0 - 50
Speed	0	0 - 55 mph	Speed	0	0 - 55 mph
Distance from Entry Local	0	0 - 65000 feet	Distance from Entry Local	0	0 - 65000 feet

Entry Local Only				Entry Local Only			
Distance from Entry Local Detector	0	0 - 999 feet		Distance from Entry Local Detector	0	0 - 999 feet	
Entry Local Detector	0	0	0 - 32	Entry Local Detector	0	0	0 - 32

Master Local				Master Local			
Master Mid - System Critical Detectors	0	0	0 - 16	Master Mid - System Critical Detectors	0	0	0 - 16

Force Off Percents

Inbound	1	3	4	5	7	8	Outbound	1	3	4	5	7	8
Split 1	0	0	0	0	0	0	Split 1	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	Split 2	0	0	0	0	0	0
	0 - 100 %							0 - 100 %					

Time of Day Data (next/2/4)

Day Program (next/2/4/1)

	Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off		Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On/Off
1							51						
2							52						
3							53						
4							54						
5							55						
6							56						
7							57						
8							58						
9							59						
10							60						
11							61						
12							62						
13							63						
14							64						
15							65						
16							66						
17							67						
18							68						
19							69						
20							70						
21							71						
22							72						
23							73						
24							74						
25							75						
26							76						
27							77						
28							78						
29							79						
30							80						
31							81						
32							82						
33							83						
34							84						
35							85						
36							86						
37							87						
38							88						
39							89						
40							90						
41							91						
42							92						
43							93						
44							94						
45							95						
46							96						
47							97						
48							98						
49							99						
50							100						
	1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on		1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on

Day Program cont.													
	Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off		Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off
101							151						
102							152						
103							153						
104							154						
105							155						
106							156						
107							157						
108							158						
109							159						
110							160						
111							161						
112							162						
113							163						
114							164						
115							165						
116							166						
117							167						
118							168						
119							169						
120							170						
121							171						
122							172						
123							173						
124							174						
125							175						
126							176						
127							177						
128							178						
129							179						
130							180						
131							181						
132							182						
133							183						
134							184						
135							185						
136							186						
137							187						
138							188						
139							189						
140							190						
141							191						
142							192						
143							193						
144							194						
145							195						
146							196						
147							197						
148							198						
149							199						
150							200						
	1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on		1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on

Week Program (next/2/4/2)

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1

0 = none, 1 - 15 = day plan

Exception Days (next/2/4/6)

	DOW	WOM	DOM	MOY	Day Prog.
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
	0-10	0 - 5	0-31	0-12	0 - 15

Year Program (next/2/4/3)

From Date	To Date	Week Program
01/01/2017	12/31/2017	1

New Years Day - Date - January 1st

Martin Luther King Day - DOW WOM - 3rd Monday of January

President's Day - DOW WOM - 3rd Monday February

Memorial Day - DOW WOM - Last Monday May

Fourth of July - Date - July 4th

Labor Day - DOW WOM - 1st Monday September

Columbus Day - DOW WOM - 2nd Monday October

Veteran's Day - Date - November 11th

Thanksgiving - DOW WOM - 4th Thursday November

Christmas - Date - December 25th

Time Clock References (next/2/4/5)

Synch reference Mode	0	0 = timed, 1 = by event
Synch Reference Time	00:00	00:00 - 23:59
Daylight Savings Enable	X	X = on
Reset Time	00:00	00:00 - 23:59

Exception day headings - DOW = Day of Week, WOM = Week of Month, DOM = Day of Month, MOY = Month of Year

Circuit Overrides (next/2/4/4)							
1 - Coord Line 1	CL1	*TOD*	On / Off / TOD	51 - Ped Omit 3	PO3	*TOD*	On / Off / TOD
2 - Coord Line 2	CL2	*TOD*		52 - Ped Omit 4	PO4	*TOD*	
3 - Coord Line 4	CL4	*TOD*		53 - Ped Omit 5	PO5	*TOD*	
4 - Coord Line 8	CL8	*TOD*		54 - Ped Omit 6	PO6	*TOD*	
5 - Coord Line 16	C16	*TOD*		55 - Ped Omit 7	PO7	*TOD*	
6 - Coord Operation	CRD	*TOD*		56 - Ped Omit 8	PO8	*TOD*	
7 - Soft Flash	SFL	*TOD*		57 - Conditional Service	CVS	*TOD*	
8 - Enable System Relays	ESR	*TOD*		58 - Inhibit Simultaneous Gap Out	ISG	*On*	
9 - Call to Non Act 1	CN1	*TOD*		59 - Inhibit Hardwire	HWI	*TOD*	
10 - Call to Non Act 2	CN2	*TOD*		60 - Ped Override Mode	POM	*On*	
11 - Walk Rest Modifier	WRM	*TOD*		61 - Dual Entry	DLE	*TOD*	
12 - Min Recall	MIN	*Off*		62 - Exclusive Ped	EPD	*TOD*	
13 - Max 2 Both Rings	MX2	*TOD*		63 - Call to Time Clock Mode	CTC	*TOD*	
14 - Coord Inhibit Max Ring 1, 2	IMT	*TOD*		64 - Dual Enhanced Ped	DEP	*TOD*	
15 - Enable Service Log	ESL	*TOD*		65 - Service Plan 1	SP1	*TOD*	
16 - Call to Free	CTF	*TOD*		66 - Service Plan 2	SP2	*TOD*	
17 - TOD Output 1	TO1	*TOD*		67 - Service Plan 3	SP3	*TOD*	
18 - TOD Output 2	TO2	*TOD*		68 - Service Plan 4	SP4	*TOD*	
19 - TOD Output 3	TO3	*TOD*		69 - Service Plan 5	SP5	*TOD*	
20 - TOD Output 4	TO4	*TOD*		70 - Service Plan 6	SP6	*TOD*	
21 - TOD Output 5	TO5	*TOD*		71 - Service Plan 7	SP7	*TOD*	
22 - TOD Output 6	TO6	*TOD*		72 - Service Plan 8	SP8	*TOD*	
23 - TOD Output 7	TO7	*TOD*		73 - Max Plan 1	MP1	*TOD*	
24 - TOD Output 8	TO8	*TOD*		74 - Max Plan 2	MP2	*TOD*	
25 - Vehicle Call Phase 1	VC1	*TOD*		75 - Max Plan 3	MP3	*TOD*	
26 - Vehicle Call Phase 2	VC2	*TOD*		76 - Max Plan 4	MP4	*TOD*	
27 - Vehicle Call Phase 3	VC3	*TOD*		77 - Max Plan 5	MP5	*TOD*	
28 - Vehicle Call Phase 4	VC4	*TOD*		78 - Max Plan 6	MP6	*TOD*	
29 - Vehicle Call Phase 5	VC5	*TOD*		79 - Max Plan 7	MP7	*TOD*	
30 - Vehicle Call Phase 6	VC6	*TOD*		80 - Max Plan 8	MP8	*TOD*	
31 - Vehicle Call Phase 7	VC7	*TOD*		81 - Transit Priority Max Group 1	TG1	*TOD*	
32 - Vehicle Call Phase 8	VC8	*TOD*		82 - Transit Priority Max Group 2	TG2	*TOD*	
33 - Ped Call Phase 1	PC1	*TOD*		83 - Transit Priority Max Group 3	TG3	*TOD*	
34 - Ped Call Phase 2	PC2	*TOD*		84 - Transit Priority Max Group 4	TG4	*TOD*	
35 - Ped Call Phase 3	PC3	*TOD*		85 - Transit Priority Max Group 5	TG5	*TOD*	
36 - Ped Call Phase 4	PC4	*TOD*		86 - Transit Priority Max Group 6	TG6	*TOD*	
37 - Ped Call Phase 5	PC5	*TOD*		87 - Transit Priority Max Group 7	TG7	*TOD*	
38 - Ped Call Phase 6	PC6	*TOD*		88 - Transit Priority Max Group 8	TG8	*TOD*	
39 - Ped Call Phase 7	PC7	*TOD*		89 - Inhibit Volume Density 1	IV1	*TOD*	
40 - Ped Call Phase 8	PC8	*TOD*		90 - Inhibit Volume Density 2	IV2	*TOD*	
41 - Vehicle Omit 1	VO1	*TOD*		91 - Inhibit Volume Density 3	Iv3	*TOD*	
42 - Vehicle Omit 2	VO2	*TOD*		92 - Inhibit Volume Density 4	IV4	*TOD*	
43 - Vehicle Omit 3	VO3	*TOD*		93 - Inhibit Volume Density 5	IV5	*TOD*	
44 - Vehicle Omit 4	VO4	*TOD*		94 - Inhibit Volume Density 6	IV6	*TOD*	
45 - Vehicle Omit 5	VO5	*TOD*		95 - Inhibit Volume Density 7	IV7	*TOD*	
46 - Vehicle Omit 6	VO6	*TOD*		96 - Inhibit Volume Density 8	IV8	*TOD*	
47 - Vehicle Omit 7	VO7	*TOD*		97 - Lag 1	LG1	*TOD*	
48 - Vehicle Omit 8	VO8	*TOD*		98 - Lag 3	LG3	*TOD*	
49 - Ped Omit 1	PO1	*TOD*		99 - Lag 5	LG5	*TOD*	
50 - Ped Omit 2	PO2	*TOD*		100 - Lag 7	LG7	*TOD*	

Circuit Overrides cont.							
101 - Inhibit Overlap A	**OLA**	*TOD*	On / Off / TOD	**151 - Coord Hold 7**	**HD7**	*TOD*	On / Off / TOD
102 - Inhibit Overlap B	**OLB**	*TOD*		**152 - Coord Hold 8**	**HD8**	*TOD*	
103 - Inhibit Overlap C	**OLC**	*TOD*		**153 - PE Priority Return B**	**PRB**	*TOD*	
104 - Inhibit Overlap D	**OLD**	*TOD*		**154 - PE Priority Return C**	**PRC**	*TOD*	
105 - Enable Schedule A Phone 1	**AT1**	*TOD*		**155 - PE Priority Return D**	**PRD**	*TOD*	
106 - Enable Schedule A Phone 2	**AT2**	*TOD*		**156 - PE Priority Return E**	**PRE**	*TOD*	
107 - Enable Schedule B Phone 1	**BT1**	*TOD*		**157 - Platoon Inbound**	**PPI**	*TOD*	
108 - Enable Schedule B Phone 2	**BT2**	*TOD*		**158 - Platoon Outbound**	**PPO**	*TOD*	
109 - Enable Schedule C Phone 1	**CT1**	*TOD*		**159 - Platoon Spl 2**	**PS2**	*TOD*	
110 - Enable Schedule C Phone 2	**CT2**	*TOD*		**160 - Coord Walk Rest**	**CWR**	*TOD*	
111 - Enable Volume to Call Phone 1	**VT1**	*TOD*		**161 - Dynamic Phase Length Short Inhibit 1**	**SI1**	*TOD*	
112 - Enable Volume to Call Phone 2	**VT2**	*TOD*		**162 - Dynamic Phase Length Short Inhibit 2**	**SI2**	*TOD*	
113 - Enable Volume Logging	**EVL**	***On***		**163 - Dynamic Phase Length Short Inhibit 3**	**SI3**	*TOD*	
114 - Enable MOE Logging	**EML**	***On***		**164 - Dynamic Phase Length Short Inhibit 4**	**SI4**	*TOD*	
115 - Detector Low Threshold Inhibit	**DLI**	*TOD*		**165 - Dynamic Phase Length Short Inhibit 5**	**SI5**	*TOD*	
116 - Detector Continue Presence Inhibit	**DPI**	*TOD*		**166 - Dynamic Phase Length Short Inhibit 6**	**SI6**	*TOD*	
117 - Inhibit Detector Based on Programming	**IND**	*TOD*		**167 - Dynamic Phase Length Short Inhibit 7**	**SI7**	*TOD*	
118 - Inhibit Detector Delay	**IDD**	*TOD*		**168 - Dynamic Phase Length Short Inhibit 8**	**SI8**	*TOD*	
119 - Inhibit Conditional Ped	**ICP**	*TOD*		**169 - Coord Late Left Turn 1**	**CT1**	*TOD*	
120 - Inhibit Transit Priority	**ITP**	*TOD*		**170 - Coord Late Left Turn 3**	**CT3**	*TOD*	
121 - Red Rest Ring 1,2	**RRM**	*TOD*		**171 - Coord Late Left Turn 5**	**CT5**	*TOD*	
122 - Enable Transcend	**TRA**	*TOD*		**172 - Coord Late Left Turn 7**	**CT7**	*TOD*	
123 - Omit Red Clear Ring 1,2	**ORC**	*TOD*		**173 - Dynamic Phase Length Enable A**	**DPA**	*TOD*	
124 - Not Used	**N/U**	*TOD*		**174 - Dynamic Phase Length Enable B**	**DPB**	*TOD*	
125 - Ped Recycle Ring 1,2	**PCY**	*TOD*		**175 - Dynamic Phase Length Enable C**	**DPC**	*TOD*	
126 - Not Used	**N/U**	*TOD*		**176 - Dynamic Phase Length Enable D**	**DPD**	*TOD*	
127 - Enable MOE Log to Call Phone 1	**MT1**	*TOD*		**177 - Proactive Plan Select Average**	**PSA**	*TOD*	
128 - Enable MOE Log to Call Phone 2	**MT2**	*TOD*		**178 - Proactive Plan Select Inbound**	**PSI**	*TOD*	
129 - Transit Inhibit Short Time 1	**IS1**	*TOD*		**179 - Proactive Plan Select Outbound**	**PSO**	*TOD*	
130 - Transit Inhibit Short Time 2	**IS2**	*TOD*		**180 - Split Variant Inbound**	**SVI**	*TOD*	
131 - Transit Inhibit Short Time 3	**IS3**	*TOD*		**181 - Split Variant Outbound**	**SVO**	*TOD*	
132 - Transit Inhibit Short Time 4	**IS4**	*TOD*		**182 - Disable Coord Walk Rest Ring 1**	**DW1**	*TOD*	
133 - Transit Inhibit Short Time 5	**IS5**	*TOD*		**183 - Disable Coord Walk Rest Ring 2**	**DW2**	*TOD*	
134 - Transit Inhibit Short Time 6	**IS6**	*TOD*		**184 - Proactive Plan Select New Look**	**NLK**	*TOD*	
135 - Transit Inhibit Short Time 7	**IS7**	*TOD*		**185 - Disable Red Clearance Extension**	**DRX**	*TOD*	
136 - Transit Inhibit Short Time 8	**IS8**	*TOD*		**186 - Detector Plan Line 1**	**DL1**	*TOD*	
137 - Enable Transit Priority Logging	**ETL**	*TOD*		**187 - Detector Plan Line 2**	**DL2**	*TOD*	
138 - Disable Flashing Yellow Arrow 1	**DF1**	*TOD*		**188 - Disable LRT 1 Vertical Flashing Bar**	**DV1**	*TOD*	
139 - Disable Flashing Yellow Arrow 3	**DF3**	*TOD*		**189 - Disable LRT 2 Vertical Flashing Bar**	**DV2**	*TOD*	
140 - Disable Flashing Yellow Arrow 5	**DF5**	*TOD*		**190 - Disable LRT 3 Vertical Flashing Bar**	**DV3**	*TOD*	
141 - Disable Flashing Yellow Arrow 7	**DF7**	*TOD*		**191 - Disable LRT 4 Vertical Flashing Bar**	**DV4**	*TOD*	
142 - Disable Auto Max	**DAM**	*TOD*		**192 - Datakey Enable**	**DKE**	***On***	
143 - Disable Repeat Phase Service	**DRS**	*TOD*		**193 - Dynamic Phase Reversal Enable 1**	**DR1**	*TOD*	
144 - Coord End of Main Street	**EMS**	*TOD*		**194 - Dynamic Phase Reversal Enable 3**	**DR3**	*TOD*	
145 - Coord Hold 1	**HD1**	*TOD*		**195 - Dynamic Phase Reversal Enable 5**	**DR5**	*TOD*	
146 - Coord Hold 2	**HD2**	*TOD*		**196 - Dynamic Phase Reversal Enable 7**	**DR7**	*TOD*	
147 - Coord Hold 3	**HD3**	*TOD*		**197 - Enable Coord Logging**	**ECL**	***On***	
148 - Coord Hold 4	**HD4**	*TOD*		**198 - Disable Gap FYLTA 1,3,5,7**	**DGF**	*TOD*	
149 - Coord Hold 5	**HD5**	*TOD*		**199 - Coordination Auto Walk**	**CAW**	*TOD*	
150 - Coord Hold 6	**HD6**	*TOD*		**200 - Enable Coordinated Auto Max**	**ECM**	*TOD*	

Preemption Data (next/2/5)

Sequence (next/2/5/1 - 8)

Sequences / Intervals		Instruction	Phases Serviced	Interval Time	Hold On Input	Outputs On	Output Mode
1	1	*197*	*25*	*0*	*1*		*0*
	2	*98*		*0*	*0*		*0*
	3	*0*		*0*	*0*		*0*
	4	*0*		*0*	*0*		*0*
	5	*0*		*0*	*0*		*0*
	6	*0*		*0*	*0*		*0*
	7	*0*		*0*	*0*		*0*
	8	*0*		*0*	*0*		*0*
	9	*0*		*0*	*0*		*0*
	10	*0*		*0*	*0*		*0*
2	1	*0*		*0*	*0*		*0*
	2	*0*		*0*	*0*		*0*
	3	*0*		*0*	*0*		*0*
	4	*0*		*0*	*0*		*0*
	5	*0*		*0*	*0*		*0*
	6	*0*		*0*	*0*		*0*
	7	*0*		*0*	*0*		*0*
	8	*0*		*0*	*0*		*0*
	9	*0*		*0*	*0*		*0*
	10	*0*		*0*	*0*		*0*
3	1	*197*	*16*	*0*	*1*		*0*
	2	*98*		*0*	*0*		*0*
	3	*0*		*0*	*0*		*0*
	4	*0*		*0*	*0*		*0*
	5	*0*		*0*	*0*		*0*
	6	*0*		*0*	*0*		*0*
	7	*0*		*0*	*0*		*0*
	8	*0*		*0*	*0*		*0*
	9	*0*		*0*	*0*		*0*
	10	*0*		*0*	*0*		*0*
4	1	*197*	*8*	*0*	*1*		*0*
	2	*98*		*0*	*0*		*0*
	3	*0*		*0*	*0*		*0*
	4	*0*		*0*	*0*		*0*
	5	*0*		*0*	*0*		*0*
	6	*0*		*0*	*0*		*0*
	7	*0*		*0*	*0*		*0*
	8	*0*		*0*	*0*		*0*
	9	*0*		*0*	*0*		*0*
	10	*0*		*0*	*0*		*0*
5	1	*0*		*0*	*0*		*0*
	2	*0*		*0*	*0*		*0*
	3	*0*		*0*	*0*		*0*
	4	*0*		*0*	*0*		*0*
	5	*0*		*0*	*0*		*0*
	6	*0*		*0*	*0*		*0*
	7	*0*		*0*	*0*		*0*
	8	*0*		*0*	*0*		*0*
	9	*0*		*0*	*0*		*0*
	10	*0*		*0*	*0*		*0*

Instructions
0 - Service Phases
1-9 = Special Interval 1-9
10 - Preempt Sequence Allows FYLTA
11 - Preempt Interval Disables FYLTA
15 - Alternate Trap Protection
90 - Go to all Red
91 - Soft Flash On
92 - Soft Flash Off
93 - Enable Ped
94 - Disable Peds
95 - Priority Return
96 - Enable Coordination with peds
97 - Enable Coordination without peds
98 - Return with NO Calls
99 - Return with Vehicle Calls
100 - jump to step in Interval Time
101 - Use Interval Time as Resetable Gap Timer
196 - Coord Re-synch with Peds
197 - Coord Re-synch without Peds
200 - Light Rail Train phase without Peds
201 - Light Rail Train phase with Peds
202 - Return to highest queue/delay phase (this uses the Dynamic Phase Length Back Detectors)
216 - Light Rail Train Coord Re-synch with Peds
217 - Light Rail Train Coord Re-synch without Peds

Phases Serviced - phases 1 - 8

Interval Time - 0 - 255 sec or interval 1 - 10

Hold on Input:
0 = Do not hold
1 = Hold
2 = Ped Service to Rest in Walk

Outputs On - output 1 - 8

Output Modes -
0 = all steady on
1 = all flash together
2 = odd flashes WIG, even flashes WAG
3 = 1 - 4 steady on, 5 - 8 all flash together

Sequence cont.							
Sequences / Intervals		Instruction	Phases Serviced	Interval Time	Hold On Input	Outputs On	Output Mode
6	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
7	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
8	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0

Sequence Timing (next/2/5/0)										
	Sequence -- >	1	2	3	4	5	6	7	8	
	Input Memory									X = on
	Input Priority	6	6	6	6	0	0	0	0	0 = lowest, - 8 = highest
Entry (Transition) Parameters	Min Green	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
	Walk	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0 would time the normal function time
	Ped Clear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Overlap Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
	Overlap Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Delay to Preempt	0	0	0	0	0	0	0	0	0 - 255 sec
	Delay Ped Omit	0	0	0	0	0	0	0	0	
	Delay Phase Omit	0	0	0	0	0	0	0	0	
	Min Reservice	0	0	0	0	0	0	0	0	0 - 255 min
Overlap Inhibits	A									X = inhibit
	B									
	C									
	D									
Exit Parameters	Exit to Coord Plan Offset by X	0	0	0	0	0	0	0	0	0 - 20
	Exit Coord Plan Time	0	0	0	0	0	0	0	0	0 - 60 min
	Exit to Max Plan	0	0	0	0	0	0	0	0	0 - 8
	Exit Free Time	0	0	0	0	0	0	0	0	0 - 60 min
	Override Time	0	0	0	0	0	0	0	0	
	Fail Time	0	0	0	0	0	0	0	0	
	Exit Mode Time	0	0	0	0	0	0	0	0	

Priority Return and Special Intervals (next/2/5/0/6, next/2/5/9)													
Phase / Overlap -->		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**A**	**B**	**C**	**D**
Priority Return	**Enable**	*0*	0 = disabled, 1 = enabled, 2 = enabled, skip preemption phases on exit										
	A (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 100% of currently used max			
	B (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*				
	C (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*				
	D (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*				
	E (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*				
	Ped Clear	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 100% of currently used ped clearance			
Queue Delay Recovery		*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.			
Special Intervals	**1**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	3	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	4	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	5	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	6	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	7	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	8	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	9	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

0 = Dark
1 = green don't walk
2 = green walk
3 = green flashing don't walk
4 = yellow
5 = red
6 = flashing yellow WIG
7 = flashing yellow WAG
8 = flashing red WIG
9 = flashing red WAG
10 = walk only
11=flashing don't walk only

Light Rail Train (next/2/5/0/7)						
Light Rail Train -->	**1**	**2**	**3**	**4**	
Associated Preempt	*0*	*0*	*0*	*0*	0 = none, preempt 1 - 8
Time to Green	*0*	*0*	*0*	*0*	0 - 255 sec
Horizontal Bar Flash Time	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
Vertical Bar Flash Time	*0.0*	*0.0*	*0.0*	*0.0*	
Min Duration	*0*	*0*	*0*	*0*	0 - 255 sec

Communications Data (next/2/6)

1st Central Phone Number		**2nd Central Phone Number**	
Modem Setup String		**Intersection Name**	*South Canal at Odem Medo*
Subnet Mask	*255.255.255.192*		
IP (ethernet) Port	*25000*		
Central Port	*6*		
System Mode	*0*		
System Port	*0*	**Alternate System Port**	*0*

System ID	*154*	**AB3418e Physical Address**	*1*		**IP Address**	*10.12.64.67*	
Local ID	*1*	**AB3418e Group Address**	*0*		**Gateway Address**	*10.12.64.65*	

Baud Rates		**Flow Control**	**Port Use**
Port 1 (Slot A2 Upper)	*0*	*1*	*Suggested Use - FSK*
Port 2 (Slot A2 Lower)	*0*	*1*	*modem to central*
Port 3 (Slot A1 Upper)	*0*	*0*	*Suggested Use - Modem to Central*
Port 4 (Slot A1 Lower or C50S)	*2*	*N\U*	*Suggested Use - RS232 to Laptop*
0 = 1200, 1 = 2400, 2 = 9600, 3 = 19200 baud		0 = off, 1 = on	

Reports

Volume Log Period	*60*	minutes	**Volume/Occ Log Period**	*0*	second	**MOE Log Period**	*30*	minute

0 = disabled, 1,2,3,4,5,6,10,12,15,20,30,60 minutes

Function Schedule Mapping (next/2/6/7)

Alarm 1	*0*		**Soft Flash**	*3*	
Alarm 2	*0*		**Manual Control Enable (MCE)**	*3*	
Alarm 3	*0*		**Emergency or Railroad Preempt**	*1*	
Alarm 4	*0*		**Not Used**	*0*	
Alarm 5	*0*	0 = none	**Cycle Failure**	*2*	0 = none
Not Used	*0*	1 = schedule A	**Coordination Failure**	*2*	1 = schedule A
Not Used	*0*	2 = schedule B	**Keyboard use / Data Changed**	*2*	2 = schedule B
Not Used	*0*	3 = schedule C	**Coord Running / Free**	*3*	3 = schedule C
Not Used	*0*	4 = schedule R	**Cabinet Door**	*2*	4 = schedule R
Power On / Off	*2*		**Extended Ped Pushbutton**	*0*	
Checksum Failure	*2*		**Monitor Status**	*2*	
Video / Detector Failure	*2*		**Red Extension**	*0*	
Master to Local Comm Lost	*0*				

Miscellaneous Data

Transit Priority (next/2/7)

	1	2	3	4	5	6	7	8	
Phases									Phases 1 - 8 (max of 2 compatible phases)
PE Enable (6.25Hz TP call on PE)									X = 6.25 Hz signal will activate TP
Priority	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 8 = highest
Memory									X = on
Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
Minimum Reservice Time (per input)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 min
Override Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
Bus Extend	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
Minimum Reservice Time (all inputs)	*0*	0 - 255 min							
Free Operation Mode	*0*	0 = use shortest of max 1 or 2, 1 - 8 = use max time of group 1 - 8, 9 = use time of day							

Transit Priority Alternate Force Off Plans

Current Coord Plan	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Alternate TP Force Off Plan	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Current Coord Plan	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Alternate TP Force Off Plan	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

0 = none
17 - 32 = coord plan 17 - 32

Group Timing

	Phase -->	1	2	3	4	5	6	7	8
Group 1	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 2	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 3	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 4	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 5	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 6	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 7	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 8	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

0 - 255 sec
0 would time the normal function time

Truck Priority (next/2/7/9)

	1	2	3	4	
Truck Priority-->	**1**	**2**	**3**	**4**	
Associated Transit Priority	*0*	*0*	*0*	*0*	0 = none 1 - 8 = transit priority 1 - 8
Leading Detector	*0*	*0*	*0*	*0*	0 = none, 1 - 32 = detector 1 - 32
Trailing Detector	*0*	*0*	*0*	*0*	
Stop Bar Distance	*0*	*0*	*0*	*0*	0 - 999 feet
Trap Distance	*0*	*0*	*0*	*0*	0.0 - 99.9 feet
Minimum Speed	*0*	*0*	*0*	*0*	0 - 100 mph
Minimum Length	*0*	*0*	*0*	*0*	0 - 255 feet
Downhill Grade	*0*	*0*	*0*	*0*	0 - 20 %
Uphill Grade	*0*	*0*	*0*	*0*	
Undersized Vehicle					X = Enabled

Change I/O		X = On (After a download with a power on - off cycle)

Inputs (Non Default I/O is offset to the right) (next/2/8/1)

C1-39	*101*	*VD9*	**C1-55**	*15*	*VD5*	**C1-67**	*22*	*PED2*	**C11-15**	*254*	*N/U*
C1-40	*113*	*VD19*	**C1-56**	*11*	*VD1*	**C1-68**	*26*	*PED6*	**C11-16**	*254*	*N/U*
C1-41	*106*	*VD14*	**C1-57**	*17*	*VD7*	**C1-69**	*24*	*PED4*	**C11-17**	*254*	*N/U*
C1-42	*118*	*VD24*	**C1-58**	*13*	*VD3*	**C1-70**	*28*	*PED8*	**C11-18**	*254*	*N/U*
C1-43	*102*	*VD10*	**C1-59**	*16*	*VD6*	**C1-71**	*151*	*PE1*	**C11-19**	*254*	*N/U*
C1-44	*114*	*VD20*	**C1-60**	*12*	*VD2*	**C1-72**	*152*	*PE2*	**C11-20**	*254*	*N/U*
C1-45	*107*	*VD15*	**C1-61**	*18*	*VD8*	**C1-73**	*153*	*PE3*	**C11-21**	*254*	*N/U*
C1-46	*161*	*VD25*	**C1-62**	*14*	*VD4*	**C1-74**	*154*	*PE4*	**C11-22**	*254*	*N/U*
C1-47	*105*	*VD13*	**C11-10**	*254*	*N/U*	**C1-75**	*254*	*N/U*	**C11-23**	*254*	*N/U*
C1-48	*117*	*VD23*	**C11-11**	*254*	*N/U*	**C1-76**	*104*	*VD12*	**C11-24**	*254*	*N/U*
C1-49	*112*	*VD18*	**C11-12**	*254*	*N/U*	**C1-77**	*116*	*VD22*	**C11-25**	*254*	*N/U*
C1-50	*164*	*VD28*	**C11-13**	*254*	*N/U*	**C1-78**	*111*	*VD17*	**C11-26**	*254*	*N/U*
C1-51	*199*	*PEDI*	**C1-63**	*103*	*VD11*	**C1-79**	*163*	*VD27*	**C11-27**	*254*	*N/U*
C1-52	*155*	*PE5*	**C1-64**	*115*	*VD21*	**C1-80**	*82*	*IADV*	**C11-28**	*254*	*N/U*
C1-53	*85*	*MCE*	**C1-65**	*108*	*VD16*	**C1-81**	*137*	*MONS*	**C11-29**	*254*	*N/U*
C1-54	*254*	*N/U*	**C1-66**	*162*	*VD26*	**C1-82**	*62*	*ST1*	**C11-30**	*254*	*N/U*

Outputs (Non Default I/O is offset to the right) (next/2/8/2)

C1-2	*44*	*4DWK*	**C1-19**	*48*	*8DWK*	**C1-35**	*215*	*FYA1*	**C1-91**	*41*	*1DWK*
C1-3	*64*	*4WLK*	**C1-20**	*68*	*8WLK*	**C1-36**	*217*	*FYA5*	**C1-93**	*61*	*1WLK*
C1-4	*14*	*4RED*	**C1-21**	*18*	*8RED*	**C1-37**	*133*	*TO3*	**C1-94**	*106*	*OLBR*
C1-5	*24*	*4YEL*	**C1-22**	*28*	*8YEL*	**C1-38**	*134*	*TO4*	**C1-95**	*105*	*OLBY*
C1-6	*34*	*4GRN*	**C1-23**	*38*	*8GRN*	**C1-100**	*53*	*3PCL*	**C1-96**	*104*	*OLBG*
C1-7	*13*	*3RED*	**C1-24**	*17*	*7RED*	**C1-101**	*51*	*1PCL*	**C1-97**	*103*	*OLAR*
C1-8	*23*	*3YEL*	**C1-25**	*27*	*7YEL*	**C1-102**	*187*	*SFL*	**C1-98**	*102*	*OLAY*
C1-9	*33*	*3GRN*	**C1-26**	*37*	*7GRN*	**C1-103**	*147*	*WDOG*	**C1-99**	*101*	*OLAG*
C1-10	*42*	*2DWK*	**C1-27**	*46*	*6DWK*	**C1-83**	*43*	*3DWK*	**C11-1**	*254*	*N/U*
C1-11	*62*	*2WLK*	**C1-28**	*66*	*6WLK*	**C1-84**	*63*	*3WLK*	**C11-2**	*254*	*N/U*
C1-12	*12*	*2RED*	**C1-29**	*16*	*6RED*	**C1-85**	*116*	*OLDR*	**C11-3**	*254*	*N/U*
C1-13	*22*	*2YEL*	**C1-30**	*26*	*6YEL*	**C1-86**	*115*	*OLDY*	**C11-4**	*254*	*N/U*
C1-15	*32*	*2GRN*	**C1-31**	*36*	*6GRN*	**C1-87**	*114*	*OLDG*	**C11-5**	*254*	*N/U*
C1-16	*11*	*1RED*	**C1-32**	*15*	*5RED*	**C1-88**	*113*	*OLCR*	**C11-6**	*254*	*N/U*
C1-17	*221*	*FYC1*	**C1-33**	*223*	*FYC5*	**C1-89**	*112*	*OLCY*	**C11-7**	*254*	*N/U*
C1-18	*31*	*1GRN*	**C1-34**	*35*	*5GRN*	**C1-90**	*111*	*OLCG*	**C11-8**	*254*	*N/U*

Internal Logic (next/2/9)			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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FYLTA - Continued (next/2/2/8/6)						
	Phase Pairs -->	**1 - 2**	**3 - 4**	**5 - 6**	**7 - 8**	
Gap-Dependent FYLTA (next/2/2/8/6-A)	**Detector Input**	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Not Ped	*2*	*0*	*2*	*0*	0 - 255 sec

FYLTA Gap-Dependent Plans (next/2/2/8/6)						
	Phase Pairs -->	**1 - 2**	**3 - 4**	**5 - 6**	**7 - 8**	
FYLTA Gap-Dependent Plan A	**Detector Input**	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Not Ped	*0*	*0*	*0*	*0*	0 - 255 sec
FYLTA Gap-Dependent Plan B	**Detector Input**	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Not Ped	*0*	*0*	*0*	*0*	0 - 255 sec
FYLTA Gap-Dependent Plan C	**Detector Input**	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec

	Not Ped	0	0	0	0	0 - 255 sec
FYLTA Gap-Dependent Plan D	Detector Input	0	0	0	0	0 = disable, 1 - 64 detectors
	Min Delay	0	0	0	0	0 - 255 sec
	Detector Gap	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Max Delay	0	0	0	0	0 - 255 sec
	Not Ped	0	0	0	0	0 - 255 sec

Preemption - Continued

Railroad Communications (IEEE 1570) (next/2/5/0/8)

	ATC	Wayside	
Railroad Number	0	0	0 - 999, represents railroad
Railroad Line Number	0	0	0 - 999, represents railroad line
Group Number	0	0	0 - 999, represents physical group of equipment
Subnode Number	0	0	0 - 99, subnode within physical group of equipment
Device Number	0	0	0 - 99, device within physical group of equipment
Associated Preempt	0		0 - 8
Communication Port	0		0 - 4

Reports - Continued

Reports - Service Delay Modes (next/2/6/0)

Phase -->	1	2	3	4	5	6	7	8	
Mode	0	0	0	0	0	0	0	0	0 = disable, 1 = enable, 2 = Ped, 3 = Veh/P

Ped Overlap -->	A	B	C	D	E	F	G	H	
Mode	0	0	0	0	0	0	0	0	0 = disable, 1 = enable

Detector -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detector -->	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detector -->	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detector -->	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix F – Existing PM Operational Analysis Worksheets

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	159	398	7	166	261	74
Future Volume (vph)	159	398	7	166	261	74
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1733	1458	1421	1716	1630	1458
Flt Permitted	1.00	1.00	0.47	1.00	0.95	1.00
Satd. Flow (perm)	1733	1458	702	1716	1630	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	173	433	8	180	284	80
RTOR Reduction (vph)	0	298	0	0	0	55
Lane Group Flow (vph)	173	135	8	180	284	25
Heavy Vehicles (%)	1%	2%	17%	2%	2%	2%
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	11.8	11.8	17.1	17.1	11.7	11.7
Effective Green, g (s)	11.8	11.8	17.1	17.1	11.7	11.7
Actuated g/C Ratio	0.31	0.31	0.45	0.45	0.31	0.31
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	540	455	332	776	504	451
v/s Ratio Prot	c0.10		0.00	c0.10	c0.17	
v/s Ratio Perm		0.09	0.01			0.02
v/c Ratio	0.32	0.30	0.02	0.23	0.56	0.05
Uniform Delay, d1	9.9	9.9	6.0	6.3	10.9	9.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.4	0.0	0.2	1.4	0.1
Delay (s)	10.3	10.2	6.0	6.5	12.4	9.2
Level of Service	B	B	A	A	B	A
Approach Delay (s)	10.2			6.5	11.7	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	37.8	Sum of lost time (s)	13.5
Intersection Capacity Utilization	39.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	173	433	8	180	284	80
v/c Ratio	0.29	0.55	0.02	0.28	0.51	0.15
Control Delay	12.0	4.9	7.1	8.9	14.0	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.0	4.9	7.1	8.9	14.0	4.2
Queue Length 50th (ft)	18	0	1	19	31	0
Queue Length 95th (ft)	88	55	7	61	137	23
Internal Link Dist (ft)	689			452	761	
Turn Bay Length (ft)			200			175
Base Capacity (vph)	1634	1399	412	1684	1444	1301
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.31	0.02	0.11	0.20	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	549	107	57	369	1	0	0	0	8	0	216
Future Volume (vph)	0	549	107	57	369	1	0	0	0	8	0	216
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5		4.5	4.5						4.5	4.5
Lane Util. Factor		0.95		1.00	1.00						1.00	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.98		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.95	1.00
Satd. Flow (prot)		3206		1662	1715						1662	1458
Flt Permitted		1.00		0.27	1.00						0.95	1.00
Satd. Flow (perm)		3206		477	1715						1662	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	597	116	62	401	1	0	0	0	9	0	235
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	0	0	0	194
Lane Group Flow (vph)	0	695	0	62	402	0	0	0	0	0	9	41
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	2%
Turn Type		NA		pm+pt	NA					Perm	NA	Perm
Protected Phases		6		5	2						8	
Permitted Phases				2						8		8
Actuated Green, G (s)		18.2		26.2	26.2						7.4	7.4
Effective Green, g (s)		18.2		26.2	26.2						7.4	7.4
Actuated g/C Ratio		0.43		0.62	0.62						0.17	0.17
Clearance Time (s)		4.5		4.5	4.5						4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		1369		390	1054						288	253
v/s Ratio Prot		c0.22		0.01	c0.23							
v/s Ratio Perm				0.08							0.01	c0.03
v/c Ratio		0.51		0.16	0.38						0.03	0.16
Uniform Delay, d1		8.9		3.8	4.1						14.6	15.0
Progression Factor		1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2		0.3		0.2	0.2						0.0	0.3
Delay (s)		9.2		4.0	4.4						14.7	15.3
Level of Service		A		A	A						B	B
Approach Delay (s)		9.2			4.3			0.0			15.2	
Approach LOS		A			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	42.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	713	62	402	9	235
v/c Ratio	0.49	0.13	0.40	0.03	0.52
Control Delay	10.6	4.3	5.9	16.4	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	4.3	5.9	16.4	7.8
Queue Length 50th (ft)	63	4	33	2	0
Queue Length 95th (ft)	123	17	94	11	46
Internal Link Dist (ft)	3583		689	648	
Turn Bay Length (ft)		250			275
Base Capacity (vph)	2252	477	1556	1337	1219
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.13	0.26	0.01	0.19

Intersection Summary

Intersection	
Intersection Delay, s/veh	16.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	115	53	315	170	88	74	69	258	47	44	6
Future Vol, veh/h	6	115	53	315	170	88	74	69	258	47	44	6
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	0	3	0	1	0	0	0	0	1	0	0	0
Mvmt Flow	6	122	56	335	181	94	79	73	274	50	47	6
Number of Lanes	1	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	13.6	18.9	14.3	12.9
HCM LOS	B	C	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	52%	0%	100%	0%	100%	0%	48%
Vol Thru, %	48%	0%	0%	68%	0%	66%	45%
Vol Right, %	0%	100%	0%	32%	0%	34%	6%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	143	258	6	168	315	258	97
LT Vol	74	0	6	0	315	0	47
Through Vol	69	0	0	115	0	170	44
RT Vol	0	258	0	53	0	88	6
Lane Flow Rate	152	274	6	179	335	274	103
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.31	0.484	0.014	0.353	0.654	0.477	0.221
Departure Headway (Hd)	7.328	6.352	7.793	7.105	7.14	6.369	7.695
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	493	571	460	508	509	568	467
Service Time	5.028	4.052	5.522	4.834	4.84	4.069	5.722
HCM Lane V/C Ratio	0.308	0.48	0.013	0.352	0.658	0.482	0.221
HCM Control Delay	13.3	14.9	10.6	13.7	22.3	14.7	12.9
HCM Lane LOS	B	B	B	B	C	B	B
HCM 95th-tile Q	1.3	2.6	0	1.6	4.7	2.6	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	163	152	156	197	27	221	421	226	40	292	148
Future Volume (vph)	106	163	152	156	197	27	221	421	226	40	292	148
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1598	1733	1454	1646	1686		1646	3131		1539	3101	
Flt Permitted	0.53	1.00	1.00	0.52	1.00		0.32	1.00		0.34	1.00	
Satd. Flow (perm)	891	1733	1454	896	1686		559	3131		547	3101	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	116	179	167	171	216	30	243	463	248	44	321	163
RTOR Reduction (vph)	0	0	128	0	6	0	0	72	0	0	71	0
Lane Group Flow (vph)	116	179	39	171	240	0	243	639	0	44	413	0
Confl. Peds. (#/hr)	2		1	1		2	2					2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	4%	1%	1%	1%	2%	0%	1%	1%	0%	8%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)	20.9	15.5	15.5	24.5	17.3		31.1	23.4		22.5	18.8	
Effective Green, g (s)	20.9	15.5	15.5	24.5	17.3		31.1	23.4		22.5	18.8	
Actuated g/C Ratio	0.32	0.23	0.23	0.37	0.26		0.47	0.35		0.34	0.28	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	338	405	339	412	439		398	1105		240	879	
v/s Ratio Prot	0.03	0.10		c0.05	c0.14		c0.08	0.20		0.01	0.13	
v/s Ratio Perm	0.08		0.03	0.11			c0.21			0.05		
v/c Ratio	0.34	0.44	0.12	0.42	0.55		0.61	0.58		0.18	0.47	
Uniform Delay, d1	16.8	21.7	20.0	14.8	21.1		11.5	17.4		14.9	19.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.8	0.2	0.7	1.4		2.8	0.7		0.4	0.4	
Delay (s)	17.4	22.5	20.2	15.5	22.5		14.3	18.2		15.3	20.0	
Level of Service	B	C	C	B	C		B	B		B	C	
Approach Delay (s)		20.4			19.6			17.2			19.6	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	66.3	Sum of lost time (s)	16.5
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	116	179	167	171	246	243	711	44	484
v/c Ratio	0.31	0.46	0.36	0.42	0.53	0.63	0.58	0.14	0.54
Control Delay	16.0	26.2	6.7	17.8	26.5	20.9	17.7	11.7	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	26.2	6.7	17.8	26.5	20.9	17.7	11.7	18.4
Queue Length 50th (ft)	28	59	0	42	83	55	107	9	64
Queue Length 95th (ft)	70	129	43	99	172	#131	190	28	122
Internal Link Dist (ft)		3891			719		1235		3583
Turn Bay Length (ft)	200		200	100		100		100	
Base Capacity (vph)	383	927	855	404	906	387	1654	323	1582
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.19	0.20	0.42	0.27	0.63	0.43	0.14	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	137	20	8	19	2	13	26	30	76	19	25
Future Vol, veh/h	17	137	20	8	19	2	13	26	30	76	19	25
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	0	0	20	0	0	0	0	0	0	0	11	0
Mvmt Flow	21	171	25	10	24	3	16	33	38	95	24	31

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	26	0	0	198	0	0	301	274	188	308	286	25
Stage 1	-	-	-	-	-	-	228	228	-	45	45	-
Stage 2	-	-	-	-	-	-	73	46	-	263	241	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.61	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.61	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.61	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4.099	3.3
Pot Cap-1 Maneuver	1601	-	-	1387	-	-	655	637	859	648	609	1057
Stage 1	-	-	-	-	-	-	779	719	-	974	840	-
Stage 2	-	-	-	-	-	-	942	861	-	747	690	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1601	-	-	1384	-	-	605	622	856	584	595	1057
Mov Cap-2 Maneuver	-	-	-	-	-	-	605	622	-	584	595	-
Stage 1	-	-	-	-	-	-	766	707	-	959	834	-
Stage 2	-	-	-	-	-	-	882	855	-	670	678	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	2.1	10.8	12.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	702	1601	-	-	1384	-	-	646
HCM Lane V/C Ratio	0.123	0.013	-	-	0.007	-	-	0.232
HCM Control Delay (s)	10.8	7.3	0	-	7.6	0	-	12.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.9

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	9	95	34	12	35	22	139	5	5	71	8
Future Vol, veh/h	38	9	95	34	12	35	22	139	5	5	71	8
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	0	11	6	0	8	0	23	1	0	0	3	62
Mvmt Flow	44	10	110	40	14	41	26	162	6	6	83	9
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	8.6	8.4	10.1	8.8
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	13%	27%	42%	7%	0%
Vol Thru, %	84%	6%	15%	93%	0%
Vol Right, %	3%	67%	43%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	166	142	81	76	8
LT Vol	22	38	34	5	0
Through Vol	139	9	12	71	0
RT Vol	5	95	35	0	8
Lane Flow Rate	193	165	94	88	9
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.274	0.203	0.122	0.131	0.012
Departure Headway (Hd)	5.117	4.418	4.67	5.317	4.63
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	699	811	765	672	769
Service Time	3.167	2.458	2.717	3.071	2.383
HCM Lane V/C Ratio	0.276	0.203	0.123	0.131	0.012
HCM Control Delay	10.1	8.6	8.4	8.9	7.4
HCM Lane LOS	B	A	A	A	A
HCM 95th-tile Q	1.1	0.8	0.4	0.4	0

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	42	0	56	0	82	71	40	39	0
Future Vol, veh/h	0	0	0	42	0	56	0	82	71	40	39	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	1	0	8	0
Mvmt Flow	0	0	0	51	0	67	0	99	86	48	47	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	318	327	47	285	285	142	47	0	0	184	0	0
Stage 1	143	143	-	142	142	-	-	-	-	-	-	-
Stage 2	175	184	-	143	143	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	639	595	1028	671	628	911	1573	-	-	1403	-	-
Stage 1	865	782	-	866	783	-	-	-	-	-	-	-
Stage 2	832	751	-	865	782	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	576	574	1028	653	606	911	1573	-	-	1403	-	-
Mov Cap-2 Maneuver	576	574	-	653	606	-	-	-	-	-	-	-
Stage 1	865	755	-	866	783	-	-	-	-	-	-	-
Stage 2	770	751	-	835	755	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	10.4	0	3.9
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1573	-	-	-	779	1403	-	-
HCM Lane V/C Ratio	-	-	-	-	0.152	0.034	-	-
HCM Control Delay (s)	0	-	-	0	10.4	7.7	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0.1	-	-

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	74	42	114	76	24	36	90	108	15	53	2
Future Vol, veh/h	2	74	42	114	76	24	36	90	108	15	53	2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	3	2	1	0	0	0	0	1	0	0	0
Mvmt Flow	2	85	48	131	87	28	41	103	124	17	61	2
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	9.8	10.1	10.4	9.3
HCM LOS	A	B	B	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	45%	0%	64%	0%	76%	0%	96%
Vol Right, %	0%	55%	0%	36%	0%	24%	0%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	36	198	2	116	114	100	15	55
LT Vol	36	0	2	0	114	0	15	0
Through Vol	0	90	0	74	0	76	0	53
RT Vol	0	108	0	42	0	24	0	2
Lane Flow Rate	41	228	2	133	131	115	17	63
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.07	0.33	0.004	0.208	0.225	0.175	0.031	0.104
Departure Headway (Hd)	6.214	5.324	6.319	5.609	6.182	5.491	6.443	5.912
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	580	680	569	643	584	657	557	608
Service Time	3.914	3.024	4.031	3.321	3.882	3.191	4.164	3.632
HCM Lane V/C Ratio	0.071	0.335	0.004	0.207	0.224	0.175	0.031	0.104
HCM Control Delay	9.4	10.6	9.1	9.8	10.7	9.4	9.4	9.3
HCM Lane LOS	A	B	A	A	B	A	A	A
HCM 95th-tile Q	0.2	1.4	0	0.8	0.9	0.6	0.1	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	121	44	55	184	177	70	371	50	57	289	104
Future Volume (vph)	104	121	44	55	184	177	70	371	50	57	289	104
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.97	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1620	1658		1628	1733	1448	1662	1694		1662	1671	
Flt Permitted	0.50	1.00		0.65	1.00	1.00	0.37	1.00		0.26	1.00	
Satd. Flow (perm)	857	1658		1106	1733	1448	646	1694		453	1671	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	112	130	47	59	198	190	75	399	54	61	311	112
RTOR Reduction (vph)	0	16	0	0	0	129	0	5	0	0	14	0
Lane Group Flow (vph)	112	161	0	59	198	61	75	448	0	61	409	0
Confl. Peds. (#/hr)	12		2	2		12	1		4	4		1
Heavy Vehicles (%)	2%	1%	0%	2%	1%	0%	0%	1%	2%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	21.6	16.8		18.8	15.4	21.9	28.4	23.8		32.2	25.7	
Effective Green, g (s)	21.6	16.8		18.8	15.4	21.9	28.4	23.8		32.2	25.7	
Actuated g/C Ratio	0.32	0.25		0.27	0.22	0.32	0.41	0.35		0.47	0.38	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	3.5		2.0	3.5	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	323	406		329	389	558	336	588		327	626	
v/s Ratio Prot	c0.02	0.10		0.01	c0.11	0.01	0.01	c0.26		c0.02	0.24	
v/s Ratio Perm	0.08			0.04		0.03	0.08			0.07		
v/c Ratio	0.35	0.40		0.18	0.51	0.11	0.22	0.76		0.19	0.65	
Uniform Delay, d1	17.3	21.6		18.7	23.2	16.4	12.7	19.8		11.2	17.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.8		0.1	1.2	0.0	0.1	5.8		0.1	2.5	
Delay (s)	17.6	22.4		18.8	24.5	16.5	12.8	25.6		11.3	20.2	
Level of Service	B	C		B	C	B	B	C		B	C	
Approach Delay (s)		20.5			20.3			23.8			19.1	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	68.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	112	177	59	198	190	75	453	61	423
v/c Ratio	0.33	0.40	0.16	0.52	0.32	0.20	0.78	0.19	0.64
Control Delay	19.3	24.3	17.0	30.9	4.7	11.0	30.3	11.0	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	24.3	17.0	30.9	4.7	11.0	30.3	11.0	23.3
Queue Length 50th (ft)	30	56	15	74	0	15	161	12	142
Queue Length 95th (ft)	74	126	44	152	40	40	299	34	268
Internal Link Dist (ft)		2545		3983			2700		5211
Turn Bay Length (ft)	125		150		225	175		225	
Base Capacity (vph)	343	745	377	767	595	393	863	336	857
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.24	0.16	0.26	0.32	0.19	0.52	0.18	0.49

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	58	62	19	101	0	0	0	0	14	597	114
Future Volume (vph)	0	58	62	19	101	0	0	0	0	14	597	114
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		1.00			1.00						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.93			1.00						0.98	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		1628			1736						3196	
Flt Permitted		1.00			0.93						1.00	
Satd. Flow (perm)		1628			1626						3196	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	61	65	20	106	0	0	0	0	15	628	120
RTOR Reduction (vph)	0	49	0	0	0	0	0	0	0	0	24	0
Lane Group Flow (vph)	0	77	0	0	126	0	0	0	0	0	739	0
Confl. Peds. (#/hr)	1					1	1		1	1		1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		8			4						2	
Permitted Phases				4						2		
Actuated Green, G (s)		8.5			8.5						16.1	
Effective Green, g (s)		8.5			8.5						16.1	
Actuated g/C Ratio		0.25			0.25						0.47	
Clearance Time (s)		5.0			5.0						5.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		399			399						1487	
v/s Ratio Prot		0.05										
v/s Ratio Perm					c0.08						0.23	
v/c Ratio		0.19			0.32						0.50	
Uniform Delay, d1		10.3			10.7						6.4	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.2			0.5						0.3	
Delay (s)		10.6			11.1						6.7	
Level of Service		B			B						A	
Approach Delay (s)		10.6			11.1			0.0			6.7	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	34.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	126	126	763
v/c Ratio	0.28	0.32	0.51
Control Delay	9.2	14.9	7.6
Queue Delay	0.0	0.0	0.0
Total Delay	9.2	14.9	7.6
Queue Length 50th (ft)	9	19	41
Queue Length 95th (ft)	44	61	86
Internal Link Dist (ft)	3983	187	3118
Turn Bay Length (ft)			
Base Capacity (vph)	1225	1207	2979
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.10	0.10	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	16	0	0	26	8	110	771	6	0	0	0
Future Volume (vph)	58	16	0	0	26	8	110	771	6	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		1.00			1.00			0.95				
Frpb, ped/bikes		1.00			1.00			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.97			1.00				
Flt Protected		0.96			1.00			0.99				
Satd. Flow (prot)		1684			1645			3267				
Flt Permitted		0.75			1.00			0.99				
Satd. Flow (perm)		1305			1645			3267				
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	66	18	0	0	30	9	125	876	7	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	84	0	0	31	0	0	1007	0	0	0	0
Confl. Peds. (#/hr)							2		1	1		2
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	0%	1%	17%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			6				
Permitted Phases	8						6					
Actuated Green, G (s)		5.3			5.3			28.8				
Effective Green, g (s)		5.3			5.3			28.8				
Actuated g/C Ratio		0.12			0.12			0.65				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		156			197			2133				
v/s Ratio Prot					0.02							
v/s Ratio Perm		c0.06						0.31				
v/c Ratio		0.54			0.16			0.47				
Uniform Delay, d1		18.2			17.4			3.8				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		3.5			0.4			0.2				
Delay (s)		21.8			17.8			4.0				
Level of Service		C			B			A				
Approach Delay (s)		21.8			17.8			4.0			0.0	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	44.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	84	39	1008
v/c Ratio	0.31	0.12	0.41
Control Delay	19.4	13.9	5.3
Queue Delay	0.0	0.0	0.0
Total Delay	19.4	13.9	5.3
Queue Length 50th (ft)	18	6	65
Queue Length 95th (ft)	53	26	124
Internal Link Dist (ft)	187	470	1008
Turn Bay Length (ft)			
Base Capacity (vph)	677	857	3011
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.12	0.05	0.33

Intersection Summary

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	4	7	12	3	8	6	146	2	4	230	24
Future Vol, veh/h	23	4	7	12	3	8	6	146	2	4	230	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	4	0	0	0	0	25	50	4	0	50	8	4
Mvmt Flow	27	5	8	14	4	9	7	172	2	5	271	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	488	482	285	488	495	173	299	0	0	174	0	0
Stage 1	294	294	-	187	187	-	-	-	-	-	-	-
Stage 2	194	188	-	301	308	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.5	6.2	7.1	6.5	6.45	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	6.14	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4	3.3	3.5	4	3.525	2.65	-	-	2.65	-	-
Pot Cap-1 Maneuver	487	487	759	493	479	814	1033	-	-	1159	-	-
Stage 1	710	673	-	819	749	-	-	-	-	-	-	-
Stage 2	803	748	-	712	664	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	474	481	759	479	473	814	1033	-	-	1159	-	-
Mov Cap-2 Maneuver	474	481	-	479	473	-	-	-	-	-	-	-
Stage 1	704	670	-	812	743	-	-	-	-	-	-	-
Stage 2	784	742	-	696	661	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.6	11.8	0.3	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1033	-	-	515	558	1159	-	-
HCM Lane V/C Ratio	0.007	-	-	0.078	0.048	0.004	-	-
HCM Control Delay (s)	8.5	0	-	12.6	11.8	8.1	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	54	15	94	59	0	0	0	0	86	621	29
Future Volume (vph)	0	54	15	94	59	0	0	0	0	86	621	29
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.99			1.00						1.00	
Flpb, ped/bikes		1.00			0.99						1.00	
Frt		0.97			1.00						0.99	
Flt Protected		1.00			0.97						0.99	
Satd. Flow (prot)		1662			1683						3233	
Flt Permitted		1.00			0.77						0.99	
Satd. Flow (perm)		1662			1330						3233	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	61	17	106	66	0	0	0	0	97	698	33
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	66	0	0	172	0	0	0	0	0	824	0
Confl. Peds. (#/hr)	21		19	19		21	16		26	26		16
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	1%	1%	3%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		8			4						2	
Permitted Phases				4						2		
Actuated Green, G (s)		11.2			11.2						19.3	
Effective Green, g (s)		11.2			11.2						19.3	
Actuated g/C Ratio		0.28			0.28						0.48	
Clearance Time (s)		5.0			5.0						5.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		459			367						1540	
v/s Ratio Prot		0.04										
v/s Ratio Perm					c0.13						0.25	
v/c Ratio		0.14			0.47						0.53	
Uniform Delay, d1		11.0			12.2						7.4	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.1			0.9						0.4	
Delay (s)		11.2			13.1						7.8	
Level of Service		B			B						A	
Approach Delay (s)		11.2			13.1			0.0			7.8	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	40.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	78	172	828
v/c Ratio	0.17	0.48	0.55
Control Delay	11.8	19.1	9.4
Queue Delay	0.0	0.0	0.0
Total Delay	11.8	19.1	9.4
Queue Length 50th (ft)	10	32	58
Queue Length 95th (ft)	41	94	129
Internal Link Dist (ft)	369	175	1004
Turn Bay Length (ft)			
Base Capacity (vph)	1080	855	2735
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.07	0.20	0.30

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	108	0	0	121	235	28	645	28	0	0	0
Future Volume (vph)	35	108	0	0	121	235	28	645	28	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		1.00			1.00			0.95				
Frpb, ped/bikes		1.00			0.99			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.91			0.99				
Flt Protected		0.99			1.00			1.00				
Satd. Flow (prot)		1703			1538			3296				
Flt Permitted		0.84			1.00			1.00				
Satd. Flow (perm)		1456			1538			3296				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	39	120	0	0	134	261	31	717	31	0	0	0
RTOR Reduction (vph)	0	0	0	0	72	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	159	0	0	323	0	0	775	0	0	0	0
Confl. Peds. (#/hr)	2		3	3		2	1		1	1		1
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	3%	1%	0%	0%	2%	3%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			6				
Permitted Phases	8						6					
Actuated Green, G (s)		15.0			15.0			18.1				
Effective Green, g (s)		15.0			15.0			18.1				
Actuated g/C Ratio		0.35			0.35			0.42				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		506			535			1384				
v/s Ratio Prot					c0.21							
v/s Ratio Perm		0.11						0.24				
v/c Ratio		0.31			0.60			0.56				
Uniform Delay, d1		10.3			11.6			9.5				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		0.4			1.9			0.5				
Delay (s)		10.6			13.5			10.0				
Level of Service		B			B			A				
Approach Delay (s)		10.6			13.5			10.0			0.0	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	43.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	159	395	779
v/c Ratio	0.32	0.66	0.57
Control Delay	13.5	15.3	12.4
Queue Delay	0.0	0.0	0.0
Total Delay	13.5	15.3	12.4
Queue Length 50th (ft)	26	51	66
Queue Length 95th (ft)	80	162	161
Internal Link Dist (ft)	175	838	646
Turn Bay Length (ft)			
Base Capacity (vph)	1087	1175	2346
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.15	0.34	0.33

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	87	76	262	233	105	251	1053	185	86	922	28
Future Volume (vph)	50	87	76	262	233	105	251	1053	185	86	922	28
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1630	1602		1614	1617		1630	3107	1417	1646	3107	1488
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1630	1602		1614	1617		1630	3107	1417	1646	3107	1488
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	95	83	285	253	114	273	1145	201	93	1002	30
RTOR Reduction (vph)	0	24	0	0	12	0	0	0	114	0	0	20
Lane Group Flow (vph)	54	154	0	285	355	0	273	1145	87	93	1002	10
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	1%	1%	3%	1%	8%	2%	7%	5%	1%	7%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Prot	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6	6	5	2	
Permitted Phases												2
Actuated Green, G (s)	7.2	20.4		24.6	37.8		22.6	57.5	57.5	10.2	45.1	45.1
Effective Green, g (s)	7.2	20.4		24.6	37.8		22.6	57.5	57.5	10.2	45.1	45.1
Actuated g/C Ratio	0.05	0.15		0.19	0.28		0.17	0.43	0.43	0.08	0.34	0.34
Clearance Time (s)	4.5	5.0		4.5	5.0		4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	88	246		299	460		277	1346	613	126	1055	505
v/s Ratio Prot	0.03	0.10		c0.18	c0.22		c0.17	0.37	0.06	0.06	c0.32	
v/s Ratio Perm												0.01
v/c Ratio	0.61	0.63		0.95	0.77		0.99	0.85	0.14	0.74	0.95	0.02
Uniform Delay, d1	61.4	52.6		53.5	43.5		54.9	33.7	22.7	59.9	42.7	29.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.0	4.9		39.3	7.8		49.7	5.4	0.1	20.0	16.7	0.0
Delay (s)	73.4	57.5		92.8	51.3		104.6	39.1	22.8	80.0	59.4	29.1
Level of Service	E	E		F	D		F	D	C	E	E	C
Approach Delay (s)		61.2			69.5			48.1			60.3	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	56.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	132.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	54	178	285	367	273	1145	201	93	1002	30
v/c Ratio	0.52	0.69	0.95	0.77	0.98	0.85	0.27	0.73	0.94	0.05
Control Delay	79.2	58.0	93.9	53.8	103.7	41.2	4.4	91.8	59.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.2	58.0	93.9	53.8	103.7	41.2	4.4	91.8	59.4	0.1
Queue Length 50th (ft)	45	123	240	285	232	445	0	78	428	0
Queue Length 95th (ft)	98	201	#475	407	#468	#681	51	#185	#665	0
Internal Link Dist (ft)		838		3278		1074			1019	
Turn Bay Length (ft)	150		450		275		575	350		100
Base Capacity (vph)	117	483	300	662	279	1355	731	131	1064	605
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.37	0.95	0.55	0.98	0.85	0.27	0.71	0.94	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	65	1202	0	0	0	0	0	31	18
Future Volume (vph)	0	0	0	65	1202	0	0	0	0	0	31	18
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					4.5						4.5	
Lane Util. Factor					0.95						0.95	
Frpb, ped/bikes					1.00						0.99	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.94	
Flt Protected					1.00						1.00	
Satd. Flow (prot)					3255						3124	
Flt Permitted					1.00						1.00	
Satd. Flow (perm)					3255						3124	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	0	0	75	1382	0	0	0	0	0	36	21
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	20	0
Lane Group Flow (vph)	0	0	0	0	1454	0	0	0	0	0	37	0
Confl. Peds. (#/hr)	3		1	1		3	3		2	2		3
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type				Perm	NA						NA	
Protected Phases					6						4	
Permitted Phases				6								
Actuated Green, G (s)					47.5						3.6	
Effective Green, g (s)					47.5						3.6	
Actuated g/C Ratio					0.79						0.06	
Clearance Time (s)					4.5						4.5	
Vehicle Extension (s)					3.0						3.0	
Lane Grp Cap (vph)					2572						187	
v/s Ratio Prot											c0.01	
v/s Ratio Perm					0.45							
v/c Ratio					0.57						0.20	
Uniform Delay, d1					2.4						26.9	
Progression Factor					1.00						1.00	
Incremental Delay, d2					0.3						0.5	
Delay (s)					2.7						27.4	
Level of Service					A						C	
Approach Delay (s)		0.0			2.7			0.0			27.4	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	3.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	60.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	SBT
Lane Group Flow (vph)	1457	57
v/c Ratio	0.52	0.15
Control Delay	3.3	21.2
Queue Delay	0.0	0.0
Total Delay	3.3	21.2
Queue Length 50th (ft)	88	6
Queue Length 95th (ft)	132	23
Internal Link Dist (ft)	472	448
Turn Bay Length (ft)		
Base Capacity (vph)	3253	1071
Starvation Cap Reductn	273	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.49	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	832	14	404	133	0	0	0	0
Future Volume (vph)	0	0	0	0	832	14	404	133	0	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					4.5		4.5	4.5				
Lane Util. Factor					0.95		0.91	0.91				
Frpb, ped/bikes					1.00		1.00	1.00				
Flpb, ped/bikes					1.00		1.00	1.00				
Frt					1.00		1.00	1.00				
Flt Protected					1.00		0.95	0.97				
Satd. Flow (prot)					3252		1482	3053				
Flt Permitted					1.00		0.95	0.97				
Satd. Flow (perm)					3252		1482	3053				
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	0	0	0	0	990	17	481	158	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	81	81	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1006	0	159	318	0	0	0	0
Confl. Peds. (#/hr)	3					3	1					1
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%	0%	0%
Turn Type					NA		Perm	NA				
Protected Phases					6			8				
Permitted Phases							8					
Actuated Green, G (s)					23.8		12.7	12.7				
Effective Green, g (s)					23.8		12.7	12.7				
Actuated g/C Ratio					0.52		0.28	0.28				
Clearance Time (s)					4.5		4.5	4.5				
Vehicle Extension (s)					3.0		3.0	3.0				
Lane Grp Cap (vph)					1701		413	852				
v/s Ratio Prot					c0.31							
v/s Ratio Perm							c0.11	0.10				
v/c Ratio					0.59		0.39	0.37				
Uniform Delay, d1					7.5		13.2	13.2				
Progression Factor					1.00		1.00	1.00				
Incremental Delay, d2					0.6		0.6	0.3				
Delay (s)					8.0		13.8	13.5				
Level of Service					A		B	B				
Approach Delay (s)		0.0			8.0			13.6			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	45.5	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	NBL	NBT
Lane Group Flow (vph)	1007	240	399
v/c Ratio	0.60	0.49	0.43
Control Delay	9.9	12.6	12.1
Queue Delay	0.0	0.0	0.0
Total Delay	9.9	12.6	12.1
Queue Length 50th (ft)	80	27	30
Queue Length 95th (ft)	161	92	75
Internal Link Dist (ft)	765		275
Turn Bay Length (ft)			
Base Capacity (vph)	3155	1155	2353
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.32	0.21	0.17

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	106	458	0	0	0	0	0	662	290
Future Volume (vph)	0	0	0	106	458	0	0	0	0	0	662	290
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					4.5						4.5	
Lane Util. Factor					0.95						0.95	
Frpb, ped/bikes					1.00						1.00	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.95	
Flt Protected					0.99						1.00	
Satd. Flow (prot)					3215						3137	
Flt Permitted					0.99						1.00	
Satd. Flow (perm)					3215						3137	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	114	492	0	0	0	0	0	712	312
RTOR Reduction (vph)	0	0	0	0	22	0	0	0	0	0	53	0
Lane Group Flow (vph)	0	0	0	0	584	0	0	0	0	0	971	0
Confl. Peds. (#/hr)			2	2			2		2	2		2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	1%	0%
Turn Type				Perm	NA						NA	
Protected Phases					6						4	
Permitted Phases				6								
Actuated Green, G (s)					17.6						28.5	
Effective Green, g (s)					17.6						28.5	
Actuated g/C Ratio					0.32						0.52	
Clearance Time (s)					4.5						4.5	
Vehicle Extension (s)					3.0						3.0	
Lane Grp Cap (vph)					1026						1622	
v/s Ratio Prot											c0.31	
v/s Ratio Perm					0.18							
v/c Ratio					0.57						0.60	
Uniform Delay, d1					15.6						9.3	
Progression Factor					1.00						1.00	
Incremental Delay, d2					0.7						0.6	
Delay (s)					16.3						9.9	
Level of Service					B						A	
Approach Delay (s)		0.0			16.3			0.0			9.9	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	55.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	SBT
Lane Group Flow (vph)	606	1024
v/c Ratio	0.58	0.62
Control Delay	18.8	10.7
Queue Delay	0.0	0.0
Total Delay	18.8	10.7
Queue Length 50th (ft)	79	98
Queue Length 95th (ft)	170	203
Internal Link Dist (ft)	179	644
Turn Bay Length (ft)		
Base Capacity (vph)	2264	2858
Starvation Cap Reductn	173	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.29	0.36

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	481	243	62	631	0	0	0	0
Future Volume (vph)	0	0	0	0	481	243	62	631	0	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					4.5	4.5	4.5	4.5				
Lane Util. Factor					0.95	1.00	0.91	0.91				
Frpb, ped/bikes					1.00	0.99	1.00	1.00				
Flpb, ped/bikes					1.00	1.00	1.00	1.00				
Frt					1.00	0.85	1.00	1.00				
Flt Protected					1.00	1.00	0.95	1.00				
Satd. Flow (prot)					3228	1440	1513	3183				
Flt Permitted					1.00	1.00	0.95	1.00				
Satd. Flow (perm)					3228	1440	1513	3183				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	523	264	67	686	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	110	27	9	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	523	154	33	684	0	0	0	0
Confl. Peds. (#/hr)	1					1			1	1		
Heavy Vehicles (%)	0%	0%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%
Turn Type					NA	Perm	Perm	NA				
Protected Phases					4			6				
Permitted Phases						4	6					
Actuated Green, G (s)					15.8	15.8	17.6	17.6				
Effective Green, g (s)					15.8	15.8	17.6	17.6				
Actuated g/C Ratio					0.37	0.37	0.42	0.42				
Clearance Time (s)					4.5	4.5	4.5	4.5				
Vehicle Extension (s)					3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)					1202	536	628	1321				
v/s Ratio Prot					c0.16							
v/s Ratio Perm						0.11	0.02	0.21				
v/c Ratio					0.44	0.29	0.05	0.52				
Uniform Delay, d1					10.0	9.3	7.4	9.2				
Progression Factor					1.00	1.00	1.00	1.00				
Incremental Delay, d2					0.3	0.3	0.0	0.3				
Delay (s)					10.2	9.6	7.5	9.6				
Level of Service					B	A	A	A				
Approach Delay (s)		0.0			10.0			9.4			0.0	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	42.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	523	264	60	693
v/c Ratio	0.44	0.41	0.09	0.53
Control Delay	12.2	6.6	4.7	11.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.2	6.6	4.7	11.3
Queue Length 50th (ft)	45	13	2	59
Queue Length 95th (ft)	104	63	21	133
Internal Link Dist (ft)	478			255
Turn Bay Length (ft)		125	75	
Base Capacity (vph)	2945	1328	1460	3067
Starvation Cap Reductn	0	0	0	55
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.18	0.20	0.04	0.23

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR	SBR2	SEL	SER
Lane Configurations									
Traffic Volume (vph)	381	243	454	1109	980	0	280	0	0
Future Volume (vph)	381	243	454	1109	980	0	280	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	5.5	5.5		5.5		
Lane Util. Factor	0.97	1.00	0.97	0.95	0.95		1.00		
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00		
Frt	1.00	0.85	1.00	1.00	1.00		0.85		
Flt Protected	0.95	1.00	0.95	1.00	1.00		1.00		
Satd. Flow (prot)	3131	1473	3162	3167	3137		1458		
Flt Permitted	0.95	1.00	0.95	1.00	1.00		1.00		
Satd. Flow (perm)	3131	1473	3162	3167	3137		1458		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	401	256	478	1167	1032	0	304	0	0
RTOR Reduction (vph)	0	206	0	0	0	0	121	0	0
Lane Group Flow (vph)	401	50	478	1167	1032	0	183	0	0
Confl. Bikes (#/hr)						1			
Heavy Vehicles (%)	3%	1%	2%	5%	6%	3%	2%	2%	2%
Turn Type	Prot	Perm	Prot	NA	NA		Perm		
Protected Phases	8		1	6	2				
Permitted Phases		3					2		
Actuated Green, G (s)	20.2	20.2	22.6	72.9	45.8		45.8		
Effective Green, g (s)	20.2	20.2	22.6	72.9	45.8		45.8		
Actuated g/C Ratio	0.20	0.20	0.22	0.71	0.44		0.44		
Clearance Time (s)	4.5	4.5	4.5	5.5	5.5		5.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0		
Lane Grp Cap (vph)	613	288	693	2239	1393		647		
v/s Ratio Prot	c0.13		c0.15	0.37	c0.33				
v/s Ratio Perm		0.03					0.13		
v/c Ratio	0.65	0.17	0.69	0.52	0.74		0.28		
Uniform Delay, d1	38.2	34.5	37.0	7.0	23.7		18.2		
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		
Incremental Delay, d2	2.5	0.3	2.9	0.2	2.2		0.2		
Delay (s)	40.7	34.8	39.9	7.2	25.9		18.5		
Level of Service	D	C	D	A	C		B		
Approach Delay (s)	38.4			16.7	24.2			0.0	
Approach LOS	D			B	C			A	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	103.1	Sum of lost time (s)	14.5
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR2
Lane Group Flow (vph)	401	256	478	1167	1032	304
v/c Ratio	0.66	0.52	0.69	0.52	0.75	0.40
Control Delay	46.8	9.5	45.5	8.3	29.0	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	9.5	45.5	8.3	29.0	8.0
Queue Length 50th (ft)	124	0	147	161	284	33
Queue Length 95th (ft)	234	77	271	266	475	112
Internal Link Dist (ft)	383			2738	1074	
Turn Bay Length (ft)		200	325			200
Base Capacity (vph)	1168	710	1050	2917	2132	1060
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.36	0.46	0.40	0.48	0.29

Intersection Summary

Intersection	
Int Delay, s/veh	50.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	57	473	27	84	463	44	23	123	95	21	34	45
Future Vol, veh/h	57	473	27	84	463	44	23	123	95	21	34	45
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	-	525	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	5	5	3	3	0	0	0	1	0	8	0
Mvmt Flow	61	503	29	89	493	47	24	131	101	22	36	48

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	539	0	0	532	0	0	1376	1357	518	1450	1348	516
Stage 1	-	-	-	-	-	-	639	639	-	695	695	-
Stage 2	-	-	-	-	-	-	737	718	-	755	653	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	6.5	6.21	7.1	6.58	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.58	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4	3.309	3.5	4.072	3.3
Pot Cap-1 Maneuver	1040	-	-	1030	-	-	124	150	560	110	147	563
Stage 1	-	-	-	-	-	-	468	474	-	436	435	-
Stage 2	-	-	-	-	-	-	413	436	-	404	454	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1040	-	-	1030	-	-	79	~ 129	560	-	126	563
Mov Cap-2 Maneuver	-	-	-	-	-	-	79	~ 129	-	-	126	-
Stage 1	-	-	-	-	-	-	441	446	-	410	397	-
Stage 2	-	-	-	-	-	-	314	398	-	220	427	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	1.3	$ 306.2	
HCM LOS			F	-

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	170	1040	-	-	1030	-	-	-
HCM Lane V/C Ratio	1.508	0.058	-	-	0.087	-	-	-
HCM Control Delay (s)	$ 306.2	8.7	-	-	8.8	-	-	-
HCM Lane LOS	F	A	-	-	A	-	-	-
HCM 95th %tile Q(veh)	16.6	0.2	-	-	0.3	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	531	39	228	587	139	52	215	125	147	218	37
Future Volume (vph)	81	531	39	228	587	139	52	215	125	147	218	37
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.7	5.0		4.7	5.0		4.7	5.0		4.7	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97		1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1662	1670		1662	1652		1582	1613		1630	1733	1410
Flt Permitted	0.10	1.00		0.13	1.00		0.50	1.00		0.21	1.00	1.00
Satd. Flow (perm)	182	1670		236	1652		828	1613		356	1733	1410
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	559	41	240	618	146	55	226	132	155	229	39
RTOR Reduction (vph)	0	2	0	0	8	0	0	21	0	0	0	29
Lane Group Flow (vph)	85	598	0	240	756	0	55	337	0	155	229	10
Confl. Peds. (#/hr)	1					1	1		1	1		1
Confl. Bikes (#/hr)						1						1
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%	5%	2%	1%	2%	1%	3%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	43.4	38.5		54.8	45.2		28.0	23.1		30.8	24.5	24.5
Effective Green, g (s)	43.4	38.5		54.8	45.2		28.0	23.1		30.8	24.5	24.5
Actuated g/C Ratio	0.44	0.39		0.55	0.46		0.28	0.23		0.31	0.25	0.25
Clearance Time (s)	4.7	5.0		4.7	5.0		4.7	5.0		4.7	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	153	650		298	755		271	376		192	429	349
v/s Ratio Prot	0.03	0.36		c0.09	c0.46		0.01	c0.21		c0.05	0.13	
v/s Ratio Perm	0.22			0.35			0.05			0.20		0.01
v/c Ratio	0.56	0.92		0.81	1.00		0.20	0.90		0.81	0.53	0.03
Uniform Delay, d1	20.9	28.7		18.5	26.9		26.4	36.7		28.8	32.2	28.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.3	18.0		14.6	33.0		0.4	23.0		21.4	1.3	0.0
Delay (s)	25.2	46.8		33.0	59.9		26.8	59.7		50.3	33.5	28.2
Level of Service	C	D		C	E		C	E		D	C	C
Approach Delay (s)		44.1			53.5			55.3			39.2	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	48.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	98.9	Sum of lost time (s)	19.4
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	85	600	240	764	55	358	155	229	39
v/c Ratio	0.48	0.93	0.79	0.98	0.19	0.92	0.81	0.52	0.08
Control Delay	22.0	51.4	35.9	55.6	24.3	65.7	58.3	38.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	51.4	35.9	55.6	24.3	65.7	58.3	38.2	0.3
Queue Length 50th (ft)	23	355	75	~490	24	208	71	130	0
Queue Length 95th (ft)	51	#576	#196	#743	51	#382	#152	209	0
Internal Link Dist (ft)		5185		2015		2675		2548	
Turn Bay Length (ft)	225		275		125		150		150
Base Capacity (vph)	179	678	313	779	294	406	192	438	488
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.88	0.77	0.98	0.19	0.88	0.81	0.52	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	664	9	283	845	293	18	190	177	212	179	83
Future Volume (vph)	110	664	9	283	845	293	18	190	177	212	179	83
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3222		1662	1733	1409	1661	1733	1468	1662	1733	1453
Flt Permitted	0.13	1.00		0.22	1.00	1.00	0.64	1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)	219	3222		384	1733	1409	1116	1733	1468	693	1733	1453
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	117	706	10	301	899	312	19	202	188	226	190	88
RTOR Reduction (vph)	0	1	0	0	0	124	0	0	149	0	0	66
Lane Group Flow (vph)	117	715	0	301	899	188	19	202	39	226	190	22
Confl. Peds. (#/hr)	3		2	2		3	1		1	1		1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	5%	3%	0%	0%	1%	3%	0%	1%	0%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	36.9	30.4		48.1	37.1	37.1	20.3	17.8	17.8	28.3	21.8	21.8
Effective Green, g (s)	36.9	30.4		48.1	37.1	37.1	20.3	17.8	17.8	28.3	21.8	21.8
Actuated g/C Ratio	0.43	0.35		0.56	0.43	0.43	0.24	0.21	0.21	0.33	0.25	0.25
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	197	1140		411	748	608	279	359	304	301	439	368
v/s Ratio Prot	0.04	0.22		c0.11	c0.52		0.00	0.12		c0.06	0.11	
v/s Ratio Perm	0.21			0.30		0.13	0.01		0.03	c0.19		0.02
v/c Ratio	0.59	0.63		0.73	1.20	0.31	0.07	0.56	0.13	0.75	0.43	0.06
Uniform Delay, d1	19.5	23.0		12.5	24.4	16.0	25.3	30.6	27.7	24.9	26.9	24.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.7	1.1		6.6	103.4	0.3	0.1	2.0	0.2	10.1	0.7	0.1
Delay (s)	24.2	24.1		19.1	127.8	16.3	25.4	32.6	27.9	35.0	27.6	24.4
Level of Service	C	C		B	F	B	C	C	C	D	C	C
Approach Delay (s)		24.1			83.2			30.1			30.3	
Approach LOS		C			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	53.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	85.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	117	716	301	899	312	19	202	188	226	190	88
v/c Ratio	0.57	0.61	0.71	1.16	0.42	0.06	0.65	0.45	0.81	0.42	0.18
Control Delay	25.4	25.0	21.1	112.7	7.3	19.6	41.5	8.2	49.1	30.1	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	25.0	21.1	112.7	7.3	19.6	41.5	8.2	49.1	30.1	0.8
Queue Length 50th (ft)	25	157	73	~561	28	7	98	0	93	76	0
Queue Length 95th (ft)	#88	244	#190	#875	95	21	166	51	#193	156	1
Internal Link Dist (ft)		2015		1820			1014			2700	
Turn Bay Length (ft)	225		200			200		175	250		250
Base Capacity (vph)	204	1177	430	773	748	330	668	681	278	668	661
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.61	0.70	1.16	0.42	0.06	0.30	0.28	0.81	0.28	0.13

Intersection Summary

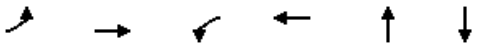
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	854	54	48	1090	49	206	84	68	36	35	77
Future Volume (vph)	45	854	54	48	1090	49	206	84	68	36	35	77
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.97			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1662	3201		1658	3239			1627			1569	
Flt Permitted	0.12	1.00		0.20	1.00			0.73			0.87	
Satd. Flow (perm)	211	3201		353	3239			1229			1379	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	928	59	52	1185	53	224	91	74	39	38	84
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	25	0
Lane Group Flow (vph)	49	987	0	52	1235	0	0	389	0	0	136	0
Confl. Peds. (#/hr)	1		8	8		1	6		1	1		6
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	1%	3%	0%	0%	0%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	39.7	39.7		39.7	39.7			31.6			31.6	
Effective Green, g (s)	39.7	39.7		39.7	39.7			31.6			31.6	
Actuated g/C Ratio	0.50	0.50		0.50	0.50			0.40			0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	105	1602		176	1621			489			549	
v/s Ratio Prot		0.31			c0.38							
v/s Ratio Perm	0.23			0.15				c0.32			0.10	
v/c Ratio	0.47	0.62		0.30	0.76			0.80			0.25	
Uniform Delay, d1	12.9	14.3		11.6	16.0			21.0			15.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	3.3	0.7		0.9	2.2			8.7			0.2	
Delay (s)	16.2	15.0		12.5	18.2			29.7			16.2	
Level of Service	B	B		B	B			C			B	
Approach Delay (s)		15.1			17.9			29.7			16.2	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	79.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	49	987	52	1238	389	161
v/c Ratio	0.47	0.62	0.30	0.77	0.80	0.28
Control Delay	34.0	17.7	20.1	21.3	36.6	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	17.7	20.1	21.3	36.6	14.7
Queue Length 50th (ft)	16	187	15	261	178	41
Queue Length 95th (ft)	#69	302	51	417	326	92
Internal Link Dist (ft)		1820		1191	423	675
Turn Bay Length (ft)	125		125			
Base Capacity (vph)	139	2105	231	2133	712	817
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.47	0.23	0.58	0.55	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	659	341	0	0	0	0	0	0	12	85	0
Future Volume (vph)	0	659	341	0	0	0	0	0	0	12	85	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		1.00									1.00	
Flpb, ped/bikes		1.00									1.00	
Frt		0.95									1.00	
Flt Protected		1.00									0.99	
Satd. Flow (prot)		3080									3305	
Flt Permitted		1.00									0.99	
Satd. Flow (perm)		3080									3305	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	716	371	0	0	0	0	0	0	13	92	0
RTOR Reduction (vph)	0	71	0	0	0	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	1016	0	0	0	0	0	0	0	0	91	0
Confl. Peds. (#/hr)							3					3
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA								Perm	NA	
Protected Phases		2									4	
Permitted Phases										4		
Actuated Green, G (s)		28.6									5.3	
Effective Green, g (s)		28.6									5.3	
Actuated g/C Ratio		0.67									0.12	
Clearance Time (s)		4.5									4.0	
Vehicle Extension (s)		3.0									3.0	
Lane Grp Cap (vph)		2077									413	
v/s Ratio Prot		c0.33										
v/s Ratio Perm											0.03	
v/c Ratio		0.49									0.22	
Uniform Delay, d1		3.4									16.7	
Progression Factor		1.00									1.00	
Incremental Delay, d2		0.2									0.3	
Delay (s)		3.5									17.0	
Level of Service		A									B	
Approach Delay (s)		3.5			0.0			0.0			17.0	
Approach LOS		A			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	42.4	Sum of lost time (s)	8.5
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SBT
Lane Group Flow (vph)	1087	105
v/c Ratio	0.48	0.19
Control Delay	3.9	14.8
Queue Delay	0.0	0.0
Total Delay	3.9	14.8
Queue Length 50th (ft)	41	10
Queue Length 95th (ft)	76	26
Internal Link Dist (ft)	1097	269
Turn Bay Length (ft)		
Base Capacity (vph)	3080	1798
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.35	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	663	0	0	0	0	0	501	126	0	0	0
Future Volume (vph)	34	663	0	0	0	0	0	501	126	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5						4.5	4.5			
Lane Util. Factor		0.95						0.95	1.00			
Frpb, ped/bikes		1.00						1.00	1.00			
Flpb, ped/bikes		1.00						1.00	1.00			
Frt		1.00						1.00	0.85			
Flt Protected		1.00						1.00	1.00			
Satd. Flow (prot)		3249						3260	1488			
Flt Permitted		1.00						1.00	1.00			
Satd. Flow (perm)		3249						3260	1488			
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	37	713	0	0	0	0	0	539	135	0	0	0
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	88	0	0	0
Lane Group Flow (vph)	0	741	0	0	0	0	0	539	47	0	0	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	4%	2%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Turn Type	Perm	NA						NA	Perm			
Protected Phases		2						8				
Permitted Phases	2								8			
Actuated Green, G (s)		17.8						14.2	14.2			
Effective Green, g (s)		17.8						14.2	14.2			
Actuated g/C Ratio		0.43						0.35	0.35			
Clearance Time (s)		4.5						4.5	4.5			
Vehicle Extension (s)		3.0						3.0	3.0			
Lane Grp Cap (vph)		1410						1129	515			
v/s Ratio Prot								c0.17				
v/s Ratio Perm		0.23							0.03			
v/c Ratio		0.53						0.48	0.09			
Uniform Delay, d1		8.5						10.5	9.0			
Progression Factor		1.00						1.00	1.00			
Incremental Delay, d2		0.4						0.3	0.1			
Delay (s)		8.9						10.8	9.1			
Level of Service		A						B	A			
Approach Delay (s)		8.9			0.0			10.5			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	41.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	NBT	NBR
Lane Group Flow (vph)	750	539	135
v/c Ratio	0.53	0.48	0.23
Control Delay	10.3	13.0	3.9
Queue Delay	0.0	0.0	0.0
Total Delay	10.3	13.0	3.9
Queue Length 50th (ft)	56	48	0
Queue Length 95th (ft)	122	105	28
Internal Link Dist (ft)	460	568	
Turn Bay Length (ft)			175
Base Capacity (vph)	3214	2932	1352
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.23	0.18	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱							↰	↑↑	
Traffic Volume (vph)	0	779	55	0	0	0	0	0	0	179	577	0
Future Volume (vph)	0	779	55	0	0	0	0	0	0	179	577	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0							4.0	4.0	
Lane Util. Factor		0.95	1.00							1.00	0.95	
Frpb, ped/bikes		1.00	0.99							1.00	1.00	
Flpb, ped/bikes		1.00	1.00							1.00	1.00	
Frt		1.00	0.85							1.00	1.00	
Flt Protected		1.00	1.00							0.95	1.00	
Satd. Flow (prot)		3260	1469							1658	3292	
Flt Permitted		1.00	1.00							0.95	1.00	
Satd. Flow (perm)		3260	1469							1658	3292	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	820	58	0	0	0	0	0	0	188	607	0
RTOR Reduction (vph)	0	0	28	0	0	0	0	0	0	88	0	0
Lane Group Flow (vph)	0	820	30	0	0	0	0	0	0	100	607	0
Confl. Peds. (#/hr)									4	4		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type		NA	Perm							Perm	NA	
Protected Phases		2									4	
Permitted Phases			2							4		
Actuated Green, G (s)		22.1	22.1							18.6	18.6	
Effective Green, g (s)		22.1	22.1							18.6	18.6	
Actuated g/C Ratio		0.45	0.45							0.38	0.38	
Clearance Time (s)		4.0	4.0							4.0	4.0	
Vehicle Extension (s)		3.0	3.0							3.0	3.0	
Lane Grp Cap (vph)		1479	666							633	1257	
v/s Ratio Prot		c0.25									c0.18	
v/s Ratio Perm			0.02							0.06		
v/c Ratio		0.55	0.05							0.16	0.48	
Uniform Delay, d1		9.7	7.4							9.9	11.4	
Progression Factor		1.00	1.00							1.00	1.00	
Incremental Delay, d2		0.5	0.0							0.1	0.3	
Delay (s)		10.2	7.4							10.0	11.7	
Level of Service		B	A							B	B	
Approach Delay (s)		10.0			0.0			0.0			11.3	
Approach LOS		A			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	48.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	SBL	SBT
Lane Group Flow (vph)	820	58	188	607
v/c Ratio	0.56	0.08	0.26	0.49
Control Delay	12.3	4.2	5.4	13.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.3	4.2	5.4	13.9
Queue Length 50th (ft)	78	1	8	62
Queue Length 95th (ft)	175	19	48	142
Internal Link Dist (ft)	782			261
Turn Bay Length (ft)		100	150	
Base Capacity (vph)	3059	1381	1365	2666
Starvation Cap Reductn	0	0	0	86
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.27	0.04	0.14	0.24

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	386	575	0	0	0	0	0	323	48	0	0	0
Future Volume (vph)	386	575	0	0	0	0	0	323	48	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5						4.5				
Lane Util. Factor	0.91	0.91						0.95				
Frt	1.00	1.00						0.98				
Flt Protected	0.95	0.99						1.00				
Satd. Flow (prot)	1513	3112						3260				
Flt Permitted	0.95	0.99						1.00				
Satd. Flow (perm)	1513	3112						3260				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	415	618	0	0	0	0	0	347	52	0	0	0
RTOR Reduction (vph)	171	10	0	0	0	0	0	14	0	0	0	0
Lane Group Flow (vph)	165	687	0	0	0	0	0	385	0	0	0	0
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA						NA				
Protected Phases		8						6				
Permitted Phases	8											
Actuated Green, G (s)	19.0	19.0						10.9				
Effective Green, g (s)	19.0	19.0						10.9				
Actuated g/C Ratio	0.49	0.49						0.28				
Clearance Time (s)	4.5	4.5						4.5				
Vehicle Extension (s)	3.0	3.0						3.0				
Lane Grp Cap (vph)	738	1520						913				
v/s Ratio Prot								c0.12				
v/s Ratio Perm	0.11	0.22										
v/c Ratio	0.22	0.45						0.42				
Uniform Delay, d1	5.7	6.5						11.4				
Progression Factor	1.00	1.00						1.00				
Incremental Delay, d2	0.2	0.2						0.3				
Delay (s)	5.9	6.7						11.7				
Level of Service	A	A						B				
Approach Delay (s)		6.5			0.0			11.7			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	38.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	NBT
Lane Group Flow (vph)	336	697	399
v/c Ratio	0.37	0.46	0.43
Control Delay	2.3	7.7	13.8
Queue Delay	0.0	0.0	0.0
Total Delay	2.3	7.7	13.8
Queue Length 50th (ft)	0	44	34
Queue Length 95th (ft)	31	96	84
Internal Link Dist (ft)		156	664
Turn Bay Length (ft)	75		
Base Capacity (vph)	1503	3086	2994
Starvation Cap Reductn	180	403	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.25	0.26	0.13

Intersection Summary

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	57	281	240	102	108	100
Future Vol, veh/h	57	281	240	102	108	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	3	4	6	6	4
Mvmt Flow	63	309	264	112	119	110

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	264	0	-	0	698	264
Stage 1	-	-	-	-	264	-
Stage 2	-	-	-	-	434	-
Critical Hdwy	4.12	-	-	-	6.46	6.24
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.218	-	-	-	3.554	3.336
Pot Cap-1 Maneuver	1300	-	-	-	401	770
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	645	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1300	-	-	-	378	770
Mov Cap-2 Maneuver	-	-	-	-	378	-
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	608	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	18.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1300	-	-	-	500
HCM Lane V/C Ratio	0.048	-	-	-	0.457
HCM Control Delay (s)	7.9	0	-	-	18.1
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	2.4

Intersection	
Intersection Delay, s/veh	11.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	37	46	25	21	50	3	60	285	18	6	182	69
Future Vol, veh/h	37	46	25	21	50	3	60	285	18	6	182	69
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	3	0	4	0	0	0	3	1	0	0	1	0
Mvmt Flow	41	51	28	23	56	3	67	317	20	7	202	77
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	10.2	9.9	12.9	11.9
HCM LOS	B	A	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	34%	28%	100%	0%
Vol Thru, %	0%	94%	43%	68%	0%	73%
Vol Right, %	0%	6%	23%	4%	0%	27%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	60	303	108	74	6	251
LT Vol	60	0	37	21	6	0
Through Vol	0	285	46	50	0	182
RT Vol	0	18	25	3	0	69
Lane Flow Rate	67	337	120	82	7	279
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.111	0.507	0.193	0.135	0.011	0.42
Departure Headway (Hd)	6.002	5.421	5.79	5.928	6.099	5.416
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	599	667	619	604	588	667
Service Time	3.724	3.143	3.827	3.968	3.825	3.141
HCM Lane V/C Ratio	0.112	0.505	0.194	0.136	0.012	0.418
HCM Control Delay	9.5	13.6	10.2	9.9	8.9	12
HCM Lane LOS	A	B	B	A	A	B
HCM 95th-tile Q	0.4	2.9	0.7	0.5	0	2.1

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	49	3	24	0	3	8	21	256	10	8	205	58
Future Vol, veh/h	49	3	24	0	3	8	21	256	10	8	205	58
Conflicting Peds, #/hr	4	0	0	0	0	4	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	0	0
Mvmt Flow	52	3	26	0	3	9	22	272	11	9	218	62

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	600	596	251	602	621	282	282	0	0	283	0	0
Stage 1	268	268	-	322	322	-	-	-	-	-	-	-
Stage 2	332	328	-	280	299	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	416	420	793	414	406	762	1292	-	-	1291	-	-
Stage 1	742	691	-	694	655	-	-	-	-	-	-	-
Stage 2	686	651	-	731	670	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	398	408	791	390	394	759	1292	-	-	1286	-	-
Mov Cap-2 Maneuver	398	408	-	390	394	-	-	-	-	-	-	-
Stage 1	726	684	-	680	642	-	-	-	-	-	-	-
Stage 2	659	638	-	698	663	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.2	11.1	0.6	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1292	-	-	473	606	1286	-	-
HCM Lane V/C Ratio	0.017	-	-	0.171	0.019	0.007	-	-
HCM Control Delay (s)	7.8	0	-	14.2	11.1	7.8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.1	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	185	116	117	321	189	127	278	82	168	344	10
Future Volume (vph)	9	185	116	117	321	189	127	278	82	168	344	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1660	1699	1473	1646	3228	1438	1646	1733	1444	3193	1725	
Flt Permitted	0.55	1.00	1.00	0.45	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	962	1699	1473	772	3228	1438	1646	1733	1444	3193	1725	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	9	193	121	122	334	197	132	290	85	175	358	10
RTOR Reduction (vph)	0	0	73	0	0	132	0	0	50	0	1	0
Lane Group Flow (vph)	9	193	48	122	334	65	132	290	35	175	367	0
Confl. Peds. (#/hr)	3					3	3		1	1		3
Heavy Vehicles (%)	0%	3%	1%	1%	3%	1%	1%	1%	2%	1%	1%	0%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5	2	3	1	6		3	8	1	7	4	
Permitted Phases	2		2	6		6			8			
Actuated Green, G (s)	18.7	17.7	28.5	28.8	23.8	23.8	10.8	22.5	29.6	8.5	20.2	
Effective Green, g (s)	18.7	17.7	28.5	28.8	23.8	23.8	10.8	22.5	29.6	8.5	20.2	
Actuated g/C Ratio	0.26	0.25	0.40	0.40	0.33	0.33	0.15	0.31	0.41	0.12	0.28	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	260	418	666	396	1070	476	247	543	675	378	485	
v/s Ratio Prot	0.00	c0.11	0.01	c0.03	0.10		c0.08	0.17	0.01	0.05	c0.21	
v/s Ratio Perm	0.01		0.02	0.09		0.05			0.02			
v/c Ratio	0.03	0.46	0.07	0.31	0.31	0.14	0.53	0.53	0.05	0.46	0.76	
Uniform Delay, d1	19.7	23.0	13.4	14.2	17.9	16.8	28.2	20.3	12.7	29.5	23.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.8	0.0	0.4	0.2	0.1	2.2	1.0	0.0	0.9	6.7	
Delay (s)	19.8	23.8	13.5	14.7	18.1	16.9	30.4	21.3	12.7	30.4	30.2	
Level of Service	B	C	B	B	B	B	C	C	B	C	C	
Approach Delay (s)		19.8			17.1			22.3			30.3	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	71.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	9	193	121	122	334	197	132	290	85	175	368
v/c Ratio	0.03	0.55	0.17	0.33	0.30	0.32	0.51	0.51	0.13	0.44	0.73
Control Delay	17.7	33.3	3.8	20.4	20.4	5.7	37.3	22.2	3.0	35.4	31.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.7	33.3	3.8	20.4	20.4	5.7	37.3	22.2	3.0	35.4	31.6
Queue Length 50th (ft)	2	73	0	34	50	0	50	96	0	35	135
Queue Length 95th (ft)	13	162	30	88	126	53	128	180	21	82	261
Internal Link Dist (ft)		693			446			553			1860
Turn Bay Length (ft)	125		200	175		150	225		125	250	
Base Capacity (vph)	372	795	766	371	1511	777	348	968	672	434	834
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.24	0.16	0.33	0.22	0.25	0.38	0.30	0.13	0.40	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	131	228	195	301	163	265	1324	110	83	1080	61
Future Volume (vph)	76	131	228	195	301	163	265	1324	110	83	1080	61
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1683	1463	1583	3056		1646	3057		1599	3063	
Flt Permitted	0.22	1.00	1.00	0.48	1.00		0.09	1.00		0.07	1.00	
Satd. Flow (perm)	377	1683	1463	797	3056		164	3057		124	3063	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	82	141	245	210	324	175	285	1424	118	89	1161	66
RTOR Reduction (vph)	0	0	31	0	52	0	0	4	0	0	3	0
Lane Group Flow (vph)	82	141	214	210	447	0	285	1538	0	89	1224	0
Confl. Peds. (#/hr)	7					7			2	2		
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	4%	1%	5%	2%	3%	1%	7%	12%	4%	8%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	29.8	23.3	45.8	33.8	25.3		91.2	74.6		76.3	64.2	
Effective Green, g (s)	29.8	23.3	45.8	33.8	25.3		91.2	74.6		76.3	64.2	
Actuated g/C Ratio	0.22	0.17	0.33	0.25	0.18		0.67	0.54		0.56	0.47	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	5.0		4.5	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	142	286	537	245	564		352	1664		199	1435	
v/s Ratio Prot	0.03	0.08	0.07	c0.05	0.15		c0.13	c0.50		0.04	0.40	
v/s Ratio Perm	0.10		0.08	c0.16			0.41			0.21		
v/c Ratio	0.58	0.49	0.40	0.86	0.79		0.81	0.92		0.45	0.85	
Uniform Delay, d1	44.8	51.5	35.0	48.8	53.3		34.8	28.6		21.1	32.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.6	1.3	0.5	24.3	7.5		12.9	9.1		1.6	5.1	
Delay (s)	50.3	52.8	35.5	73.1	60.8		47.7	37.7		22.7	37.4	
Level of Service	D	D	D	E	E		D	D		C	D	
Approach Delay (s)		43.3			64.5			39.3			36.4	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	137.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	82	141	245	210	499	285	1542	89	1227
v/c Ratio	0.57	0.49	0.47	0.86	0.81	0.81	0.92	0.45	0.85
Control Delay	55.9	57.3	28.4	76.3	57.4	47.2	39.7	27.6	40.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	57.3	28.4	76.3	57.4	47.2	39.7	27.6	40.4
Queue Length 50th (ft)	57	115	127	159	199	161	632	26	509
Queue Length 95th (ft)	101	183	202	#262	264	#324	#924	86	#728
Internal Link Dist (ft)		446			2921		4483		2738
Turn Bay Length (ft)	175			150		150		175	
Base Capacity (vph)	143	446	541	245	901	375	1668	204	1437
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.32	0.45	0.86	0.55	0.76	0.92	0.44	0.85

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Intersection Delay, s/veh	11.9
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	111	56	172	125	111	183
Future Vol, veh/h	111	56	172	125	111	183
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	3	9	5	9	4	4
Mvmt Flow	121	61	187	136	121	199
Number of Lanes	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.4	13.2	11.9
HCM LOS	A	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	38%	0%	0%	58%
Vol Thru, %	0%	100%	0%	42%
Vol Right, %	62%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	294	111	56	297
LT Vol	111	0	0	172
Through Vol	0	111	0	125
RT Vol	183	0	56	0
Lane Flow Rate	320	121	61	323
Geometry Grp	2	7	7	5
Degree of Util (X)	0.437	0.195	0.088	0.479
Departure Headway (Hd)	5.024	5.821	5.215	5.342
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	722	619	690	678
Service Time	3.024	3.529	2.923	3.342
HCM Lane V/C Ratio	0.443	0.195	0.088	0.476
HCM Control Delay	11.9	9.9	8.4	13.2
HCM Lane LOS	B	A	A	B
HCM 95th-tile Q	2.2	0.7	0.3	2.6

Intersection	
Int Delay, s/veh	5.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	330	6	219	285	4	275
Future Vol, veh/h	330	6	219	285	4	275
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	3	40	2	5	0	3
Mvmt Flow	355	6	235	306	4	296

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	361	0	1135	358
Stage 1	-	-	-	-	358	-
Stage 2	-	-	-	-	777	-
Critical Hdwy	-	-	4.12	-	6.4	6.23
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.327
Pot Cap-1 Maneuver	-	-	1198	-	226	684
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	457	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1198	-	182	684
Mov Cap-2 Maneuver	-	-	-	-	182	-
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	367	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.8	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	658	-	-	1198	-
HCM Lane V/C Ratio	0.456	-	-	0.197	-
HCM Control Delay (s)	15	-	-	8.7	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	2.4	-	-	0.7	-

Intersection	
Intersection Delay, s/veh	16.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	66	24	89	141	72	56	271	84	34	165	4
Future Vol, veh/h	10	66	24	89	141	72	56	271	84	34	165	4
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	0	0	1	1	3	0	1	0	0	2	0
Mvmt Flow	11	76	28	102	162	83	64	311	97	39	190	5
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	11.8	14.1	21.3	13.2
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	76%	0%	73%	0%	66%	0%	98%
Vol Right, %	0%	24%	0%	27%	0%	34%	0%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	56	355	10	90	89	213	34	169
LT Vol	56	0	10	0	89	0	34	0
Through Vol	0	271	0	66	0	141	0	165
RT Vol	0	84	0	24	0	72	0	4
Lane Flow Rate	64	408	11	103	102	245	39	194
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.123	0.708	0.025	0.208	0.212	0.456	0.08	0.372
Departure Headway (Hd)	7.019	6.36	7.951	7.245	7.464	6.712	7.388	6.895
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	514	571	452	497	484	541	486	523
Service Time	4.719	4.06	5.672	4.967	5.164	4.412	5.112	4.619
HCM Lane V/C Ratio	0.125	0.715	0.024	0.207	0.211	0.453	0.08	0.371
HCM Control Delay	10.7	23	10.9	11.9	12.2	14.9	10.8	13.7
HCM Lane LOS	B	C	B	B	B	B	B	B
HCM 95th-tile Q	0.4	5.7	0.1	0.8	0.8	2.4	0.3	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	171	0	366	0	291	154	221	258	0
Future Volume (vph)	0	0	0	171	0	366	0	291	154	221	258	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					5.0	5.0		5.0	5.0	5.0	5.0	
Lane Util. Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes					1.00	0.98		1.00	1.00	1.00	1.00	
Flpb, ped/bikes					0.99	1.00		1.00	1.00	1.00	1.00	
Frt					1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1643	1437		1733	1473	1662	1733	
Flt Permitted					0.76	1.00		1.00	1.00	0.37	1.00	
Satd. Flow (perm)					1310	1437		1733	1473	652	1733	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	178	0	381	0	303	160	230	269	0
RTOR Reduction (vph)	0	0	0	0	0	288	0	0	112	0	0	0
Lane Group Flow (vph)	0	0	0	0	178	93	0	303	48	230	269	0
Confl. Peds. (#/hr)	4		10	10		4	3					3
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	1%	1%	0%	1%	0%
Turn Type				Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)					12.3	12.3		15.2	15.2	28.1	28.1	
Effective Green, g (s)					12.3	12.3		15.2	15.2	28.1	28.1	
Actuated g/C Ratio					0.24	0.24		0.30	0.30	0.56	0.56	
Clearance Time (s)					5.0	5.0		5.0	5.0	5.0	5.0	
Vehicle Extension (s)					2.0	2.0		3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)					319	350		522	444	521	966	
v/s Ratio Prot								c0.17		c0.07	0.16	
v/s Ratio Perm					c0.14	0.06			0.03	0.18		
v/c Ratio					0.56	0.27		0.58	0.11	0.44	0.28	
Uniform Delay, d1					16.7	15.4		14.9	12.7	6.4	5.8	
Progression Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2					1.2	0.1		1.6	0.1	0.2	0.2	
Delay (s)					17.9	15.5		16.5	12.8	6.6	6.0	
Level of Service					B	B		B	B	A	A	
Approach Delay (s)		0.0			16.3			15.3			6.3	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	50.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	178	381	303	160	230	269
v/c Ratio	0.56	0.60	0.59	0.29	0.45	0.28
Control Delay	25.7	6.9	21.5	4.8	9.5	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	6.9	21.5	4.8	9.5	7.6
Queue Length 50th (ft)	44	0	72	0	28	33
Queue Length 95th (ft)	115	57	168	35	81	94
Internal Link Dist (ft)	931		2881			465
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	589	856	854	807	546	1046
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.45	0.35	0.20	0.42	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	252	14	157	9	22	15	266	1406	9	9	1111	260
Future Volume (vph)	252	14	157	9	22	15	266	1406	9	9	1111	260
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	6.0		5.0	6.0	5.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1563	1577	1435	1662	1585		1646	3194		1662	3107	1428
Flt Permitted	0.50	0.50	1.00	0.66	1.00		0.11	1.00		0.14	1.00	1.00
Satd. Flow (perm)	830	818	1435	1159	1585		198	3194		247	3107	1428
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	268	15	167	10	23	16	283	1496	10	10	1182	277
RTOR Reduction (vph)	0	0	73	0	14	0	0	0	0	0	0	111
Lane Group Flow (vph)	142	141	94	10	25	0	283	1506	0	10	1182	166
Confl. Peds. (#/hr)	1		1	1		1	2		1	1		2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	1%	0%	3%	0%	0%	7%	1%	4%	0%	0%	7%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	8	1	7	4		1	6		5	2	3
Permitted Phases	8		8	4			6			2		2
Actuated Green, G (s)	25.5	25.5	38.7	12.0	11.1		78.5	72.2		55.7	54.4	63.8
Effective Green, g (s)	25.5	25.5	38.7	12.0	11.1		78.5	72.2		55.7	54.4	63.8
Actuated g/C Ratio	0.22	0.22	0.34	0.10	0.10		0.68	0.63		0.48	0.47	0.55
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	6.0		5.0	6.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	243	243	545	124	152		375	2005		135	1469	792
v/s Ratio Prot	c0.05	0.05	0.03	0.00	0.02		c0.13	0.47		0.00	c0.38	0.02
v/s Ratio Perm	c0.08	0.08	0.04	0.01			0.39			0.03		0.10
v/c Ratio	0.58	0.58	0.17	0.08	0.16		0.75	0.75		0.07	0.80	0.21
Uniform Delay, d1	38.4	40.0	26.9	46.4	47.7		24.3	15.1		15.8	25.8	12.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.6	3.5	0.2	0.3	0.5		8.4	1.6		0.2	3.3	0.1
Delay (s)	42.0	43.5	27.0	46.7	48.2		32.7	16.7		16.1	29.1	13.0
Level of Service	D	D	C	D	D		C	B		B	C	B
Approach Delay (s)		36.9			47.9			19.2			26.0	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	142	141	167	10	39	283	1506	10	1182	277
v/c Ratio	0.63	0.63	0.28	0.05	0.24	0.71	0.70	0.04	0.82	0.30
Control Delay	56.0	55.7	10.9	41.2	38.3	30.8	14.5	8.0	31.7	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.0	55.7	10.9	41.2	38.3	30.8	14.5	8.0	31.7	3.2
Queue Length 50th (ft)	94	93	24	6	16	101	271	2	359	7
Queue Length 95th (ft)	#191	#189	87	23	55	239	612	8	566	51
Internal Link Dist (ft)		931			261		4040		4483	
Turn Bay Length (ft)	150		125	150		100		150		275
Base Capacity (vph)	225	344	694	187	499	513	2509	249	1977	910
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.41	0.24	0.05	0.08	0.55	0.60	0.04	0.60	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔		↰	↱	
Traffic Vol, veh/h	4	13	1	18	10	33	6	202	48	35	77	8
Future Vol, veh/h	4	13	1	18	10	33	6	202	48	35	77	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	5	0
Mvmt Flow	4	13	1	19	10	34	6	208	49	36	79	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	424	426	84	408	405	233	88	0	0	258	0	0
Stage 1	156	156	-	245	245	-	-	-	-	-	-	-
Stage 2	268	270	-	163	160	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	544	524	981	557	538	811	1520	-	-	1318	-	-
Stage 1	851	772	-	763	707	-	-	-	-	-	-	-
Stage 2	742	690	-	844	769	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	501	507	981	532	521	811	1520	-	-	1318	-	-
Mov Cap-2 Maneuver	501	507	-	532	521	-	-	-	-	-	-	-
Stage 1	847	751	-	759	703	-	-	-	-	-	-	-
Stage 2	697	687	-	805	748	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.2	11.1	0.2	2.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1520	-	-	520	651	1318	-	-
HCM Lane V/C Ratio	0.004	-	-	0.036	0.097	0.027	-	-
HCM Control Delay (s)	7.4	0	-	12.2	11.1	7.8	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0.1	-	-

Intersection	
Intersection Delay, s/veh	14.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	71	33	4	97	7	96	380	5	3	159	29
Future Vol, veh/h	36	71	33	4	97	7	96	380	5	3	159	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	3	1	0	0	0	0	2	1	0	0	1	3
Mvmt Flow	39	77	36	4	105	8	104	413	5	3	173	32
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	11.1	10.6	16.8	11.7
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	26%	4%	100%	0%
Vol Thru, %	0%	99%	51%	90%	0%	85%
Vol Right, %	0%	1%	24%	6%	0%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	96	385	140	108	3	188
LT Vol	96	0	36	4	3	0
Through Vol	0	380	71	97	0	159
RT Vol	0	5	33	7	0	29
Lane Flow Rate	104	418	152	117	3	204
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.179	0.655	0.253	0.198	0.006	0.337
Departure Headway (Hd)	6.164	5.632	5.985	6.076	6.538	5.938
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	582	640	598	589	547	605
Service Time	3.9	3.367	4.04	4.133	4.286	3.686
HCM Lane V/C Ratio	0.179	0.653	0.254	0.199	0.005	0.337
HCM Control Delay	10.2	18.5	11.1	10.6	9.3	11.7
HCM Lane LOS	B	C	B	B	A	B
HCM 95th-tile Q	0.6	4.8	1	0.7	0	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	180	174	274	552	0	0	0	0	88	0	151
Future Volume (vph)	0	180	174	274	552	0	0	0	0	88	0	151
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1667	1424	1567	1733						1662	1458
Flt Permitted		1.00	1.00	0.45	1.00						0.95	1.00
Satd. Flow (perm)		1667	1424	748	1733						1662	1458
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	202	196	308	620	0	0	0	0	99	0	170
RTOR Reduction (vph)	0	0	135	0	0	0	0	0	0	0	0	142
Lane Group Flow (vph)	0	202	61	308	620	0	0	0	0	0	99	28
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	0%	5%	2%	6%	1%	0%	0%	0%	0%	0%	0%	2%
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		12.8	12.8	24.1	24.1						6.8	6.8
Effective Green, g (s)		12.8	12.8	24.1	24.1						6.8	6.8
Actuated g/C Ratio		0.31	0.31	0.59	0.59						0.17	0.17
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		521	445	566	1021						276	242
v/s Ratio Prot		0.12		0.08	c0.36							
v/s Ratio Perm			0.04	0.24							0.06	0.02
v/c Ratio		0.39	0.14	0.54	0.61						0.36	0.12
Uniform Delay, d1		11.0	10.1	4.7	5.4						15.1	14.5
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.5	0.1	1.1	1.0						0.8	0.2
Delay (s)		11.5	10.2	5.8	6.4						15.9	14.7
Level of Service		B	B	A	A						B	B
Approach Delay (s)		10.9			6.2			0.0			15.2	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	40.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	202	196	308	620	99	170
v/c Ratio	0.39	0.34	0.53	0.56	0.28	0.38
Control Delay	14.7	4.2	9.4	8.9	17.3	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	4.2	9.4	8.9	17.3	6.4
Queue Length 50th (ft)	37	0	33	82	18	0
Queue Length 95th (ft)	85	31	81	192	58	37
Internal Link Dist (ft)	1380			488	462	
Turn Bay Length (ft)		75	150			200
Base Capacity (vph)	1057	973	581	1484	1267	1152
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.20	0.53	0.42	0.08	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	180	0	0	479	124	348	1	175	0	0	0
Future Volume (vph)	87	180	0	0	479	124	348	1	175	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.85				
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)	1598	1667			1683	1396	1630	1432				
Flt Permitted	0.19	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	317	1667			1683	1396	1630	1432				
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	102	212	0	0	564	146	409	1	206	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	57	0	137	0	0	0	0
Lane Group Flow (vph)	102	212	0	0	564	89	409	70	0	0	0	0
Confl. Peds. (#/hr)	3		1	1		3						
Heavy Vehicles (%)	4%	5%	0%	0%	4%	4%	2%	0%	4%	0%	0%	0%
Turn Type	pm+pt	NA			NA	Perm	Perm	NA				
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	35.3	35.3			27.0	27.0	22.6	22.6				
Effective Green, g (s)	35.3	35.3			27.0	27.0	22.6	22.6				
Actuated g/C Ratio	0.52	0.52			0.40	0.40	0.33	0.33				
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	227	866			669	555	542	476				
v/s Ratio Prot	c0.02	0.13			c0.34			0.05				
v/s Ratio Perm	0.21					0.06	c0.25					
v/c Ratio	0.45	0.24			0.84	0.16	0.75	0.15				
Uniform Delay, d1	11.3	9.0			18.5	13.2	20.2	15.9				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	1.4	0.1			9.5	0.1	5.9	0.1				
Delay (s)	12.7	9.1			28.0	13.3	26.1	16.0				
Level of Service	B	A			C	B	C	B				
Approach Delay (s)		10.3			25.0			22.7			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	67.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	102	212	564	146	409	207
v/c Ratio	0.41	0.25	0.83	0.24	0.74	0.33
Control Delay	15.7	11.7	34.8	8.6	29.2	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	11.7	34.8	8.6	29.2	4.2
Queue Length 50th (ft)	20	46	215	14	156	0
Queue Length 95th (ft)	52	101	#436	51	228	32
Internal Link Dist (ft)		488	979			520
Turn Bay Length (ft)	150			100		
Base Capacity (vph)	251	962	722	652	839	836
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.22	0.78	0.22	0.49	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	249	25	5	395	48	12
Future Vol, veh/h	249	25	5	395	48	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	75	-	150	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	3	16	0	5	0	8
Mvmt Flow	286	29	6	454	55	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	315	0	767	301
Stage 1	-	-	-	-	301	-
Stage 2	-	-	-	-	466	-
Critical Hdwy	-	-	4.1	-	6.4	6.28
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.372
Pot Cap-1 Maneuver	-	-	1257	-	373	725
Stage 1	-	-	-	-	755	-
Stage 2	-	-	-	-	636	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1257	-	371	725
Mov Cap-2 Maneuver	-	-	-	-	371	-
Stage 1	-	-	-	-	755	-
Stage 2	-	-	-	-	633	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	371	725	-	-	1257	-
HCM Lane V/C Ratio	0.149	0.019	-	-	0.005	-
HCM Control Delay (s)	16.4	10.1	-	-	7.9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	76	251	249	141	4
Future Vol, veh/h	6	76	251	249	141	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	4	1	0	1	0
Mvmt Flow	7	88	292	290	164	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1039	166	169	0	-	0
Stage 1	166	-	-	-	-	-
Stage 2	873	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.209	-	-	-
Pot Cap-1 Maneuver	258	873	1415	-	-	-
Stage 1	868	-	-	-	-	-
Stage 2	412	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	195	873	1415	-	-	-
Mov Cap-2 Maneuver	195	-	-	-	-	-
Stage 1	868	-	-	-	-	-
Stage 2	311	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	4.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1415	-	696	-	-
HCM Lane V/C Ratio	0.206	-	0.137	-	-
HCM Control Delay (s)	8.2	0	11	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.8	-	0.5	-	-

Appendix G – Crash Data

Project Name:	Redmond Transportation System Plan
Project Number:	17720
Query Information:	ODOT
Date Queried:	ODOT
Data Provider:	ODOT Crash Analysis Reporting Unit
Analyst:	JXG
Current Date:	10/20/2017

General Crash Information

Crash ID	Record Type	# Vehicles Involved	# Participants Involved	Serial #	Crash Month	Crash Day	Crash Year	Week Day Code	Crash Hour (Hour Starting)	County	City	Latitude Degrees	Longitude Degrees	Impact Location	Collision Type	Crash Severity	Weather Condition	Road Surface Condition	Light Condition
1402355	1	2	3	90105	January	21	2011	Friday	5:00 PM	Deschutes	Redmond	44.2550608	-121.1645797	Outbound within 50 feet	Sideswipe-meeting	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1402357	1	2	3	117	January	25	2011	Tuesday	4:00 PM	Deschutes	Redmond	44.25661252	-121.1840729	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1402383	1	2	2	133	January	28	2011	Friday	10:00 AM	Deschutes	Redmond	44.25178189	-121.184415	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1402544	1	2	2	120	January	25	2011	Tuesday	11:00 AM	Deschutes	Redmond	44.27551943	-121.1774854	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1402718	1	2	2	25	January	6	2011	Thursday	2:00 PM	Deschutes	Redmond	44.29098996	-121.1777389	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1404278	1	2	2	192	February	13	2011	Sunday	1:00 PM	Deschutes	Redmond	44.2620657	-121.1840302	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1404372	1	1	1	210	February	16	2011	Wednesday	7:00 AM	Deschutes	Redmond	44.26804243	-121.1921673	NW Intersection Quadrant	Fixed-Object or Other-Object	Property damage only crash (PDO)	Snow	Ice	Daylight
1405426	1	2	2	262	February	23	2011	Wednesday	9:00 AM	Deschutes	Redmond	44.27156419	-121.1732073	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1405477	1	1	1	271	February	24	2011	Thursday	2:00 PM	Deschutes	Redmond	44.24889698	-121.2058398	NW Intersection Quadrant	Non-collision	Property damage only crash (PDO)	Clear	Dry	Daylight
1406506	1	2	2	288	February	28	2011	Monday	7:00 AM	Deschutes	Redmond	44.26585001	-121.2044111	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1406509	1	2	1	286	February	27	2011	Sunday	3:00 AM	Deschutes	Redmond	44.2985979	-121.1634111	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1408836	1	2	2	51	January	12	2011	Wednesday	6:00 AM	Deschutes	Redmond	44.23986658	-121.1956407	Inbound within 50 feet	Sideswipe-meeting	Non-fatal injury crash	Cloudy	Dry	Darkness – no street lights
1409766	1	2	2	14	January	4	2011	Tuesday	3:00 PM	Deschutes	Redmond	44.27831906	-121.1732161	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1409770	1	2	3	17	January	5	2011	Wednesday	11:00 AM	Deschutes	Redmond	44.29099062	-121.1739116	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1410234	1	2	2	47	January	11	2011	Tuesday	5:00 PM	Deschutes	Redmond	44.28374233	-121.1742142	NW Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Darkness – no street lights
1410248	1	2	2	132	January	28	2011	Friday	11:00 AM	Deschutes	Redmond	44.27228596	-121.1628902	Southwest Intersection Quadrant	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1410273	1	2	2	28	January	7	2011	Friday	5:00 PM	Deschutes	Redmond	44.26928222	-121.1912836	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1410277	1	2	5	130	January	28	2011	Friday	3:00 PM	Deschutes	Redmond	44.26959572	-121.1753555	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1410283	1	2	2	205	February	15	2011	Tuesday	12:00 PM	Deschutes	Redmond	44.25383447	-121.1830576	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Snow	Snow	Daylight
1410294	1	2	4	215	February	16	2011	Wednesday	8:00 AM	Deschutes	Redmond	44.27058731	-121.1742634	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Snow	Snow	Daylight
1410343	1	2	2	234	February	19	2011	Saturday	8:00 AM	Deschutes	Redmond	44.23783689	-121.1976202	Southwest Intersection Quadrant	Sideswipe-overtaking	Non-fatal injury crash	Snow	Snow	Daylight
1410351	1	2	2	243	February	19	2011	Saturday	8:00 PM	Deschutes	Redmond	44.27058985	-121.1753571	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Snow	Ice	Darkness – no street lights
1410460	1	2	2	270	February	24	2011	Thursday	8:00 AM	Deschutes	Redmond	44.25177244	-121.1844213	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Snow	Daylight
1410528	1	2	5	163	February	8	2011	Tuesday	4:00 PM	Deschutes	Redmond	44.27255507	-121.1732051	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1410575	1	2	2	164	February	5	2011	Saturday	5:00 PM	Deschutes	Redmond	44.27058731	-121.1742634	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1410606	1	2	3	170	February	7	2011	Monday	1:00 PM	Deschutes	Redmond	44.29099062	-121.1739116	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1410942	1	2	3	195	February	13	2011	Sunday	4:00 PM	Deschutes	Redmond	44.29099062	-121.1739116	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Cloudy	Dry	Daylight
1410956	1	2	2	196	February	14	2011	Monday	6:00 PM	Deschutes	Redmond	44.27058731	-121.1742634	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1411002	1	2	2	201	February	15	2011	Tuesday	6:00 AM	Deschutes	Redmond	44.27255507	-121.1732051	Outbound within 50 feet	Angle	Non-fatal injury crash	Snow	Snow	Dawn (Twilight)
1411689	1	1	1	314	March	8	2011	Tuesday	6:00 PM	Deschutes	Redmond	44.28918627	-121.1682816	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1411693	1	2	2	316	March	8	2011	Tuesday	4:00 PM	Deschutes	Redmond	44.28778886	-121.1722052	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1411728	1	2	3	347	March	16	2011	Wednesday	6:00 PM	Deschutes	Redmond	44.25819154	-121.1827953	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1411745	1	2	1	362	March	18	2011	Friday	7:00 PM	Deschutes	Redmond	44.25470462	-121.2029694	Midblock location	Sideswipe-meeting	Non-fatal injury crash	Cloudy	Snow	Darkness – no street lights
1411824	1	2	1	387	March	24	2011	Thursday	9:00 AM	Deschutes	Redmond	44.25476691	-121.1917305	Outbound within 50 feet	Rear-End	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1411830	1	2	4	388	March	25	2011	Friday	1:00 PM	Deschutes	Redmond	44.25843183	-121.182603	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Dry	Daylight
1411841	1	1	1	394	March	26	2011	Saturday	11:00 PM	Deschutes	Redmond	44.25112028	-121.19795	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1411878	1	2	3	413	March	26	2011	Saturday	2:00 PM	Deschutes	Redmond	44.29100875	-121.1638389	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Dry	Daylight
1411905	1	3	3	184	February	11	2011	Friday	2:00 PM	Deschutes	Redmond	44.27257627	-121.1694391	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1411917	1	2	1	381	March	23	2011	Wednesday	6:00 AM	Deschutes	Redmond	44.29936127	-121.1592165	Outbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Dawn (Twilight)
1412059	1	2	2	330	March	12	2011	Saturday	7:00 PM	Deschutes	Redmond	44.27256109	-121.1732051	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1412248	1	2	3	403	March	31	2011	Thursday	7:00 PM	Deschutes	Redmond	44.27255667	-121.1769805	Outbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1412551	1	2	2	379	March	23	2011	Wednesday	3:00 PM	Deschutes	Redmond	44.2679015	-121.174682	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Dry	Daylight
1412620	1	3	3	395	March	27	2011	Sunday	8:00 AM	Deschutes	Redmond	44.26306834	-121.1769782	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Dawn (Twilight)
1412716	1	2	2	363	March	16	2011	Wednesday	8:00 AM	Deschutes	Redmond	44.265425	-121.1732556	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1412760	1	2	2	352	March	17	2011	Thursday	1:00 PM	Deschutes	Redmond	44.2593823	-121.1794061	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1414431	1	6	6	810	June	8	2011	Wednesday	5:00 PM	Deschutes	Redmond	44.24117854	-121.1943734	Southeast Intersection Quadrant	Sideswipe-overtaking	Fatal crash	Clear	Dry	Daylight
1415410	1	2	4	494	April	16	2011	Saturday	9:00 AM	Deschutes	Redmond	44.26920447	-121.1993511	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1415468	1	3	3	512	April	22	2011	Friday	4:00 PM	Deschutes	Redmond	44.28914401	-121.1891194	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1415694	1	2	1	495	April	16	2011	Saturday	12:00 PM	Deschutes	Redmond	44.27921975	-121.1764194	Outbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Dry	Daylight
1415731	1	2	1	515	April	23	2011	Saturday	3:00 AM	Deschutes	Redmond	44.30313066	-121.1758785	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1415733	1	2	1	90515	April	23	2011	Saturday	3:00 AM	Deschutes	Redmond	44.30313066	-121.1758785	Midblock location	Backing	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1415804	1	2	3	453	April	7	2011	Thursday	3:00 PM	Deschutes	Redmond	44.27552781	-121.1732154	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Cloudy	Dry	Daylight
1415840	1	2	2	465	April	8	2011	Friday	1:00 PM	Deschutes	Redmond	44.27741646	-121.1732175	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1416013	1	2	2	496	April	17	2011	Sunday	2:00 PM	Deschutes	Redmond	44.28918627	-121.1682816	NE Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1416247	1	3	3	429	April	2	2011	Saturday	11:00 AM	Deschutes	Redmond	44.26948132	-121.1866937	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Dry	Daylight
1416254	1	2	3	479	April	13	2011	Wednesday	7:00 AM	Deschutes	Redmond	44.26958287	-121.1840678	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1416309	1	1	1	502	April	19	2011	Tuesday	8:00 AM	Deschutes	Redmond	44.26631909	-121.1565569	Midblock location	Non-collision	Non-fatal injury crash	Clear	Dry	Daylight
1416313	1	2	2	544	April	30	2011	Saturday	10:00 AM	Deschutes	Redmond	44.26963023	-121.1732032	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1416384	1	2	2	435	April	3	2011	Sunday	12:00 PM	Deschutes	Redmond	44.2890004	-121.1672745	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1416388	1	2	2	500	April	18	2011	Monday	5:00 PM	Deschutes	Redmond	44.25476003	-121.1928889	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1416572	1	2	2	507	April	20	2011	Wednesday	10:00 AM	Deschutes	Redmond	44.27255507	-121.1732051	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1416696	1	1	1	522	April	25	2011	Monday	6:00 AM	Deschutes	Redmond	44.23783689	-121.1976202	Southwest Intersection Quadrant	Miscellaneous	Property damage only crash (PDO)	Clear	Dry	Daylight
1416758	1	2	2	536	April	28	2011	Thursday	2:00 PM	Deschutes	Redmond	44.25177244	-121.1844213	Outbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1416771	1	2	2	542	April	18	2011	Monday	5:00 PM	Deschutes	Redmond	44.2562857	-121.1814444	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1420333	1	2	2	688	May	29	2011	Sunday	9:00 AM	Deschutes	Redmond	44.27833463	-121.19925	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1420811	1	2	2	638	May	16	2011	Monday	3:00 PM	Deschutes	Redmond	44.28137944	-121.1892	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1421005	1	2	2	648	May	20	2011	Friday	9:00 AM	Deschutes	Redmond	44.26959201	-121.1795959	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Unknown	Dry	Daylight
1421010	1	2	2	654	May	21	2011	Saturday	2:00 PM	Deschutes	Redmond	44.24750034	-121.1991389	Outbound within 50 feet	Turning Movement	Non-fatal injury crash	Cloudy	Dry	Daylight
1421021	1	2	2	664	May	24	2011	Tuesday	6:00 PM	Deschutes	Redmond	44.27439582	-121.1732153	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1421031	1	2	2	673	May	25	2011	Wednesday	6:00 PM	Deschutes	Redmond	44.28556071	-121.17645	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1421069	1	3	3	562	May	3	2011	Tuesday	12:00 PM	Deschutes	Redmond	44.26011057	-121.181429	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1421075	1	2	2	565	May	4	2011	Wednesday	4:00 PM	Deschutes	Redmond	44.27551943	-121.1774854	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1421082	1	2	2	566	May	4	2011	Wednesday	6:00 PM	Deschutes	Redmond	44.25471702	-121.2125695	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1421206	1	2	2	567	May	4	2011	Wednesday	5:00 PM	Deschutes	Redmond	44.26948132	-121.1866937	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1421225	1	3	4	597	May	11	2011	Wednesday	3:00 PM	Deschutes	Redmond	44.26934103	-121.1892356	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight

1421231	1	2	2	604	May	12	2011	Thursday	6:00 PM	Deschutes	Redmond	44.26961205	-121.1742622	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1421271	1	2	2	627	May	17	2011	Tuesday	7:00 PM	Deschutes	Redmond	44.2695899	-121.1807742	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1421291	1	2	2	658	May	22	2011	Sunday	2:00 PM	Deschutes	Redmond	44.26920439	-121.2093365	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1421415	1	2	2	636	May	16	2011	Monday	12:00 PM	Deschutes	Redmond	44.28259765	-121.1742713	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1422280	1	3	1	653	May	21	2011	Saturday	7:00 PM	Deschutes	Redmond	44.28543453	-121.1740052	NE Intersection Quadrant	Sideswipe-meeting	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1422326	1	2	2	672	May	25	2011	Wednesday	5:00 PM	Deschutes	Redmond	44.26973674	-121.1732044	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1422358	1	2	2	551	May	2	2011	Monday	12:00 PM	Deschutes	Redmond	44.29099062	-121.1739116	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1422574	1	2	3	602	May	12	2011	Thursday	9:00 PM	Deschutes	Redmond	44.24517129	-121.1904594	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1422683	1	2	2	618	May	14	2011	Saturday	4:00 PM	Deschutes	Redmond	44.25835007	-121.1800856	Southwest Intersection Quadrant	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1423841	1	2	1	592	May	9	2011	Monday	11:00 AM	Deschutes	Redmond	44.27832815	-121.1967	Inbound within 50 feet	Backing	Property damage only crash (PDO)	Clear	Dry	Daylight
1423853	1	1	1	588	May	7	2011	Saturday	7:00 PM	Deschutes	Redmond	44.23785575	-121.2116578	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1426846	1	1	1	728	June	7	2011	Tuesday	7:00 AM	Deschutes	Redmond	44.26928222	-121.1912836	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1426879	1	2	3	741	June	7	2011	Tuesday	4:00 PM	Deschutes	Redmond	44.26934103	-121.1892356	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1426969	1	2	2	788	June	18	2011	Saturday	1:00 PM	Deschutes	Redmond	44.265425	-121.1732556	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1427296	1	1	2	1127	August	4	2011	Thursday	12:00 AM	Deschutes	Redmond	44.24343695	-121.192169	Southwest Intersection Quadrant	Pedestrian	Fatal crash	Clear	Dry	Darkness – no street lights
1427555	1	1	2	708	June	3	2011	Friday	10:00 AM	Deschutes	Redmond	44.29099062	-121.1739116	Outbound within 50 feet	Pedestrian	Non-fatal injury crash	Clear	Dry	Daylight
1428158	1	4	5	778	June	17	2011	Friday	10:00 AM	Deschutes	Redmond	44.25977834	-121.1791497	Southeast Intersection Quadrant	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1428233	1	2	2	791	June	20	2011	Monday	3:00 PM	Deschutes	Redmond	44.26241416	-121.1774237	Southeast Intersection Quadrant	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1428431	1	2	2	815	June	25	2011	Saturday	12:00 AM	Deschutes	Redmond	44.27058883	-121.1732138	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1428548	1	3	4	833	June	28	2011	Tuesday	5:00 PM	Deschutes	Redmond	44.28394294	-121.1734034	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1428777	1	2	2	697	May	31	2011	Tuesday	3:00 PM	Deschutes	Redmond	44.27741638	-121.1774889	NE Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1428787	1	2	2	702	June	2	2011	Thursday	4:00 PM	Deschutes	Redmond	44.25475245	-121.1941611	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1428831	1	2	2	717	June	7	2011	Tuesday	5:00 PM	Deschutes	Redmond	44.25998198	-121.1810852	Midblock location	Rear-End	Non-fatal injury crash	Cloudy	Dry	Daylight
1428853	1	2	2	720	June	7	2011	Tuesday	4:00 PM	Deschutes	Redmond	44.26454259	-121.1773518	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1428861	1	2	2	731	June	8	2011	Wednesday	11:00 AM	Deschutes	Redmond	44.2792234	-121.1721388	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1428872	1	2	2	770	June	14	2011	Tuesday	11:00 AM	Deschutes	Redmond	44.26373177	-121.1787643	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1428881	1	2	2	767	June	12	2011	Sunday	5:00 PM	Deschutes	Redmond	44.27255507	-121.1732051	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1428891	1	2	2	772	June	15	2011	Wednesday	5:00 PM	Deschutes	Redmond	44.26963023	-121.1732032	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1428956	1	2	3	779	June	17	2011	Friday	2:00 PM	Deschutes	Redmond	44.29098996	-121.1777389	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1429001	1	2	2	800	June	22	2011	Wednesday	10:00 PM	Deschutes	Redmond	44.27380471	-121.1892387	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1429010	1	3	3	827	June	27	2011	Monday	7:00 PM	Deschutes	Redmond	44.25349881	-121.1873626	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1429416	1	2	3	758	June	13	2011	Monday	9:00 AM	Deschutes	Redmond	44.24750034	-121.1991389	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1431685	1	2	3	859	July	4	2011	Monday	5:00 PM	Deschutes	Redmond	44.30092516	-121.1721588	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1431894	1	1	1	877	June	4	2011	Saturday	2:00 AM	Deschutes	Redmond	44.247961	-121.1945693	NW Intersection Quadrant	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1431934	1	2	2	881	July	7	2011	Thursday	8:00 PM	Deschutes	Redmond	44.26928222	-121.1912836	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1432303	1	2	2	861	July	5	2011	Tuesday	5:00 PM	Deschutes	Redmond	44.25618051	-121.2043898	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1433311	1	2	2	893	July	8	2011	Friday	6:00 PM	Deschutes	Redmond	44.2593823	-121.1794061	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1433481	1	2	2	924	July	15	2011	Friday	3:00 PM	Deschutes	Redmond	44.24594862	-121.1896962	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1433488	1	2	2	927	July	15	2011	Friday	3:00 PM	Deschutes	Redmond	44.24594862	-121.1896962	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1433568	1	2	2	936	July	18	2011	Monday	10:00 AM	Deschutes	Redmond	44.25177244	-121.1844213	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1433577	1	2	2	939	June	30	2011	Thursday	3:00 PM	Deschutes	Redmond	44.29099062	-121.1739116	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1433856	1	2	2	898	July	9	2011	Saturday	9:00 PM	Deschutes	Redmond	44.26928222	-121.1912836	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1433866	1	2	2	888	July	8	2011	Friday	9:00 PM	Deschutes	Redmond	44.27057002	-121.1795923	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1433868	1	2	2	879	July	7	2011	Thursday	8:00 AM	Deschutes	Redmond	44.26920439	-121.2093365	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1433882	1	2	2	869	July	6	2011	Wednesday	11:00 AM	Deschutes	Redmond	44.26928222	-121.1912836	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1434139	1	2	2	962	July	23	2011	Saturday	7:00 PM	Deschutes	Redmond	44.26919735	-121.204399	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1434226	1	2	2	999	July	29	2011	Friday	2:00 PM	Deschutes	Redmond	44.26920439	-121.2093365	Inbound within 50 feet	Backing	Property damage only crash (PDO)	Clear	Dry	Daylight
1434234	1	2	2	1002	July	30	2011	Saturday	11:00 AM	Deschutes	Redmond	44.26920439	-121.2093365	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1434462	1	2	2	917	July	14	2011	Thursday	6:00 PM	Deschutes	Redmond	44.27155795	-121.1742876	Inbound within 50 feet	Parking Maneuver	Property damage only crash (PDO)	Clear	Dry	Daylight
1434473	1	2	2	922	July	15	2011	Friday	11:00 AM	Deschutes	Redmond	44.26306834	-121.1769782	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1434506	1	2	2	938	July	18	2011	Monday	5:00 PM	Deschutes	Redmond	44.27255649	-121.1742768	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Rain	Wet	Daylight
1434621	1	3	4	1006	July	30	2011	Saturday	2:00 PM	Deschutes	Redmond	44.26959215	-121.1774611	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1434648	1	2	1	1008	July	30	2011	Saturday	7:00 PM	Deschutes	Redmond	44.2490499	-121.1966527	Midblock location	Backing	Property damage only crash (PDO)	Clear	Dry	Daylight
1436810	1	2	2	941	July	19	2011	Tuesday	7:00 PM	Deschutes	Redmond	44.26805708	-121.1993499	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1440338	1	2	2	1019	August	2	2011	Tuesday	7:00 AM	Deschutes	Redmond	44.26961205	-121.1742622	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1440348	1	2	4	1072	August	10	2011	Wednesday	6:00 PM	Deschutes	Redmond	44.27058731	-121.1742634	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1440356	1	1	1	1111	August	18	2011	Thursday	12:00 AM	Deschutes	Redmond	44.26921218	-121.2012702	Outbound within 50 feet	Miscellaneous	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1440403	1	2	2	1139	August	22	2011	Monday	11:00 AM	Deschutes	Redmond	44.26920447	-121.1993511	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1440475	1	2	3	1020	August	2	2011	Tuesday	2:00 PM	Deschutes	Redmond	44.25163492	-121.184527	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1440525	1	2	2	1024	August	3	2011	Wednesday	3:00 PM	Deschutes	Redmond	44.25202934	-121.1842497	Outbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1440555	1	2	2	1045	August	5	2011	Friday	7:00 AM	Deschutes	Redmond	44.26306834	-121.1769782	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1440571	1	2	2	1055	August	8	2011	Monday	2:00 PM	Deschutes	Redmond	44.26962985	-121.1716312	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1440647	1	2	2	1076	August	11	2011	Thursday	1:00 AM	Deschutes	Redmond	44.26975131	-121.1715393	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1440661	1	2	2	1078	August	11	2011	Thursday	7:00 AM	Deschutes	Redmond	44.2698441	-121.1717056	Outbound within 50 feet	Backing	Property damage only crash (PDO)	Clear	Dry	Daylight
1440700	1	2	2	1815	August	4	2011	Thursday	3:00 PM	Deschutes	Redmond	44.24296237	-121.1939709	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Unknown	Unknown	Daylight
1441727	1	2	2	1270	September	20	2011	Tuesday	9:00 PM	Deschutes	Redmond	44.26928222	-121.1912836	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1441840	1	2	2	1294	September	27	2011	Tuesday	5:00 PM	Deschutes	Redmond	44.26920447	-121.1993511	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1441935	1	2	2	1223	September	9	2011	Friday	6:00 PM	Deschutes	Redmond	44.28202684	-121.1732328	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1442022	1	3	3	1250	September	15	2011	Thursday	4:00 PM	Deschutes	Redmond	44.26306834	-121.1769782	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1442047	1	3	3	1253	September	15	2011	Thursday	5:00 PM	Deschutes	Redmond	44.26924028	-121.1947013	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1442167	1	2	3	1323	October	1	2011	Saturday	4:00 PM	Deschutes	Redmond	44.28412169	-121.1741717	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1442178	1	2	2	1199	September	6	2011	Tuesday	5:00 PM	Deschutes	Redmond	44.28202684	-121.1732328	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1442195	1	2	2	1358	October	11	2011	Tuesday	4:00 PM	Deschutes	Redmond	44.26936198	-121.1888311	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1442241	1	2	2	1372	October	13	2011	Thursday	6:00 PM	Deschutes	Redmond	44.26928222	-121.1912836	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1442246	1	2	2	1373	October	13	2011	Thursday	9:00 AM	Deschutes	Redmond	44.27058731	-121.1742634	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1442277	1	1	2	1207	September	7	2011	Wednesday	11:00 AM	Deschutes	Redmond	44.26928222	-121.1912836	Inbound within 50 feet	Pedestrian	Non-fatal injury crash	Clear	Dry	Daylight
1442316	1	1	2	1390	October	18	2011	Tuesday	3:00 PM	Deschutes	Redmond	44.26958287	-121.1840678	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1442340	1	1	1	1404	October	15	2011	Saturday	1:00 PM	Deschutes	Redmond	44.23652188	-121.1988981	NW Intersection Quadrant	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Daylight
1442378	1	2	2	1419	October	22	2011	Saturday	8:00 AM	Deschutes	Redmond	44.2593823	-121.1794061	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1442454	1	2	4	1435	October	26	2011	Wednesday	5:00 PM	Deschutes	Redmond	44.26959572	-121.1753555	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1442469	1	2	2	1444	October	27	2011	Thursday	12:00 PM	Deschutes	Redmond	44.27058731	-121.1742634	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1442477	1	2	2	1446	October	28	2011	Friday	12:00 PM	Deschutes	Redmond	44.26920447	-121.1993511	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1442559	1	2	2	1475	November	3	2011	Thursday	3:00 PM	Deschutes	Redmond	44.28202684	-121.1732328	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1442560	1	2	5	1476	November	3	2011	Thursday	7:00 AM	Deschutes	Redmond	44.27276946	-121.1892497	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Rain	Wet	Dawn (Twilight)
1442955	1	2	2	1512	November	10	2011	Thursday	11:00 AM	Deschutes	Redmond	44.26928222	-121.1912836	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1443007	1	2	2	1524	November	13	2011	Sunday	2:00 PM	Deschutes	Redmond	44.26928885	-121.1912837	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1443031	1	1	1	1528	November	14	2011	Monday	5:00 PM	Deschutes	Redmond	44.28409816	-121.173515	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1443047	1	2	2	1534	November	12	2011	Saturday	10:00 PM	Deschutes	Redmond	44.26961205	-121.1742622	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Unknown

1443056	1	2	2	1540	November	17	2011	Thursday	12:00 PM	Deschutes	Redmond	44.27058985	-121.1753571	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1443058	1	2	5	1541	November	17	2011	Thursday	4:00 PM	Deschutes	Redmond	44.26934103	-121.1892356	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1443060	1	2	2	1546	November	16	2011	Wednesday	1:00 PM	Deschutes	Redmond	44.28736914	-121.1740028	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1443348	1	2	3	1560	November	18	2011	Friday	2:00 PM	Deschutes	Redmond	44.272058	-121.1626224	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1443465	1	2	2	1608	November	28	2011	Monday	5:00 PM	Deschutes	Redmond	44.25177244	-121.1844213	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1443498	1	2	2	1620	November	21	2011	Monday	2:00 PM	Deschutes	Redmond	44.26920447	-121.1993511	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1443838	1	1	1	1785	December	30	2011	Friday	1:00 PM	Deschutes	Redmond	44.28452247	-121.1738387	Inbound within 50 feet	Miscellaneous	Property damage only crash (PDO)	Rain	Wet	Daylight
1443924	1	2	2	1634	December	2	2011	Friday	2:00 PM	Deschutes	Redmond	44.26962985	-121.1716312		Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1443948	1	1	2	1649	December	5	2011	Monday	12:00 PM	Deschutes	Redmond	44.27255649	-121.1742768	Outbound within 50 feet	Pedestrian	Non-fatal injury crash	Clear	Dry	Daylight
1443952	1	1	1	1650	December	5	2011	Monday	9:00 PM	Deschutes	Redmond	44.23783689	-121.1976202	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1444032	1	2	3	1668	December	9	2011	Friday	2:00 PM	Deschutes	Redmond	44.24507421	-121.1905551	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1444064	1	1	1	1677	December	11	2011	Sunday	1:00 AM	Deschutes	Redmond	44.27246859	-121.1632057	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1444078	1	2	2	1683	December	13	2011	Tuesday	3:00 PM	Deschutes	Redmond	44.26959208	-121.1774715	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1444171	1	2	2	1721	December	20	2011	Tuesday	7:00 PM	Deschutes	Redmond	44.2695899	-121.1807742	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – with street lights
1444174	1	2	2	1723	December	20	2011	Tuesday	4:00 AM	Deschutes	Redmond	44.2427261	-121.1928699	Southwest Intersection Quadrant	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1444182	1	2	3	1728	December	21	2011	Wednesday	4:00 PM	Deschutes	Redmond	44.26267583	-121.1772455	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1444762	1	2	2	1332	October	4	2011	Tuesday	2:00 PM	Deschutes	Redmond	44.25785736	-121.1830627	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1444777	1	1	1	1335	October	5	2011	Wednesday	12:00 AM	Deschutes	Redmond	44.25553273	-121.184939	Midblock location	Non-collision	Non-fatal injury crash	Cloudy	Wet	Darkness – no street lights
1445062	1	2	3	1309	September	29	2011	Thursday	2:00 PM	Deschutes	Redmond	44.26903897	-121.1753566	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1445618	1	2	1	1066	August	9	2011	Tuesday	10:00 AM	Deschutes	Redmond	44.27057135	-121.1785425	Outbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1445680	1	1	1	1014	August	1	2011	Monday	6:00 PM	Deschutes	Redmond	44.27200121	-121.1893056	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Rain	Wet	Daylight
1445692	1	2	2	1030	August	3	2011	Wednesday	12:00 PM	Deschutes	Redmond	44.24313685	-121.1861004	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1445754	1	2	4	1047	August	5	2011	Friday	11:00 PM	Deschutes	Redmond	44.27652284	-121.1721388	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1445767	1	2	2	1048	August	5	2011	Friday	6:00 PM	Deschutes	Redmond	44.26296312	-121.1766213	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1445856	1	3	4	1071	August	10	2011	Wednesday	12:00 PM	Deschutes	Redmond	44.25117098	-121.1904512	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1445943	1	2	2	10870	August	12	2011	Friday	5:00 PM	Deschutes	Redmond	44.25661333	-121.1840723	Southeast Intersection Quadrant	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1445966	1	3	3	1094	August	15	2011	Monday	4:00 PM	Deschutes	Redmond	44.26928244	-121.1912836	Outbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Dry	Daylight
1445995	1	3	3	1104	August	18	2011	Thursday	9:00 PM	Deschutes	Redmond	44.25177244	-121.1844213	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1446014	1	2	2	1114	August	19	2011	Friday	6:00 PM	Deschutes	Redmond	44.27642255	-121.2093806	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1446033	1	2	2	1124	August	20	2011	Saturday	1:00 PM	Deschutes	Redmond	44.27552781	-121.1732154	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1446047	1	2	2	1151	August	25	2011	Thursday	6:00 PM	Deschutes	Redmond	44.27551291	-121.17805	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1446099	1	2	2	1157	August	26	2011	Friday	3:00 PM	Deschutes	Redmond	44.2792148	-121.1753611	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1446113	1	2	2	1158	August	26	2011	Friday	2:00 PM	Deschutes	Redmond	44.26788581	-121.1747806	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Unknown	Unknown	Daylight
1446467	1	2	3	1061	August	8	2011	Monday	3:00 PM	Deschutes	Redmond	44.27358037	-121.1666353	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1446484	1	2	3	1073	August	10	2011	Wednesday	8:00 AM	Deschutes	Redmond	44.28202684	-121.1732328	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1446733	1	2	1	1013	August	1	2011	Monday	5:00 AM	Deschutes	Redmond	44.2800679	-121.1974889	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Dawn (Twilight)
1446739	1	2	4	1069	May	10	2011	Tuesday	5:00 PM	Deschutes	Redmond	44.2460886	-121.1967303	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1447676	1	2	2	1167	August	27	2011	Saturday	3:00 PM	Deschutes	Redmond	44.28375517	-121.1753695	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1447884	1	2	2	1184	September	1	2011	Thursday	3:00 PM	Deschutes	Redmond	44.27831288	-121.1742851	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1448168	1	2	2	1204	September	7	2011	Wednesday	3:00 PM	Deschutes	Redmond	44.27258966	-121.1643392	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1448382	1	1	2	1213	September	8	2011	Thursday	4:00 PM	Deschutes	Redmond	44.27551943	-121.1774854	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1448495	1	1	2	1656	December	4	2011	Sunday	4:00 PM	Deschutes	Redmond	44.29450072	-121.1738889	Outbound within 50 feet	Pedestrian	Non-fatal injury crash	Clear	Dry	Daylight
1448498	1	1	1	1517	November	10	2011	Thursday	12:00 AM	Deschutes	Redmond	44.25286379	-121.2045183	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1448565	1	2	2	1529	November	14	2011	Monday	11:00 AM	Deschutes	Redmond	44.27921721	-121.1732111	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1448577	1	2	2	1542	November	17	2011	Thursday	9:00 PM	Deschutes	Redmond	44.27553402	-121.1721389	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1448583	1	2	3	1318	September	30	2011	Friday	5:00 PM	Deschutes	Redmond	44.25476107	-121.1941738	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1448713	1	2	1	1604	November	27	2011	Sunday	11:00 AM	Deschutes	Redmond	44.29941146	-121.1828631	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1448883	1	2	2	1638	December	2	2011	Friday	4:00 PM	Deschutes	Redmond	44.25476107	-121.1941738	Southwest Intersection Quadrant	Rear-End	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1448892	1	2	1	1641	November	12	2011	Saturday	4:00 PM	Deschutes	Redmond	44.28048894	-121.1942439	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1448907	1	2	2	1651	December	6	2011	Tuesday	3:00 PM	Deschutes	Redmond	44.27354199	-121.1721388	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1448946	1	2	2	1662	December	7	2011	Wednesday	5:00 PM	Deschutes	Redmond	44.28914401	-121.1891194	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1448953	1	5	2	1666	December	9	2011	Friday	10:00 PM	Deschutes	Redmond	44.25799996	-121.1875687	Midblock location	Sideswipe-meeting	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1448958	1	2	2	1262	September	19	2011	Monday	10:00 AM	Deschutes	Redmond	44.27255649	-121.1742768	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1449112	1	2	4	1486	November	5	2011	Saturday	2:00 AM	Deschutes	Redmond	44.27763067	-121.2093667	Midblock location	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1449113	1	2	2	1667	December	9	2011	Friday	9:00 AM	Deschutes	Redmond	44.26897025	-121.1913226	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1449125	1	1	1	1675	December	10	2011	Saturday	9:00 PM	Deschutes	Redmond	44.26161908	-121.1999917	Unknown	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1449186	1	1	1	1692	December	15	2011	Thursday	12:00 AM	Deschutes	Redmond	44.265425	-121.1732556	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1449200	1	2	2	1697	December	15	2011	Thursday	6:00 PM	Deschutes	Redmond	44.29098996	-121.1777389	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1449209	1	2	2	1702	December	16	2011	Friday	6:00 PM	Deschutes	Redmond	44.26942958	-121.1876343	Outbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1449235	1	2	2	1709	December	17	2011	Saturday	12:00 PM	Deschutes	Redmond	44.24752984	-121.2293806	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1449309	1	2	3	1724	December	20	2011	Tuesday	3:00 PM	Deschutes	Redmond	44.27551921	-121.17535	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1449325	1	2	2	1247	September	14	2011	Wednesday	1:00 PM	Deschutes	Redmond	44.25107976	-121.2139194	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1449350	1	1	1	1740	December	22	2011	Thursday	6:00 PM	Deschutes	Redmond	44.29639412	-121.1789889	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1449393	1	2	4	1766	December	29	2011	Thursday	5:00 PM	Deschutes	Redmond	44.27642255	-121.2093806	NW Intersection Quadrant	Angle	Non-fatal injury crash	Rain	Wet	Darkness – no street lights
1449420	1	2	2	1715	December	19	2011	Monday	9:00 AM	Deschutes	Redmond	44.27643064	-121.1992874	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1449431	1	2	3	1433	October	26	2011	Wednesday	7:00 AM	Deschutes	Redmond	44.27647106	-121.1878695	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1449436	1	2	2	1379	October	14	2011	Friday	11:00 AM	Deschutes	Redmond	44.27258618	-121.1666297	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1449439	1	2	2	1381	October	14	2011	Friday	6:00 PM	Deschutes	Redmond	44.265425	-121.1732556	Unknown	Angle	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1449452	1	3	3	1394	October	17	2011	Monday	4:00 PM	Deschutes	Redmond	44.25477868	-121.1892806	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1449454	1	3	5	1441	October	27	2011	Thursday	5:00 PM	Deschutes	Redmond	44.2384333	-121.209912	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1449467	1	2	2	1342	October	7	2011	Friday	8:00 PM	Deschutes	Redmond	44.27408055	-121.1892505	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1449491	1	2	2	1460	October	31	2011	Monday	11:00 AM	Deschutes	Redmond	44.27741638	-121.1774889	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1449525	1	2	2	1346	October	8	2011	Saturday	2:00 PM	Deschutes	Redmond	44.29098056	-121.1839696	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1449533	1	2	3	1349	October	9	2011	Sunday	10:00 PM	Deschutes	Redmond	44.27971121	-121.1892214	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – with street lights
1449556	1	2	2	1362	October	11	2011	Tuesday	4:00 PM	Deschutes	Redmond	44.27626928	-121.1807054	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1449600	1	1	1	1773	December	28	2011	Wednesday	4:00 PM	Deschutes	Redmond	44.27663893	-121.1721495	Inbound within 50 feet	Fixed-Object or Other-Object	Non-fatal injury crash	Rain	Wet	Dusk (Twilight)
1449625	1	2	2	978	July	26	2011	Tuesday	10:00 AM	Deschutes	Redmond	44.27648641	-121.1688372	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1449630	1	2	2	1809	November	7	2011	Monday	11:00 AM	Deschutes	Redmond	44.27139617	-121.1742836	Outbound within 50 feet	Backing	Property damage only crash (PDO)	Clear	Dry	Daylight
1449698	1	1	1	6	January	1	2012	Sunday	1:00 AM	Deschutes	Redmond	44.26921114	-121.2093365	NW Intersection Quadrant	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1449702	1	2	2	13	January	4	2012	Wednesday	4:00 PM	Deschutes	Redmond	44.26306835	-121.1769782	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1449861	1	2	2	131	January	25	2012	Wednesday	8:00 AM	Deschutes	Redmond	44.26962986	-121.1716312	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1449886	1	2	3	126	January	25	2012	Wednesday	12:00 PM	Deschutes	Redmond	44.27255507	-121.1732051	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1449891	1	2	2	110	January	22	2012	Sunday	4:00 PM	Deschutes	Redmond	44.26928222	-121.1912836	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Cloudy	Dry	Daylight
1450158	1	2	2	48	January	14	2012	Saturday	6:00 PM	Deschutes	Redmond	44.25603089	-121.1816121	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1450196	1	2	2	27	January	9	2012	Monday	3:00 PM	Deschutes	Redmond	44.24527376	-121.1903585	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1451434	1	3	1	4	January	1	2012	Sunday	7:00 PM	Deschutes	Redmond	44.26446612	-121.2035611	NE Intersection Quadrant	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1451461	1	2	2	18	January	3	2012	Tuesday	12:00 PM	Deschutes	Redmond	44.2748286	-121.1732157	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1451490	1	2	2	20	January	5	2012	Thursday	12:00 PM	Deschutes	Redmond	44.27453025	-121.1753498	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight

1451494	1	2	2	31	January	10	2012	Tuesday	9:00 AM	Deschutes	Redmond	44.27155794	-121.1742876	Outbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1451518	1	2	2	36	January	12	2012	Thursday	3:00 PM	Deschutes	Redmond	44.26011057	-121.181429	Outbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1451635	1	2	2	78	January	17	2012	Tuesday	3:00 PM	Deschutes	Redmond	44.29099025	-121.1741389	Midblock location	Turning Movement	Property damage only crash (PDO)	Cloudy	Wet	Daylight
1451660	1	2	2	114	January	23	2012	Monday	4:00 PM	Deschutes	Redmond	44.25475238	-121.1941737	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1451702	1	2	3	125	January	25	2012	Wednesday	9:00 PM	Deschutes	Redmond	44.26928222	-121.1912836	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1451758	1	2	2	160	January	30	2012	Monday	8:00 AM	Deschutes	Redmond	44.26193592	-121.2095351	NE Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Wet	Daylight
1452680	1	1	1	69	January	18	2012	Wednesday	9:00 AM	Deschutes	Redmond	44.25227222	-121.2127761	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Rain	Wet	Daylight
1452682	1	1	1	135	January	25	2012	Wednesday	10:00 AM	Deschutes	Redmond	44.27642303	-121.1977561	Inbound within 50 feet	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Daylight
1453092	1	2	2	143	January	26	2012	Thursday	5:00 PM	Deschutes	Redmond	44.25293678	-121.1865075	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1456809	1	3	6	99	February	6	2012	Monday	7:00 AM	Deschutes	Redmond	44.29705735	-121.1665449	Southeast Intersection Quadrant	Head-On	Fatal crash	Fog	Ice	Dawn (Twilight)
1456929	1	1	1	196	February	8	2012	Wednesday	3:00 AM	Deschutes	Redmond	44.26956065	-121.1848889	NW Intersection Quadrant	Fixed-Object or Other-Object	Property damage only crash (PDO)	Snow	Ice	Darkness – no street lights
1456950	1	2	3	206	February	10	2012	Friday	2:00 PM	Deschutes	Redmond	44.26958279	-121.1840684	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1456957	1	2	2	285	February	20	2012	Monday	9:00 AM	Deschutes	Redmond	44.26958313	-121.1819346	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1456967	1	2	4	173	February	3	2012	Friday	12:00 PM	Deschutes	Redmond	44.26963023	-121.1732033	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1457026	1	2	2	202	February	9	2012	Thursday	5:00 AM	Deschutes	Redmond	44.27058884	-121.1732138	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Rain	Wet	Darkness – no street lights
1457030	1	2	1	177	February	3	2012	Friday	1:00 AM	Deschutes	Redmond	44.25957548	-121.1799145	Midblock location	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Ice	Darkness – no street lights
1458638	1	2	2	208	February	10	2012	Friday	4:00 PM	Deschutes	Redmond	44.29099062	-121.1739116	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1458648	1	2	2	253	February	21	2012	Tuesday	4:00 PM	Deschutes	Redmond	44.24752987	-121.2293879	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1458663	1	2	4	280	February	25	2012	Saturday	Unknown Tim	Deschutes	Redmond	44.2547787	-121.1872167	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1458711	1	2	2	296	February	27	2012	Monday	2:00 PM	Deschutes	Redmond	44.26204552	-121.1865592	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Snow	Daylight
1459704	1	1	2	193	February	8	2012	Wednesday	3:00 AM	Deschutes	Redmond	44.26560499	-121.1711043	Inbound within 50 feet	Fixed-Object or Other-Object	Non-fatal injury crash	Snow	Ice	Darkness – no street lights
1459706	1	2	2	260	February	23	2012	Thursday	7:00 AM	Deschutes	Redmond	44.29819684	-121.1789649	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1465547	1	2	2	342	March	2	2012	Friday	6:00 PM	Deschutes	Redmond	44.26920439	-121.2093365	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1465562	1	2	3	329	March	1	2012	Thursday	3:00 PM	Deschutes	Redmond	44.27057753	-121.1774794	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1465715	1	2	2	349	March	5	2012	Monday	11:00 AM	Deschutes	Redmond	44.27058757	-121.1740861	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1465719	1	2	2	367	March	9	2012	Friday	1:00 PM	Deschutes	Redmond	44.26959572	-121.1753555	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1465752	1	2	2	419	March	20	2012	Tuesday	2:00 PM	Deschutes	Redmond	44.26306827	-121.1769789	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1465760	1	2	2	426	March	21	2012	Wednesday	10:00 AM	Deschutes	Redmond	44.26306835	-121.1769782	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Snow	Wet	Daylight
1465945	1	2	2	371	March	11	2012	Sunday	4:00 PM	Deschutes	Redmond	44.25177244	-121.1844213	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1466086	1	1	1	382	March	13	2012	Tuesday	1:00 PM	Deschutes	Redmond	44.26559374	-121.2060748	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1466133	1	2	2	348	March	5	2012	Monday	3:00 PM	Deschutes	Redmond	44.29450072	-121.1738889	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1466239	1	2	2	90393	March	15	2012	Thursday	11:00 AM	Deschutes	Redmond	44.26959201	-121.1795959	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1466278	1	2	3	365	March	8	2012	Thursday	7:00 PM	Deschutes	Redmond	44.27642256	-121.2093913	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1467691	1	2	2	569	April	28	2012	Saturday	1:00 PM	Deschutes	Redmond	44.29099062	-121.1739116	Inbound within 50 feet	Turning Movement	Non-fatal injury crash	Cloudy	Dry	Daylight
1467713	1	1	1	543	April	20	2012	Friday	10:00 PM	Deschutes	Redmond	44.2497221	-121.1860386	Southwest Intersection Quadrant	Miscellaneous	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1467717	1	2	2	487	April	6	2012	Friday	5:00 PM	Deschutes	Redmond	44.29099062	-121.1739116	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1467725	1	2	2	503	April	9	2012	Monday	12:00 PM	Deschutes	Redmond	44.26958287	-121.1840678	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1467728	1	2	2	508	April	10	2012	Tuesday	10:00 AM	Deschutes	Redmond	44.27058884	-121.1732138	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1467732	1	2	2	552	April	21	2012	Saturday	12:00 PM	Deschutes	Redmond	44.27058731	-121.1742633	Inbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1467901	1	2	2	553	April	21	2012	Saturday	12:00 PM	Deschutes	Redmond	44.27651528	-121.1764086	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1467907	1	2	2	551	April	21	2012	Saturday	1:00 PM	Deschutes	Redmond	44.28102804	-121.1753731	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1467919	1	2	2	550	April	23	2012	Monday	1:00 PM	Deschutes	Redmond	44.24751033	-121.1951154	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1467927	1	2	2	514	April	12	2012	Thursday	2:00 PM	Deschutes	Redmond	44.27255717	-121.1796198	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1467935	1	2	2	494	February	9	2012	Thursday	4:00 PM	Deschutes	Redmond	44.28378839	-121.1588211	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1468074	1	3	3	538	April	19	2012	Thursday	2:00 PM	Deschutes	Redmond	44.27258618	-121.1666297	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Rain	Wet	Daylight
1469461	1	2	2	598	May	5	2012	Saturday	1:00 PM	Deschutes	Redmond	44.27074999	-121.1742674	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1469465	1	2	3	619	May	11	2012	Friday	4:00 PM	Deschutes	Redmond	44.26934103	-121.1892356	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1469476	1	2	2	650	May	17	2012	Thursday	4:00 PM	Deschutes	Redmond	44.26934103	-121.1892356	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1469480	1	2	2	656	May	20	2012	Sunday	9:00 PM	Deschutes	Redmond	44.27058731	-121.1742633	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1469481	1	2	2	589	May	3	2012	Thursday	7:00 AM	Deschutes	Redmond	44.25177244	-121.1844213	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1469520	1	2	2	633	May	14	2012	Monday	10:00 AM	Deschutes	Redmond	44.2593823	-121.1794061	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1469536	1	2	2	635	May	15	2012	Tuesday	6:00 PM	Deschutes	Redmond	44.25383561	-121.1830569	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1469545	1	2	2	645	May	16	2012	Wednesday	5:00 AM	Deschutes	Redmond	44.25758069	-121.180592	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Dawn (Twilight)
1470234	1	2	2	657	May	20	2012	Sunday	2:00 PM	Deschutes	Redmond	44.25842836	-121.1826058	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1470239	1	2	2	666	May	23	2012	Wednesday	1:00 PM	Deschutes	Redmond	44.26195902	-121.1942435	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1470282	1	2	2	582	May	1	2012	Tuesday	3:00 PM	Deschutes	Redmond	44.27551173	-121.1785601	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1470290	1	2	2	587	May	2	2012	Wednesday	7:00 AM	Deschutes	Redmond	44.26880844	-121.1840673	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1470309	1	2	2	588	May	2	2012	Wednesday	6:00 PM	Deschutes	Redmond	44.265425	-121.1732556	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1470311	1	2	3	602	May	6	2012	Sunday	3:00 PM	Deschutes	Redmond	44.27380457	-121.1892505	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1470313	1	2	2	632	May	14	2012	Monday	8:00 AM	Deschutes	Redmond	44.29099062	-121.1739116	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1470341	1	2	2	641	May	16	2012	Wednesday	4:00 PM	Deschutes	Redmond	44.27195	-121.2093303	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1470375	1	2	2	596	May	5	2012	Saturday	11:00 PM	Deschutes	Redmond	44.25469615	-121.2043724	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1470379	1	2	2	593	May	4	2012	Friday	10:00 AM	Deschutes	Redmond	44.26404335	-121.1942637	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1470387	1	1	1	6110	May	12	2012	Saturday	3:00 PM	Deschutes	Redmond	44.26920447	-121.1993511	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1472507	1	2	2	710	June	4	2012	Monday	11:00 AM	Deschutes	Redmond	44.27058884	-121.1732138	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1472643	1	2	3	728	June	10	2012	Sunday	1:00 PM	Deschutes	Redmond	44.25770598	-121.1805096	Outbound within 50 feet	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1472732	1	2	3	714	June	5	2012	Tuesday	8:00 AM	Deschutes	Redmond	44.29569389	-121.1787167	Inbound within 50 feet	Backing	Property damage only crash (PDO)	Clear	Dry	Daylight
1472748	1	2	2	717	June	6	2012	Wednesday	10:00 AM	Deschutes	Redmond	44.26924339	-121.194297	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1472754	1	2	2	723	June	8	2012	Friday	9:00 PM	Deschutes	Redmond	44.24016568	-121.1882861	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Rain	Wet	Darkness – no street lights
1472759	1	2	2	729	June	10	2012	Sunday	4:00 PM	Deschutes	Redmond	44.26928222	-121.1912836	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1472867	1	2	2	734	June	12	2012	Tuesday	4:00 PM	Deschutes	Redmond	44.27645257	-121.1892509	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1472907	1	2	3	756	June	16	2012	Saturday	5:00 PM	Deschutes	Redmond	44.27822065	-121.189233	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1473193	1	2	1	667	May	23	2012	Wednesday	8:00 PM	Deschutes	Redmond	44.25372604	-121.2162071	Inbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Cloudy	Dry	Dusk (Twilight)
1473196	1	1	1	605	May	7	2012	Monday	11:00 AM	Deschutes	Redmond	44.26063605	-121.1999782	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1473198	1	2	3	689	May	29	2012	Tuesday	7:00 AM	Deschutes	Redmond	44.25779723	-121.2002906	Midblock location	Backing	Property damage only crash (PDO)	Clear	Dry	Daylight
1473630	1	2	2	786	June	22	2012	Friday	4:00 PM	Deschutes	Redmond	44.26959201	-121.1774722	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Rain	Wet	Daylight
1473633	1	2	2	787	June	22	2012	Friday	12:00 PM	Deschutes	Redmond	44.26920439	-121.2093365	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Dry	Daylight
1473649	1	2	2	771	June	19	2012	Tuesday	9:00 AM	Deschutes	Redmond	44.24296032	-121.1939744	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1473666	1	2	2	806	June	16	2012	Saturday	2:00 PM	Deschutes	Redmond	44.24667445	-121.1889878	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1473675	1	3	3	813	June	28	2012	Thursday	2:00 PM	Deschutes	Redmond	44.29099062	-121.1739116	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1473683	1	2	4	785	June	22	2012	Friday	3:00 PM	Deschutes	Redmond	44.25177244	-121.1844213	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Rain	Wet	Daylight
1473691	1	2	2	784	June	22	2012	Friday	5:00 PM	Deschutes	Redmond	44.27169699	-121.1703464	Midblock location	Rear-End	Property damage only crash (PDO)	Rain	Wet	Daylight
1473726	1	2	2	796	June	23	2012	Saturday	8:00 PM	Deschutes	Redmond	44.28372153	-121.1942152	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1473728	1	2	2	812	June	27	2012	Wednesday	1:00 PM	Deschutes	Redmond	44.26808774	-121.1785081	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1473912	1	2	2	794	June	23	2012	Saturday	1:00 PM	Deschutes	Redmond	44.27552781	-121.1732154	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1474206	1	1	2	1373	May	9	2012	Wednesday	10:00 PM	Deschutes	Redmond	44.28827778	-121.1739753	Inbound within 50 feet	Pedestrian	Fatal crash	Clear	Dry	Darkness – no street lights
1476413	1	2	2	864	July	9	2012	Monday	11:00 AM	Deschutes	Redmond	44.27552781	-121.1732154	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1476464	1	2	2	884	July	13	2012	Friday	12:00 PM	Deschutes	Redmond	44.28374234	-121.1742142	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight

1476470	1	2	2	890	July	14	2012	Saturday	7:00 PM	Deschutes	Redmond	44.26959572	-121.1753555	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1476476	1	1	1	900	July	16	2012	Monday	8:00 PM	Deschutes	Redmond	44.26428407	-121.1524576	Midblock location	Non-collision	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1476492	1	3	5	928	July	21	2012	Saturday	6:00 PM	Deschutes	Redmond	44.26961205	-121.1742622	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1476500	1	2	2	953	July	27	2012	Friday	5:00 PM	Deschutes	Redmond	44.26920447	-121.1993511	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1476505	1	2	3	962	July	28	2012	Saturday	5:00 PM	Deschutes	Redmond	44.26958287	-121.1840678	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1476513	1	2	2	838	July	3	2012	Tuesday	5:00 PM	Deschutes	Redmond	44.26306835	-121.1769782	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1476570	1	2	3	974	July	30	2012	Monday	12:00 PM	Deschutes	Redmond	44.28917966	-121.173948	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1476734	1	2	4	886	July	13	2012	Friday	7:00 AM	Deschutes	Redmond	44.27255507	-121.1732051	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1476799	1	2	2	903	July	17	2012	Tuesday	6:00 PM	Deschutes	Redmond	44.29821917	-121.1738577	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1476848	1	2	2	915	July	20	2012	Friday	5:00 PM	Deschutes	Redmond	44.26402292	-121.1763469	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1477045	1	1	1	956	July	27	2012	Friday	3:00 PM	Deschutes	Redmond	44.2593823	-121.1794061	Inbound within 50 feet	Non-collision	Non-fatal injury crash	Clear	Dry	Daylight
1477280	1	2	4	831	July	2	2012	Monday	3:00 PM	Deschutes	Redmond	44.28597631	-121.1740004	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1477301	1	1	1	847	July	5	2012	Thursday	4:00 AM	Deschutes	Redmond	44.28536676	-121.1917796	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1477302	1	2	2	859	July	8	2012	Sunday	3:00 PM	Deschutes	Redmond	44.28393471	-121.1741926	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1477304	1	2	2	868	July	11	2012	Wednesday	11:00 AM	Deschutes	Redmond	44.27551919	-121.1753571	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1477306	1	2	2	939	July	25	2012	Wednesday	10:00 AM	Deschutes	Redmond	44.2890096	-121.1673682	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1477307	1	1	2	869	June	22	2012	Friday	8:00 PM	Deschutes	Redmond	44.24824167	-121.229414	Midblock location	Fixed-Object or Other-Object	Non-fatal injury crash	Rain	Wet	Dusk (Twilight)
1478826	1	1	2	979	July	30	2012	Monday	10:00 AM	Deschutes	Redmond	44.27355049	-121.1753491	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1482094	1	2	2	1049	August	11	2012	Saturday	8:00 PM	Deschutes	Redmond	44.26617867	-121.1749184	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1482107	1	2	2	992	August	2	2012	Thursday	6:00 PM	Deschutes	Redmond	44.26959209	-121.1774715	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1482118	1	3	4	1024	August	27	2012	Monday	5:00 PM	Deschutes	Redmond	44.26948132	-121.1866937	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1482569	1	2	2	982	August	1	2012	Wednesday	10:00 PM	Deschutes	Redmond	44.24131557	-121.1914855	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1482611	1	2	2	999	August	3	2012	Friday	5:00 PM	Deschutes	Redmond	44.27741166	-121.1753516	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1483812	1	2	2	964	July	24	2012	Tuesday	8:00 AM	Deschutes	Redmond	44.26437328	-121.1999642	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1483998	1	2	1	998	August	3	2012	Friday	10:00 PM	Deschutes	Redmond	44.27861839	-121.1732156	Midblock location	Sideswipe-overtaking	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1484075	1	2	3	993	August	3	2012	Friday	4:00 PM	Deschutes	Redmond	44.25478923	-121.1857208	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1484084	1	1	2	90993	August	3	2012	Friday	4:00 PM	Deschutes	Redmond	44.25474208	-121.1967325	Inbound within 50 feet	Non-collision	Property damage only crash (PDO)	Clear	Dry	Daylight
1484087	1	1	2	70993	August	3	2012	Friday	4:00 PM	Deschutes	Redmond	44.25474986	-121.1954293	Inbound within 50 feet	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Daylight
1484100	1	2	2	987	August	2	2012	Thursday	7:00 AM	Deschutes	Redmond	44.25111261	-121.1992302	Outbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1484278	1	2	2	1110	August	23	2012	Thursday	4:00 PM	Deschutes	Redmond	44.29099062	-121.1739116	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1484410	1	2	2	1091	August	19	2012	Sunday	6:00 PM	Deschutes	Redmond	44.2593823	-121.1794061	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1484439	1	2	2	1102	August	21	2012	Tuesday	3:00 PM	Deschutes	Redmond	44.26959201	-121.1795959	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Dry	Daylight
1484451	1	2	2	1107	August	22	2012	Wednesday	1:00 PM	Deschutes	Redmond	44.26961205	-121.1742622	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1484587	1	3	3	1096	August	20	2012	Monday	3:00 PM	Deschutes	Redmond	44.25842836	-121.1826058	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1484605	1	2	2	1131	August	28	2012	Tuesday	10:00 PM	Deschutes	Redmond	44.25472675	-121.1992912	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1484985	1	2	2	1138	August	30	2012	Thursday	6:00 AM	Deschutes	Redmond	44.26015548	-121.1942265	Inbound within 50 feet	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1488060	1	1	1	99999	October	12	2012	Friday	10:00 PM	Deschutes	Redmond	44.29599798	-121.1908039	NW Intersection Quadrant	Miscellaneous	Fatal crash	Rain	Wet	Darkness – no street lights
1488442	1	2	2	1213	September	14	2012	Friday	4:00 PM	Deschutes	Redmond	44.2640599	-121.1520105	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1488445	1	2	2	1222	September	17	2012	Monday	1:00 PM	Deschutes	Redmond	44.26928222	-121.1912836	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1488463	1	2	3	1239	September	19	2012	Wednesday	7:00 AM	Deschutes	Redmond	44.27058731	-121.1742633	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1488468	1	2	2	1262	September	24	2012	Monday	1:00 PM	Deschutes	Redmond	44.26920447	-121.1993511	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1488472	1	2	2	1195	September	10	2012	Monday	4:00 PM	Deschutes	Redmond	44.26920447	-121.1993511	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1488498	1	2	3	1153	August	28	2012	Tuesday	4:00 PM	Deschutes	Redmond	44.27057003	-121.1795923	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1488704	1	2	2	1259	September	25	2012	Tuesday	2:00 PM	Deschutes	Redmond	44.26306835	-121.1769782	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1488712	1	2	2	1274	September	27	2012	Thursday	12:00 PM	Deschutes	Redmond	44.29099062	-121.1739116	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1488763	1	2	3	1279	September	28	2012	Friday	11:00 AM	Deschutes	Redmond	44.27257329	-121.1698777	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1488785	1	2	2	1187	September	8	2012	Saturday	10:00 AM	Deschutes	Redmond	44.2549983	-121.1822917	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1488788	1	2	2	1183	August	31	2012	Friday	4:00 PM	Deschutes	Redmond	44.28736914	-121.1740028	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1488802	1	2	2	1173	September	5	2012	Wednesday	7:00 AM	Deschutes	Redmond	44.27552157	-121.1742958	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1488969	1	2	1	1209	September	13	2012	Thursday	2:00 PM	Deschutes	Redmond	44.27143333	-121.1753583	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1488998	1	2	2	1211	September	14	2012	Friday	10:00 AM	Deschutes	Redmond	44.28536062	-121.1891697	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1489016	1	2	2	1242	September	20	2012	Thursday	8:00 AM	Deschutes	Redmond	44.27652765	-121.1742746	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1489025	1	2	2	1232	August	31	2012	Friday	12:00 PM	Deschutes	Redmond	44.25350115	-121.1873662	Southwest Intersection Quadrant	Backing	Property damage only crash (PDO)	Clear	Dry	Daylight
1489027	1	2	2	1185	September	7	2012	Friday	7:00 AM	Deschutes	Redmond	44.27255507	-121.1732051	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1489034	1	2	2	1189	September	8	2012	Saturday	9:00 AM	Deschutes	Redmond	44.24427384	-121.1989275	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1489096	1	2	3	1158	September	3	2012	Monday	7:00 PM	Deschutes	Redmond	44.26805698	-121.1993568	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1489782	1	2	1	1152	August	25	2012	Saturday	11:00 PM	Deschutes	Redmond	44.27356123	-121.2078784	Midblock location	Angle	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1490542	1	2	2	1366	October	17	2012	Wednesday	7:00 AM	Deschutes	Redmond	44.27058731	-121.1742633	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Dawn (Twilight)
1490548	1	2	2	1324	October	6	2012	Saturday	7:00 PM	Deschutes	Redmond	44.27056699	-121.1817687	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1490569	1	3	3	1394	September	10	2012	Monday	5:00 PM	Deschutes	Redmond	44.26934103	-121.1892356	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1490720	1	1	2	1326	October	8	2012	Monday	6:00 AM	Deschutes	Redmond	44.26306835	-121.1769782	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1490742	1	2	2	1348	October	12	2012	Friday	4:00 PM	Deschutes	Redmond	44.29099062	-121.1739116	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Rain	Wet	Daylight
1490746	1	2	2	1356	October	14	2012	Sunday	2:00 PM	Deschutes	Redmond	44.25654728	-121.1812722	Southwest Intersection Quadrant	Rear-End	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1490751	1	2	3	1384	October	19	2012	Friday	5:00 AM	Deschutes	Redmond	44.27651661	-121.1732188	NE Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Darkness – no street lights
1490756	1	2	2	1385	October	19	2012	Friday	7:00 PM	Deschutes	Redmond	44.265425	-121.1732556	Outbound within 50 feet	Head-On	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1490765	1	2	2	1390	October	20	2012	Saturday	3:00 PM	Deschutes	Redmond	44.2593823	-121.1794061	Inbound within 50 feet	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1490796	1	2	2	1418	October	25	2012	Thursday	8:00 PM	Deschutes	Redmond	44.26306835	-121.1769782	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1491013	1	2	2	1297	October	2	2012	Tuesday	3:00 PM	Deschutes	Redmond	44.27741166	-121.1753516	NE Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1491082	1	2	2	1315	October	5	2012	Friday	4:00 PM	Deschutes	Redmond	44.25475238	-121.1941737	Outbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1491108	1	2	3	1344	October	12	2012	Friday	7:00 AM	Deschutes	Redmond	44.27650901	-121.177489	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1491146	1	1	2	1387	October	3	2012	Wednesday	7:00 AM	Deschutes	Redmond	44.27012515	-121.1909864	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1491173	1	2	2	1421	October	25	2012	Thursday	11:00 AM	Deschutes	Redmond	44.28013332	-121.1732135	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1491220	1	2	3	1445	October	30	2012	Tuesday	2:00 PM	Deschutes	Redmond	44.26878302	-121.1914015	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1491719	1	2	2	1447	October	30	2012	Tuesday	4:00 PM	Deschutes	Redmond	44.27255781	-121.1764116	Outbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1493278	1	2	2	1476	November	6	2012	Tuesday	3:00 PM	Deschutes	Redmond	44.26920439	-121.2093365	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1493317	1	2	2	1478	November	6	2012	Tuesday	1:00 PM	Deschutes	Redmond	44.26306835	-121.1769782	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1493320	1	2	2	1486	November	7	2012	Wednesday	3:00 PM	Deschutes	Redmond	44.26254709	-121.1773332	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1493559	1	2	2	1498	November	9	2012	Friday	12:00 PM	Deschutes	Redmond	44.2593823	-121.1794061	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1493659	1	2	2	1535	November	14	2012	Wednesday	3:00 PM	Deschutes	Redmond	44.29450072	-121.1738889	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1493670	1	2	2	1561	November	18	2012	Sunday	3:00 PM	Deschutes	Redmond	44.2695902	-121.1785327	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Unknown	Unknown	Daylight
1493806	1	2	2	1583	November	23	2012	Friday	2:00 PM	Deschutes	Redmond	44.26961205	-121.1742622	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1493821	1	2	2	1601	November	28	2012	Wednesday	2:00 PM	Deschutes	Redmond	44.26961205	-121.1742622	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1493851	1	2	2	1614	November	30	2012	Friday	12:00 PM	Deschutes	Redmond	44.26924339	-121.194297	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1494315	1	2	2	1602	November	28	2012	Wednesday	11:00 AM	Deschutes	Redmond	44.26963023	-121.1732033	NE Intersection Quadrant	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1494864	1	2	2	1639	December	4	2012	Tuesday	12:00 PM	Deschutes	Redmond	44.27057003	-121.1795923	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1494879	1	2	2	1662	December	10	2012	Monday	3:00 PM	Deschutes	Redmond	44.26959721	-121.175993	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1494898	1	2	2	1666	December	12	2012	Wednesday	5:00 PM	Deschutes	Redmond	44.26920447	-121.1993511	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1494904	1	2	3	1683	December	14	2012	Friday	5:00 PM	Deschutes	Redmond	44.2701378	-121.1818681	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – no street lights

1494909	1	2	2	1686	December	14	2012	Friday	2:00 PM	Deschutes	Redmond	44.27058731	-121.1742633	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1494912	1	2	2	1691	December	15	2012	Saturday	12:00 PM	Deschutes	Redmond	44.27058984	-121.1753571	Outbound within 50 feet	Sideswipe-overtaking	Non-fatal injury crash	Cloudy	Dry	Daylight
1494916	1	2	2	1747	December	19	2012	Wednesday	6:00 PM	Deschutes	Redmond	44.29099062	-121.1739116	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Cloudy	Dry	Darkness – no street lights
1494922	1	3	3	1772	December	22	2012	Saturday	11:00 AM	Deschutes	Redmond	44.26958287	-121.1840678	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1495010	1	2	4	1824	December	27	2012	Thursday	3:00 PM	Deschutes	Redmond	44.27057134	-121.1785425	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Ice	Daylight
1495014	1	2	2	1830	December	27	2012	Thursday	8:00 AM	Deschutes	Redmond	44.27057761	-121.1774788	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Ice	Daylight
1495035	1	2	2	1833	December	28	2012	Friday	10:00 AM	Deschutes	Redmond	44.29450072	-121.1738889	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Ice	Daylight
1495039	1	2	2	1845	December	30	2012	Sunday	2:00 PM	Deschutes	Redmond	44.27411407	-121.1742822	Midblock location	Rear-End	Property damage only crash (PDO)	Cloudy	Ice	Daylight
1495088	1	2	4	1861	December	31	2012	Monday	4:00 PM	Deschutes	Redmond	44.27255649	-121.1742768	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Ice	Daylight
1495323	1	2	2	1651	December	6	2012	Thursday	4:00 PM	Deschutes	Redmond	44.24752423	-121.1881584	Outbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1495713	1	2	2	1797	December	23	2012	Sunday	1:00 PM	Deschutes	Redmond	44.25177244	-121.1844213	Outbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Snow	Snow	Daylight
1495727	1	1	1	1817	December	26	2012	Wednesday	7:00 AM	Deschutes	Redmond	44.23556218	-121.1998129	NW Intersection Quadrant	Fixed-Object or Other-Object	Property damage only crash (PDO)	Snow	Ice	Dawn (Twilight)
1495828	1	2	2	1826	December	27	2012	Thursday	11:00 AM	Deschutes	Redmond	44.25396557	-121.1829713	Midblock location	Turning Movement	Non-fatal injury crash	Cloudy	Wet	Daylight
1495854	1	2	2	1846	December	30	2012	Sunday	4:00 PM	Deschutes	Redmond	44.30403335	-121.1732688	Outbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Cloudy	Ice	Dusk (Twilight)
1496890	1	1	1	1458	November	2	2012	Friday	11:00 PM	Deschutes	Redmond	44.24427384	-121.1989275	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Rain	Wet	Darkness – no street lights
1496953	1	2	1	1460	November	2	2012	Friday	8:00 PM	Deschutes	Redmond	44.29705	-121.1814594	Midblock location	Rear-End	Non-fatal injury crash	Rain	Wet	Darkness – no street lights
1496984	1	2	2	1523	November	13	2012	Tuesday	2:00 AM	Deschutes	Redmond	44.25660201	-121.1840812	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Dry	Darkness – no street lights
1496987	1	3	5	1525	November	4	2012	Sunday	1:00 PM	Deschutes	Redmond	44.26010309	-121.181434	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1496993	1	2	3	1558	November	17	2012	Saturday	5:00 PM	Deschutes	Redmond	44.25475238	-121.1941737	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Snow	Darkness – no street lights
1497052	1	2	2	1579	November	24	2012	Saturday	4:00 PM	Deschutes	Redmond	44.25347996	-121.1646912	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Rain	Wet	Dusk (Twilight)
1497064	1	2	1	1586	November	25	2012	Sunday	3:00 PM	Deschutes	Redmond	44.27352894	-121.1825557	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1497138	1	2	4	1605	November	29	2012	Thursday	2:00 PM	Deschutes	Redmond	44.25471722	-121.2125811	NW Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1497176	1	2	5	1610	November	30	2012	Friday	2:00 PM	Deschutes	Redmond	44.27256127	-121.1721324	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1497798	1	2	2	1545	November	15	2012	Thursday	1:00 PM	Deschutes	Redmond	44.27551421	-121.1774854	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1498720	1	1	2	1650	November	27	2012	Tuesday	5:00 PM	Deschutes	Redmond	44.26928222	-121.1912836	Outbound within 50 feet	Pedestrian	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1498819	1	2	2	1657	December	9	2012	Sunday	12:00 PM	Deschutes	Redmond	44.27553805	-121.1633562	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1498847	1	2	1	1661	December	10	2012	Monday	1:00 AM	Deschutes	Redmond	44.27768612	-121.1753545	Midblock location	Sideswipe-overtaking	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1498861	1	2	2	1664	December	12	2012	Wednesday	8:00 AM	Deschutes	Redmond	44.2583557	-121.1942095	NW Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Ice	Daylight
1498868	1	3	3	1673	December	13	2012	Thursday	7:00 AM	Deschutes	Redmond	44.27921484	-121.1753699	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1498900	1	1	1	1702	December	15	2012	Saturday	9:00 PM	Deschutes	Redmond	44.25841306	-121.1875711	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Snow	Ice	Darkness – no street lights
1498966	1	2	2	1737	December	18	2012	Tuesday	5:00 PM	Deschutes	Redmond	44.29445631	-121.172669	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1499118	1	2	2	1780	December	23	2012	Sunday	12:00 PM	Deschutes	Redmond	44.28012734	-121.1775316	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Snow	Snow	Daylight
1499122	1	1	1	1802	December	18	2012	Tuesday	11:00 AM	Deschutes	Redmond	44.265425	-121.1732556	Southwest Intersection Quadrant	Non-collision	Property damage only crash (PDO)	Snow	Snow	Daylight
1499128	1	2	2	1805	December	24	2012	Monday	10:00 AM	Deschutes	Redmond	44.27645257	-121.1892509	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Snow	Daylight
1499240	1	2	3	1832	December	28	2012	Friday	9:00 PM	Deschutes	Redmond	44.25901582	-121.2044192	Outbound within 50 feet	Turning Movement	Non-fatal injury crash	Snow	Ice	Darkness – no street lights
1502990	1	1	1	53	January	10	2013	Thursday	12:00 PM	Deschutes	Redmond	44.26961205	-121.1742622	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Snow	Ice	Daylight
1502999	1	2	2	63	January	11	2013	Friday	3:00 PM	Deschutes	Redmond	44.26959571	-121.1753555	Outbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Clear	Ice	Daylight
1503012	1	2	2	93	January	17	2013	Thursday	3:00 PM	Deschutes	Redmond	44.26928223	-121.191283	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1503025	1	2	2	139	January	26	2013	Saturday	11:00 AM	Deschutes	Redmond	44.26959571	-121.1753555	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1503335	1	2	2	19	January	4	2013	Friday	12:00 PM	Deschutes	Redmond	44.29099061	-121.1739116	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1503348	1	2	2	49	January	10	2013	Thursday	12:00 PM	Deschutes	Redmond	44.27058736	-121.1742881	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Snow	Ice	Daylight
1503392	1	2	2	54	January	10	2013	Thursday	1:00 PM	Deschutes	Redmond	44.30190382	-121.1701868	Outbound within 50 feet	Turning Movement	Non-fatal injury crash	Snow	Ice	Daylight
1503421	1	2	2	64	January	11	2013	Friday	10:00 AM	Deschutes	Redmond	44.28104064	-121.1732236	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Ice	Daylight
1503542	1	2	2	137	January	26	2013	Saturday	5:00 AM	Deschutes	Redmond	44.28883052	-121.1673002	Outbound within 50 feet	Sideswipe-meeting	Non-fatal injury crash	Cloudy	Ice	Darkness – no street lights
1504070	1	2	2	18	January	4	2013	Friday	6:00 PM	Deschutes	Redmond	44.29450071	-121.1738888	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Cloudy	Dry	Darkness – no street lights
1504097	1	1	1	48	January	9	2013	Wednesday	11:00 PM	Deschutes	Redmond	44.25452916	-121.1860905	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Cloudy	Dry	Darkness – no street lights
1504112	1	2	2	52	January	10	2013	Thursday	3:00 PM	Deschutes	Redmond	44.24427384	-121.1989275	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Snow	Ice	Daylight
1504194	1	2	2	66	January	11	2013	Friday	3:00 PM	Deschutes	Redmond	44.2792268	-121.1715472	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Ice	Daylight
1504199	1	1	1	68	January	12	2013	Saturday	11:00 PM	Deschutes	Redmond	44.26209321	-121.1791798	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1504214	1	2	1	70	January	13	2013	Sunday	6:00 AM	Deschutes	Redmond	44.2774164	-121.1775004	Outbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Ice	Darkness – no street lights
1504350	1	2	2	107	January	19	2013	Saturday	5:00 PM	Deschutes	Redmond	44.25841305	-121.1875711	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1504355	1	1	1	109	January	20	2013	Sunday	3:00 PM	Deschutes	Redmond	44.25056632	-121.228174	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1504363	1	1	1	116	January	22	2013	Tuesday	7:00 AM	Deschutes	Redmond	44.29095761	-121.1872361	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1504415	1	3	3	120	January	22	2013	Tuesday	11:00 AM	Deschutes	Redmond	44.27645257	-121.1892509	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1504420	1	2	2	131	January	25	2013	Friday	8:00 AM	Deschutes	Redmond	44.26663679	-121.1795573	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Rain	Wet	Daylight
1504587	1	2	2	183	February	4	2013	Monday	10:00 PM	Deschutes	Redmond	44.26306803	-121.1769784	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1505036	1	1	1	38	January	5	2013	Saturday	3:00 PM	Deschutes	Redmond	44.255272	-121.2211386	NW Intersection Quadrant	Fixed-Object or Other-Object	Non-fatal injury crash	Snow	Ice	Daylight
1505917	1	1	1	186	February	6	2013	Wednesday	5:00 PM	Deschutes	Redmond	44.26958312	-121.1819345	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Cloudy	Dry	Dusk (Twilight)
1505934	1	2	2	209	February	2	2013	Saturday	8:00 PM	Deschutes	Redmond	44.24427384	-121.1989275	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1505944	1	2	2	212	February	12	2013	Tuesday	12:00 PM	Deschutes	Redmond	44.27552156	-121.1742957	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1505946	1	1	1	234	February	20	2013	Wednesday	7:00 AM	Deschutes	Redmond	44.25110572	-121.1905364	Inbound within 50 feet	Non-collision	Non-fatal injury crash	Clear	Dry	Daylight
1505958	1	1	1	253	February	23	2013	Saturday	9:00 PM	Deschutes	Redmond	44.26808773	-121.1785081	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1506031	1	2	1	4	January	1	2013	Tuesday	12:00 AM	Deschutes	Redmond	44.26048958	-121.2035528	NW Intersection Quadrant	Sideswipe-overtaking	Property damage only crash (PDO)	Fog	Ice	Darkness – no street lights
1506149	1	2	2	200	February	9	2013	Saturday	10:00 PM	Deschutes	Redmond	44.26962985	-121.1716311	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1506179	1	2	2	172	February	2	2013	Saturday	2:00 PM	Deschutes	Redmond	44.26372435	-121.1787697	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1506180	1	2	2	184	February	4	2013	Monday	1:00 PM	Deschutes	Redmond	44.27652277	-121.1721499	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1506181	1	2	2	193	February	8	2013	Friday	1:00 PM	Deschutes	Redmond	44.26961205	-121.1742622	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1506182	1	2	3	214	February	13	2013	Wednesday	7:00 PM	Deschutes	Redmond	44.27255507	-121.1732051	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1506195	1	1	2	219	February	14	2013	Thursday	2:00 PM	Deschutes	Redmond	44.29098998	-121.1777475	Inbound within 50 feet	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1506197	1	2	3	236	February	20	2013	Wednesday	5:00 PM	Deschutes	Redmond	44.26934105	-121.1892351	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1506204	1	2	3	233	February	15	2013	Friday	9:00 PM	Deschutes	Redmond	44.26920446	-121.1993511	Outbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1506210	1	2	3	235	February	15	2013	Friday	3:00 PM	Deschutes	Redmond	44.25244465	-121.1857587	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1506237	1	1	2	90227	February	16	2013	Saturday	3:00 PM	Deschutes	Redmond	44.25350115	-121.1873662	NE Intersection Quadrant	Pedestrian	Non-fatal injury crash	Clear	Dry	Daylight
1506243	1	2	2	241	February	21	2013	Thursday	8:00 AM	Deschutes	Redmond	44.26962985	-121.1716311	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1506278	1	2	2	258	February	24	2013	Sunday	8:00 PM	Deschutes	Redmond	44.26959571	-121.1753555	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1506282	1	2	2	266	February	27	2013	Wednesday	5:00 PM	Deschutes	Redmond	44.27353655	-121.1806861	NW Intersection Quadrant	Angle	Non-fatal injury crash	Unknown	Unknown	Darkness – no street lights
1506467	1	2	2	189	February	7	2013	Thursday	9:00 AM	Deschutes	Redmond	44.27741257	-121.1817618	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1507322	1	2	1	58	January	10	2013	Thursday	9:00 PM	Deschutes	Redmond	44.2644902	-121.1853222	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Ice	Darkness – no street lights
1507330	1	2	2	164	February	1	2013	Friday	12:00 PM	Deschutes	Redmond	44.29821194	-121.1764898	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1510954	1	2	2	280	March	1	2013	Friday	3:00 PM	Deschutes	Redmond	44.28536062	-121.1891697	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1510973	1	2	2	296	March	7	2013	Thursday	1:00 PM	Deschutes	Redmond	44.27012515	-121.1909864	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1511028	1	2	2	301	March	8	2013	Friday	7:00 AM	Deschutes	Redmond	44.24752986	-121.2293878	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Snow	Ice	Daylight
1511041	1	2	1	309	January	6	2013	Sunday	2:00 AM	Deschutes	Redmond	44.29640592	-121.1768861	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Unknown	Ice	Darkness – no street lights
1511090	1	2	2	329	March	14	2013	Thursday	12:00 PM	Deschutes	Redmond	44.27553395	-121.1721503	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1511100	1	2	2	341	March	18	2013	Monday	7:00 AM	Deschutes	Redmond	44.25837989	-121.1916393	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1512034	1	2	1	310	January	6	2013	Sunday	2:00 AM	Deschutes	Redmond	44.29589444	-121.1762939	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Unknown	Ice	Darkness – no street lights
1512040	1	2	2	350	March	21	2013	Thursday	6:00 PM	Deschutes	Redmond	44.27255507	-121.1732051	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1512566	1	2	2	342	March	19	2013	Tuesday	7:00 AM	Deschutes	Redmond	44.25770733	-121.1805087	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight

1512593	1	2	2	294	March	7	2013	Thursday	3:00 PM	Deschutes	Redmond	44.26959571	-121.1753555	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1512602	1	2	2	305	March	9	2013	Saturday	4:00 PM	Deschutes	Redmond	44.27058731	-121.1742629	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1512655	1	2	3	320	March	13	2013	Wednesday	4:00 PM	Deschutes	Redmond	44.27058731	-121.1742629	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1512667	1	3	3	324	March	14	2013	Thursday	11:00 AM	Deschutes	Redmond	44.2695906	-121.1803809	Midblock location	Rear-End	Non-fatal injury crash	Cloudy	Dry	Daylight
1512683	1	2	2	328	March	14	2013	Thursday	12:00 PM	Deschutes	Redmond	44.26959208	-121.177471	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1512735	1	2	3	380	March	28	2013	Thursday	11:00 AM	Deschutes	Redmond	44.27056869	-121.1806562	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1513794	1	2	2	293	March	7	2013	Thursday	3:00 PM	Deschutes	Redmond	44.29951109	-121.1789323	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1514751	1	2	2	407	April	2	2013	Tuesday	4:00 PM	Deschutes	Redmond	44.27454443	-121.1710818	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1515065	1	2	3	413	April	3	2013	Wednesday	7:00 AM	Deschutes	Redmond	44.29099061	-121.1739116	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1515068	1	2	3	414	April	3	2013	Wednesday	12:00 PM	Deschutes	Redmond	44.26306835	-121.1769782	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1515071	1	2	2	416	April	3	2013	Wednesday	9:00 AM	Deschutes	Redmond	44.27058984	-121.1753571	Outbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1515084	1	2	2	439	March	18	2013	Monday	9:00 AM	Deschutes	Redmond	44.27642256	-121.2093913	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1515168	1	2	2	446	April	11	2013	Thursday	3:00 PM	Deschutes	Redmond	44.27355049	-121.1753491	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1515198	1	1	2	454	April	14	2013	Sunday	9:00 PM	Deschutes	Redmond	44.26168611	-121.1942409	Midblock location	Pedestrian	Non-fatal injury crash	Cloudy	Dry	Darkness – no street lights
1515210	1	2	1	460	April	16	2013	Tuesday	4:00 PM	Deschutes	Redmond	44.25841536	-121.1871805	NW Intersection Quadrant	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1515216	1	2	2	463	April	16	2013	Tuesday	4:00 PM	Deschutes	Redmond	44.256602	-121.1840812	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1515293	1	2	2	482	April	19	2013	Friday	3:00 PM	Deschutes	Redmond	44.26928221	-121.1912836	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1515327	1	2	2	495	April	22	2013	Monday	12:00 PM	Deschutes	Redmond	44.280148	-121.1706667	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1515330	1	2	2	501	April	23	2013	Tuesday	1:00 PM	Deschutes	Redmond	44.27551421	-121.1774854	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1515341	1	2	2	507	April	25	2013	Thursday	11:00 AM	Deschutes	Redmond	44.26928221	-121.1912836	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1515372	1	3	3	534	April	30	2013	Tuesday	8:00 PM	Deschutes	Redmond	44.27970977	-121.1892214	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1515377	1	1	1	521	April	28	2013	Sunday	4:00 AM	Deschutes	Redmond	44.28306113	-121.1782446	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1515729	1	2	1	405	April	2	2013	Tuesday	7:00 AM	Deschutes	Redmond	44.26582584	-121.1999541	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1516438	1	2	2	529	April	17	2013	Wednesday	5:00 PM	Deschutes	Redmond	44.26963035	-121.1732028	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1516444	1	2	3	491	April	22	2013	Monday	5:00 PM	Deschutes	Redmond	44.29099061	-121.1739116	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1516641	1	2	2	412	April	3	2013	Wednesday	7:00 AM	Deschutes	Redmond	44.26920439	-121.2093361	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1516675	1	3	3	444	April	10	2013	Wednesday	7:00 PM	Deschutes	Redmond	44.26958286	-121.1840678	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1516993	1	4	5	502	April	24	2013	Wednesday	3:00 PM	Deschutes	Redmond	44.27257293	-121.1698778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1517007	1	2	2	473	April	18	2013	Thursday	4:00 PM	Deschutes	Redmond	44.27257293	-121.1698778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1517013	1	2	5	421	April	4	2013	Thursday	2:00 PM	Deschutes	Redmond	44.25203137	-121.1842484	Southwest Intersection Quadrant	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1517035	1	2	2	536	April	30	2013	Tuesday	7:00 AM	Deschutes	Redmond	44.26794696	-121.2044187	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1517040	1	2	2	468	April	17	2013	Wednesday	2:00 AM	Deschutes	Redmond	44.25657121	-121.1916204	Outbound within 50 feet	Rear-End	Property damage only crash (PDO)	Cloudy	Ice	Darkness – no street lights
1519265	1	2	1	459	April	16	2013	Tuesday	10:00 AM	Deschutes	Redmond	44.29608055	-121.1637995	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1520508	1	2	2	575	May	8	2013	Wednesday	1:00 PM	Deschutes	Redmond	44.27645257	-121.1892509	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1520532	1	2	2	546	May	4	2013	Saturday	1:00 PM	Deschutes	Redmond	44.2909865	-121.1764281	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1520570	1	2	1	655	May	28	2013	Tuesday	11:00 AM	Deschutes	Redmond	44.27255566	-121.1774805	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1520629	1	2	3	663	May	29	2013	Wednesday	10:00 AM	Deschutes	Redmond	44.27642256	-121.2093913	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1520681	1	2	2	557	May	6	2013	Monday	6:00 AM	Deschutes	Redmond	44.27255507	-121.1732051	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1520704	1	2	1	607	May	18	2013	Saturday	7:00 AM	Deschutes	Redmond	44.2584192	-121.1865293	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1520793	1	1	1	676	May	31	2013	Friday	12:00 PM	Deschutes	Redmond	44.26205493	-121.1400551	NW Intersection Quadrant	Non-collision	Property damage only crash (PDO)	Clear	Dry	Daylight
1520804	1	2	2	90588	May	11	2013	Saturday	Unknown Tim	Deschutes	Redmond	44.24886635	-121.190956	Midblock location	Backing	Property damage only crash (PDO)	Clear	Dry	Daylight
1520808	1	2	3	573	May	10	2013	Friday	10:00 AM	Deschutes	Redmond	44.27954443	-121.2093375	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1520822	1	2	3	629	May	22	2013	Wednesday	12:00 PM	Deschutes	Redmond	44.25656151	-121.1929065	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Rain	Wet	Daylight
1521105	1	2	3	540	May	2	2013	Thursday	2:00 PM	Deschutes	Redmond	44.27255507	-121.1732051	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1521113	1	2	2	562	May	7	2013	Tuesday	6:00 AM	Deschutes	Redmond	44.25177243	-121.1844213	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1521128	1	2	2	570	May	9	2013	Thursday	9:00 PM	Deschutes	Redmond	44.26961205	-121.1742622	Inbound within 50 feet	Backing	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1521140	1	2	2	579	May	10	2013	Friday	10:00 AM	Deschutes	Redmond	44.27058731	-121.1742629	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1521141	1	2	2	592	May	14	2013	Tuesday	12:00 PM	Deschutes	Redmond	44.26961205	-121.1742622	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1521144	1	1	2	596	May	15	2013	Wednesday	8:00 PM	Deschutes	Redmond	44.28319402	-121.1681487	Midblock location	Miscellaneous	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1521147	1	2	2	603	May	17	2013	Friday	4:00 PM	Deschutes	Redmond	44.25177243	-121.1844213	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1521185	1	5	7	605	May	18	2013	Saturday	10:00 AM	Deschutes	Redmond	44.27284877	-121.1697537	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1521210	1	2	2	622	May	21	2013	Tuesday	9:00 AM	Deschutes	Redmond	44.25306165	-121.1835662	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Rain	Wet	Daylight
1521212	1	2	2	627	May	22	2013	Wednesday	4:00 PM	Deschutes	Redmond	44.27226914	-121.1700403	Midblock location	Rear-End	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1521214	1	2	2	637	May	23	2013	Thursday	6:00 AM	Deschutes	Redmond	44.26962985	-121.1716311	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1521216	1	2	3	638	May	24	2013	Friday	11:00 AM	Deschutes	Redmond	44.26920447	-121.1993511	Outbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1523009	1	1	1	686	June	3	2013	Monday	12:00 PM	Deschutes	Redmond	44.26241641	-121.1774221	Midblock location	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Daylight
1523038	1	1	1	750	June	16	2013	Sunday	4:00 PM	Deschutes	Redmond	44.28348516	-121.1681157	Midblock location	Non-collision	Non-fatal injury crash	Clear	Dry	Daylight
1523058	1	2	2	802	June	25	2013	Tuesday	2:00 PM	Deschutes	Redmond	44.25163711	-121.1845253	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1523089	1	2	2	709	April	17	2013	Wednesday	2:00 PM	Deschutes	Redmond	44.26334077	-121.176798	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1523135	1	2	2	757	June	17	2013	Monday	1:00 PM	Deschutes	Redmond	44.2593823	-121.1794061	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1523136	1	2	2	818	June	28	2013	Friday	6:00 PM	Deschutes	Redmond	44.26975102	-121.1715395	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1523201	1	2	2	824	June	29	2013	Saturday	9:00 PM	Deschutes	Redmond	44.26975102	-121.1715395	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1523230	1	2	2	755	June	16	2013	Sunday	10:00 AM	Deschutes	Redmond	44.25370709	-121.1831414	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1523568	1	2	2	696	June	4	2013	Tuesday	1:00 PM	Deschutes	Redmond	44.26959571	-121.1753555	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1523587	1	2	4	698	June	4	2013	Tuesday	5:00 PM	Deschutes	Redmond	44.26928223	-121.191283	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1523589	1	2	2	797	June	24	2013	Monday	1:00 PM	Deschutes	Redmond	44.26924338	-121.1942969	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1523755	1	2	2	787	June	21	2013	Friday	4:00 PM	Deschutes	Redmond	44.27258964	-121.1643387	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1523854	1	1	1	724	June	10	2013	Monday	6:00 PM	Deschutes	Redmond	44.2640599	-121.1520105	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1523876	1	2	2	681	June	1	2013	Saturday	3:00 PM	Deschutes	Redmond	44.25177243	-121.1844213	Outbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1523891	1	2	2	718	June	10	2013	Monday	8:00 AM	Deschutes	Redmond	44.2620006	-121.1731638	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1523895	1	2	2	746	June	14	2013	Friday	5:00 PM	Deschutes	Redmond	44.27255507	-121.1732051	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1523899	1	2	2	761	June	14	2013	Friday	10:00 AM	Deschutes	Redmond	44.29099061	-121.1739116	Inbound within 50 feet	Backing	Property damage only crash (PDO)	Clear	Dry	Daylight
1523910	1	2	3	712	June	8	2013	Saturday	1:00 PM	Deschutes	Redmond	44.26457889	-121.177228	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1523919	1	2	2	715	June	8	2013	Saturday	2:00 PM	Deschutes	Redmond	44.27055038	-121.1993453	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1523926	1	2	2	727	June	11	2013	Tuesday	3:00 PM	Deschutes	Redmond	44.25474207	-121.1967325	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1523931	1	2	2	748	June	15	2013	Saturday	9:00 AM	Deschutes	Redmond	44.26828096	-121.1942973	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1523937	1	2	2	778	June	20	2013	Thursday	6:00 PM	Deschutes	Redmond	44.2573111	-121.1875648	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1523946	1	2	2	796	June	24	2013	Monday	9:00 AM	Deschutes	Redmond	44.27921718	-121.1732147	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Rain	Wet	Daylight
1528189	1	2	3	846	July	3	2013	Wednesday	11:00 AM	Deschutes	Redmond	44.26920439	-121.2093361	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1528191	1	2	2	842	June	28	2013	Friday	8:00 PM	Deschutes	Redmond	44.26542499	-121.1732555	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1528283	1	1	1	680	June	1	2013	Saturday	3:00 AM	Deschutes	Redmond	44.23879313	-121.2193867	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1528286	1	2	1	179	February	5	2013	Tuesday	4:00 PM	Deschutes	Redmond	44.28174444	-121.1732302	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1528350	1	1	1	939	July	19	2013	Friday	1:00 PM	Deschutes	Redmond	44.26928223	-121.191283	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1528618	1	3	4	1007	July	30	2013	Tuesday	3:00 PM	Deschutes	Redmond	44.23783823	-121.1976188	Southwest Intersection Quadrant	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1528941	1	2	2	1010	July	31	2013	Wednesday	6:00 PM	Deschutes	Redmond	44.26920439	-121.2093361	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1528944	1	2	2	1001	July	29	2013	Monday	2:00 PM	Deschutes	Redmond	44.27058883	-121.1732138	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1528949	1	2	2	977	July	18	2013	Thursday	3:00 PM	Deschutes	Redmond	44.26928223	-121.191283	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1529041	1	2	2	975	July	26	2013	Friday	9:00 AM	Deschutes	Redmond	44.26958286	-121.1840678	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight

1529334	1	1	1	916	July	16	2013	Tuesday	6:00 AM	Deschutes	Redmond	44.2774164	-121.1775004	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1529979	1	2	2	820	July	3	2013	Wednesday	3:00 PM	Deschutes	Redmond	44.26542499	-121.1732555	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1529986	1	2	2	872	July	8	2013	Monday	11:00 AM	Deschutes	Redmond	44.27508333	-121.1892507	Midblock location	Sideswipe-meeting	Property damage only crash (PDO)	Clear	Dry	Daylight
1529996	1	2	3	877	July	9	2013	Tuesday	3:00 PM	Deschutes	Redmond	44.25835569	-121.1942095	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1530024	1	2	2	891	July	11	2013	Thursday	11:00 AM	Deschutes	Redmond	44.2735419	-121.1721529	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1530026	1	2	2	898	July	12	2013	Friday	4:00 PM	Deschutes	Redmond	44.2855585	-121.1739997	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1530062	1	2	2	935	July	19	2013	Friday	7:00 AM	Deschutes	Redmond	44.27257293	-121.1698778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1530098	1	2	2	946	July	21	2013	Sunday	10:00 AM	Deschutes	Redmond	44.27801666	-121.1732166	Midblock location	Sideswipe-overtaking	Non-fatal injury crash	Clear	Dry	Daylight
1530147	1	2	2	947	July	21	2013	Sunday	8:00 PM	Deschutes	Redmond	44.26542499	-121.1732555	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1530152	1	2	2	956	July	23	2013	Tuesday	12:00 PM	Deschutes	Redmond	44.30181269	-121.1788749	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1530162	1	1	2	1000	July	29	2013	Monday	9:00 PM	Deschutes	Redmond	44.26189063	-121.2000004	Southwest Intersection Quadrant	Pedestrian	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1531247	1	2	2	1063	August	9	2013	Friday	3:00 PM	Deschutes	Redmond	44.26975102	-121.1715395	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1531253	1	2	2	1169	August	30	2013	Friday	1:00 PM	Deschutes	Redmond	44.26962985	-121.1716311	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Unknown	Unknown	Daylight
1531259	1	2	3	1138	July	18	2013	Thursday	5:00 PM	Deschutes	Redmond	44.27257293	-121.1698778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1531492	1	2	2	1069	August	10	2013	Saturday	11:00 AM	Deschutes	Redmond	44.27257293	-121.1698778	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1531517	1	2	4	1045	August	6	2013	Tuesday	4:00 PM	Deschutes	Redmond	44.25177243	-121.1844213	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1531618	1	2	2	1015	August	1	2013	Thursday	1:00 PM	Deschutes	Redmond	44.26928223	-121.191283	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Snow	Daylight
1531745	1	2	3	1090	August	14	2013	Wednesday	3:00 PM	Deschutes	Redmond	44.26942093	-121.1878229	Outbound within 50 feet	Sideswipe-overtaking	Non-fatal injury crash	Clear	Dry	Daylight
1531759	1	2	2	1078	August	11	2013	Sunday	2:00 PM	Deschutes	Redmond	44.26963035	-121.1732028	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1531789	1	2	2	1035	August	4	2013	Sunday	7:00 PM	Deschutes	Redmond	44.26959208	-121.177471	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1531796	1	2	2	1334	September	27	2013	Friday	5:00 PM	Deschutes	Redmond	44.29821916	-121.1738577	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1531933	1	1	1	1139	August	26	2013	Monday	7:00 AM	Deschutes	Redmond	44.27255507	-121.1732051	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1532345	1	2	2	1025	August	2	2013	Friday	7:00 PM	Deschutes	Redmond	44.29450071	-121.1738888	Inbound within 50 feet	Backing	Property damage only crash (PDO)	Clear	Dry	Daylight
1532391	1	2	2	1065	August	9	2013	Friday	3:00 PM	Deschutes	Redmond	44.2705776	-121.1774788	Outbound within 50 feet	Rear-End	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1532396	1	2	4	1079	August	12	2013	Monday	2:00 PM	Deschutes	Redmond	44.2547787	-121.1872167	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1532699	1	2	2	1123	August	22	2013	Thursday	8:00 PM	Deschutes	Redmond	44.27642256	-121.2093913	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1532719	1	3	3	1153	August	29	2013	Thursday	12:00 PM	Deschutes	Redmond	44.27256126	-121.1721324	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1532722	1	2	3	1023	August	2	2013	Friday	7:00 AM	Deschutes	Redmond	44.27257293	-121.1698778	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1535660	1	1	1	1266	September	11	2013	Wednesday	7:00 PM	Deschutes	Redmond	44.29802205	-121.1670876	Outbound within 50 feet	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Daylight
1535687	1	1	1	1176	September	2	2013	Monday	2:00 PM	Deschutes	Redmond	44.26963035	-121.1732028	Inbound within 50 feet	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Daylight
1535869	1	2	2	1318	September	25	2013	Wednesday	5:00 PM	Deschutes	Redmond	44.26920439	-121.2093361	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Cloudy	Snow	Daylight
1535871	1	2	2	1213	September	6	2013	Friday	3:00 PM	Deschutes	Redmond	44.27058883	-121.1732138	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1535872	1	2	2	1177	September	3	2013	Tuesday	10:00 PM	Deschutes	Redmond	44.26959208	-121.177471	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1535933	1	4	4	1226	September	8	2013	Sunday	1:00 PM	Deschutes	Redmond	44.25177243	-121.1844213	Southwest Intersection Quadrant	Sideswipe-meeting	Property damage only crash (PDO)	Clear	Dry	Daylight
1535947	1	2	2	1230	September	8	2013	Sunday	7:00 PM	Deschutes	Redmond	44.26920447	-121.1993511	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1535949	1	1	2	1251	September	13	2013	Friday	6:00 PM	Deschutes	Redmond	44.25770733	-121.1805087	Midblock location	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1536145	1	2	2	1328	September	26	2013	Thursday	6:00 PM	Deschutes	Redmond	44.26963035	-121.1732028	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1536146	1	2	2	1326	September	26	2013	Thursday	3:00 PM	Deschutes	Redmond	44.26193196	-121.2074648	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1536250	1	2	1	1268	September	17	2013	Tuesday	4:00 PM	Deschutes	Redmond	44.26191486	-121.204373	Inbound within 50 feet	Angle	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1536305	1	4	1	1337	September	28	2013	Saturday	10:00 AM	Deschutes	Redmond	44.2583404	-121.1967722	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1536314	1	2	2	1270	September	18	2013	Wednesday	2:00 PM	Deschutes	Redmond	44.27277499	-121.1892497	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1536318	1	2	2	1267	September	10	2013	Tuesday	7:00 PM	Deschutes	Redmond	44.26805697	-121.1993568	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1536320	1	2	2	1253	September	13	2013	Friday	11:00 AM	Deschutes	Redmond	44.27155794	-121.1742876	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1536324	1	2	2	1243	September	11	2013	Wednesday	11:00 AM	Deschutes	Redmond	44.27551919	-121.1753571	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1536328	1	2	2	1244	September	11	2013	Wednesday	3:00 PM	Deschutes	Redmond	44.27258618	-121.1666297	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1536370	1	1	1	1186	September	4	2013	Wednesday	7:00 AM	Deschutes	Redmond	44.28917606	-121.1780167	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1536375	1	2	2	1196	September	5	2013	Thursday	1:00 PM	Deschutes	Redmond	44.26858886	-121.1819271	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1537837	1	1	1	1498	October	28	2013	Monday	5:00 AM	Deschutes	Redmond	44.25306165	-121.1835662	Southwest Intersection Quadrant	Non-collision	Property damage only crash (PDO)	Sleet	Wet	Darkness – no street lights
1537937	1	2	2	1494	October	29	2013	Tuesday	3:00 PM	Deschutes	Redmond	44.25177243	-121.1844213	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1537940	1	2	2	1491	October	29	2013	Tuesday	7:00 PM	Deschutes	Redmond	44.26920439	-121.2093361	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1537961	1	2	2	1433	October	16	2013	Wednesday	1:00 PM	Deschutes	Redmond	44.26955225	-121.1850848	Midblock location	Backing	Property damage only crash (PDO)	Clear	Dry	Daylight
1537962	1	2	3	1409	October	11	2013	Friday	1:00 PM	Deschutes	Redmond	44.26920439	-121.2093361	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1537965	1	2	2	1398	October	9	2013	Wednesday	4:00 PM	Deschutes	Redmond	44.26920439	-121.2093361	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Dry	Daylight
1537971	1	2	2	1393	October	8	2013	Tuesday	1:00 PM	Deschutes	Redmond	44.26963035	-121.1732028	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1537974	1	2	3	1380	October	6	2013	Sunday	6:00 PM	Deschutes	Redmond	44.26961205	-121.1742622	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1537976	1	2	2	1375	September	22	2013	Sunday	Unknown Tim	Deschutes	Redmond	44.26924338	-121.1942969	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Rain	Wet	Daylight
1538093	1	2	2	1411	October	11	2013	Friday	7:00 PM	Deschutes	Redmond	44.28899912	-121.1672747	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1538597	1	2	3	1506	October	28	2013	Monday	3:00 PM	Deschutes	Redmond	44.256602	-121.1840812	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1538601	1	2	2	1502	October	28	2013	Monday	1:00 PM	Deschutes	Redmond	44.27921718	-121.1732147	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1538606	1	2	2	1499	October	23	2013	Wednesday	9:00 AM	Deschutes	Redmond	44.27155349	-121.177479	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1538608	1	2	4	1496	June	9	2013	Sunday	2:00 PM	Deschutes	Redmond	44.26959571	-121.1753555	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1538624	1	2	2	1476	October	24	2013	Thursday	2:00 PM	Deschutes	Redmond	44.26286959	-121.1788432	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1538630	1	2	3	1468	October	23	2013	Wednesday	4:00 PM	Deschutes	Redmond	44.25452916	-121.1860905	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1538677	1	1	2	1457	October	18	2013	Friday	5:00 PM	Deschutes	Redmond	44.26881388	-121.1942971	Midblock location	Pedestrian	Non-fatal injury crash	Clear	Dry	Daylight
1538685	1	2	2	1453	October	21	2013	Monday	5:00 PM	Deschutes	Redmond	44.27645257	-121.1892509	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1538689	1	2	2	1437	October	17	2013	Thursday	8:00 AM	Deschutes	Redmond	44.2774164	-121.1775004	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1538697	1	2	2	1405	October	10	2013	Thursday	5:00 PM	Deschutes	Redmond	44.28918832	-121.1682915	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1538709	1	1	1	1376	October	5	2013	Saturday	9:00 AM	Deschutes	Redmond	44.24855302	-121.2293818	Midblock location	Non-collision	Non-fatal injury crash	Clear	Dry	Daylight
1538985	1	2	2	1432	October	15	2013	Tuesday	4:00 PM	Deschutes	Redmond	44.27553804	-121.1633562	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1539273	1	1	1	1531	November	3	2013	Sunday	2:00 AM	Deschutes	Redmond	44.25203137	-121.1842484	Midblock location	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1539280	1	1	1	1534	November	4	2013	Monday	11:00 AM	Deschutes	Redmond	44.24010485	-121.1954105	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1539544	1	1	1	1557	November	8	2013	Friday	9:00 AM	Deschutes	Redmond	44.27156417	-121.1732083	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1539723	1	2	4	1570	November	11	2013	Monday	12:00 PM	Deschutes	Redmond	44.26437328	-121.1999642	NW Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1540261	1	1	1	1512	November	1	2013	Friday	6:00 PM	Deschutes	Redmond	44.25158889	-121.2043246	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1540275	1	1	2	1538	November	4	2013	Monday	3:00 PM	Deschutes	Redmond	44.24749298	-121.2022914	Midblock location	Pedestrian	Non-fatal injury crash	Cloudy	Dry	Daylight
1540288	1	2	2	1547	November	5	2013	Tuesday	1:00 PM	Deschutes	Redmond	44.26142331	-121.168888	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Cloudy	Snow	Daylight
1540321	1	2	2	1555	November	8	2013	Friday	5:00 PM	Deschutes	Redmond	44.27276666	-121.1892497	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1540331	1	2	2	1565	November	10	2013	Sunday	5:00 PM	Deschutes	Redmond	44.256602	-121.1840812	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1540373	1	3	3	1594	November	19	2013	Tuesday	4:00 PM	Deschutes	Redmond	44.27058731	-121.1742629	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1540374	1	2	2	1572	November	11	2013	Monday	9:00 AM	Deschutes	Redmond	44.26788578	-121.1746686	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1540386	1	2	2	1633	November	20	2013	Wednesday	12:00 PM	Deschutes	Redmond	44.28013332	-121.1732135	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1540422	1	2	3	1668	November	27	2013	Wednesday	11:00 AM	Deschutes	Redmond	44.26010309	-121.181434	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1540426	1	3	9	1646	November	22	2013	Friday	2:00 PM	Deschutes	Redmond	44.25842836	-121.1826058	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1540429	1	2	2	1635	November	20	2013	Wednesday	5:00 PM	Deschutes	Redmond	44.27645257	-121.1892509	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1540433	1	2	2	1639	November	21	2013	Thursday	11:00 AM	Deschutes	Redmond	44.24131557	-121.1914855	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1540508	1	2	2	1630	November	20	2013	Wednesday	8:00 AM	Deschutes	Redmond	44.26306803	-121.1769784	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Dawn (Twilight)
1540513	1	2	2	1593	November	14	2013	Thursday	7:00 AM	Deschutes	Redmond	44.27022186	-121.1712268	Southeast Intersection Quadrant	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1540518	1	2	2	1583	November	13	2013	Wednesday	6:00 PM	Deschutes	Redmond	44.29099061	-121.1739116	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)

1540558	1	3	4	1575	November	12	2013	Tuesday	5:00 PM	Deschutes	Redmond	44.26934105	-121.1892351	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1540585	1	2	3	1569	November	11	2013	Monday	11:00 AM	Deschutes	Redmond	44.25177243	-121.1844213	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1540596	1	3	4	1513	November	1	2013	Friday	3:00 PM	Deschutes	Redmond	44.27257293	-121.1698778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1540612	1	2	3	1618	November	18	2013	Monday	5:00 PM	Deschutes	Redmond	44.27058984	-121.1753566	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1540891	1	2	4	1561	November	9	2013	Saturday	2:00 PM	Deschutes	Redmond	44.26959571	-121.1753555	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1540912	1	2	2	1606	November	15	2013	Friday	6:00 PM	Deschutes	Redmond	44.26928223	-121.191283	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1541405	1	2	4	1751	December	8	2013	Sunday	1:00 PM	Deschutes	Redmond	44.26962985	-121.1716311	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Ice	Daylight
1541422	1	2	3	1778	December	10	2013	Tuesday	9:00 AM	Deschutes	Redmond	44.27058883	-121.1732138	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Ice	Daylight
1541424	1	2	2	1832	December	19	2013	Thursday	3:00 PM	Deschutes	Redmond	44.26956939	-121.1846848	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1541494	1	6	7	1839	December	19	2013	Thursday	5:00 PM	Deschutes	Redmond	44.26924338	-121.1942969	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Dry	Darkness – no street lights
1541502	1	2	2	1891	December	28	2013	Saturday	4:00 PM	Deschutes	Redmond	44.2703728	-121.1724418	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1541508	1	2	2	1900	December	31	2013	Tuesday	8:00 PM	Deschutes	Redmond	44.26958245	-121.1842675	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1541636	1	1	1	1681	November	29	2013	Friday	6:00 PM	Deschutes	Redmond	44.23783823	-121.1976188	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1541638	1	2	2	1756	December	8	2013	Sunday	1:00 PM	Deschutes	Redmond	44.27257329	-121.1698771	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Ice	Daylight
1541644	1	2	2	1759	December	9	2013	Monday	7:00 PM	Deschutes	Redmond	44.29099061	-121.1739116	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Ice	Darkness – no street lights
1541645	1	2	2	1834	December	19	2013	Thursday	12:00 PM	Deschutes	Redmond	44.25693428	-121.1810175	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1541975	1	1	1	1775	December	6	2013	Friday	6:00 PM	Deschutes	Redmond	44.26958286	-121.1840678	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Snow	Darkness – no street lights
1542172	1	1	1	1848	December	20	2013	Friday	12:00 PM	Deschutes	Redmond	44.27254939	-121.1785574	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Snow	Snow	Daylight
1542261	1	2	2	1874	December	24	2013	Tuesday	8:00 AM	Deschutes	Redmond	44.2475003	-121.1991462	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Ice	Daylight
1542276	1	2	1	1889	December	27	2013	Friday	9:00 PM	Deschutes	Redmond	44.28201666	-121.1753689	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Cloudy	Dry	Darkness – no street lights
1542279	1	2	2	1890	December	27	2013	Friday	5:00 PM	Deschutes	Redmond	44.25842836	-121.1826058	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1542280	1	2	2	1892	December	28	2013	Saturday	2:00 PM	Deschutes	Redmond	44.26372435	-121.1787697	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1542656	1	2	2	1902	December	31	2013	Tuesday	4:00 PM	Deschutes	Redmond	44.27645257	-121.1892509	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1542660	1	2	2	1904	December	31	2013	Tuesday	12:00 PM	Deschutes	Redmond	44.25244465	-121.1857587	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1542665	1	2	2	1768	December	9	2013	Monday	6:00 AM	Deschutes	Redmond	44.26404335	-121.1942637	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Snow	Ice	Darkness – no street lights
1542676	1	2	4	1772	December	10	2013	Tuesday	3:00 PM	Deschutes	Redmond	44.25830692	-121.2002965	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Ice	Daylight
1542680	1	2	2	1692	December	3	2013	Tuesday	5:00 PM	Deschutes	Redmond	44.24837152	-121.1941001	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1542858	1	3	1	1863	December	22	2013	Sunday	6:00 PM	Deschutes	Redmond	44.28633337	-121.1776291	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1542891	1	3	3	1838	December	19	2013	Thursday	3:00 PM	Deschutes	Redmond	44.24752986	-121.2293878	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1543127	1	2	2	1708	December	5	2013	Thursday	2:00 PM	Deschutes	Redmond	44.28104064	-121.1732236	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1543131	1	2	2	1706	December	5	2013	Thursday	7:00 AM	Deschutes	Redmond	44.25469614	-121.2043724	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1543139	1	2	2	1683	December	2	2013	Monday	9:00 AM	Deschutes	Redmond	44.2511126	-121.1992302	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1543161	1	2	2	1762	December	9	2013	Monday	12:00 PM	Deschutes	Redmond	44.27642256	-121.2093913	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Ice	Daylight
1543700	1	2	3	1777	December	10	2013	Tuesday	2:00 PM	Deschutes	Redmond	44.27353655	-121.1806861	NW Intersection Quadrant	Angle	Non-fatal injury crash	Rain	Ice	Daylight
1543834	1	2	2	1368	October	4	2013	Friday	11:00 AM	Deschutes	Redmond	44.2986991	-121.1695828	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1543875	1	1	1	1206	September	6	2013	Friday	9:00 PM	Deschutes	Redmond	44.24034739	-121.1930091	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1543880	1	1	1	1198	September	5	2013	Thursday	11:00 PM	Deschutes	Redmond	44.24562643	-121.1846973	Inbound within 50 feet	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1543956	1	2	1	1423	October	14	2013	Monday	1:00 PM	Deschutes	Redmond	44.28139525	-121.1848919	Inbound within 50 feet	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1543990	1	2	2	1603	November	15	2013	Friday	7:00 AM	Deschutes	Redmond	44.23934581	-121.2070449	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1544044	1	2	2	1613	November	16	2013	Saturday	1:00 PM	Deschutes	Redmond	44.28536676	-121.1917796	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1544682	1	1	1	873	July	9	2013	Tuesday	12:00 PM	Deschutes	Redmond	44.26537499	-121.1795531	Midblock location	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Daylight
1544893	1	2	3	227	February	16	2013	Saturday	3:00 PM	Deschutes	Redmond	44.29098233	-121.179063	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1550467	1	2	2	35	January	10	2014	Friday	10:00 AM	Deschutes	Redmond	44.26924339	-121.194297	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Dry	Daylight
1550469	1	2	2	92	January	21	2014	Tuesday	3:00 PM	Deschutes	Redmond	44.26934103	-121.1892356	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1550483	1	2	2	162	January	31	2014	Friday	4:00 PM	Deschutes	Redmond	44.26963023	-121.1732032	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1550524	1	2	5	10	January	4	2014	Saturday	4:00 PM	Deschutes	Redmond	44.27257329	-121.1698777	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1550525	1	1	1	31	January	9	2014	Thursday	12:00 AM	Deschutes	Redmond	44.24868329	-121.1870299	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Rain	Wet	Darkness – no street lights
1550540	1	2	2	9	January	4	2014	Saturday	11:00 PM	Deschutes	Redmond	44.26975131	-121.1715393	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1550547	1	2	3	78	January	18	2014	Saturday	11:00 AM	Deschutes	Redmond	44.28377665	-121.1680827	Outbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1551519	1	2	2	3	January	2	2014	Thursday	2:00 PM	Deschutes	Redmond	44.25471722	-121.2125811	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1551525	1	2	3	24	January	8	2014	Wednesday	7:00 AM	Deschutes	Redmond	44.25244465	-121.1857587	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Cloudy	Snow	Daylight
1551528	1	2	2	27	January	8	2014	Wednesday	2:00 PM	Deschutes	Redmond	44.27151667	-121.1968193	Midblock location	Backing	Property damage only crash (PDO)	Clear	Dry	Daylight
1551539	1	2	2	34	January	9	2014	Thursday	4:00 PM	Deschutes	Redmond	44.25177244	-121.1844213	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1551573	1	2	2	122	January	25	2014	Saturday	8:00 AM	Deschutes	Redmond	44.29100873	-121.1638514	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Snow	Ice	Daylight
1551575	1	2	2	105	January	23	2014	Thursday	5:00 PM	Deschutes	Redmond	44.26788579	-121.1746687	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1551576	1	1	1	91	January	20	2014	Monday	2:00 PM	Deschutes	Redmond	44.23825784	-121.2131558	Midblock location	Non-collision	Property damage only crash (PDO)	Cloudy	Wet	Daylight
1551629	1	2	2	93	January	21	2014	Tuesday	1:00 PM	Deschutes	Redmond	44.26556633	-121.1853473	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1551638	1	2	2	63	January	14	2014	Tuesday	2:00 PM	Deschutes	Redmond	44.28137943	-121.1892062	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1551646	1	2	2	154	January	30	2014	Thursday	3:00 PM	Deschutes	Redmond	44.25841306	-121.1875711	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1551649	1	2	2	89	January	20	2014	Monday	9:00 AM	Deschutes	Redmond	44.26961205	-121.1742622	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Cloudy	Snow	Daylight
1551652	1	2	2	76	January	17	2014	Friday	8:00 AM	Deschutes	Redmond	44.26963023	-121.1732032	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1551666	1	2	2	39	January	10	2014	Friday	3:00 PM	Deschutes	Redmond	44.28556074	-121.1764568	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1553195	1	1	1	181	February	3	2014	Monday	10:00 AM	Deschutes	Redmond	44.30174736	-121.172408	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Cloudy	Ice	Daylight
1553220	1	2	2	354	February	28	2014	Friday	9:00 AM	Deschutes	Redmond	44.25873716	-121.1798308	Southwest Intersection Quadrant	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1553227	1	2	3	285	February	17	2014	Monday	3:00 PM	Deschutes	Redmond	44.26962985	-121.1716311	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1553237	1	2	4	209	February	7	2014	Friday	3:00 PM	Deschutes	Redmond	44.27257329	-121.1698777	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Snow	Ice	Daylight
1553242	1	3	5	208	February	7	2014	Friday	3:00 PM	Deschutes	Redmond	44.25122005	-121.1848383	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Snow	Snow	Daylight
1553267	1	2	2	183	February	3	2014	Monday	4:00 PM	Deschutes	Redmond	44.25122005	-121.1848383	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1553594	1	2	3	353	February	28	2014	Friday	10:00 AM	Deschutes	Redmond	44.27058743	-121.1731892	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1553598	1	2	2	165	February	1	2014	Saturday	7:00 PM	Deschutes	Redmond	44.26959208	-121.1774715	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Dry	Darkness – no street lights
1553606	1	2	2	201	February	6	2014	Thursday	3:00 PM	Deschutes	Redmond	44.26928222	-121.1912836	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Cloudy	Ice	Daylight
1553644	1	2	2	235	February	8	2014	Saturday	2:00 PM	Deschutes	Redmond	44.25122005	-121.1848383	Southwest Intersection Quadrant	Sideswipe-overtaking	Property damage only crash (PDO)	Snow	Snow	Daylight
1553809	1	1	2	288	February	18	2014	Tuesday	12:00 PM	Deschutes	Redmond	44.27058731	-121.1742634	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1553819	1	2	2	282	February	16	2014	Sunday	2:00 PM	Deschutes	Redmond	44.26961205	-121.1742622	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1553823	1	2	2	314	February	21	2014	Friday	10:00 AM	Deschutes	Redmond	44.265425	-121.1732556	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1553986	1	1	1	191	February	5	2014	Wednesday	11:00 PM	Deschutes	Redmond	44.27645126	-121.1896389	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Snow	Ice	Darkness – no street lights
1554002	1	1	1	246	February	10	2014	Monday	2:00 PM	Deschutes	Redmond	44.30182247	-121.1642694	NW Intersection Quadrant	Fixed-Object or Other-Object	Property damage only crash (PDO)	Cloudy	Ice	Daylight
1554039	1	1	1	349	February	27	2014	Thursday	5:00 PM	Deschutes	Redmond	44.27155783	-121.1840737	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Sleet	Ice	Daylight
1554378	1	2	2	291	February	18	2014	Tuesday	3:00 PM	Deschutes	Redmond	44.24232789	-121.2019784	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Rain	Wet	Daylight
1554384	1	2	2	298	February	19	2014	Wednesday	6:00 AM	Deschutes	Redmond	44.24710833	-121.1815865	Midblock location	Parking Maneuver	Property damage only crash (PDO)	Clear	Snow	Dawn (Twilight)
1554414	1	2	2	319	February	6	2014	Thursday	4:00 PM	Deschutes	Redmond	44.26920447	-121.1993511	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Snow	Ice	Daylight
1554416	1	2	2	350	February	27	2014	Thursday	12:00 PM	Deschutes	Redmond	44.27138889	-121.1942957	Midblock location	Parking Maneuver	Property damage only crash (PDO)	Clear	Dry	Daylight
1554418	1	2	2	203	February	6	2014	Thursday	1:00 PM	Deschutes	Redmond	44.25177244	-121.1844213	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Snow	Ice	Daylight
1554463	1	2	2	242	February	9	2014	Sunday	3:00 PM	Deschutes	Redmond	44.27552157	-121.1742958	Inbound within 50 feet	Angle	Property damage only crash (PDO)	Snow	Ice	Daylight
1554550	1	2	2	245	February	10	2014	Monday	11:00 AM	Deschutes	Redmond	44.27255606	-121.1806791	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Snow	Daylight
1554592	1	2	2	164	February	1	2014	Saturday	10:00 AM	Deschutes	Redmond	44.26836723	-121.1918093	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1554597	1	2	1	169	February	2	2014	Sunday	10:00 AM	Deschutes	Redmond	44.27085833	-121.1774788	Midblock location	Backing	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1554634	1	2	2	180	February	3	2014	Monday	8:00 AM	Deschutes	Redmond	44.28137943	-121.1892062	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Ice	Daylight

1554638	1	2	2	188	February	3	2014	Monday	7:00 AM	Deschutes	Redmond	44.23759552	-121.2123459	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Rain	Ice	Daylight
1558729	1	2	2	80061	March	18	2014	Tuesday	10:00 AM	Deschutes	Redmond	44.29099062	-121.1739116	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1559709	1	2	2	410	March	11	2014	Tuesday	4:00 PM	Deschutes	Redmond	44.26962985	-121.1716311	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1559734	1	2	2	467	March	24	2014	Monday	3:00 PM	Deschutes	Redmond	44.26927766	-121.1916381	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1559738	1	2	2	484	March	29	2014	Saturday	11:00 AM	Deschutes	Redmond	44.26959208	-121.1774715	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1559742	1	2	6	494	March	31	2014	Monday	3:00 PM	Deschutes	Redmond	44.26920439	-121.2093365	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1559749	1	1	2	451	March	20	2014	Thursday	5:00 PM	Deschutes	Redmond	44.26958287	-121.1840678	Inbound within 50 feet	Pedestrian	Non-fatal injury crash	Clear	Dry	Daylight
1559782	1	2	3	368	March	3	2014	Monday	4:00 PM	Deschutes	Redmond	44.25177244	-121.1844213	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Cloudy	Dry	Daylight
1559960	1	2	5	430	March	17	2014	Monday	2:00 PM	Deschutes	Redmond	44.26306834	-121.1769782	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1560014	1	2	2	475	March	26	2014	Wednesday	12:00 PM	Deschutes	Redmond	44.24180303	-121.1922861	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1560054	1	3	2	478	March	27	2014	Thursday	2:00 PM	Deschutes	Redmond	44.27299722	-121.174283	Midblock location	Parking Maneuver	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1560345	1	2	1	487	March	30	2014	Sunday	2:00 PM	Deschutes	Redmond	44.28535895	-121.1894528	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1560372	1	2	2	272	February	14	2014	Friday	6:00 PM	Deschutes	Redmond	44.29098233	-121.179063	Inbound within 50 feet	Angle	Non-fatal injury crash	Rain	Wet	Darkness – no street lights
1560387	1	1	1	90034	January	9	2014	Thursday	8:00 AM	Deschutes	Redmond	44.29097322	-121.1834678	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Cloudy	Ice	Daylight
1560506	1	2	2	374	February	10	2014	Monday	4:00 PM	Deschutes	Redmond	44.27257776	-121.1692198	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Ice	Daylight
1560517	1	3	3	382	March	5	2014	Wednesday	4:00 PM	Deschutes	Redmond	44.26306834	-121.1769782	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1560528	1	2	2	385	March	6	2014	Thursday	4:00 PM	Deschutes	Redmond	44.24077493	-121.1906668	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1560535	1	2	2	421	March	14	2014	Friday	10:00 AM	Deschutes	Redmond	44.26817899	-121.1866826	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1560538	1	2	2	437	March	18	2014	Tuesday	4:00 PM	Deschutes	Redmond	44.27258618	-121.1666297	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1560539	1	2	2	470	March	25	2014	Tuesday	12:00 PM	Deschutes	Redmond	44.27648678	-121.1866943	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1560564	1	2	2	400	March	8	2014	Saturday	7:00 PM	Deschutes	Redmond	44.2909865	-121.1764281	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1560570	1	2	2	376	March	4	2014	Tuesday	7:00 PM	Deschutes	Redmond	44.27256127	-121.1721324	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1560579	1	2	2	403	March	9	2014	Sunday	4:00 PM	Deschutes	Redmond	44.24296032	-121.1939744	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Rain	Wet	Daylight
1560622	1	2	2	446	March	19	2014	Wednesday	8:00 AM	Deschutes	Redmond	44.29099062	-121.1739116	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Dawn (Twilight)
1560627	1	2	2	447	March	20	2014	Thursday	6:00 PM	Deschutes	Redmond	44.25452917	-121.1860905	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1562025	1	2	2	555	April	13	2014	Sunday	10:00 AM	Deschutes	Redmond	44.26959201	-121.1795959	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1562345	1	1	1	536	April	9	2014	Wednesday	6:00 PM	Deschutes	Redmond	44.26095252	-121.166264	Midblock location	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1562347	1	1	1	90536	April	9	2014	Wednesday	6:00 PM	Deschutes	Redmond	44.2666866	-121.174565	Midblock location	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1562351	1	2	2	537	April	9	2014	Wednesday	6:00 PM	Deschutes	Redmond	44.27733973	-121.1687484	Midblock location	Backing	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1562490	1	1	1	508	April	1	2014	Tuesday	11:00 PM	Deschutes	Redmond	44.24432013	-121.1988258	Southeast Intersection Quadrant	Fixed-Object or Other-Object	Property damage only crash (PDO)	Unknown	Unknown	Darkness – no street lights
1562751	1	2	3	519	April	6	2014	Sunday	9:00 AM	Deschutes	Redmond	44.25469615	-121.2043724	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1562815	1	2	2	550	April	12	2014	Saturday	10:00 AM	Deschutes	Redmond	44.27255649	-121.1742768	Inbound within 50 feet	Backing	Non-fatal injury crash	Clear	Dry	Daylight
1562904	1	2	2	534	April	9	2014	Wednesday	5:00 PM	Deschutes	Redmond	44.29098999	-121.1777475	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1562958	1	3	3	570	April	17	2014	Thursday	5:00 PM	Deschutes	Redmond	44.27258966	-121.1643392	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Dry	Daylight
1563024	1	2	2	575	April	18	2014	Friday	2:00 PM	Deschutes	Redmond	44.24610658	-121.196709	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1563069	1	2	2	585	April	21	2014	Monday	4:00 PM	Deschutes	Redmond	44.26142331	-121.168888	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1563071	1	2	2	606	April	26	2014	Saturday	2:00 PM	Deschutes	Redmond	44.26010309	-121.181434	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Unknown	Unknown	Daylight
1563076	1	2	2	616	April	30	2014	Wednesday	5:00 PM	Deschutes	Redmond	44.26437328	-121.1999642	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1563082	1	2	2	600	April	24	2014	Thursday	1:00 PM	Deschutes	Redmond	44.265425	-121.1732556	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1563089	1	2	2	580	April	19	2014	Saturday	8:00 AM	Deschutes	Redmond	44.25831547	-121.2076246	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1563121	1	2	2	576	April	18	2014	Friday	12:00 PM	Deschutes	Redmond	44.26010309	-121.181434	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1563122	1	2	2	568	April	16	2014	Wednesday	9:00 AM	Deschutes	Redmond	44.27552157	-121.1742958	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1563156	1	1	2	601	April	24	2014	Thursday	2:00 PM	Deschutes	Redmond	44.27354325	-121.1770111	Midblock location	Pedestrian	Non-fatal injury crash	Clear	Dry	Daylight
1566276	1	1	1	663	May	9	2014	Friday	12:00 PM	Deschutes	Redmond	44.265425	-121.1732556	NW Intersection Quadrant	Fixed-Object or Other-Object	Property damage only crash (PDO)	Unknown	Unknown	Daylight
1566312	1	2	2	642	May	4	2014	Sunday	5:00 PM	Deschutes	Redmond	44.26961111	-121.1742611	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1566430	1	1	1	724	May	21	2014	Wednesday	8:00 PM	Deschutes	Redmond	44.27228611	-121.1628917	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1566454	1	2	2	714	May	19	2014	Monday	4:00 PM	Deschutes	Redmond	44.26961111	-121.1742611	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1566554	1	2	2	695	May	16	2014	Friday	12:00 PM	Deschutes	Redmond	44.25177222	-121.1844222	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1566623	1	3	3	743	May	23	2014	Friday	12:00 PM	Deschutes	Redmond	44.25177222	-121.1844222	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1566663	1	1	1	670	May	11	2014	Sunday	8:00 PM	Deschutes	Redmond	44.27257222	-121.1698778	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1567467	1	2	2	748	May	26	2014	Monday	11:00 PM	Deschutes	Redmond	44.265425	-121.1732556	Midblock location	Sideswipe-meeting	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1567476	1	2	5	764	May	29	2014	Thursday	1:00 PM	Deschutes	Redmond	44.263725	-121.1787694	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1567610	1	2	2	699	May	16	2014	Friday	9:00 AM	Deschutes	Redmond	44.25472778	-121.1992917	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1571444	1	1	1	565	April	16	2014	Wednesday	4:00 AM	Deschutes	Redmond	44.27302778	-121.2093389	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1573477	1	2	3	803	June	5	2014	Thursday	9:00 PM	Deschutes	Redmond	44.27257222	-121.1698778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1573530	1	3	3	832	June	9	2014	Monday	4:00 PM	Deschutes	Redmond	44.26306944	-121.1769778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1573648	1	2	2	891	June	19	2014	Thursday	6:00 PM	Deschutes	Redmond	44.25990833	-121.1790667	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1573768	1	3	3	937	June	26	2014	Thursday	5:00 PM	Deschutes	Redmond	44.27257222	-121.1698778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1573796	1	4	4	967	June	30	2014	Monday	5:00 PM	Deschutes	Redmond	44.25938333	-121.1794056	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1573818	1	1	1	837	June	9	2014	Monday	4:00 PM	Deschutes	Redmond	44.26213056	-121.1478389	Inbound within 50 feet	Non-collision	Non-fatal injury crash	Clear	Dry	Daylight
1573850	1	2	2	896	June	19	2014	Thursday	10:00 AM	Deschutes	Redmond	44.26961111	-121.1742611	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1573926	1	2	2	950	June	27	2014	Friday	1:00 PM	Deschutes	Redmond	44.26963056	-121.1716306	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1573939	1	2	2	951	June	27	2014	Friday	11:00 AM	Deschutes	Redmond	44.26963056	-121.1716306	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1573996	1	2	2	939	June	26	2014	Thursday	11:00 PM	Deschutes	Redmond	44.272575	-121.1636361	Midblock location	Sideswipe-meeting	Non-fatal injury crash	Cloudy	Dry	Darkness – no street lights
1574130	1	2	3	539	April	16	2014	Wednesday	4:00 PM	Deschutes	Redmond	44.289675	-121.1649472	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1574139	1	1	1	452	March	20	2014	Thursday	12:00 PM	Deschutes	Redmond	44.29096944	-121.1843611	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1574706	1	2	2	797	June	4	2014	Wednesday	1:00 PM	Deschutes	Redmond	44.28104167	-121.1742972	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Unknown	Unknown	Daylight
1574709	1	2	2	820	June	8	2014	Sunday	3:00 PM	Deschutes	Redmond	44.25835556	-121.1942083	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1574737	1	2	3	835	June	9	2014	Monday	4:00 PM	Deschutes	Redmond	44.26760833	-121.1819167	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1574743	1	2	6	841	June	10	2014	Tuesday	9:00 PM	Deschutes	Redmond	44.26920556	-121.19935	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1574773	1	3	3	878	June	16	2014	Monday	3:00 PM	Deschutes	Redmond	44.25475	-121.1954306	Inbound within 50 feet	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1574777	1	1	2	881	June	17	2014	Tuesday	12:00 AM	Deschutes	Redmond	44.28400278	-121.1741444	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Cloudy	Dry	Darkness – no street lights
1574787	1	2	3	901	June	20	2014	Friday	10:00 AM	Deschutes	Redmond	44.263725	-121.1787694	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1574794	1	2	2	919	June	22	2014	Sunday	12:00 PM	Deschutes	Redmond	44.26788611	-121.1746694	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1579959	1	2	2	1030	July	11	2014	Friday	5:00 PM	Deschutes	Redmond	44.270575	-121.1776917	Inbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1580125	1	2	2	971	July	1	2014	Tuesday	3:00 PM	Deschutes	Redmond	44.25177222	-121.1844222	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1580130	1	2	4	1047	July	15	2014	Tuesday	2:00 PM	Deschutes	Redmond	44.25177222	-121.1844222	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1580146	1	2	2	983	July	3	2014	Thursday	3:00 PM	Deschutes	Redmond	44.25744722	-121.1806806	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1580165	1	2	3	998	July	6	2014	Sunday	5:00 PM	Deschutes	Redmond	44.27257222	-121.1698778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1580178	1	2	2	1052	July	16	2014	Wednesday	11:00 AM	Deschutes	Redmond	44.28883056	-121.1673	Southeast Intersection Quadrant	Miscellaneous	Property damage only crash (PDO)	Clear	Dry	Daylight
1580181	1	2	2	1062	July	18	2014	Friday	3:00 PM	Deschutes	Redmond	44.26975	-121.1715389	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1580215	1	1	1	1110	July	28	2014	Monday	9:00 PM	Deschutes	Redmond	44.29035556	-121.1670806	NW Intersection Quadrant	Non-collision	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1580541	1	2	3	1060	July	17	2014	Thursday	3:00 PM	Deschutes	Redmond	44.30332222	-121.1732444	Midblock location	Sideswipe-meeting	Non-fatal injury crash	Clear	Dry	Daylight
1580747	1	2	2	1045	July	15	2014	Tuesday	1:00 PM	Deschutes	Redmond	44.25475278	-121.194175	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1580752	1	2	1	1046	July	15	2014	Tuesday	8:00 AM	Deschutes	Redmond	44.26221111	-121.2095444	NW Intersection Quadrant	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1580815	1	2	2	1081	July	21	2014	Monday	9:00 AM	Deschutes	Redmond	44.29820556	-121.1826722	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1580823	1	2	2	1087	July	23	2014	Wednesday	1:00 PM	Deschutes	Redmond	44.27971111	-121.1892222	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Rain	Wet	Daylight
1580826	1	2	2	1089	July	23	2014	Wednesday	1:00 PM	Deschutes	Redmond	44.28202778	-121.1732333	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight

1580841	1	2	2	1115	July	29	2014	Tuesday	2:00 PM	Deschutes	Redmond	44.263725	-121.1787694	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1580851	1	2	3	984	July	3	2014	Thursday	5:00 PM	Deschutes	Redmond	44.26663611	-121.1795583	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1580853	1	2	2	985	July	3	2014	Thursday	10:00 AM	Deschutes	Redmond	44.2535	-121.1873667	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1580876	1	2	2	991	July	4	2014	Friday	3:00 PM	Deschutes	Redmond	44.26921667	-121.2093472	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1580884	1	2	1	1006	July	7	2014	Monday	5:00 PM	Deschutes	Redmond	44.27380833	-121.1942861	Inbound within 50 feet	Miscellaneous	Property damage only crash (PDO)	Clear	Dry	Daylight
1580894	1	2	2	1008	July	7	2014	Monday	6:00 PM	Deschutes	Redmond	44.24753056	-121.2293889	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1580896	1	2	2	1019	July	8	2014	Tuesday	5:00 PM	Deschutes	Redmond	44.26010278	-121.1814333	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1585203	1	1	6	1152	July	7	2014	Monday	6:00 PM	Deschutes	Redmond	44.29169167	-121.1668944	Midblock location	Non-collision	Non-fatal injury crash	Clear	Dry	Daylight
1585331	1	2	2	1257	July	11	2014	Friday	10:00 PM	Deschutes	Redmond	44.26919722	-121.2044	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1585342	1	2	4	1146	August	4	2014	Monday	4:00 PM	Deschutes	Redmond	44.26306944	-121.1769778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1585349	1	2	2	1181	July	25	2014	Friday	5:00 PM	Deschutes	Redmond	44.27257222	-121.1698778	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1586372	1	1	1	1211	August	15	2014	Friday	7:00 AM	Deschutes	Redmond	44.29096944	-121.1851333	Midblock location	Miscellaneous	Property damage only crash (PDO)	Clear	Dry	Daylight
1586472	1	3	3	1128	August	1	2014	Friday	7:00 AM	Deschutes	Redmond	44.25453056	-121.1860917	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1586475	1	2	2	1130	August	1	2014	Friday	11:00 AM	Deschutes	Redmond	44.263725	-121.1787694	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1586496	1	2	3	1132	August	1	2014	Friday	4:00 PM	Deschutes	Redmond	44.29075556	-121.173925	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1586524	1	2	2	1139	August	3	2014	Sunday	6:00 PM	Deschutes	Redmond	44.26961111	-121.1742611	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1586542	1	2	2	1176	August	8	2014	Friday	8:00 PM	Deschutes	Redmond	44.25243333	-121.1857583	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1586581	1	2	2	1202	August	14	2014	Thursday	12:00 AM	Deschutes	Redmond	44.27741667	-121.1775	Inbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Unknown	Unknown	Darkness – no street lights
1586604	1	2	2	1234	August	19	2014	Tuesday	10:00 AM	Deschutes	Redmond	44.276525	-121.1721361	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1587821	1	2	2	1131	August	1	2014	Friday	7:00 PM	Deschutes	Redmond	44.24016667	-121.1882861	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1587825	1	4	1	1179	August	9	2014	Saturday	1:00 AM	Deschutes	Redmond	44.27723056	-121.1985917	Midblock location	Sideswipe-meeting	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1587827	1	2	2	1204	August	14	2014	Thursday	3:00 PM	Deschutes	Redmond	44.27279722	-121.1993306	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Rain	Wet	Daylight
1592271	1	1	3	1382	September	15	2014	Monday	9:00 PM	Deschutes	Redmond	44.26134444	-121.1584222	Outbound within 50 feet	Non-collision	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1592366	1	1	1	1423	September	24	2014	Wednesday	4:00 PM	Deschutes	Redmond	44.26808889	-121.1785083	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Rain	Wet	Daylight
1592436	1	2	5	1412	September	22	2014	Monday	4:00 PM	Deschutes	Redmond	44.27643056	-121.1957806	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1592541	1	2	2	1417	September	24	2014	Wednesday	2:00 PM	Deschutes	Redmond	44.26928333	-121.1912833	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Unknown	Unknown	Daylight
1592655	1	2	2	1425	September	24	2014	Wednesday	12:00 PM	Deschutes	Redmond	44.27255556	-121.1732056	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Cloudy	Snow	Daylight
1592689	1	1	2	1454	September	29	2014	Monday	7:00 AM	Deschutes	Redmond	44.27643611	-121.1942778	Inbound within 50 feet	Pedestrian	Non-fatal injury crash	Clear	Dry	Daylight
1592699	1	2	2	1429	September	25	2014	Thursday	2:00 PM	Deschutes	Redmond	44.27226389	-121.1721278	Midblock location	Parking Maneuver	Property damage only crash (PDO)	Clear	Dry	Daylight
1592785	1	2	1	1393	September	18	2014	Thursday	7:00 PM	Deschutes	Redmond	44.27832778	-121.1968944	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1592835	1	2	2	1420	September	24	2014	Wednesday	10:00 PM	Deschutes	Redmond	44.27255833	-121.1732111	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Rain	Wet	Darkness – no street lights
1592838	1	2	2	1428	September	25	2014	Thursday	5:00 PM	Deschutes	Redmond	44.26959167	-121.1795972	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1592883	1	2	3	1378	September	15	2014	Monday	6:00 PM	Deschutes	Redmond	44.26565	-121.1795611	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1592999	1	2	1	1353	September	10	2014	Wednesday	7:00 AM	Deschutes	Redmond	44.26662222	-121.182275	NW Intersection Quadrant	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1593009	1	2	2	1356	September	11	2014	Thursday	11:00 AM	Deschutes	Redmond	44.26459444	-121.1771778	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1593284	1	2	2	1312	September	3	2014	Wednesday	9:00 AM	Deschutes	Redmond	44.27257222	-121.1702611	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1593768	1	2	2	1456	September	30	2014	Tuesday	5:00 PM	Deschutes	Redmond	44.24189167	-121.1936861	Southwest Intersection Quadrant	Miscellaneous	Property damage only crash (PDO)	Clear	Dry	Daylight
1593772	1	2	2	1383	September	16	2014	Tuesday	12:00 PM	Deschutes	Redmond	44.27241944	-121.1699583	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1593779	1	2	2	1407	September	21	2014	Sunday	11:00 AM	Deschutes	Redmond	44.25318056	-121.1834889	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1593789	1	2	2	1355	September	11	2014	Thursday	9:00 AM	Deschutes	Redmond	44.23783611	-121.1976194	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1593792	1	2	3	1335	September	7	2014	Sunday	4:00 PM	Deschutes	Redmond	44.29099167	-121.1739111	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1593846	1	3	4	1301	September	2	2014	Tuesday	4:00 PM	Deschutes	Redmond	44.26306944	-121.1769778	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1593897	1	2	2	1387	September	16	2014	Tuesday	12:00 PM	Deschutes	Redmond	44.26958333	-121.1840667	Outbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1593910	1	3	3	1411	September	22	2014	Monday	5:00 PM	Deschutes	Redmond	44.26948056	-121.1866944	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1593918	1	2	2	1424	September	24	2014	Wednesday	12:00 PM	Deschutes	Redmond	44.26961111	-121.1742611	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Rain	Wet	Daylight
1596377	1	1	1	1651	October	17	2014	Friday	5:00 PM	Deschutes	Redmond	44.27003333	-121.1720333	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Rain	Wet	Daylight
1596528	1	2	2	1532	October	12	2014	Sunday	9:00 AM	Deschutes	Redmond	44.27058889	-121.1732139	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1596549	1	2	2	1523	September	5	2014	Friday	7:00 AM	Deschutes	Redmond	44.26958333	-121.1840667	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1596553	1	2	2	1506	October	8	2014	Wednesday	6:00 PM	Deschutes	Redmond	44.26961111	-121.1742611	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1596562	1	2	2	1605	October	24	2014	Friday	4:00 PM	Deschutes	Redmond	44.26959167	-121.1774722	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1596567	1	2	2	1655	October	30	2014	Thursday	7:00 AM	Deschutes	Redmond	44.29099167	-121.1739111	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Cloudy	Wet	Daylight
1596594	1	2	2	1631	October	26	2014	Sunday	1:00 PM	Deschutes	Redmond	44.26975	-121.1715389	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1596773	1	2	2	1568	October	18	2014	Saturday	11:00 AM	Deschutes	Redmond	44.26975	-121.1715389	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1596876	1	4	4	1652	October	30	2014	Thursday	3:00 PM	Deschutes	Redmond	44.25821944	-121.1801722	Southwest Intersection Quadrant	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1596883	1	3	3	1538	October	13	2014	Monday	5:00 PM	Deschutes	Redmond	44.26306944	-121.1769778	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1597037	1	2	2	1600	October	23	2014	Thursday	6:00 AM	Deschutes	Redmond	44.26958611	-121.1813611	Inbound within 50 feet	Angle	Non-fatal injury crash	Rain	Wet	Dawn (Twilight)
1597101	1	2	3	1603	October	23	2014	Thursday	2:00 PM	Deschutes	Redmond	44.29099167	-121.1739111	Inbound within 50 feet	Backing	Property damage only crash (PDO)	Clear	Dry	Daylight
1597356	1	2	2	1463	October	1	2014	Wednesday	2:00 PM	Deschutes	Redmond	44.27318056	-121.1732028	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1597361	1	2	2	1464	October	1	2014	Wednesday	5:00 PM	Deschutes	Redmond	44.26268333	-121.17725	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Unknown	Unknown	Dusk (Twilight)
1597840	1	2	2	1517	October	10	2014	Friday	1:00 PM	Deschutes	Redmond	44.26458056	-121.1772222	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1597855	1	1	2	1520	October	10	2014	Friday	1:00 PM	Deschutes	Redmond	44.28202778	-121.1732333	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1597913	1	2	2	1541	October	13	2014	Monday	9:00 AM	Deschutes	Redmond	44.269625	-121.173325	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1597916	1	2	2	1543	October	14	2014	Tuesday	4:00 PM	Deschutes	Redmond	44.27553333	-121.17215	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1598048	1	2	2	1585	October	20	2014	Monday	7:00 AM	Deschutes	Redmond	44.27058889	-121.1732083	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Dawn (Twilight)
1598061	1	2	4	1589	October	22	2014	Wednesday	7:00 AM	Deschutes	Redmond	44.27845556	-121.1892333	Midblock location	Rear-End	Non-fatal injury crash	Cloudy	Wet	Dawn (Twilight)
1598200	1	2	2	1649	October	29	2014	Wednesday	10:00 AM	Deschutes	Redmond	44.28200833	-121.1769194	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1598262	1	1	1	1670	October	15	2014	Wednesday	12:00 PM	Deschutes	Redmond	44.27785556	-121.1992694	Midblock location	Miscellaneous	Property damage only crash (PDO)	Clear	Dry	Daylight
1598429	1	2	4	1701	November	6	2014	Thursday	5:00 PM	Deschutes	Redmond	44.29099167	-121.1722	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Darkness – with street lights
1598445	1	2	2	1707	November	7	2014	Friday	9:00 AM	Deschutes	Redmond	44.27653611	-121.1638611	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1598451	1	2	2	1709	November	7	2014	Friday	2:00 PM	Deschutes	Redmond	44.29097222	-121.1834667	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1598456	1	2	3	1711	November	7	2014	Friday	7:00 AM	Deschutes	Redmond	44.25111389	-121.1992306	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1598589	1	2	2	1738	November	12	2014	Wednesday	5:00 PM	Deschutes	Redmond	44.254825	-121.1857028	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1598703	1	2	2	1754	November	13	2014	Thursday	1:00 PM	Deschutes	Redmond	44.244275	-121.1989278	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Snow	Snow	Daylight
1598714	1	2	2	1759	November	13	2014	Thursday	1:00 PM	Deschutes	Redmond	44.2535	-121.1873667	Inbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Snow	Ice	Daylight
1598754	1	2	5	1770	November	14	2014	Friday	3:00 PM	Deschutes	Redmond	44.27256944	-121.1698833	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Unknown	Ice	Daylight
1598780	1	2	2	1780	November	16	2014	Sunday	11:00 AM	Deschutes	Redmond	44.28914444	-121.1891333	Inbound within 50 feet	Sideswipe-meeting	Property damage only crash (PDO)	Unknown	Ice	Daylight
1598813	1	2	2	1787	November	17	2014	Monday	5:00 PM	Deschutes	Redmond	44.28917778	-121.1740056	Inbound within 50 feet	Turning Movement	Non-fatal injury crash	Clear	Ice	Darkness – with street lights
1598884	1	1	1	1804	November	18	2014	Tuesday	11:00 AM	Deschutes	Redmond	44.28523333	-121.174	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Unknown	Ice	Daylight
1599037	1	2	2	1826	November	3	2014	Monday	8:00 AM	Deschutes	Redmond	44.27645556	-121.1892556	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Cloudy	Ice	Daylight
1599089	1	2	2	1834	November	22	2014	Saturday	10:00 AM	Deschutes	Redmond	44.26958333	-121.1840778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Rain	Snow	Daylight
1599090	1	1	1	1835	November	22	2014	Saturday	11:00 AM	Deschutes	Redmond	44.24710833	-121.1815861	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Snow	Wet	Daylight
1599127	1	2	2	1842	September	2	2014	Tuesday	5:00 PM	Deschutes	Redmond	44.28200833	-121.1768111	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1599140	1	2	2	1844	November	23	2014	Sunday	3:00 PM	Deschutes	Redmond	44.25293333	-121.1864972	Midblock location	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1599340	1	2	2	1892	December	3	2014	Wednesday	3:00 PM	Deschutes	Redmond	44.26142222	-121.1688889	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Unknown	Ice	Daylight
1599368	1	1	1	1901	December	4	2014	Thursday	8:00 PM	Deschutes	Redmond	44.26920556	-121.2039778	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Cloudy	Ice	Darkness – no street lights
1599411	1	1	1	1911	December	5	2014	Friday	8:00 AM	Deschutes	Redmond	44.26408889	-121.1792972	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Fog	Ice	Daylight
1599416	1	2	2	1913	December	5	2014	Friday	6:00 PM	Deschutes	Redmond	44.26962778	-121.173325	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1599490	1	2	2	1929	December	9	2014	Tuesday	7:00 PM	Deschutes	Redmond	44.26928611	-121.1912833	Outbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Cloudy	Dry	Darkness – with street lights

1599530	1	2	2	1939	December	11	2014	Thursday	1:00 PM	Deschutes	Redmond	44.27058333	-121.1774833	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1599601	1	1	2	1958	December	15	2014	Monday	1:00 PM	Deschutes	Redmond	44.25098889	-121.2278917	Midblock location	Fixed-Object or Other-Object	Non-fatal injury crash	Fog	Ice	Daylight
1599605	1	2	3	1960	December	15	2014	Monday	5:00 PM	Deschutes	Redmond	44.26307222	-121.1769861	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1599606	1	2	3	1961	December	15	2014	Monday	1:00 PM	Deschutes	Redmond	44.26306944	-121.1769778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Unknown	Wet	Daylight
1599618	1	2	2	1963	December	15	2014	Monday	8:00 AM	Deschutes	Redmond	44.29758611	-121.1738611	Midblock location	Sideswipe-meeting	Non-fatal injury crash	Cloudy	Ice	Daylight
1599627	1	2	2	1965	December	15	2014	Monday	8:00 AM	Deschutes	Redmond	44.26975833	-121.1715417		Rear-End	Non-fatal injury crash	Snow	Ice	Daylight
1599637	1	1	1	1969	December	15	2014	Monday	9:00 AM	Deschutes	Redmond	44.30075833	-121.1725	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Unknown	Ice	Daylight
1599638	1	2	2	1970	December	15	2014	Monday	7:00 AM	Deschutes	Redmond	44.25177222	-121.1844222	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Ice	Darkness – with street lights
1599653	1	3	4	1972	December	15	2014	Monday	6:00 AM	Deschutes	Redmond	44.24180278	-121.1922861	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Snow	Ice	Dawn (Twilight)
1599684	1	2	2	1978	December	16	2014	Tuesday	2:00 PM	Deschutes	Redmond	44.24233333	-121.2019833	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1599705	1	1	2	1982	December	16	2014	Tuesday	12:00 AM	Deschutes	Redmond	44.24180278	-121.1922861	Outbound within 50 feet	Fixed-Object or Other-Object	Non-fatal injury crash	Snow	Ice	Darkness – with street lights
1599755	1	2	2	1999	December	19	2014	Friday	11:00 AM	Deschutes	Redmond	44.27258056	-121.1698833	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1599789	1	1	2	2008	December	20	2014	Saturday	5:00 PM	Deschutes	Redmond	44.26613889	-121.1756111	Inbound within 50 feet	Pedestrian	Non-fatal injury crash	Rain	Wet	Darkness – no street lights
1599817	1	2	3	2011	December	21	2014	Sunday	5:00 PM	Deschutes	Redmond	44.28646389	-121.174	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1599835	1	2	3	2018	December	22	2014	Monday	8:00 AM	Deschutes	Redmond	44.26961389	-121.1742639	NW Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1599837	1	2	2	2019	December	22	2014	Monday	5:00 PM	Deschutes	Redmond	44.26373056	-121.1787667	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – with street lights
1599901	1	2	2	2043	December	25	2014	Thursday	7:00 PM	Deschutes	Redmond	44.26975556	-121.1715528	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1599925	1	2	3	2052	December	26	2014	Friday	10:00 PM	Deschutes	Redmond	44.28202778	-121.1743056	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Darkness – with street lights
1599930	1	3	1	2053	December	26	2014	Friday	9:00 PM	Deschutes	Redmond	44.27333889	-121.1753472	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1600030	1	2	2	2071	December	29	2014	Monday	1:00 PM	Deschutes	Redmond	44.26142222	-121.1688889	Inbound within 50 feet	Turning Movement	Non-fatal injury crash	Snow	Snow	Daylight
1600067	1	2	2	2085	December	29	2014	Monday	9:00 AM	Deschutes	Redmond	44.26924444	-121.1943056	Inbound within 50 feet	Turning Movement	Non-fatal injury crash	Snow	Ice	Daylight
1600087	1	2	2	2093	December	29	2014	Monday	12:00 PM	Deschutes	Redmond	44.27652222	-121.1753417	NW Intersection Quadrant	Angle	Non-fatal injury crash	Snow	Ice	Daylight
1600114	1	2	2	2105	December	29	2014	Monday	8:00 AM	Deschutes	Redmond	44.26142222	-121.1688889	Inbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Snow	Ice	Daylight
1600167	1	2	2	2109	December	29	2014	Monday	10:00 AM	Deschutes	Redmond	44.26142222	-121.1688889	Inbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Clear	Ice	Daylight
1600175	1	2	2	2115	December	29	2014	Monday	7:00 AM	Deschutes	Redmond	44.24411944	-121.1988056	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Snow	Ice	Dawn (Twilight)
1600185	1	2	2	2118	December	29	2014	Monday	1:00 PM	Deschutes	Redmond	44.27256111	-121.1721333	Inbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Snow	Ice	Daylight
1600200	1	2	3	2121	December	30	2014	Tuesday	1:00 PM	Deschutes	Redmond	44.26307222	-121.1769778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Ice	Daylight
1600262	1	2	2	2132	December	30	2014	Tuesday	3:00 PM	Deschutes	Redmond	44.27791389	-121.1742917	Midblock location	Turning Movement	Property damage only crash (PDO)	Unknown	Unknown	Dusk (Twilight)
1600277	1	2	2	2137	December	31	2014	Wednesday	3:00 PM	Deschutes	Redmond	44.26963333	-121.1716306	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Ice	Daylight
1600314	1	2	2	2149	December	22	2014	Monday	4:00 PM	Deschutes	Redmond	44.24594722	-121.1896917	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1600839	1	2	2	2126	December	30	2014	Tuesday	4:00 PM	Deschutes	Redmond	44.26186944	-121.1562028	Midblock location	Sideswipe-meeting	Non-fatal injury crash	Snow	Ice	Dusk (Twilight)
1600845	1	1	1	1505	August	16	2014	Saturday	8:00 PM	Deschutes	Redmond	44.27641667	-121.2043167	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1600849	1	2	6	1558	October	16	2014	Thursday	5:00 PM	Deschutes	Redmond	44.25841944	-121.1840167	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1600854	1	1	1	1608	October	24	2014	Friday	4:00 PM	Deschutes	Redmond	44.24978333	-121.1922806	NE Intersection Quadrant	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Daylight
1600867	1	2	1	1699	October	14	2014	Tuesday	2:00 PM	Deschutes	Redmond	44.25109167	-121.2043194	Outbound within 50 feet	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1600868	1	1	1	1777	November	15	2014	Saturday	4:00 PM	Deschutes	Redmond	44.28734722	-121.18915	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Snow	Ice	Daylight
1600878	1	1	1	1881	December	2	2014	Tuesday	7:00 PM	Deschutes	Redmond	44.2819	-121.1992472	Southeast Intersection Quadrant	Fixed-Object or Other-Object	Property damage only crash (PDO)	Fog	Unknown	Darkness – no street lights
1600883	1	2	1	1921	December	7	2014	Sunday	9:00 PM	Deschutes	Redmond	44.30339722	-121.1848861	Midblock location	Rear-End	Non-fatal injury crash	Rain	Wet	Darkness – no street lights
1607094	1	2	3	32	January	5	2015	Monday	9:00 AM	Deschutes	Redmond	44.26928333	-121.1912833	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1607118	1	2	2	34	January	6	2015	Tuesday	3:00 PM	Deschutes	Redmond	44.28430278	-121.1740972	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1607141	1	2	2	45	January	7	2015	Wednesday	8:00 AM	Deschutes	Redmond	44.27058611	-121.1742639	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Dawn (Twilight)
1607683	1	2	2	96	January	19	2015	Monday	3:00 PM	Deschutes	Redmond	44.27058889	-121.1732139	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1607738	1	2	2	106	January	21	2015	Wednesday	7:00 PM	Deschutes	Redmond	44.27058611	-121.1742639	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Darkness – with street lights
1607790	1	2	2	58	January	10	2015	Saturday	12:00 PM	Deschutes	Redmond	44.26963056	-121.1716306	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1607807	1	1	1	116	January	24	2015	Saturday	4:00 PM	Deschutes	Redmond	44.26920278	-121.2085472	Inbound within 50 feet	Non-collision	Non-fatal injury crash	Clear	Dry	Daylight
1608063	1	2	5	131	January	30	2015	Friday	9:00 AM	Deschutes	Redmond	44.26959167	-121.1795972	NW Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1608581	1	2	3	160	February	7	2015	Saturday	12:00 PM	Deschutes	Redmond	44.26959167	-121.177825	Southeast Intersection Quadrant	Sideswipe-overtaking	Non-fatal injury crash	Clear	Dry	Daylight
1608620	1	3	3	174	February	11	2015	Wednesday	1:00 PM	Deschutes	Redmond	44.25177222	-121.1844222	Inbound within 50 feet	Sideswipe-overtaking	Non-fatal injury crash	Clear	Dry	Daylight
1608641	1	2	2	172	February	9	2015	Monday	6:00 PM	Deschutes	Redmond	44.26934167	-121.1892361	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1608942	1	2	4	235	February	25	2015	Wednesday	5:00 PM	Deschutes	Redmond	44.26928333	-121.1912833	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1608992	1	1	2	197	February	15	2015	Sunday	3:00 AM	Deschutes	Redmond	44.30075833	-121.1706139	Outbound within 50 feet	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1611989	1	2	2	308	March	10	2015	Tuesday	7:00 PM	Deschutes	Redmond	44.27058611	-121.1742639	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1611998	1	2	5	325	March	15	2015	Sunday	6:00 PM	Deschutes	Redmond	44.27058611	-121.1742639	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1612066	1	2	6	323	March	14	2015	Saturday	11:00 AM	Deschutes	Redmond	44.27057778	-121.1774778	NE Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1612180	1	2	2	336	March	17	2015	Tuesday	5:00 PM	Deschutes	Redmond	44.29088056	-121.1739167	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1612459	1	2	3	350	March	21	2015	Saturday	9:00 AM	Deschutes	Redmond	44.27057778	-121.1774778	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1612514	1	2	3	363	March	20	2015	Friday	12:00 PM	Deschutes	Redmond	44.26963056	-121.1716306	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Unknown	Daylight
1612607	1	2	5	383	March	28	2015	Saturday	10:00 PM	Deschutes	Redmond	44.2519	-121.1843361	Midblock location	Rear-End	Non-fatal injury crash	Cloudy	Dry	Darkness – with street lights
1613044	1	2	3	407	April	1	2015	Wednesday	5:00 PM	Deschutes	Redmond	44.26928333	-121.1912833	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1613086	1	2	2	438	April	7	2015	Tuesday	5:00 PM	Deschutes	Redmond	44.28314167	-121.1732417	Midblock location	Sideswipe-overtaking	Non-fatal injury crash	Rain	Wet	Dusk (Twilight)
1613172	1	2	4	442	April	8	2015	Wednesday	7:00 PM	Deschutes	Redmond	44.25318889	-121.1834833	Inbound within 50 feet	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1613457	1	2	2	497	April	17	2015	Friday	10:00 AM	Deschutes	Redmond	44.26959167	-121.1799889	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1613560	1	2	2	498	February	6	2015	Friday	11:00 AM	Deschutes	Redmond	44.24816944	-121.1875306	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1613634	1	3	3	528	April	24	2015	Friday	10:00 PM	Deschutes	Redmond	44.27271111	-121.1698139	Southwest Intersection Quadrant	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – with street lights
1616345	1	2	3	595	May	6	2015	Wednesday	6:00 AM	Deschutes	Redmond	44.26959167	-121.1795972	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Dawn (Twilight)
1616363	1	3	4	560	May	1	2015	Friday	4:00 PM	Deschutes	Redmond	44.25228611	-121.1840778	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1616410	1	1	2	589	May	5	2015	Tuesday	12:00 PM	Deschutes	Redmond	44.25318889	-121.1834833	Midblock location	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1616660	1	2	2	642	May	12	2015	Tuesday	7:00 AM	Deschutes	Redmond	44.26306944	-121.1769778	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Wet	Daylight
1616712	1	3	3	649	May	15	2015	Friday	4:00 PM	Deschutes	Redmond	44.26934444	-121.1718833	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1616723	1	1	2	653	May	15	2015	Friday	1:00 PM	Deschutes	Redmond	44.27652778	-121.174275	Southwest Intersection Quadrant	Pedestrian	Non-fatal injury crash	Clear	Dry	Daylight
1617075	1	2	3	663	May	20	2015	Wednesday	7:00 AM	Deschutes	Redmond	44.26959167	-121.1795972	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1617478	1	2	2	707	May	26	2015	Tuesday	12:00 PM	Deschutes	Redmond	44.26920556	-121.2093361	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1617506	1	2	2	734	May	21	2015	Thursday	11:00 AM	Deschutes	Redmond	44.26334167	-121.1767972	Southeast Intersection Quadrant	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1617909	1	4	6	764	June	7	2015	Sunday	2:00 PM	Deschutes	Redmond	44.26254444	-121.1773333	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1617938	1	2	4	784	June	11	2015	Thursday	8:00 PM	Deschutes	Redmond	44.27255556	-121.1732056	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1617954	1	2	2	794	June	12	2015	Friday	4:00 PM	Deschutes	Redmond	44.26924722	-121.1939417	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1618930	1	2	2	894	June	26	2015	Friday	5:00 AM	Deschutes	Redmond	44.26959167	-121.1795972	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Dawn (Twilight)
1618938	1	2	2	905	June	28	2015	Sunday	1:00 PM	Deschutes	Redmond	44.26920556	-121.2093361	NE Intersection Quadrant	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1618954	1	2	2	906	June	29	2015	Monday	3:00 PM	Deschutes	Redmond	44.26975	-121.1715389	Southwest Intersection Quadrant	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1618971	1	2	3	909	June	29	2015	Monday	1:00 PM	Deschutes	Redmond	44.25215833	-121.1841639	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1618981	1	2	3	915	June	30	2015	Tuesday	12:00 PM	Deschutes	Redmond	44.27299167	-121.1696944	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1619714	1	2	2	996	July	11	2015	Saturday	10:00 AM	Deschutes	Redmond	44.25938333	-121.1794056	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1620117	1	2	4	1062	July	24	2015	Friday	12:00 PM	Deschutes	Redmond	44.23341667	-121.201925	Southwest Intersection Quadrant	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1620135	1	2	2	1073	July	27	2015	Monday	4:00 PM	Deschutes	Redmond	44.26963056	-121.1732028	Southwest Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1620148	1	3	4	1091	July	31	2015	Friday	8:00 PM	Deschutes	Redmond	44.27058611	-121.1742639	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1620467	1	2	5	1140	August	9	2015	Sunday	3:00 PM	Deschutes	Redmond	44.26928333	-121.1912833	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Cloudy	Dry	Daylight
1620741	1	2	2	1148	August	10	2015	Monday	4:00 PM	Deschutes	Redmond	44.26280556	-121.1771556	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1620776	1	3	4	1165	August	13	2015	Thursday	8:00 PM	Deschutes	Redmond	44.26961111	-121.1742611	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)

1621274	1	3	7	1260	August	31	2015	Monday	3:00 PM	Deschutes	Redmond	44.25344722	-121.1833111	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1622780	1	3	3	1281	September	3	2015	Thursday	7:00 AM	Deschutes	Redmond	44.27257222	-121.1698778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1623027	1	2	2	1311	September	4	2015	Friday	11:00 AM	Deschutes	Redmond	44.26975	-121.1715389	NW Intersection Quadrant	Sideswipe-overtaking	Non-fatal injury crash	Clear	Dry	Daylight
1623660	1	2	3	1318	September	12	2015	Saturday	12:00 PM	Deschutes	Redmond	44.26959167	-121.1774722	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1623814	1	2	4	1354	September	16	2015	Wednesday	11:00 AM	Deschutes	Redmond	44.27741111	-121.1742806	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1623819	1	2	2	1356	September	16	2015	Wednesday	11:00 AM	Deschutes	Redmond	44.26920556	-121.2093361	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1623826	1	2	3	1358	September	16	2015	Wednesday	10:00 PM	Deschutes	Redmond	44.23724167	-121.1982083	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1624778	1	2	3	1406	September	26	2015	Saturday	7:00 PM	Deschutes	Redmond	44.26959167	-121.1774722	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1624789	1	2	2	1413	September	27	2015	Sunday	11:00 AM	Deschutes	Redmond	44.28104167	-121.1742972	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1624795	1	2	2	1420	September	28	2015	Monday	12:00 PM	Deschutes	Redmond	44.262675	-121.1772444	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1624802	1	2	2	1421	September	28	2015	Monday	3:00 PM	Deschutes	Redmond	44.26920556	-121.19935	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1624967	1	2	3	1386	September	22	2015	Tuesday	7:00 PM	Deschutes	Redmond	44.28918056	-121.1740056	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1625149	1	2	2	1438	October	1	2015	Thursday	4:00 PM	Deschutes	Redmond	44.26228333	-121.1775139	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1625167	1	2	3	1480	October	6	2015	Tuesday	10:00 AM	Deschutes	Redmond	44.27257222	-121.1698778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1625431	1	2	2	1505	October	12	2015	Monday	4:00 AM	Deschutes	Redmond	44.26306944	-121.1769778	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Darkness – with street lights
1625607	1	2	3	1557	October	14	2015	Wednesday	2:00 PM	Deschutes	Redmond	44.27011111	-121.1712944	Southeast Intersection Quadrant	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1625612	1	2	2	1558	October	20	2015	Tuesday	2:00 PM	Deschutes	Redmond	44.26958889	-121.1805778	Southwest Intersection Quadrant	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1625619	1	2	5	1591	October	24	2015	Saturday	3:00 PM	Deschutes	Redmond	44.2945	-121.1738889	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1625739	1	2	3	1612	October	28	2015	Wednesday	11:00 AM	Deschutes	Redmond	44.26920556	-121.19915	Southeast Intersection Quadrant	Rear-End	Non-fatal injury crash	Rain	Wet	Daylight
1625959	1	2	2	1633	November	1	2015	Sunday	6:00 PM	Deschutes	Redmond	44.24296111	-121.193975	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – with street lights
1625969	1	3	3	1635	November	2	2015	Monday	12:00 PM	Deschutes	Redmond	44.262675	-121.1772444	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Dry	Daylight
1625984	1	2	2	1656	November	4	2015	Wednesday	3:00 PM	Deschutes	Redmond	44.26928333	-121.1912833	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1625996	1	2	2	1672	November	6	2015	Friday	8:00 AM	Deschutes	Redmond	44.26306944	-121.1769778	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1626004	1	2	15	1676	November	6	2015	Friday	8:00 PM	Deschutes	Redmond	44.25680278	-121.1811056	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – with street lights
1626017	1	2	3	1685	November	8	2015	Sunday	4:00 PM	Deschutes	Redmond	44.27058611	-121.1742639	NE Intersection Quadrant	Angle	Non-fatal injury crash	Rain	Wet	Dusk (Twilight)
1626021	1	2	4	1693	November	9	2015	Monday	12:00 PM	Deschutes	Redmond	44.26961111	-121.1742611	NE Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1626200	1	3	3	1714	November	11	2015	Wednesday	1:00 PM	Deschutes	Redmond	44.26975	-121.1715389	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Cloudy	Dry	Daylight
1626229	1	2	2	1723	November	13	2015	Friday	4:00 PM	Deschutes	Redmond	44.24985556	-121.1859222	Southeast Intersection Quadrant	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1626445	1	2	2	1760	November	18	2015	Wednesday	3:00 PM	Deschutes	Redmond	44.26924167	-121.1945	Outbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1626449	1	2	2	1771	November	19	2015	Thursday	3:00 PM	Deschutes	Redmond	44.26958333	-121.1840667	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1626998	1	2	2	90	January	18	2015	Sunday	8:00 AM	Deschutes	Redmond	44.27058611	-121.1742639	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1627004	1	2	2	95	January	19	2015	Monday	9:00 AM	Deschutes	Redmond	44.25770556	-121.1805111	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1627071	1	2	2	540	April	27	2015	Monday	2:00 PM	Deschutes	Redmond	44.26958333	-121.1840667	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1627114	1	2	2	1980	December	8	2015	Tuesday	10:00 AM	Deschutes	Redmond	44.26961111	-121.1742611	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1627124	1	2	2	1991	December	10	2015	Thursday	9:00 PM	Deschutes	Redmond	44.25409167	-121.1828889	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – with street lights
1627185	1	2	3	1187	August	16	2015	Sunday	11:00 AM	Deschutes	Redmond	44.26920556	-121.2093361	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1627201	1	2	3	1782	November	20	2015	Friday	7:00 PM	Deschutes	Redmond	44.29099167	-121.1739111	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – with street lights
1627353	1	1	2	2058	December	18	2015	Friday	3:00 AM	Deschutes	Redmond	44.271525	-121.1619583	Southeast Intersection Quadrant	Head-On	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1627464	1	2	2	2054	December	18	2015	Friday	12:00 PM	Deschutes	Redmond	44.28918056	-121.1740056	Inbound within 50 feet	Backing	Non-fatal injury crash	Clear	Dry	Daylight
1627737	1	2	3	2135	December	26	2015	Saturday	11:00 AM	Deschutes	Redmond	44.26306944	-121.1769778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1628006	1	3	2	2159	December	29	2015	Tuesday	6:00 PM	Deschutes	Redmond	44.28175833	-121.1732306	Midblock location	Sideswipe-overtaking	Non-fatal injury crash	Clear	Wet	Darkness – no street lights
1628017	1	2	2	2168	December	30	2015	Wednesday	8:00 PM	Deschutes	Redmond	44.26975	-121.1715389	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Fog	Dry	Darkness – no street lights
1630954	1	2	2	13	January	2	2015	Friday	8:00 AM	Deschutes	Redmond	44.27058611	-121.1742639	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Snow	Daylight
1630976	1	2	2	23	January	3	2015	Saturday	6:00 PM	Deschutes	Redmond	44.2945	-121.1738889	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1631394	1	2	2	107	January	21	2015	Wednesday	6:00 PM	Deschutes	Redmond	44.247525	-121.1881583	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Cloudy	Dry	Darkness – with street lights
1631607	1	1	1	145	February	5	2015	Thursday	10:00 PM	Deschutes	Redmond	44.30489167	-121.1731	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1631623	1	2	2	146	February	5	2015	Thursday	4:00 PM	Deschutes	Redmond	44.28629722	-121.174	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1631626	1	2	2	153	February	4	2015	Wednesday	12:00 PM	Deschutes	Redmond	44.25886667	-121.1797472	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1631634	1	2	2	161	February	7	2015	Saturday	11:00 AM	Deschutes	Redmond	44.26961111	-121.1742611	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1631640	1	2	2	168	February	10	2015	Tuesday	4:00 PM	Deschutes	Redmond	44.26929722	-121.1907722	Outbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1631643	1	2	2	177	February	11	2015	Wednesday	5:00 PM	Deschutes	Redmond	44.24201389	-121.1935667	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1631994	1	2	2	216	February	19	2015	Thursday	2:00 PM	Deschutes	Redmond	44.28961389	-121.1671861	Southwest Intersection Quadrant	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1632243	1	2	2	272	March	3	2015	Tuesday	6:00 PM	Deschutes	Redmond	44.2692	-121.2039806	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1632248	1	2	2	273	March	3	2015	Tuesday	4:00 PM	Deschutes	Redmond	44.259125	-121.179575	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1632264	1	2	2	296	March	2	2015	Monday	3:00 PM	Deschutes	Redmond	44.27041944	-121.1813056	Outbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1632268	1	2	2	298	March	9	2015	Monday	3:00 PM	Deschutes	Redmond	44.26961111	-121.1742611	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1632523	1	2	2	313	March	12	2015	Thursday	3:00 PM	Deschutes	Redmond	44.26959167	-121.1774722	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1632528	1	2	2	321	March	14	2015	Saturday	12:00 PM	Deschutes	Redmond	44.25228611	-121.1840778	Southwest Intersection Quadrant	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1632767	1	2	2	346	March	20	2015	Friday	4:00 PM	Deschutes	Redmond	44.28883056	-121.1673	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1632792	1	2	2	377	March	26	2015	Thursday	1:00 PM	Deschutes	Redmond	44.27255556	-121.1742778	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1632797	1	2	2	386	March	29	2015	Sunday	12:00 PM	Deschutes	Redmond	44.27226944	-121.1700389	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1632802	1	2	2	397	March	30	2015	Monday	7:00 AM	Deschutes	Redmond	44.26958056	-121.1836472	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1632810	1	1	1	399	March	31	2015	Tuesday	5:00 PM	Deschutes	Redmond	44.27258611	-121.1641028	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1636955	1	2	2	481	April	14	2015	Tuesday	11:00 AM	Deschutes	Redmond	44.24972222	-121.1860389	Southeast Intersection Quadrant	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1637298	1	1	1	531	April	25	2015	Saturday	4:00 AM	Deschutes	Redmond	44.26958889	-121.1805778	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1637414	1	1	1	554	April	30	2015	Thursday	3:00 PM	Deschutes	Redmond	44.272575	-121.1694389	NW Intersection Quadrant	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1637565	1	2	2	561	May	2	2015	Saturday	4:00 PM	Deschutes	Redmond	44.26958889	-121.180775	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1637573	1	2	2	571	May	3	2015	Sunday	3:00 PM	Deschutes	Redmond	44.26961111	-121.1742611	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1637941	1	2	2	676	May	21	2015	Thursday	4:00 PM	Deschutes	Redmond	44.24517222	-121.1904583	Midblock location	Rear-End	Property damage only crash (PDO)	Rain	Wet	Daylight
1638857	1	2	2	778	June	10	2015	Wednesday	5:00 PM	Deschutes	Redmond	44.28578333	-121.174	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1639085	1	2	2	844	June	19	2015	Friday	10:00 PM	Deschutes	Redmond	44.27257222	-121.1698778	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1639091	1	1	1	853	June	21	2015	Sunday	12:00 AM	Deschutes	Redmond	44.27621667	-121.168875	Midblock location	Miscellaneous	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1639155	1	2	2	842	June	19	2015	Friday	4:00 PM	Deschutes	Redmond	44.24595	-121.1896972	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1639235	1	1	1	525	April	23	2015	Thursday	10:00 PM	Deschutes	Redmond	44.27256389	-121.1714278	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Cloudy	Dry	Darkness – no street lights
1639346	1	2	2	903	June	27	2015	Saturday	7:00 AM	Deschutes	Redmond	44.27058611	-121.1742639	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1639370	1	2	2	921	June	30	2015	Tuesday	5:00 PM	Deschutes	Redmond	44.25108056	-121.1849389	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1639548	1	2	2	939	July	2	2015	Thursday	12:00 PM	Deschutes	Redmond	44.26925	-121.1937639	Midblock location	Rear-End	Property damage only crash (PDO)	Unknown	Unknown	Daylight
1639554	1	2	2	943	July	3	2015	Friday	11:00 AM	Deschutes	Redmond	44.29120556	-121.1739111	Outbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1639560	1	2	2	978	July	8	2015	Wednesday	8:00 PM	Deschutes	Redmond	44.29821944	-121.1738583	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1639855	1	2	2	984	July	8	2015	Wednesday	1:00 PM	Deschutes	Redmond	44.2945	-121.1738889	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1639866	1	2	2	989	July	10	2015	Friday	1:00 PM	Deschutes	Redmond	44.28403056	-121.17345	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1639920	1	1	1	1017	July	15	2015	Wednesday	9:00 PM	Deschutes	Redmond	44.23568056	-121.1997	Midblock location	Miscellaneous	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1640109	1	2	2	1041	July	21	2015	Tuesday	4:00 PM	Deschutes	Redmond	44.28202778	-121.1732333	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1640123	1	2	2	1071	July	27	2015	Monday	2:00 PM	Deschutes	Redmond	44.26975	-121.1715389	Southeast Intersection Quadrant	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1640130	1	2	2	1074	July	27	2015	Monday	6:00 PM	Deschutes	Redmond	44.26958056	-121.1838583	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1640229	1	2	2	1113	August	4	2015	Tuesday	2:00 PM	Deschutes	Redmond	44.27184722	-121.1742833	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1640234	1	2	2	1141	August	9	2015	Sunday	10:00 AM	Deschutes	Redmond	44.26920278	-121.2091389	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1640500	1	2	2	1170	August	13	2015	Thursday	1:00 PM	Deschutes	Redmond	44.29099167	-121.1739111	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight

1641293	1	2	2	1296	September	6	2015	Sunday	2:00 PM	Deschutes	Redmond	44.26958333	-121.1840667	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1641679	1	2	2	1450	October	2	2015	Friday	8:00 AM	Deschutes	Redmond	44.28883056	-121.1673	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1641689	1	2	2	1440	October	1	2015	Thursday	12:00 PM	Deschutes	Redmond	44.265425	-121.1732556	Southeast Intersection Quadrant	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1641705	1	2	2	1469	October	5	2015	Monday	9:00 AM	Deschutes	Redmond	44.25383333	-121.1830583	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1641828	1	1	1	1503	October	12	2015	Monday	9:00 AM	Deschutes	Redmond	44.29099167	-121.1739111	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1641839	1	2	2	1500	October	12	2015	Monday	5:00 PM	Deschutes	Redmond	44.30138056	-121.1719833	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1641847	1	2	2	1510	October	13	2015	Tuesday	9:00 AM	Deschutes	Redmond	44.26429444	-121.1761667	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1641999	1	2	2	1552	October	19	2015	Monday	9:00 AM	Deschutes	Redmond	44.26963056	-121.1716306	Outbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1642004	1	2	2	1575	October	22	2015	Thursday	7:00 AM	Deschutes	Redmond	44.25177222	-121.1844222	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1642099	1	1	1	1642	October	17	2015	Saturday	5:00 AM	Deschutes	Redmond	44.28883056	-121.1673	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Rain	Wet	Darkness – with street lights
1642226	1	2	2	1652	November	1	2015	Sunday	5:00 PM	Deschutes	Redmond	44.26921667	-121.1977333	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1642240	1	2	2	1660	November	4	2015	Wednesday	1:00 PM	Deschutes	Redmond	44.26975	-121.1715389	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Unknown	Unknown	Daylight
1642244	1	2	2	1666	November	5	2015	Thursday	3:00 PM	Deschutes	Redmond	44.24260833	-121.1929861	Southeast Intersection Quadrant	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1642506	1	1	1	1735	November	14	2015	Saturday	10:00 PM	Deschutes	Redmond	44.28377778	-121.1680833	Inbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1642643	1	2	2	1746	November	16	2015	Monday	5:00 PM	Deschutes	Redmond	44.29821944	-121.1738583	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1642649	1	2	2	1764	November	18	2015	Wednesday	5:00 PM	Deschutes	Redmond	44.26228333	-121.1775139	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1642652	1	3	3	1781	November	20	2015	Friday	4:00 PM	Deschutes	Redmond	44.26910833	-121.1721056	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1642658	1	2	2	1788	November	21	2015	Saturday	12:00 PM	Deschutes	Redmond	44.25149722	-121.1846333	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1642810	1	2	2	1791	November	23	2015	Monday	10:00 AM	Deschutes	Redmond	44.27155833	-121.1742889	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1643119	1	2	2	1888	November	28	2015	Saturday	9:00 AM	Deschutes	Redmond	44.28555833	-121.174	Inbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Cloudy	Ice	Daylight
1643124	1	2	2	1894	November	28	2015	Saturday	12:00 PM	Deschutes	Redmond	44.27255556	-121.1742778	Outbound within 50 feet	Rear-End	Property damage only crash (PDO)	Cloudy	Ice	Daylight
1643134	1	2	2	1908	November	30	2015	Monday	11:00 AM	Deschutes	Redmond	44.28736944	-121.1740028	Inbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Clear	Ice	Daylight
1643205	1	1	1	1920	November	29	2015	Sunday	1:00 PM	Deschutes	Redmond	44.30249444	-121.1729778	Midblock location	Non-collision	Property damage only crash (PDO)	Clear	Ice	Daylight
1643278	1	2	2	2145	November	25	2015	Wednesday	5:00 PM	Deschutes	Redmond	44.25177222	-121.1844222	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Ice	Dusk (Twilight)
1643344	1	2	2	1929	December	1	2015	Tuesday	11:00 AM	Deschutes	Redmond	44.29388056	-121.1738917	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Snow	Ice	Daylight
1643371	1	2	2	1962	December	5	2015	Saturday	1:00 PM	Deschutes	Redmond	44.26958889	-121.180775	NE Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1643463	1	2	2	1985	December	9	2015	Wednesday	1:00 PM	Deschutes	Redmond	44.265425	-121.1732556	Unknown	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1643468	1	2	2	1994	December	10	2015	Thursday	4:00 PM	Deschutes	Redmond	44.26375	-121.1765278	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Dusk (Twilight)
1643790	1	2	2	2095	December	21	2015	Monday	8:00 PM	Deschutes	Redmond	44.27255556	-121.1732056	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1643792	1	2	2	2102	December	22	2015	Tuesday	5:00 PM	Deschutes	Redmond	44.25177222	-121.1844222	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1643801	1	2	2	2104	December	22	2015	Tuesday	10:00 PM	Deschutes	Redmond	44.26920556	-121.19935	Southwest Intersection Quadrant	Sideswipe-meeting	Property damage only crash (PDO)	Snow	Ice	Darkness – no street lights
1643857	1	2	2	2132	December	25	2015	Friday	8:00 AM	Deschutes	Redmond	44.27921111	-121.1742917	Southeast Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Ice	Daylight
1644022	1	2	2	2169	December	30	2015	Wednesday	7:00 AM	Deschutes	Redmond	44.24046389	-121.1950639	Midblock location	Turning Movement	Property damage only crash (PDO)	Cloudy	Snow	Daylight
1607753	1	2	2	109	January	21	2015	Wednesday	5:00 PM	Deschutes	Redmond	44.24546944	-121.1974639	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1613050	1	2	4	423	April	5	2015	Sunday	1:00 PM	Deschutes	Redmond	44.25842778	-121.1826056	NE Intersection Quadrant	Rear-End	Non-fatal injury crash	Cloudy	Dry	Daylight
1613072	1	2	2	436	April	7	2015	Tuesday	1:00 PM	Deschutes	Redmond	44.24431944	-121.198825	NE Intersection Quadrant	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1616325	1	2	2	562	May	2	2015	Saturday	10:00 PM	Deschutes	Redmond	44.25386389	-121.1869139	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1617124	1	2	3	690	May	23	2015	Saturday	4:00 PM	Deschutes	Redmond	44.29093889	-121.1891472	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1617888	1	2	2	753	June	5	2015	Friday	3:00 PM	Deschutes	Redmond	44.27886944	-121.1992611	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1619323	1	2	2	928	July	1	2015	Wednesday	6:00 PM	Deschutes	Redmond	44.24232778	-121.2019778	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1619725	1	2	3	1002	July	12	2015	Sunday	11:00 AM	Deschutes	Redmond	44.27654444	-121.1588083	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1620842	1	1	2	1721	November	23	2015	Monday	5:00 PM	Deschutes	Redmond	44.2535	-121.1873667	Outbound within 50 feet	Pedestrian	Fatal crash	Cloudy	Dry	Darkness – with street lights
1623015	1	2	2	1303	September	8	2015	Tuesday	7:00 AM	Deschutes	Redmond	44.25830556	-121.2002972	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1624813	1	2	2	1425	September	29	2015	Tuesday	11:00 AM	Deschutes	Redmond	44.29098889	-121.1777472	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1625439	1	2	2	1517	October	15	2015	Thursday	3:00 PM	Deschutes	Redmond	44.29098889	-121.1777472	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1625447	1	2	2	1536	October	13	2015	Tuesday	7:00 PM	Deschutes	Redmond	44.2535	-121.1873667	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – with street lights
1625624	1	2	2	1605	October	27	2015	Tuesday	8:00 PM	Deschutes	Redmond	44.263725	-121.1787694	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Cloudy	Dry	Darkness – with street lights
1626238	1	1	2	1742	November	15	2015	Sunday	5:00 PM	Deschutes	Redmond	44.25459722	-121.1860028	Midblock location	Pedestrian	Non-fatal injury crash	Cloudy	Dry	Darkness – no street lights
1626456	1	2	3	1780	November	20	2015	Friday	12:00 PM	Deschutes	Redmond	44.24107778	-121.1911278	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1626850	1	1	3	1891	November	28	2015	Saturday	6:00 PM	Deschutes	Redmond	44.25341944	-121.1992694	Midblock location	Fixed-Object or Other-Object	Non-fatal injury crash	Fog	Ice	Darkness – no street lights
1627577	1	1	1	1267	August	15	2015	Saturday	10:00 PM	Deschutes	Redmond	44.24821111	-121.1732333	Outbound within 50 feet	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1628011	1	2	2	2167	December	30	2015	Wednesday	12:00 PM	Deschutes	Redmond	44.26808889	-121.1785083	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1631593	1	2	2	140	February	1	2015	Sunday	3:00 PM	Deschutes	Redmond	44.29394444	-121.171825	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1632004	1	2	2	236	February	26	2015	Thursday	9:00 AM	Deschutes	Redmond	44.25190556	-121.1894778	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1636730	1	2	2	422	February	7	2015	Saturday	1:00 PM	Deschutes	Redmond	44.24408611	-121.1991806	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1636944	1	2	2	472	April	13	2015	Monday	12:00 PM	Deschutes	Redmond	44.26296111	-121.1766139	Inbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1637583	1	2	2	606	May	7	2015	Thursday	6:00 PM	Deschutes	Redmond	44.29100833	-121.1638528	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1637890	1	2	2	632	May	11	2015	Monday	6:00 AM	Deschutes	Redmond	44.25786944	-121.1830528	Midblock location	Rear-End	Property damage only crash (PDO)	Rain	Wet	Daylight
1640141	1	2	2	1086	July	30	2015	Thursday	12:00 PM	Deschutes	Redmond	44.26209444	-121.1791806	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1640223	1	2	2	1111	August	4	2015	Tuesday	1:00 PM	Deschutes	Redmond	44.29100833	-121.1638528	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1640504	1	2	2	1184	August	15	2015	Saturday	11:00 AM	Deschutes	Redmond	44.26209444	-121.1791806	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1641093	1	2	2	1257	August	31	2015	Monday	10:00 PM	Deschutes	Redmond	44.26808889	-121.1785083	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1641414	1	2	2	1378	September	21	2015	Monday	11:00 AM	Deschutes	Redmond	44.26326944	-121.1775444	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1641559	1	1	1	1494	August	7	2015	Friday	10:00 PM	Deschutes	Redmond	44.24914722	-121.1930917	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – with street lights
1641673	1	2	2	1441	October	1	2015	Thursday	5:00 PM	Deschutes	Redmond	44.24821111	-121.1732333	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1641700	1	2	2	1452	October	2	2015	Friday	3:00 PM	Deschutes	Redmond	44.263725	-121.1787694	Outbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1641849	1	2	2	1530	October	16	2015	Friday	5:00 PM	Deschutes	Redmond	44.29100833	-121.1638528	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1642435	1	1	1	1680	November	7	2015	Saturday	Unknown Tim	Deschutes	Redmond	44.25363611	-121.1992722	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Unknown	Unknown	Unknown
1642439	1	3	3	1703	November	10	2015	Tuesday	7:00 AM	Deschutes	Redmond	44.26183056	-121.1715889	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1642644	1	2	2	1758	November	17	2015	Tuesday	1:00 PM	Deschutes	Redmond	44.29098889	-121.1777472	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1642653	1	2	2	1784	November	20	2015	Friday	12:00 PM	Deschutes	Redmond	44.26458333	-121.1772167	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1642930	1	2	2	1826	November	24	2015	Tuesday	1:00 PM	Deschutes	Redmond	44.2535	-121.1873667	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Snow	Ice	Daylight
1642935	1	3	3	1842	November	25	2015	Wednesday	1:00 PM	Deschutes	Redmond	44.29099167	-121.1722	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Unknown	Ice	Daylight
1642942	1	2	2	1865	November	27	2015	Friday	1:00 PM	Deschutes	Redmond	44.24411111	-121.1988028	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Ice	Daylight
1643180	1	1	1	1904	November	30	2015	Monday	8:00 AM	Deschutes	Redmond	44.25066944	-121.2281083	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Ice	Daylight
1643201	1	2	2	1918	November	29	2015	Sunday	3:00 PM	Deschutes	Redmond	44.24861944	-121.2293611	Midblock location	Head-On	Property damage only crash (PDO)	Snow	Ice	Daylight
1643618	1	2	2	2037	December	16	2015	Wednesday	6:00 PM	Deschutes	Redmond	44.25830556	-121.2002972	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Cloudy	Dry	Darkness – with street lights
1643786	1	2	2	2087	December	20	2015	Sunday	12:00 PM	Deschutes	Redmond	44.24408611	-121.1991806	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1607859	1	2	3	113	January	23	2015	Friday	2:00 PM	Deschutes	Redmond	44.27642222	-121.2093917	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1608043	1	2	2	120	January	26	2015	Monday	5:00 PM	Deschutes	Redmond	44.28370556	-121.1891861	Southeast Intersection Quadrant	Rear-End	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1608766	1	2	2	193	February	14	2015	Saturday	7:00 PM	Deschutes	Redmond	44.25831667	-121.207625	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Darkness – with street lights
1608776	1	2	3	233	February	24	2015	Tuesday	2:00 PM	Deschutes	Redmond	44.27551389	-121.1774861	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1619846	1	2	2	1001	July	12	2015	Sunday	1:00 PM	Deschutes	Redmond	44.27551389	-121.1774861	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Daylight
1622872	1	1	2	1290	September	4	2015	Friday	9:00 PM	Deschutes	Redmond	44.26195833	-121.1942444	Southwest Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Dry	Darkness – no street lights
1623020	1	2	6	1307	September	9	2015	Wednesday	4:00 PM	Deschutes	Redmond	44.25475278	-121.194175	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Dry	Daylight
1623729	1	2	3	1340	September	15	2015	Tuesday	6:00 PM	Deschutes	Redmond	44.25838056	-121.1916389	NE Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1624955	1	2	3	1385	September	22	2015	Tuesday	4:00 PM	Deschutes	Redmond	44.27576944	-121.18925	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1625742	1	2	2	1630	October	22	2015	Thursday	9:00 AM	Deschutes	Redmond	44.28570278	-121.1891667	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight

1626193	1	2	2	1709	November	11	2015	Wednesday	8:00 PM	Deschutes	Redmond	44.26206111	-121.1845361	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Darkness – with street lights
1626233	1	2	3	1739	November	14	2015	Saturday	11:00 AM	Deschutes	Redmond	44.27954444	-121.1892222	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1626478	1	4	4	1801	November	24	2015	Tuesday	2:00 PM	Deschutes	Redmond	44.26031944	-121.1942278	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Snow	Snow	Daylight
1626840	1	2	2	1871	November	28	2015	Saturday	3:00 PM	Deschutes	Redmond	44.27551944	-121.1753583	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Cloudy	Ice	Daylight
1626848	1	2	3	1877	November	28	2015	Saturday	5:00 PM	Deschutes	Redmond	44.25655278	-121.1941917	NE Intersection Quadrant	Turning Movement	Non-fatal injury crash	Cloudy	Ice	Darkness – no street lights
1627078	1	2	3	1964	December	7	2015	Monday	5:00 PM	Deschutes	Redmond	44.27551944	-121.1753583	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Cloudy	Wet	Darkness – no street lights
1627120	1	2	2	1990	December	9	2015	Wednesday	11:00 AM	Deschutes	Redmond	44.276525	-121.1721361	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Wet	Daylight
1627342	1	2	2	2041	March	6	2015	Friday	9:00 AM	Deschutes	Redmond	44.25475278	-121.194175	NW Intersection Quadrant	Turning Movement	Non-fatal injury crash	Clear	Wet	Daylight
1631388	1	2	2	98	January	20	2015	Tuesday	11:00 AM	Deschutes	Redmond	44.28918889	-121.1682917	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1631997	1	2	2	217	February	19	2015	Thursday	2:00 PM	Deschutes	Redmond	44.25477222	-121.1907167	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1636964	1	2	2	491	April	16	2015	Thursday	12:00 PM	Deschutes	Redmond	44.28737778	-121.1707056	Midblock location	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1637902	1	1	1	639	May	13	2015	Wednesday	9:00 PM	Deschutes	Redmond	44.30183333	-121.1687833	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Cloudy	Dry	Darkness – no street lights
1638314	1	2	1	736	June	1	2015	Monday	12:00 PM	Deschutes	Redmond	44.25839722	-121.1902444	Outbound within 50 feet	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Daylight
1638322	1	2	2	766	June	7	2015	Sunday	3:00 PM	Deschutes	Redmond	44.25475278	-121.194175	Inbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1639340	1	2	2	893	June	26	2015	Friday	4:00 PM	Deschutes	Redmond	44.28918889	-121.1682917	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1640239	1	2	2	1142	August	9	2015	Sunday	12:00 PM	Deschutes	Redmond	44.273	-121.18925	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1641149	1	2	2	936	July	2	2015	Thursday	5:00 PM	Deschutes	Redmond	44.28066667	-121.1892139	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1641424	1	1	1	1388	September	22	2015	Tuesday	4:00 PM	Deschutes	Redmond	44.28918889	-121.1682917	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Daylight
1642067	1	2	2	1614	October	29	2015	Thursday	1:00 PM	Deschutes	Redmond	44.27551944	-121.1753583	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1642214	1	2	2	1637	November	2	2015	Monday	4:00 PM	Deschutes	Redmond	44.25477778	-121.1872167	NW Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Rain	Wet	Dusk (Twilight)
1643130	1	2	2	1901	November	30	2015	Monday	3:00 PM	Deschutes	Redmond	44.26928333	-121.1912833	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Cloudy	Ice	Daylight
1643370	1	2	1	1948	December	3	2015	Thursday	11:00 AM	Deschutes	Redmond	44.24831389	-121.2043583	Inbound within 50 feet	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1643458	1	2	2	1965	December	7	2015	Monday	5:00 PM	Deschutes	Redmond	44.27642222	-121.2093917	NW Intersection Quadrant	Angle	Property damage only crash (PDO)	Cloudy	Wet	Darkness – with street lights
1616732	1	2	2	660	May	19	2015	Tuesday	4:00 PM	Deschutes	Redmond	44.26685833	-121.1898639	Southeast Intersection Quadrant	Turning Movement	Non-fatal injury crash	Cloudy	Wet	Daylight
1620737	1	4	2	1180	August	15	2015	Saturday	10:00 PM	Deschutes	Redmond	44.26312778	-121.1876528	Midblock location	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1628027	1	1	1	2188	October	14	2015	Wednesday	2:00 PM	Deschutes	Redmond	44.27921389	-121.1753694	NE Intersection Quadrant	Non-collision	Non-fatal injury crash	Clear	Dry	Daylight
1636990	1	2	2	508	April	20	2015	Monday	8:00 AM	Deschutes	Redmond	44.27831667	-121.1775111	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1640513	1	2	2	1204	August	20	2015	Thursday	4:00 PM	Deschutes	Redmond	44.27921389	-121.1753694	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1643459	1	2	2	1968	December	7	2015	Monday	3:00 PM	Deschutes	Redmond	44.27741667	-121.1775	Southeast Intersection Quadrant	Angle	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1607728	1	2	2	101	January	21	2015	Wednesday	12:00 PM	Deschutes	Redmond	44.26858889	-121.1819278	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1608344	1	3	1	143	February	2	2015	Monday	8:00 PM	Deschutes	Redmond	44.27279167	-121.1666306	Outbound within 50 feet	Head-On	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1608357	1	2	2	166	February	10	2015	Tuesday	8:00 AM	Deschutes	Redmond	44.28918056	-121.1722194	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1614131	1	1	1	361	March	22	2015	Sunday	1:00 AM	Deschutes	Redmond	44.28826389	-121.1764417	Midblock location	Fixed-Object or Other-Object	Non-fatal injury crash	Clear	Dry	Darkness – no street lights
1616697	1	1	1	648	May	14	2015	Thursday	11:00 PM	Deschutes	Redmond	44.26281111	-121.1910833	Midblock location	Fixed-Object or Other-Object	Non-fatal injury crash	Rain	Wet	Darkness – no street lights
1617497	1	2	3	718	May	28	2015	Thursday	4:00 PM	Deschutes	Redmond	44.28201667	-121.1753694	NW Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1618668	1	2	3	814	May	8	2015	Friday	7:00 PM	Deschutes	Redmond	44.26679444	-121.1960806	Midblock location	Angle	Non-fatal injury crash	Clear	Dry	Dusk (Twilight)
1622378	1	1	2	963	July	5	2015	Sunday	7:00 PM	Deschutes	Redmond	44.24926389	-121.2072556	Southeast Intersection Quadrant	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1622397	1	2	2	925	July	1	2015	Wednesday	12:00 PM	Deschutes	Redmond	44.28014167	-121.1863083	Midblock location	Angle	Non-fatal injury crash	Clear	Dry	Daylight
1625153	1	2	2	1453	October	2	2015	Friday	3:00 PM	Deschutes	Redmond	44.27155833	-121.181925	Outbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1627517	1	2	2	1638	November	2	2015	Monday	6:00 AM	Deschutes	Redmond	44.264475	-121.2029139	Midblock location	Turning Movement	Non-fatal injury crash	Clear	Dry	Dawn (Twilight)
1627551	1	2	2	1044	July	21	2015	Tuesday	6:00 AM	Deschutes	Redmond	44.27554444	-121.1623611	Inbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Daylight
1627762	1	3	1	1264	August	30	2015	Sunday	1:00 AM	Deschutes	Redmond	44.26016944	-121.1929694	Outbound within 50 feet	Rear-End	Non-fatal injury crash	Clear	Dry	Darkness – with street lights
1631168	1	2	1	89	January	18	2015	Sunday	7:00 PM	Deschutes	Redmond	44.27890556	-121.1785972	Midblock location	Sideswipe-overtaking	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1632944	1	1	1	362	March	14	2015	Saturday	1:00 AM	Deschutes	Redmond	44.24954167	-121.2093889	Midblock location	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1637268	1	2	1	515	April	4	2015	Saturday	5:00 AM	Deschutes	Redmond	44.25056667	-121.1941306	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Wet	Darkness – no street lights
1637594	1	3	1	607	May	7	2015	Thursday	3:00 AM	Deschutes	Redmond	44.26584167	-121.2002667	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Cloudy	Dry	Darkness – no street lights
1637925	1	2	2	671	May	21	2015	Thursday	12:00 PM	Deschutes	Redmond	44.28375556	-121.1753806	Southwest Intersection Quadrant	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1639220	1	2	2	495	April	17	2015	Friday	7:00 AM	Deschutes	Redmond	44.28728889	-121.1917556	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1641085	1	2	2	1246	August	28	2015	Friday	12:00 PM	Deschutes	Redmond	44.27155833	-121.1764222	Southwest Intersection Quadrant	Angle	Property damage only crash (PDO)	Cloudy	Dry	Daylight
1641135	1	2	1	647	May	14	2015	Thursday	3:00 PM	Deschutes	Redmond	44.24210833	-121.203	Midblock location	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1641451	1	2	2	1399	September	24	2015	Thursday	5:00 PM	Deschutes	Redmond	44.26618333	-121.2024833	Midblock location	Turning Movement	Property damage only crash (PDO)	Clear	Dry	Daylight
1641454	1	2	1	1375	September	21	2015	Monday	7:00 AM	Deschutes	Redmond	44.28410833	-121.1852167	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Dawn (Twilight)
1641458	1	2	1	1334	September	14	2015	Monday	5:00 PM	Deschutes	Redmond	44.28305556	-121.1998028	Midblock location	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1641478	1	2	2	1382	September	21	2015	Monday	7:00 AM	Deschutes	Redmond	44.25524722	-121.19135	NE Intersection Quadrant	Angle	Property damage only crash (PDO)	Clear	Dry	Daylight
1642003	1	1	1	1565	October	21	2015	Wednesday	2:00 AM	Deschutes	Redmond	44.26556667	-121.1853472	Outbound within 50 feet	Fixed-Object or Other-Object	Property damage only crash (PDO)	Clear	Dry	Darkness – no street lights
1642458	1	2	1	1560	October	6	2015	Tuesday	10:00 AM	Deschutes	Redmond	44.29378611	-121.1620722	Midblock location	Rear-End	Property damage only crash (PDO)	Clear	Dry	Daylight
1643114	1	2	2	1880	November	28	2015	Saturday	4:00 PM	Deschutes	Redmond	44.27058889	-121.1753583	Inbound within 50 feet	Rear-End	Property damage only crash (PDO)	Snow	Ice	Dusk (Twilight)
1643938	1	2	2	1945	December	2	2015	Wednesday	9:00 AM	Deschutes	Redmond	44.29308889	-121.1620806	Inbound within 50 feet	Turning Movement	Property damage only crash (PDO)	Clear	Ice	Daylight
1643961	1	2	1	2103	December	22	2015	Tuesday	9:00 PM	Deschutes	Redmond	44.28894444	-121.1834806	Outbound within 50 feet	Rear-End	Property damage only crash (PDO)	Snow	Ice	Darkness – no street lights

Summary of Crashes within the Redmond UGB (2011-2015)

Crash Severity	Frequency	%
Property Damage Only	610	47.73%
Injury C	427	33.41%
Injury B	205	16.04%
Injury A	30	2.35%
Fatal	6	0.47%
Road Conditions	**Frequency**	**%**
Dry	1065	83.33%
Ice	101	7.90%
Snow	30	2.35%
Wet	64	5.01%
Unknown	18	1.41%
Light Conditions	**Frequency**	**%**
Daylight	979	76.60%
Darkness – no street lights	175	13.69%
Darkness – with street lights	44	3.44%
Twilight (Dusk and Dawn)	78	6.10%
Unknown	2	0.16%
	Frequency	**%**
Alcohol Involved	69	5.40%
Drugs Involved	15	1.17%
Hit and Run	62	4.85%
Excessive Speed Involved	84	6.57%

Collision Type	Frequency	%
Angle	290	22.69%
Backing	20	1.56%
Fixed-Object or Other-Object	110	8.61%
Head-On	5	0.39%
Non-collision	20	1.56%
Parking	5	0.39%
Pedestrian	19	1.49%
Rear-End	420	32.86%
Sideswipe-meeting	16	1.25%
Sideswipe-overtaking	76	5.95%
Turning Movement	284	22.22%
Miscellaneous	13	1.02%
Weather Conditions	**Frequency**	**%**
Clear	1002	78.40%
Cloudy	141	11.03%
Fog	7	0.55%
Rain	48	3.76%
Sleet	2	0.16%
Snow	52	4.07%
Unknown	26	2.03%

*Includes *Redmond South US 97 Corridor Plan* area crashes

Study Segment Crash Data

Roadway	Segment Boundaries	Length (miles)	ADT	Functional Class.	Average Statewide Crash Rate	Crash Rate (2011-2015 average)	Crash Type						Crash Severity			Total
							Rear end	Side swipe	Angle/ Turning Movement	Fixed Object	Non Collision	Misc.	PDO	Injury	Fatal	
US 97	Yew Avenue to south City Limits	*Redmond South US 97 Corridor Plan*														
US 97	Highland Avenue to Veterans Way	0.5	31,120	Other Principal Arterial	1.55	0.70	2	1	0	1	0	0	3	1	0	4
US 97	Canal Boulevard to north City Limits	0.33	26,628	Other Principal Arterial	1.55	1.87	0	2	1	2	1	0	5	1	0	6
OR 126	SW 35th Street to SW 27th Street	0.5	13,373	Other Principal Arterial	1.55	2.05	2	0	1	1	0	1	5	0	0	5
OR 126	Veterans Way to east City Limits	0.96	7,280	Other Principal Arterial	1.55	0.78	0	0	0	0	2	0	1	1	0	2
Canal Boulevard	SW 27th Street to Badger Avenue	0.82	6,493	Urban Minor Arterial	3.22	2.57	4	0	1	0	0	0	2	3	0	5

Summary of Crashes within the Redmond UGB (2011-2015)

Crash Severity	Frequency	%
Property Damage Only	610	47.73%
Injury C	427	33.41%
Injury B	205	16.04%
Injury A	30	2.35%
Fatal	6	0.47%
Road Conditions	**Frequency**	**%**
Dry	1065	83.33%
Ice	101	7.90%
Snow	30	2.35%
Wet	64	5.01%
Unknown	18	1.41%
Light Conditions	**Frequency**	**%**
Daylight	979	76.60%
Darkness – no street lights	175	13.69%
Darkness – with street lights	44	3.44%
Twilight (Dusk and Dawn)	78	6.10%
Unknown	2	0.16%
	Frequency	**%**
Alcohol Involved	69	5.40%
Drugs Involved	15	1.17%
Hit and Run	62	4.85%
Excessive Speed Involved	84	6.57%

Collision Type	Frequency	%
Angle	290	22.46%
Backing	20	1.55%
Fixed-Object or Other-Object	110	8.52%
Head-On	5	0.39%
Non-collision	20	1.55%
Parking	5	0.39%
Pedestrian	19	1.47%
Bicycle	13	1.01%
Rear-End	420	32.53%
Sideswipe-meeting	16	1.24%
Sideswipe-overtaking	76	5.89%
Turning Movement	284	22.00%
Miscellaneous	13	1.01%
Weather Conditions	**Frequency**	**%**
Clear	1002	78.40%
Cloudy	141	11.03%
Fog	7	0.55%
Rain	48	3.76%
Sleet	2	0.16%
Snow	52	4.07%
Unknown	26	2.03%

*Includes *Redmond South US 97 Corridor Plan* area crashes

Study Segment Crash Data

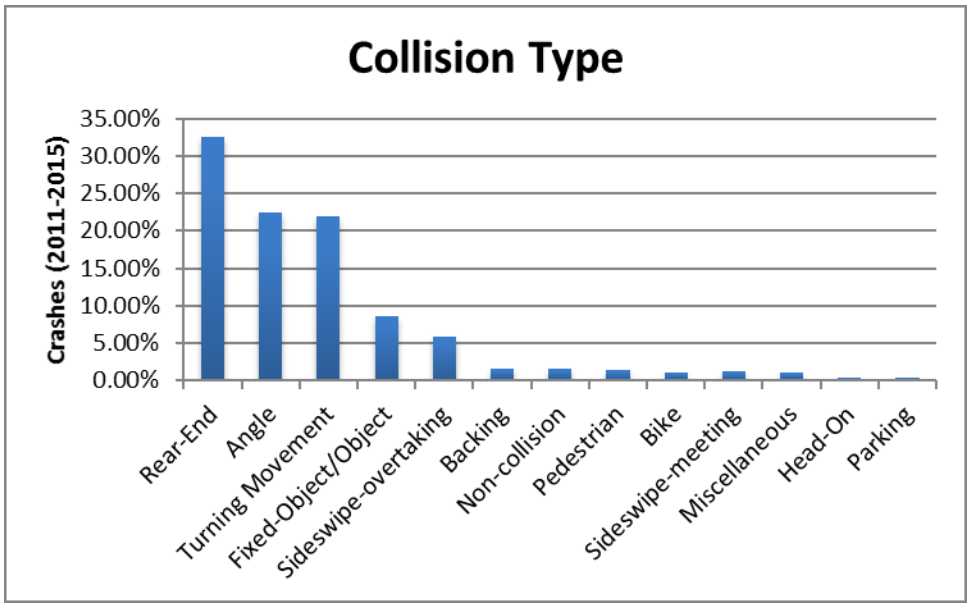
Roadway	Segment Boundaries	Length (miles)	ADT	Functional Class.	Average Statewide Crash Rate (2011-2015)	Crash Rate (2011-2015 average)	Crash Type						Crash Severity			Total
							Rear end	Side swipe	Angle/ Turning Movement	Fixed Object	Non Collision	Misc.	PDO	Injury	Fatal	
US 97	Yew Avenue to south City Limits	*Redmond South US 97 Corridor Plan*														
US 97	Highland Avenue to Veterans Way	0.5	31,120	Other Principal Arterial	1.55	0.70	2	1	0	1	0	0	3	1	0	4
US 97	Canal Boulevard to north City Limits	0.33	26,628	Other Principal Arterial	1.55	1.87	0	2	1	2	1	0	5	1	0	6
OR 126	SW 35th Street to SW 27th Street	0.5	13,373	Other Principal Arterial	1.55	2.05	2	0	1	1	0	1	5	0	0	5
OR 126	Veterans Way to east City Limits	0.96	7,280	Other Principal Arterial	1.55	0.78	0	0	0	0	2	0	1	1	0	2
Canal Boulevard	SW 27th Street to Badger Avenue	0.82	6,493	Urban Minor Arterial	3.22	2.57	4	0	1	0	0	0	2	3	0	5

Appendix H – Study Intersection Crash Type and Severity

Study Intersection Crash Type and Severity

ID	Intersection Name	Crash Type								Severity			Total
		Rear-End	Turning	Angle	Fixed-Object	Pedestrian	Bicycle	Sideswipe	Other	Fatal & Severe Injury (K+A)	Moderate & Minor Injury (B+C)	PDO* (O)	
1	NW Canal Blvd/US 97 NB Ramp	0	1	0	0	0	0	0	0	0	1	0	1
2	NW Canal Blvd/US 97 SB Ramp	0	0	0	2	0	0	0	0	0	0	2	2
3	NW Maple Ave/NW 19th St	0	0	1	0	0	0	0	0	0	1	0	1
4	NW Maple Ave/NW 6th St	16	10	3	1	1	0	0	2	1	18	14	33
5	NW Larch Ave/NW Canal Blvd	0	1	3	2	0	0	0	0	0	2	4	6
6	NE Hemlock Ave/NE 9th St	1	0	0	0	0	0	0	0	0	0	1	1
7	W Antler Ave/SW Helmholtz Way	0	0	0	0	0	0	0	0	0	0	0	0
8	W Antler Ave/SW 27th St	0	0	1	0	0	0	0	0	0	0	1	1
9	W Antler Ave/SW Rimrock Way	6	3	0	1	0	0	0	0	0	3	7	10
10	SW Black Butte Blvd/SW 6th St	1	1	2	0	0	0	0	0	0	2	2	4
11	SW Black Butte Blvd/SW 5th St	1	4	0	0	0	0	0	0	0	2	3	5
12	E Antler Ave/NE 9th St	0	0	1	0	0	0	0	0	0	1	0	1
13	SW Evergreen Ave/SW 6th St	2	2	0	0	1	0	2	2	0	3	6	9
14	SW Evergreen Ave/SW 5th St	4	1	11	1	0	0	1	0	0	9	9	18
15	SW Evergreen Ave/US 97	23	1	2	1	0	0	0	0	1	18	8	27
16	OR 126 (SW Glacier Ave)/ SW 11th St	0	1	2	0	0	0	0	0	0	0	3	3
17	OR 126 (SW Glacier Ave)/SW 9th St	1	4	2	0	0	0	0	1	0	3	5	8
18	OR 126 (SW Glacier Ave)/SW 6th St	*Analyzed as Part of South Redmond US 97 Corridor Plan*											
19	OR 126 (SW Glacier Ave)/SW 5th St	*Analyzed as Part of South Redmond US 97 Corridor Plan*											
20	OR 126 (SW Glacier/Highland Ave)/US 97	*Analyzed as Part of South Redmond US 97 Corridor Plan*											
21	OR 126 (SW Highland Ave)/ SW Helmholtz Way	0	0	0	0	0	0	0	0	0	0	0	0
22	OR 126 (SW Highland Ave)/SW 27th St	13	2	1	1	0	0	1	0	0	9	9	18
23	OR 126 (SW Highland Ave)/SW Rimrock Way	13	18	2	2	2	0	0	0	0	22	15	37

ID	Intersection Name	Crash Type								Severity			Total
		Rear-End	Turning	Angle	Fixed-Object	Pedestrian	Bicycle	Sideswipe	Other	Fatal & Severe Injury (K+A)	Moderate & Minor Injury (B+C)	PDO* (O)	
24	OR 126 (SW Highland Ave)/SW 15th St	5	11	2	2	1	1	1	0	0	10	12	22
25	OR 126 (SW Highland Ave)/SW 11th St	3	1	6	0	0	0	0	0	0	9	1	10
26	OR 126 (SW Highland Ave)/SW 9th St	5	0	7	0	0	0	2	0	1	8	5	14
27	OR 126 (SW Highland Ave)/SW 6th St	*Analyzed as Part of South Redmond US 97 Corridor Plan*											
28	OR 126 (SW Highland Ave)/SW 5th St	*Analyzed as Part of South Redmond US 97 Corridor Plan*											
29	OR 126/SE 9th St (McCaffrey Rd)	0	0	0	0	0	0	0	0	0	0	0	0
30	SW Obsidian Ave/SW 27th St	0	0	0	1	1	0	0	0	1	0	1	2
31	SW Obsidian Ave/SW 23rd St	0	1	1	0	1	1	0	0	0	2	1	3
32	SW Veterans Way/SW Canal Blvd	4	5	1	1	0	0	0	0	0	4	7	11
33	SW Veterans Way/US 97	*Analyzed as Part of South Redmond US 97 Corridor Plan*											
34	SW Veterans Way/SE Airport Way	0	0	0	1	0	0	0	0	0	1	0	1
35	SW Veterans Way/OR 126	0	1	0	1	0	0	0	1	1	1	1	3
36	SW Salmon Ave/SW 27th St	0	0	2	0	0	0	0	0	0	0	2	2
37	SW Odem Medo Way/SW Canal Blvd	*Analyzed as Part of South Redmond US 97 Corridor Plan*											
38	SW Odem Medo Way/US 97	*Analyzed as Part of South Redmond US 97 Corridor Plan*											
39	SW Wickiup Ave/SW Helmholtz Way	0	2	3	1	0	0	0	0	0	3	3	6
40	SW Wickiup Ave/SW 27th St	0	1	2	0	0	0	0	0	0	2	1	3
41	SW Canal Blvd/SW 27th St	4	1	4	2	0	0	0	0	0	2	9	11
42	SW Yew Ave/US 97 SB Ramp	*Analyzed as Part of South Redmond US 97 Corridor Plan*											
43	SE Airport Way/US 97 NB Ramp	*Analyzed as Part of South Redmond US 97 Corridor Plan*											
44	SE Airport Way/NE 19th St	0	0	0	0	0	0	0	0	0	0	0	0
45	S Canal Blvd/SW Helmholtz Way	0	0	0	8	0	0	0	1	2	4	3	9



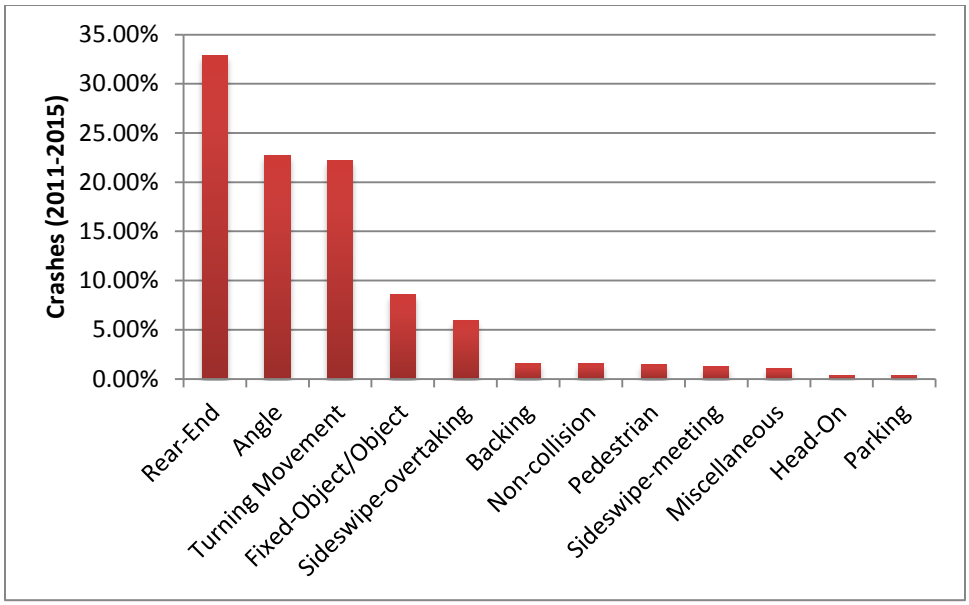
Collision Type during Study Period (2011-2015)

Appendix H – Study Intersection Crash Type and Severity

Study Intersection Crash Type and Severity

ID	Intersection Name	Crash Type							Severity			Total
		Rear-End	Turning	Angle	Fixed-Object	Pedestrian /Bicycle	Sideswipe	Other	Fatal & Severe Injury (K+A)	Moderate & Minor Injury (B+C)	PDO* (O)	
1	NW Canal Blvd/US 97 NB Ramp	0	1	0	0	0	0	0	0	1	0	1
2	NW Canal Blvd/US 97 SB Ramp	0	0	0	2	0	0	0	0	0	2	2
3	NW Maple Ave/NW 19th St	0	0	1	0	0	0	0	0	1	0	1
4	NW Maple Ave/NW 6th St	16	10	3	1	1	0	2	1	18	14	33
5	NW Larch Ave/NW Canal Blvd	0	1	3	2	0	0	0	0	2	4	6
6	NE Hemlock Ave/NE 9th St	1	0	0	0	0	0	0	0	0	1	1
7	W Antler Ave/SW Helmholtz Way	0	0	0	0	0	0	0	0	0	0	0
8	W Antler Ave/SW 27th St	0	0	1	0	0	0	0	0	0	1	1
9	W Antler Ave/SW Rimrock Way	6	3	0	1	0	0	0	0	3	7	10
10	SW Black Butte Blvd/SW 6th St	1	1	2	0	0	0	0	0	2	2	4
11	SW Black Butte Blvd/SW 5th St	1	4	0	0	0	0	0	0	2	3	5
12	E Antler Ave/NE 9th St	0	0	1	0	0	0	0	0	1	0	1
13	SW Evergreen Ave/SW 6th St	2	2	0	0	1	2	2	0	3	6	9
14	SW Evergreen Ave/SW 5th St	4	1	11	1	0	1	0	0	9	9	18
15	SW Evergreen Ave/US 97	23	1	2	1	0	0	0	1	18	8	27
16	OR 126 (SW Glacier Ave)/ SW 11th St	0	1	2	0	0	0	0	0	0	3	3
17	OR 126 (SW Glacier Ave)/SW 9th St	1	4	2	0	0	0	1	0	3	5	8
18	OR 126 (SW Glacier Ave)/SW 6th St	1	3	23	0	0	1	0	0	18	10	28
19	OR 126 (SW Glacier Ave)/SW 5th St	2	1	8	0	0	0	0	0	7	4	11
20	OR 126 (SW Glacier/Highland Ave)/US 97	22	12	1	1	0	1	1	1	22	15	38
21	OR 126 (SW Highland Ave)/ SW Helmholtz Way	0	0	0	0	0	0	0	0	0	0	0
22	OR 126 (SW Highland Ave)/SW 27th St	13	2	1	1	0	1	0	0	9	9	18
23	OR 126 (SW Highland Ave)/SW Rimrock Way	13	18	2	2	2	0	0	0	22	15	37
24	OR 126 (SW Highland Ave)/SW	5	11	2	2	1	1	0	0	10	12	22

	15th St											
25	OR 126 (SW Highland Ave)/SW 11th St	3	1	6	0	0	0	0	0	9	1	10
26	OR 126 (SW Highland Ave)/SW 9th St	5	0	7	0	0	2	0	1	8	5	14
27	OR 126 (SW Highland Ave)/SW 6th St	4	0	21	1	0	0	1	0	10	17	27
28	OR 126 (SW Highland Ave)/SW 5th St	1	4	8	1	0	1	0	0	5	10	15
29	OR 126/SE 9th St (McCaffrey Rd)	0	0	0	0	0	0	0	0	0	0	0
30	SW Obsidian Ave/SW 27th St	0	0	0	1	1	0	0	1	0	1	2
31	SW Obsidian Ave/SW 23rd St	0	1	1	0	1	0	0	0	2	1	3
32	SW Veterans Way/SW Canal Blvd	4	5	1	1	0	0	0	0	4	7	11
33	SW Veterans Way/US 97	*Analyzed as Part of South Redmond US 97 Corridor Plan*										
34	SW Veterans Way/SE Airport Way	0	0	0	1	0	0	0	0	1	0	1
35	SW Veterans Way/OR 126	0	1	0	1	0	0	1	1	1	1	3
36	SW Salmon Ave/SW 27th St	0	0	2	0	0	0	0	0	0	2	2
37	SW Odem Medo Way/SW Canal Blvd	4	0	2	0	2	0	1	1	3	5	9
38	SW Odem Medo Way/US 97	*Analyzed as Part of South Redmond US 97 Corridor Plan*										
39	SW Wickiup Ave/SW Helmholtz Way	0	2	3	1	0	0	0	0	3	3	6
40	SW Wickiup Ave/SW 27th St	0	1	2	0	0	0	0	0	2	1	3
41	SW Canal Blvd/SW 27th St	4	1	4	2	0	0	0	0	2	9	11
42	SW Yew Ave/US 97 SB Ramp	*Analyzed as Part of South Redmond US 97 Corridor Plan*										
43	SE Airport Way/US 97 NB Ramp	*Analyzed as Part of South Redmond US 97 Corridor Plan*										
44	SE Airport Way/NE 19th St	0	0	0	0	0	0	0	0	0	0	0
45	S Canal Blvd/SW Helmholtz Way	0	0	0	8	0	0	1	2	4	3	9



Collision Type during Study Period (2011-2015)

Fatal Crashes Discussion

During this period, there were six fatal crashes, five of which occurred on a major roadway (collector or arterial). One of the crashes occurred approximately a quarter of a mile south of Canal Boulevard on US 97. This collision happened during icy roadway conditions in February of 2012 when a vehicle crossed over the median and crashed into an oncoming vehicle. Two fatalities and several injuries resulted from the crash.

There were three nighttime pedestrian related fatalities that occurred during the study period: one at the intersection of Canal Boulevard/Odem Medo Way, one just north of Yew Avenue on US 97, and one at NW 6th Street/Kingwood Avenue. In two scenarios the pedestrians were wearing dark clothing and were reportedly illegally in the roadway. Alcohol was indicated in two of the pedestrian fatalities.

The remaining two collisions involved a motorcycle animal crash and a sideswipe-overtaking crash. The motorcycle crash occurred on NW Poplar Avenue and alcohol was indicated in the crash report. The sideswipe crash occurred on US 97 just south of Yew Avenue. The crash report indicated a vehicle improperly changed lanes and overtook another vehicle.

Half of the fatal crashes were pedestrian related and half of the fatal crashes occurred on US 97, however, there does not appear to be a trend for fatal crashes associated with location, crash type, time of day, or weather conditions.

Appendix I– 90th Percentile Crash Rate

Study Intersection 90th Percentile Crash Rates

ID	Intersection Name	AADT Entering Intersection	Total Crashes	Urban Intersection Type	Intersection Crash Rate†	Statewide 90th Percentile Crash Rate	Exceeds Statewide 90th Percentile Crash Rate?
1	NW Canal Blvd/US 97 NB Ramp	9,120	1	4-leg Signal	0.060	0.860	No
2	NW Canal Blvd/US 97 SB Ramp	11,220	2	4-leg Signal	0.098	0.860	No
3	NW Maple Ave/NW 19th St	12,520	1	4-leg Stop	0.044	0.408	No
4	NW Maple Ave/NW 6th St	21,560	33	4-leg Signal	0.839	0.860	No
5	**NW Larch Ave/NW Canal Blvd**	**4.330**	**6**	**3-leg Stop**	**0.759**	**0.293**	**Yes**
6	NE Hemlock Ave/NE 9th St	5,670	1	4-leg Stop	0.097	0.408	No
7	W Antler Ave/SW Helmholtz Way	3,400	0	4-leg Stop	0.000	0.408	No
8	W Antler Ave/SW 27th St	6,360	1	4-leg Signal	0.086	0.860	No
9	W Antler Ave/SW Rimrock Way	16,260	10	4-leg Signal	0.337	0.860	No
10	SW Black Butte Blvd/SW 6th St	10,560	4	4-leg Signal	0.208	0.860	No
11	SW Black Butte Blvd/SW 5th St	10220	5	4-leg Signal	0.268	0.860	No
12	E Antler Ave/NE 9th St	4990	1	4-leg Stop	0.110	0.408	No
13	SW Evergreen Ave/SW 6th St	10230	9	4-leg Signal	0.482	0.860	No
14	SW Evergreen Ave/SW 5th St	12450	18	4-leg Signal	0.792	0.860	No
15	SW Evergreen Ave/US 97	30210	27	4-leg Signal	0.490	0.860	No
16	OR 126 (SW Glacier Ave)/ SW 11th St	10520	3	4-leg Signal	0.156	0.860	No
17	OR 126 (SW Glacier Ave)/SW 9th St	10910	8	4-leg Signal	0.402	0.860	No
18	**OR 126 (SW Glacier Ave)/SW 6th St**	**11750**	**28**	**4-leg Signal**	**1.306**	**0.860**	**Yes**
19	OR 126 (SW Glacier Ave)/SW 5th St	10980	11	4-leg Signal	0.549	0.860	No
20	**OR 126 (SW Glacier/Highland Ave)/US 97**	**33350**	**38**	**3-leg Signal**	**0.624**	**0.509**	**Yes**
21	OR 126 (SW Highland Ave)/ SW Helmholtz Way	11750	0	4-leg Stop	0.000	0.408	No
22	OR 126 (SW Highland Ave)/SW 27th St	19150	18	4-leg Signal	0.515	0.860	No
23	OR 126 (SW Highland Ave)/SW Rimrock Way	24520	37	4-leg Signal	0.827	0.860	No
24	OR 126 (SW Highland Ave)/SW 15th St	20700	22	4-leg Signal	0.582	0.860	No
25	OR 126 (SW Highland Ave)/SW 11th St	9520	10	4-leg Signal	0.576	0.860	No
26	OR 126 (SW Highland Ave)/SW 9th St	10430	14	4-leg Signal	0.735	0.860	No
27	**OR 126 (SW Highland Ave)/SW 6th St**	**12630**	**27**	**4-leg Signal**	**1.171**	**0.860**	**Yes**
28	OR 126 (SW Highland Ave)/SW 5th St	10730	15	4-leg Signal	0.766	0.860	No
29	OR 126/SE 9th St (McCaffrey Rd)	8210	0	3-leg Stop	0.000	0.293	No
30	SW Obsidian Ave/SW 27th St	8100	2	4-leg Stop	0.135	0.408	No
31	SW Obsidian Ave/SW 23rd	6450	3	4-leg Stop	0.255	0.408	No

	St						
32	SW Veterans Way/SW Canal Blvd	18940	11	4-leg Signal	0.318	0.860	No
33	SW Veterans Way/US 97	*Analyzed as Part of South Redmond US 97 Corridor Plan*					
34	SW Veterans Way/SE Airport Way	7580	1	3-leg Stop	0.072	0.293	No
35	SW Veterans Way/OR 126	10170	3	3-leg Stop	0.162	0.293	No
36	**SW Salmon Ave/SW 27th St**	**1039**	**2**	**4-leg Stop**	**1.055**	**0.408**	**Yes**
37	SW Odem Medo Way/SW Canal Blvd	14610	9	4-leg Signal	0.338	0.860	No
38	SW Odem Medo Way/US 97	*Analyzed as Part of South Redmond US 97 Corridor Plan*					
39	**SW Wickiup Ave/SW Helmholtz Way**	**4550**	**6**	**4-leg Stop**	**0.723**	**0.408**	**Yes**
40	SW Wickiup Ave/SW 27th St	9200	3	4-leg Stop	0.179	0.408	No
41	**SW Canal Blvd/SW 27th St**	**13090**	**11**	**4-leg Stop**	**0.460**	**0.408**	**Yes**
42	SW Yew Ave/US 97 SB Ramp	*Analyzed as Part of South Redmond US 97 Corridor Plan*					
43	SE Airport Way/US 97 NB Ramp	*Analyzed as Part of South Redmond US 97 Corridor Plan*					
44	SE Airport Way/NE 19th St	9820	0	3-leg Stop	0.000	0.293	No
45	**S Canal Blvd/SW Helmholtz Way**	**7380**	**9**	**4-leg Stop**	**0.668**	**0.408**	**Yes**

Appendix J – Critical Crash Comparison

General & Site Information	
Analyst:	JXG
Agency/Company:	Kittelson & Associates, Inc.
Date:	9/15/2017
Project Name:	Redmond TSP Update

Intersection Crash Data

Intersection	Intersection Type	Year 2011	2012	2013	2014	2015	Total
NW Canal Blvd/US 97 NB Ramp	Urban 4SG			1			1
NW Canal Blvd/US 97 SB Ramp	Urban 4SG	1			1		2
NW Maple Ave/NW 19th St	Urban 4ST					1	1
NW Maple Ave/NW 6th St	Urban 4SG	6	10	6	6	5	33
NW Larch Ave/NW Canal Blvd	Urban 3ST	2		1		3	6
NE Hemlock Ave/NE 9th St	Urban 4ST		1				1
W Antler Ave/SW Helmholtz Way	Urban 4ST						0
W Antler Ave/SW 27th St	Urban 4SG	1					1
W Antler Ave/SW Rimrock Way	Urban 4SG		2	5	2	1	10
SW Black Butte Blvd/SW 6th St	Urban 4SG		1	1	2		4
SW Black Butte Blvd/SW 5th St	Urban 4SG	2	3				5
E Antler Ave/NE 9th St	Urban 4ST					1	1
SW Evergreen Ave/SW 6th St	Urban 4SG	3	1		2	3	9
SW Evergreen Ave/SW 5th St	Urban 4SG	5	3	6	2	2	18
SW Evergreen Ave/US 97	Urban 4SG		1	10	11	5	27
OR 126 (SW Glacier Ave)/ SW 11th St	Urban 4SG	1	2				3
OR 126 (SW Glacier Ave)/SW 9th St	Urban 4SG		2	1	3	2	8
OR 126 (SW Glacier Ave)/SW 6th St	Urban 4SG	6	7	5	1	9	28
OR 126 (SW Glacier Ave)/SW 5th St	Urban 4SG	1	3	3	3	1	11
OR 126 (SW Glacier/Highland Ave)/US 97	Urban 3SG	4	1	9	12	12	38
OR 126 (SW Highland Ave)/ SW Helmholtz Way	Urban 4ST						0
OR 126 (SW Highland Ave)/SW 27th St	Urban 4SG	5	5	3	2	3	18
OR 126 (SW Highland Ave)/SW Rimrock Way	Urban 4SG	12	6	8	4	7	37
OR 126 (SW Highland Ave)/SW 15th St	Urban 4SG	2	6	5	4	5	22
OR 126 (SW Highland Ave)/SW 11th St	Urban 4SG	1	2		2	5	10
OR 126 (SW Highland Ave)/SW 9th St	Urban 4SG	2	2	3	3	4	14
OR 126 (SW Highland Ave)/SW 6th St	Urban 4SG	3	4	5	9	6	27
OR 126 (SW Highland Ave)/SW 5th St	Urban 4SG	3	2	5	4	1	15
OR 126/SE 9th St (McCaffrey Rd)	Urban 3ST						0
SW Obsidian Ave/SW 27th St	Urban 4ST	1		1			2
SW Obsidian Ave/SW 23rd St	Urban 4ST		1	1		1	3
SW Veterans Way/SW Canal Blvd	Urban 4SG	1		2	6	2	11
SW Veterans Way/SE Airport Way	Urban 3ST				1		1
SW Veterans Way/OR 126	Urban 3ST		2	1			3
SW Salmon Ave/SW 27th St	Urban 4ST		1		1		2
SW Odem Medo Way/SW Canal Blvd	Urban 4SG	1	1	1	2	4	9
SW Wickiup Ave/SW Helmholtz Way	Urban 4ST	1	2	2	1		6
SW Wickiup Ave/SW 27th St	Urban 4ST	2		1			3
SW Canal Blvd/SW 27th St	Urban 4ST		2	2	3	4	11
SE Airport Way/NE 19th St	Urban 3ST						0
S Canal Blvd/SW Helmholtz Way	Urban 4ST	3	3			3	9
	Total	52	56	64	57	65	294

Intersection Population Type Crash Rate				
Average Crash Rate per intersection type				
Intersection Pop. Type	Sum of Crashes	Sum of 5-year MEV	Avg Crash Rate for Ref Pop.	INT in Pop
Rural 3SG	0	0		
Rural 3ST	0	0		
Rural 4SG	0	0		
Rural 4ST	0	0		
Urban 3ST	10	73	0.1366	5
Urban 3SG	38	61	0.6243	1
Urban 4ST	39	161	0.2425	12
Urban 4SG	323	591	0.5470	23

Critical Rate Calculation								
Intersection	AADT Entering Intersection	5-year MEV	Crash Total	Intersection Population Type	Intersection Crash Rate	Reference Population Crash Rate	Critical Rate	Over Critical
NW Canal Blvd/US 97 NB Ramp	9,120	16.6	1	Urban 4SG	0.06	0.55	0.88	Under
NW Canal Blvd/US 97 SB Ramp	11,220	20.5	2	Urban 4SG	0.10	0.55	0.84	Under
NW Maple Ave/NW 19th St	12,520	22.8	1	Urban 4ST	0.04	0.24	0.43	Under
NW Maple Ave/NW 6th St	21,560	39.3	33	Urban 4SG	0.84	0.55	0.75	**Over**
NW Larch Ave/NW Canal Blvd	4,330	7.9	6	Urban 3ST	0.76	0.14	0.42	**Over**
NE Hemlock Ave/NE 9th St	5,670	10.3	1	Urban 4ST	0.10	0.24	0.54	Under
W Antler Ave/SW Helmholtz Way	3,400	6.2	0	Urban 4ST	0.00	0.24	0.65	Under
W Antler Ave/SW 27th St	6,360	11.6	1	Urban 4SG	0.09	0.55	0.95	Under
W Antler Ave/SW Rimrock Way	16,260	29.7	10	Urban 4SG	0.34	0.55	0.79	Under
SW Black Butte Blvd/SW 6th St	10,560	19.3	4	Urban 4SG	0.21	0.55	0.85	Under
SW Black Butte Blvd/SW 5th St	10,220	18.7	5	Urban 4SG	0.27	0.55	0.86	Under
E Antler Ave/NE 9th St	4,990	9.1	1	Urban 4ST	0.11	0.24	0.57	Under
SW Evergreen Ave/SW 6th St	10,230	18.7	9	Urban 4SG	0.48	0.55	0.86	Under
SW Evergreen Ave/SW 5th St	12,450	22.7	18	Urban 4SG	0.79	0.55	0.82	Under
SW Evergreen Ave/US 97	30,210	55.1	27	Urban 4SG	0.49	0.55	0.72	Under
OR 126 (SW Glacier Ave)/ SW 11th St	10,520	19.2	3	Urban 4SG	0.16	0.55	0.85	Under
OR 126 (SW Glacier Ave)/SW 9th St	10,910	19.9	8	Urban 4SG	0.40	0.55	0.84	Under
OR 126 (SW Glacier Ave)/SW 6th St	11,750	21.4	28	Urban 4SG	1.31	0.55	0.83	**Over**
OR 126 (SW Glacier Ave)/SW 5th St	10,980	20.0	11	Urban 4SG	0.55	0.55	0.84	Under
OR 126 (SW Glacier/Highland Ave)/US 97	33,350	60.9	38	Urban 3SG	0.62	0.62	0.80	Under
OR 126 (SW Highland Ave)/ SW Helmholtz Way	11,750	21.4	0	Urban 4ST	0.00	0.24	0.44	Under
OR 126 (SW Highland Ave)/SW 27th St	19,150	34.9	18	Urban 4SG	0.52	0.55	0.77	Under
OR 126 (SW Highland Ave)/SW Rimrock Way	24,520	44.7	37	Urban 4SG	0.83	0.55	0.74	**Over**
OR 126 (SW Highland Ave)/SW 15th St	20,700	37.8	22	Urban 4SG	0.58	0.55	0.76	Under
OR 126 (SW Highland Ave)/SW 11th St	9,520	17.4	10	Urban 4SG	0.58	0.55	0.87	Under
OR 126 (SW Highland Ave)/SW 9th St	10,430	19.0	14	Urban 4SG	0.74	0.55	0.85	Under
OR 126 (SW Highland Ave)/SW 6th St	12,630	23.0	27	Urban 4SG	1.17	0.55	0.82	**Over**
OR 126 (SW Highland Ave)/SW 5th St	10,730	19.6	15	Urban 4SG	0.77	0.55	0.85	Under
OR 126/SE 9th St (McCaffrey Rd)	8,210	15.0	0	Urban 3ST	0.00	0.14	0.33	Under
SW Obsidian Ave/SW 27th St	8,100	14.8	2	Urban 4ST	0.14	0.24	0.49	Under
SW Obsidian Ave/SW 23rd St	6,450	11.8	3	Urban 4ST	0.25	0.24	0.52	Under
SW Veterans Way/SW Canal Blvd	18,940	34.6	11	Urban 4SG	0.32	0.55	0.77	Under
SW Veterans Way/SE Airport Way	7,580	13.8	1	Urban 3ST	0.07	0.14	0.34	Under
SW Veterans Way/OR 126	10,170	18.6	3	Urban 3ST	0.16	0.14	0.30	Under
SW Salmon Ave/SW 27th St	1,039	1.9	2	Urban 4ST	1.05	0.24	1.09	Under
SW Odem Medo Way/SW Canal Blvd	14,610	26.7	9	Urban 4SG	0.34	0.55	0.80	Under
SW Wickiup Ave/SW Helmholtz Way	4,550	8.3	6	Urban 4ST	0.72	0.24	0.58	**Over**
SW Wickiup Ave/SW 27th St	9,200	16.8	3	Urban 4ST	0.18	0.24	0.47	Under
SW Canal Blvd/SW 27th St	13,090	23.9	11	Urban 4ST	0.46	0.24	0.43	**Over**
SE Airport Way/NE 19th St	9,820	17.9	0	Urban 3ST	0.00	0.14	0.31	Under
S Canal Blvd/SW Helmholtz Way	7,380	13.5	9	Urban 4ST	0.67	0.24	0.50	**Over**

Appendix K –Statewide Crash Performance Standards Summary

90th Percentile Crash Rate Comparisons

A method used to identify intersections with more crashes than expected is to compare the crash rate to the statewide 90th percentile rates for similar intersection types, as documented in Table 4-1 of the ODOT APM. The daily total entering vehicles used to determine the crash rate was based on the peak hour intersection turning movement counts. The peak hour was assumed to be ten percent of the daily volume. Appendix I shows a table of all the study intersection crash rates compared to the statewide 90th percentile rates for similar facilities and the table below identifies the study intersection that exceed the 90th percentile rates. Eight locations were identified as having crash rates above the 90th percentile.

Study Intersections that Exceed 90th Percentile Crash Rate

Intersection	Intersection Control Type	Statewide 90th Perc. Crash Rate	Intersection Crash Rate
NW Larch Avenue/NW Canal Boulevard[1]	3-Leg Stop	0.293	0.759
OR 126 (Glacier Avenue)/SW 6th Street	4-Leg Signal	0.860	1.306
OR 126 (Highland Avenue)/SW 6th Street	4-Leg Signal	0.860	1.171
OR 126/US 97	3-Leg Signal	0.509	0.624
SW Salmon Avenue/SW 27th Street	4-Leg Stop	0.408	1.055[2]
SW Wickiup Avenue/Helmholtz Way	4-Leg Stop	0.408	0.723
SW Canal Boulevard/SW 27th Street	Roundabout	0.408	0.460
S Canal Boulevard/SW Helmholtz Way	4-Leg Stop	0.408	0.668

[1]Estimated 10,000 ADT

[2]Two crashes at intersection with 1,000 ADT

Reported crashes along the study segments are summarized in the table below. The ADT was based on an average of the 48-hour count data. The crash rate for each segment was compared to the statewide five-year average for similar facilities as reported in the *ODOT 2015 Crash Rate Table II Five-Year Comparison of State Highway Crash Rates*. Both US 97 and OR 126 were classified as *Other Urban Principal Arterials* and Canal Boulevard was classified as a *Minor Arterial*. As indicated by the shaded cells, the segment of US97 from Canal Boulevard and the northern most city limits and the segment of OR 126 from SW 35th Street to SW 27th Street both exceed the statewide crash data. Additional discussion of these two segments is included in the *Key Intersection and Segment Safety Observations* section below. A detailed table with segment crash types and crash severity is provided in Appendix H.

Study Segment Crash Rates

Roadway	Segment Boundaries	Length (miles)	ADT	Average Statewide Crash Rate	Crash Rate (2011-2015 Average)	Exceeds Statewide Crash Rate?
US 97	Yew Avenue to south City Limits	*Included in Redmond South US 97 Corridor Plan*				
US 97	Highland Avenue to Veterans Way	0.50	31,120	1.55	0.70	No
US 97	Canal Boulevard to north City Limits	0.33	26,628	1.55	1.87	Yes
OR 126	SW 35th Street to SW 27th Street	0.50	13,373	1.55	2.05	Yes
OR 126	Veterans Way to east City Limits	0.96	7,280	1.55	0.78	No
Canal Boulevard	SW 27th Street to Badger Avenue	0.82	6,493	3.22	2.57	No

Critical Crash Rate Comparisons

A critical crash rate may be used to identify intersections that warrant further investigation and may represent opportunities to reduce crash frequency and severity. The critical crash rate establishes a threshold for comparison among intersections with similar number of approaches and similar traffic control. Appendix J includes the Critical Crash Rate data as provided by ODOT and defined in Chapter 4 of the ODOT APM. The following intersections are identified in the table below the intersection control type.

Study Intersections that Exceed the Critical Crash Rate

Intersection	Intersection Control Type
NW Maple Avenue/NW 6th Street	Urban 4-Legged Traffic Signal
NW Larch Avenue/NW Canal Boulevard	Urban 3-Legged Stop Controlled
OR 126 (Glacier Avenue)/SW 6th Street	Urban 4-Legged Traffic Signal
OR 126 (Highland Avenue)/SW Rimrock Way	Urban 4-Legged Traffic Signal
OR 126 (Highland Avenue)/SW 6th Street	Urban 4-Legged Traffic Signal
SW Wickiup Avenue/Helmholtz Way	Urban 4-Legged Stop Controlled
SW Canal Boulevard/SW 27th Street	Urban 4-Legged Stop Controlled
S Canal Boulevard/SW Helmholtz Way	Urban 4-Legged Stop Controlled

Statewide Safety Priority Index System

The ODOT Statewide Safety Priority Index System (SPIS) identifies sites along state highways where safety issues warrant further investigation. The SPIS is a method developed by ODOT for identifying hazardous locations on state highways through consideration of crash frequency, crash rate, and

crash severity. Figure 14 shows the locations of the SPIS sites in the City of Redmond. The sites are listed under the 2015 SPIS based on 2012 through 2014 crash data. The table below identifies the study intersections that are above the 85% SPIS percentile.

2015 ODOT SPIS Study Intersection Locations in Redmond

Intersection	SPIS Percentile Range
OR 126 (Glacier Avenue/)SW 5th Street	90%-95%
OR 126 (Glacier Avenue)/SW 6th Street	90%-95%
OR 126 (Highland Avenue)/SW 5th Street	90%-95%
OR 126 (Highland Avenue)/SW 6th Street	90%-95%
US 97/Evergreen Avenue	95%-100%

Summary of Key Study Intersections and Study Segments

The following is a summary of key observations at intersections that exceed the 90th percentile crash rate, are above the critical crash rate, are identified as SPIS sites, or are flagged due to other reported trends in the data:

- **NW Maple Avenue/NW 6th Street**
  - Exceeds the ODOT critical crash rate
  - A total of 16 rear-end crashes (48%) and 10 turning movement crashes (30%) were reported at this signalized intersection.
  - One crash involved a pedestrian and resulted in moderate injuries.
  - The primary causes of crashes were reported as vehicles "following too closely" and "disregarding the traffic signal".
- **NW Larch Avenue/NE Canal Boulevard**
  - Exceeds both the statewide 90th percentile crash rate and critical crash rate.
  - Of the six crashes at the intersection three were angle crashes, two were fixed object collisions and one was a turning movement crash.
  - Two crashes resulted in injury.
- **SW Evergreen Avenue/US 97**
  - Identified on the SPIS site list.
  - One of the highest volume intersections in city, 27 crashes occurred at this intersection.
  - The majority of the crashes (85%) were rear-end collisions. Most of these crashes involved southbound vehicles. This intersection is the first signalized intersection on US 97 for southbound vehicles.
- **OR 126 (Glacier Avenue)/SW 6th Street**

- Exceeds both the statewide 90th percentile crash rate and critical crash rate and is identified on the SPIS site list.
- The intersection is one way in the southbound and westbound directions.
- The majority of the reported crashes were angle (82%) crashes. Nearly all the angle crashes were reported as "disregarding the traffic signal".

- **OR 126 (Highland Avenue/Glacier/Avenue)/US 97**
  - Exceeds the 90th percentile crash rate.
  - This intersection has the highest demand and one of the highest number of crashes in the city during the study period.
  - A total of 22 rear-end crashes (58%) and 12 turning movement crashes (32%) were reported at this signalized intersection.
- **OR 126 (Highland Avenue)/Rimrock Way**
  - Exceeds the ODOT critical crash rate
  - A total of 13 rear-end crashes (35%) and 18 turning movement crashes (49%) were reported at this signalized intersection.
  - One crash involved a pedestrian during nighttime conditions and resulted in minor injuries.
  - The primary reported causes include "following too closely" and "did not yield right-of-way".
- **OR 126 (Highland Avenue)/SW 6th Street**
  - Exceeds both the statewide 90th percentile crash rate and critical crash rate and is identified on the SPIS site list.
  - The intersection is one way in the southbound and eastbound directions.
  - The majority of the crashes (78%) were angle collisions.
  - The primary reported cause crashes (74%) were reported as "disregarding the traffic signal".
  - Most crashes (81%) resulted in minor injuries or property damage only.
- **Canal Boulevard/SW 27th Street**
  - Exceeds both the statewide 90th percentile crash rate and critical crash rate.
  - A roundabout was installed at this intersection in 2012.
  - Five of the eleven crashes occurred during adverse weather conditions.
  - All of the crashes resulted in minor injuries or property damage only.
- **Canal Boulevard/Hemholtz Way**
  - Exceeds both the statewide 90th percentile crash rate and critical crash rate.
  - Located southeast of Redmond city limits with a posted speed of 55 miles per hour on Canal Boulevard.
  - Over half of crashes occurred in dark lighting conditions. There is no street lighting at the stop controlled intersection.
  - All crashes were non collision related (cutting slope embankment, hitting power pole, sliding, tire failure).

- **US 97 between Canal Boulevard and the northern city limits**
    - Exceeds the statewide crash rate for a state highway classified as an "Other Principal Arterial"
    - The segment had two side swipe crashes, one turning movement crash, two fixed object crashes and one non collision crash.
    - One crash resulted in injuries and five resulted in PDO.
    - Three of the crashes occurred during icy or wet pavement conditions. The horizontal curvature of the roadway may be a contributing factor to the crashes during adverse weather conditions.
    - The short segment (0.33 miles) likely contributes to the high crash rate.
- **OR 126 between SW 35th Street and SW 27th Street**
    - Exceeds the statewide crash rate for a state highway classified as an "Other Principal Arterial"
    - The segment had two rear end collisions, one animal crash, one turning movement crash and one fixed object crash.
    - All crashes resulted in PDO.
    - Four of the five crashes occurred during the nighttime. Street lighting is only accounted for at intersections along the segment.

Appendix L - Bridge Analysis Locations

1. 20416 – ODOT/ODOT
2. 20465 – City/City
3. 19839 – City/City
4. 20672 – City/City
5. 19838 – ODOT/ODOT
6. 19837 – ODOT/ODOT
7. 20417 – ODOT/ODOT
8. 17C19 – City/City
9. 20438 – ODOT/ODOT
10. 20023 – ODOT/ODOT
11. 20441 – ODOT/ODOT
12. 17C560 – City/City
13. 16561 – ODOT/ODOT

Appendix E Future Systems Conditions

REDMOND
Transportation System Plan

Technical Memorandum #5

Date:	April 13, 2018	Project #: 17720 ODOT PA #27456
To:	Redmond TSP Project Management Team (PMT)	
Subject:	Future Systems Conditions	

This technical memorandum presents the key findings related to the year 2040 Baseline Needs Analyses (i.e., No Build) for the Redmond Transportation System Plan (TSP). The following analyses relate primarily to the street system. The memo addresses the "quality of service" anticipated in the future for active modes of travel (i.e., walking, cycling, and transit) and the operational conditions projected to occur along key streets and intersections. Information contained in this memorandum can be used to inform the identification and evaluation of future multimodal transportation system alternatives that meet the goals and objectives guiding the TSP.

All of the technical analyses summarized herein assume that the City will continue to see growth in employment and population between now and the year 2040 in a manner consistent with the existing Comprehensive Plan land use designations, within the existing Urban Growth Boundary (UGB) and consistent with the statewide and regional growth forecasts. At the same time, the analyses assume that the street, transit, pedestrian and bicycle systems will remain as they exist today. This "No Build" scenario is used as a foundation by which cities can test the effectiveness of potential transportation projects, policies, and programs and to help policy makers to weigh trade-offs regarding future funding priorities in a manner that ensures that the transportation system supports and enhances the continued economic growth in a manner that is safe, sustainable, fundable and diverse.

As will be discussed in this memorandum, the baseline analyses highlight the following primary deficiencies:

- Increasing congestion along OR 126 within the UGB, Maple Avenue between US 97 and Northwest Way, Yew Avenue between Airport Way and S 27th Street and US 97 south of SW Glacier Avenue. The City and ODOT are currently engaged in the South US 97 corridor planning efforts to address long-term transportation and land use needs in this segment of the highway. That study will also evaluate portions of Yew Avenue and the OR 126 corridor near US 97.
- Localized intersection improvement needs occur along the congested corridors identified. Improvement needs are most notable along the OR 126 corridor within the UGB.
- Several of the streets within the City, especially in the residential neighborhoods to the west of US 97, lack sidewalks. As future alternatives, the potential to prioritize new sidewalks and pathways that connect neighborhoods to schools, commercial areas and other key destinations should be considered.

- Today, cyclists are required to "share the road" on most streets within Redmond or ride on busier collector and arterial bike lanes, which are classified as "high-stress" under existing and year 2040 baseline conditions and are not suitable for riders of all ages and abilities. When bike lanes are provided, the facilities are often non-buffered and located on higher volume/higher speed roads, which typically offset the "stress reducing" attributes of the bike lane. As part of future alternatives, the need for additional low stress bike facilities to support commuting, recreational and personal travel will be identified.
- A higher level of transit service providing fixed route service throughout the City.

The remainder of this memorandum outlines the Baseline Deficiencies analyses assumptions and findings. Most of the analysis results are presented in figures and tables, with supplemental text provided to explain the illustrated information.

BASIS OF NEEDS ASSESSMENT

The following sections describe the assumptions used to develop the assessment of needs for the TSP.

Planning Area and Land Use Assumptions

The TSP addresses the projects, programs, and policies needed to support growth in population and jobs within the Redmond UGB as well as the travel associated with regional and state economic growth over the next twenty years. The TSP defines the transportation facilities needs within Redmond's adopted Urban Growth Boundary (UGB), as defined in the adopted comprehensive plan. Over time, the City, Deschutes County, and ODOT will monitor the multimodal transportation needs and can update the TSP to respond to changing conditions.

The TSP will establish the multimodal system needed to support the land use designations in the City's Comprehensive Plan. The establishment of the multimodal projects will reflect Redmond policy makers' and community members' priorities to maintain existing facilities and provide multiple transportation options for local and regional travel. These priorities are based on the premise that the City can reduce congestion, save money, and provide health benefits for the entire community by providing alternatives to single-occupancy vehicle travel and by making existing streets safer and more efficient without costly increases to automobile-oriented infrastructure.

2040 Population and Employment Forecasts

The future needs were identified based on forecast year 2040 traffic volumes. These volumes reflect estimates of household and job growth within the adopted Redmond UGB (as shown in Appendix A, Figure 1) as well as in Deschutes County and the overall Central Oregon region. These population and employment forecasts were "coordinated" for compliance with Oregon transportation and land use planning requirements.

Table 1 shows the household and job growth forecasts within the City's UGB. The City of Redmond, in coordination with ODOT, allocated this growth to developable areas within the UGB consistent with the land use designations shown in the adopted Comprehensive Plan.

Table 1: City of Redmond Land Use Estimates

	Year 2010	Year 2040	Growth
Households	10,061	22,433	12,372 (
Employees	10,134	28,550	18,416 (181%)

Traffic Volume Development

Based on the geographic allocations of future job and household growth within the UGB, ODOT's Transportation Planning and Analysis Unit (TPAU) developed traffic volume forecasts for the City's collector and arterial street system using the Bend-Redmond regional" travel demand model, which is a tool that is used to forecast future street volumes based on projected increases in jobs and housing as well as changing travel preferences. This model is calibrated to existing traffic volumes measured on streets and highways within the City. In addition to land use and street network inputs, the model also relies on information about existing traveler behavior and trip-making characteristics derived from surveys, and from research that forecasts how people might use the transportation system in the future.

The travel demand forecasts and measured traffic counts at 45 intersections within the City were used to calculate year 2040 intersection and roadway volumes for use in the analyses of future system deficiencies. The future volume calculations were performed using the procedures outlined in ODOT's Analysis and Procedures Manual (APM).

Baseline Streets and Intersections Analyses

Previously adopted plans and policies for the City, Deschutes County and ODOT all identified a variety of street, pedestrian, bicycle, and transit projects that could be implemented in the future. As discussed above, the baseline Analysis (also known as a "no build alternative") was performed to help identify multimodal projects and programs needed to support economic growth through the year 2040. This analysis will inform the potential project list that will be developed in Spring/Summer 2018.

The Baseline Analysis assumes the 2040 population and employment forecast and the existing transportation system will not change by 2040 except for the construction of transportation improvements that have already been started or for which funding is already allocated. At the time the analysis was prepared, there were no guaranteed funding sources for any major projects that will materially affect traveler behaviors and traffic volumes on the City's street network in the future. This City is upgrading S Canal Boulevard between SW Obsidian Avenue and SW Yew Avenue within the 2018/2019 construction season; this cross-section to the upgrade is reflected within the analyses.

IDENTIFIED TRANSPORTATION NEEDS

For the purposes of identifying future transportation system alternatives, it is helpful to look at a holistic, corridor approach to understand the baseline deficiencies. This broader system approach can be guided by the comparison of anticipated demand on key corridors within the city to planning-level estimates of street capacity. Review of the street segments can identify network connectivity, functional issues, potential corridor management strategies, and multimodal opportunities. This can ensure that the future transportation system looks, feels and operates in a manner consistent with the community's vision.

The baseline streets and intersection needs are based on the information contained in Technical Memorandum #4 , and in adherence with the following overarching TSP goals:

Goal 1. Provide a safe and efficient transportation network that complements key economic development priority areas, the comprehensive plan, and adopted state, regional and local plans and policies.

Goal 2. Advance community and statewide emergency preparedness efforts through support of the Oregon Resiliency Plan.

Safety Needs

A safety analysis and review was completed as part of the existing conditions analysis. Key findings from that memorandum have been used to identify safety needs within Redmond. These include:

- Most injury and fatal crashes during the 2011-2015 timeframe occurred along arterial and collector corridors.
- Six study intersections do not meet one or more statewide crash performance standards (critical crash rate or identified on Safety Priority Index System (SPIS) lists). These include:
    - NW 6th Street at NW Maple Avenue
    - NW Canal Boulevard at NW Larch Avenue
    - US 97 at OR 126
    - SW 23rd Street at SW Highland Avenue
    - SW 27th Street at SW Salmon Avenue
    - SW Helmholtz Way at SW Reservoir Drive
- The central area of Redmond near 5th Street, 6th Street, OR 126, and US 97 has several intersections identified on SPIS lists and with crash rates that exceed statewide crash performance standards. This TSP update will work with the US 97 South Corridor Plan,

whose study area extends to this vicinity, to identify improvement options for these intersections.

Systemic or spot policies or improvements to address these findings should be considered as part of the Alternatives Analysis for this TSP update.

Severe and fatal crashes during the study period as well as study intersection safety performance are shown in Figure 2 and Figure 3.

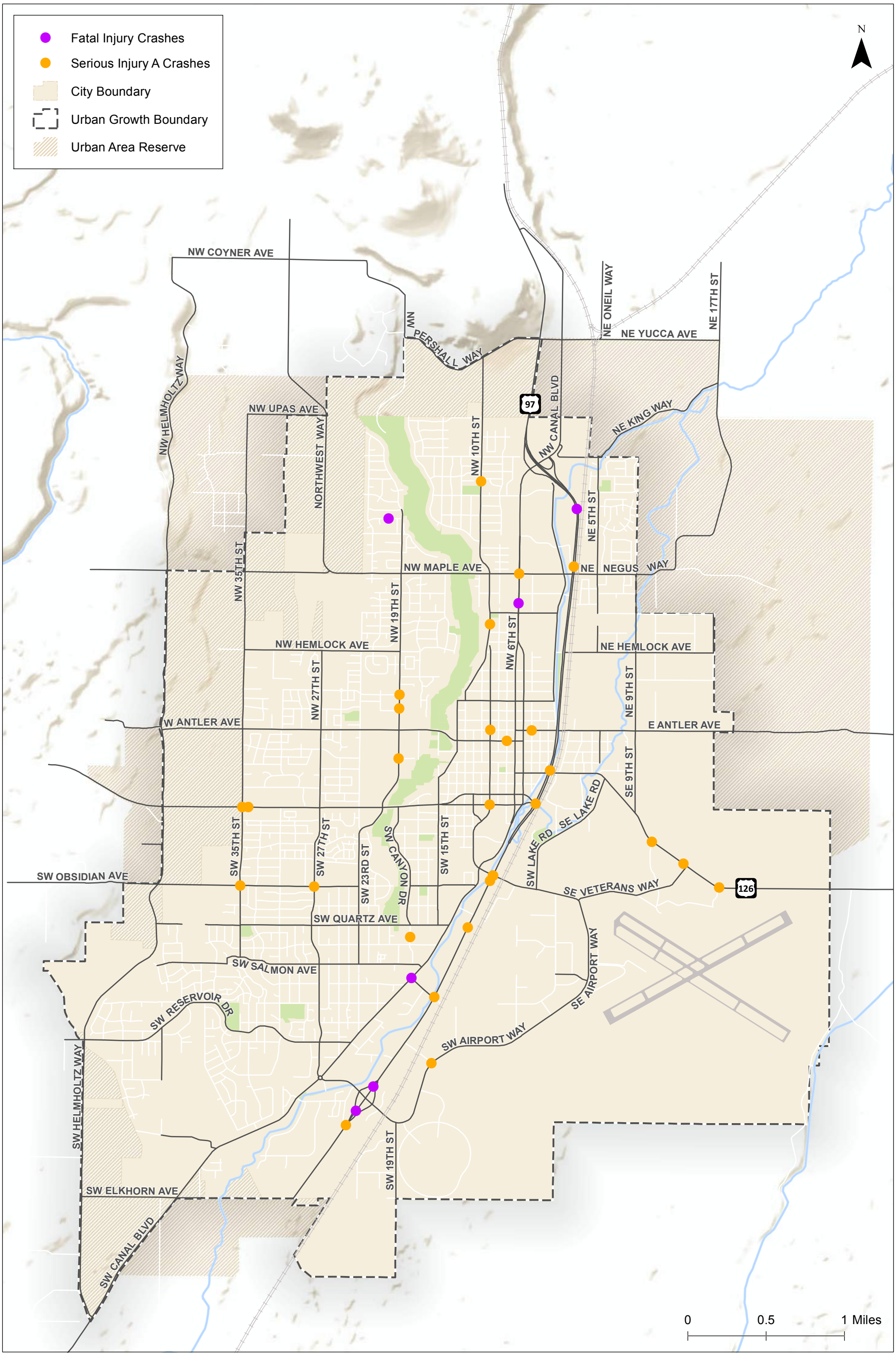
Operational Needs

To inform the baseline assessment, the comparison of the year 2040 traffic demand to capacity for individual arterial and collector streets within Redmond was assessed and then classified within three categories:

- Streets that operate "well" – defined for the purposes of this memo as the baseline demand is less than 80 percent of the capacity. These streets are shown in green in Figure 4.
- Streets that are "nearing capacity" – the demand is between 80 and 100 percent of the capacity. These streets are shown in yellow in the figure.
- Streets that are "over capacity" – the baseline demand exceeds the capacity, which is shown in red on the figure.

Together, with the intersection analyses results (also shown on Figure 4), the corridor analyses can be used to identify the baseline street system deficiencies throughout Redmond. The results of the year 2040 Baseline Analyses are detailed in Appendix B. Per this analysis, key corridors that could experience vehicular congestion and long queues at intersections include:

- OR 126 between SW 15th and Hemholtz
- OR 126 from US 97 east to SE 9th
- Maple Avenue between US 97 and Northwest Way
- US 97 south of SW Glacier Avenue (this segment of the highway is under study by the US 97 South Corridor Plan)
- Yew Avenue/Airport Way between SW 19th and SW Canal



Severe and Fatal Crashes (2011-2015)
Redmond, Oregon

Figure **2**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

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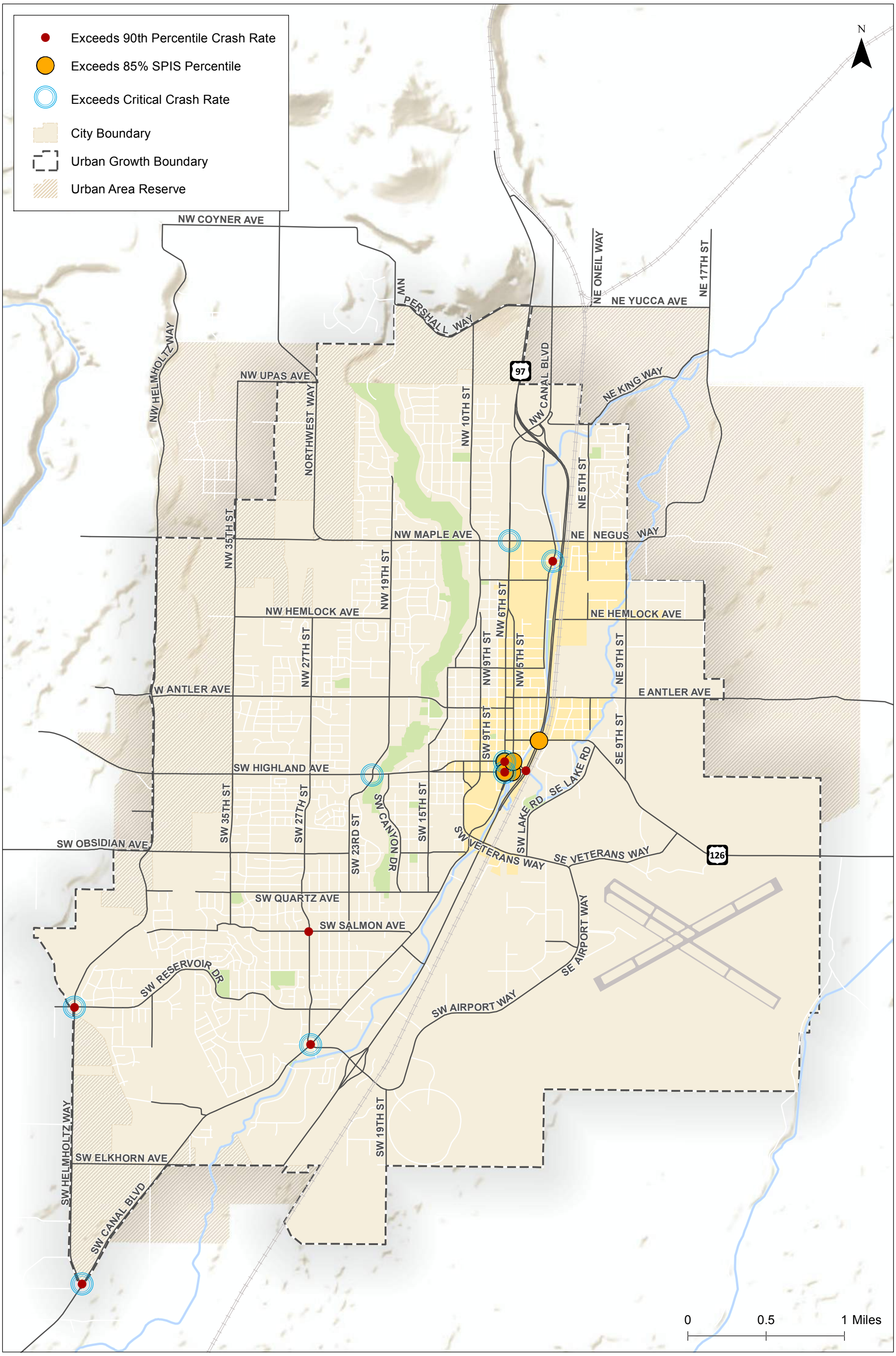

Study Intersection Safety Performance
Redmond, Oregon

Figure **3**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

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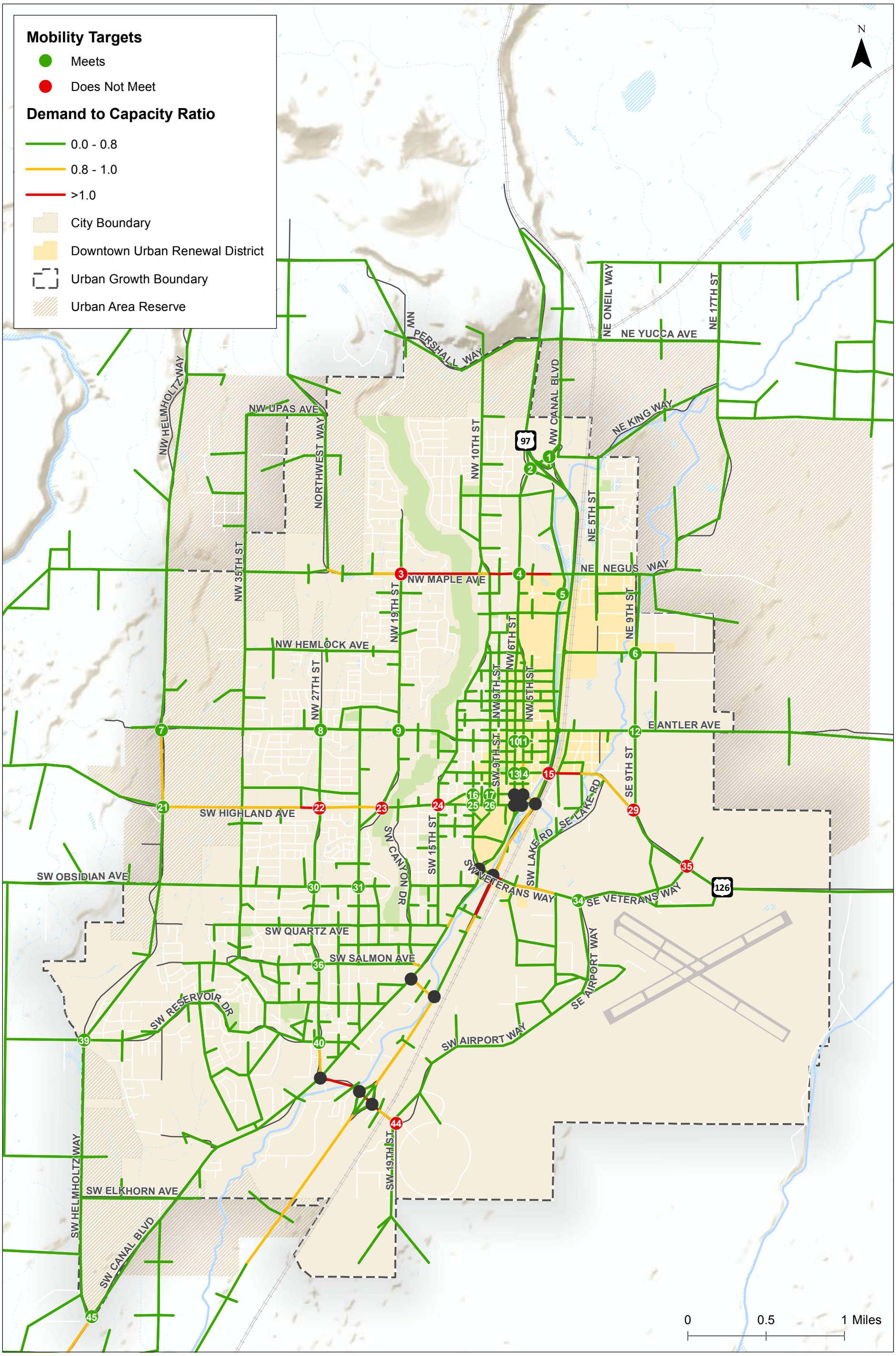

Future Conditions (2040) Intersection and Segment Operational Analyses
Redmond, Oregon

Figure **4**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

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As noted on Figure 4, several study intersections along these corridors are expected to exceed applicable performance standards under 2040 conditions. Individual intersection needs are most notable along the OR 126 corridor within the UGB. Improvements at these locations should be considered in conjunction with the overall context of each corridor.

Alternative Mobility Targets

Two intersections within the City of Redmond currently have established Alternative Mobility Targets, as adopted by the Oregon Transportation Commission (OTC), including

- US 97/Evergreen Avenue – a volume-to-capacity (v/c) ratio of less than 1.0 based on Annual Average Weekday PM Peak conditions during no more than two hours; and,
- US 97/Veterans Way – v/c ratio of less than 0.98.

Both Alternatives Mobility Targets were established through the Senate Bill 1544 transportation analysis and subsequent mitigation plan specifically to allow more traffic congestion associated with economic development benefits from the industrial area. This TSP update and the US 97 South Corridor Study will evaluate the continued need for these Alternative Mobility Standards or if there are mitigation measures that would alleviate the need for them.

ACTIVE TRANSPORTATION NEEDS

The baseline pedestrian, bicycle and transit needs are based on the findings summarized in Technical Memorandum #4 regarding existing system deficiencies as well as other adopted and ongoing planning efforts, and in adherence with the following overarching TSP goals:

Goal 3. Provide transportation choices and address the needs and safety of all travelers, including people of all ages, abilities, ethnicities, and incomes.

Goal 4. Provide comfortable, convenient and safe pedestrian and bicycle facilities for all users.

Goal 5. Provide reliable and convenient transit service to Redmond residents and businesses as well as special transit options for the City's elderly and disabled residents.

Pedestrian Needs

As discussed in Technical Memorandum #4, the City's sidewalk and multi-use pathways contribute to support an economically vital, healthy and equitable community. Today, many of the streets in the residential areas west of US 97 lack a complete sidewalk network. As part of their Access Plan, the City has designated certain streets as American with Disabilities Act (ADA) routes and, within these routes, has identified where infrastructure is missing or in need of updating to meet applicable ADA standards

to connect residents, schools, shopping and parking. The City's ADA Transition Plan prioritizes these routes. Figure 5 illustrates the Access Plan routes.

Figure 6 identifies the presence of sidewalks or existing gaps in the sidewalk network along collector and arterial facilities. Filling these gaps is a need that will be evaluated during the Alternatives Analysis.

As future alternatives are considered, the potential to prioritize sidewalk improvements that connect neighborhoods with key destinations in the City will be analyzed. Also, as identified in the existing conditions deficiencies analyses, the City's Neighborhood Revitalization Project rated several key pedestrian facilities related to "Pedestrian Level of Traffic Stress (PLTS)." The PLTS can communicate the level of comfort pedestrians experience while using specific facilities and generally accounts for the presence and condition of sidewalks and ADA ramps, the nature of crossings, and the characteristics of the adjacent roadways. Using this measure and based on community input, the City's Neighborhood Revitalization Plan identified the following deficiencies:

- Citywide sidewalk coverage is largely limited and incomplete.
- The majority of city sidewalks are classified as PLTS 3 (medium stress).
- The only low stress facilities (PTLS 1) throughout the city are separate multiuse paths such as the Dry Canyon Trail.
- Overall, the high stress scores citywide are predominately a result of sidewalk width and condition. Other characteristics affecting the scores included proximity to higher speed and higher volume vehicle corridors, curb ramp conditions and high-stress crossings.

With the anticipated increase in traffic volumes between now and 2040, the level of stress observed today is expected to further degrade in the future.

Bicycle Needs

As discussed in Technical Memorandum #4, most of the arterial and collector streets within the City are planned to include bike lanes in the future but very few do today, as shown in Figure 7. Rather, most cyclists "share the road" on most streets within Redmond.

As a complement to the on-street bike lanes, the City is planning to sign and stripe bicycle boulevards on a number of low volume, low speed streets throughout the City as well as to develop off-street pathways to provide lower stress environments for cyclists.

As part of future alternatives, the need for additional bike facilities to support commuting, recreational and personal travel will be identified. Also, as identified in the existing conditions deficiencies analyses, the City's Neighborhood Revitalization Project used this Bicycle Level of Street methodology to identify the following deficiencies:

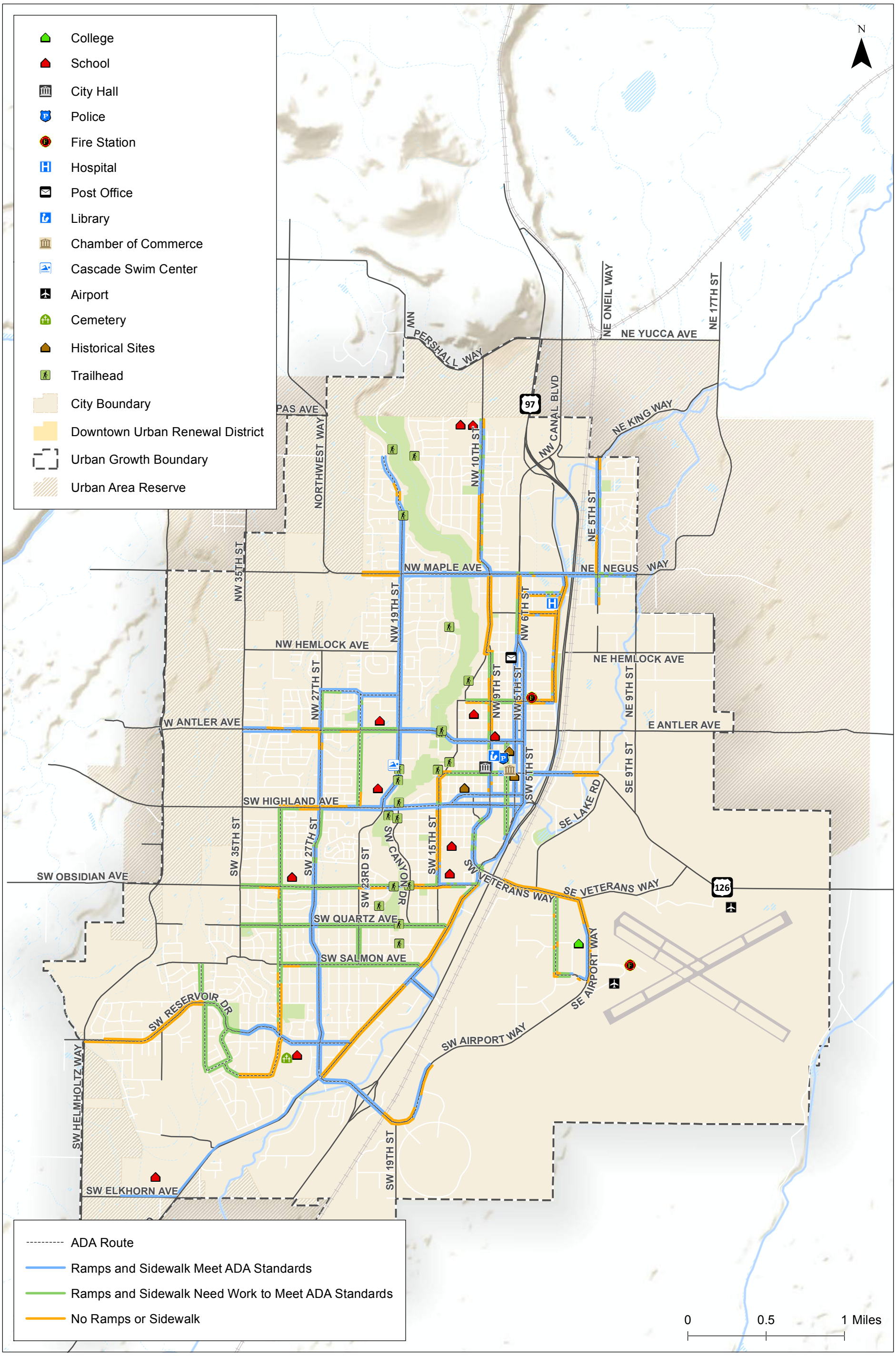
- Neighborhood communities provide a low-stress environment for bicycles, but are generally isolated by high-stress collector and arterial roadways
- Nearly all higher order roadways that provide continuous north-south and east-west connectivity scored as LTS 3 (medium stress) or LTS 4 (high stress)
- Where on-street bike lanes are provided, high posted speeds often reduce the benefit of the dedicated bike facility
- The eastern portion of the city has large areas connected by low stress bicycle environments
- The western portion of the city has frequent instances of high stress roadways acting as barriers between destinations and residential areas
- The Dry Canyon Trail provides a low stress north-south facility through the city, but has limited east-west crossings, causing significant out of direction travel for east-west travelers

With the anticipated increase in traffic volumes between now and 2040, the level of stress observed today is expected to further degrade in the future.

Transit Needs

The City of Redmond, in cooperation with Cascades East Transit, ODOT and the City of Bend, will be undertaking a planning effort to update the Regional Transit Master Plan (RTMP) that will "provide opportunities for transit to "expand mobility options, support community vibrancy and economic vitality, and promote environmental stewardship." These efforts will support the identification of future transit alternatives for the Redmond TSP.

The transit alternatives will also reflect ongoing discussions between CET and the City of Redmond regarding future system needs.



Pedestrian Needs along ADA Routes
Redmond, Oregon

Figure **5**

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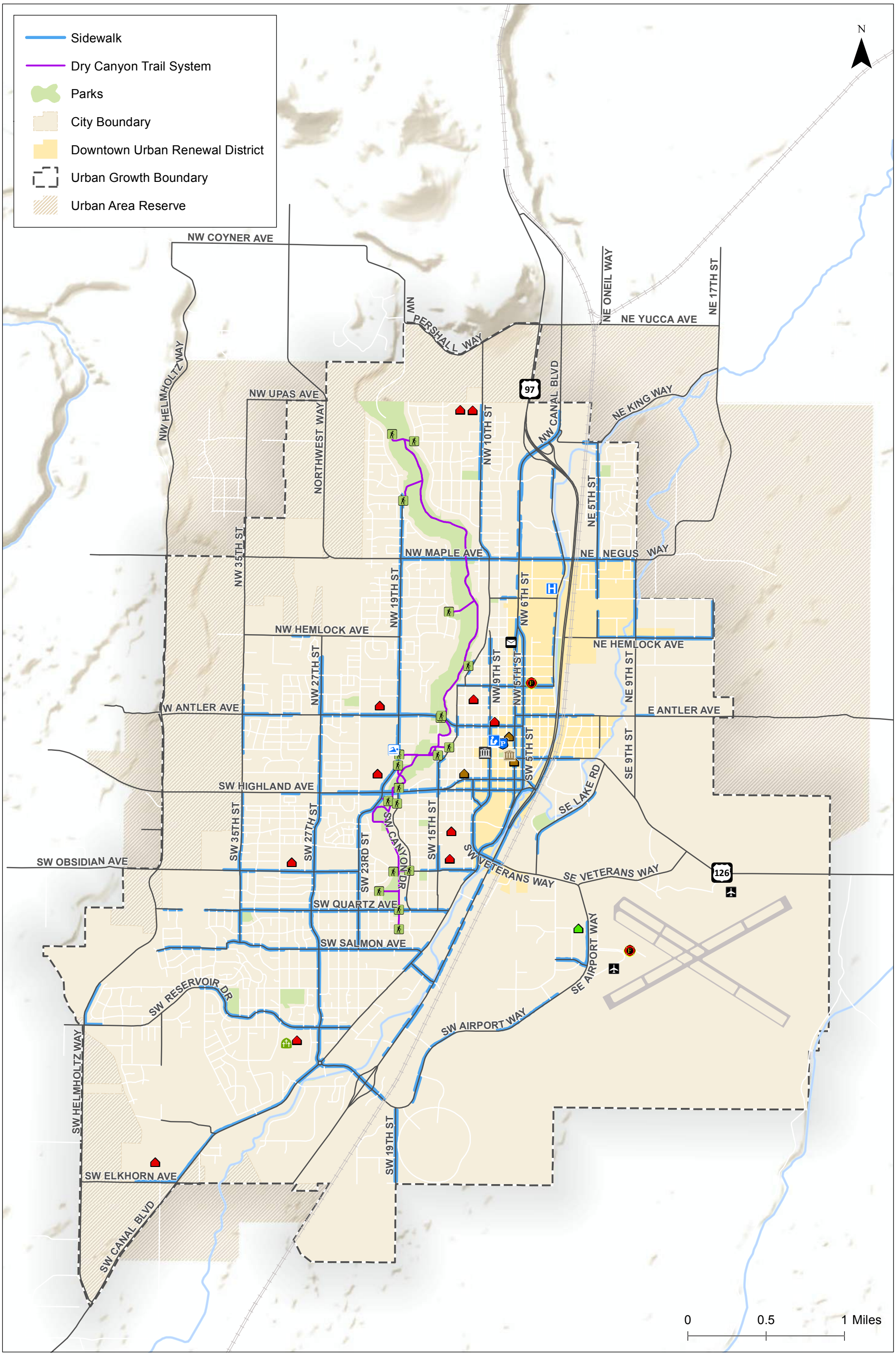
Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl



Sidewalk Gaps along Major Corridors
Redmond, Oregon

Figure **6**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

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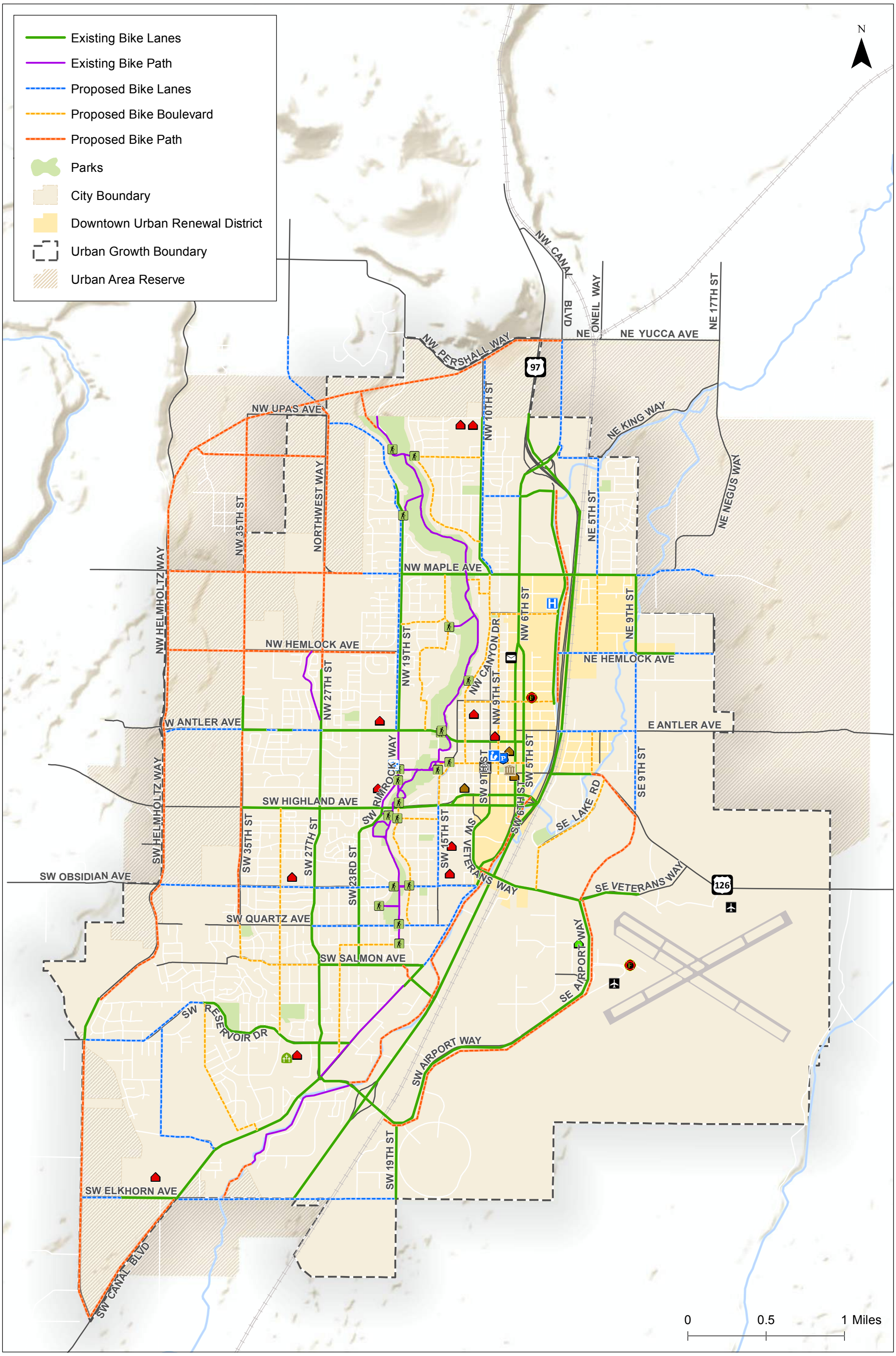

Existing and Planned Bicycle Facilities
Redmond, Oregon

Figure **7**

H:\17\17720 - Redmond Transportation System Plan\gis\Bike.mxd - mbarrus - 12:00 PM 12/11/2017

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

ALTERNATIVES EVALUATION FRAMEWORK

As discussed in Technical Memorandum #3, the identification and evaluation of future alternatives considered for the TSP will be informed by the following activities:

- Feedback received through the stakeholder interviews related to needed transportation investments;
- Existing and future baseline deficiencies analyses (as identified in Technical Memorandum #4 and summarized herein);
- Feedback received through the first Public Open House;
- Feedback from the Project Advisory Committee (PAC) and PMT;
- Workshop with City and ODOT staff, and the PMT to consider the feedback obtained to date and weigh the feasibility of potential alternatives.

A preliminary screen of the ideas gathered through the above activities will be conducted by evaluating the ideas against the following key questions:

- Does the project address an identified transportation need, deficiency, or opportunity?
- Is the project within the City's Urban Growth Boundary? Is it within the City's control, or the control of its partnering agencies, to implement?
- Is it technically feasible to construct and/or implement?
- Could the project be reasonably funded within the next 20 years?

If the answer to any question is "no," the project idea will not be further considered. The remaining ideas would be evaluated by City staff and the PMT against the criteria that are intended to help differentiate between alternatives. There are likely other important criteria for consideration that may not be "differentiators" but the following criteria are anticipated for the more detailed review:

- Balances impacts to developable parcels with system and community needs;
- Minimizes impacts to Goal 5 resources;
- Supports or enhances the ability to implement the Oregon Resiliency Plan and/or other key state or regional projects;
- Leverages future transportation investments to reduce access, economic, safety and health disparities between neighborhoods, particularly those with greater populations of low income, minority, youth and/or elderly population than the City as a whole.
- Addresses key connectivity needs on the collector and arterial street system;
- Addresses known safety issues;

- Supports enhanced multimodal access to major activity centers and/or economic development priority areas within the City as well as the region;
- Provides pedestrian and bicycle connectivity to key transit corridors;
- Provides pedestrian and bicycle connectivity to key routes to school;
- Addresses key gaps in the bicycle system;
- Addresses key gaps in the pedestrian system;
- Improves freight mobility on designated freight, truck, rail and air routes;
- Improves mobility for through traffic on state highways; and,
- Leverages public and private investments.

The results of the more detailed analyses against the evaluation criteria will be presented to the PAC for review. The evaluation results will be presented in tabular format with a rating provided for how each alternative addresses the criteria via the following:

●	The project idea addresses the criterion and/or makes substantial improvements in the criteria category
◒	The project idea partially addresses the criterion and/or makes moderate improvements in the criteria category
○	The project idea does not support the intent of, provides minor or incidental benefit and/or negatively impacts the criteria category
N/A	The project idea neither meets nor does not meet intent of criterion. The project idea has no effect, or criterion does not apply

The results of this evaluation will define a 20-year project list that could address the identified transportation needs, and meet the TSP goals as well as criteria contained on ORS 660-012-0035.

SUMMARY OF IDENTIFIED BASELINE DEFICIENCIES

As discussed herein, the 2040 Baseline Analyses identified the following deficiencies for consideration as part of the alternatives analyses:

- Increasing congestion along OR 126 within the UGB, Maple Avenue between US 97 and Northwest Way, Yew Avenue between Airport Way and S 27th Street and US 97 south of SW Glacier Avenue. The City and ODOT are currently engaged in the South US 97 corridor planning efforts to address long-term transportation and land use needs in this segment of the highway. That study will also evaluate portions of Yew Avenue and the OR 126 corridor near US 97.
- Several of the intersections along the congested corridors do not meet adopted standards. Notable locations include:

- OR 126 (SW Highland) corridor intersections including SW 15th, Rimrock, SW 27th, and SW 35th.
- OR 126 (east) corridor intersection including SE 9th and SE Veteran's Way;
- US 97 intersections including Veteran's Way, Odem Meadow and the Yew Avenue ramps.
- Maple/NW 19th; and
- Yew Avenue at SW 27th and at SW 19th (Airport Way).

- Several of the streets within the City, especially in the residential neighborhoods to the west of US 97, lack sidewalks today. As future alternatives, the potential to prioritize new sidewalks and pathways that connect neighborhoods to schools, commercial areas and other key destinations should be considered.
- Today, cyclists are required to "share the road" on most streets within Redmond or ride on busier collector and arterial bike lanes, which are classified as "high-stress" under existing and year 2040 baseline conditions and are not suitable for riders of all ages and abilities. When bike lanes are provided, the facilities are often non-buffered and located on higher volume/higher speed roads, which typically offset the "stress reducing" attributes of the bike lane. As part of future alternatives, the need for additional low stress bike facilities to support commuting, recreational and personal travel will be identified.
- A higher level of transit service providing fixed route service throughout the City.

Appendix A 2040 Traffic Volumes

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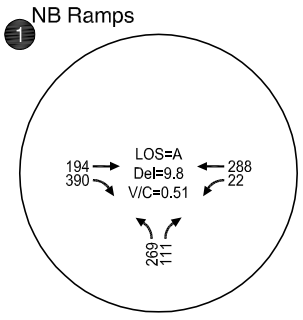

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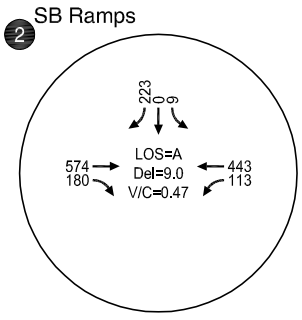

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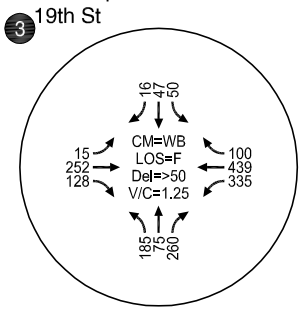

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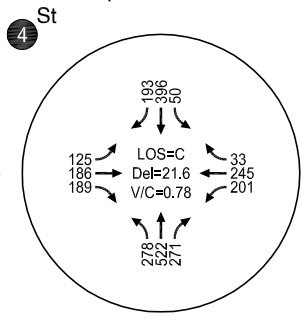

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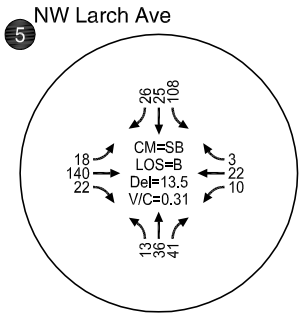

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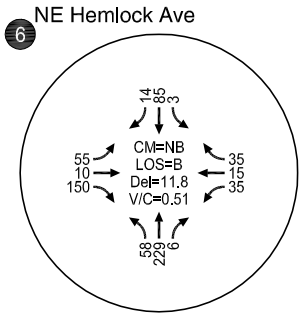

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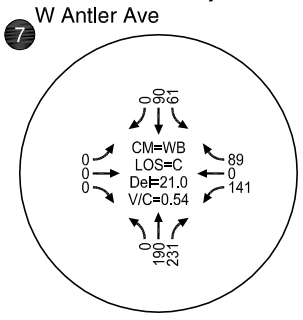

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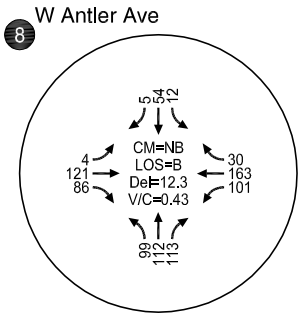

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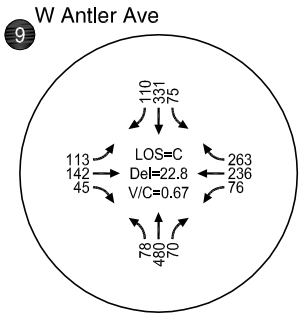

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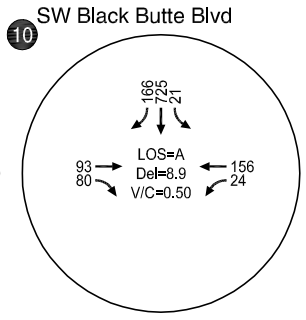

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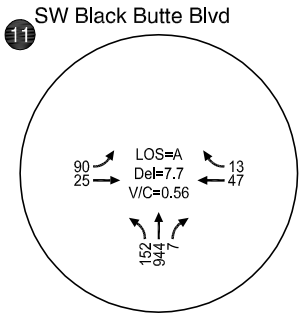

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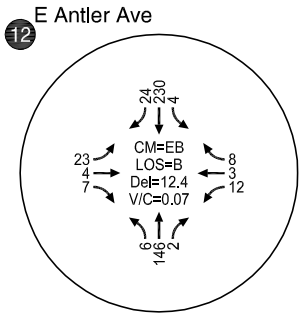

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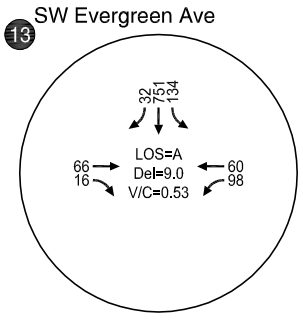

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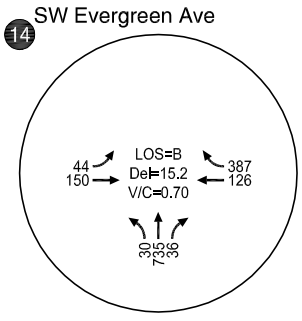

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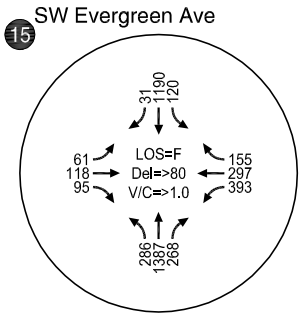

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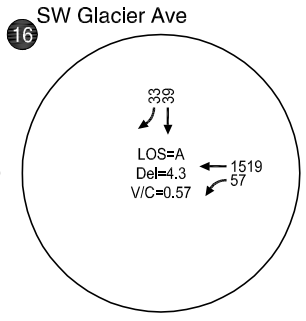

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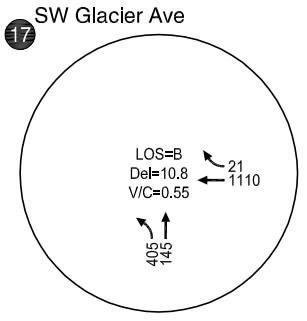

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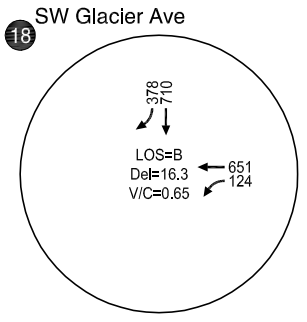

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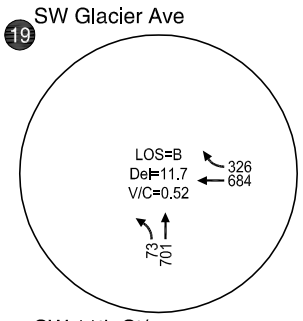

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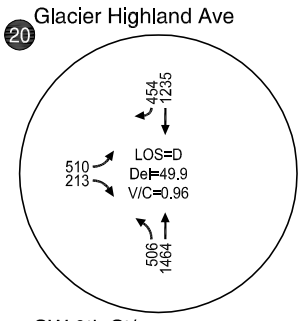

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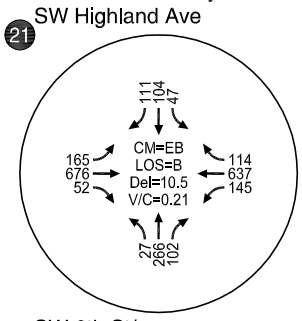

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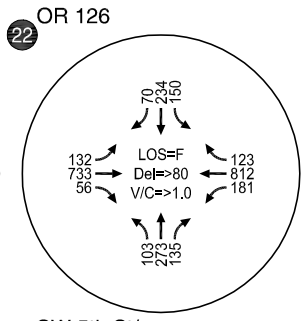

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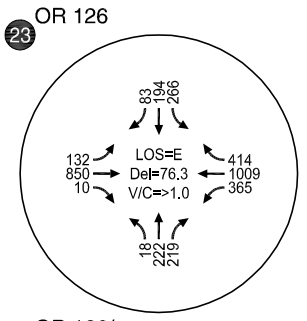

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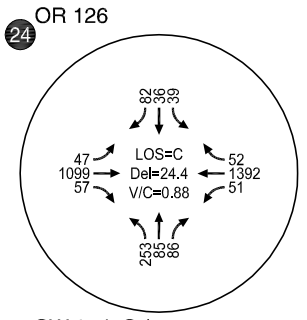

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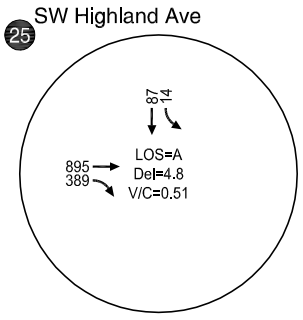

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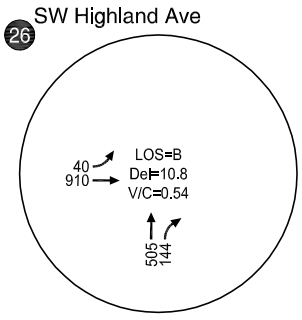

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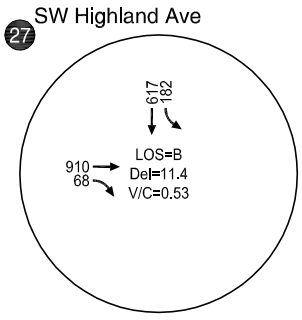

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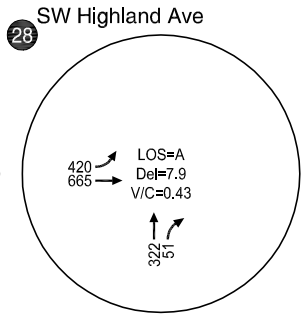

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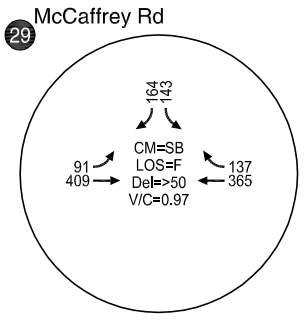

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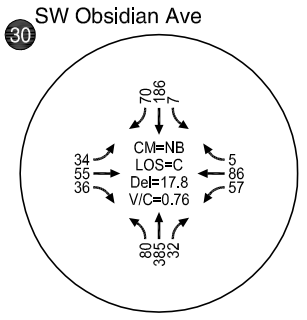

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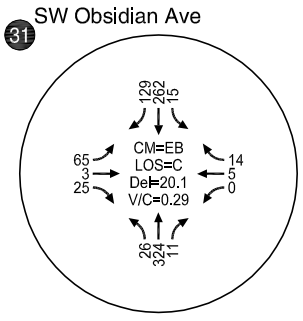

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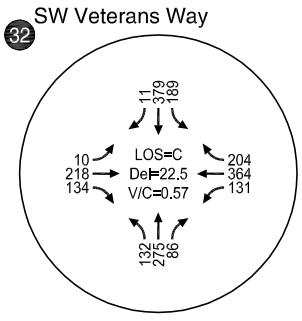

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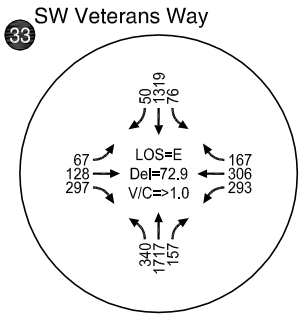

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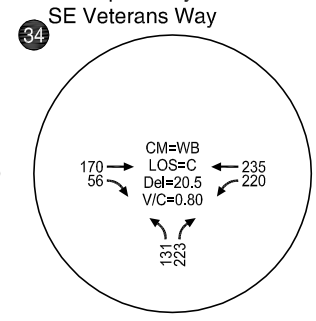

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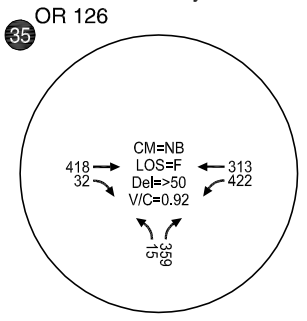
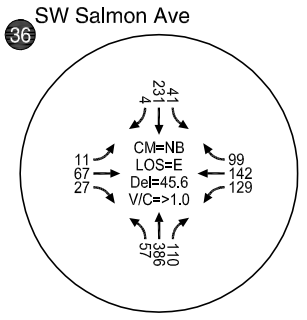
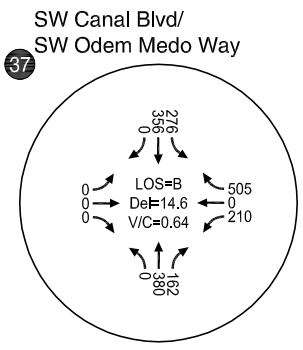


36 SW 27th St/ SW Salmon Ave


37 SW Canal Blvd/ SW Odem Medo Way


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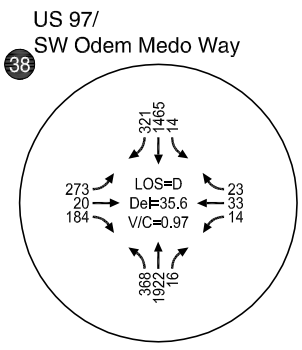
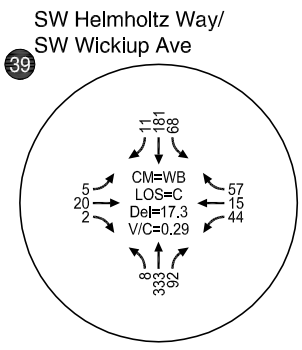


39 SW Helmholtz Way/ SW Wickiup Ave


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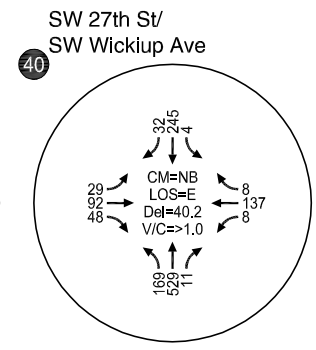

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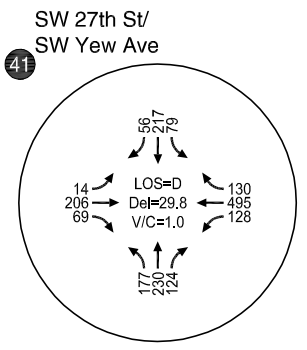
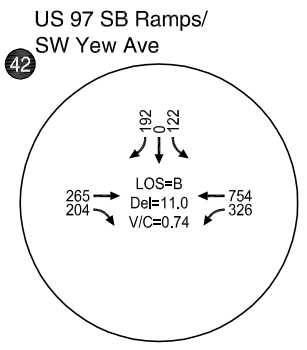
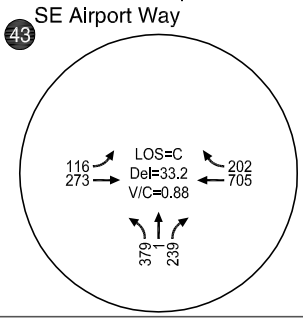


42 US 97 SB Ramps/ SW Yew Ave


43 US 97 NB Ramps/ SE Airport Way


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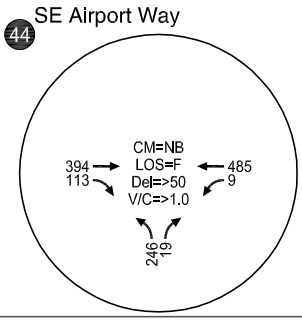

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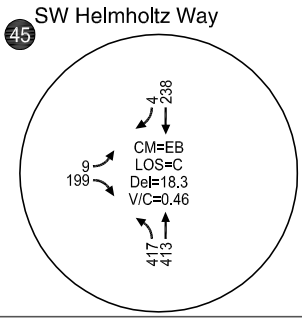


2040 Intersection Peak Hour Volumes and Lane Configurations
Redmond, Oregon

Figure **XX**

H:\17\17720 - Redmond Transportation System Plan\dwgs\figs\17720_figures.dwg Dec 07, 2017 - 1:20pm - mbarrus Layout Tab: Future 2040 Volumes

Appendix B Operational Analyses

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	194	390	22	288	269	111
Future Volume (vph)	194	390	22	288	269	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1881	1583	1543	1863	1770	1583
Flt Permitted	1.00	1.00	0.46	1.00	0.95	1.00
Satd. Flow (perm)	1881	1583	750	1863	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	211	424	24	313	292	121
RTOR Reduction (vph)	0	286	0	0	0	84
Lane Group Flow (vph)	211	138	24	313	292	37
Heavy Vehicles (%)	1%	2%	17%	2%	2%	2%
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	12.7	12.7	18.0	18.0	12.0	12.0
Effective Green, g (s)	12.7	12.7	18.0	18.0	12.0	12.0
Actuated g/C Ratio	0.33	0.33	0.46	0.46	0.31	0.31
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	612	515	362	859	544	487
v/s Ratio Prot	0.11		0.00	c0.17	c0.17	
v/s Ratio Perm		0.09	0.03			0.02
v/c Ratio	0.34	0.27	0.07	0.36	0.54	0.08
Uniform Delay, d1	10.0	9.7	6.0	6.8	11.2	9.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.3	0.1	0.3	1.0	0.1
Delay (s)	10.3	10.0	6.1	7.1	12.2	9.6
Level of Service	B	A	A	A	B	A
Approach Delay (s)	10.1			7.0	11.5	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	39.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	211	424	24	313	292	121
v/c Ratio	0.32	0.51	0.05	0.43	0.49	0.20
Control Delay	11.8	4.2	7.4	10.1	13.9	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	4.2	7.4	10.1	13.9	4.0
Queue Length 50th (ft)	22	0	2	35	35	0
Queue Length 95th (ft)	101	53	12	100	139	28
Internal Link Dist (ft)	689			452	761	
Turn Bay Length (ft)			200			175
Base Capacity (vph)	1775	1518	450	1831	1514	1371
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.28	0.05	0.17	0.19	0.09

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	574	180	113	443	0	0	0	0	9	0	223
Future Volume (vph)	0	574	180	113	443	0	0	0	0	9	0	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		4.5	4.5						4.5	4.5
Lane Util. Factor		0.95		1.00	1.00						1.00	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.96		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.95	1.00
Satd. Flow (prot)		3437		1805	1863						1805	1583
Flt Permitted		1.00		0.22	1.00						0.95	1.00
Satd. Flow (perm)		3437		413	1863						1805	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	624	196	123	482	0	0	0	0	10	0	242
RTOR Reduction (vph)	0	34	0	0	0	0	0	0	0	0	0	202
Lane Group Flow (vph)	0	786	0	123	482	0	0	0	0	0	10	40
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	2%
Turn Type		NA		pm+pt	NA					Perm	NA	Perm
Protected Phases		6		5	2						8	
Permitted Phases				2						8		8
Actuated Green, G (s)		17.7		27.2	27.2						7.2	7.2
Effective Green, g (s)		17.7		27.2	27.2						7.2	7.2
Actuated g/C Ratio		0.41		0.63	0.63						0.17	0.17
Clearance Time (s)		4.5		4.5	4.5						4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		1401		419	1167						299	262
v/s Ratio Prot		c0.23		0.03	c0.26							
v/s Ratio Perm				0.15							0.01	c0.03
v/c Ratio		0.56		0.29	0.41						0.03	0.15
Uniform Delay, d1		9.9		4.2	4.1						15.2	15.5
Progression Factor		1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2		0.5		0.4	0.2						0.0	0.3
Delay (s)		10.4		4.6	4.3						15.2	15.8
Level of Service		B		A	A						B	B
Approach Delay (s)		10.4			4.4			0.0			15.7	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	43.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	820	123	482	10	242
v/c Ratio	0.56	0.26	0.42	0.03	0.52
Control Delay	11.5	4.9	5.7	16.9	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	4.9	5.7	16.9	7.7
Queue Length 50th (ft)	71	8	41	2	0
Queue Length 95th (ft)	135	28	109	13	47
Internal Link Dist (ft)	3583		689	648	
Turn Bay Length (ft)		250			275
Base Capacity (vph)	2294	470	1663	1412	1291
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.36	0.26	0.29	0.01	0.19

Intersection Summary

Intersection	
Intersection Delay, s/veh	71.9
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	252	128	335	439	100	185	76	260	50	47	16
Future Vol, veh/h	15	252	128	335	439	100	185	76	260	50	47	16
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	0	3	0	1	0	0	0	0	1	0	0	0
Mvmt Flow	16	268	136	356	467	106	197	81	277	53	50	17
Number of Lanes	1	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	55.1	114.8	24.6	17.6
HCM LOS	F	F	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	71%	0%	100%	0%	100%	0%	44%
Vol Thru, %	29%	0%	0%	66%	0%	81%	42%
Vol Right, %	0%	100%	0%	34%	0%	19%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	261	260	15	380	335	539	113
LT Vol	185	0	15	0	335	0	50
Through Vol	76	0	0	252	0	439	47
RT Vol	0	260	0	128	0	100	16
Lane Flow Rate	278	277	16	404	356	573	120
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.67	0.586	0.04	0.926	0.85	1.261	0.321
Departure Headway (Hd)	8.974	7.881	9.318	8.606	8.584	7.914	9.989
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	405	462	387	424	424	459	362
Service Time	6.674	5.581	7.018	6.306	6.331	5.66	7.989
HCM Lane V/C Ratio	0.686	0.6	0.041	0.953	0.84	1.248	0.331
HCM Control Delay	28.1	21.1	12.4	56.8	44.2	158.6	17.6
HCM Lane LOS	D	C	B	F	E	F	C
HCM 95th-tile Q	4.7	3.7	0.1	10.3	8.3	23.8	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	186	189	201	245	33	278	522	271	50	396	193
Future Volume (vph)	125	186	189	201	245	33	278	522	271	50	396	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1735	1881	1579	1787	1831		1787	3403		1671	3372	
Flt Permitted	0.42	1.00	1.00	0.47	1.00		0.23	1.00		0.23	1.00	
Satd. Flow (perm)	769	1881	1579	885	1831		441	3403		410	3372	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	137	204	208	221	269	36	305	574	298	55	435	212
RTOR Reduction (vph)	0	0	157	0	6	0	0	66	0	0	64	0
Lane Group Flow (vph)	137	204	51	221	299	0	305	806	0	55	583	0
Confl. Peds. (#/hr)	2		1	1		2	2					2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	4%	1%	1%	1%	2%	0%	1%	1%	0%	8%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)	22.9	17.6	17.6	26.9	19.6		34.6	26.9		26.0	22.3	
Effective Green, g (s)	22.9	17.6	17.6	26.9	19.6		34.6	26.9		26.0	22.3	
Actuated g/C Ratio	0.32	0.24	0.24	0.37	0.27		0.48	0.37		0.36	0.31	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	315	459	385	422	498		367	1271		212	1044	
v/s Ratio Prot	0.03	0.11		c0.05	c0.16		c0.10	0.24		0.01	0.17	
v/s Ratio Perm	0.11		0.03	0.14			c0.30			0.08		
v/c Ratio	0.43	0.44	0.13	0.52	0.60		0.83	0.63		0.26	0.56	
Uniform Delay, d1	18.4	23.1	21.2	16.3	22.8		13.1	18.5		15.5	20.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.7	0.2	1.2	2.0		14.7	1.0		0.7	0.7	
Delay (s)	19.3	23.7	21.4	17.5	24.8		27.9	19.6		16.2	21.4	
Level of Service	B	C	C	B	C		C	B		B	C	
Approach Delay (s)		21.7			21.8			21.7			21.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	137	204	208	221	305	305	872	55	647
v/c Ratio	0.38	0.46	0.39	0.54	0.59	0.84	0.63	0.19	0.62
Control Delay	18.4	27.0	6.1	21.7	28.6	38.6	19.4	12.7	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.4	27.0	6.1	21.7	28.6	38.6	19.4	12.7	21.0
Queue Length 50th (ft)	38	75	0	64	117	77	154	12	104
Queue Length 95th (ft)	85	150	49	131	221	#222	253	35	178
Internal Link Dist (ft)		3891			719		1235		3583
Turn Bay Length (ft)	200		200	100		100		100	
Base Capacity (vph)	364	927	883	411	906	361	1656	297	1585
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.22	0.24	0.54	0.34	0.84	0.53	0.19	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	140	22	10	22	3	13	36	41	108	25	26
Future Vol, veh/h	18	140	22	10	22	3	13	36	41	108	25	26
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	20	0	0	0	0	0	0	0	11	0
Mvmt Flow	21	165	26	12	26	4	15	42	48	127	29	31

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	29	0	0	193	0	0	303	275	182	318	286	28
Stage 1	-	-	-	-	-	-	222	222	-	51	51	-
Stage 2	-	-	-	-	-	-	81	53	-	267	235	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.61	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.61	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.61	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4.099	3.3
Pot Cap-1 Maneuver	1597	-	-	1392	-	-	653	636	866	639	609	1053
Stage 1	-	-	-	-	-	-	785	723	-	967	835	-
Stage 2	-	-	-	-	-	-	932	855	-	743	694	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1597	-	-	1389	-	-	598	620	863	560	593	1053
Mov Cap-2 Maneuver	-	-	-	-	-	-	598	620	-	560	593	-
Stage 1	-	-	-	-	-	-	772	711	-	952	827	-
Stage 2	-	-	-	-	-	-	865	847	-	649	682	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	2.2	11	13.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	707	1597	-	-	1389	-	-	612
HCM Lane V/C Ratio	0.15	0.013	-	-	0.008	-	-	0.306
HCM Control Delay (s)	11	7.3	0	-	7.6	0	-	13.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	1.3

Intersection	
Intersection Delay, s/veh	11.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	55	10	150	35	15	35	58	229	6	3	85	14
Future Vol, veh/h	55	10	150	35	15	35	58	229	6	3	85	14
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	0	11	6	0	8	0	23	1	0	0	3	62
Mvmt Flow	63	11	170	40	17	40	66	260	7	3	97	16
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	10.5	9.3	14.2	9.5
HCM LOS	B	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	20%	26%	41%	3%	0%
Vol Thru, %	78%	5%	18%	97%	0%
Vol Right, %	2%	70%	41%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	293	215	85	88	14
LT Vol	58	55	35	3	0
Through Vol	229	10	15	85	0
RT Vol	6	150	35	0	14
Lane Flow Rate	333	244	97	100	16
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.51	0.338	0.145	0.163	0.023
Departure Headway (Hd)	5.512	4.987	5.391	5.86	5.185
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	656	726	665	612	690
Service Time	3.541	2.987	3.431	3.596	2.92
HCM Lane V/C Ratio	0.508	0.336	0.146	0.163	0.023
HCM Control Delay	14.2	10.5	9.3	9.7	8
HCM Lane LOS	B	B	A	A	A
HCM 95th-tile Q	2.9	1.5	0.5	0.6	0.1

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	0	0	0	141	0	89	0	190	231	61	90	0
Future Vol, veh/h	0	0	0	141	0	89	0	190	231	61	90	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	1	0	8	0
Mvmt Flow	0	0	0	160	0	101	0	216	263	69	102	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	639	719	102	588	588	347	102	0	0	478	0	0
Stage 1	241	241	-	347	347	-	-	-	-	-	-	-
Stage 2	398	478	-	241	241	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	392	357	959	423	424	701	1503	-	-	1095	-	-
Stage 1	767	710	-	673	638	-	-	-	-	-	-	-
Stage 2	632	559	-	767	710	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	318	333	959	401	396	701	1503	-	-	1095	-	-
Mov Cap-2 Maneuver	318	333	-	401	396	-	-	-	-	-	-	-
Stage 1	767	662	-	673	638	-	-	-	-	-	-	-
Stage 2	541	559	-	716	662	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	21	0	3.4
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1503	-	-	-	481	1095	-	-
HCM Lane V/C Ratio	-	-	-	-	0.543	0.063	-	-
HCM Control Delay (s)	0	-	-	0	21	8.5	0	-
HCM Lane LOS	A	-	-	A	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	3.2	0.2	-	-

Intersection	
Intersection Delay, s/veh	12.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	121	86	101	163	30	99	112	113	12	54	5
Future Vol, veh/h	4	121	86	101	163	30	99	112	113	12	54	5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	0	3	2	1	0	0	0	0	1	0	0	0
Mvmt Flow	5	138	98	115	185	34	113	127	128	14	61	6
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	12.8	12.1	12.5	10.5
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	50%	0%	58%	0%	84%	0%	92%
Vol Right, %	0%	50%	0%	42%	0%	16%	0%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	99	225	4	207	101	193	12	59
LT Vol	99	0	4	0	101	0	12	0
Through Vol	0	112	0	121	0	163	0	54
RT Vol	0	113	0	86	0	30	0	5
Lane Flow Rate	112	256	5	235	115	219	14	67
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.213	0.422	0.009	0.4	0.215	0.372	0.028	0.126
Departure Headway (Hd)	6.812	5.948	6.873	6.122	6.739	6.104	7.323	6.752
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	525	603	519	586	531	588	487	528
Service Time	4.569	3.704	4.633	3.882	4.496	3.861	5.098	4.527
HCM Lane V/C Ratio	0.213	0.425	0.01	0.401	0.217	0.372	0.029	0.127
HCM Control Delay	11.4	13	9.7	12.9	11.3	12.5	10.3	10.5
HCM Lane LOS	B	B	A	B	B	B	B	B
HCM 95th-tile Q	0.8	2.1	0	1.9	0.8	1.7	0.1	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	142	45	76	236	263	78	480	70	75	331	110
Future Volume (vph)	113	142	45	76	236	263	78	480	70	75	331	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.97	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1762	1808		1768	1881	1570	1805	1837		1805	1819	
Flt Permitted	0.40	1.00		0.52	1.00	1.00	0.34	1.00		0.17	1.00	
Satd. Flow (perm)	746	1808		966	1881	1570	646	1837		326	1819	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	122	153	48	82	254	283	84	516	75	81	356	118
RTOR Reduction (vph)	0	14	0	0	0	148	0	5	0	0	12	0
Lane Group Flow (vph)	122	187	0	82	254	135	84	586	0	81	462	0
Confl. Peds. (#/hr)	12		2	2		12	1		4	4		1
Heavy Vehicles (%)	2%	1%	0%	2%	1%	0%	0%	1%	2%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	20.9	16.1		20.7	16.0	22.5	34.7	30.0		38.3	31.8	
Effective Green, g (s)	20.9	16.1		20.7	16.0	22.5	34.7	30.0		38.3	31.8	
Actuated g/C Ratio	0.28	0.21		0.27	0.21	0.30	0.46	0.40		0.51	0.42	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	3.5		2.0	3.5	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	271	386		315	399	562	370	731		293	768	
v/s Ratio Prot	c0.03	0.10		0.02	c0.14	c0.02	0.01	c0.32		0.02	0.25	
v/s Ratio Perm	0.10			0.06		0.07	0.09			0.12		
v/c Ratio	0.45	0.48		0.26	0.64	0.24	0.23	0.80		0.28	0.60	
Uniform Delay, d1	21.3	26.0		20.8	27.0	19.9	12.1	20.0		12.3	16.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	1.1		0.2	3.5	0.1	0.1	6.3		0.2	1.3	
Delay (s)	21.8	27.1		21.0	30.5	20.0	12.2	26.3		12.5	18.2	
Level of Service	C	C		C	C	C	B	C		B	B	
Approach Delay (s)		25.1			24.4			24.6			17.4	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	75.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	122	201	82	254	283	84	591	81	474
v/c Ratio	0.40	0.49	0.24	0.62	0.45	0.20	0.82	0.28	0.59
Control Delay	21.9	28.5	19.0	34.5	8.0	11.4	32.5	12.6	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.9	28.5	19.0	34.5	8.0	11.4	32.5	12.6	22.1
Queue Length 50th (ft)	42	80	27	115	24	18	244	18	172
Queue Length 95th (ft)	78	142	56	189	76	46	#476	44	312
Internal Link Dist (ft)		2545		3983			2700		5211
Turn Bay Length (ft)	125		150		225	175		225	
Base Capacity (vph)	305	713	348	731	631	418	823	299	823
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.28	0.24	0.35	0.45	0.20	0.72	0.27	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	93	80	24	156	0	0	0	0	21	725	166
Future Volume (vph)	0	93	80	24	156	0	0	0	0	21	725	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		1.00			1.00						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.94			1.00						0.97	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		1782			1888						3453	
Flt Permitted		1.00			0.93						1.00	
Satd. Flow (perm)		1782			1775						3453	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	98	84	25	164	0	0	0	0	22	763	175
RTOR Reduction (vph)	0	52	0	0	0	0	0	0	0	0	27	0
Lane Group Flow (vph)	0	130	0	0	189	0	0	0	0	0	933	0
Confl. Peds. (#/hr)	1					1	1		1	1		1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		8			4						2	
Permitted Phases				4						2		
Actuated Green, G (s)		10.3			10.3						21.3	
Effective Green, g (s)		10.3			10.3						21.3	
Actuated g/C Ratio		0.25			0.25						0.51	
Clearance Time (s)		5.0			5.0						5.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		441			439						1768	
v/s Ratio Prot		0.07										
v/s Ratio Perm					c0.11						0.27	
v/c Ratio		0.29			0.43						0.53	
Uniform Delay, d1		12.7			13.2						6.8	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.4			0.7						0.3	
Delay (s)		13.1			13.9						7.1	
Level of Service		B			B						A	
Approach Delay (s)		13.1			13.9			0.0			7.1	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	41.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	182	189	960
v/c Ratio	0.37	0.44	0.54
Control Delay	12.4	18.7	7.9
Queue Delay	0.0	0.0	0.0
Total Delay	12.4	18.7	7.9
Queue Length 50th (ft)	21	37	63
Queue Length 95th (ft)	75	103	127
Internal Link Dist (ft)	3983	187	3118
Turn Bay Length (ft)			
Base Capacity (vph)	1140	1110	2899
Starvation Cap Reductn	0	10	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.16	0.17	0.33

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	25	0	0	47	13	152	944	7	0	0	0
Future Volume (vph)	90	25	0	0	47	13	152	944	7	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		1.00			1.00			0.95				
Frpb, ped/bikes		1.00			1.00			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.97			1.00				
Flt Protected		0.96			1.00			0.99				
Satd. Flow (prot)		1828			1788			3546				
Flt Permitted		0.73			1.00			0.99				
Satd. Flow (perm)		1381			1788			3546				
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	102	28	0	0	53	15	173	1073	8	0	0	0
RTOR Reduction (vph)	0	0	0	0	12	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	130	0	0	56	0	0	1254	0	0	0	0
Confl. Peds. (#/hr)							2		1	1		2
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	0%	1%	17%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			6				
Permitted Phases	8						6					
Actuated Green, G (s)		8.6			8.6			31.7				
Effective Green, g (s)		8.6			8.6			31.7				
Actuated g/C Ratio		0.17			0.17			0.63				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		236			305			2234				
v/s Ratio Prot					0.03							
v/s Ratio Perm		c0.09						0.35				
v/c Ratio		0.55			0.18			0.56				
Uniform Delay, d1		19.1			17.8			5.3				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		2.8			0.3			0.3				
Delay (s)		21.9			18.1			5.6				
Level of Service		C			B			A				
Approach Delay (s)		21.9			18.1			5.6			0.0	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	50.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	130	68	1254
v/c Ratio	0.45	0.18	0.53
Control Delay	24.3	16.0	7.3
Queue Delay	0.0	0.0	0.0
Total Delay	24.3	16.0	7.3
Queue Length 50th (ft)	31	12	100
Queue Length 95th (ft)	86	43	185
Internal Link Dist (ft)	187	470	1008
Turn Bay Length (ft)			
Base Capacity (vph)	617	806	2826
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.21	0.08	0.44

Intersection Summary

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	4	7	12	3	8	6	146	2	4	230	24
Future Vol, veh/h	23	4	7	12	3	8	6	146	2	4	230	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	4	0	0	0	0	25	50	4	0	50	8	4
Mvmt Flow	26	5	8	14	3	9	7	166	2	5	261	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	471	466	275	471	479	167	289	0	0	168	0	0
Stage 1	284	284	-	181	181	-	-	-	-	-	-	-
Stage 2	187	182	-	290	298	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.5	6.2	7.1	6.5	6.45	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	6.14	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4	3.3	3.5	4	3.525	2.65	-	-	2.65	-	-
Pot Cap-1 Maneuver	500	497	769	506	489	821	1042	-	-	1165	-	-
Stage 1	719	680	-	825	754	-	-	-	-	-	-	-
Stage 2	810	753	-	722	671	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	487	491	769	493	483	821	1042	-	-	1165	-	-
Mov Cap-2 Maneuver	487	491	-	493	483	-	-	-	-	-	-	-
Stage 1	714	677	-	819	749	-	-	-	-	-	-	-
Stage 2	792	748	-	706	668	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.4	11.6	0.3	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1042	-	-	527	571	1165	-	-
HCM Lane V/C Ratio	0.007	-	-	0.073	0.046	0.004	-	-
HCM Control Delay (s)	8.5	0	-	12.4	11.6	8.1	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	66	16	98	60	0	0	0	0	134	751	32
Future Volume (vph)	0	66	16	98	60	0	0	0	0	134	751	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.99			1.00						1.00	
Flpb, ped/bikes		1.00			0.99						0.99	
Frt		0.97			1.00						0.99	
Flt Protected		1.00			0.97						0.99	
Satd. Flow (prot)		1810			1826						3503	
Flt Permitted		1.00			0.76						0.99	
Satd. Flow (perm)		1810			1427						3503	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	73	18	109	67	0	0	0	0	149	834	36
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	78	0	0	176	0	0	0	0	0	1016	0
Confl. Peds. (#/hr)	21		19	19		21	16		26	26		16
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	1%	1%	3%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		8			4						2	
Permitted Phases				4						2		
Actuated Green, G (s)		11.5			11.5						23.5	
Effective Green, g (s)		11.5			11.5						23.5	
Actuated g/C Ratio		0.26			0.26						0.52	
Clearance Time (s)		5.0			5.0						5.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		462			364						1829	
v/s Ratio Prot		0.04										
v/s Ratio Perm					c0.12						0.29	
v/c Ratio		0.17			0.48						0.56	
Uniform Delay, d1		13.0			14.2						7.2	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.2			1.0						0.4	
Delay (s)		13.2			15.2						7.6	
Level of Service		B			B						A	
Approach Delay (s)		13.2			15.2			0.0			7.6	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	91	176	1019
v/c Ratio	0.19	0.49	0.57
Control Delay	14.0	21.7	9.0
Queue Delay	0.0	0.0	0.0
Total Delay	14.0	21.7	9.0
Queue Length 50th (ft)	15	38	79
Queue Length 95th (ft)	51	106	158
Internal Link Dist (ft)	369	175	1004
Turn Bay Length (ft)			
Base Capacity (vph)	1061	827	2743
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.09	0.21	0.37

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	150	0	0	126	387	30	735	36	0	0	0
Future Volume (vph)	44	150	0	0	126	387	30	735	36	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		1.00			1.00			0.95				
Frpb, ped/bikes		1.00			0.99			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.90			0.99				
Flt Protected		0.99			1.00			1.00				
Satd. Flow (prot)		1851			1642			3575				
Flt Permitted		0.70			1.00			1.00				
Satd. Flow (perm)		1308			1642			3575				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	49	167	0	0	140	430	33	817	40	0	0	0
RTOR Reduction (vph)	0	0	0	0	46	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	216	0	0	524	0	0	885	0	0	0	0
Confl. Peds. (#/hr)	2		3	3		2	1		1	1		1
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	3%	1%	0%	0%	2%	3%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			6				
Permitted Phases	8						6					
Actuated Green, G (s)		22.5			22.5			21.6				
Effective Green, g (s)		22.5			22.5			21.6				
Actuated g/C Ratio		0.42			0.42			0.40				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		543			682			1427				
v/s Ratio Prot					c0.32							
v/s Ratio Perm		0.17						0.25				
v/c Ratio		0.40			0.77			0.62				
Uniform Delay, d1		11.1			13.6			13.0				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		0.5			5.2			0.8				
Delay (s)		11.5			18.8			13.8				
Level of Service		B			B			B				
Approach Delay (s)		11.5			18.8			13.8			0.0	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	54.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	216	570	890
v/c Ratio	0.40	0.79	0.63
Control Delay	14.7	22.0	16.3
Queue Delay	0.1	0.0	0.0
Total Delay	14.8	22.0	16.3
Queue Length 50th (ft)	47	131	117
Queue Length 95th (ft)	110	291	206
Internal Link Dist (ft)	175	838	646
Turn Bay Length (ft)			
Base Capacity (vph)	791	1023	2025
Starvation Cap Reductn	107	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.32	0.56	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	118	95	393	297	155	286	1387	268	120	1190	31
Future Volume (vph)	61	118	95	393	297	155	286	1387	268	120	1190	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1745		1752	1743		1770	3374	1538	1787	3374	1615
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1745		1752	1743		1770	3374	1538	1787	3374	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	64	124	100	414	313	163	301	1460	282	126	1253	33
RTOR Reduction (vph)	0	21	0	0	13	0	0	0	166	0	0	22
Lane Group Flow (vph)	64	203	0	414	463	0	301	1460	116	126	1253	11
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	1%	1%	3%	1%	8%	2%	7%	5%	1%	7%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Prot	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6	6	5	2	
Permitted Phases												2
Actuated Green, G (s)	7.3	26.6		24.6	43.9		22.6	57.3	57.3	10.5	45.2	45.2
Effective Green, g (s)	7.3	26.6		24.6	43.9		22.6	57.3	57.3	10.5	45.2	45.2
Actuated g/C Ratio	0.05	0.19		0.18	0.32		0.16	0.41	0.41	0.08	0.33	0.33
Clearance Time (s)	4.5	5.0		4.5	5.0		4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	92	333		310	550		287	1390	634	134	1097	525
v/s Ratio Prot	0.04	0.12		c0.24	c0.27		c0.17	0.43	0.08	0.07	c0.37	
v/s Ratio Perm												0.01
v/c Ratio	0.70	0.61		1.34	0.84		1.05	1.05	0.18	0.94	1.14	0.02
Uniform Delay, d1	64.8	51.4		57.2	44.3		58.2	40.9	26.0	63.9	46.9	31.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.4	3.2		171.3	11.2		66.5	38.5	0.1	59.5	75.2	0.0
Delay (s)	85.2	54.6		228.5	55.5		124.7	79.4	26.1	123.4	122.1	31.9
Level of Service	F	D		F	E		F	E	C	F	F	C
Approach Delay (s)		61.4			136.0			78.7			120.1	
Approach LOS		E			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	101.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	139.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	64	224	414	476	301	1460	282	126	1253	33
v/c Ratio	0.58	0.65	1.33	0.84	1.04	1.04	0.35	0.93	1.13	0.05
Control Delay	85.7	54.3	211.2	56.9	119.4	75.9	4.5	123.1	114.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.7	54.3	211.2	56.9	119.4	75.9	4.5	123.1	114.4	0.2
Queue Length 50th (ft)	57	166	~483	396	~293	~751	0	115	~691	0
Queue Length 95th (ft)	#120	254	#765	540	#536	#1014	60	#267	#937	0
Internal Link Dist (ft)		838		3278		1074			1019	
Turn Bay Length (ft)	150		450		275		575	350		100
Base Capacity (vph)	122	501	312	684	289	1399	802	136	1104	626
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.45	1.33	0.70	1.04	1.04	0.35	0.93	1.13	0.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	57	1519	0	0	0	0	0	39	33
Future Volume (vph)	0	0	0	57	1519	0	0	0	0	0	39	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.5						4.5	
Lane Util. Factor					0.95						0.95	
Frpb, ped/bikes					1.00						0.99	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.93	
Flt Protected					1.00						1.00	
Satd. Flow (prot)					3535						3336	
Flt Permitted					1.00						1.00	
Satd. Flow (perm)					3535						3336	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	62	1651	0	0	0	0	0	42	36
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	33	0
Lane Group Flow (vph)	0	0	0	0	1710	0	0	0	0	0	45	0
Confl. Peds. (#/hr)	3		1	1		3	3		2	2		3
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type				Perm	NA						NA	
Protected Phases					6						4	
Permitted Phases				6								
Actuated Green, G (s)					55.7						5.1	
Effective Green, g (s)					55.7						5.1	
Actuated g/C Ratio					0.80						0.07	
Clearance Time (s)					4.5						4.5	
Vehicle Extension (s)					3.0						3.0	
Lane Grp Cap (vph)					2820						243	
v/s Ratio Prot											c0.01	
v/s Ratio Perm					0.48							
v/c Ratio					0.61						0.18	
Uniform Delay, d1					2.8						30.4	
Progression Factor					1.00						1.00	
Incremental Delay, d2					0.4						0.4	
Delay (s)					3.1						30.8	
Level of Service					A						C	
Approach Delay (s)		0.0			3.1			0.0			30.8	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	4.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	69.8	Sum of lost time (s)	9.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	SBT
Lane Group Flow (vph)	1713	78
v/c Ratio	0.58	0.21
Control Delay	3.8	22.3
Queue Delay	0.1	0.0
Total Delay	4.0	22.3
Queue Length 50th (ft)	114	9
Queue Length 95th (ft)	175	32
Internal Link Dist (ft)	472	448
Turn Bay Length (ft)		
Base Capacity (vph)	3379	977
Starvation Cap Reductn	545	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.60	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1110	21	405	145	0	0	0	0
Future Volume (vph)	0	0	0	0	1110	21	405	145	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.5		4.5	4.5				
Lane Util. Factor					0.95		0.91	0.91				
Frpb, ped/bikes					1.00		1.00	1.00				
Flpb, ped/bikes					1.00		1.00	1.00				
Frt					1.00		1.00	1.00				
Flt Protected					1.00		0.95	0.97				
Satd. Flow (prot)					3530		1609	3320				
Flt Permitted					1.00		0.95	0.97				
Satd. Flow (perm)					3530		1609	3320				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1207	23	440	158	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	49	49	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1229	0	171	329	0	0	0	0
Confl. Peds. (#/hr)	3					3	1					1
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%	0%	0%
Turn Type					NA		Perm	NA				
Protected Phases					6			8				
Permitted Phases							8					
Actuated Green, G (s)					29.9		13.5	13.5				
Effective Green, g (s)					29.9		13.5	13.5				
Actuated g/C Ratio					0.57		0.26	0.26				
Clearance Time (s)					4.5		4.5	4.5				
Vehicle Extension (s)					3.0		3.0	3.0				
Lane Grp Cap (vph)					2014		414	855				
v/s Ratio Prot					c0.35							
v/s Ratio Perm							c0.11	0.10				
v/c Ratio					0.61		0.41	0.38				
Uniform Delay, d1					7.4		16.2	16.0				
Progression Factor					1.00		1.00	1.00				
Incremental Delay, d2					0.6		0.7	0.3				
Delay (s)					8.0		16.8	16.3				
Level of Service					A		B	B				
Approach Delay (s)		0.0			8.0			16.5			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	52.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	NBL	NBT
Lane Group Flow (vph)	1230	220	378
v/c Ratio	0.62	0.48	0.42
Control Delay	9.6	17.2	16.2
Queue Delay	0.0	0.0	0.0
Total Delay	9.6	17.2	16.2
Queue Length 50th (ft)	110	40	41
Queue Length 95th (ft)	237	131	103
Internal Link Dist (ft)	765		275
Turn Bay Length (ft)			
Base Capacity (vph)	3319	1117	2283
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.37	0.20	0.17

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	124	651	0	0	0	0	0	710	378
Future Volume (vph)	0	0	0	124	651	0	0	0	0	0	710	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.5						4.5	
Lane Util. Factor					0.95						0.95	
Frpb, ped/bikes					1.00						0.99	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.95	
Flt Protected					0.99						1.00	
Satd. Flow (prot)					3492						3382	
Flt Permitted					0.99						1.00	
Satd. Flow (perm)					3492						3382	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	133	700	0	0	0	0	0	763	406
RTOR Reduction (vph)	0	0	0	0	16	0	0	0	0	0	41	0
Lane Group Flow (vph)	0	0	0	0	817	0	0	0	0	0	1128	0
Confl. Peds. (#/hr)			2	2			2		2	2		2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	1%	0%
Turn Type				Perm	NA						NA	
Protected Phases					6						4	
Permitted Phases				6								
Actuated Green, G (s)					25.3						36.8	
Effective Green, g (s)					25.3						36.8	
Actuated g/C Ratio					0.36						0.52	
Clearance Time (s)					4.5						4.5	
Vehicle Extension (s)					3.0						3.0	
Lane Grp Cap (vph)					1242						1750	
v/s Ratio Prot											c0.33	
v/s Ratio Perm					0.23							
v/c Ratio					0.66						0.64	
Uniform Delay, d1					19.3						12.4	
Progression Factor					1.00						1.00	
Incremental Delay, d2					1.3						0.8	
Delay (s)					20.5						13.2	
Level of Service					C						B	
Approach Delay (s)		0.0			20.5			0.0			13.2	
Approach LOS		A			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	71.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	SBT
Lane Group Flow (vph)	833	1169
v/c Ratio	0.67	0.66
Control Delay	23.2	14.2
Queue Delay	0.3	0.0
Total Delay	23.5	14.2
Queue Length 50th (ft)	152	167
Queue Length 95th (ft)	288	303
Internal Link Dist (ft)	179	644
Turn Bay Length (ft)		
Base Capacity (vph)	1916	2660
Starvation Cap Reductn	448	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.57	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	684	326	73	701	0	0	0	0
Future Volume (vph)	0	0	0	0	684	326	73	701	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.5	4.5	4.5	4.5				
Lane Util. Factor					0.95	1.00	0.91	0.91				
Frpb, ped/bikes					1.00	0.99	1.00	1.00				
Flpb, ped/bikes					1.00	1.00	1.00	1.00				
Frt					1.00	0.85	1.00	1.00				
Flt Protected					1.00	1.00	0.95	1.00				
Satd. Flow (prot)					3505	1563	1643	3456				
Flt Permitted					1.00	1.00	0.95	1.00				
Satd. Flow (perm)					3505	1563	1643	3456				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	743	354	79	762	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	81	29	10	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	743	273	42	760	0	0	0	0
Confl. Peds. (#/hr)	1					1			1	1		
Heavy Vehicles (%)	0%	0%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%
Turn Type					NA	Perm	Perm	NA				
Protected Phases					4			6				
Permitted Phases						4	6					
Actuated Green, G (s)					22.9	22.9	21.3	21.3				
Effective Green, g (s)					22.9	22.9	21.3	21.3				
Actuated g/C Ratio					0.43	0.43	0.40	0.40				
Clearance Time (s)					4.5	4.5	4.5	4.5				
Vehicle Extension (s)					3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)					1508	672	657	1383				
v/s Ratio Prot					c0.21							
v/s Ratio Perm						0.17	0.03	0.22				
v/c Ratio					0.49	0.41	0.06	0.55				
Uniform Delay, d1					11.0	10.5	9.8	12.3				
Progression Factor					1.00	1.00	1.00	1.00				
Incremental Delay, d2					0.3	0.4	0.0	0.5				
Delay (s)					11.2	10.9	9.9	12.7				
Level of Service					B	B	A	B				
Approach Delay (s)		0.0			11.1			12.5			0.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	53.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	743	354	71	770
v/c Ratio	0.50	0.48	0.10	0.56
Control Delay	13.2	9.5	6.4	14.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.2	9.5	6.4	14.8
Queue Length 50th (ft)	82	40	4	92
Queue Length 95th (ft)	170	128	31	198
Internal Link Dist (ft)	478			255
Turn Bay Length (ft)		125	75	
Base Capacity (vph)	2772	1265	1452	3044
Starvation Cap Reductn	0	0	0	129
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.27	0.28	0.05	0.26

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR	SBR2	SEL	SER
Lane Configurations									
Traffic Volume (vph)	510	213	506	1464	1235	454	0	0	0
Future Volume (vph)	510	213	506	1464	1235	454	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	5.5	5.5				
Lane Util. Factor	0.97	1.00	0.97	0.95	0.95				
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99				
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00				
Frt	1.00	0.85	1.00	1.00	0.96				
Flt Protected	0.95	1.00	0.95	1.00	1.00				
Satd. Flow (prot)	3400	1599	3433	3438	3275				
Flt Permitted	0.95	1.00	0.95	1.00	1.00				
Satd. Flow (perm)	3400	1599	3433	3438	3275				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	537	224	533	1541	1300	478	0	0	0
RTOR Reduction (vph)	0	180	0	0	0	0	0	0	0
Lane Group Flow (vph)	537	44	533	1541	1778	0	0	0	0
Confl. Bikes (#/hr)						1			
Heavy Vehicles (%)	3%	1%	2%	5%	6%	3%	2%	2%	2%
Turn Type	Prot	Perm	Prot	NA	NA		Perm		
Protected Phases	8		1	6	2				
Permitted Phases		3					2		
Actuated Green, G (s)	26.3	26.3	25.5	97.0	67.0				
Effective Green, g (s)	26.3	26.3	25.5	97.0	67.0				
Actuated g/C Ratio	0.20	0.20	0.19	0.73	0.50				
Clearance Time (s)	4.5	4.5	4.5	5.5	5.5				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	670	315	656	2501	1646				
v/s Ratio Prot	c0.16		c0.16	0.45	c0.54				
v/s Ratio Perm		0.03							
v/c Ratio	0.80	0.14	0.81	0.62	1.08				
Uniform Delay, d1	51.0	44.2	51.6	9.0	33.2				
Progression Factor	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	6.9	0.2	7.6	0.5	47.3				
Delay (s)	57.9	44.4	59.2	9.4	80.5				
Level of Service	E	D	E	A	F				
Approach Delay (s)	53.9			22.2	80.5			0.0	
Approach LOS	D			C	F			A	

Intersection Summary			
HCM 2000 Control Delay	49.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	133.3	Sum of lost time (s)	14.5
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	537	224	533	1541	1778
v/c Ratio	0.80	0.45	0.81	0.62	1.08
Control Delay	61.1	8.6	62.5	10.8	80.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	61.2	8.6	62.5	10.8	80.7
Queue Length 50th (ft)	230	0	228	309	~905
Queue Length 95th (ft)	310	69	313	460	#1235
Internal Link Dist (ft)	383			2738	1074
Turn Bay Length (ft)		200	325		
Base Capacity (vph)	936	602	841	2685	1643
Starvation Cap Reductn	17	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.58	0.37	0.63	0.57	1.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	165	676	52	145	637	114	27	266	102	47	104	111
Future Vol, veh/h	165	676	52	145	637	114	27	266	102	47	104	111
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	-	525	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	5	5	3	3	0	0	0	1	0	8	0
Mvmt Flow	176	719	55	154	678	121	29	283	109	50	111	118

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	799	0	0	774	0	0	2259	2205	747	2341	2173	738
Stage 1	-	-	-	-	-	-	1098	1098	-	1047	1047	-
Stage 2	-	-	-	-	-	-	1161	1107	-	1294	1126	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	6.5	6.21	7.1	6.58	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.58	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4	3.309	3.5	4.072	3.3
Pot Cap-1 Maneuver	833	-	-	837	-	-	30	~ 45	415	~ 26	~ 45	421
Stage 1	-	-	-	-	-	-	260	291	-	278	298	-
Stage 2	-	-	-	-	-	-	240	288	-	202	273	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	833	-	-	837	-	-	-	~ 29	415	-	~ 29	421
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	~ 29	-	-	~ 29	-
Stage 1	-	-	-	-	-	-	205	~ 230	-	219	243	-
Stage 2	-	-	-	-	-	-	77	~ 235	-	-	215	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	1.7		
HCM LOS			-	-

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	833	-	-	837	-	-	-
HCM Lane V/C Ratio	-	0.211	-	-	0.184	-	-	-
HCM Control Delay (s)	-	10.5	-	-	10.3	-	-	-
HCM Lane LOS	-	B	-	-	B	-	-	-
HCM 95th %tile Q(veh)	-	0.8	-	-	0.7	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	733	56	181	812	123	103	273	135	150	234	70
Future Volume (vph)	132	733	56	181	812	123	103	273	135	150	234	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.0		4.7	5.0		4.7	5.0		4.7	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	1812		1805	1810		1718	1763		1769	1881	1531
Flt Permitted	0.10	1.00		0.09	1.00		0.42	1.00		0.17	1.00	1.00
Satd. Flow (perm)	187	1812		169	1810		754	1763		324	1881	1531
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	139	772	59	191	855	129	108	287	142	158	246	74
RTOR Reduction (vph)	0	3	0	0	6	0	0	18	0	0	0	57
Lane Group Flow (vph)	139	828	0	191	979	0	108	411	0	158	246	17
Confl. Peds. (#/hr)	1					1	1		1	1		1
Confl. Bikes (#/hr)						1						1
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%	5%	2%	1%	2%	1%	3%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	47.0	40.7		55.6	45.0		29.3	23.0		29.3	23.0	23.0
Effective Green, g (s)	47.0	40.7		55.6	45.0		29.3	23.0		29.3	23.0	23.0
Actuated g/C Ratio	0.47	0.41		0.56	0.45		0.29	0.23		0.29	0.23	0.23
Clearance Time (s)	4.7	5.0		4.7	5.0		4.7	5.0		4.7	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	189	737		267	814		281	405		185	432	352
v/s Ratio Prot	0.05	0.46		c0.08	c0.54		0.02	c0.23		c0.05	0.13	
v/s Ratio Perm	0.30			0.32			0.09			0.20		0.01
v/c Ratio	0.74	1.12		0.72	1.20		0.38	1.02		0.85	0.57	0.05
Uniform Delay, d1	22.5	29.6		23.0	27.5		27.0	38.5		30.8	34.1	30.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.8	72.6		8.8	102.6		0.9	48.7		29.8	1.7	0.1
Delay (s)	36.3	102.2		31.7	130.1		27.8	87.2		60.5	35.8	30.0
Level of Service	D	F		C	F		C	F		E	D	C
Approach Delay (s)		92.8			114.1			75.3			43.1	
Approach LOS		F			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	90.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.4
Intersection Capacity Utilization	104.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	139	831	191	984	108	429	158	246	74
v/c Ratio	0.74	1.12	0.72	1.20	0.38	1.02	0.84	0.57	0.15
Control Delay	41.0	102.0	33.8	129.6	27.8	85.6	63.6	40.1	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	102.0	33.8	129.6	27.8	85.6	63.6	40.1	0.7
Queue Length 50th (ft)	39	~624	64	~767	48	~269	72	140	0
Queue Length 95th (ft)	#133	#872	138	#1013	89	#470	#161	220	0
Internal Link Dist (ft)		5185		2015		2675		2548	
Turn Bay Length (ft)	225		275		125		150		150
Base Capacity (vph)	189	740	296	819	283	422	187	432	487
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.12	0.65	1.20	0.38	1.02	0.84	0.57	0.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	850	10	365	1009	414	18	222	219	266	194	83
Future Volume (vph)	132	850	10	365	1009	414	18	222	219	266	194	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	3499		1805	1881	1529	1804	1881	1594	1805	1881	1578
Flt Permitted	0.13	1.00		0.12	1.00	1.00	0.63	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	240	3499		236	1881	1529	1194	1881	1594	668	1881	1578
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	140	904	11	388	1073	440	19	236	233	283	206	88
RTOR Reduction (vph)	0	1	0	0	0	148	0	0	182	0	0	65
Lane Group Flow (vph)	140	914	0	388	1073	292	19	236	51	283	206	23
Confl. Peds. (#/hr)	3		2	2		3	1		1	1		1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	5%	3%	0%	0%	1%	3%	0%	1%	0%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	36.6	30.1		48.1	37.1	37.1	21.5	19.0	19.0	29.5	23.0	23.0
Effective Green, g (s)	36.6	30.1		48.1	37.1	37.1	21.5	19.0	19.0	29.5	23.0	23.0
Actuated g/C Ratio	0.42	0.35		0.55	0.43	0.43	0.25	0.22	0.22	0.34	0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	211	1209		373	801	651	312	410	347	311	496	416
v/s Ratio Prot	0.05	0.26		c0.16	c0.57		0.00	0.13		c0.07	0.11	
v/s Ratio Perm	0.23			0.41		0.19	0.01		0.03	c0.24		0.01
v/c Ratio	0.66	0.76		1.04	1.34	0.45	0.06	0.58	0.15	0.91	0.42	0.06
Uniform Delay, d1	20.2	25.3		23.6	25.0	17.7	25.0	30.4	27.5	27.1	26.5	23.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.6	2.7		57.4	161.2	0.5	0.1	2.0	0.2	28.7	0.6	0.1
Delay (s)	27.8	28.0		81.0	186.2	18.2	25.0	32.4	27.7	55.8	27.1	24.0
Level of Service	C	C		F	F	B	C	C	C	E	C	C
Approach Delay (s)		28.0			125.9			29.9			40.7	
Approach LOS		C			F			C			D	

Intersection Summary			
HCM 2000 Control Delay	76.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	87.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	102.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	915	388	1073	440	19	236	233	283	206	88
v/c Ratio	0.64	0.73	1.01	1.30	0.54	0.05	0.66	0.47	0.98	0.40	0.16
Control Delay	29.0	28.7	71.2	167.7	10.2	19.2	40.3	7.4	77.0	29.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.0	28.7	71.2	167.7	10.2	19.2	40.3	7.4	77.0	29.0	0.6
Queue Length 50th (ft)	31	215	148	~727	58	7	116	0	119	82	0
Queue Length 95th (ft)	#113	328	#382	#1086	166	21	189	55	#269	165	1
Internal Link Dist (ft)		2015		1820			1014			2700	
Turn Bay Length (ft)	225		200			200		175	250		250
Base Capacity (vph)	218	1247	386	827	816	368	715	750	289	715	701
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.73	1.01	1.30	0.54	0.05	0.33	0.31	0.98	0.29	0.13

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	1099	57	51	1392	52	253	85	86	39	36	82
Future Volume (vph)	47	1099	57	51	1392	52	253	85	86	39	36	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.97			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1805	3480		1805	3520			1761			1702	
Flt Permitted	0.09	1.00		0.12	1.00			0.71			0.85	
Satd. Flow (perm)	163	3480		223	3520			1288			1471	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	1195	62	55	1513	57	275	92	93	42	39	89
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	10	0
Lane Group Flow (vph)	51	1257	0	55	1568	0	0	460	0	0	160	0
Confl. Peds. (#/hr)	1		8	8		1	6		1	1		6
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	1%	3%	0%	0%	0%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	46.6	46.6		46.6	46.6			36.7			36.7	
Effective Green, g (s)	46.6	46.6		46.6	46.6			36.7			36.7	
Actuated g/C Ratio	0.51	0.51		0.51	0.51			0.40			0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	83	1776		113	1796			517			591	
v/s Ratio Prot		0.36			c0.45							
v/s Ratio Perm	0.31			0.25				c0.36			0.11	
v/c Ratio	0.61	0.71		0.49	0.87			0.89			0.27	
Uniform Delay, d1	15.9	17.1		14.6	19.7			25.4			18.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	12.8	1.3		3.3	5.0			16.9			0.2	
Delay (s)	28.7	18.4		17.8	24.7			42.3			18.6	
Level of Service	C	B		B	C			D			B	
Approach Delay (s)		18.8			24.5			42.3			18.6	
Approach LOS		B			C			D			B	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	91.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	51	1257	55	1570	460	170
v/c Ratio	0.62	0.71	0.49	0.87	0.89	0.28
Control Delay	55.7	20.9	35.4	27.8	47.2	18.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.7	20.9	35.4	27.8	47.2	18.3
Queue Length 50th (ft)	23	314	22	451	254	61
Queue Length 95th (ft)	#92	407	#81	#632	#438	109
Internal Link Dist (ft)		1820		1191	423	675
Turn Bay Length (ft)	125		125			
Base Capacity (vph)	89	1907	121	1931	619	715
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.66	0.45	0.81	0.74	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	895	389	0	0	0	0	0	0	14	87	0
Future Volume (vph)	0	895	389	0	0	0	0	0	0	14	87	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		1.00									1.00	
Flpb, ped/bikes		1.00									1.00	
Frt		0.95									1.00	
Flt Protected		1.00									0.99	
Satd. Flow (prot)		3365									3586	
Flt Permitted		1.00									0.99	
Satd. Flow (perm)		3365									3586	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	973	423	0	0	0	0	0	0	15	95	0
RTOR Reduction (vph)	0	43	0	0	0	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	1353	0	0	0	0	0	0	0	0	96	0
Confl. Peds. (#/hr)							3					3
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA								Perm	NA	
Protected Phases		2									4	
Permitted Phases										4		
Actuated Green, G (s)		37.7									5.5	
Effective Green, g (s)		37.7									5.5	
Actuated g/C Ratio		0.73									0.11	
Clearance Time (s)		4.5									4.0	
Vehicle Extension (s)		3.0									3.0	
Lane Grp Cap (vph)		2453									381	
v/s Ratio Prot		c0.40										
v/s Ratio Perm											0.03	
v/c Ratio		0.55									0.25	
Uniform Delay, d1		3.2									21.2	
Progression Factor		1.00									1.00	
Incremental Delay, d2		0.3									0.3	
Delay (s)		3.4									21.6	
Level of Service		A									C	
Approach Delay (s)		3.4			0.0			0.0			21.6	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	51.7	Sum of lost time (s)	8.5
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SBT
Lane Group Flow (vph)	1396	110
v/c Ratio	0.53	0.21
Control Delay	4.0	20.0
Queue Delay	0.0	0.0
Total Delay	4.0	20.0
Queue Length 50th (ft)	67	13
Queue Length 95th (ft)	118	36
Internal Link Dist (ft)	1097	269
Turn Bay Length (ft)		
Base Capacity (vph)	3367	1616
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.41	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	910	0	0	0	0	0	505	144	0	0	0
Future Volume (vph)	40	910	0	0	0	0	0	505	144	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5						4.5	4.5			
Lane Util. Factor		0.95						0.95	1.00			
Frpb, ped/bikes		1.00						1.00	1.00			
Flpb, ped/bikes		1.00						1.00	1.00			
Frt		1.00						1.00	0.85			
Flt Protected		1.00						1.00	1.00			
Satd. Flow (prot)		3529						3539	1615			
Flt Permitted		1.00						1.00	1.00			
Satd. Flow (perm)		3529						3539	1615			
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	43	978	0	0	0	0	0	543	155	0	0	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	63	0	0	0
Lane Group Flow (vph)	0	1013	0	0	0	0	0	543	92	0	0	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	4%	2%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Turn Type	Perm	NA						NA	Perm			
Protected Phases		2						8				
Permitted Phases	2								8			
Actuated Green, G (s)		23.9						15.4	15.4			
Effective Green, g (s)		23.9						15.4	15.4			
Actuated g/C Ratio		0.49						0.32	0.32			
Clearance Time (s)		4.5						4.5	4.5			
Vehicle Extension (s)		3.0						3.0	3.0			
Lane Grp Cap (vph)		1746						1128	514			
v/s Ratio Prot								c0.15				
v/s Ratio Perm		0.29							0.06			
v/c Ratio		0.58						0.48	0.18			
Uniform Delay, d1		8.6						13.2	11.9			
Progression Factor		1.00						1.00	1.00			
Incremental Delay, d2		0.5						0.3	0.2			
Delay (s)		9.1						13.6	12.1			
Level of Service		A						B	B			
Approach Delay (s)		9.1			0.0			13.2			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	48.3	Sum of lost time (s)	9.0
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	NBT	NBR
Lane Group Flow (vph)	1021	543	155
v/c Ratio	0.59	0.49	0.27
Control Delay	10.6	16.1	8.4
Queue Delay	0.0	0.0	0.0
Total Delay	10.6	16.1	8.4
Queue Length 50th (ft)	93	62	12
Queue Length 95th (ft)	186	133	55
Internal Link Dist (ft)	460	568	
Turn Bay Length (ft)			175
Base Capacity (vph)	3350	2857	1321
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.30	0.19	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱							↰	↑↑	
Traffic Volume (vph)	0	910	68	0	0	0	0	0	0	182	617	0
Future Volume (vph)	0	910	68	0	0	0	0	0	0	182	617	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0							4.0	4.0	
Lane Util. Factor		0.95	1.00							1.00	0.95	
Frpb, ped/bikes		1.00	0.99							1.00	1.00	
Flpb, ped/bikes		1.00	1.00							1.00	1.00	
Frt		1.00	0.85							1.00	1.00	
Flt Protected		1.00	1.00							0.95	1.00	
Satd. Flow (prot)		3539	1595							1799	3574	
Flt Permitted		1.00	1.00							0.95	1.00	
Satd. Flow (perm)		3539	1595							1799	3574	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	958	72	0	0	0	0	0	0	192	649	0
RTOR Reduction (vph)	0	0	29	0	0	0	0	0	0	62	0	0
Lane Group Flow (vph)	0	958	43	0	0	0	0	0	0	130	649	0
Confl. Peds. (#/hr)									4	4		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type		NA	Perm							Perm	NA	
Protected Phases		2									4	
Permitted Phases			2							4		
Actuated Green, G (s)		25.5	25.5							20.1	20.1	
Effective Green, g (s)		25.5	25.5							20.1	20.1	
Actuated g/C Ratio		0.48	0.48							0.38	0.38	
Clearance Time (s)		4.0	4.0							4.0	4.0	
Vehicle Extension (s)		3.0	3.0							3.0	3.0	
Lane Grp Cap (vph)		1683	758							674	1340	
v/s Ratio Prot		c0.27									c0.18	
v/s Ratio Perm			0.03							0.07		
v/c Ratio		0.57	0.06							0.19	0.48	
Uniform Delay, d1		10.1	7.6							11.3	12.8	
Progression Factor		1.00	1.00							1.00	1.00	
Incremental Delay, d2		0.4	0.0							0.1	0.3	
Delay (s)		10.5	7.6							11.4	13.1	
Level of Service		B	A							B	B	
Approach Delay (s)		10.3			0.0			0.0			12.7	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	SBL	SBT
Lane Group Flow (vph)	958	72	192	649
v/c Ratio	0.58	0.09	0.26	0.49
Control Delay	12.5	4.5	8.2	15.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.5	4.5	8.2	15.3
Queue Length 50th (ft)	102	3	18	76
Queue Length 95th (ft)	215	23	70	166
Internal Link Dist (ft)	782			261
Turn Bay Length (ft)		100	150	
Base Capacity (vph)	3200	1448	1384	2707
Starvation Cap Reductn	0	0	0	130
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.05	0.14	0.25

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	665	0	0	0	0	0	322	51	0	0	0
Future Volume (vph)	420	665	0	0	0	0	0	322	51	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5						4.5				
Lane Util. Factor	0.91	0.91						0.95				
Frt	1.00	1.00						0.98				
Flt Protected	0.95	1.00						1.00				
Satd. Flow (prot)	1643	3381						3536				
Flt Permitted	0.95	1.00						1.00				
Satd. Flow (perm)	1643	3381						3536				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	452	715	0	0	0	0	0	346	55	0	0	0
RTOR Reduction (vph)	154	8	0	0	0	0	0	15	0	0	0	0
Lane Group Flow (vph)	226	779	0	0	0	0	0	386	0	0	0	0
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA						NA				
Protected Phases		8						6				
Permitted Phases	8											
Actuated Green, G (s)	21.4	21.4						10.9				
Effective Green, g (s)	21.4	21.4						10.9				
Actuated g/C Ratio	0.52	0.52						0.26				
Clearance Time (s)	4.5	4.5						4.5				
Vehicle Extension (s)	3.0	3.0						3.0				
Lane Grp Cap (vph)	851	1751						933				
v/s Ratio Prot								c0.11				
v/s Ratio Perm	0.14	0.23										
v/c Ratio	0.27	0.45						0.41				
Uniform Delay, d1	5.6	6.2						12.6				
Progression Factor	1.00	1.00						1.00				
Incremental Delay, d2	0.2	0.2						0.3				
Delay (s)	5.7	6.4						12.9				
Level of Service	A	A						B				
Approach Delay (s)		6.2			0.0			12.9			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	41.3	Sum of lost time (s)	9.0
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	NBT
Lane Group Flow (vph)	380	787	401
v/c Ratio	0.38	0.45	0.43
Control Delay	2.6	7.2	14.9
Queue Delay	0.1	0.0	0.0
Total Delay	2.7	7.2	14.9
Queue Length 50th (ft)	6	50	37
Queue Length 95th (ft)	42	106	91
Internal Link Dist (ft)		156	664
Turn Bay Length (ft)	75		
Base Capacity (vph)	1615	3307	3159
Starvation Cap Reductn	286	618	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.29	0.29	0.13

Intersection Summary

Intersection	
Int Delay, s/veh	18.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	91	409	365	137	143	164
Future Vol, veh/h	91	409	365	137	143	164
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	3	4	6	6	4
Mvmt Flow	99	445	397	149	155	178

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	397	0	-	0	1039	397
Stage 1	-	-	-	-	397	-
Stage 2	-	-	-	-	642	-
Critical Hdwy	4.12	-	-	-	6.46	6.24
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.218	-	-	-	3.554	3.336
Pot Cap-1 Maneuver	1162	-	-	-	251	648
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	517	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	1162	-	-	-	223	648
Mov Cap-2 Maneuver	-	-	-	-	223	-
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	459	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	77.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1162	-	-	-	343
HCM Lane V/C Ratio	0.085	-	-	-	0.973
HCM Control Delay (s)	8.4	0	-	-	77.5
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.3	-	-	-	10.6

Intersection	
Intersection Delay, s/veh	17.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	34	55	36	57	86	5	80	385	32	7	186	70
Future Vol, veh/h	34	55	36	57	86	5	80	385	32	7	186	70
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	3	0	4	0	0	0	3	1	0	0	1	0
Mvmt Flow	38	61	40	63	96	6	89	428	36	8	207	78
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	11.8	12.5	22.7	14.5
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	27%	39%	100%	0%
Vol Thru, %	0%	92%	44%	58%	0%	73%
Vol Right, %	0%	8%	29%	3%	0%	27%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	80	417	125	148	7	256
LT Vol	80	0	34	57	7	0
Through Vol	0	385	55	86	0	186
RT Vol	0	32	36	5	0	70
Lane Flow Rate	89	463	139	164	8	284
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.161	0.76	0.254	0.303	0.015	0.484
Departure Headway (Hd)	6.503	5.906	6.596	6.642	6.913	6.126
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	548	607	547	544	521	583
Service Time	4.288	3.69	4.603	4.642	4.613	3.925
HCM Lane V/C Ratio	0.162	0.763	0.254	0.301	0.015	0.487
HCM Control Delay	10.5	25.1	11.8	12.5	9.7	14.6
HCM Lane LOS	B	D	B	B	A	B
HCM 95th-tile Q	0.6	6.9	1	1.3	0	2.6

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	65	3	25	0	5	14	26	324	11	15	262	129
Future Vol, veh/h	65	3	25	0	5	14	26	324	11	15	262	129
Conflicting Peds, #/hr	4	0	0	0	0	4	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	0	0
Mvmt Flow	69	3	27	0	5	15	28	345	12	16	279	137

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	801	793	349	800	856	355	418	0	0	356	0	0
Stage 1	381	381	-	406	406	-	-	-	-	-	-	-
Stage 2	420	412	-	394	450	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	305	323	699	306	297	693	1152	-	-	1214	-	-
Stage 1	645	617	-	626	601	-	-	-	-	-	-	-
Stage 2	615	598	-	635	575	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	282	307	698	281	282	690	1152	-	-	1209	-	-
Mov Cap-2 Maneuver	282	307	-	281	282	-	-	-	-	-	-	-
Stage 1	624	605	-	607	583	-	-	-	-	-	-	-
Stage 2	576	580	-	597	564	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.1	12.5	0.6	0.3
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1152	-	-	337	500	1209	-	-
HCM Lane V/C Ratio	0.024	-	-	0.294	0.04	0.013	-	-
HCM Control Delay (s)	8.2	0	-	20.1	12.5	8	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.2	0.1	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	218	134	131	364	204	132	275	86	189	379	11
Future Volume (vph)	10	218	134	131	364	204	132	275	86	189	379	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1803	1845	1599	1787	3505	1561	1787	1881	1568	3467	1873	
Flt Permitted	0.53	1.00	1.00	0.40	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1000	1845	1599	754	3505	1561	1787	1881	1568	3467	1873	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	227	140	136	379	212	138	286	90	197	395	11
RTOR Reduction (vph)	0	0	84	0	0	141	0	0	53	0	1	0
Lane Group Flow (vph)	10	227	56	136	379	72	138	286	37	197	405	0
Confl. Peds. (#/hr)	3					3	3		1	1		3
Heavy Vehicles (%)	0%	3%	1%	1%	3%	1%	1%	1%	2%	1%	1%	0%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5	2	3	1	6		3	8	1	7	4	
Permitted Phases	2		2	6		6			8			
Actuated Green, G (s)	19.4	18.4	29.1	29.5	24.5	24.5	10.7	22.7	29.8	8.6	20.6	
Effective Green, g (s)	19.4	18.4	29.1	29.5	24.5	24.5	10.7	22.7	29.8	8.6	20.6	
Actuated g/C Ratio	0.27	0.25	0.40	0.41	0.34	0.34	0.15	0.31	0.41	0.12	0.28	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	277	466	727	406	1179	525	262	586	728	409	529	
v/s Ratio Prot	0.00	c0.12	0.01	c0.03	0.11		c0.08	0.15	0.00	0.06	c0.22	
v/s Ratio Perm	0.01		0.02	0.10		0.05			0.02			
v/c Ratio	0.04	0.49	0.08	0.33	0.32	0.14	0.53	0.49	0.05	0.48	0.77	
Uniform Delay, d1	19.7	23.2	13.5	14.4	18.0	16.8	28.7	20.3	13.0	30.0	23.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.8	0.0	0.5	0.2	0.1	1.9	0.6	0.0	0.9	6.5	
Delay (s)	19.7	24.0	13.6	14.9	18.1	16.9	30.6	21.0	13.0	30.9	30.4	
Level of Service	B	C	B	B	B	B	C	C	B	C	C	
Approach Delay (s)		20.0			17.2			22.2			30.6	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	72.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	10	227	140	136	379	213	138	286	90	197	406
v/c Ratio	0.03	0.58	0.18	0.36	0.31	0.31	0.50	0.47	0.12	0.46	0.74
Control Delay	17.5	33.2	3.5	20.4	20.2	5.3	37.1	21.4	3.0	35.8	31.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	33.2	3.5	20.4	20.2	5.3	37.1	21.4	3.0	35.8	31.6
Queue Length 50th (ft)	3	87	0	38	57	0	54	94	0	40	152
Queue Length 95th (ft)	14	186	32	96	141	54	132	177	21	91	288
Internal Link Dist (ft)		693			446			553			1860
Turn Bay Length (ft)	125		200	175		150	225		125	250	
Base Capacity (vph)	399	851	839	383	1617	834	372	1036	724	464	892
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.27	0.17	0.36	0.23	0.26	0.37	0.28	0.12	0.42	0.46

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	128	297	293	306	167	340	1717	157	76	1319	50
Future Volume (vph)	67	128	297	293	306	167	340	1717	157	76	1319	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1804	1827	1590	1719	3317		1787	3314		1736	3331	
Flt Permitted	0.22	1.00	1.00	0.45	1.00		0.06	1.00		0.06	1.00	
Satd. Flow (perm)	417	1827	1590	807	3317		112	3314		117	3331	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	72	138	319	315	329	180	366	1846	169	82	1418	54
RTOR Reduction (vph)	0	0	31	0	54	0	0	4	0	0	2	0
Lane Group Flow (vph)	72	138	288	315	455	0	366	2011	0	82	1470	0
Confl. Peds. (#/hr)	7					7			2	2		
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	4%	1%	5%	2%	3%	1%	7%	12%	4%	8%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	26.8	21.7	46.3	33.6	25.1		91.5	74.9		74.5	62.4	
Effective Green, g (s)	26.8	21.7	46.3	33.6	25.1		91.5	74.9		74.5	62.4	
Actuated g/C Ratio	0.20	0.16	0.34	0.25	0.18		0.67	0.55		0.55	0.46	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	5.0		4.5	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	134	292	595	256	613		379	1829		208	1531	
v/s Ratio Prot	0.02	0.08	0.09	c0.08	0.14		c0.17	c0.61		0.04	0.44	
v/s Ratio Perm	0.09		0.09	c0.23			0.47			0.18		
v/c Ratio	0.54	0.47	0.48	1.23	0.74		0.97	1.10		0.39	0.96	
Uniform Delay, d1	46.0	51.8	35.3	50.6	52.2		45.7	30.4		27.6	35.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.1	1.2	0.6	133.0	4.8		36.9	53.8		1.2	14.6	
Delay (s)	50.1	53.0	35.9	183.6	57.1		82.6	84.2		28.9	50.1	
Level of Service	D	D	D	F	E		F	F		C	D	
Approach Delay (s)		42.3			105.5			84.0			49.0	
Approach LOS		D			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	72.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	135.7	Sum of lost time (s)	18.5
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	72	138	319	315	509	366	2015	82	1472
v/c Ratio	0.48	0.49	0.56	1.28	0.76	0.96	1.09	0.39	0.95
Control Delay	49.8	57.7	31.9	190.2	53.2	78.0	80.8	25.1	49.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	57.7	31.9	190.2	53.2	78.0	80.8	25.1	49.8
Queue Length 50th (ft)	49	112	183	~326	200	268	~1053	22	645
Queue Length 95th (ft)	91	179	273	#532	264	#516	#1312	78	#902
Internal Link Dist (ft)		446			2921		4483		2738
Turn Bay Length (ft)	175			150		150		175	
Base Capacity (vph)	151	493	565	247	992	382	1844	216	1543
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.28	0.56	1.28	0.51	0.96	1.09	0.38	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Intersection Delay, s/veh	20.5
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	170	56	220	235	131	223
Future Vol, veh/h	170	56	220	235	131	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	3	9	5	9	4	4
Mvmt Flow	185	61	239	255	142	242
Number of Lanes	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	11.7	27.4	17.3
HCM LOS	B	D	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	37%	0%	0%	48%
Vol Thru, %	0%	100%	0%	52%
Vol Right, %	63%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	354	170	56	455
LT Vol	131	0	0	220
Through Vol	0	170	0	235
RT Vol	223	0	56	0
Lane Flow Rate	385	185	61	495
Geometry Grp	2	7	7	5
Degree of Util (X)	0.608	0.332	0.099	0.793
Departure Headway (Hd)	5.693	6.465	5.855	5.774
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	631	554	609	623
Service Time	3.758	4.236	3.626	3.829
HCM Lane V/C Ratio	0.61	0.334	0.1	0.795
HCM Control Delay	17.3	12.5	9.3	27.4
HCM Lane LOS	C	B	A	D
HCM 95th-tile Q	4.1	1.4	0.3	7.7

Intersection	
Int Delay, s/veh	16.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	418	32	422	313	15	359
Future Vol, veh/h	418	32	422	313	15	359
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	3	40	2	5	0	3
Mvmt Flow	449	34	454	337	16	386

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	484	0	1711	467
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	1244	-
Critical Hdwy	-	-	4.12	-	6.4	6.23
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.327
Pot Cap-1 Maneuver	-	-	1079	-	101	594
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	274	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1079	-	59	594
Mov Cap-2 Maneuver	-	-	-	-	59	-
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	159	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.2	56.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	436	-	-	1079	-
HCM Lane V/C Ratio	0.922	-	-	0.421	-
HCM Control Delay (s)	56.9	-	-	10.7	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	10.3	-	-	2.1	-

Intersection	
Intersection Delay, s/veh	45.6
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	67	27	129	142	99	57	386	110	41	231	4
Future Vol, veh/h	11	67	27	129	142	99	57	386	110	41	231	4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	0	0	0	1	1	3	0	1	0	0	2	0
Mvmt Flow	13	76	31	147	161	113	65	439	125	47	263	5
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	13.7	17.9	83.8	18.5
HCM LOS	B	C	F	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	78%	0%	71%	0%	59%	0%	98%
Vol Right, %	0%	22%	0%	29%	0%	41%	0%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	57	496	11	94	129	241	41	235
LT Vol	57	0	11	0	129	0	41	0
Through Vol	0	386	0	67	0	142	0	231
RT Vol	0	110	0	27	0	99	0	4
Lane Flow Rate	65	564	12	107	147	274	47	267
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.137	1.091	0.03	0.24	0.328	0.554	0.102	0.552
Departure Headway (Hd)	7.621	6.968	9.247	8.518	8.426	7.614	8.253	7.76
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	473	524	390	424	430	477	437	467
Service Time	5.321	4.668	6.947	6.218	6.126	5.314	5.953	5.46
HCM Lane V/C Ratio	0.137	1.076	0.031	0.252	0.342	0.574	0.108	0.572
HCM Control Delay	11.5	92.1	12.2	13.9	15.2	19.4	11.9	19.6
HCM Lane LOS	B	F	B	B	C	C	B	C
HCM 95th-tile Q	0.5	17.8	0.1	0.9	1.4	3.3	0.3	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	210	0	505	0	380	162	276	356	0
Future Volume (vph)	0	0	0	210	0	505	0	380	162	276	356	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0		5.0	5.0	5.0	5.0	
Lane Util. Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes					1.00	0.98		1.00	1.00	1.00	1.00	
Flpb, ped/bikes					0.99	1.00		1.00	1.00	1.00	1.00	
Frt					1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1783	1559		1881	1599	1805	1881	
Flt Permitted					0.76	1.00		1.00	1.00	0.28	1.00	
Satd. Flow (perm)					1421	1559		1881	1599	532	1881	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	219	0	526	0	396	169	288	371	0
RTOR Reduction (vph)	0	0	0	0	0	305	0	0	115	0	0	0
Lane Group Flow (vph)	0	0	0	0	219	221	0	396	54	288	371	0
Confl. Peds. (#/hr)	4		10	10		4	3					3
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	1%	1%	0%	1%	0%
Turn Type				Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)					14.0	14.0		17.3	17.3	30.5	30.5	
Effective Green, g (s)					14.0	14.0		17.3	17.3	30.5	30.5	
Actuated g/C Ratio					0.26	0.26		0.32	0.32	0.56	0.56	
Clearance Time (s)					5.0	5.0		5.0	5.0	5.0	5.0	
Vehicle Extension (s)					2.0	2.0		3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)					365	400		597	507	489	1052	
v/s Ratio Prot								0.21		c0.09	0.20	
v/s Ratio Perm					c0.15	0.14			0.03	c0.24		
v/c Ratio					0.60	0.55		0.66	0.11	0.59	0.35	
Uniform Delay, d1					17.8	17.5		16.1	13.1	7.7	6.6	
Progression Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2					1.8	0.9		2.8	0.1	1.2	0.2	
Delay (s)					19.6	18.5		18.9	13.2	8.9	6.8	
Level of Service					B	B		B	B	A	A	
Approach Delay (s)		0.0			18.8			17.2			7.7	
Approach LOS		A			B			B			A	

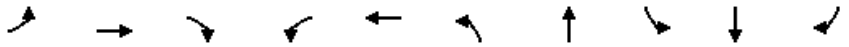
Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	54.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	219	526	396	169	288	371
v/c Ratio	0.61	0.75	0.68	0.28	0.59	0.36
Control Delay	27.0	12.6	24.1	4.5	12.9	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	12.6	24.1	4.5	12.9	8.7
Queue Length 50th (ft)	64	31	111	0	43	58
Queue Length 95th (ft)	138	134	226	36	105	136
Internal Link Dist (ft)	931		2881			465
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	593	891	860	823	513	1112
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.59	0.46	0.21	0.56	0.33

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	20	184	14	33	23	368	1922	16	14	1465	321
Future Volume (vph)	273	20	184	14	33	23	368	1922	16	14	1465	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	6.0		5.0	6.0	5.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1697	1714	1560	1804	1721		1787	3467		1805	3374	1548
Flt Permitted	0.49	0.49	1.00	0.65	1.00		0.06	1.00		0.06	1.00	1.00
Satd. Flow (perm)	882	877	1560	1239	1721		104	3467		113	3374	1548
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	290	21	196	15	35	24	391	2045	17	15	1559	341
RTOR Reduction (vph)	0	0	61	0	19	0	0	0	0	0	0	101
Lane Group Flow (vph)	154	157	135	15	40	0	391	2062	0	15	1559	240
Confl. Peds. (#/hr)	1		1	1		1	2		1	1		2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	1%	0%	3%	0%	0%	7%	1%	4%	0%	0%	7%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	8	1	7	4		1	6		5	2	3
Permitted Phases	8		8	4			6			2		2
Actuated Green, G (s)	25.1	25.1	43.9	13.3	11.0		98.4	90.3		70.4	67.3	76.4
Effective Green, g (s)	25.1	25.1	43.9	13.3	11.0		98.4	90.3		70.4	67.3	76.4
Actuated g/C Ratio	0.19	0.19	0.33	0.10	0.08		0.73	0.67		0.52	0.50	0.57
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	6.0		5.0	6.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	219	220	567	132	140		402	2327		98	1688	879
v/s Ratio Prot	0.05	c0.05	0.05	0.00	0.02		c0.19	0.59		0.00	0.46	0.02
v/s Ratio Perm	0.08	c0.08	0.04	0.01			c0.52			0.08		0.14
v/c Ratio	0.70	0.71	0.24	0.11	0.28		0.97	0.89		0.15	0.92	0.27
Uniform Delay, d1	49.9	51.3	33.1	55.1	58.0		45.6	17.9		21.1	31.2	14.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.8	10.4	0.2	0.4	1.1		37.5	4.5		0.7	8.9	0.2
Delay (s)	59.7	61.8	33.3	55.4	59.2		83.0	22.4		21.9	40.1	15.0
Level of Service	E	E	C	E	E		F	C		C	D	B
Approach Delay (s)		50.1			58.4			32.1			35.5	
Approach LOS		D			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	134.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	154	157	196	15	59	391	2062	15	1559	341
v/c Ratio	0.77	0.78	0.33	0.09	0.38	0.93	0.85	0.09	0.92	0.34
Control Delay	73.8	75.1	16.9	44.1	45.2	69.5	20.9	9.1	40.9	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.8	75.1	16.9	44.1	45.2	69.5	20.9	9.1	40.9	5.2
Queue Length 50th (ft)	124	126	54	11	30	269	497	3	612	35
Queue Length 95th (ft)	#198	#206	126	31	75	#520	#1139	11	#895	97
Internal Link Dist (ft)		931			261		4040		4483	
Turn Bay Length (ft)	150		125	150		100		150		275
Base Capacity (vph)	201	306	592	171	433	419	2440	169	1687	993
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.51	0.33	0.09	0.14	0.93	0.85	0.09	0.92	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↱	
Traffic Vol, veh/h	5	20	2	44	15	57	8	333	92	68	181	11
Future Vol, veh/h	5	20	2	44	15	57	8	333	92	68	181	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	5	0
Mvmt Flow	5	21	2	45	15	59	8	343	95	70	187	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	776	787	192	751	745	391	198	0	0	438	0	0
Stage 1	332	332	-	407	407	-	-	-	-	-	-	-
Stage 2	444	455	-	344	338	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	317	326	855	330	345	662	1387	-	-	1133	-	-
Stage 1	686	648	-	625	601	-	-	-	-	-	-	-
Stage 2	597	572	-	676	644	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	264	303	855	296	321	662	1387	-	-	1133	-	-
Mov Cap-2 Maneuver	264	303	-	296	321	-	-	-	-	-	-	-
Stage 1	681	608	-	620	596	-	-	-	-	-	-	-
Stage 2	526	567	-	611	604	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.8	17.3	0.1	2.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1387	-	-	309	412	1133	-	-
HCM Lane V/C Ratio	0.006	-	-	0.09	0.29	0.062	-	-
HCM Control Delay (s)	7.6	0	-	17.8	17.3	8.4	-	-
HCM Lane LOS	A	A	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	1.2	0.2	-	-

Intersection	
Intersection Delay, s/veh	40.2
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	92	48	8	137	8	169	529	11	4	245	32
Future Vol, veh/h	29	92	48	8	137	8	169	529	11	4	245	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	3	1	0	0	0	0	2	1	0	0	1	3
Mvmt Flow	32	100	52	9	149	9	184	575	12	4	266	35
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	14.2	14	60.6	18.7
HCM LOS	B	B	F	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	17%	5%	100%	0%
Vol Thru, %	0%	98%	54%	90%	0%	88%
Vol Right, %	0%	2%	28%	5%	0%	12%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	169	540	169	153	4	277
LT Vol	169	0	29	8	4	0
Through Vol	0	529	92	137	0	245
RT Vol	0	11	48	8	0	32
Lane Flow Rate	184	587	184	166	4	301
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.355	1.046	0.36	0.332	0.009	0.575
Departure Headway (Hd)	6.956	6.413	7.233	7.358	7.625	7.047
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	520	569	500	492	472	515
Service Time	4.656	4.113	5.233	5.358	5.325	4.747
HCM Lane V/C Ratio	0.354	1.032	0.368	0.337	0.008	0.584
HCM Control Delay	13.4	75.4	14.2	14	10.4	18.8
HCM Lane LOS	B	F	B	B	B	C
HCM 95th-tile Q	1.6	16.5	1.6	1.4	0	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	265	204	326	754	0	0	0	0	122	0	192
Future Volume (vph)	0	265	204	326	754	0	0	0	0	122	0	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1810	1545	1701	1881						1805	1583
Flt Permitted		1.00	1.00	0.43	1.00						0.95	1.00
Satd. Flow (perm)		1810	1545	779	1881						1805	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	288	222	354	820	0	0	0	0	133	0	209
RTOR Reduction (vph)	0	0	137	0	0	0	0	0	0	0	0	85
Lane Group Flow (vph)	0	288	85	354	820	0	0	0	0	0	133	124
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	0%	5%	2%	6%	1%	0%	0%	0%	0%	0%	0%	2%
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		18.1	18.1	29.3	29.3						9.7	9.7
Effective Green, g (s)		18.1	18.1	29.3	29.3						9.7	9.7
Actuated g/C Ratio		0.37	0.37	0.60	0.60						0.20	0.20
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		668	570	582	1124						357	313
v/s Ratio Prot		0.16		0.08	c0.44							
v/s Ratio Perm			0.05	0.29							0.07	c0.08
v/c Ratio		0.43	0.15	0.61	0.73						0.37	0.40
Uniform Delay, d1		11.6	10.3	5.5	7.0						17.0	17.1
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.1	1.8	2.4						0.7	0.8
Delay (s)		12.0	10.4	7.3	9.4						17.7	17.9
Level of Service		B	B	A	A						B	B
Approach Delay (s)		11.3			8.8			0.0			17.8	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	49.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	288	222	354	820	133	209
v/c Ratio	0.44	0.32	0.61	0.73	0.37	0.53
Control Delay	14.3	3.6	11.3	12.7	21.7	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	3.6	11.3	12.7	21.7	15.5
Queue Length 50th (ft)	58	1	41	134	34	26
Queue Length 95th (ft)	128	36	104	330	79	81
Internal Link Dist (ft)	1380			488	462	
Turn Bay Length (ft)		75	150			200
Base Capacity (vph)	906	880	577	1373	1129	1030
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.25	0.61	0.60	0.12	0.20

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	273	0	0	705	202	379	1	239	0	0	0
Future Volume (vph)	116	273	0	0	705	202	379	1	239	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.85				
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)	1736	1810			1827	1515	1770	1554				
Flt Permitted	0.12	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	220	1810			1827	1515	1770	1554				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	126	297	0	0	766	220	412	1	260	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	58	0	176	0	0	0	0
Lane Group Flow (vph)	126	297	0	0	766	162	412	85	0	0	0	0
Confl. Peds. (#/hr)	3		1	1		3						
Heavy Vehicles (%)	4%	5%	0%	0%	4%	4%	2%	0%	4%	0%	0%	0%
Turn Type	pm+pt	NA			NA	Perm	Perm	NA				
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	36.6	36.6			28.2	28.2	22.3	22.3				
Effective Green, g (s)	36.6	36.6			28.2	28.2	22.3	22.3				
Actuated g/C Ratio	0.53	0.53			0.41	0.41	0.32	0.32				
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	191	961			747	620	572	502				
v/s Ratio Prot	c0.03	0.16			c0.42			0.05				
v/s Ratio Perm	0.32					0.11	c0.23					
v/c Ratio	0.66	0.31			1.03	0.26	0.72	0.17				
Uniform Delay, d1	14.8	9.1			20.4	13.5	20.5	16.7				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	8.0	0.2			39.6	0.2	4.4	0.2				
Delay (s)	22.8	9.2			59.9	13.7	25.0	16.8				
Level of Service	C	A			E	B	C	B				
Approach Delay (s)		13.3			49.6			21.8			0.0	
Approach LOS		B			D			C			A	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	68.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	126	297	766	220	412	261
v/c Ratio	0.58	0.31	1.01	0.32	0.71	0.38
Control Delay	24.4	11.9	61.3	11.2	27.4	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	11.9	61.3	11.2	27.4	4.1
Queue Length 50th (ft)	25	66	~368	33	153	0
Queue Length 95th (ft)	#88	149	#687	99	241	42
Internal Link Dist (ft)		488	979			520
Turn Bay Length (ft)	150			100		
Base Capacity (vph)	216	1011	758	685	881	905
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.29	1.01	0.32	0.47	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	30

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	394	113	9	485	246	19
Future Vol, veh/h	394	113	9	485	246	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	75	-	150	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	16	0	5	0	8
Mvmt Flow	448	128	10	551	280	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	576	0	1084	512
Stage 1	-	-	-	-	512	-
Stage 2	-	-	-	-	572	-
Critical Hdwy	-	-	4.1	-	6.4	6.28
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.372
Pot Cap-1 Maneuver	-	-	1007	-	~ 242	550
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	569	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1007	-	~ 240	550
Mov Cap-2 Maneuver	-	-	-	-	~ 240	-
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	563	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	143.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	240	550	-	-	1007	-
HCM Lane V/C Ratio	1.165	0.039	-	-	0.01	-
HCM Control Delay (s)	153.2	11.8	-	-	8.6	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	13	0.1	-	-	0	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	199	417	413	238	4
Future Vol, veh/h	9	199	417	413	238	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	4	1	0	1	0
Mvmt Flow	10	221	463	459	264	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1653	267	269	0	-	0
Stage 1	267	-	-	-	-	-
Stage 2	1386	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.209	-	-	-
Pot Cap-1 Maneuver	109	767	1300	-	-	-
Stage 1	782	-	-	-	-	-
Stage 2	234	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	57	767	1300	-	-	-
Mov Cap-2 Maneuver	57	-	-	-	-	-
Stage 1	782	-	-	-	-	-
Stage 2	122	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.3	4.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1300	-	498	-	-
HCM Lane V/C Ratio	0.356	-	0.464	-	-
HCM Control Delay (s)	9.3	0	18.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	1.6	-	2.4	-	-

Appendix F Alternatives Analysis

REDMOND
Transportation System Plan

Date:	May 15, 2019	Project #: 17720 ODOT PA #27456
To:	Redmond Project Advisory Committee (PAC) Redmond TSP Project Management Team (PMT)	
Subject:	Alternatives Analysis (Tech Memo #6)	

Per Task 4.2 of the scope for the Redmond Transportation System Plan (TSP) and our work to-date on the project, this technical memorandum presents alternative solutions that address deficiencies and needs identified in the Existing Conditions analyses, Future No Build analyses, and by the Project Management Team (PMT), Project Advisory Committee (PAC), and via comments received at various venues from the public, including an Open House. The enclosed memorandum includes:

- A brief summary of the key needs identified in the Future No Build Analyses;
- Recommended Projects for Inclusion into the TSP, by mode, including:
    - Vehicular Needs
        - Functional Classification system
        - Street Cross-Sections
        - Street improvements
        - Key Intersection Improvement Locations
        - Key Safety Improvements
    - Pedestrian Needs
        - Pathway Improvements for both pedestrians and cyclists
        - Sidewalk Improvements
    - Bike Needs
        - On-Street and Off-Street Improvements
    - Transit System Needs
    - Freight Needs
    - Airport Master Plan

SUMMARY OF FUTURE NEEDS

As documented in *Technical Memorandum #5: Future Needs Analysis*, key transportation system needs within the City of Redmond includes:

- A number of primary street corridors are anticipated to experience increased congestion in the future, such as along OR 126 within the Urban Growth Boundary (UGB), Maple Avenue between US 97 and Northwest Way, Yew Avenue between Airport Way and S 27th Street and US 97 south of SW Glacier Avenue.
    - Multimodal circulation and capacity improvements are needed to support continued economic growth and vitality within the city and to offer a variety of route and mode choices to help alleviate this congestion.
    - The City and ODOT are currently engaged in the South US 97 corridor planning efforts to address long-term transportation and land use needs along US 97 to the south of Glacier Avenue. At this point, a preferred alternative for this corridor is under review.
- Approximately 50 arterial and collector intersections are anticipated to need geometric and/or traffic control modifications in the next twenty years to maintain a desired quality of service for future users.
- A number of streets within the City lack sidewalks. The City should consider prioritization of new sidewalks and pathways that connect neighborhoods to schools, commercial areas, and other key destinations – particularly in the poorer areas of the community.
- "Lower stress" bike facilities are needed to support commuting, recreational, and personal travel.
- The bicycle trail system should be expanded to encourage greater access, including inter agency coordination.
- Increased transit options are needed to facilitate travel throughout the city.

CONSIDERATION OF IMPROVEMENTS

As outlined in the *Goals and Evaluation Approach* memo (January 2018), a preliminary list of potential multimodal improvements was screened by the PMT relative to construction feasibility, financial feasibility, and the ability of an improvement to address a documented transportation need. A refined set of improvement options were forwarded on for evaluation relative to key performance criteria. Appendix A provides the rating of the refined improvement categories versus the evaluation criteria. Based on this evaluation, the PMT identified a recommended set of multimodal projects for inclusion into the TSP. A discussion of these improvements, by mode, is provided below.

VEHICULAR NEEDS

The preliminary screening evaluation identified arterial and collector streets that experience or are projected to experience traffic congestion and delay and/or are lacking pedestrian and bicycle facilities that comfortably serve a broad range of users. To meet the identified street system needs, the TSP focuses strategies that improve connections between existing neighborhoods, employment, and commercial areas; provide connections to newly developed areas; improve safety for all travelers; and increase the efficiency of the existing system.

Functional Classification of Streets

The City's street functional classification system organizes the roadway network as a balanced hierarchy of mobility and access to, through, and between different types of land uses. Some factors that are considered in setting a roadway's functional classification are average daily traffic (ADT) volumes, street connectivity, spacing of streets, and the mix and amounts of different travel modes on a typical segment (e.g., bikes and cars). As the community continues to grow and mature, the City will revisit functional classifications periodically to ensure that particular street classifications are still appropriate.

The PMT evaluated the City's previously adopted functional classification system and simplified and combined some of the categories that have seldomly been applied. The new simplified system of streets will provide more certainty for both private development investment expectations as well as for City construction process. Per the PMT discussions, the functional classification system will categorize streets in the city as:

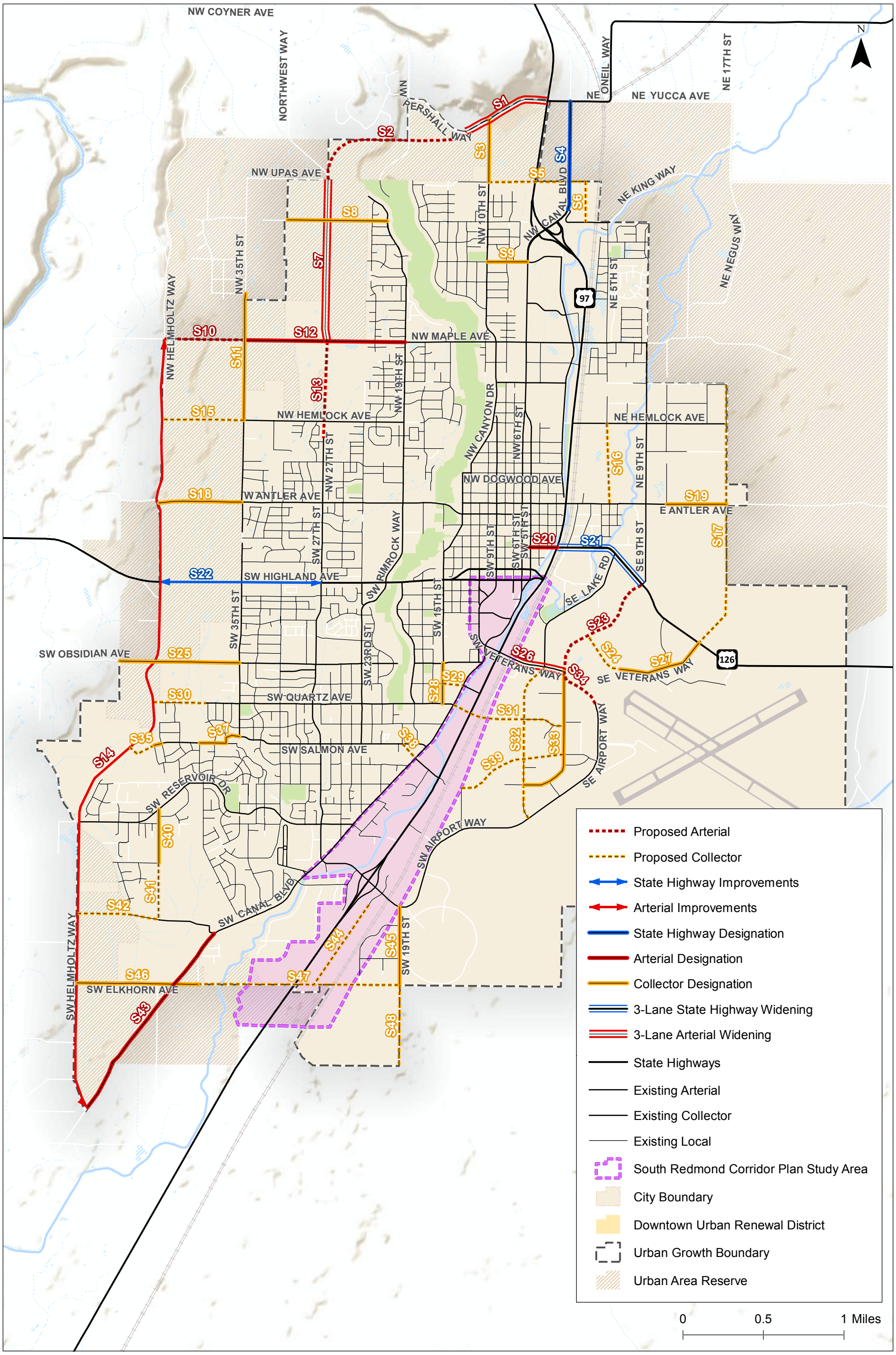
- Standard Local Residential
- Industrial Street
- Minor Collector
- Major Collector
- Minor Arterial

In addition to recommending changes to the functional classification system, the PMT also identified a number of streets that needed a change in designation is desired to reflect the intended function and form of the roadway, respond to land use patterns and economic growth opportunities, and provide further guidance to the operation and construction of all streets and roads within the City's UGB.

Based on this review, the PMT identified twenty corridors in need of modification of functional classification. These corridors are summarized in Table 1 below and shown in Figure 1.

Table 1: Identified Street Classification Modifications

Map ID	Corridor	S-W Limit	E-N Limit	Proposed Designation
S3	NW 10th St	NW Upas Way	NW Pershall Way	Collector Designation
S4	NW Canal Blvd	NE King Way	NE Oneil Way	State Highway Designation
S8	NW Spruce Ave	NW 33rd	NW 22nd	Collector Designation
S9	NW Quince Ave	NW 10th St	NW 6th St	Collector Designation
S11	NW 35th St	NW Hemlock	NW Oak Ave	Collector Designation
S12	NW Maple Ave	NW 35th St	NW 19th St	Arterial Designation
S18	W Antler Ave	SW Helmholtz Way	SW 35th St	Collector Designation
S19	E Antler Ave	11th Street	NE 17th St	Collector Designation
S20	SW Evergreen Ave	SW 6th St	US 97	Arterial Designation
S25	SW Obsidian Ave	UGB	SW 35th St	Collector Designation
S27	SE Veterans Way	east of SE Airport Way	OR 126	Collector Designation
S28	SW 15th St	SW Quartz	SW Obsidian Ave	Collector Designation
S29	SW Pumice Ave	SW 15th St	SW Canal Blvd	Proposed Collector
S33	SE 9th St	SE 6th St	SE Veterans Way	Collector Designation
S35	SW Salmon Ave	SW Forked Horn Butte	SW 43rd St	Collector Designation
S37	SW Salmon Ave	SW 39th St	SW 35th St	Collector Designation
S40	SW 43rd St	SW Yew Ave	SW Reservoir Dr	Collector Designation
S43	SW Canal Blvd	SW Helmholtz Way	SW Badger Ave	Arterial Designation
S45	SW 19th St	SW Elkhorn Ave	SW Airport Way	Collector Designation
S46	SW Elkhorn Ave	SW Helmholtz Way	SW 39th St	Collector Designation



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Future Corridor Alternatives
Redmond, Oregon

Figure **1**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

Street Design Standards

Street design standards provide information on how streets within each of the functional classifications "look and feel." The City's Street Design Standards identify how existing streets can be modified and new streets can be constructed to accommodate the needs of people with disabilities, riding bicycles, using transit, walking, driving automobiles, and moving freight. In the past, most street design standards were primarily oriented toward moving vehicular traffic, providing rudimentary bike lanes and sidewalks for pedestrians. The PMT has recommended a number of modifications to the design standards to ensure streets provide comprehensive and integrated transportation networks that serve all modes of transportation and create quality facilities that invite people of all ages and abilities to pursue active transportation.

Redmond Engineering Standards maintain more specific design elements for each of these sections, including applicable variances and pavement design requirements. The typical sections identified by the PMT and presented herein are intended to provide general guidance on right-of-way width requirements, number and type of lanes, pedestrian facilities and bicycle facilities by functional classification type. In some cases, additional features may be added on a case-by-case basis and per the direction of the City Engineer, such as wider sidewalks, multi-use paths, protected bicycle facilities, protected parking bays, or medians.

The typical sections are illustrated in Figure 2 through Figure 6.

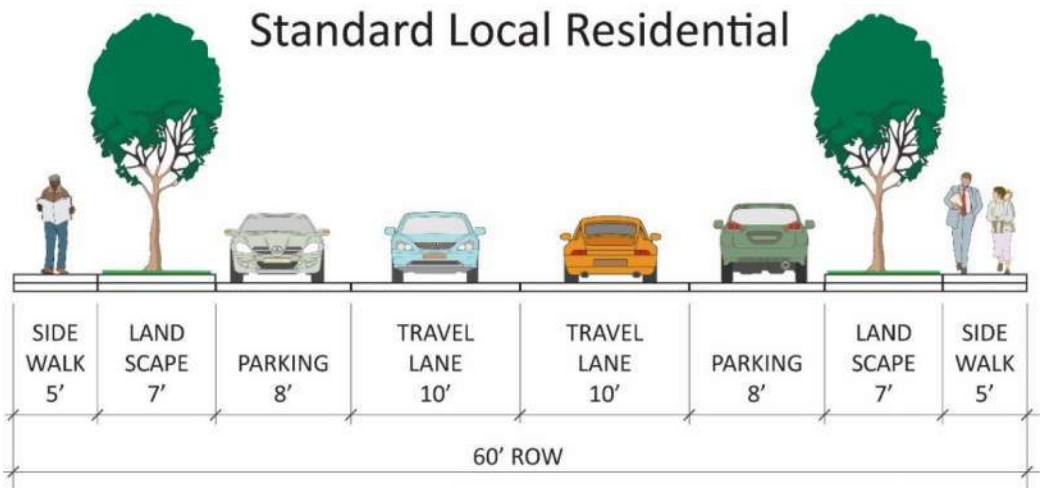
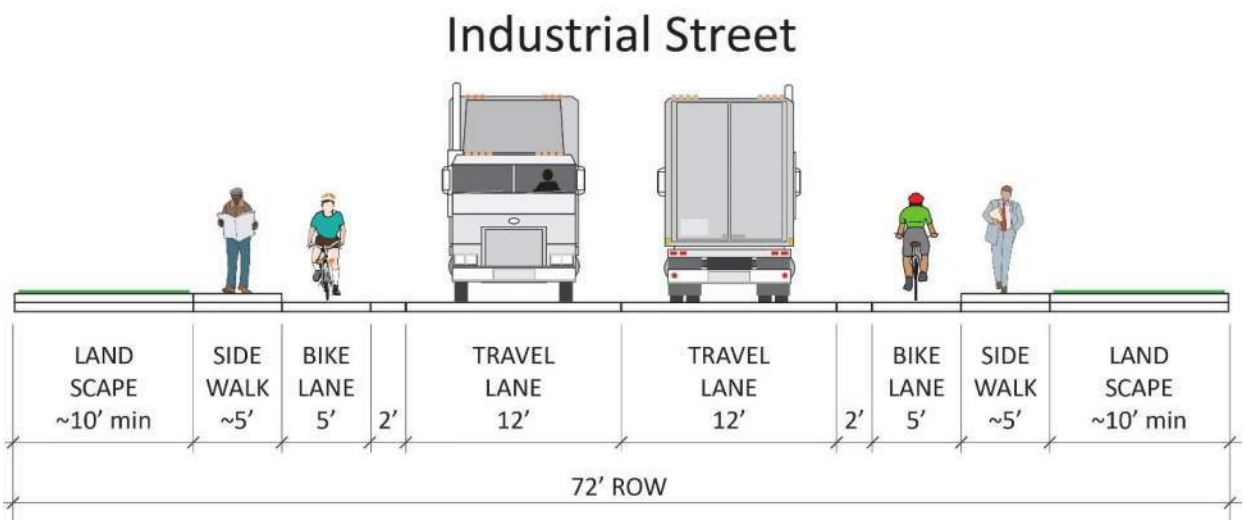


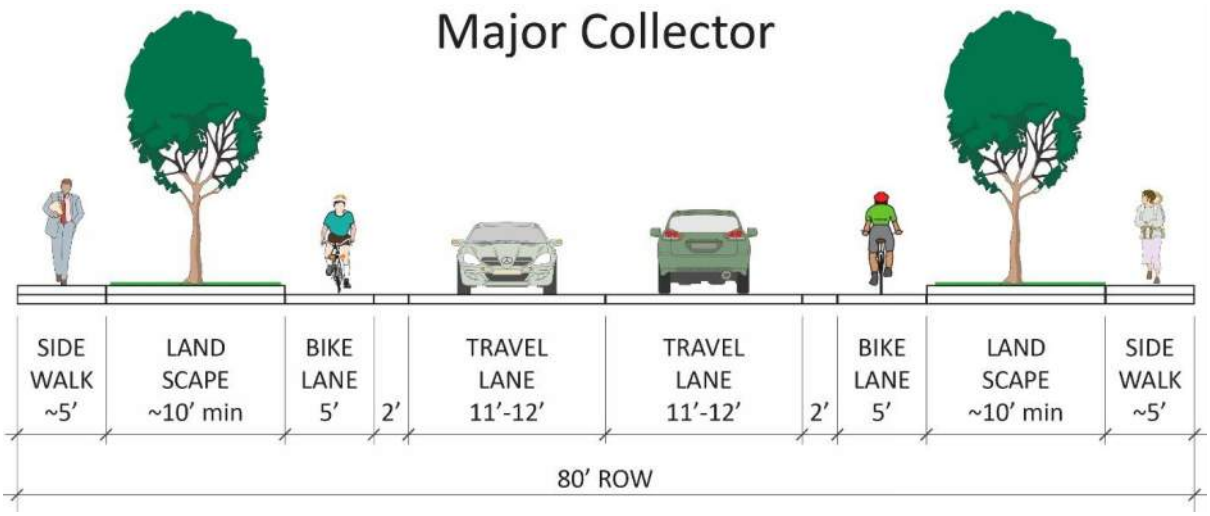
Figure 2: Standard Local Residential Typical Section



Note: Landscape & sidewalk width can be varied

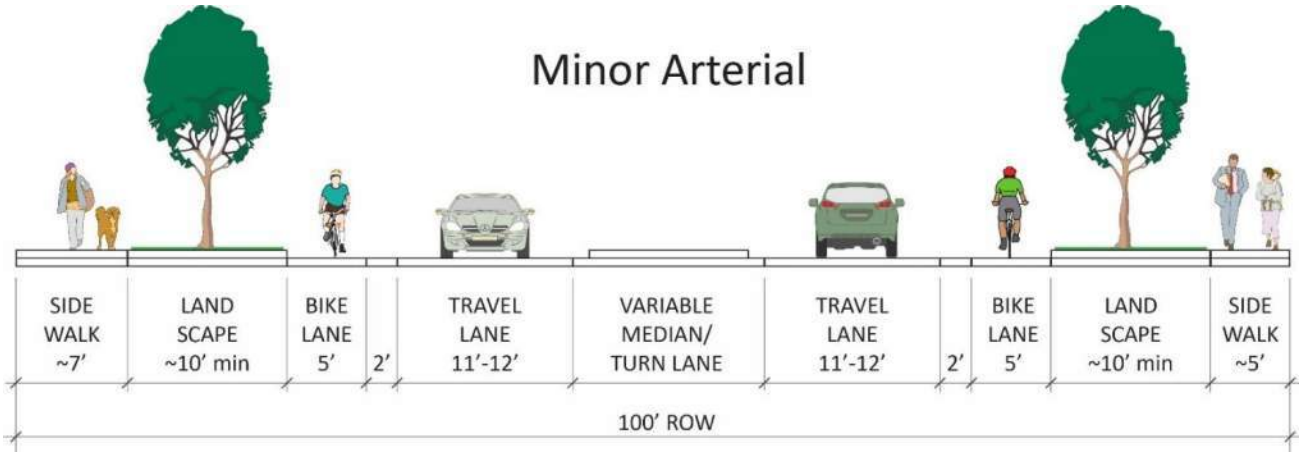
Figure 3: Industrial Street Typical Section

Figure 4: Minor Collector Typical Section



Note: Landscape & sidewalk width can be varied

Figure 5: Major Collector Typical Section



Note: Landscape & sidewalk width can be varied

Figure 6: Minor Arterial Typical Section

Street Capacity Improvements

The TSP analysis conducted to-date as well as other ongoing City planning projects identified arterial and collector streets that experience or are projected to experience traffic congestion and delay, lack pedestrian and bicycle facilities that comfortably serve a broad range of users, and/or could hinder implementation of the provision of future reliable transit services in a cost effective manner. To address these issues in a prioritized way, Table 2 reflects the six corridors identified by the PMT as areas of strategic focus for corridor capacity improvements. These corridors are also shown in Figure 1.

Table 2: Identified Strategic Street Capacity Investment Corridors

Map ID	Corridor	S-W Limit	E-N Limit	Improvement
S1	Pershall Way	New Pershall Arterial	US 97	Widen to 3-Lane Arterial
S7	Northwest Way	Maple Ave	NW Upas Ave	Widen to 3 Lanes
S14	SW/NW Helmholtz Way	SW Canal Boulevard	NW Maple Avenue	Widen roadway to add center turn lane
S21	OR 126	US 97	SE 9th St	Widen to 3 Lanes
S22	OR 126	SW Helmholtz Way	SW 27th St	Upgrade roadway as necessary
S26	SW Veterans	Railroad	SE 1st St	Widen to 3 Lanes (turn lanes where needed)

Roadway widening and similar improvements to these key corridors can help accommodate growth and economic development in the region and continue to shape the urban context for the City. Such improvements can improve mobility and connectivity as well as create opportunities to incorporate bicycle, pedestrian, and transit facilities where they do not exist.

New Planned Streets

To meet the identified street system needs, the PMT also identified a number of new streets to improve connectivity between and within existing neighborhoods, employment, and commercial areas; provide connections to newly developed/developing areas; and to provide alternative travel routes for all modes to existing streets. As part of this review, twenty-three streets were identified for extension and/or providing new connections. These projects are summarized in Table 3 and shown in Figure 1.

Table 3: New Planned Streets

Map ID	Corridor	S-W Limit	E-N Limit	Improvement
S2	NW Pershall Way	NW Upas Way	NW Pershall Way	Proposed 3-Lane Arterial
S5	NW Upas Ave	NW 10th St	East of NW Canal Blvd	Proposed Collector & Overcrossing
S6	NE 3rd	King Way	UGB	Proposed Collector
S10	NW Maple Ave	SW Helmholtz Way	NW 35th St	Proposed 3-Lane Arterial
S13	NW 27th St	NW Hemlock Ave	NW Maple Ave	Proposed Arterial
S15	NW Hemlock Ave	NW Helmholtz Way	NW 35th St	Proposed Collector
S16	NE 5th St	E Antler Ave	NE Hemlock Ave	Proposed Collector
S17	NE 17th St	OR 126	NE Kingwood	Proposed Collector
S23	SE 9th St	Veterans Way	OR 126	Proposed Arterial
S24	Veterans Way	SE 1st St	Veterans Way	Proposed Collector
S29	SW Pumice Ave	SW 15th St	SW Canal Blvd	Proposed Collector
S30	SW Quartz Ave	SW Helmholtz Way	SW 37th St	Proposed Collector
S31	SW Quartz Ave	SW Canal Blvd	Airport Way	Proposed Collector
S32	6th St	Airport Way	Veterans Way	Proposed Collector
S34	SE Airport Way	SE Airport Way	SW Veterans Way	Proposed Arterial
S35	SW 45th St	SW Salmon Ave	SW Helmholtz Way	Proposed Collector
S38	SW Odem Medo	SW Canal Blvd	SW 19th St	Proposed Collector
S39	SE Salmon Drive	13th Street	S 1st St	Proposed Collector

Map ID	Corridor	S-W Limit	E-N Limit	Improvement
S41	SW 43rd St	SW Badger Ave	SW Yew Ave	Proposed Collector
S42	SW Badger Ave	SW Helmholtz Way	SW 43rd St	Proposed Collector
S44	SW 21st St	SW Elkhorn Ave	south of SW Airport Ave	Proposed Collector
S47	SW Elkhorn Ave	SW Canal Blvd.	SW 19th St	Proposed Collector and Overcrossing
S48	SW 19th St	UGB	SW Elkhorn Ave	Proposed Collector

Intersection Capacity Improvements

Intersection capacity improvements are typically related to modifications that are lower in cost than a typical street corridor project and are ones that generally do not often require significant right-of-way acquisition. The TSP is not inclusive of all of the intersection projects that the City will pursue over the next twenty years. Rather, the projects highlighted by the PMT are those that the City can pursue to strategically improve the operational efficiency of specific intersections and important roadways. These projects can enhance system operations and can be completed as opportunities arise. Table 4 through Table 6 and Figure 7 summarize the strategic intersection capacity improvement locations identified by the PMT. In some cases, preferred intersection improvement options are identified. In all cases, the City will review the appropriate intersection control options at the time of project development and delivery. Operational results for the identified capacity improvements are provided in Appendix B.

Table 4: Identified Intersection Control Additions

Map ID	N-S Street	E-W Street	Improvement	Description
I3	NW Canal Blvd	NE King Way	Consider traffic signal or roundabout	Signal Preferred
I4	NW Helmholtz Way	NW Maple Ave	Consider traffic signal or roundabout	-
I5	NW 35th St	NW Maple Ave	Consider traffic signal or roundabout	Signal Preferred
I6	NW 27th St	NW Maple Ave	Consider traffic signal or roundabout	Roundabout Preferred
I7	NW 19th St	NW Maple Ave	Consider traffic signal or roundabout	Signal Preferred
I8	NW 9th St	NW Maple Ave	Consider traffic signal or roundabout	Signal Preferred
I10	NE 5th St	NE Maple Ave	Consider traffic signal or roundabout	-
I11	NE 9th St	NE Maple Ave	Consider traffic signal or roundabout	-
I13	NW 6th St	NW Kingwood Ave	Consider traffic signal or roundabout	Signal Preferred
I14	NW 27th St	NW Hemlock Ave	Consider traffic signal or roundabout	Signal Preferred
I15	NE 9th St	NE Hemlock Ave	Consider traffic signal or roundabout	Signal Preferred
I16	NW 27th St	W Antler Ave	Consider traffic signal or roundabout	Signal Preferred
I17	NE 9th St	E Antler Ave	Consider traffic signal or roundabout	Signal Preferred
I22	SW Helmholtz Way	OR 126	Consider traffic signal or roundabout	Roundabout Preferred
I23	SW 35th St	OR 126	Consider traffic signal or roundabout	Signal Preferred
I25	SW 15th St	OR 126	Consider traffic signal modification or roundabout	-
I29	SE 9th St	OR 126	Consider traffic signal or roundabout	Roundabout Preferred
I30	SW Helmholtz Way	SW Obsidian Ave	Consider traffic signal or roundabout	-
I31	SW 27th St	SW Obsidian Ave	Consider traffic signal or roundabout	Signal Preferred
I34	SE 9th St	SW Veterans Way	Consider traffic signal or roundabout	Roundabout Preferred

Map ID	N-S Street	E-W Street	Improvement	Description
I36	SE Veterans Way	OR 126	Consider traffic signal or roundabout	Signal Preferred
I37	SW Canal Blvd	SW Pumice	Consider traffic signal or roundabout	Disconnect SW Obsidian Ave
I38	SW Canal Blvd	SW Quartz Ave	Consider traffic signal or roundabout	Signal Preferred
I39	SW Helmholtz Way	SW Salmon Ave	Consider traffic signal or roundabout	
I40	SW 27th St	SW Salmon Ave	Consider traffic signal or roundabout	Signal Preferred
I41	SW Helmholtz Way	SW Wickiup Ave	Consider traffic signal or roundabout	Signal Preferred
I42	SW 27th St	SW Wickiup Ave	Consider traffic signal or roundabout	Roundabout Preferred
I45	SW 19th St	SW Airport Way	Consider traffic signal or roundabout	Roundabout Preferred
I46	SW Canal Blvd	SW Badger Ave	Consider traffic signal or roundabout	-
I47	SW Helmholtz Way	SW Elkhorn Ave	Consider traffic signal or roundabout	-
I48	SW Canal Blvd	SW Elkhorn Ave	Consider traffic signal or roundabout	-
I49	SW Helmholtz Way	SW Canal Blvd	Consider traffic signal or roundabout	Roundabout Preferred

Note: ODOT intersections will require traffic control evaluations

Table 5: Identified Intersection Capacity Improvements

Map ID	N-S Street	E-W Street	Improvement	Description
I2	NW 10th St	NW Pershall Way	Consider Additional Lanes	Add Eastbound Right-Turn
I19	SE Lake Rd	OR 126	Consider Access Management	Create Right-In/Right-Out in Conjunction with 9th Street Project
I24	SW Rimrock Way	OR 126	Consider Additional Lanes	Carry Westbound Lane through Intersection; Add Southbound and Westbound Right-Turns
I32	US 97	Veterans Way	Improvement to be identified by South Corridor Project	
I33	SW Lake Rd	SW Veterans Way	Consider Access Management	Create Right-In/Right-Out in Conjunction with 9th Street Project
I35	SE 10th St	SE Veterans Way	Consider Intersection Control Change	Remove Stop Signs on Veterans in Conjunction with 9th Street Project

Grade-Separated Intersection Improvements

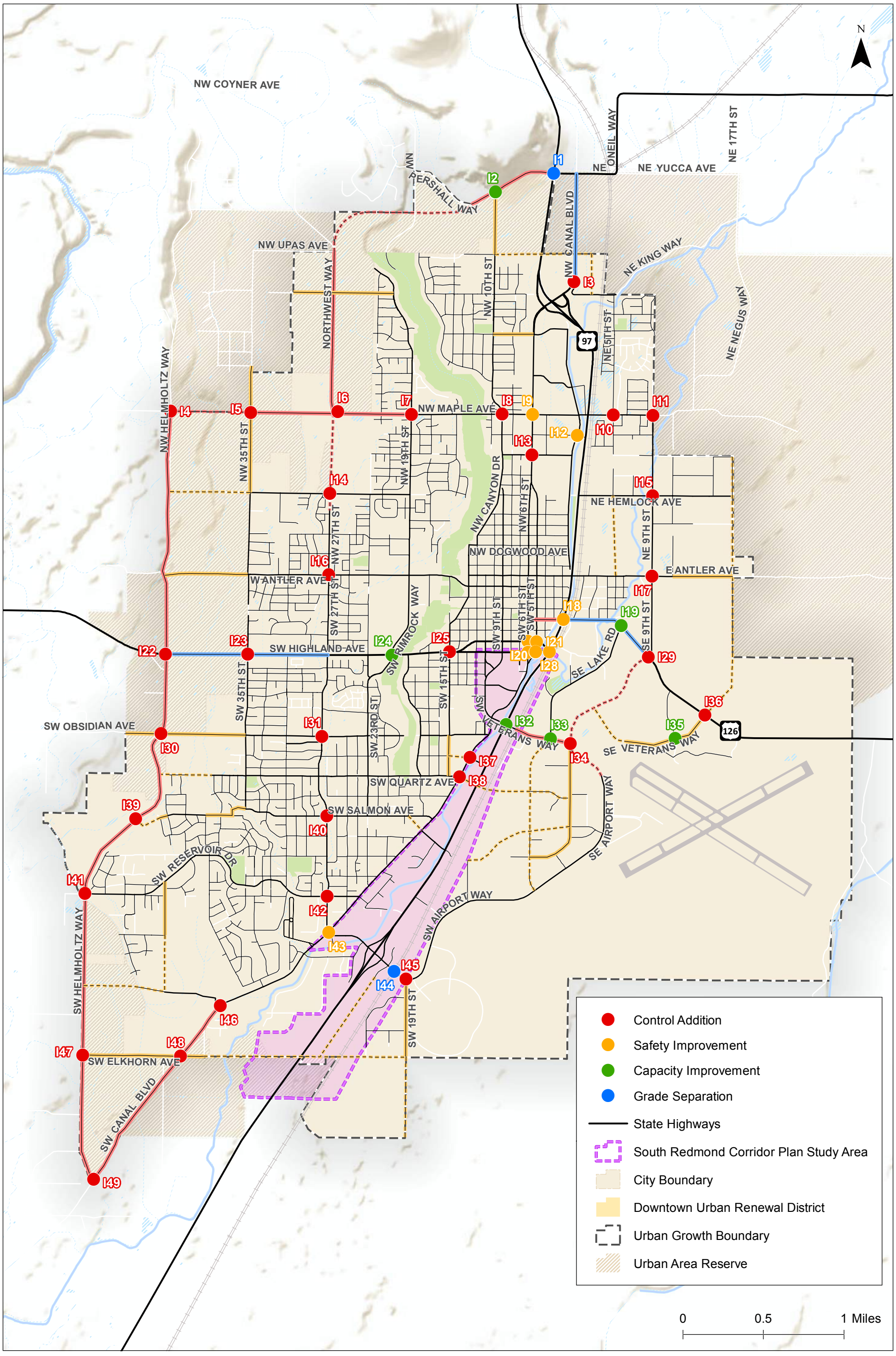
Three intersections were identified for grade separation to eliminate conflict points and improve traffic flows. One intersection was identified for future evaluation. These are identified in Table 6 and shown in Figure 7. A brief description of each is included below:

- **US 97/O'Neil Highway:** The Interchange Area Management Plan (IAMP) for this location identified the need to provide a grade-separated overcrossing of US 97 that would connect O'Neil Highway to Pershall Way. An interim option is to restrict the US 97/O'Neil Highway intersection to right-in, right-out.
- **Airport Way Rail Crossing:** Airport Way connects US 97 to the Redmond Airport. US 97 and the Redmond Airport are both critical statewide infrastructure as identified in the Oregon Resilience Plan. The planned grade-separation would eliminate the at-grade rail crossing between the highway and airport.

- **US 97/Elkhorn Avenue:** Construct overcrossing of US 97 as part of the Elkhorn Avenue extension from Canal Boulevard to SW 19th Street.
- **US 97/Hemlock Avenue:** Conduct a study to evaluate a possible grade-separated crossing of US 97.

Table 6: Identified Grade Separation Projects

Map ID	N-S Street	E-W Street	Improvement	Description
I1	US 97	O'Neil Hwy	North Interchange IAMP Project	Interim project would modify US 97/O'Neil Hwy intersection to Right-In/Right-Out; eventual project would result in grade-separation
I44	Railroad	SW Airport Way	Grade Separated Crossing	Remove Existing At-Grade Rail Crossing
S47	US 97	Elkhorn Avenue	Grade Separated Crossing	Construct US 97 overcrossing at part of roadway extension.



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Future Intersection Alternatives
Redmond, Oregon

Figure **7**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

Key Multi-Use Pathways

Multi-use pathways are paved, separated from streets and are designed for both walking and bicycling. Where space allows, corridors with high usage may be developed with redundant paths to separate people walking from people biking. The paths for people walking or running may be unpaved depending on intended use. The multiuse pathway system improves continuity for bicyclists and pedestrians to move freely throughout the transportation network and helps to eliminate barriers to east-west access, particularly through the Dry Canyon and across US 97. Twenty-one new multi-use pathways have been identified for inclusion into the TSP. These projects are summarized in Table 7 and shown in Figure 8.

Table 7: Identified Key Multi-Use Pathways

Map ID	Corridor	S-W Limit	E-N Limit
B1	SW/NW Helmholz Way	SW Umatilla Ave	NW Canal Blvd
B2	NW Pershall Way	Dry Canyon Trail	B1
B5	NW Spruce Ave	NW Helmholtz Way	NW 19th St
B11	NW Maple Ave	NW Helmholtz Way	west of NW 22nd St
B12	NW 35th St	NW Dogwood Ave	NW Upas Way
B13	NW 27th St	NW Greenwood Ave	NW Upas Way
B17	SW 39th St	SW Quartz Ave	NW Maple Ave
B18	NW Hemlock Ave	NW Helmholtz Way	NW 19th St
B19	NW 29th St	NW Hemlock Ave	UGB
B28	Lateral E Pilot Butte Canal	OR 126	NE Kingwood Ave
B46	OR 126	SE Jackson St	UGB
B47	SW 35th St	SW Quartz Ave	W Antler Ave
B52	SW Quartz Ave	SW Helmholtz Way	SW 35th St
B55	SW Quartz Ave	SW Canal Blvd	SE Airport Way
B56	SE Airport Way/SE 9th St	Railroad	OR 126
B61	SW 19th St	SW Canal Blvd	SW Reindeer Ave
B62	SW Canal Blvd/Pilot Butte Canal	SW 27th St	NE King Way
B67	SW Helmholtz Way	SW Canal Blvd	SW Reservoir Dr
B69	Pilot Butte Canal	SW Elkhorn Ave	SW Canal Blvd
B71	SW Canal Blvd	SW Helmholtz Way	SW Elkhorn Ave

Key Bicycle Corridors

In addition to the multiuse pathways, new bike boulevards, bike lanes, quiet streets and protected bike lanes will serve the cyclists of Redmond in the future. A brief description of each is provided below.

- A quiet street is a bike route on a low-volume, low-speed street that has been optimized for bicycle travel. These boulevards contain different features depending on adjacent land uses, however they are all intended to contain wayfinding signs, pavement markings, and

intersection treatments. Some may also feature diversion to reduce automobile volumes and traffic calming to slow motor vehicle speeds.

- A bike lane is a marked space along a length of roadway that is designated for use by people bicycling. Wheelchair users and some motorized scooters are allowed in bike lanes.
- Buffered bike lanes feature a buffer strip to provide space between the bike lane and the auto lane or parked cars.
- A protected bike lane, sometimes called a "cycle track", is an exclusive bicycle facility adjacent to, but separated from, the roadway. Separation is generally achieved using planters, parked cars, curbs, or posts to separate people biking from people driving. They are best on roads with few cross streets and driveways, particularly on roadways with high auto volumes and speeds. A protected bike lane provides a logical extension of a shared use path because it provides the sensation of riding on a path due to the separation from motorized traffic.

Fifty-two bicycle corridors were identified for inclusion into the TSP. These projects are summarized in Table 8 and shown in Figure 8.

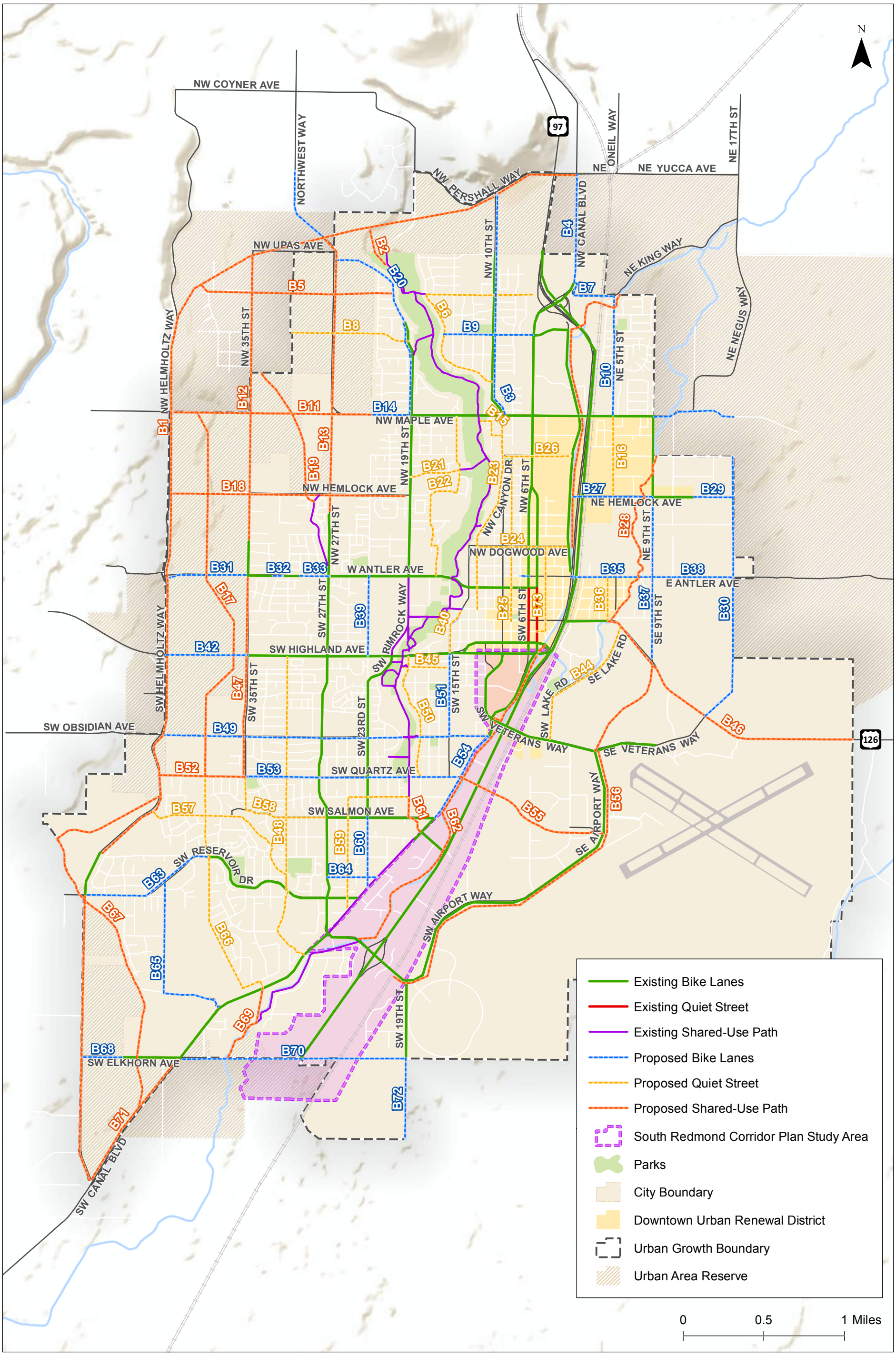
Crossing improvements, though not specifically identified in the TSP, may be provided when bicycle facilities are constructed that cross major roads. The need for and type of crossing treatment will be evaluated at the time of project development and design.

The City of Redmond will consider upgrades to existing bicycle facilities (such as including a marked buffer) on a case-by-case basis. Such upgrades typically occur in conjunction with scheduled maintenance operations.

Table 8: Identified Key Bicycle Corridors

Map ID	Corridor	S-W Limit	E-N Limit	Improvement
B3	NW 10th St	NW Maple Ave	NW Pershall Way	Bike Lanes
B4	NW Canal Blvd	NE King Way	NE Yucca Ave	Bike Lanes
B6	NW Canyon Dr/NW Spruce Ave	NW 10th St	US 97	Quiet Street
B7	NE King Way	NW Canal Blvd	NE 5th St	Bike Lanes
B8	NW Quince Ave	UGB	NW 19th St	Quiet Street
B9	NW Quince Ave	NW Canyon Dr	NW 6th St	Bike Lanes
B10	NE 5th St	NE Negus Way	NE King Way	Bike Lanes
B14	NW Maple Ave	west of NW 22nd St	NW 19th St	Bike Lanes
B15	NW 10th St/NW Larch/NW Rockcrest Ct	Dry Canyon Trail	NW 9th St	Quiet Street
B16	NE 5th St	NE Hemlock Ave	NE Maple Ave	Quiet Street
B20	NW 19th St	NW Maple Ave.	Northwest Way	Bike Lanes
B21	NW Ivy Ave	NW 19th St	NW Rimrock Ct	Quiet Street
B22	NW 17th St/NW Rimrock Ct	W Antler Ave	NW Maple Ave	Quiet Street
B23	NW Canyon Dr	SW Deschutes Ave	NW Maple Ave	Quiet Street
B24	NW Dogwood Ave	NW Canyon Dr	NW Canal Blvd	Quiet Street
B25	SW 8th St	SW Evergreen Ave	NW Kingwood Ave	Quiet Street

Map ID	Corridor	S-W Limit	E-N Limit	Improvement
B26	NW Kingwood Ave	NW Canyon Dr	NW Canal Blvd	Quiet Street
B27	NE Hemlock Ave	NW Canal Blvd	NE 9th St	Bike Lanes/Crossing
B29	NE Hemlock Ave	west of NE 15th St	NE 17th St	Bike Lanes
B30	SE 17th St	OR 126	NE Kingwood Ave	Bike Lanes
B31	W Antler Ave	SW Helmholtz Way	SW 35th St	Bike Lanes
B32	W Antler Ave	NW 32nd Ct	SW 31st St	Bike Lanes
B33	W Antler Ave	NW 29th St	SW 27th St	Bike Lanes
B35	E Antler Ave	SW 7th St	NE 17th St	Bike Lanes/Crossing
B36	SE Jackson St	OR 126	E Antler Ave	Quiet Street
B37	SE 9th St	OR 126	NE Hemlock Ave	Bike Lanes
B38	E Antler Ave	SE 9th St	NE 17th St	Bike Lanes
B39	SW 23rd St	SW Highland Ave	W Antler Ave	Bike Lanes
B40	SW 15th St	SW Highland Ave	SW Deschutes Ave	Quiet Street
B42	SW Highland Ave	SW Helmholtz Way	SW 35th St	Bike Lanes
B44	SW Lake Rd	SW Veterans Way	OR 126	Quiet Street
B45	SW Juniper Ave	Dry Canyon Trail	SW 15th St	Quiet Street
B48	SW 31st St	SW Canal Blvd	SW Highland Ave	Quiet Street
B49	SW Obsidian Ave	SW Helmholtz Way	SW Canal Blvd	Bike Lanes
B50	SW Canyon Dr	SW Quartz Ave	SW Highland Ave	Quiet Street
B51	SW 15th St	SW Obsidian Ave	SW Highland Ave	Bike Lanes
B53	SW Quartz Ave	SW 35th St	SW Canal Blvd	Bike Lanes
B54	SW Canal Blvd	SW Salmon Ave	SW Obsidian Ave	Bike Lanes
B57	SW Salmon Ave/SW Valleyview Dr/SW 32nd Ct	SW Helmholtz Way	SW 31st St	Quiet Street
B58	SW 35th St/SW Salmon Ave	SW Quartz Ave	SW 27th St	Quiet Street
B59	SW 25th St/SW Reindeer Ave	SW Canal Blvd	Dry Canyon Trail/SW 19th St	Quiet Street
B60	SW 23rd St	SW Canal Blvd	SW Salmon Ave	Bike Lanes
B63	SW Reservoir Dr	SW Helmholtz Way	SW 39th St	Bike Lanes
B64	Volcano Avenue	27th Street	SW Canal Boulevard	Bike Lanes
B65	SW 43rd St/SW Badger Ave	SW Canal Blvd	SW Reservoir Dr	Bike Lanes
B66	SW Cascade Vista Dr/SW Antelope Ave	SW Canal Blvd	SW Quartz Ave	Quiet Street
B68	SW Elkhorn Ave	SW Helmholtz Way	Lateral B Canal	Bike Lanes
B70	SW Elkhorn Ave	SW Canal Blvd	SW 19th St	Bike Lanes
B72	SW 19th St	UGB	SW Elkhorn Ave	Bike Lanes
B73	SW 4th St/SW Forest/SW 5th	SW Highland	SW Dogwood Ave	Quiet Street



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Existing and Planned Bicycle Facilities
Redmond, Oregon

Figure **8**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

Key Pedestrian Improvements

Sidewalks are paved walkways adjacent to streets. Sidewalks are particularly important for providing basic mobility for people with disabilities. Setback sidewalks (featuring a planted barrier between the sidewalk and travel way) can create more comfort and safety for people walking. All streets within the City are anticipated to have sidewalks over time. Key priority sidewalk investment areas, as identified by the PMT, are reflected in Figure 9 and listed in Table 9 and Table 10. Sidewalks gaps are shown in Figure 10. The identified improvements are intended to prioritize sidewalk facilities along ADA routes, as defined by the City of Redmond.

Crossing improvements, though not specifically identified, may be provided when pedestrian facilities are constructed that cross major roads. The need for and type of crossing treatment will be evaluated at the time of project development and design.

Table 9: Identified Priority Pedestrian Improvements – Sidewalk and Ramp Additions

Map ID	Corridor	S-W Limit	E-N Limit	Street Side	Note
P4	NW 10th St	NW 9th St	NW Quince Ave	West	Add Sidewalk or Ramps
P5	NE 5th St	NE Negus Way	NE Oak Ave	West	Add Sidewalk or Ramps
P6	NW Maple Ave	NW 22nd St	NW 19th St	Both	Add Sidewalk or Ramps
P8	NW 9th St	NW Hemlock Ave	NW Maple Ave	Both	Add Sidewalk or Ramps
P9	NW 6th St	North of NW Larch Ave	NW Maple Ave	Both	Add Sidewalk or Ramps
P11	NW 6th St	NW Jackpine Ave	NW Larch Ave	East	Add Sidewalk or Ramps
P12	NW 6th St	South of NW Kingwood Ave	South of Larch Ave	West	Add Sidewalk or Ramps
P13	NW Larch Ave	NW 6th St	NW 4th St	Both	Add Sidewalk or Ramps
P14	NW Larch Ave	NW 4th St	West of NW Canal Blvd	South	Add Sidewalk or Ramps
P16	NW Kingwood Ave	NW 6th St	NW Canal Blvd	Both	Add Sidewalk or Ramps
P18	NW 6th St	North of NW Jackpine Ave	South of NW Kingwood Ave	West	Add Sidewalk or Ramps
P19	NW 6th St	NW Jackpine Ave	NW Kingwood Ave	East	Add Sidewalk or Ramps
P20	NW Canal Blvd	NW Elm Ave	NW Larch Ave	West	Add Sidewalk or Ramps
P21	NW Hemlock Ave	NW Canyon Dr	NW 9th St	Both	Add Sidewalk or Ramps
P23	NW 9th St	W Antler Ave	NW Greenwood Ave	Both	Add Sidewalk or Ramps
P24	NW Dogwood Ave	NW Canyon Dr	NW 10th St	South	Add Sidewalk or Ramps
P29	W Antler Ave	NW 32nd Ct	NW 27th St	Both	Add Sidewalk or Ramps
P34	SW 23rd St	SW Glacier Pl	SW Glacier Ave	East	Add Sidewalk or Ramps
P35	SW Highland Ave	SW 31st St	SW 24th Ct	North	Add Sidewalk or Ramps
P37	SW Highland Ave	SW Indian Cir	SW 27th St	South	Add Sidewalk or Ramps
P40	SW 15th St	SW Metolius Ave	SW Indian Ave	Both	Add Sidewalk or Ramps
P44	SW Obsidian Ave	SW 33rd St	SW 31st St	South	Add Sidewalk or Ramps
P46	SW Obsidian Ave	SW 23rd St	SW 21st Pl	South	Add Sidewalk or Ramps
P48	SW Obsidian Ave	SW Canyon Dr	SW 17th St	North	Add Sidewalk or Ramps
P50	SW Obsidian Ave	SW Canyon Dr	East of SW 15th St	South	Add Sidewalk or Ramps
P52	SW Veterans Way/SE Airport Way	US 97	SE Salmon Dr	Both	Add Sidewalk or Ramps

Map ID	Corridor	S-W Limit	E-N Limit	Street Side	Note
P57	SW Canal Blvd	North of SW Salmon Ave	South of SW Obsidian Ave	West	Add Sidewalk or Ramps
P59	SW Salmon Ave	SW 31st St	SW 29th St	South	Add Sidewalk or Ramps
P66	SW Xero Ln	West of SW 34th St	SW 31st St	Both	Add Sidewalk or Ramps
P67	SW 31st St	SW 33rd St	SW Savannah Ct	West	Add Sidewalk or Ramps
P69	SW 31st St	SW Timber Ct	SW 33rd St	East	Add Sidewalk or Ramps
P70	SW 31st St	SW Xero Ln	SW Volcano Way	Both	Add Sidewalk or Ramps
P71	SW Canal Blvd	SW 27th St	SW Timber Ave	East	Add Sidewalk or Ramps
P72	SE Airport Way	Railroad Line	South of Fairgrounds north entrance	Both	Add Sidewalk or Ramps

Table 10: Identified Priority Pedestrian Improvements – Sidewalk and Ramp ADA Upgrades

Map ID	Corridor	S-W Limit	E-N Limit	Street Side	Note
P1	NW 10th St	NW Redwood Ave	NW Teak Ave	West	Upgrade Sidewalk or Ramps
P2	NW 10th St	NW Oak Pl	NW Teak Ave	East	Upgrade Sidewalk or Ramps
P3	NE 5th St	NE Cheyenne Dr	NE Quince Ln	East	Upgrade Sidewalk or Ramps
P7	NE Negus Way	NE 5th St	NE 7th St	Both	Upgrade Sidewalk or Ramps
P10	NW 6th St	North of NW Kingwood Ave	North of NW Larch Ave	West	Upgrade Sidewalk or Ramps
P15	NE 5th St	NE Larch Ave	NE Negus Way	Both	Upgrade Sidewalk or Ramps
P17	NW 6th St	NW Jackpine Ave	NW Kingwood Ave	West	Upgrade Sidewalk or Ramps
P22	NW 9th St	NW Fir Ave	NW Hemlock Ave	Both	Upgrade Sidewalk or Ramps
P25	NW Dogwood Ave	NW Canyon Dr	NW 10th St	North	Upgrade Sidewalk or Ramps
P26	NW Dogwood Ave	NW 10th St	NW 6th St	Both	Upgrade Sidewalk or Ramps
P27	NW Elm Ave	NW 27th St	NW 25th St	Both	Upgrade Sidewalk or Ramps
P28	NW 27th St	NW Cedar Ave	NW Elm Ave	Both	Upgrade Sidewalk or Ramps
P30	W Antler Ave	SW 27th St	SW Rimrock Way	Both	Upgrade Sidewalk or Ramps
P31	SW 23rd St	SW Highland Ave	W Antler Ave	Both	Upgrade Sidewalk or Ramps
P32	W Evergreen Ave	SW Canyon Dr	SW 8th St	Both	Upgrade Sidewalk or Ramps
P33	SW 7th St	SW Indian Ave	SW Black Butte Blvd	Both	Upgrade Sidewalk or Ramps
P36	SW Highland Ave	SW 31st St	SW Indian Cir	South	Upgrade Sidewalk or Ramps
P38	SW 31st St	SW Savanna Ct	SW Highland Ave	Both	Upgrade Sidewalk or Ramps
P39	SW 27th St	SW Metolius Ave	SW Highland Ave	East	Upgrade Sidewalk or Ramps
P41	SW Veterans Way	SW Canal Blvd	SW Indian Ave	Both	Upgrade Sidewalk or Ramps
P42	SW Obsidian Ave	SW 35th St	Dry Canyon	North	Upgrade Sidewalk or Ramps
P43	SW Obsidian Ave	SW 35th St	SW 33rd St	South	Upgrade Sidewalk or Ramps
P45	SW Obsidian Ave	SW 31st St	SW 23rd St	South	Upgrade Sidewalk or Ramps
P47	SW Obsidian Ave	SW 21st Pl	SW Rimrock Way	South	Upgrade Sidewalk or Ramps
P49	SW Obsidian Ave	SW 17th St	SW 15th St	North	Upgrade Sidewalk or Ramps
P51	SW Obsidian Ave	East of SW 15th St	SW Canal Blvd	Both	Upgrade Sidewalk or Ramps
P53	S 1st St	SE Salmon Dr	SW Veterans Way	Both	Upgrade Sidewalk or Ramps
P54	SE Salmon Dr	S 1st St	West of Timber Ave	Both	Upgrade Sidewalk or Ramps
P55	SW Quartz Ave	SW 35th St	SW Canal Blvd	Both	Upgrade Sidewalk or Ramps
P56	SW 23rd St	SW Salmon Ave	SW Quartz Ave	Both	Upgrade Sidewalk or Ramps
P58	SW Salmon Ave	SW 31st St	SW Canal Blvd	North	Upgrade Sidewalk or Ramps

Map ID	Corridor	S-W Limit	E-N Limit	Street Side	Note
P60	SW Salmon Ave	SW 29th St	SW Canal Blvd	South	Upgrade Sidewalk or Ramps
P61	SW 39th St	SW 35th St	SW Salmon Ave	Both	Upgrade Sidewalk or Ramps
P62	SW Reservoir Dr	SW 39th St	SW 36th St	Both	Upgrade Sidewalk or Ramps
P63	SW 36th St	SW 35th St	SW Reservoir Dr	Both	Upgrade Sidewalk or Ramps
P64	SW 35th St	SW Cascade Vista Dr	SW 36th St	Both	Upgrade Sidewalk or Ramps
P65	SW Xero Ln	SW 35th St	West of SW 34th St	Both	Upgrade Sidewalk or Ramps

Key Transit Corridors

The provision of high-quality, available, and reliable transit service fundamentally supports the environment, economic development, and equity for all travelers. The TSP includes both key north-south and east-west transit within all quadrants of the City's UGB between the downtown urban core, residential neighborhoods, existing and planned pedestrian and bicycle corridors, jobs, health care, schools and places of interest. These corridors correlate with the planned Redmond Transit Hub located at the corner of SW Kalama Avenue and SW Canal Blvd. Multimodal infrastructure along these corridors will be pursued by the City to enhance the accessibility of future transit service.

The City and Cascades East Transit will continue to work to refine these transit corridors and identify a program to implement more robust transit service within Redmond. Specifically, the City intends to explore various service options in partnership with Cascades East Transit (CET) to better serve the community. Initial recommendations from the Regional Transit Master Plan (COIC, 2013) suggest implementing fixed-route service. That document also included short-, mid-, and long-term service concepts that should be considered.

As documented within the Regional Transit Master Plan, the suggested transit routes would serve approximately 50-80 percent of the City's population and employment with transit access when implemented.

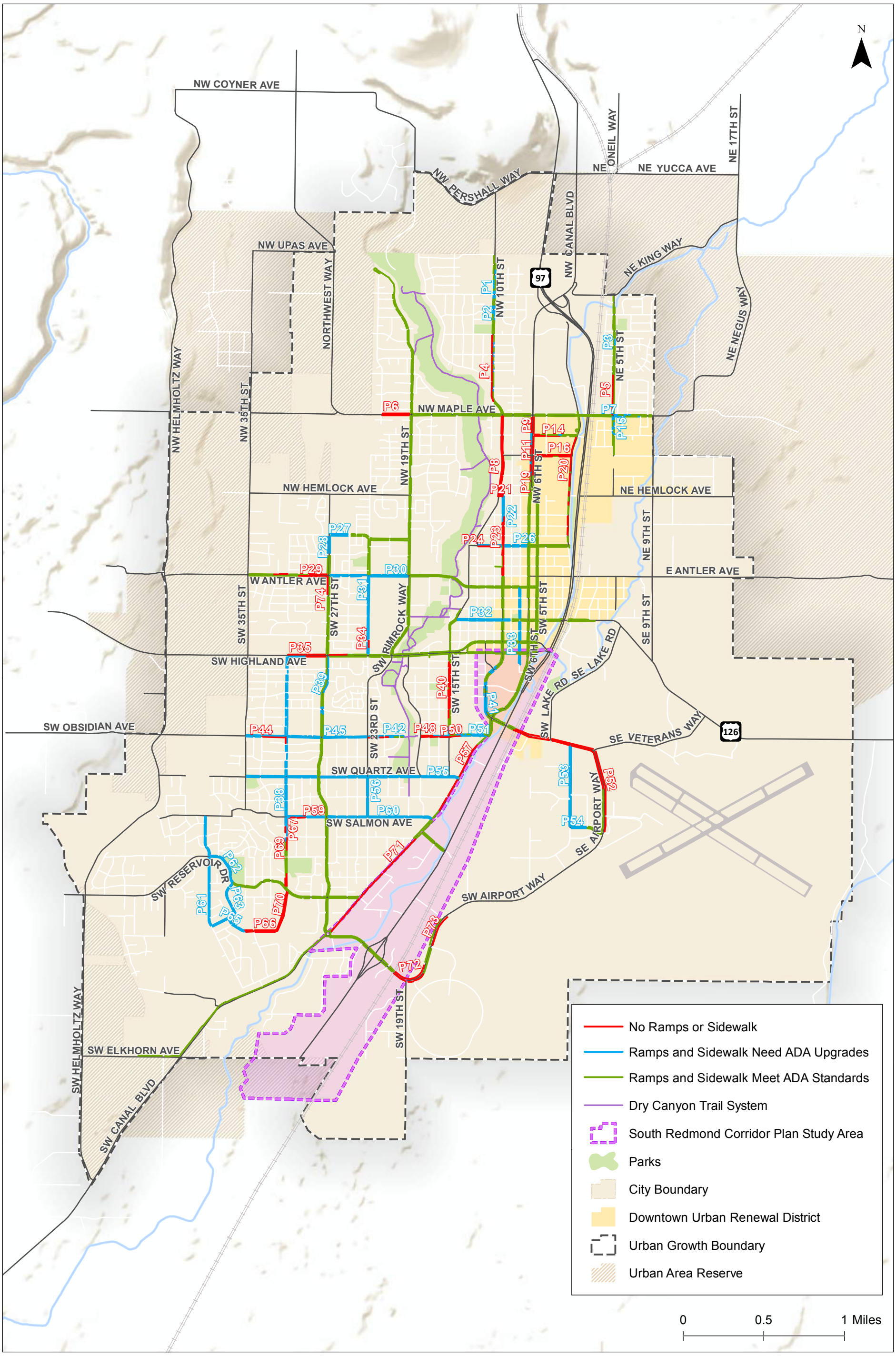
The key transit corridors identified by the PMT are shown in Figure 10.

Key Freight Routes

Both the TSP and the many state policies and plans recognize the important role that an efficient and reliable transportation system plays in supporting the region's economy, growth, and quality of life. Within the City, highways, city streets, airports, pipelines, and railways provide freight mobility. Trucks, rail, and air service must function together to ensure the efficient and timely movement of freight to, within, and through the community.

As part of the needs analysis, changes to the existing freight and truck routes were identified to ensure consistency with state and federal designations and guidance and in reflection of ongoing planning

efforts. In particular, the PMT identified potential freight routes that provide alternative access points to the industrial lands east of US 97 both to the north and south of OR 126. As shown in Figure 11, these routes utilize SW Airport Way, SE 9th Street, and NE Hemlock Avenue.



Priority (ADA) Pedestrian Routes
Redmond, Oregon

Figure **9**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

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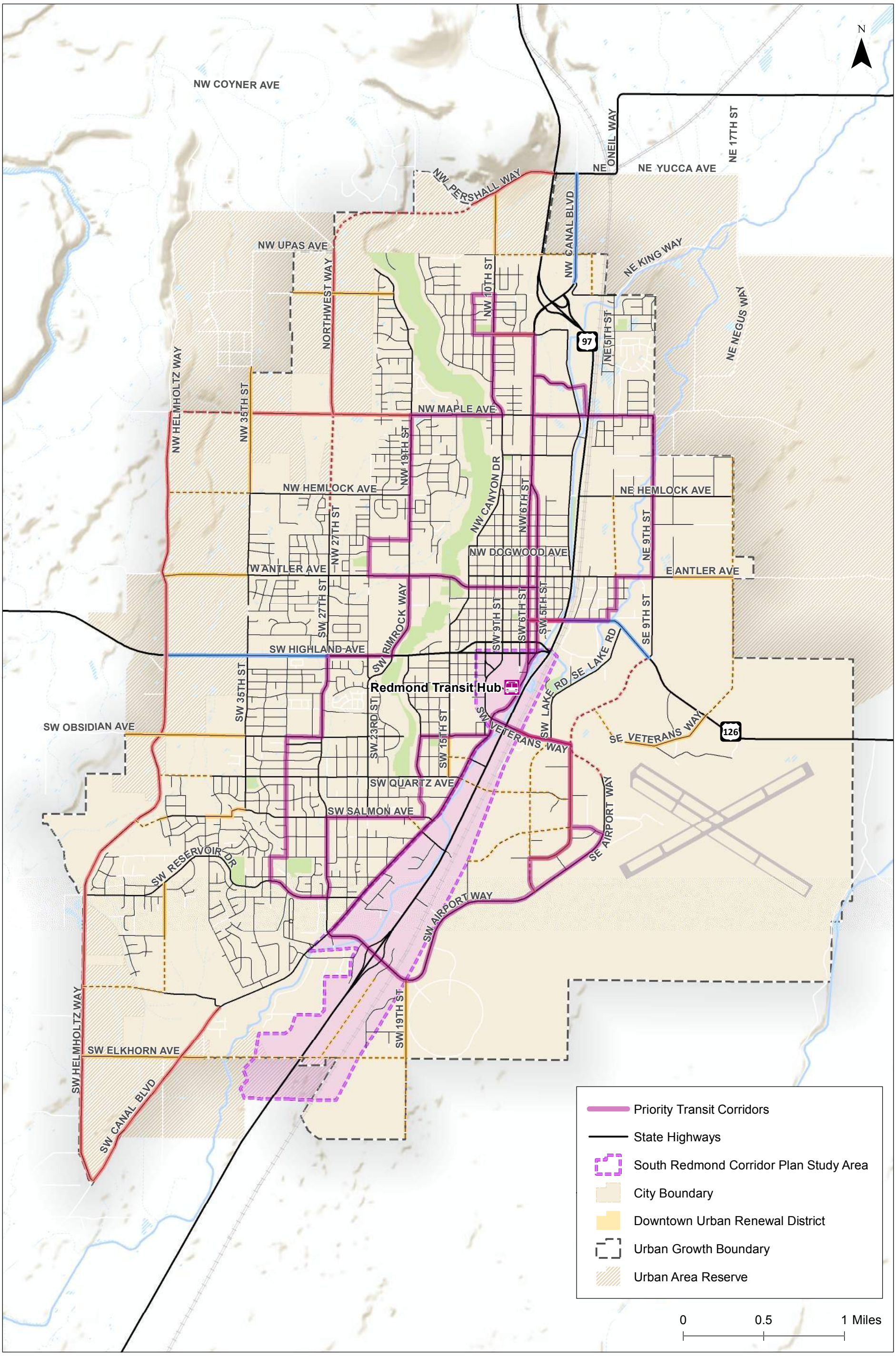

Future Transit Corridors
Redmond, Oregon

Figure **10**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

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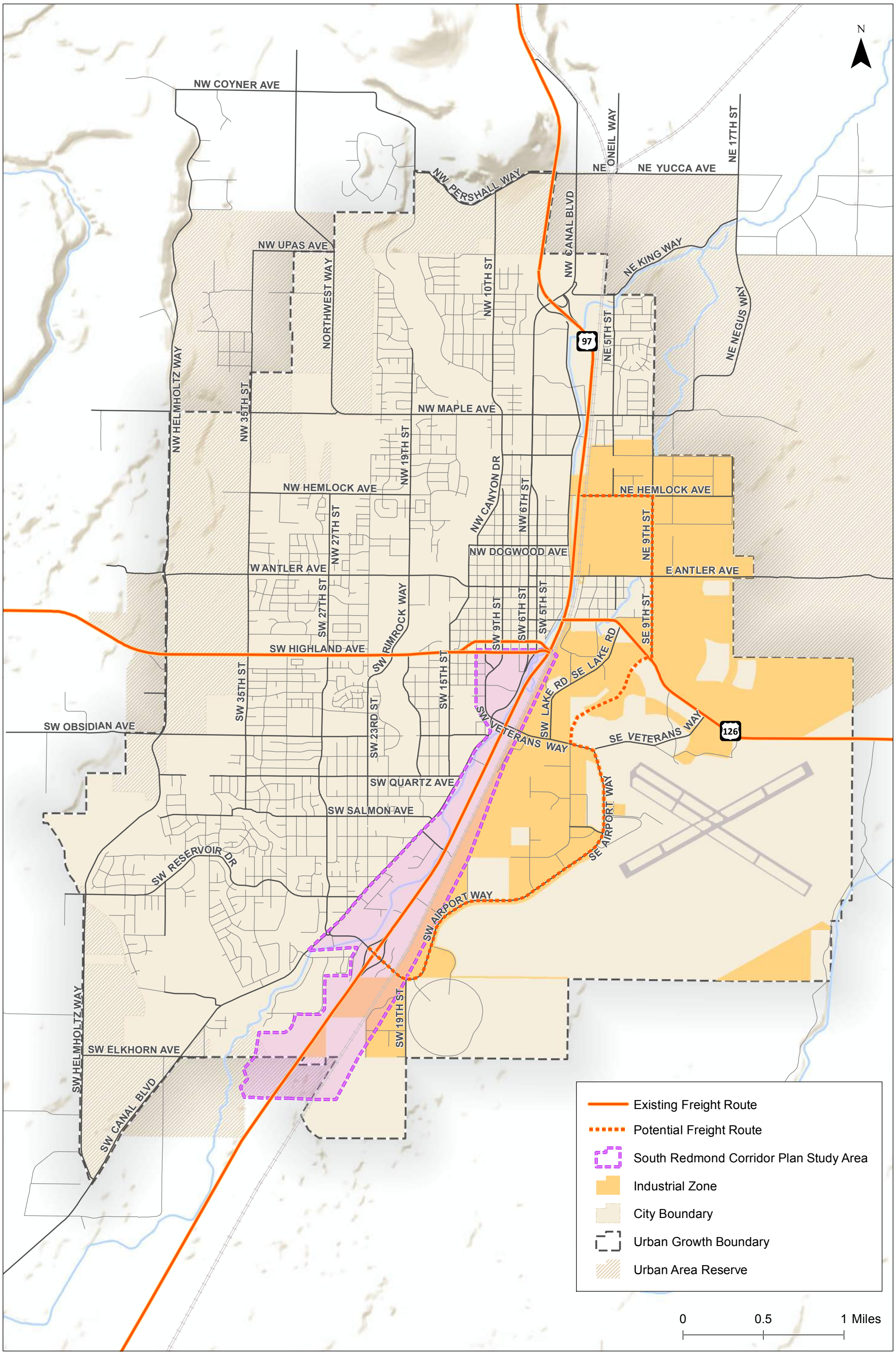

Future Freight Routes
Redmond, Oregon

Figure **11**

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Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

Airport Master Plan Recommendations

Key recommendations for the ongoing Airport Master Plan will be incorporated into the TSP prior to adoption.

VEHICULAR SYSTEM PERFORMANCE

The City uses motor vehicle level of service (LOS) standards to evaluate acceptable vehicular performance on the local, collector, and arterial streets. LOS standards are presented as grades A (free flow traffic conditions) to F (congested traffic conditions). ODOT uses mobility targets based on volume to capacity (V/C) ratios to evaluate acceptable vehicular performance on state facilities. As V/C ratios approach 1.0, traffic congestion increases.

In some cases, it may not be possible or desirable to meet the designated mobility target or LOS standard. In those cases, an alternative mix of strategies such as land use, transportation demand management, safety improvements or increased use of active modes may be applied.

To understand the effectiveness of the identified TSP projects in addressing the needs previously identified, anticipated year 2040 intersection performance were assessed at several key locations throughout the City. The results from this analysis are shown in Table 10 and Table 11 and Figure 12.

Locations not meeting identified performance standards are highlighted in red. These locations will be discussed by the PMT for possible alternative performance criteria and/or other mitigation measures.

Table 11: Future Year 2040 Study Intersection Performance

Study Intersection		Existing Control	Without Improvements		Proposed Control	With Improvements	
			v/c	LOS		v/c	LOS
1	NW Canal Blvd/ US 97 NB Ramps	Signal	0.51	A	No change	0.74	A
2	NW Canal Blvd/ US 97 SB Ramps	Signal	0.47	A	No change	0.67	A
3	NW Maple Ave/ NW 19th St	AWSC	**1.25**	**F**	Signal	0.77	C
4	NW Maple Ave/ NW 6th St	Signal	0.78	C	No change	0.81	C
5	NW Larch Ave/ NW Canal Blvd	TWSC	0.31	B	No change	0.28	B
6	NE Hemlock Ave/ NE 9th St	AWSC	0.51	B	Signal	0.45	B
7	W Antler Ave/ SW Helmholtz Way	TWSC	0.54	C	TWSC	0.24	C
8	W Antler Ave/ SW 27th St	AWSC	0.43	B	Signal	0.62	B
9	W Antler Ave/ SW Rimrock Way	Signal	0.67	C	No change	0.68	C
10	SW Black Butte Blvd/ SW 6th St	Signal	0.50	A	No change	0.50	A
11	SW Black Butte Blvd/ SW 5th St	Signal	0.56	A	No change	0.52	A
12	E Antler Ave/ NE 9th St	TWSC	0.07	B	Signal	0.30	A
13	SW Evergreen Ave/ SW 6th St	Signal	0.53	A	No change	0.65	B
14	SW Evergreen Ave/ SW 5th St	Signal	0.70	B	No change	0.66	B

	Study Intersection	Existing Control	Without Improvements		Proposed Control	With Improvements	
			v/c	LOS		v/c	LOS
15	SW Evergreen Ave/ US 97	Signal	**1.11**	**F**	No change	**1.23**	**F**
16	OR 126 (SW Glacier Ave)/ SW 11th St	Signal	0.57	A	No change	0.61	A
17	OR 126 (SW Glacier Ave)/ SW 9th St	Signal	0.55	A	No change	0.58	B
21	OR 126 (SW Highland Ave) / SW Helmholtz Way	TWSC	**>1.0**	**F**	Roundabout	**0.92**	**D**
22	OR 126 (SW Highland Ave)/ SW 27th St	Signal	**>1.0**	**F**	No change	**>1.0**	**F**
23	OR 126 (SW Highland Ave)/ SW Rimrock Way	Signal	**>1.0**	**E**	Lane Additions	**1.0**	**C**
24	OR 126 (SW Highland Ave)/ SW 15th St	Signal	**0.88**	**C**	No change	**0.97**	**D**
25	OR 126 (SW Highland Ave)/ SW 11th St	Signal	0.51	A	No change	0.54	A
26	OR 126 (SW Highland Ave)/ SW 9th St	Signal	0.54	B	No change	0.57	B
29	OR 126/ SE 9th St	TWSC	**0.97**	**F**	Roundabout	0.62	B
30	SW Obsidian Ave/ SW 27th St	AWSC	0.76	C	No change	0.49	B
31	SW Obsidian Ave/ SW 23rd St	TWSC	0.29	C	No change	0.18	C
34	SW Veterans Way/ SE Airport Way*	AWSC	0.80	C	-	-	-
35	SW Veterans Way/ OR 126	TWSC	**0.92**	**F**	Signal	**0.84**	**C**
36	SW Salmon Ave/ SW 27th St	AWSC	>1.0	E	Signal	0.67	C
39	SW Wickiup Ave/ SW Helmholtz Way	TWSC	0.29	C	Signal	0.49	B
40	SW Wickiup Ave / SW 27th St	AWSC	>1.0	E	Roundabout	0.67	B
44	SE Airport Way/ SW 19th St	TWSC	**>1.0**	**F**	Roundabout	0.54	B
45	S Canal Blvd / SW Helmholtz Way	TWSC	0.46	C	Roundabout	0.64	B

Note: Fluctuations in travel demand model runs result in some variations between "existing control" and "proposed control" where no improvements are proposed.

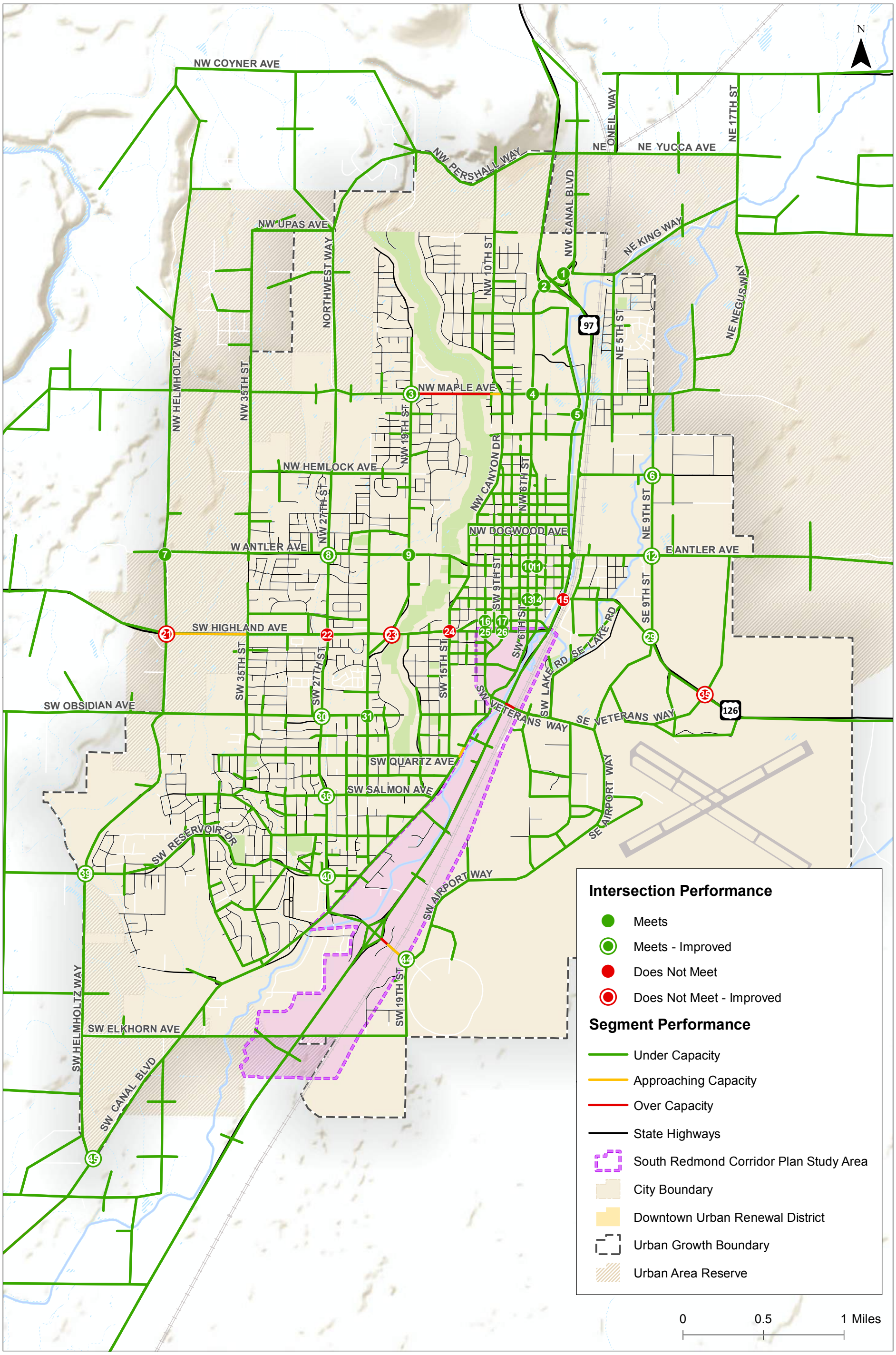
*Removed with corridor improvements

Table 12: Future Year 2040 Study Segment Performance

Segment	Travel Direction	v/c (without improvements)	v/c (with improvements)
Canal Blvd (near Badger Ave)	Northbound	0.99	0.84
	Southbound	0.93	0.76
OR 126 (near SW 35th St)	Eastbound	0.57	0.54
	Westbound	0.65	0.63
OR 126 (near SW Veterans Way)	Eastbound	0.27	0.27
	Westbound	0.28	0.28
US 97 (near SW Glacier Ave)	Northbound	**1.14**	**1.21**
	Southbound	**1.01**	**1.00**
US 97 (near NW Canal Blvd)	Northbound	0.99	**1.10**
	Southbound	0.83	0.87

NEXT STEPS

The Alternatives identified herein will be presented to the PAC and at an Open House at a forthcoming date. Based on the feedback, the list of multimodal projects will be refined and planning-level cost estimates will be developed to enable the city to consider the ability of the projected revenue stream to meet future demands.



Future (2040) Intersection and Segment Performance with Improvements
Redmond, Oregon

Figure **12**

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Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

Appendix A Project Category Evaluation

	Project Ratings						
Project Category	**Balances impacts to developable parcels with system and community needs;**	**Minimizes impacts to Goal 5 resources**	**Supports or enhances the ability to implement the Oregon Resiliency Plan and/or other key state or regional projects**	**Leverages future transportation investments to reduce access, economic, safety and health disparities between neighborhoods, particularly those with greater populations of low income, minority, youth and/or elderly population than the City as a whole.**	**Addresses key connectivity needs on the collector and arterial street system**	**Addresses known safety issues**	**Supports enhanced multimodal access to major activity centers and/or economic development priority areas within the City as well as the region**
Strategic Street Capacity Investment Corridors	●	●	◒	●	●	◒	●
New Planned Streets	●	●	◒	●	●	◒	●
Intersection Control Additions	●	●	○	◒	●	◒	●
Intersection Capacity Improvements	●	●	○	◒	●	◒	●
Grade Separation Projects	●	●	●	◒	●	●	●
Multi-use Pathways	●	●	○	●	◒	●	●
Bicycle Corridors	●	●	○	●	◒	●	●
Pedestrian Improvements	●	●	○	●	◒	●	●

	Provides pedestrian and bicycle connectivity to key transit corridors	**Provides pedestrian and bicycle connectivity to key routes to school**	**Addresses key gaps in the bicycle system**	**Addresses key gaps in the pedestrian system**	**Improves freight mobility on designated freight, truck, rail and air routes**	**Improves mobility for through traffic on state highways; and**	**Leverages public and private investments**
Strategic Street Capacity Investment Corridors	●	●	●	●	●	◒	◒
New Planned Streets	●	●	●	●	●	◒	◒
Intersection Control Additions	◒	◒	◒	◒	●	◒	◒
Intersection Capacity Improvements	◒	◒	◒	◒	●	◒	◒
Grade Separation Projects	◒	◒	●	●	●	●	◒
Multi-use Pathways	●	●	●	●	○	○	◒
Bicycle Corridors	●	●	●	○	○	○	◒
Pedestrian Improvements	●	●	○	●	○	○	◒

Appendix B Future Intersection Operational Analyses with Improvements

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	197	464	8	359	522	78
Future Volume (vph)	197	464	8	359	522	78
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1733	1458	1421	1716	1630	1458
Flt Permitted	1.00	1.00	0.45	1.00	0.95	1.00
Satd. Flow (perm)	1733	1458	673	1716	1630	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	214	504	9	390	567	85
RTOR Reduction (vph)	0	365	0	0	0	36
Lane Group Flow (vph)	214	139	9	390	567	49
Heavy Vehicles (%)	1%	2%	17%	2%	2%	2%
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	17.0	17.0	22.6	22.6	29.9	29.9
Effective Green, g (s)	17.0	17.0	22.6	22.6	29.9	29.9
Actuated g/C Ratio	0.28	0.28	0.37	0.37	0.49	0.49
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	479	403	260	630	792	708
v/s Ratio Prot	0.12		0.00	c0.23	c0.35	
v/s Ratio Perm		0.10	0.01			0.03
v/c Ratio	0.45	0.35	0.03	0.62	0.72	0.07
Uniform Delay, d1	18.4	17.8	12.7	15.9	12.5	8.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.5	0.1	1.8	3.1	0.0
Delay (s)	19.0	18.3	12.7	17.7	15.6	8.4
Level of Service	B	B	B	B	B	A
Approach Delay (s)	18.5			17.6	14.6	
Approach LOS	B			B	B	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	61.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	214	504	9	390	567	85
v/c Ratio	0.42	0.64	0.03	0.70	0.67	0.11
Control Delay	19.9	6.4	12.0	23.8	18.2	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	6.4	12.0	23.8	18.2	4.4
Queue Length 50th (ft)	55	0	2	114	124	2
Queue Length 95th (ft)	131	68	9	188	#387	27
Internal Link Dist (ft)	689			452	761	
Turn Bay Length (ft)			200			175
Base Capacity (vph)	1230	1181	304	1568	842	788
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.43	0.03	0.25	0.67	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	646	127	214	667	0	0	0	0	16	0	188
Future Volume (vph)	0	646	127	214	667	0	0	0	0	16	0	188
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5		4.5	4.5						4.5	4.5
Lane Util. Factor		0.95		1.00	1.00						1.00	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.98		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.95	1.00
Satd. Flow (prot)		3205		1662	1716						1662	1458
Flt Permitted		1.00		0.20	1.00						0.95	1.00
Satd. Flow (perm)		3205		352	1716						1662	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	702	138	233	725	0	0	0	0	17	0	204
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	0	0	0	124
Lane Group Flow (vph)	0	821	0	233	725	0	0	0	0	0	17	80
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	2%
Turn Type		NA		pm+pt	NA					Perm	NA	Perm
Protected Phases		6		5	2						8	
Permitted Phases				2						8		8
Actuated Green, G (s)		18.6		29.8	29.8						8.3	8.3
Effective Green, g (s)		18.6		29.8	29.8						8.3	8.3
Actuated g/C Ratio		0.39		0.63	0.63						0.18	0.18
Clearance Time (s)		4.5		4.5	4.5						4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		1265		409	1085						292	256
v/s Ratio Prot		0.26		0.08	c0.42							
v/s Ratio Perm				0.28							0.01	c0.06
v/c Ratio		0.65		0.57	0.67						0.06	0.31
Uniform Delay, d1		11.6		5.2	5.5						16.1	16.9
Progression Factor		1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2		1.2		1.8	1.6						0.1	0.7
Delay (s)		12.8		7.0	7.1						16.2	17.6
Level of Service		B		A	A						B	B
Approach Delay (s)		12.8			7.1			0.0			17.5	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	47.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

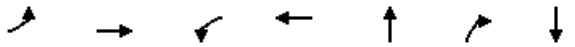
Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	840	233	725	17	204
v/c Ratio	0.66	0.58	0.67	0.06	0.54
Control Delay	14.3	11.3	9.9	18.4	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	11.3	9.9	18.4	12.8
Queue Length 50th (ft)	85	20	93	4	12
Queue Length 95th (ft)	158	#65	247	19	67
Internal Link Dist (ft)	3583		689	648	
Turn Bay Length (ft)		250			275
Base Capacity (vph)	1924	405	1433	1172	1072
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.44	0.58	0.51	0.01	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	250	109	332	409	104	151	69	261	55	45	14
Future Volume (vph)	14	250	109	332	409	104	151	69	261	55	45	14
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0			4.5	4.5		4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.95		1.00	0.97			1.00	0.85		0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1662	1623		1645	1689			1692	1473		1680	
Flt Permitted	0.33	1.00		0.24	1.00			0.74	1.00		0.79	
Satd. Flow (perm)	581	1623		424	1689			1294	1473		1359	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	15	266	116	353	435	111	161	73	278	59	48	15
RTOR Reduction (vph)	0	17	0	0	9	0	0	0	161	0	3	0
Lane Group Flow (vph)	15	365	0	353	537	0	0	234	117	0	119	0
Confl. Peds. (#/hr)			3	3								
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	3%	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4			6		5	2	
Permitted Phases	8			4			6		6			
Actuated Green, G (s)	28.1	26.9		43.0	37.8			37.7	37.7		37.7	
Effective Green, g (s)	28.1	26.9		43.0	37.8			37.7	37.7		37.7	
Actuated g/C Ratio	0.32	0.30		0.48	0.42			0.42	0.42		0.42	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	197	489		370	715			546	622		574	
v/s Ratio Prot	0.00	0.22		c0.13	0.32							
v/s Ratio Perm	0.02			c0.33				c0.18	0.08		0.09	
v/c Ratio	0.08	0.75		0.95	0.75			0.43	0.19		0.21	
Uniform Delay, d1	21.4	28.1		18.4	21.7			18.2	16.2		16.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.2	6.1		34.7	4.4			0.5	0.1		0.2	
Delay (s)	21.6	34.2		53.1	26.2			18.7	16.3		16.5	
Level of Service	C	C		D	C			B	B		B	
Approach Delay (s)		33.7			36.7			17.4			16.5	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	15	382	353	546	234	278	122
v/c Ratio	0.05	0.82	0.96	0.73	0.41	0.35	20.33
Control Delay	12.6	42.2	58.4	26.6	21.0	3.7	9007.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	42.2	58.4	26.6	21.0	3.7	9007.6
Queue Length 50th (ft)	4	180	125	217	84	0	~132
Queue Length 95th (ft)	14	284	#288	#450	172	48	#259
Internal Link Dist (ft)		906		3891	5211		1243
Turn Bay Length (ft)	100		75			100	
Base Capacity (vph)	296	640	367	791	566	801	8
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.60	0.96	0.69	0.41	0.35	15.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	201	186	190	263	29	266	403	250	48	349	193
Future Volume (vph)	113	201	186	190	263	29	266	403	250	48	349	193
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1598	1733	1454	1646	1691		1646	3115		1539	3090	
Flt Permitted	0.42	1.00	1.00	0.46	1.00		0.25	1.00		0.32	1.00	
Satd. Flow (perm)	699	1733	1454	805	1691		426	3115		511	3090	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	124	221	204	209	289	32	292	443	275	53	384	212
RTOR Reduction (vph)	0	0	150	0	4	0	0	99	0	0	83	0
Lane Group Flow (vph)	124	221	54	209	317	0	292	619	0	53	513	0
Confl. Peds. (#/hr)	2		1	1		2	2					2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	4%	1%	1%	1%	2%	0%	1%	1%	0%	8%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)	24.4	19.0	19.0	28.2	20.9		32.6	24.8		24.1	20.3	
Effective Green, g (s)	24.4	19.0	19.0	28.2	20.9		32.6	24.8		24.1	20.3	
Actuated g/C Ratio	0.34	0.27	0.27	0.39	0.29		0.46	0.35		0.34	0.28	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	306	461	386	403	494		336	1081		227	878	
v/s Ratio Prot	0.03	0.13		c0.05	c0.19		c0.10	0.20		0.01	0.17	
v/s Ratio Perm	0.11		0.04	0.15			c0.30			0.07		
v/c Ratio	0.41	0.48	0.14	0.52	0.64		0.87	0.57		0.23	0.58	
Uniform Delay, d1	17.0	22.0	20.0	15.2	22.0		14.1	19.0		16.3	21.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.8	0.2	1.1	2.8		20.5	0.7		0.5	1.0	
Delay (s)	17.9	22.8	20.1	16.3	24.8		34.6	19.7		16.8	22.9	
Level of Service	B	C	C	B	C		C	B		B	C	
Approach Delay (s)		20.7			21.5			24.0			22.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	124	221	204	209	321	292	718	53	596
v/c Ratio	0.36	0.49	0.39	0.53	0.62	0.88	0.59	0.18	0.66
Control Delay	16.8	26.2	5.9	20.3	28.4	47.6	18.3	13.8	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.8	26.2	5.9	20.3	28.4	47.6	18.3	13.8	22.1
Queue Length 50th (ft)	30	77	0	54	118	77	110	12	91
Queue Length 95th (ft)	77	161	47	123	235	#264	201	37	169
Internal Link Dist (ft)		3891			719		1235		3583
Turn Bay Length (ft)	200		200	100		100		100	
Base Capacity (vph)	350	864	827	395	846	330	1563	302	1487
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.26	0.25	0.53	0.38	0.88	0.46	0.18	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	141	23	11	27	3	14	35	41	99	23	25
Future Vol, veh/h	17	141	23	11	27	3	14	35	41	99	23	25
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	20	0	0	0	0	0	0	0	11	0
Mvmt Flow	20	166	27	13	32	4	16	41	48	116	27	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	35	0	0	195	0	0	309	282	183	325	294	34
Stage 1	-	-	-	-	-	-	221	221	-	59	59	-
Stage 2	-	-	-	-	-	-	88	61	-	266	235	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.61	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.61	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.61	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4.099	3.3
Pot Cap-1 Maneuver	1589	-	-	1390	-	-	647	630	865	632	602	1045
Stage 1	-	-	-	-	-	-	786	724	-	958	828	-
Stage 2	-	-	-	-	-	-	925	848	-	744	694	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1589	-	-	1387	-	-	595	614	862	555	587	1045
Mov Cap-2 Maneuver	-	-	-	-	-	-	595	614	-	555	587	-
Stage 1	-	-	-	-	-	-	774	713	-	945	820	-
Stage 2	-	-	-	-	-	-	861	840	-	651	683	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	2	11	13.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	703	1589	-	-	1387	-	-	609
HCM Lane V/C Ratio	0.151	0.013	-	-	0.009	-	-	0.284
HCM Control Delay (s)	11	7.3	0	-	7.6	0	-	13.2
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	17	149	36	17	33	69	229	11	5	81	15
Future Volume (vph)	50	17	149	36	17	33	69	229	11	5	81	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5			4.5		4.5	4.5			4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	1.00
Frt		0.91			0.95		1.00	0.99			1.00	0.85
Flt Protected		0.99			0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)		1494			1600		1352	1721			1697	918
Flt Permitted		0.90			0.80		0.95	1.00			1.00	1.00
Satd. Flow (perm)		1357			1308		1352	1721			1697	918
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	57	19	169	41	19	38	78	260	12	6	92	17
RTOR Reduction (vph)	0	97	0	0	27	0	0	2	0	0	0	13
Lane Group Flow (vph)	0	148	0	0	71	0	78	271	0	0	98	4
Heavy Vehicles (%)	0%	11%	6%	0%	8%	0%	23%	1%	0%	0%	3%	62%
Turn Type	Perm	NA		Perm	NA		Split	NA		Split	NA	Perm
Protected Phases		4			8		2	2		6	6	
Permitted Phases	4			8								6
Actuated Green, G (s)		10.8			10.8		13.9	13.9			10.8	10.8
Effective Green, g (s)		10.8			10.8		13.9	13.9			10.8	10.8
Actuated g/C Ratio		0.22			0.22		0.28	0.28			0.22	0.22
Clearance Time (s)		4.5			4.5		4.5	4.5			4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		299			288		383	488			374	202
v/s Ratio Prot							0.06	c0.16			c0.06	
v/s Ratio Perm		c0.11			0.05							0.00
v/c Ratio		0.50			0.25		0.20	0.56			0.26	0.02
Uniform Delay, d1		16.7			15.7		13.3	14.9			15.8	15.0
Progression Factor		1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		1.3			0.4		0.3	1.4			0.4	0.0
Delay (s)		18.0			16.2		13.6	16.3			16.2	15.0
Level of Service		B			B		B	B			B	B
Approach Delay (s)		18.0			16.2			15.7			16.0	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	49.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	245	98	78	273	98	17
v/c Ratio	0.62	0.31	0.21	0.56	0.26	0.07
Control Delay	17.3	15.0	16.3	21.0	21.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	15.0	16.3	21.0	21.5	0.5
Queue Length 50th (ft)	28	14	16	61	22	0
Queue Length 95th (ft)	99	52	51	150	73	0
Internal Link Dist (ft)	782	827		2579	629	
Turn Bay Length (ft)			100			
Base Capacity (vph)	783	715	807	1028	799	471
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.14	0.10	0.27	0.12	0.04

Intersection Summary

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	42	0	53	0	334	92	46	150	0
Future Vol, veh/h	0	0	0	42	0	53	0	334	92	46	150	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	1	0	8	0
Mvmt Flow	0	0	0	48	0	60	0	380	105	52	170	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	737	759	170	707	707	432	170	0	0	484	0	0
Stage 1	275	275	-	432	432	-	-	-	-	-	-	-
Stage 2	462	484	-	275	275	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	337	338	879	353	363	628	1420	-	-	1089	-	-
Stage 1	736	686	-	606	586	-	-	-	-	-	-	-
Stage 2	584	555	-	736	686	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	292	320	879	339	344	628	1420	-	-	1089	-	-
Mov Cap-2 Maneuver	292	320	-	339	344	-	-	-	-	-	-	-
Stage 1	736	650	-	606	586	-	-	-	-	-	-	-
Stage 2	528	555	-	697	650	-	-	-	-	-	-	-

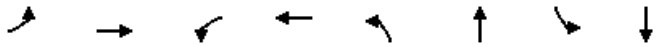
Approach	EB	WB	NB	SB
HCM Control Delay, s	0	15.3	0	2
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1420	-	-	-	456	1089	-	-
HCM Lane V/C Ratio	-	-	-	-	0.237	0.048	-	-
HCM Control Delay (s)	0	-	-	0	15.3	8.5	0	-
HCM Lane LOS	A	-	-	A	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.9	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	87	111	133	114	40	118	268	137	19	148	7
Future Volume (vph)	6	87	111	133	114	40	118	268	137	19	148	7
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.96		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1544		1644	1682		1660	1644		1662	1736	
Flt Permitted	0.65	1.00		0.43	1.00		0.56	1.00		0.33	1.00	
Satd. Flow (perm)	1132	1544		739	1682		971	1644		572	1736	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	7	99	126	151	130	45	134	305	156	22	168	8
RTOR Reduction (vph)	0	58	0	0	14	0	0	19	0	0	2	0
Lane Group Flow (vph)	7	167	0	151	161	0	134	442	0	22	174	0
Confl. Peds. (#/hr)			3	3			3		1	1		3
Heavy Vehicles (%)	0%	3%	2%	1%	0%	0%	0%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	17.2	16.3		25.2	20.3		27.4	22.6		21.6	19.7	
Effective Green, g (s)	17.2	16.3		25.2	20.3		27.4	22.6		21.6	19.7	
Actuated g/C Ratio	0.27	0.26		0.40	0.32		0.43	0.35		0.34	0.31	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	3.5		2.0	3.5		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	313	395		361	536		469	583		226	536	
v/s Ratio Prot	0.00	0.11		c0.03	0.10		c0.02	c0.27		0.00	0.10	
v/s Ratio Perm	0.01			c0.13			0.10			0.03		
v/c Ratio	0.02	0.42		0.42	0.30		0.29	0.76		0.10	0.32	
Uniform Delay, d1	17.0	19.8		13.2	16.3		11.3	18.1		14.5	16.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.9		0.3	0.4		0.1	5.6		0.1	0.4	
Delay (s)	17.1	20.6		13.5	16.7		11.5	23.8		14.5	17.2	
Level of Service	B	C		B	B		B	C		B	B	
Approach Delay (s)		20.5			15.2			21.0			16.9	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	63.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	7	225	151	175	134	461	22	176
v/c Ratio	0.02	0.53	0.40	0.29	0.27	0.70	0.06	0.33
Control Delay	14.3	20.6	17.9	16.7	11.9	23.4	10.3	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	20.6	17.9	16.7	11.9	23.4	10.3	19.6
Queue Length 50th (ft)	1	40	28	29	26	105	4	49
Queue Length 95th (ft)	10	122	86	113	63	#317	16	104
Internal Link Dist (ft)		5288		2545		2548		1288
Turn Bay Length (ft)	50		100		75		100	
Base Capacity (vph)	428	957	384	1019	499	875	358	912
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.24	0.39	0.17	0.27	0.53	0.06	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	122	38	83	222	231	80	457	83	76	333	96
Future Volume (vph)	78	122	38	83	222	231	80	457	83	76	333	96
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.97	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1622	1665		1628	1733	1445	1662	1683		1662	1683	
Flt Permitted	0.43	1.00		0.57	1.00	1.00	0.36	1.00		0.19	1.00	
Satd. Flow (perm)	733	1665		980	1733	1445	626	1683		339	1683	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	84	131	41	89	239	248	86	491	89	82	358	103
RTOR Reduction (vph)	0	14	0	0	0	175	0	6	0	0	10	0
Lane Group Flow (vph)	84	158	0	89	239	73	86	574	0	82	451	0
Confl. Peds. (#/hr)	12		2	2		12	1		4	4		1
Heavy Vehicles (%)	2%	1%	0%	2%	1%	0%	0%	1%	2%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	21.0	16.2		21.0	16.2	22.6	36.2	31.5		39.6	33.2	
Effective Green, g (s)	21.0	16.2		21.0	16.2	22.6	36.2	31.5		39.6	33.2	
Actuated g/C Ratio	0.27	0.21		0.27	0.21	0.29	0.47	0.41		0.51	0.43	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	3.5		2.0	3.5	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	255	350		308	365	509	358	689		284	726	
v/s Ratio Prot	c0.02	0.09		0.02	c0.14	0.01	0.01	c0.34		c0.02	0.27	
v/s Ratio Perm	0.07			0.06		0.04	0.10			0.12		
v/c Ratio	0.33	0.45		0.29	0.65	0.14	0.24	0.83		0.29	0.62	
Uniform Delay, d1	21.6	26.5		21.5	27.8	20.0	11.9	20.3		12.1	17.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.1		0.2	4.4	0.0	0.1	8.5		0.2	1.7	
Delay (s)	21.9	27.6		21.7	32.2	20.1	12.0	28.8		12.3	18.6	
Level of Service	C	C		C	C	C	B	C		B	B	
Approach Delay (s)		25.7			25.3			26.7			17.7	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	76.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	84	172	89	239	248	86	580	82	461
v/c Ratio	0.30	0.46	0.27	0.64	0.41	0.22	0.85	0.29	0.61
Control Delay	20.3	28.1	19.6	36.1	4.7	11.7	35.7	13.0	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	28.1	19.6	36.1	4.7	11.7	35.7	13.0	23.2
Queue Length 50th (ft)	28	67	30	109	0	19	248	18	174
Queue Length 95th (ft)	58	123	60	181	44	48	#499	46	319
Internal Link Dist (ft)		2545		3983			2700		5211
Turn Bay Length (ft)	125		150		225	175		225	
Base Capacity (vph)	284	639	332	653	612	400	733	290	755
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.27	0.27	0.37	0.41	0.21	0.79	0.28	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	82	89	22	136	0	0	0	0	16	681	151
Future Volume (vph)	0	82	89	22	136	0	0	0	0	16	681	151
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		1.00			1.00						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.93			1.00						0.97	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		1627			1738						3184	
Flt Permitted		1.00			0.93						1.00	
Satd. Flow (perm)		1627			1631						3184	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	86	94	23	143	0	0	0	0	17	717	159
RTOR Reduction (vph)	0	65	0	0	0	0	0	0	0	0	26	0
Lane Group Flow (vph)	0	115	0	0	166	0	0	0	0	0	867	0
Confl. Peds. (#/hr)	1					1	1		1	1		1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		8			4						2	
Permitted Phases				4						2		
Actuated Green, G (s)		10.0			10.0						20.1	
Effective Green, g (s)		10.0			10.0						20.1	
Actuated g/C Ratio		0.25			0.25						0.50	
Clearance Time (s)		5.0			5.0						5.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		405			406						1595	
v/s Ratio Prot		0.07										
v/s Ratio Perm					c0.10						0.27	
v/c Ratio		0.28			0.41						0.54	
Uniform Delay, d1		12.2			12.6						6.9	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.4			0.7						0.4	
Delay (s)		12.5			13.3						7.2	
Level of Service		B			B						A	
Approach Delay (s)		12.5			13.3			0.0			7.2	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	40.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	180	166	893
v/c Ratio	0.39	0.41	0.56
Control Delay	11.3	18.2	8.2
Queue Delay	0.0	0.0	0.0
Total Delay	11.3	18.2	8.2
Queue Length 50th (ft)	16	31	56
Queue Length 95th (ft)	68	92	120
Internal Link Dist (ft)	3983	187	3118
Turn Bay Length (ft)			
Base Capacity (vph)	1088	1061	2728
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.17	0.16	0.33

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	27	0	0	48	13	128	790	8	0	0	0
Future Volume (vph)	72	27	0	0	48	13	128	790	8	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		1.00			1.00			0.95				
Frpb, ped/bikes		1.00			1.00			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.97			1.00				
Flt Protected		0.96			1.00			0.99				
Satd. Flow (prot)		1689			1648			3263				
Flt Permitted		0.74			1.00			0.99				
Satd. Flow (perm)		1297			1648			3263				
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	82	31	0	0	55	15	145	898	9	0	0	0
RTOR Reduction (vph)	0	0	0	0	12	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	113	0	0	58	0	0	1051	0	0	0	0
Confl. Peds. (#/hr)							2		1	1		2
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	0%	1%	17%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			6				
Permitted Phases	8						6					
Actuated Green, G (s)		8.0			8.0			28.0				
Effective Green, g (s)		8.0			8.0			28.0				
Actuated g/C Ratio		0.17			0.17			0.61				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		225			286			1986				
v/s Ratio Prot					0.03							
v/s Ratio Perm		c0.09						0.32				
v/c Ratio		0.50			0.20			0.53				
Uniform Delay, d1		17.2			16.3			5.2				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		1.8			0.3			0.3				
Delay (s)		19.0			16.6			5.5				
Level of Service		B			B			A				
Approach Delay (s)		19.0			16.6			5.5			0.0	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	46.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	113	70	1052
v/c Ratio	0.41	0.19	0.49
Control Delay	21.7	14.8	7.1
Queue Delay	0.0	0.0	0.0
Total Delay	21.7	14.8	7.1
Queue Length 50th (ft)	22	10	74
Queue Length 95th (ft)	72	42	148
Internal Link Dist (ft)	187	470	1008
Turn Bay Length (ft)			
Base Capacity (vph)	635	814	2800
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.18	0.09	0.38

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	4	7	12	3	8	6	146	2	4	230	24
Future Volume (vph)	23	4	7	12	3	8	6	146	2	4	230	24
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0		4.0	4.5		4.0	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.95		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1604			1495		1108	1680		1108	1600	
Flt Permitted		1.00			1.00		0.58	1.00		0.65	1.00	
Satd. Flow (perm)		1657			1535		681	1680		759	1600	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	26	5	8	14	3	9	7	166	2	5	261	27
RTOR Reduction (vph)	0	8	0	0	9	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	31	0	0	17	0	7	168	0	5	284	0
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	4%	0%	0%	0%	0%	25%	50%	4%	0%	50%	8%	4%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		1.2			1.2		23.8	22.9		23.8	22.9	
Effective Green, g (s)		1.2			1.2		23.8	22.9		23.8	22.9	
Actuated g/C Ratio		0.03			0.03		0.63	0.61		0.63	0.61	
Clearance Time (s)		4.0			4.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		53			49		442	1025		490	977	
v/s Ratio Prot							c0.00	0.10		0.00	c0.18	
v/s Ratio Perm		c0.02			0.01		0.01			0.01		
v/c Ratio		0.59			0.35		0.02	0.16		0.01	0.29	
Uniform Delay, d1		17.9			17.8		2.5	3.2		2.5	3.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		15.7			4.3		0.0	0.1		0.0	0.2	
Delay (s)		33.6			22.1		2.5	3.2		2.5	3.6	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		33.6			22.1			3.2			3.6	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	37.5	Sum of lost time (s)	12.5
Intersection Capacity Utilization	26.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	26	7	168	5	288
v/c Ratio	0.11	0.08	0.01	0.11	0.01	0.21
Control Delay	10.2	9.9	2.2	4.0	2.0	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	9.9	2.2	4.0	2.0	4.2
Queue Length 50th (ft)	4	2	0	0	0	0
Queue Length 95th (ft)	24	18	3	56	3	95
Internal Link Dist (ft)	792	663		2596		2579
Turn Bay Length (ft)			100		100	
Base Capacity (vph)	1243	1153	677	1680	716	1600
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.02	0.01	0.10	0.01	0.18

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	72	15	96	61	0	0	0	0	152	967	30
Future Volume (vph)	0	72	15	96	61	0	0	0	0	152	967	30
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.99			1.00						1.00	
Flpb, ped/bikes		1.00			0.99						0.99	
Frt		0.98			1.00						1.00	
Flt Protected		1.00			0.97						0.99	
Satd. Flow (prot)		1672			1680						3234	
Flt Permitted		1.00			0.76						0.99	
Satd. Flow (perm)		1672			1311						3234	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	80	17	107	68	0	0	0	0	169	1074	33
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	84	0	0	175	0	0	0	0	0	1274	0
Confl. Peds. (#/hr)	21		19	19		21	16		26	26		16
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	1%	1%	3%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		8			4						2	
Permitted Phases				4						2		
Actuated Green, G (s)		12.6			12.6						30.4	
Effective Green, g (s)		12.6			12.6						30.4	
Actuated g/C Ratio		0.24			0.24						0.57	
Clearance Time (s)		5.0			5.0						5.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		397			311						1854	
v/s Ratio Prot		0.05										
v/s Ratio Perm					c0.13						0.39	
v/c Ratio		0.21			0.56						0.69	
Uniform Delay, d1		16.2			17.8						8.0	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.3			2.3						1.1	
Delay (s)		16.5			20.1						9.0	
Level of Service		B			C						A	
Approach Delay (s)		16.5			20.1			0.0			9.0	
Approach LOS		B			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	53.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	97	175	1276
v/c Ratio	0.24	0.57	0.69
Control Delay	16.6	27.2	11.1
Queue Delay	0.0	0.0	0.0
Total Delay	16.6	27.2	11.1
Queue Length 50th (ft)	23	55	127
Queue Length 95th (ft)	54	107	249
Internal Link Dist (ft)	369	175	1004
Turn Bay Length (ft)			
Base Capacity (vph)	822	636	2203
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.12	0.28	0.58

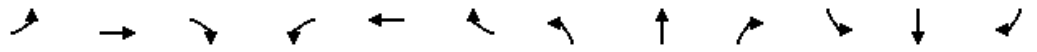
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	174	0	0	130	375	27	571	34	0	0	0
Future Volume (vph)	41	174	0	0	130	375	27	571	34	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		1.00			1.00			0.95				
Frpb, ped/bikes		1.00			0.99			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.90			0.99				
Flt Protected		0.99			1.00			1.00				
Satd. Flow (prot)		1709			1516			3287				
Flt Permitted		0.77			1.00			1.00				
Satd. Flow (perm)		1334			1516			3287				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	46	193	0	0	144	417	30	634	38	0	0	0
RTOR Reduction (vph)	0	0	0	0	84	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	239	0	0	477	0	0	696	0	0	0	0
Confl. Peds. (#/hr)	2		3	3		2	1		1	1		1
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	3%	1%	0%	0%	2%	3%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			6				
Permitted Phases	8						6					
Actuated Green, G (s)		20.7			20.7			18.3				
Effective Green, g (s)		20.7			20.7			18.3				
Actuated g/C Ratio		0.42			0.42			0.37				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		563			640			1227				
v/s Ratio Prot					c0.31							
v/s Ratio Perm		0.18						0.21				
v/c Ratio		0.42			0.75			0.57				
Uniform Delay, d1		10.0			11.9			12.2				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		0.5			4.7			0.6				
Delay (s)		10.5			16.7			12.8				
Level of Service		B			B			B				
Approach Delay (s)		10.5			16.7			12.8			0.0	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	49.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	239	561	702
v/c Ratio	0.43	0.79	0.58
Control Delay	13.8	18.9	15.4
Queue Delay	0.1	0.0	0.0
Total Delay	13.9	18.9	15.4
Queue Length 50th (ft)	44	89	79
Queue Length 95th (ft)	118	260	160
Internal Link Dist (ft)	175	838	646
Turn Bay Length (ft)			
Base Capacity (vph)	898	1068	2080
Starvation Cap Reductn	83	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.29	0.53	0.34

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	138	96	366	291	159	290	1510	299	140	1227	33
Future Volume (vph)	68	138	96	366	291	159	290	1510	299	140	1227	33
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1630	1617		1614	1602		1630	3107	1417	1646	3107	1488
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1630	1617		1614	1602		1630	3107	1417	1646	3107	1488
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	72	145	101	385	306	167	305	1589	315	147	1292	35
RTOR Reduction (vph)	0	17	0	0	14	0	0	0	187	0	0	24
Lane Group Flow (vph)	72	229	0	385	459	0	305	1589	128	147	1292	11
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	1%	1%	3%	1%	8%	2%	7%	5%	1%	7%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Prot	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6	6	5	2	
Permitted Phases												2
Actuated Green, G (s)	9.1	29.1		24.6	44.6		22.6	57.3	57.3	10.5	45.2	45.2
Effective Green, g (s)	9.1	29.1		24.6	44.6		22.6	57.3	57.3	10.5	45.2	45.2
Actuated g/C Ratio	0.06	0.21		0.17	0.32		0.16	0.40	0.40	0.07	0.32	0.32
Clearance Time (s)	4.5	5.0		4.5	5.0		4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	104	332		280	504		260	1258	573	122	992	475
v/s Ratio Prot	0.04	0.14		c0.24	c0.29		c0.19	c0.51	0.09	0.09	0.42	
v/s Ratio Perm												0.01
v/c Ratio	0.69	0.69		1.38	0.91		1.17	1.26	0.22	1.20	1.30	0.02
Uniform Delay, d1	64.8	52.0		58.4	46.5		59.5	42.1	27.5	65.5	48.1	33.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.1	5.8		189.7	20.7		110.9	124.9	0.2	146.7	143.5	0.0
Delay (s)	82.9	57.8		248.2	67.2		170.3	167.0	27.7	212.2	191.6	33.0
Level of Service	F	E		F	E		F	F	C	F	F	C
Approach Delay (s)		63.5			148.4			147.6			189.9	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	155.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	141.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	107.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	72	246	385	473	305	1589	315	147	1292	35
v/c Ratio	0.69	0.70	1.38	0.91	1.17	1.27	0.41	1.20	1.30	0.06
Control Delay	98.4	58.3	232.4	67.6	161.7	161.8	4.8	199.3	182.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.4	58.3	232.4	67.6	161.7	161.8	4.8	199.3	182.4	0.2
Queue Length 50th (ft)	67	193	~479	405	~343	~990	0	~168	~820	0
Queue Length 95th (ft)	#151	290	#725	#565	#565	#1205	64	#331	#1022	0
Internal Link Dist (ft)		838		3278		1074			1019	
Turn Bay Length (ft)	150		450		275		575	350		100
Base Capacity (vph)	109	451	280	614	260	1256	760	122	992	573
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.55	1.38	0.77	1.17	1.27	0.41	1.20	1.30	0.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	63	1505	0	0	0	0	0	32	24
Future Volume (vph)	0	0	0	63	1505	0	0	0	0	0	32	24
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					4.5						4.5	
Lane Util. Factor					0.95						0.95	
Frpb, ped/bikes					1.00						0.99	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.94	
Flt Protected					1.00						1.00	
Satd. Flow (prot)					3256						3091	
Flt Permitted					1.00						1.00	
Satd. Flow (perm)					3256						3091	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	68	1636	0	0	0	0	0	35	26
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	24	0
Lane Group Flow (vph)	0	0	0	0	1701	0	0	0	0	0	37	0
Confl. Peds. (#/hr)	3		1	1		3	3		2	2		3
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type				Perm	NA						NA	
Protected Phases					6						4	
Permitted Phases				6								
Actuated Green, G (s)					59.8						5.1	
Effective Green, g (s)					59.8						5.1	
Actuated g/C Ratio					0.81						0.07	
Clearance Time (s)					4.5						4.5	
Vehicle Extension (s)					3.0						3.0	
Lane Grp Cap (vph)					2634						213	
v/s Ratio Prot											c0.01	
v/s Ratio Perm					0.52							
v/c Ratio					0.65						0.17	
Uniform Delay, d1					2.8						32.4	
Progression Factor					1.00						1.00	
Incremental Delay, d2					0.6						0.4	
Delay (s)					3.4						32.8	
Level of Service					A						C	
Approach Delay (s)		0.0			3.4			0.0			32.8	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	4.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	73.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	SBT
Lane Group Flow (vph)	1704	61
v/c Ratio	0.62	0.19
Control Delay	4.1	25.6
Queue Delay	0.2	0.0
Total Delay	4.3	25.6
Queue Length 50th (ft)	121	8
Queue Length 95th (ft)	187	30
Internal Link Dist (ft)	472	448
Turn Bay Length (ft)		
Base Capacity (vph)	3014	860
Starvation Cap Reductn	444	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.66	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1096	20	409	143	0	0	0	0
Future Volume (vph)	0	0	0	0	1096	20	409	143	0	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					4.5		4.5	4.5				
Lane Util. Factor					0.95		0.91	0.91				
Frpb, ped/bikes					1.00		1.00	1.00				
Flpb, ped/bikes					1.00		1.00	1.00				
Frt					1.00		1.00	1.00				
Flt Protected					1.00		0.95	0.97				
Satd. Flow (prot)					3251		1482	3056				
Flt Permitted					1.00		0.95	0.97				
Satd. Flow (perm)					3251		1482	3056				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1191	22	445	155	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	51	51	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1212	0	171	327	0	0	0	0
Confl. Peds. (#/hr)	3					3	1					1
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%	0%	0%
Turn Type					NA		Perm	NA				
Protected Phases					6			8				
Permitted Phases							8					
Actuated Green, G (s)					32.1		14.5	14.5				
Effective Green, g (s)					32.1		14.5	14.5				
Actuated g/C Ratio					0.58		0.26	0.26				
Clearance Time (s)					4.5		4.5	4.5				
Vehicle Extension (s)					3.0		3.0	3.0				
Lane Grp Cap (vph)					1876		386	796				
v/s Ratio Prot					c0.37							
v/s Ratio Perm							c0.12	0.11				
v/c Ratio					0.65		0.44	0.41				
Uniform Delay, d1					7.9		17.2	17.0				
Progression Factor					1.00		1.00	1.00				
Incremental Delay, d2					0.8		0.8	0.3				
Delay (s)					8.7		18.0	17.4				
Level of Service					A		B	B				
Approach Delay (s)		0.0			8.7			17.6			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	55.6	Sum of lost time (s)	9.0
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	NBL	NBT
Lane Group Flow (vph)	1213	222	378
v/c Ratio	0.66	0.51	0.45
Control Delay	10.7	18.7	17.3
Queue Delay	0.0	0.0	0.0
Total Delay	10.7	18.7	17.3
Queue Length 50th (ft)	119	43	43
Queue Length 95th (ft)	264	141	110
Internal Link Dist (ft)	765		275
Turn Bay Length (ft)			
Base Capacity (vph)	2980	983	2002
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.41	0.23	0.19

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	121	653	0	0	0	0	0	660	361
Future Volume (vph)	0	0	0	121	653	0	0	0	0	0	660	361
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					4.5						4.5	
Lane Util. Factor					0.95						0.95	
Frpb, ped/bikes					1.00						0.99	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.95	
Flt Protected					0.99						1.00	
Satd. Flow (prot)					3217						3112	
Flt Permitted					0.99						1.00	
Satd. Flow (perm)					3217						3112	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	130	702	0	0	0	0	0	710	388
RTOR Reduction (vph)	0	0	0	0	15	0	0	0	0	0	41	0
Lane Group Flow (vph)	0	0	0	0	817	0	0	0	0	0	1057	0
Confl. Peds. (#/hr)			2	2			2		2	2		2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	1%	0%
Turn Type				Perm	NA						NA	
Protected Phases					6						4	
Permitted Phases				6								
Actuated Green, G (s)					26.2						36.7	
Effective Green, g (s)					26.2						36.7	
Actuated g/C Ratio					0.36						0.51	
Clearance Time (s)					4.5						4.5	
Vehicle Extension (s)					3.0						3.0	
Lane Grp Cap (vph)					1172						1588	
v/s Ratio Prot											c0.34	
v/s Ratio Perm					0.25							
v/c Ratio					0.70						0.67	
Uniform Delay, d1					19.5						13.0	
Progression Factor					1.00						1.00	
Incremental Delay, d2					1.8						1.1	
Delay (s)					21.3						14.1	
Level of Service					C						B	
Approach Delay (s)		0.0			21.3			0.0			14.1	
Approach LOS		A			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	71.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	SBT
Lane Group Flow (vph)	832	1098
v/c Ratio	0.71	0.68
Control Delay	24.3	15.1
Queue Delay	0.3	0.0
Total Delay	24.7	15.1
Queue Length 50th (ft)	155	165
Queue Length 95th (ft)	298	291
Internal Link Dist (ft)	179	644
Turn Bay Length (ft)		
Base Capacity (vph)	1745	2423
Starvation Cap Reductn	386	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.61	0.45

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	650	192	108	645	0	0	0	0
Future Volume (vph)	0	0	0	0	650	192	108	645	0	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					4.5	4.5	4.5	4.5				
Lane Util. Factor					0.95	1.00	0.91	0.91				
Frpb, ped/bikes					1.00	0.99	1.00	1.00				
Flpb, ped/bikes					1.00	1.00	1.00	1.00				
Frt					1.00	0.85	1.00	1.00				
Flt Protected					1.00	1.00	0.95	1.00				
Satd. Flow (prot)					3228	1440	1513	3182				
Flt Permitted					1.00	1.00	0.95	1.00				
Satd. Flow (perm)					3228	1440	1513	3182				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	707	209	117	701	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	100	47	9	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	707	109	58	704	0	0	0	0
Confl. Peds. (#/hr)	1					1			1	1		
Heavy Vehicles (%)	0%	0%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%
Turn Type					NA	Perm	Perm	NA				
Protected Phases					4			6				
Permitted Phases						4	6					
Actuated Green, G (s)					20.5	20.5	20.4	20.4				
Effective Green, g (s)					20.5	20.5	20.4	20.4				
Actuated g/C Ratio					0.41	0.41	0.41	0.41				
Clearance Time (s)					4.5	4.5	4.5	4.5				
Vehicle Extension (s)					3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)					1326	591	618	1300				
v/s Ratio Prot					c0.22							
v/s Ratio Perm						0.08	0.04	0.22				
v/c Ratio					0.53	0.19	0.09	0.54				
Uniform Delay, d1					11.1	9.4	9.1	11.2				
Progression Factor					1.00	1.00	1.00	1.00				
Incremental Delay, d2					0.4	0.2	0.1	0.5				
Delay (s)					11.5	9.5	9.1	11.7				
Level of Service					B	A	A	B				
Approach Delay (s)		0.0			11.1			11.3			0.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	49.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	707	209	105	713
v/c Ratio	0.54	0.31	0.16	0.55
Control Delay	13.8	4.9	5.3	13.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.8	4.9	5.3	13.7
Queue Length 50th (ft)	73	6	4	75
Queue Length 95th (ft)	164	47	35	169
Internal Link Dist (ft)	478			255
Turn Bay Length (ft)		125	75	
Base Capacity (vph)	2685	1225	1379	2885
Starvation Cap Reductn	0	0	0	99
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.17	0.08	0.26

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR	SBR2	SEL	SER
Lane Configurations									
Traffic Volume (vph)	542	166	374	1556	1253	436	0	0	0
Future Volume (vph)	542	166	374	1556	1253	436	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	5.5	5.5				
Lane Util. Factor	0.97	1.00	0.97	0.95	0.95				
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99				
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00				
Frt	1.00	0.85	1.00	1.00	0.96				
Flt Protected	0.95	1.00	0.95	1.00	1.00				
Satd. Flow (prot)	3131	1473	3162	3167	3021				
Flt Permitted	0.95	1.00	0.95	1.00	1.00				
Satd. Flow (perm)	3131	1473	3162	3167	3021				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	571	175	394	1638	1319	459	0	0	0
RTOR Reduction (vph)	0	133	0	0	0	0	0	0	0
Lane Group Flow (vph)	571	42	394	1638	1778	0	0	0	0
Confl. Bikes (#/hr)						1			
Heavy Vehicles (%)	3%	1%	2%	5%	6%	3%	2%	2%	2%
Turn Type	Prot	Perm	Prot	NA	NA		Perm		
Protected Phases	8		1	6	2				
Permitted Phases		3					2		
Actuated Green, G (s)	28.8	28.8	21.8	93.2	66.9				
Effective Green, g (s)	28.8	28.8	21.8	93.2	66.9				
Actuated g/C Ratio	0.22	0.22	0.17	0.71	0.51				
Clearance Time (s)	4.5	4.5	4.5	5.5	5.5				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	683	321	522	2236	1531				
v/s Ratio Prot	c0.18		0.12	c0.52	c0.59				
v/s Ratio Perm		0.03							
v/c Ratio	0.84	0.13	0.75	0.73	1.16				
Uniform Delay, d1	49.3	41.5	52.6	11.8	32.5				
Progression Factor	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	8.7	0.2	6.1	1.3	80.3				
Delay (s)	58.1	41.7	58.7	13.1	112.8				
Level of Service	E	D	E	B	F				
Approach Delay (s)	54.2			21.9	112.8			0.0	
Approach LOS	D			C	F			A	

Intersection Summary			
HCM 2000 Control Delay	62.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	571	175	394	1638	1778
v/c Ratio	0.84	0.39	0.76	0.73	1.16
Control Delay	61.5	9.2	62.9	15.0	112.1
Queue Delay	0.1	0.0	0.0	0.0	0.0
Total Delay	61.5	9.2	62.9	15.0	112.1
Queue Length 50th (ft)	242	3	168	410	~951
Queue Length 95th (ft)	328	66	237	595	#1276
Internal Link Dist (ft)	383			2738	1074
Turn Bay Length (ft)		200	325		
Base Capacity (vph)	870	532	783	2497	1529
Starvation Cap Reductn	11	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.66	0.33	0.50	0.66	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

MOVEMENT SUMMARY

Site: [21 - SW Helmholtz @ OR 126]

Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SW Helmholtz Way											
3	L2	36	0.0	0.550	15.1	LOS C	2.9	73.3	0.75	0.84	30.5
8	T1	315	0.0	0.550	15.1	LOS C	2.9	73.3	0.75	0.84	30.4
18	R2	128	1.0	0.228	9.4	LOS A	0.8	21.0	0.65	0.65	31.9
Approach		479	0.3	0.550	13.6	LOS B	2.9	73.3	0.73	0.79	30.8
East: OR 126											
1	L2	173	3.0	0.917	34.8	LOS D	14.8	379.2	1.00	1.37	24.0
6	T1	645	3.0	0.917	34.8	LOS D	14.8	379.2	1.00	1.37	23.9
16	R2	103	0.0	0.123	5.5	LOS A	0.5	11.7	0.50	0.44	33.8
Approach		921	2.7	0.917	31.5	LOS D	14.8	379.2	0.94	1.27	24.7
North: SW Helmholtz Way											
7	L2	38	0.0	0.226	8.4	LOS A	0.8	20.6	0.62	0.62	33.0
4	T1	105	8.0	0.226	8.4	LOS A	0.8	20.6	0.62	0.62	32.7
14	R2	96	0.0	0.159	7.9	LOS A	0.6	14.4	0.62	0.62	32.6
Approach		239	3.5	0.226	8.2	LOS A	0.8	20.6	0.62	0.62	32.7
West: OR 126											
5	L2	162	0.0	0.841	23.0	LOS C	11.4	294.1	0.92	0.99	27.4
2	T1	705	5.0	0.841	23.0	LOS C	11.4	294.1	0.92	0.99	27.3
12	R2	68	5.0	0.072	4.4	LOS A	0.3	6.7	0.40	0.28	34.2
Approach		936	4.1	0.841	21.6	LOS C	11.4	294.1	0.88	0.94	27.7
All Vehicles		2575	2.8	0.917	22.4	LOS C	14.8	379.2	0.85	1.00	27.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	732	48	236	869	233	70	328	132	214	285	70
Future Volume (vph)	162	732	48	236	869	233	70	328	132	214	285	70
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.7	5.0		4.7	5.0		4.7	5.0		4.7	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1662	1671		1662	1647		1583	1636		1630	1733	1410
Flt Permitted	0.10	1.00		0.09	1.00		0.36	1.00		0.16	1.00	1.00
Satd. Flow (perm)	179	1671		160	1647		606	1636		272	1733	1410
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	171	771	51	248	915	245	74	345	139	225	300	74
RTOR Reduction (vph)	0	2	0	0	10	0	0	14	0	0	0	56
Lane Group Flow (vph)	171	820	0	248	1150	0	74	470	0	225	300	18
Confl. Peds. (#/hr)	1					1	1		1	1		1
Confl. Bikes (#/hr)						1						1
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%	5%	2%	1%	2%	1%	3%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	45.4	39.1		56.0	45.0		28.9	23.9		31.5	25.2	25.2
Effective Green, g (s)	45.4	39.1		56.0	45.0		28.9	23.9		31.5	25.2	25.2
Actuated g/C Ratio	0.45	0.39		0.56	0.45		0.29	0.24		0.31	0.25	0.25
Clearance Time (s)	4.7	5.0		4.7	5.0		4.7	5.0		4.7	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	173	647		270	734		221	387		169	432	352
v/s Ratio Prot	0.06	0.49		c0.11	c0.70		0.02	0.29		c0.08	0.17	
v/s Ratio Perm	0.38			0.40			0.08			c0.33		0.01
v/c Ratio	0.99	1.27		0.92	1.57		0.33	1.21		1.33	0.69	0.05
Uniform Delay, d1	24.0	30.9		29.0	28.0		27.4	38.5		32.6	34.4	28.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	64.4	132.0		33.6	261.7		0.9	117.5		183.8	4.8	0.1
Delay (s)	88.4	162.9		62.6	289.6		28.3	156.0		216.4	39.2	28.8
Level of Service	F	F		E	F		C	F		F	D	C
Approach Delay (s)		150.1			249.6			139.1			104.5	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	180.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.47		
Actuated Cycle Length (s)	100.9	Sum of lost time (s)	19.4
Intersection Capacity Utilization	131.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	171	822	248	1160	74	484	225	300	74
v/c Ratio	0.98	1.25	0.91	1.54	0.31	1.24	1.33	0.69	0.15
Control Delay	88.0	156.0	60.7	276.6	26.5	162.0	212.5	44.5	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.0	156.0	60.7	276.6	26.5	162.0	212.5	44.5	0.7
Queue Length 50th (ft)	60	~663	108	~1051	32	~377	~144	179	0
Queue Length 95th (ft)	#198	#898	#255	#1304	65	#577	#298	#300	0
Internal Link Dist (ft)		5185		1541		2675		2548	
Turn Bay Length (ft)	225		275		125		150		150
Base Capacity (vph)	174	655	274	751	240	390	169	436	486
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	1.25	0.91	1.54	0.31	1.24	1.33	0.69	0.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	848	9	294	1133	386	21	219	196	258	180	107
Future Volume (vph)	146	848	9	294	1133	386	21	219	196	258	180	107
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3223		1662	3292	1414	1662	1733	1468	1662	1733	1467
Flt Permitted	0.13	1.00		0.12	1.00	1.00	0.64	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	224	3223		212	3292	1414	1115	1733	1468	635	1733	1467
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	155	902	10	313	1205	411	22	233	209	274	191	114
RTOR Reduction (vph)	0	1	0	0	0	188	0	0	162	0	0	83
Lane Group Flow (vph)	155	911	0	313	1205	223	22	233	47	274	191	31
Confl. Peds. (#/hr)	3		2	2		3	1		1	1		1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	5%	3%	0%	0%	1%	3%	0%	1%	0%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	36.2	29.7		47.8	36.8	43.3	22.0	19.6	19.6	30.2	23.7	23.7
Effective Green, g (s)	36.2	29.7		47.8	36.8	43.3	22.0	19.6	19.6	30.2	23.7	23.7
Actuated g/C Ratio	0.41	0.34		0.55	0.42	0.50	0.25	0.22	0.22	0.35	0.27	0.27
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	193	1095		341	1386	773	295	388	329	295	469	397
v/s Ratio Prot	0.06	0.28		c0.14	0.37	0.02	0.00	0.13		c0.07	0.11	
v/s Ratio Perm	0.27			c0.36		0.14	0.02		0.03	c0.25		0.02
v/c Ratio	0.80	0.83		0.92	0.87	0.29	0.07	0.60	0.14	0.93	0.41	0.08
Uniform Delay, d1	18.8	26.6		22.3	23.1	13.0	24.8	30.4	27.2	27.2	26.1	23.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.9	5.5		28.5	6.1	0.2	0.1	2.6	0.2	33.8	0.6	0.1
Delay (s)	39.7	32.1		50.9	29.2	13.2	24.9	33.0	27.4	61.0	26.7	23.8
Level of Service	D	C		D	C	B	C	C	C	E	C	C
Approach Delay (s)		33.2			29.3			30.1			42.4	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	87.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	155	912	313	1205	411	22	233	209	274	191	114
v/c Ratio	0.78	0.81	0.89	0.84	0.46	0.06	0.68	0.46	1.00	0.39	0.22
Control Delay	43.4	32.6	49.1	29.3	3.7	19.2	41.7	7.6	82.9	28.9	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.4	32.6	49.1	29.3	3.7	19.2	41.7	7.6	82.9	28.9	2.5
Queue Length 50th (ft)	36	224	111	287	8	8	116	0	116	76	0
Queue Length 95th (ft)	#155	#372	#302	#482	57	23	190	53	#274	156	17
Internal Link Dist (ft)		394		1820			1014			2700	
Turn Bay Length (ft)	225		200		200	200		175	250		250
Base Capacity (vph)	200	1146	351	1444	903	349	657	686	275	657	658
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.80	0.89	0.83	0.46	0.06	0.35	0.30	1.00	0.29	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	1065	59	47	1384	48	278	86	82	37	36	90
Future Volume (vph)	48	1065	59	47	1384	48	278	86	82	37	36	90
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.98			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1662	3204		1662	3243			1625			1559	
Flt Permitted	0.08	1.00		0.12	1.00			0.69			0.86	
Satd. Flow (perm)	143	3204		208	3243			1161			1353	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	1158	64	51	1504	52	302	93	89	40	39	98
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	9	0
Lane Group Flow (vph)	52	1222	0	51	1553	0	0	484	0	0	168	0
Confl. Peds. (#/hr)	1		8	8		1	6		1	1		6
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	1%	3%	0%	0%	0%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	49.0	49.0		49.0	49.0			41.8			41.8	
Effective Green, g (s)	49.0	49.0		49.0	49.0			41.8			41.8	
Actuated g/C Ratio	0.50	0.50		0.50	0.50			0.42			0.42	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	70	1589		103	1608			491			572	
v/s Ratio Prot		0.38			c0.48							
v/s Ratio Perm	0.36			0.25				c0.42			0.12	
v/c Ratio	0.74	0.77		0.50	0.97			0.99			0.29	
Uniform Delay, d1	19.9	20.3		16.6	24.1			28.2			18.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	34.2	2.3		3.7	15.0			36.6			0.3	
Delay (s)	54.1	22.6		20.3	39.1			64.8			19.1	
Level of Service	D	C		C	D			E			B	
Approach Delay (s)		23.9			38.5			64.8			19.1	
Approach LOS		C			D			E			B	

Intersection Summary			
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	52	1222	51	1556	484	177
v/c Ratio	0.73	0.77	0.50	0.97	0.99	0.30
Control Delay	78.5	24.7	38.1	41.0	67.1	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.5	24.7	38.1	41.0	67.1	18.7
Queue Length 50th (ft)	25	325	21	490	294	65
Queue Length 95th (ft)	#101	414	#77	#672	#509	116
Internal Link Dist (ft)		1820		1191	423	675
Turn Bay Length (ft)	125		125			
Base Capacity (vph)	71	1588	102	1610	505	597
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.77	0.50	0.97	0.96	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	855	384	0	0	0	0	0	0	14	86	0
Future Volume (vph)	0	855	384	0	0	0	0	0	0	14	86	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		1.00									1.00	
Flpb, ped/bikes		1.00									1.00	
Frt		0.95									1.00	
Flt Protected		1.00									0.99	
Satd. Flow (prot)		3096									3302	
Flt Permitted		1.00									0.99	
Satd. Flow (perm)		3096									3302	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	929	417	0	0	0	0	0	0	15	93	0
RTOR Reduction (vph)	0	46	0	0	0	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	1300	0	0	0	0	0	0	0	0	94	0
Confl. Peds. (#/hr)							3					3
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA								Perm	NA	
Protected Phases		2									4	
Permitted Phases										4		
Actuated Green, G (s)		37.7									5.6	
Effective Green, g (s)		37.7									5.6	
Actuated g/C Ratio		0.73									0.11	
Clearance Time (s)		4.5									4.0	
Vehicle Extension (s)		3.0									3.0	
Lane Grp Cap (vph)		2253									356	
v/s Ratio Prot		c0.42										
v/s Ratio Perm											0.03	
v/c Ratio		0.58									0.26	
Uniform Delay, d1		3.3									21.2	
Progression Factor		1.00									1.00	
Incremental Delay, d2		0.4									0.4	
Delay (s)		3.7									21.6	
Level of Service		A									C	
Approach Delay (s)		3.7			0.0			0.0			21.6	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	5.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	51.8	Sum of lost time (s)	8.5
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SBT
Lane Group Flow (vph)	1346	108
v/c Ratio	0.56	0.22
Control Delay	4.3	20.1
Queue Delay	0.0	0.0
Total Delay	4.3	20.1
Queue Length 50th (ft)	66	13
Queue Length 95th (ft)	123	36
Internal Link Dist (ft)	1097	269
Turn Bay Length (ft)		
Base Capacity (vph)	3098	1491
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.43	0.07

Intersection Summary

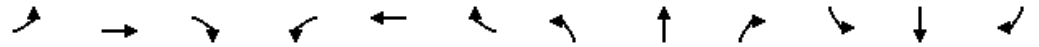
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	866	0	0	0	0	0	508	144	0	0	0
Future Volume (vph)	38	866	0	0	0	0	0	508	144	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5						4.5	4.5			
Lane Util. Factor		0.95						0.95	1.00			
Frpb, ped/bikes		1.00						1.00	1.00			
Flpb, ped/bikes		1.00						1.00	1.00			
Frt		1.00						1.00	0.85			
Flt Protected		1.00						1.00	1.00			
Satd. Flow (prot)		3250						3260	1488			
Flt Permitted		1.00						1.00	1.00			
Satd. Flow (perm)		3250						3260	1488			
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	41	931	0	0	0	0	0	546	155	0	0	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	70	0	0	0
Lane Group Flow (vph)	0	964	0	0	0	0	0	546	85	0	0	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	4%	2%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Turn Type	Perm	NA						NA	Perm			
Protected Phases		2						8				
Permitted Phases	2								8			
Actuated Green, G (s)		24.6						16.3	16.3			
Effective Green, g (s)		24.6						16.3	16.3			
Actuated g/C Ratio		0.49						0.33	0.33			
Clearance Time (s)		4.5						4.5	4.5			
Vehicle Extension (s)		3.0						3.0	3.0			
Lane Grp Cap (vph)		1602						1064	486			
v/s Ratio Prot								c0.17				
v/s Ratio Perm		0.30							0.06			
v/c Ratio		0.60						0.51	0.17			
Uniform Delay, d1		9.1						13.6	12.0			
Progression Factor		1.00						1.00	1.00			
Incremental Delay, d2		0.6						0.4	0.2			
Delay (s)		9.8						14.0	12.2			
Level of Service		A						B	B			
Approach Delay (s)		9.8			0.0			13.6			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	49.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	NBT	NBR
Lane Group Flow (vph)	972	546	155
v/c Ratio	0.61	0.52	0.28
Control Delay	11.5	16.7	7.8
Queue Delay	0.0	0.0	0.0
Total Delay	11.5	16.7	7.8
Queue Length 50th (ft)	94	64	10
Queue Length 95th (ft)	194	141	53
Internal Link Dist (ft)	460	568	
Turn Bay Length (ft)			175
Base Capacity (vph)	3043	2567	1193
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.32	0.21	0.13

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱							↰	↑↑	
Traffic Volume (vph)	0	884	69	0	0	0	0	0	0	168	589	0
Future Volume (vph)	0	884	69	0	0	0	0	0	0	168	589	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0							4.0	4.0	
Lane Util. Factor		0.95	1.00							1.00	0.95	
Frpb, ped/bikes		1.00	0.99							1.00	1.00	
Flpb, ped/bikes		1.00	1.00							1.00	1.00	
Frt		1.00	0.85							1.00	1.00	
Flt Protected		1.00	1.00							0.95	1.00	
Satd. Flow (prot)		3260	1469							1657	3292	
Flt Permitted		1.00	1.00							0.95	1.00	
Satd. Flow (perm)		3260	1469							1657	3292	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	931	73	0	0	0	0	0	0	177	620	0
RTOR Reduction (vph)	0	0	30	0	0	0	0	0	0	67	0	0
Lane Group Flow (vph)	0	931	43	0	0	0	0	0	0	110	620	0
Confl. Peds. (#/hr)									4	4		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type		NA	Perm							Perm	NA	
Protected Phases		2									4	
Permitted Phases			2							4		
Actuated Green, G (s)		25.7	25.7							19.9	19.9	
Effective Green, g (s)		25.7	25.7							19.9	19.9	
Actuated g/C Ratio		0.48	0.48							0.37	0.37	
Clearance Time (s)		4.0	4.0							4.0	4.0	
Vehicle Extension (s)		3.0	3.0							3.0	3.0	
Lane Grp Cap (vph)		1563	704							615	1222	
v/s Ratio Prot		c0.29									c0.19	
v/s Ratio Perm			0.03							0.07		
v/c Ratio		0.60	0.06							0.18	0.51	
Uniform Delay, d1		10.2	7.5							11.3	13.1	
Progression Factor		1.00	1.00							1.00	1.00	
Incremental Delay, d2		0.6	0.0							0.1	0.3	
Delay (s)		10.8	7.5							11.5	13.4	
Level of Service		B	A							B	B	
Approach Delay (s)		10.5			0.0			0.0			13.0	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	SBL	SBT
Lane Group Flow (vph)	931	73	177	620
v/c Ratio	0.60	0.10	0.26	0.51
Control Delay	13.0	4.4	7.6	16.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.0	4.4	7.6	16.0
Queue Length 50th (ft)	99	2	13	73
Queue Length 95th (ft)	217	24	62	166
Internal Link Dist (ft)	782			261
Turn Bay Length (ft)		100	150	
Base Capacity (vph)	2939	1330	1269	2474
Starvation Cap Reductn	0	0	0	102
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.32	0.05	0.14	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	407	658	0	0	0	0	0	324	51	0	0	0
Future Volume (vph)	407	658	0	0	0	0	0	324	51	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5						4.5				
Lane Util. Factor	0.91	0.91						0.95				
Frt	1.00	1.00						0.98				
Flt Protected	0.95	1.00						1.00				
Satd. Flow (prot)	1513	3114						3257				
Flt Permitted	0.95	1.00						1.00				
Satd. Flow (perm)	1513	3114						3257				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	438	708	0	0	0	0	0	348	55	0	0	0
RTOR Reduction (vph)	153	8	0	0	0	0	0	15	0	0	0	0
Lane Group Flow (vph)	219	766	0	0	0	0	0	388	0	0	0	0
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA						NA				
Protected Phases		8						6				
Permitted Phases	8											
Actuated Green, G (s)	21.7	21.7						11.5				
Effective Green, g (s)	21.7	21.7						11.5				
Actuated g/C Ratio	0.51	0.51						0.27				
Clearance Time (s)	4.5	4.5						4.5				
Vehicle Extension (s)	3.0	3.0						3.0				
Lane Grp Cap (vph)	778	1601						887				
v/s Ratio Prot								c0.12				
v/s Ratio Perm	0.15	0.25										
v/c Ratio	0.28	0.48						0.44				
Uniform Delay, d1	5.8	6.6						12.7				
Progression Factor	1.00	1.00						1.00				
Incremental Delay, d2	0.2	0.2						0.3				
Delay (s)	6.0	6.8						13.0				
Level of Service	A	A						B				
Approach Delay (s)		6.6			0.0			13.0			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	42.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	NBT
Lane Group Flow (vph)	372	774	403
v/c Ratio	0.40	0.49	0.45
Control Delay	2.9	7.9	15.3
Queue Delay	0.1	0.0	0.0
Total Delay	3.0	7.9	15.3
Queue Length 50th (ft)	6	52	37
Queue Length 95th (ft)	43	114	94
Internal Link Dist (ft)		156	664
Turn Bay Length (ft)	75		
Base Capacity (vph)	1480	3030	2867
Starvation Cap Reductn	225	495	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.30	0.31	0.14

Intersection Summary

MOVEMENT SUMMARY

Site: [29 - SE 9th St @ OR 126]

Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SE 9th St											
3	L2	36	1.0	0.191	8.6	LOS A	0.8	19.1	0.66	0.66	32.6
8	T1	33	1.0	0.191	8.6	LOS A	0.8	19.1	0.66	0.66	32.5
18	R2	43	1.0	0.191	8.6	LOS A	0.8	19.1	0.66	0.66	31.6
Approach		112	1.0	0.191	8.6	LOS A	0.8	19.1	0.66	0.66	32.2
East: OR 126											
1	L2	30	1.0	0.535	9.5	LOS A	3.7	96.9	0.49	0.32	32.9
6	T1	415	4.0	0.535	9.5	LOS A	3.7	96.9	0.49	0.32	32.8
16	R2	160	6.0	0.535	9.5	LOS A	3.7	96.9	0.49	0.32	31.8
Approach		605	4.4	0.535	9.5	LOS A	3.7	96.9	0.49	0.32	32.5
North: SE 9th St											
7	L2	180	6.0	0.433	10.1	LOS B	2.3	59.3	0.66	0.68	31.2
4	T1	24	1.0	0.433	10.1	LOS B	2.3	59.3	0.66	0.68	31.3
14	R2	138	4.0	0.433	10.1	LOS B	2.3	59.3	0.66	0.68	30.4
Approach		342	4.8	0.433	10.1	LOS B	2.3	59.3	0.66	0.68	30.9
West: OR 126											
5	L2	82	2.0	0.621	12.0	LOS B	5.2	131.8	0.67	0.56	31.5
2	T1	540	3.0	0.621	12.0	LOS B	5.2	131.8	0.67	0.56	31.5
12	R2	27	1.0	0.621	12.0	LOS B	5.2	131.8	0.67	0.56	30.7
Approach		649	2.8	0.621	12.0	LOS B	5.2	131.8	0.67	0.56	31.5
All Vehicles		1709	3.6	0.621	10.5	LOS B	5.2	131.8	0.61	0.51	31.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	31	57	22	30	1	117	396	18	4	248	80
Future Volume (vph)	35	31	57	22	30	1	117	396	18	4	248	80
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	0.99		1.00	0.96	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1559			1709		1614	1722		1662	1665	
Flt Permitted		0.90			0.85		0.38	1.00		0.50	1.00	
Satd. Flow (perm)		1419			1479		650	1722		872	1665	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	39	34	63	24	33	1	130	440	20	4	276	89
RTOR Reduction (vph)	0	39	0	0	1	0	0	2	0	0	15	0
Lane Group Flow (vph)	0	97	0	0	57	0	130	458	0	4	350	0
Confl. Peds. (#/hr)	1		1	1		1						
Confl. Bikes (#/hr)						1						1
Heavy Vehicles (%)	3%	0%	4%	0%	0%	0%	3%	1%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		2			6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		8.9			8.9		28.1	22.9		19.3	18.5	
Effective Green, g (s)		8.9			8.9		28.1	22.9		19.3	18.5	
Actuated g/C Ratio		0.20			0.20		0.62	0.50		0.42	0.41	
Clearance Time (s)		4.0			4.0		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		276			288		510	864		382	675	
v/s Ratio Prot							c0.03	c0.27		0.00	0.21	
v/s Ratio Perm		c0.07			0.04		0.13			0.00		
v/c Ratio		0.35			0.20		0.25	0.53		0.01	0.52	
Uniform Delay, d1		15.9			15.4		4.2	7.7		7.6	10.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.8			0.3		0.3	0.6		0.0	0.7	
Delay (s)		16.6			15.7		4.5	8.3		7.6	10.9	
Level of Service		B			B		A	A		A	B	
Approach Delay (s)		16.6			15.7			7.5			10.8	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	45.6	Sum of lost time (s)	13.0
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	136	58	130	460	4	365
v/c Ratio	0.41	0.19	0.24	0.50	0.01	0.58
Control Delay	16.4	18.4	5.3	9.4	4.2	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	18.4	5.3	9.4	4.2	15.2
Queue Length 50th (ft)	18	12	11	46	0	66
Queue Length 95th (ft)	70	44	33	197	3	152
Internal Link Dist (ft)	1098	1419		1239		2675
Turn Bay Length (ft)			75		125	
Base Capacity (vph)	946	969	552	1604	555	1540
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.06	0.24	0.29	0.01	0.24

Intersection Summary

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	41	2	18	0	2	13	11	370	11	14	257	47
Future Vol, veh/h	41	2	18	0	2	13	11	370	11	14	257	47
Conflicting Peds, #/hr	4	0	0	0	0	4	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	0	0
Mvmt Flow	44	2	19	0	2	14	12	394	12	15	273	50

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	765	759	300	762	778	403	325	0	0	405	0	0
Stage 1	330	330	-	423	423	-	-	-	-	-	-	-
Stage 2	435	429	-	339	355	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	323	338	744	324	330	652	1246	-	-	1165	-	-
Stage 1	687	649	-	613	591	-	-	-	-	-	-	-
Stage 2	604	587	-	680	633	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	306	328	743	307	320	650	1246	-	-	1161	-	-
Mov Cap-2 Maneuver	306	328	-	307	320	-	-	-	-	-	-	-
Stage 1	677	637	-	606	584	-	-	-	-	-	-	-
Stage 2	580	580	-	650	622	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.7	11.5	0.2	0.4
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1246	-	-	371	571	1161	-	-
HCM Lane V/C Ratio	0.009	-	-	0.175	0.028	0.013	-	-
HCM Control Delay (s)	7.9	0	-	16.7	11.5	8.1	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.1	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	219	129	139	385	212	131	268	89	185	356	10
Future Volume (vph)	9	219	129	139	385	212	131	268	89	185	356	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1661	1699	1473	1646	3228	1438	1646	1733	1444	3193	1726	
Flt Permitted	0.52	1.00	1.00	0.40	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	902	1699	1473	699	3228	1438	1646	1733	1444	3193	1726	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	9	228	134	145	401	221	136	279	93	193	371	10
RTOR Reduction (vph)	0	0	80	0	0	146	0	0	55	0	1	0
Lane Group Flow (vph)	9	228	54	145	401	75	136	279	38	193	380	0
Confl. Peds. (#/hr)	3					3	3		1	1		3
Heavy Vehicles (%)	0%	3%	1%	1%	3%	1%	1%	1%	2%	1%	1%	0%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5	2	3	1	6		3	8	1	7	4	
Permitted Phases	2		2	6		6			8			
Actuated Green, G (s)	20.2	19.2	30.3	30.4	25.4	25.4	11.1	23.4	30.6	8.7	21.0	
Effective Green, g (s)	20.2	19.2	30.3	30.4	25.4	25.4	11.1	23.4	30.6	8.7	21.0	
Actuated g/C Ratio	0.27	0.26	0.41	0.41	0.34	0.34	0.15	0.31	0.41	0.12	0.28	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	254	437	678	376	1100	490	245	544	670	372	486	
v/s Ratio Prot	0.00	c0.13	0.01	c0.04	0.12		c0.08	0.16	0.01	0.06	c0.22	
v/s Ratio Perm	0.01		0.03	0.12		0.05			0.02			
v/c Ratio	0.04	0.52	0.08	0.39	0.36	0.15	0.56	0.51	0.06	0.52	0.78	
Uniform Delay, d1	19.9	23.7	13.6	14.8	18.5	17.1	29.4	20.9	13.2	30.9	24.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	1.1	0.1	0.7	0.2	0.1	2.7	0.8	0.0	1.2	8.0	
Delay (s)	20.0	24.8	13.6	15.5	18.7	17.2	32.1	21.7	13.3	32.2	32.7	
Level of Service	B	C	B	B	B	B	C	C	B	C	C	
Approach Delay (s)		20.7			17.7			23.0			32.5	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	74.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	9	228	134	145	401	221	136	279	93	193	381
v/c Ratio	0.03	0.61	0.19	0.41	0.35	0.34	0.54	0.49	0.14	0.50	0.75
Control Delay	17.4	34.7	3.6	21.8	20.8	5.4	39.7	22.7	3.2	37.9	33.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	34.7	3.6	21.8	20.8	5.4	39.7	22.7	3.2	37.9	33.9
Queue Length 50th (ft)	2	91	0	43	64	0	55	96	0	41	149
Queue Length 95th (ft)	13	189	31	102	150	54	135	182	23	92	284
Internal Link Dist (ft)		693			446			553			1860
Turn Bay Length (ft)	125		200	175		150	225		125	250	
Base Capacity (vph)	366	765	778	354	1455	768	334	932	670	417	803
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.30	0.17	0.41	0.28	0.29	0.41	0.30	0.14	0.46	0.47

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	108	319	287	307	147	379	1676	134	59	1313	51
Future Volume (vph)	65	108	319	287	307	147	379	1676	134	59	1313	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1661	1683	1464	1583	3072		1646	3059		1599	3068	
Flt Permitted	0.25	1.00	1.00	0.50	1.00		0.06	1.00		0.06	1.00	
Satd. Flow (perm)	434	1683	1464	837	3072		102	3059		106	3068	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	70	116	343	309	330	158	408	1802	144	63	1412	55
RTOR Reduction (vph)	0	0	31	0	41	0	0	3	0	0	2	0
Lane Group Flow (vph)	70	116	312	309	447	0	408	1943	0	63	1465	0
Confl. Peds. (#/hr)	7					7			2	2		
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	4%	1%	5%	2%	3%	1%	7%	12%	4%	8%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	27.5	22.4	47.0	34.3	25.8		92.5	78.6		72.8	63.4	
Effective Green, g (s)	27.5	22.4	47.0	34.3	25.8		92.5	78.6		72.8	63.4	
Actuated g/C Ratio	0.20	0.16	0.34	0.25	0.19		0.67	0.57		0.53	0.46	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	5.0		4.5	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	132	274	548	255	576		345	1749		158	1415	
v/s Ratio Prot	0.02	0.07	0.10	c0.07	0.15		c0.21	0.64		0.03	0.48	
v/s Ratio Perm	0.09		0.11	c0.23			c0.58			0.18		
v/c Ratio	0.53	0.42	0.57	1.21	0.78		1.18	1.11		0.40	1.04	
Uniform Delay, d1	46.3	51.7	36.9	51.3	53.0		47.1	29.4		28.5	37.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.0	1.1	1.4	125.9	6.5		107.9	58.6		1.7	33.6	
Delay (s)	50.4	52.8	38.3	177.2	59.5		155.0	88.0		30.2	70.6	
Level of Service	D	D	D	F	E		F	F		C	E	
Approach Delay (s)		43.1			105.1			99.6			69.0	
Approach LOS		D			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	85.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	137.4	Sum of lost time (s)	18.5
Intersection Capacity Utilization	103.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	116	343	309	488	408	1946	63	1467
v/c Ratio	0.47	0.44	0.65	1.25	0.78	1.17	1.10	0.33	1.04
Control Delay	49.7	55.9	35.6	181.9	56.1	141.0	81.6	22.1	70.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	55.9	35.6	181.9	56.1	141.0	81.6	22.1	70.4
Queue Length 50th (ft)	48	93	208	~317	199	~387	~1074	18	~743
Queue Length 95th (ft)	89	155	310	#520	263	#652	#1332	60	#977
Internal Link Dist (ft)		446			2921		4483		2738
Turn Bay Length (ft)	175			150		150		175	
Base Capacity (vph)	148	452	528	247	907	349	1777	197	1414
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.26	0.65	1.25	0.54	1.17	1.10	0.32	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

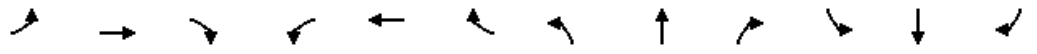
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Intersection Delay, s/veh	11.6
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	32	119	149	92	246	64
Future Vol, veh/h	32	119	149	92	246	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	3	9	5	9	4	4
Mvmt Flow	35	129	162	100	267	70
Number of Lanes	1	1	0	1	1	0

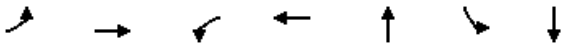
Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.1	11.7	12.7
HCM LOS	A	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	79%	0%	0%	62%
Vol Thru, %	0%	100%	0%	38%
Vol Right, %	21%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	310	32	119	241
LT Vol	246	0	0	149
Through Vol	0	32	0	92
RT Vol	64	0	119	0
Lane Flow Rate	337	35	129	262
Geometry Grp	2	7	7	5
Degree of Util (X)	0.474	0.055	0.184	0.386
Departure Headway (Hd)	5.059	5.734	5.128	5.302
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	708	618	691	671
Service Time	3.134	3.533	2.927	3.39
HCM Lane V/C Ratio	0.476	0.057	0.187	0.39
HCM Control Delay	12.7	8.9	9.1	11.7
HCM Lane LOS	B	A	A	B
HCM 95th-tile Q	2.6	0.2	0.7	1.8



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	586	3	267	349	37	0	5	92	119	10	37
Future Volume (vph)	13	586	3	267	349	37	0	5	92	119	10	37
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0		5.0	5.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99			0.86		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1630	1695		1630	1647			1457		1630	1514	
Flt Permitted	0.52	1.00		0.12	1.00			1.00		0.43	1.00	
Satd. Flow (perm)	891	1695		204	1647			1457		736	1514	
Peak-hour factor, PHF	0.92	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.93	0.92	0.92	0.92
Adj. Flow (vph)	14	630	3	287	375	40	0	5	99	129	11	40
RTOR Reduction (vph)	0	0	0	0	2	0	0	90	0	0	31	0
Lane Group Flow (vph)	14	633	0	287	413	0	0	14	0	129	20	0
Heavy Vehicles (%)	2%	3%	40%	2%	5%	2%	0%	2%	3%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	29.8	28.7		49.9	43.8			7.0		15.9	15.9	
Effective Green, g (s)	29.8	28.7		49.9	43.8			7.0		15.9	15.9	
Actuated g/C Ratio	0.40	0.38		0.67	0.59			0.09		0.21	0.21	
Clearance Time (s)	5.0	5.0		5.0	5.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	365	650		444	964			136		215	321	
v/s Ratio Prot	0.00	c0.37		c0.14	0.25			0.01		c0.04	0.01	
v/s Ratio Perm	0.01			0.29						c0.09		
v/c Ratio	0.04	0.97		0.65	0.43			0.10		0.60	0.06	
Uniform Delay, d1	13.7	22.7		15.3	8.6			31.0		25.4	23.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.0	28.6		3.2	0.3			0.3		4.5	0.1	
Delay (s)	13.7	51.3		18.5	8.9			31.4		29.9	23.6	
Level of Service	B	D		B	A			C		C	C	
Approach Delay (s)		50.5			12.8			31.4			28.1	
Approach LOS		D			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	74.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	14	633	287	415	104	129	51
v/c Ratio	0.03	1.07	0.62	0.40	0.44	0.53	0.14
Control Delay	8.0	84.2	18.7	9.8	15.1	32.6	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.0	84.2	18.7	9.8	15.1	32.6	11.4
Queue Length 50th (ft)	2	~318	67	73	2	47	4
Queue Length 95th (ft)	9	#615	156	213	46	101	31
Internal Link Dist (ft)		2626		631	1973		4566
Turn Bay Length (ft)	150		150			100	
Base Capacity (vph)	814	593	611	1034	564	243	545
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	1.07	0.47	0.40	0.18	0.53	0.09

Intersection Summary

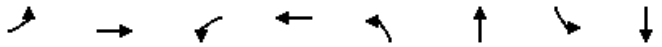
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	59	30	90	126	89	62	430	74	38	270	5
Future Volume (vph)	15	59	30	90	126	89	62	430	74	38	270	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.94		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1660	1650		1645	1596		1662	1697		1662	1711	
Flt Permitted	0.61	1.00		0.54	1.00		0.49	1.00		0.23	1.00	
Satd. Flow (perm)	1061	1650		930	1596		853	1697		399	1711	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	17	67	34	102	143	101	70	489	84	43	307	6
RTOR Reduction (vph)	0	22	0	0	28	0	0	7	0	0	1	0
Lane Group Flow (vph)	17	79	0	102	216	0	70	566	0	43	312	0
Confl. Peds. (#/hr)	3		1	1		3						
Heavy Vehicles (%)	0%	0%	0%	1%	1%	3%	0%	1%	0%	0%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	14.7	13.9		22.7	17.9		29.3	26.4		28.3	25.9	
Effective Green, g (s)	14.7	13.9		22.7	17.9		29.3	26.4		28.3	25.9	
Actuated g/C Ratio	0.22	0.21		0.35	0.27		0.45	0.40		0.43	0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	245	350		374	436		417	683		218	676	
v/s Ratio Prot	0.00	0.05		c0.02	c0.14		c0.01	c0.33		0.01	0.18	
v/s Ratio Perm	0.01			0.07			0.07			0.08		
v/c Ratio	0.07	0.23		0.27	0.49		0.17	0.83		0.20	0.46	
Uniform Delay, d1	19.9	21.3		15.0	20.0		10.6	17.5		12.2	14.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.3		0.4	0.9		0.2	8.2		0.4	0.5	
Delay (s)	20.0	21.7		15.4	20.9		10.8	25.7		12.6	15.1	
Level of Service	C	C		B	C		B	C		B	B	
Approach Delay (s)		21.4			19.3			24.1			14.8	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	65.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	17	101	102	244	70	573	43	313
v/c Ratio	0.05	0.31	0.27	0.49	0.14	0.77	0.14	0.43
Control Delay	19.2	23.3	20.8	22.7	9.0	25.3	9.4	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	23.3	20.8	22.7	9.0	25.3	9.4	16.8
Queue Length 50th (ft)	5	27	31	67	11	188	7	88
Queue Length 95th (ft)	19	71	71	168	38	#417	26	194
Internal Link Dist (ft)		602		599		2595		1305
Turn Bay Length (ft)	100		100		75		75	
Base Capacity (vph)	335	771	374	820	503	1120	307	1104
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.13	0.27	0.30	0.14	0.51	0.14	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	216	0	543	0	339	166	316	340	0
Future Volume (vph)	0	0	0	216	0	543	0	339	166	316	340	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					5.0	5.0		5.0	5.0	5.0	5.0	
Lane Util. Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes					1.00	0.98		1.00	1.00	1.00	1.00	
Flpb, ped/bikes					0.99	1.00		1.00	1.00	1.00	1.00	
Frt					1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1641	1436		1733	1473	1662	1733	
Flt Permitted					0.76	1.00		1.00	1.00	0.31	1.00	
Satd. Flow (perm)					1308	1436		1733	1473	549	1733	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	225	0	566	0	353	173	329	354	0
RTOR Reduction (vph)	0	0	0	0	0	327	0	0	120	0	0	0
Lane Group Flow (vph)	0	0	0	0	225	239	0	353	53	329	354	0
Confl. Peds. (#/hr)	4		10	10		4	3					3
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	1%	1%	0%	1%	0%
Turn Type				Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)					14.9	14.9		17.0	17.0	30.8	30.8	
Effective Green, g (s)					14.9	14.9		17.0	17.0	30.8	30.8	
Actuated g/C Ratio					0.27	0.27		0.31	0.31	0.55	0.55	
Clearance Time (s)					5.0	5.0		5.0	5.0	5.0	5.0	
Vehicle Extension (s)					2.0	2.0		3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)					349	384		528	449	479	958	
v/s Ratio Prot								0.20		c0.11	0.20	
v/s Ratio Perm					c0.17	0.17			0.04	c0.27		
v/c Ratio					0.64	0.62		0.67	0.12	0.69	0.37	
Uniform Delay, d1					18.1	17.9		16.9	13.9	8.2	7.0	
Progression Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2					3.0	2.2		3.2	0.1	3.3	0.2	
Delay (s)					21.1	20.2		20.1	14.1	11.4	7.2	
Level of Service					C	C		C	B	B	A	
Approach Delay (s)		0.0			20.4			18.1			9.2	
Approach LOS		A			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	55.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

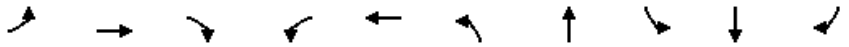
Lane Group	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	225	566	353	173	329	354
v/c Ratio	0.65	0.80	0.68	0.31	0.69	0.37
Control Delay	29.0	14.9	25.5	4.8	18.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.0	14.9	25.5	4.8	18.2	9.3
Queue Length 50th (ft)	67	32	101	0	54	58
Queue Length 95th (ft)	146	#162	206	37	#152	134
Internal Link Dist (ft)	931		2881			465
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	533	850	773	752	487	996
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.67	0.46	0.23	0.68	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	282	21	218	15	33	21	409	1903	16	13	1491	319
Future Volume (vph)	282	21	218	15	33	21	409	1903	16	13	1491	319
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	6.0		5.0	6.0	5.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1563	1579	1436	1661	1594		1646	3194		1662	3107	1426
Flt Permitted	0.52	0.52	1.00	0.65	1.00		0.06	1.00		0.06	1.00	1.00
Satd. Flow (perm)	853	848	1436	1135	1594		96	3194		104	3107	1426
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	300	22	232	16	35	22	435	2024	17	14	1586	339
RTOR Reduction (vph)	0	0	59	0	17	0	0	0	0	0	0	100
Lane Group Flow (vph)	159	163	173	16	40	0	435	2041	0	14	1586	239
Confl. Peds. (#/hr)	1		1	1		1	2		1	1		2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	1%	0%	3%	0%	0%	7%	1%	4%	0%	0%	7%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	8	1	7	4		1	6		5	2	3
Permitted Phases	8		8	4			6			2		2
Actuated Green, G (s)	27.3	27.3	46.1	15.2	12.9		98.4	90.4		70.3	67.3	76.7
Effective Green, g (s)	27.3	27.3	46.1	15.2	12.9		98.4	90.4		70.3	67.3	76.7
Actuated g/C Ratio	0.20	0.20	0.34	0.11	0.09		0.72	0.66		0.51	0.49	0.56
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	6.0		5.0	6.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	219	219	536	135	150		365	2112		87	1529	800
v/s Ratio Prot	0.05	c0.05	0.06	0.00	0.02		c0.23	0.64		0.00	0.51	0.02
v/s Ratio Perm	0.09	c0.10	0.06	0.01			c0.63			0.08		0.15
v/c Ratio	0.73	0.74	0.32	0.12	0.27		1.19	0.97		0.16	1.04	0.30
Uniform Delay, d1	50.1	51.4	33.7	54.5	57.5		47.2	21.7		22.3	34.7	15.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	11.3	12.8	0.4	0.4	1.0		110.3	12.5		0.9	33.3	0.2
Delay (s)	61.4	64.2	34.0	54.9	58.4		157.5	34.2		23.2	68.0	16.0
Level of Service	E	E	C	D	E		F	C		C	E	B
Approach Delay (s)		50.8			57.7			55.9			58.6	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	56.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	136.7	Sum of lost time (s)	21.0
Intersection Capacity Utilization	98.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	159	163	232	16	57	435	2041	14	1586	339
v/c Ratio	0.79	0.81	0.41	0.09	0.35	1.14	0.92	0.09	1.04	0.37
Control Delay	76.3	78.5	19.9	43.3	44.5	130.0	27.8	10.1	66.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.3	78.5	19.9	43.3	44.5	130.0	27.8	10.1	66.5	6.0
Queue Length 50th (ft)	129	132	77	11	31	~385	603	3	~758	39
Queue Length 95th (ft)	#207	#215	162	31	74	#670	#1259	12	#1026	110
Internal Link Dist (ft)		931			261		4040		4483	
Turn Bay Length (ft)	150		125	150		100		150		275
Base Capacity (vph)	201	287	564	170	394	380	2213	153	1529	912
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.57	0.41	0.09	0.14	1.14	0.92	0.09	1.04	0.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	13	1	46	10	66	6	380	94	72	194	8
Future Volume (vph)	4	13	1	46	10	66	6	380	94	72	194	8
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		3.5			3.5		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.93		1.00	0.97		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1718			1592		1662	1698		1662	1660	
Flt Permitted		0.94			0.88		0.63	1.00		0.33	1.00	
Satd. Flow (perm)		1632			1435		1098	1698		573	1660	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	4	13	1	47	10	68	6	392	97	74	200	8
RTOR Reduction (vph)	0	1	0	0	55	0	0	11	0	0	1	0
Lane Group Flow (vph)	0	17	0	0	70	0	6	478	0	74	207	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		2			6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		8.5			8.5		21.3	20.5		27.3	23.5	
Effective Green, g (s)		8.5			8.5		21.3	20.5		27.3	23.5	
Actuated g/C Ratio		0.18			0.18		0.46	0.44		0.59	0.51	
Clearance Time (s)		3.5			3.5		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		299			263		514	751		427	842	
v/s Ratio Prot							0.00	c0.28		c0.01	c0.12	
v/s Ratio Perm		0.01			c0.05		0.01			0.09		
v/c Ratio		0.06			0.27		0.01	0.64		0.17	0.25	
Uniform Delay, d1		15.6			16.2		6.8	10.0		4.8	6.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.5		0.0	1.8		0.2	0.2	
Delay (s)		15.7			16.8		6.8	11.8		5.0	6.6	
Level of Service		B			B		A	B		A	A	
Approach Delay (s)		15.7			16.8			11.7			6.1	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	46.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	18	125	6	489	74	208
v/c Ratio	0.06	0.37	0.01	0.65	0.14	0.23
Control Delay	19.4	14.7	3.7	15.6	4.1	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	14.7	3.7	15.6	4.1	6.4
Queue Length 50th (ft)	4	14	1	102	5	16
Queue Length 95th (ft)	20	61	3	219	19	79
Internal Link Dist (ft)	831	737		9408		839
Turn Bay Length (ft)			250		250	
Base Capacity (vph)	1083	975	641	1504	557	1506
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.13	0.01	0.33	0.13	0.14

Intersection Summary

MOVEMENT SUMMARY

Site: [40 - SW 27th @ SW Wickiup]

Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SW 27th											
3	L2	195	2.0	0.671	12.4	LOS B	6.4	161.6	0.62	0.41	31.1
8	T1	586	1.0	0.671	12.4	LOS B	6.4	161.6	0.62	0.41	31.1
18	R2	12	0.0	0.671	12.4	LOS B	6.4	161.6	0.62	0.41	30.3
Approach		792	1.2	0.671	12.4	LOS B	6.4	161.6	0.62	0.41	31.1
East: SW Wickiup											
1	L2	9	0.0	0.265	9.5	LOS A	1.1	27.6	0.68	0.68	32.9
6	T1	141	0.0	0.265	9.5	LOS A	1.1	27.6	0.68	0.68	32.9
16	R2	8	0.0	0.265	9.5	LOS A	1.1	27.6	0.68	0.68	32.0
Approach		158	0.0	0.265	9.5	LOS A	1.1	27.6	0.68	0.68	32.8
North: SW 27th											
7	L2	4	0.0	0.323	7.2	LOS A	1.6	41.3	0.55	0.46	34.2
4	T1	271	1.0	0.323	7.2	LOS A	1.6	41.3	0.55	0.46	34.1
14	R2	34	3.0	0.323	7.2	LOS A	1.6	41.3	0.55	0.46	33.1
Approach		309	1.2	0.323	7.2	LOS A	1.6	41.3	0.55	0.46	34.0
West: SW Wickiup											
5	L2	34	3.0	0.191	5.3	LOS A	0.9	22.3	0.45	0.34	34.6
2	T1	101	1.0	0.191	5.3	LOS A	0.9	22.3	0.45	0.34	34.6
12	R2	60	0.0	0.191	5.3	LOS A	0.9	22.3	0.45	0.34	33.6
Approach		195	1.0	0.191	5.3	LOS A	0.9	22.3	0.45	0.34	34.3
All Vehicles		1453	1.1	0.671	10.0	LOS B	6.4	161.6	0.59	0.44	32.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [41 - SW 27th @ SW Canal Blvd]

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SW Canal Dr											
3	L2	191	5.0	0.594	12.6	LOS B	4.5	115.5	0.73	0.73	30.7
8	T1	221	1.0	0.594	12.6	LOS B	4.5	115.5	0.73	0.73	30.7
18	R2	127	3.0	0.594	12.6	LOS B	4.5	115.5	0.73	0.73	29.9
Approach		538	2.9	0.594	12.6	LOS B	4.5	115.5	0.73	0.73	30.5
East: SW Yew Ave											
1	L2	110	0.0	0.976	46.6	LOS E	25.2	633.0	1.00	1.63	21.3
6	T1	602	1.0	0.976	46.6	LOS E	25.2	633.0	1.00	1.63	21.3
16	R2	141	0.0	0.976	46.6	LOS E	25.2	633.0	1.00	1.63	20.9
Approach		853	0.7	0.976	46.6	LOS E	25.2	633.0	1.00	1.63	21.2
North: SW Canal Blvd											
7	L2	101	0.0	0.722	25.8	LOS D	5.3	132.4	0.87	1.06	26.3
4	T1	210	1.0	0.722	25.8	LOS D	5.3	132.4	0.87	1.06	26.2
14	R2	77	0.0	0.722	25.8	LOS D	5.3	132.4	0.87	1.06	25.7
Approach		388	0.5	0.722	25.8	LOS D	5.3	132.4	0.87	1.06	26.1
West: SW 27th St											
5	L2	17	0.0	0.391	8.5	LOS A	2.1	51.5	0.62	0.57	33.4
2	T1	266	0.0	0.391	8.5	LOS A	2.1	51.5	0.62	0.57	33.3
12	R2	66	0.0	0.391	8.5	LOS A	2.1	51.5	0.62	0.57	32.4
Approach		350	0.0	0.391	8.5	LOS A	2.1	51.5	0.62	0.57	33.1
All Vehicles		2130	1.1	0.976	28.0	LOS D	25.2	633.0	0.85	1.13	25.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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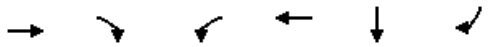
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	256	232	352	741	0	0	0	0	109	0	183
Future Volume (vph)	0	256	232	352	741	0	0	0	0	109	0	183
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1667	1423	1567	1733						1662	1458
Flt Permitted		1.00	1.00	0.47	1.00						0.95	1.00
Satd. Flow (perm)		1667	1423	776	1733						1662	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	278	252	383	805	0	0	0	0	118	0	199
RTOR Reduction (vph)	0	0	144	0	0	0	0	0	0	0	0	91
Lane Group Flow (vph)	0	278	108	383	805	0	0	0	0	0	118	108
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	0%	5%	2%	6%	1%	0%	0%	0%	0%	0%	0%	2%
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		23.0	23.0	34.0	34.0						9.7	9.7
Effective Green, g (s)		23.0	23.0	34.0	34.0						9.7	9.7
Actuated g/C Ratio		0.43	0.43	0.63	0.63						0.18	0.18
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		713	609	579	1097						300	263
v/s Ratio Prot		0.17		0.07	c0.46							
v/s Ratio Perm			0.08	0.34							0.07	c0.07
v/c Ratio		0.39	0.18	0.66	0.73						0.39	0.41
Uniform Delay, d1		10.5	9.5	5.5	6.7						19.4	19.5
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.1	2.8	2.6						0.9	1.0
Delay (s)		10.9	9.6	8.3	9.3						20.3	20.5
Level of Service		B	A	A	A						C	C
Approach Delay (s)		10.3			9.0			0.0			20.4	
Approach LOS		B			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	53.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	278	252	383	805	118	199
v/c Ratio	0.39	0.34	0.66	0.73	0.39	0.56
Control Delay	13.4	3.3	13.6	13.4	23.6	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	3.3	13.6	13.4	23.6	16.5
Queue Length 50th (ft)	56	0	46	137	35	25
Queue Length 95th (ft)	127	37	#141	#429	72	75
Internal Link Dist (ft)	1380			488	462	
Turn Bay Length (ft)		75	150			200
Base Capacity (vph)	750	777	579	1137	935	868
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.32	0.66	0.71	0.13	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	250	0	0	662	188	430	1	247	0	0	0
Future Volume (vph)	115	250	0	0	662	188	430	1	247	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.85				
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)	1599	1667			1683	1395	1630	1431				
Flt Permitted	0.12	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	205	1667			1683	1395	1630	1431				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	272	0	0	720	204	467	1	268	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	60	0	173	0	0	0	0
Lane Group Flow (vph)	125	272	0	0	720	144	467	96	0	0	0	0
Confl. Peds. (#/hr)	3		1	1		3						
Heavy Vehicles (%)	4%	5%	0%	0%	4%	4%	2%	0%	4%	0%	0%	0%
Turn Type	pm+pt	NA			NA	Perm	Perm	NA				
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	37.3	37.3			27.8	27.8	25.8	25.8				
Effective Green, g (s)	37.3	37.3			27.8	27.8	25.8	25.8				
Actuated g/C Ratio	0.51	0.51			0.38	0.38	0.35	0.35				
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	190	850			640	530	575	505				
v/s Ratio Prot	c0.04	0.16			c0.43			0.07				
v/s Ratio Perm	0.29					0.10	c0.29					
v/c Ratio	0.66	0.32			1.12	0.27	0.81	0.19				
Uniform Delay, d1	15.6	10.5			22.6	15.7	21.5	16.4				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	8.0	0.2			75.2	0.3	8.6	0.2				
Delay (s)	23.6	10.7			97.8	15.9	30.0	16.6				
Level of Service	C	B			F	B	C	B				
Approach Delay (s)		14.8			79.8			25.1			0.0	
Approach LOS		B			E			C			A	

Intersection Summary			
HCM 2000 Control Delay	47.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	73.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	125	272	720	204	467	269
v/c Ratio	0.66	0.32	1.13	0.35	0.81	0.40
Control Delay	31.9	13.4	103.8	11.9	33.3	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.9	13.4	103.8	11.9	33.3	4.1
Queue Length 50th (ft)	30	71	~399	33	186	0
Queue Length 95th (ft)	#94	139	#660	91	296	43
Internal Link Dist (ft)		488	979			520
Turn Bay Length (ft)	150			100		
Base Capacity (vph)	190	849	637	588	740	796
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.32	1.13	0.35	0.63	0.34

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

MOVEMENT SUMMARY

Site: [44 - SW 19th @ SE Airport Way]

Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SW 19th St											
3	L2	267	0.0	0.329	7.8	LOS A	1.6	40.7	0.60	0.55	31.5
18	R2	21	8.0	0.329	7.8	LOS A	1.6	40.7	0.60	0.55	30.5
Approach		288	0.6	0.329	7.8	LOS A	1.6	40.7	0.60	0.55	31.4
East: SE Airport Way											
1	L2	10	0.0	0.536	10.4	LOS B	3.5	90.7	0.61	0.50	32.7
6	T1	527	5.0	0.536	10.4	LOS B	3.5	90.7	0.61	0.50	32.5
Approach		537	4.9	0.536	10.4	LOS B	3.5	90.7	0.61	0.50	32.5
West: SE Airport Way											
2	T1	428	3.0	0.427	7.0	LOS A	2.8	73.7	0.09	0.02	34.2
12	R2	123	16.0	0.427	7.0	LOS A	2.8	73.7	0.09	0.02	32.9
Approach		551	5.9	0.427	7.0	LOS A	2.8	73.7	0.09	0.02	33.9
All Vehicles		1376	4.4	0.536	8.5	LOS A	3.5	90.7	0.40	0.32	32.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: [45 - SW Helmholtz @ SW Canal]

Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
NorthEast: SW Canal											
6x	T1	198	1.0	0.240	6.9	LOS A	1.1	27.3	0.58	0.53	34.3
16x	R2	2	0.0	0.240	6.9	LOS A	1.1	27.3	0.58	0.53	33.4
Approach		200	1.0	0.240	6.9	LOS A	1.1	27.3	0.58	0.53	34.3
NorthWest: SW Helmholtz											
7x	L2	7	0.0	0.221	5.4	LOS A	1.0	27.0	0.39	0.26	34.9
14x	R2	233	4.0	0.221	5.4	LOS A	1.0	27.0	0.39	0.26	33.7
Approach		239	3.9	0.221	5.4	LOS A	1.0	27.0	0.39	0.26	33.8
SouthWest: SW Canal											
5x	L2	479	1.0	0.636	10.3	LOS B	7.1	179.4	0.12	0.02	31.3
2x	T1	388	0.0	0.636	10.3	LOS B	7.1	179.4	0.12	0.02	31.3
Approach		867	0.6	0.636	10.3	LOS B	7.1	179.4	0.12	0.02	31.3
All Vehicles		1307	1.2	0.636	8.9	LOS A	7.1	179.4	0.24	0.14	32.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	197	464	8	359	522	78
Future Volume (vph)	197	464	8	359	522	78
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1733	1458	1421	1716	1630	1458
Flt Permitted	1.00	1.00	0.45	1.00	0.95	1.00
Satd. Flow (perm)	1733	1458	673	1716	1630	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	214	504	9	390	567	85
RTOR Reduction (vph)	0	365	0	0	0	36
Lane Group Flow (vph)	214	139	9	390	567	49
Heavy Vehicles (%)	1%	2%	17%	2%	2%	2%
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	17.0	17.0	22.6	22.6	29.9	29.9
Effective Green, g (s)	17.0	17.0	22.6	22.6	29.9	29.9
Actuated g/C Ratio	0.28	0.28	0.37	0.37	0.49	0.49
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	479	403	260	630	792	708
v/s Ratio Prot	0.12		0.00	c0.23	c0.35	
v/s Ratio Perm		0.10	0.01			0.03
v/c Ratio	0.45	0.35	0.03	0.62	0.72	0.07
Uniform Delay, d1	18.4	17.8	12.7	15.9	12.5	8.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.5	0.1	1.8	3.1	0.0
Delay (s)	19.0	18.3	12.7	17.7	15.6	8.4
Level of Service	B	B	B	B	B	A
Approach Delay (s)	18.5			17.6	14.6	
Approach LOS	B			B	B	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	61.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	214	504	9	390	567	85
v/c Ratio	0.42	0.64	0.03	0.70	0.67	0.11
Control Delay	19.9	6.4	12.0	23.8	18.2	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	6.4	12.0	23.8	18.2	4.4
Queue Length 50th (ft)	55	0	2	114	124	2
Queue Length 95th (ft)	131	68	9	188	#387	27
Internal Link Dist (ft)	689			452	761	
Turn Bay Length (ft)			200			175
Base Capacity (vph)	1230	1181	304	1568	842	788
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.43	0.03	0.25	0.67	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	646	127	214	667	0	0	0	0	16	0	188
Future Volume (vph)	0	646	127	214	667	0	0	0	0	16	0	188
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5		4.5	4.5						4.5	4.5
Lane Util. Factor		0.95		1.00	1.00						1.00	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.98		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.95	1.00
Satd. Flow (prot)		3205		1662	1716						1662	1458
Flt Permitted		1.00		0.20	1.00						0.95	1.00
Satd. Flow (perm)		3205		352	1716						1662	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	702	138	233	725	0	0	0	0	17	0	204
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	0	0	0	124
Lane Group Flow (vph)	0	821	0	233	725	0	0	0	0	0	17	80
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	2%
Turn Type		NA		pm+pt	NA					Perm	NA	Perm
Protected Phases		6		5	2						8	
Permitted Phases				2						8		8
Actuated Green, G (s)		18.6		29.8	29.8						8.3	8.3
Effective Green, g (s)		18.6		29.8	29.8						8.3	8.3
Actuated g/C Ratio		0.39		0.63	0.63						0.18	0.18
Clearance Time (s)		4.5		4.5	4.5						4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		1265		409	1085						292	256
v/s Ratio Prot		0.26		0.08	c0.42							
v/s Ratio Perm				0.28							0.01	c0.06
v/c Ratio		0.65		0.57	0.67						0.06	0.31
Uniform Delay, d1		11.6		5.2	5.5						16.1	16.9
Progression Factor		1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2		1.2		1.8	1.6						0.1	0.7
Delay (s)		12.8		7.0	7.1						16.2	17.6
Level of Service		B		A	A						B	B
Approach Delay (s)		12.8			7.1			0.0			17.5	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	47.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

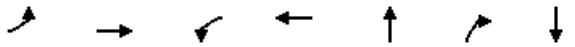
Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	840	233	725	17	204
v/c Ratio	0.66	0.58	0.67	0.06	0.54
Control Delay	14.3	11.3	9.9	18.4	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	11.3	9.9	18.4	12.8
Queue Length 50th (ft)	85	20	93	4	12
Queue Length 95th (ft)	158	#65	247	19	67
Internal Link Dist (ft)	3583		689	648	
Turn Bay Length (ft)		250			275
Base Capacity (vph)	1924	405	1433	1172	1072
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.44	0.58	0.51	0.01	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	250	109	332	409	104	151	69	261	55	45	14
Future Volume (vph)	14	250	109	332	409	104	151	69	261	55	45	14
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0			4.5	4.5		4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.95		1.00	0.97			1.00	0.85		0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1662	1623		1645	1689			1692	1473		1680	
Flt Permitted	0.33	1.00		0.24	1.00			0.74	1.00		0.79	
Satd. Flow (perm)	581	1623		424	1689			1294	1473		1359	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	15	266	116	353	435	111	161	73	278	59	48	15
RTOR Reduction (vph)	0	17	0	0	9	0	0	0	161	0	3	0
Lane Group Flow (vph)	15	365	0	353	537	0	0	234	117	0	119	0
Confl. Peds. (#/hr)			3	3								
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	3%	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4			6		5	2	
Permitted Phases	8			4			6		6			
Actuated Green, G (s)	28.1	26.9		43.0	37.8			37.7	37.7		37.7	
Effective Green, g (s)	28.1	26.9		43.0	37.8			37.7	37.7		37.7	
Actuated g/C Ratio	0.32	0.30		0.48	0.42			0.42	0.42		0.42	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	197	489		370	715			546	622		574	
v/s Ratio Prot	0.00	0.22		c0.13	0.32							
v/s Ratio Perm	0.02			c0.33				c0.18	0.08		0.09	
v/c Ratio	0.08	0.75		0.95	0.75			0.43	0.19		0.21	
Uniform Delay, d1	21.4	28.1		18.4	21.7			18.2	16.2		16.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.2	6.1		34.7	4.4			0.5	0.1		0.2	
Delay (s)	21.6	34.2		53.1	26.2			18.7	16.3		16.5	
Level of Service	C	C		D	C			B	B		B	
Approach Delay (s)		33.7			36.7			17.4			16.5	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	15	382	353	546	234	278	122
v/c Ratio	0.05	0.82	0.96	0.73	0.41	0.35	20.33
Control Delay	12.6	42.2	58.4	26.6	21.0	3.7	9007.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	42.2	58.4	26.6	21.0	3.7	9007.6
Queue Length 50th (ft)	4	180	125	217	84	0	~132
Queue Length 95th (ft)	14	284	#288	#450	172	48	#259
Internal Link Dist (ft)		906		3891	5211		1243
Turn Bay Length (ft)	100		75			100	
Base Capacity (vph)	296	640	367	791	566	801	8
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.60	0.96	0.69	0.41	0.35	15.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	201	186	190	263	29	266	403	250	48	349	193
Future Volume (vph)	113	201	186	190	263	29	266	403	250	48	349	193
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1598	1733	1454	1646	1691		1646	3115		1539	3090	
Flt Permitted	0.42	1.00	1.00	0.46	1.00		0.25	1.00		0.32	1.00	
Satd. Flow (perm)	699	1733	1454	805	1691		426	3115		511	3090	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	124	221	204	209	289	32	292	443	275	53	384	212
RTOR Reduction (vph)	0	0	150	0	4	0	0	99	0	0	83	0
Lane Group Flow (vph)	124	221	54	209	317	0	292	619	0	53	513	0
Confl. Peds. (#/hr)	2		1	1		2	2					2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	4%	1%	1%	1%	2%	0%	1%	1%	0%	8%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)	24.4	19.0	19.0	28.2	20.9		32.6	24.8		24.1	20.3	
Effective Green, g (s)	24.4	19.0	19.0	28.2	20.9		32.6	24.8		24.1	20.3	
Actuated g/C Ratio	0.34	0.27	0.27	0.39	0.29		0.46	0.35		0.34	0.28	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	306	461	386	403	494		336	1081		227	878	
v/s Ratio Prot	0.03	0.13		c0.05	c0.19		c0.10	0.20		0.01	0.17	
v/s Ratio Perm	0.11		0.04	0.15			c0.30			0.07		
v/c Ratio	0.41	0.48	0.14	0.52	0.64		0.87	0.57		0.23	0.58	
Uniform Delay, d1	17.0	22.0	20.0	15.2	22.0		14.1	19.0		16.3	21.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.8	0.2	1.1	2.8		20.5	0.7		0.5	1.0	
Delay (s)	17.9	22.8	20.1	16.3	24.8		34.6	19.7		16.8	22.9	
Level of Service	B	C	C	B	C		C	B		B	C	
Approach Delay (s)		20.7			21.5			24.0			22.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	124	221	204	209	321	292	718	53	596
v/c Ratio	0.36	0.49	0.39	0.53	0.62	0.88	0.59	0.18	0.66
Control Delay	16.8	26.2	5.9	20.3	28.4	47.6	18.3	13.8	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.8	26.2	5.9	20.3	28.4	47.6	18.3	13.8	22.1
Queue Length 50th (ft)	30	77	0	54	118	77	110	12	91
Queue Length 95th (ft)	77	161	47	123	235	#264	201	37	169
Internal Link Dist (ft)		3891			719		1235		3583
Turn Bay Length (ft)	200		200	100		100		100	
Base Capacity (vph)	350	864	827	395	846	330	1563	302	1487
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.26	0.25	0.53	0.38	0.88	0.46	0.18	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	141	23	11	27	3	14	35	41	99	23	25
Future Vol, veh/h	17	141	23	11	27	3	14	35	41	99	23	25
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	20	0	0	0	0	0	0	0	11	0
Mvmt Flow	20	166	27	13	32	4	16	41	48	116	27	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	35	0	0	195	0	0	309	282	183	325	294	34
Stage 1	-	-	-	-	-	-	221	221	-	59	59	-
Stage 2	-	-	-	-	-	-	88	61	-	266	235	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.61	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.61	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.61	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4.099	3.3
Pot Cap-1 Maneuver	1589	-	-	1390	-	-	647	630	865	632	602	1045
Stage 1	-	-	-	-	-	-	786	724	-	958	828	-
Stage 2	-	-	-	-	-	-	925	848	-	744	694	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1589	-	-	1387	-	-	595	614	862	555	587	1045
Mov Cap-2 Maneuver	-	-	-	-	-	-	595	614	-	555	587	-
Stage 1	-	-	-	-	-	-	774	713	-	945	820	-
Stage 2	-	-	-	-	-	-	861	840	-	651	683	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	2	11	13.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	703	1589	-	-	1387	-	-	609
HCM Lane V/C Ratio	0.151	0.013	-	-	0.009	-	-	0.284
HCM Control Delay (s)	11	7.3	0	-	7.6	0	-	13.2
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	17	149	36	17	33	69	229	11	5	81	15
Future Volume (vph)	50	17	149	36	17	33	69	229	11	5	81	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5			4.5		4.5	4.5			4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	1.00
Frt		0.91			0.95		1.00	0.99			1.00	0.85
Flt Protected		0.99			0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)		1494			1600		1352	1721			1697	918
Flt Permitted		0.90			0.80		0.95	1.00			1.00	1.00
Satd. Flow (perm)		1357			1308		1352	1721			1697	918
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	57	19	169	41	19	38	78	260	12	6	92	17
RTOR Reduction (vph)	0	97	0	0	27	0	0	2	0	0	0	13
Lane Group Flow (vph)	0	148	0	0	71	0	78	271	0	0	98	4
Heavy Vehicles (%)	0%	11%	6%	0%	8%	0%	23%	1%	0%	0%	3%	62%
Turn Type	Perm	NA		Perm	NA		Split	NA		Split	NA	Perm
Protected Phases		4			8		2	2		6	6	
Permitted Phases	4			8								6
Actuated Green, G (s)		10.8			10.8		13.9	13.9			10.8	10.8
Effective Green, g (s)		10.8			10.8		13.9	13.9			10.8	10.8
Actuated g/C Ratio		0.22			0.22		0.28	0.28			0.22	0.22
Clearance Time (s)		4.5			4.5		4.5	4.5			4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		299			288		383	488			374	202
v/s Ratio Prot							0.06	c0.16			c0.06	
v/s Ratio Perm		c0.11			0.05							0.00
v/c Ratio		0.50			0.25		0.20	0.56			0.26	0.02
Uniform Delay, d1		16.7			15.7		13.3	14.9			15.8	15.0
Progression Factor		1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		1.3			0.4		0.3	1.4			0.4	0.0
Delay (s)		18.0			16.2		13.6	16.3			16.2	15.0
Level of Service		B			B		B	B			B	B
Approach Delay (s)		18.0			16.2			15.7			16.0	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	49.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	245	98	78	273	98	17
v/c Ratio	0.62	0.31	0.21	0.56	0.26	0.07
Control Delay	17.3	15.0	16.3	21.0	21.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	15.0	16.3	21.0	21.5	0.5
Queue Length 50th (ft)	28	14	16	61	22	0
Queue Length 95th (ft)	99	52	51	150	73	0
Internal Link Dist (ft)	782	827		2579	629	
Turn Bay Length (ft)			100			
Base Capacity (vph)	783	715	807	1028	799	471
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.14	0.10	0.27	0.12	0.04

Intersection Summary

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	42	0	53	0	334	92	46	150	0
Future Vol, veh/h	0	0	0	42	0	53	0	334	92	46	150	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	1	0	8	0
Mvmt Flow	0	0	0	48	0	60	0	380	105	52	170	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	737	759	170	707	707	432	170	0	0	484	0	0
Stage 1	275	275	-	432	432	-	-	-	-	-	-	-
Stage 2	462	484	-	275	275	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	337	338	879	353	363	628	1420	-	-	1089	-	-
Stage 1	736	686	-	606	586	-	-	-	-	-	-	-
Stage 2	584	555	-	736	686	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	292	320	879	339	344	628	1420	-	-	1089	-	-
Mov Cap-2 Maneuver	292	320	-	339	344	-	-	-	-	-	-	-
Stage 1	736	650	-	606	586	-	-	-	-	-	-	-
Stage 2	528	555	-	697	650	-	-	-	-	-	-	-

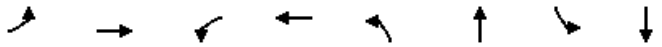
Approach	EB	WB	NB	SB
HCM Control Delay, s	0	15.3	0	2
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1420	-	-	-	456	1089	-	-
HCM Lane V/C Ratio	-	-	-	-	0.237	0.048	-	-
HCM Control Delay (s)	0	-	-	0	15.3	8.5	0	-
HCM Lane LOS	A	-	-	A	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.9	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	87	111	133	114	40	118	268	137	19	148	7
Future Volume (vph)	6	87	111	133	114	40	118	268	137	19	148	7
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.96		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1544		1644	1682		1660	1644		1662	1736	
Flt Permitted	0.65	1.00		0.43	1.00		0.56	1.00		0.33	1.00	
Satd. Flow (perm)	1132	1544		739	1682		971	1644		572	1736	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	7	99	126	151	130	45	134	305	156	22	168	8
RTOR Reduction (vph)	0	58	0	0	14	0	0	19	0	0	2	0
Lane Group Flow (vph)	7	167	0	151	161	0	134	442	0	22	174	0
Confl. Peds. (#/hr)			3	3			3		1	1		3
Heavy Vehicles (%)	0%	3%	2%	1%	0%	0%	0%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	17.2	16.3		25.2	20.3		27.4	22.6		21.6	19.7	
Effective Green, g (s)	17.2	16.3		25.2	20.3		27.4	22.6		21.6	19.7	
Actuated g/C Ratio	0.27	0.26		0.40	0.32		0.43	0.35		0.34	0.31	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	3.5		2.0	3.5		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	313	395		361	536		469	583		226	536	
v/s Ratio Prot	0.00	0.11		c0.03	0.10		c0.02	c0.27		0.00	0.10	
v/s Ratio Perm	0.01			c0.13			0.10			0.03		
v/c Ratio	0.02	0.42		0.42	0.30		0.29	0.76		0.10	0.32	
Uniform Delay, d1	17.0	19.8		13.2	16.3		11.3	18.1		14.5	16.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.9		0.3	0.4		0.1	5.6		0.1	0.4	
Delay (s)	17.1	20.6		13.5	16.7		11.5	23.8		14.5	17.2	
Level of Service	B	C		B	B		B	C		B	B	
Approach Delay (s)		20.5			15.2			21.0			16.9	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	63.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	7	225	151	175	134	461	22	176
v/c Ratio	0.02	0.53	0.40	0.29	0.27	0.70	0.06	0.33
Control Delay	14.3	20.6	17.9	16.7	11.9	23.4	10.3	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	20.6	17.9	16.7	11.9	23.4	10.3	19.6
Queue Length 50th (ft)	1	40	28	29	26	105	4	49
Queue Length 95th (ft)	10	122	86	113	63	#317	16	104
Internal Link Dist (ft)		5288		2545		2548		1288
Turn Bay Length (ft)	50		100		75		100	
Base Capacity (vph)	428	957	384	1019	499	875	358	912
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.24	0.39	0.17	0.27	0.53	0.06	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	122	38	83	222	231	80	457	83	76	333	96
Future Volume (vph)	78	122	38	83	222	231	80	457	83	76	333	96
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.97	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1622	1665		1628	1733	1445	1662	1683		1662	1683	
Flt Permitted	0.43	1.00		0.57	1.00	1.00	0.36	1.00		0.19	1.00	
Satd. Flow (perm)	733	1665		980	1733	1445	626	1683		339	1683	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	84	131	41	89	239	248	86	491	89	82	358	103
RTOR Reduction (vph)	0	14	0	0	0	175	0	6	0	0	10	0
Lane Group Flow (vph)	84	158	0	89	239	73	86	574	0	82	451	0
Confl. Peds. (#/hr)	12		2	2		12	1		4	4		1
Heavy Vehicles (%)	2%	1%	0%	2%	1%	0%	0%	1%	2%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	21.0	16.2		21.0	16.2	22.6	36.2	31.5		39.6	33.2	
Effective Green, g (s)	21.0	16.2		21.0	16.2	22.6	36.2	31.5		39.6	33.2	
Actuated g/C Ratio	0.27	0.21		0.27	0.21	0.29	0.47	0.41		0.51	0.43	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	3.5		2.0	3.5	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	255	350		308	365	509	358	689		284	726	
v/s Ratio Prot	c0.02	0.09		0.02	c0.14	0.01	0.01	c0.34		c0.02	0.27	
v/s Ratio Perm	0.07			0.06		0.04	0.10			0.12		
v/c Ratio	0.33	0.45		0.29	0.65	0.14	0.24	0.83		0.29	0.62	
Uniform Delay, d1	21.6	26.5		21.5	27.8	20.0	11.9	20.3		12.1	17.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.1		0.2	4.4	0.0	0.1	8.5		0.2	1.7	
Delay (s)	21.9	27.6		21.7	32.2	20.1	12.0	28.8		12.3	18.6	
Level of Service	C	C		C	C	C	B	C		B	B	
Approach Delay (s)		25.7			25.3			26.7			17.7	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	76.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	84	172	89	239	248	86	580	82	461
v/c Ratio	0.30	0.46	0.27	0.64	0.41	0.22	0.85	0.29	0.61
Control Delay	20.3	28.1	19.6	36.1	4.7	11.7	35.7	13.0	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	28.1	19.6	36.1	4.7	11.7	35.7	13.0	23.2
Queue Length 50th (ft)	28	67	30	109	0	19	248	18	174
Queue Length 95th (ft)	58	123	60	181	44	48	#499	46	319
Internal Link Dist (ft)		2545		3983			2700		5211
Turn Bay Length (ft)	125		150		225	175		225	
Base Capacity (vph)	284	639	332	653	612	400	733	290	755
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.27	0.27	0.37	0.41	0.21	0.79	0.28	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	82	89	22	136	0	0	0	0	16	681	151
Future Volume (vph)	0	82	89	22	136	0	0	0	0	16	681	151
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		1.00			1.00						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.93			1.00						0.97	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		1627			1738						3184	
Flt Permitted		1.00			0.93						1.00	
Satd. Flow (perm)		1627			1631						3184	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	86	94	23	143	0	0	0	0	17	717	159
RTOR Reduction (vph)	0	65	0	0	0	0	0	0	0	0	26	0
Lane Group Flow (vph)	0	115	0	0	166	0	0	0	0	0	867	0
Confl. Peds. (#/hr)	1					1	1		1	1		1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		8			4						2	
Permitted Phases				4						2		
Actuated Green, G (s)		10.0			10.0						20.1	
Effective Green, g (s)		10.0			10.0						20.1	
Actuated g/C Ratio		0.25			0.25						0.50	
Clearance Time (s)		5.0			5.0						5.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		405			406						1595	
v/s Ratio Prot		0.07										
v/s Ratio Perm					c0.10						0.27	
v/c Ratio		0.28			0.41						0.54	
Uniform Delay, d1		12.2			12.6						6.9	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.4			0.7						0.4	
Delay (s)		12.5			13.3						7.2	
Level of Service		B			B						A	
Approach Delay (s)		12.5			13.3			0.0			7.2	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	40.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	180	166	893
v/c Ratio	0.39	0.41	0.56
Control Delay	11.3	18.2	8.2
Queue Delay	0.0	0.0	0.0
Total Delay	11.3	18.2	8.2
Queue Length 50th (ft)	16	31	56
Queue Length 95th (ft)	68	92	120
Internal Link Dist (ft)	3983	187	3118
Turn Bay Length (ft)			
Base Capacity (vph)	1088	1061	2728
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.17	0.16	0.33

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	27	0	0	48	13	128	790	8	0	0	0
Future Volume (vph)	72	27	0	0	48	13	128	790	8	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		1.00			1.00			0.95				
Frpb, ped/bikes		1.00			1.00			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.97			1.00				
Flt Protected		0.96			1.00			0.99				
Satd. Flow (prot)		1689			1648			3263				
Flt Permitted		0.74			1.00			0.99				
Satd. Flow (perm)		1297			1648			3263				
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	82	31	0	0	55	15	145	898	9	0	0	0
RTOR Reduction (vph)	0	0	0	0	12	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	113	0	0	58	0	0	1051	0	0	0	0
Confl. Peds. (#/hr)							2		1	1		2
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	0%	1%	17%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			6				
Permitted Phases	8						6					
Actuated Green, G (s)		8.0			8.0			28.0				
Effective Green, g (s)		8.0			8.0			28.0				
Actuated g/C Ratio		0.17			0.17			0.61				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		225			286			1986				
v/s Ratio Prot					0.03							
v/s Ratio Perm		c0.09						0.32				
v/c Ratio		0.50			0.20			0.53				
Uniform Delay, d1		17.2			16.3			5.2				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		1.8			0.3			0.3				
Delay (s)		19.0			16.6			5.5				
Level of Service		B			B			A				
Approach Delay (s)		19.0			16.6			5.5			0.0	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	46.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	113	70	1052
v/c Ratio	0.41	0.19	0.49
Control Delay	21.7	14.8	7.1
Queue Delay	0.0	0.0	0.0
Total Delay	21.7	14.8	7.1
Queue Length 50th (ft)	22	10	74
Queue Length 95th (ft)	72	42	148
Internal Link Dist (ft)	187	470	1008
Turn Bay Length (ft)			
Base Capacity (vph)	635	814	2800
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.18	0.09	0.38

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	4	7	12	3	8	6	146	2	4	230	24
Future Volume (vph)	23	4	7	12	3	8	6	146	2	4	230	24
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0		4.0	4.5		4.0	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.95		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1604			1495		1108	1680		1108	1600	
Flt Permitted		1.00			1.00		0.58	1.00		0.65	1.00	
Satd. Flow (perm)		1657			1535		681	1680		759	1600	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	26	5	8	14	3	9	7	166	2	5	261	27
RTOR Reduction (vph)	0	8	0	0	9	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	31	0	0	17	0	7	168	0	5	284	0
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	4%	0%	0%	0%	0%	25%	50%	4%	0%	50%	8%	4%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		1.2			1.2		23.8	22.9		23.8	22.9	
Effective Green, g (s)		1.2			1.2		23.8	22.9		23.8	22.9	
Actuated g/C Ratio		0.03			0.03		0.63	0.61		0.63	0.61	
Clearance Time (s)		4.0			4.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		53			49		442	1025		490	977	
v/s Ratio Prot							c0.00	0.10		0.00	c0.18	
v/s Ratio Perm		c0.02			0.01		0.01			0.01		
v/c Ratio		0.59			0.35		0.02	0.16		0.01	0.29	
Uniform Delay, d1		17.9			17.8		2.5	3.2		2.5	3.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		15.7			4.3		0.0	0.1		0.0	0.2	
Delay (s)		33.6			22.1		2.5	3.2		2.5	3.6	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		33.6			22.1			3.2			3.6	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	37.5	Sum of lost time (s)	12.5
Intersection Capacity Utilization	26.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	26	7	168	5	288
v/c Ratio	0.11	0.08	0.01	0.11	0.01	0.21
Control Delay	10.2	9.9	2.2	4.0	2.0	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	9.9	2.2	4.0	2.0	4.2
Queue Length 50th (ft)	4	2	0	0	0	0
Queue Length 95th (ft)	24	18	3	56	3	95
Internal Link Dist (ft)	792	663		2596		2579
Turn Bay Length (ft)			100		100	
Base Capacity (vph)	1243	1153	677	1680	716	1600
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.02	0.01	0.10	0.01	0.18

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	72	15	96	61	0	0	0	0	152	967	30
Future Volume (vph)	0	72	15	96	61	0	0	0	0	152	967	30
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.99			1.00						1.00	
Flpb, ped/bikes		1.00			0.99						0.99	
Frt		0.98			1.00						1.00	
Flt Protected		1.00			0.97						0.99	
Satd. Flow (prot)		1672			1680						3234	
Flt Permitted		1.00			0.76						0.99	
Satd. Flow (perm)		1672			1311						3234	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	80	17	107	68	0	0	0	0	169	1074	33
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	84	0	0	175	0	0	0	0	0	1274	0
Confl. Peds. (#/hr)	21		19	19		21	16		26	26		16
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	1%	1%	3%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		8			4						2	
Permitted Phases				4						2		
Actuated Green, G (s)		12.6			12.6						30.4	
Effective Green, g (s)		12.6			12.6						30.4	
Actuated g/C Ratio		0.24			0.24						0.57	
Clearance Time (s)		5.0			5.0						5.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		397			311						1854	
v/s Ratio Prot		0.05										
v/s Ratio Perm					c0.13						0.39	
v/c Ratio		0.21			0.56						0.69	
Uniform Delay, d1		16.2			17.8						8.0	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.3			2.3						1.1	
Delay (s)		16.5			20.1						9.0	
Level of Service		B			C						A	
Approach Delay (s)		16.5			20.1			0.0			9.0	
Approach LOS		B			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	53.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	97	175	1276
v/c Ratio	0.24	0.57	0.69
Control Delay	16.6	27.2	11.1
Queue Delay	0.0	0.0	0.0
Total Delay	16.6	27.2	11.1
Queue Length 50th (ft)	23	55	127
Queue Length 95th (ft)	54	107	249
Internal Link Dist (ft)	369	175	1004
Turn Bay Length (ft)			
Base Capacity (vph)	822	636	2203
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.12	0.28	0.58

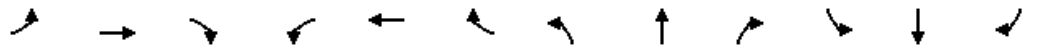
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	174	0	0	130	375	27	571	34	0	0	0
Future Volume (vph)	41	174	0	0	130	375	27	571	34	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		1.00			1.00			0.95				
Frpb, ped/bikes		1.00			0.99			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.90			0.99				
Flt Protected		0.99			1.00			1.00				
Satd. Flow (prot)		1709			1516			3287				
Flt Permitted		0.77			1.00			1.00				
Satd. Flow (perm)		1334			1516			3287				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	46	193	0	0	144	417	30	634	38	0	0	0
RTOR Reduction (vph)	0	0	0	0	84	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	239	0	0	477	0	0	696	0	0	0	0
Confl. Peds. (#/hr)	2		3	3		2	1		1	1		1
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	3%	1%	0%	0%	2%	3%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			6				
Permitted Phases	8						6					
Actuated Green, G (s)		20.7			20.7			18.3				
Effective Green, g (s)		20.7			20.7			18.3				
Actuated g/C Ratio		0.42			0.42			0.37				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		563			640			1227				
v/s Ratio Prot					c0.31							
v/s Ratio Perm		0.18						0.21				
v/c Ratio		0.42			0.75			0.57				
Uniform Delay, d1		10.0			11.9			12.2				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		0.5			4.7			0.6				
Delay (s)		10.5			16.7			12.8				
Level of Service		B			B			B				
Approach Delay (s)		10.5			16.7			12.8			0.0	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	49.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	239	561	702
v/c Ratio	0.43	0.79	0.58
Control Delay	13.8	18.9	15.4
Queue Delay	0.1	0.0	0.0
Total Delay	13.9	18.9	15.4
Queue Length 50th (ft)	44	89	79
Queue Length 95th (ft)	118	260	160
Internal Link Dist (ft)	175	838	646
Turn Bay Length (ft)			
Base Capacity (vph)	898	1068	2080
Starvation Cap Reductn	83	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.29	0.53	0.34

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	138	96	366	291	159	290	1510	299	140	1227	33
Future Volume (vph)	68	138	96	366	291	159	290	1510	299	140	1227	33
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1630	1617		1614	1602		1630	3107	1417	1646	3107	1488
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1630	1617		1614	1602		1630	3107	1417	1646	3107	1488
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	72	145	101	385	306	167	305	1589	315	147	1292	35
RTOR Reduction (vph)	0	17	0	0	14	0	0	0	187	0	0	24
Lane Group Flow (vph)	72	229	0	385	459	0	305	1589	128	147	1292	11
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	1%	1%	3%	1%	8%	2%	7%	5%	1%	7%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Prot	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6	6	5	2	
Permitted Phases												2
Actuated Green, G (s)	9.1	29.1		24.6	44.6		22.6	57.3	57.3	10.5	45.2	45.2
Effective Green, g (s)	9.1	29.1		24.6	44.6		22.6	57.3	57.3	10.5	45.2	45.2
Actuated g/C Ratio	0.06	0.21		0.17	0.32		0.16	0.40	0.40	0.07	0.32	0.32
Clearance Time (s)	4.5	5.0		4.5	5.0		4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	104	332		280	504		260	1258	573	122	992	475
v/s Ratio Prot	0.04	0.14		c0.24	c0.29		c0.19	c0.51	0.09	0.09	0.42	
v/s Ratio Perm												0.01
v/c Ratio	0.69	0.69		1.38	0.91		1.17	1.26	0.22	1.20	1.30	0.02
Uniform Delay, d1	64.8	52.0		58.4	46.5		59.5	42.1	27.5	65.5	48.1	33.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.1	5.8		189.7	20.7		110.9	124.9	0.2	146.7	143.5	0.0
Delay (s)	82.9	57.8		248.2	67.2		170.3	167.0	27.7	212.2	191.6	33.0
Level of Service	F	E		F	E		F	F	C	F	F	C
Approach Delay (s)		63.5			148.4			147.6			189.9	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	155.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	141.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	107.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	72	246	385	473	305	1589	315	147	1292	35
v/c Ratio	0.69	0.70	1.38	0.91	1.17	1.27	0.41	1.20	1.30	0.06
Control Delay	98.4	58.3	232.4	67.6	161.7	161.8	4.8	199.3	182.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.4	58.3	232.4	67.6	161.7	161.8	4.8	199.3	182.4	0.2
Queue Length 50th (ft)	67	193	~479	405	~343	~990	0	~168	~820	0
Queue Length 95th (ft)	#151	290	#725	#565	#565	#1205	64	#331	#1022	0
Internal Link Dist (ft)		838		3278		1074			1019	
Turn Bay Length (ft)	150		450		275		575	350		100
Base Capacity (vph)	109	451	280	614	260	1256	760	122	992	573
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.55	1.38	0.77	1.17	1.27	0.41	1.20	1.30	0.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	63	1505	0	0	0	0	0	32	24
Future Volume (vph)	0	0	0	63	1505	0	0	0	0	0	32	24
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					4.5						4.5	
Lane Util. Factor					0.95						0.95	
Frpb, ped/bikes					1.00						0.99	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.94	
Flt Protected					1.00						1.00	
Satd. Flow (prot)					3256						3091	
Flt Permitted					1.00						1.00	
Satd. Flow (perm)					3256						3091	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	68	1636	0	0	0	0	0	35	26
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	24	0
Lane Group Flow (vph)	0	0	0	0	1701	0	0	0	0	0	37	0
Confl. Peds. (#/hr)	3		1	1		3	3		2	2		3
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type				Perm	NA						NA	
Protected Phases					6						4	
Permitted Phases				6								
Actuated Green, G (s)					59.8						5.1	
Effective Green, g (s)					59.8						5.1	
Actuated g/C Ratio					0.81						0.07	
Clearance Time (s)					4.5						4.5	
Vehicle Extension (s)					3.0						3.0	
Lane Grp Cap (vph)					2634						213	
v/s Ratio Prot											c0.01	
v/s Ratio Perm					0.52							
v/c Ratio					0.65						0.17	
Uniform Delay, d1					2.8						32.4	
Progression Factor					1.00						1.00	
Incremental Delay, d2					0.6						0.4	
Delay (s)					3.4						32.8	
Level of Service					A						C	
Approach Delay (s)		0.0			3.4			0.0			32.8	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	4.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	73.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	SBT
Lane Group Flow (vph)	1704	61
v/c Ratio	0.62	0.19
Control Delay	4.1	25.6
Queue Delay	0.2	0.0
Total Delay	4.3	25.6
Queue Length 50th (ft)	121	8
Queue Length 95th (ft)	187	30
Internal Link Dist (ft)	472	448
Turn Bay Length (ft)		
Base Capacity (vph)	3014	860
Starvation Cap Reductn	444	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.66	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1096	20	409	143	0	0	0	0
Future Volume (vph)	0	0	0	0	1096	20	409	143	0	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					4.5		4.5	4.5				
Lane Util. Factor					0.95		0.91	0.91				
Frpb, ped/bikes					1.00		1.00	1.00				
Flpb, ped/bikes					1.00		1.00	1.00				
Frt					1.00		1.00	1.00				
Flt Protected					1.00		0.95	0.97				
Satd. Flow (prot)					3251		1482	3056				
Flt Permitted					1.00		0.95	0.97				
Satd. Flow (perm)					3251		1482	3056				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1191	22	445	155	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	51	51	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1212	0	171	327	0	0	0	0
Confl. Peds. (#/hr)	3					3	1					1
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%	0%	0%
Turn Type					NA		Perm	NA				
Protected Phases					6			8				
Permitted Phases							8					
Actuated Green, G (s)					32.1		14.5	14.5				
Effective Green, g (s)					32.1		14.5	14.5				
Actuated g/C Ratio					0.58		0.26	0.26				
Clearance Time (s)					4.5		4.5	4.5				
Vehicle Extension (s)					3.0		3.0	3.0				
Lane Grp Cap (vph)					1876		386	796				
v/s Ratio Prot					c0.37							
v/s Ratio Perm							c0.12	0.11				
v/c Ratio					0.65		0.44	0.41				
Uniform Delay, d1					7.9		17.2	17.0				
Progression Factor					1.00		1.00	1.00				
Incremental Delay, d2					0.8		0.8	0.3				
Delay (s)					8.7		18.0	17.4				
Level of Service					A		B	B				
Approach Delay (s)		0.0			8.7			17.6			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	55.6	Sum of lost time (s)	9.0
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	NBL	NBT
Lane Group Flow (vph)	1213	222	378
v/c Ratio	0.66	0.51	0.45
Control Delay	10.7	18.7	17.3
Queue Delay	0.0	0.0	0.0
Total Delay	10.7	18.7	17.3
Queue Length 50th (ft)	119	43	43
Queue Length 95th (ft)	264	141	110
Internal Link Dist (ft)	765		275
Turn Bay Length (ft)			
Base Capacity (vph)	2980	983	2002
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.41	0.23	0.19

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	121	653	0	0	0	0	0	660	361
Future Volume (vph)	0	0	0	121	653	0	0	0	0	0	660	361
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					4.5						4.5	
Lane Util. Factor					0.95						0.95	
Frpb, ped/bikes					1.00						0.99	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.95	
Flt Protected					0.99						1.00	
Satd. Flow (prot)					3217						3112	
Flt Permitted					0.99						1.00	
Satd. Flow (perm)					3217						3112	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	130	702	0	0	0	0	0	710	388
RTOR Reduction (vph)	0	0	0	0	15	0	0	0	0	0	41	0
Lane Group Flow (vph)	0	0	0	0	817	0	0	0	0	0	1057	0
Confl. Peds. (#/hr)			2	2			2		2	2		2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	1%	0%
Turn Type				Perm	NA						NA	
Protected Phases					6						4	
Permitted Phases				6								
Actuated Green, G (s)					26.2						36.7	
Effective Green, g (s)					26.2						36.7	
Actuated g/C Ratio					0.36						0.51	
Clearance Time (s)					4.5						4.5	
Vehicle Extension (s)					3.0						3.0	
Lane Grp Cap (vph)					1172						1588	
v/s Ratio Prot											c0.34	
v/s Ratio Perm					0.25							
v/c Ratio					0.70						0.67	
Uniform Delay, d1					19.5						13.0	
Progression Factor					1.00						1.00	
Incremental Delay, d2					1.8						1.1	
Delay (s)					21.3						14.1	
Level of Service					C						B	
Approach Delay (s)		0.0			21.3			0.0			14.1	
Approach LOS		A			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	71.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	SBT
Lane Group Flow (vph)	832	1098
v/c Ratio	0.71	0.68
Control Delay	24.3	15.1
Queue Delay	0.3	0.0
Total Delay	24.7	15.1
Queue Length 50th (ft)	155	165
Queue Length 95th (ft)	298	291
Internal Link Dist (ft)	179	644
Turn Bay Length (ft)		
Base Capacity (vph)	1745	2423
Starvation Cap Reductn	386	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.61	0.45

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	650	192	108	645	0	0	0	0
Future Volume (vph)	0	0	0	0	650	192	108	645	0	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					4.5	4.5	4.5	4.5				
Lane Util. Factor					0.95	1.00	0.91	0.91				
Frpb, ped/bikes					1.00	0.99	1.00	1.00				
Flpb, ped/bikes					1.00	1.00	1.00	1.00				
Frt					1.00	0.85	1.00	1.00				
Flt Protected					1.00	1.00	0.95	1.00				
Satd. Flow (prot)					3228	1440	1513	3182				
Flt Permitted					1.00	1.00	0.95	1.00				
Satd. Flow (perm)					3228	1440	1513	3182				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	707	209	117	701	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	100	47	9	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	707	109	58	704	0	0	0	0
Confl. Peds. (#/hr)	1					1			1	1		
Heavy Vehicles (%)	0%	0%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%
Turn Type					NA	Perm	Perm	NA				
Protected Phases					4			6				
Permitted Phases						4	6					
Actuated Green, G (s)					20.5	20.5	20.4	20.4				
Effective Green, g (s)					20.5	20.5	20.4	20.4				
Actuated g/C Ratio					0.41	0.41	0.41	0.41				
Clearance Time (s)					4.5	4.5	4.5	4.5				
Vehicle Extension (s)					3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)					1326	591	618	1300				
v/s Ratio Prot					c0.22							
v/s Ratio Perm						0.08	0.04	0.22				
v/c Ratio					0.53	0.19	0.09	0.54				
Uniform Delay, d1					11.1	9.4	9.1	11.2				
Progression Factor					1.00	1.00	1.00	1.00				
Incremental Delay, d2					0.4	0.2	0.1	0.5				
Delay (s)					11.5	9.5	9.1	11.7				
Level of Service					B	A	A	B				
Approach Delay (s)		0.0			11.1			11.3			0.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	49.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	707	209	105	713
v/c Ratio	0.54	0.31	0.16	0.55
Control Delay	13.8	4.9	5.3	13.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.8	4.9	5.3	13.7
Queue Length 50th (ft)	73	6	4	75
Queue Length 95th (ft)	164	47	35	169
Internal Link Dist (ft)	478			255
Turn Bay Length (ft)		125	75	
Base Capacity (vph)	2685	1225	1379	2885
Starvation Cap Reductn	0	0	0	99
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.17	0.08	0.26

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR	SBR2	SEL	SER
Lane Configurations									
Traffic Volume (vph)	542	166	374	1556	1253	436	0	0	0
Future Volume (vph)	542	166	374	1556	1253	436	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	5.5	5.5				
Lane Util. Factor	0.97	1.00	0.97	0.95	0.95				
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99				
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00				
Frt	1.00	0.85	1.00	1.00	0.96				
Flt Protected	0.95	1.00	0.95	1.00	1.00				
Satd. Flow (prot)	3131	1473	3162	3167	3021				
Flt Permitted	0.95	1.00	0.95	1.00	1.00				
Satd. Flow (perm)	3131	1473	3162	3167	3021				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	571	175	394	1638	1319	459	0	0	0
RTOR Reduction (vph)	0	133	0	0	0	0	0	0	0
Lane Group Flow (vph)	571	42	394	1638	1778	0	0	0	0
Confl. Bikes (#/hr)						1			
Heavy Vehicles (%)	3%	1%	2%	5%	6%	3%	2%	2%	2%
Turn Type	Prot	Perm	Prot	NA	NA		Perm		
Protected Phases	8		1	6	2				
Permitted Phases		3					2		
Actuated Green, G (s)	28.8	28.8	21.8	93.2	66.9				
Effective Green, g (s)	28.8	28.8	21.8	93.2	66.9				
Actuated g/C Ratio	0.22	0.22	0.17	0.71	0.51				
Clearance Time (s)	4.5	4.5	4.5	5.5	5.5				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	683	321	522	2236	1531				
v/s Ratio Prot	c0.18		0.12	c0.52	c0.59				
v/s Ratio Perm		0.03							
v/c Ratio	0.84	0.13	0.75	0.73	1.16				
Uniform Delay, d1	49.3	41.5	52.6	11.8	32.5				
Progression Factor	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	8.7	0.2	6.1	1.3	80.3				
Delay (s)	58.1	41.7	58.7	13.1	112.8				
Level of Service	E	D	E	B	F				
Approach Delay (s)	54.2			21.9	112.8			0.0	
Approach LOS	D			C	F			A	

Intersection Summary			
HCM 2000 Control Delay	62.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	571	175	394	1638	1778
v/c Ratio	0.84	0.39	0.76	0.73	1.16
Control Delay	61.5	9.2	62.9	15.0	112.1
Queue Delay	0.1	0.0	0.0	0.0	0.0
Total Delay	61.5	9.2	62.9	15.0	112.1
Queue Length 50th (ft)	242	3	168	410	~951
Queue Length 95th (ft)	328	66	237	595	#1276
Internal Link Dist (ft)	383			2738	1074
Turn Bay Length (ft)		200	325		
Base Capacity (vph)	870	532	783	2497	1529
Starvation Cap Reductn	11	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.66	0.33	0.50	0.66	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

MOVEMENT SUMMARY

Site: [21 - SW Helmholtz @ OR 126]

Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SW Helmholtz Way											
3	L2	36	0.0	0.550	15.1	LOS C	2.9	73.3	0.75	0.84	30.5
8	T1	315	0.0	0.550	15.1	LOS C	2.9	73.3	0.75	0.84	30.4
18	R2	128	1.0	0.228	9.4	LOS A	0.8	21.0	0.65	0.65	31.9
Approach		479	0.3	0.550	13.6	LOS B	2.9	73.3	0.73	0.79	30.8
East: OR 126											
1	L2	173	3.0	0.917	34.8	LOS D	14.8	379.2	1.00	1.37	24.0
6	T1	645	3.0	0.917	34.8	LOS D	14.8	379.2	1.00	1.37	23.9
16	R2	103	0.0	0.123	5.5	LOS A	0.5	11.7	0.50	0.44	33.8
Approach		921	2.7	0.917	31.5	LOS D	14.8	379.2	0.94	1.27	24.7
North: SW Helmholtz Way											
7	L2	38	0.0	0.226	8.4	LOS A	0.8	20.6	0.62	0.62	33.0
4	T1	105	8.0	0.226	8.4	LOS A	0.8	20.6	0.62	0.62	32.7
14	R2	96	0.0	0.159	7.9	LOS A	0.6	14.4	0.62	0.62	32.6
Approach		239	3.5	0.226	8.2	LOS A	0.8	20.6	0.62	0.62	32.7
West: OR 126											
5	L2	162	0.0	0.841	23.0	LOS C	11.4	294.1	0.92	0.99	27.4
2	T1	705	5.0	0.841	23.0	LOS C	11.4	294.1	0.92	0.99	27.3
12	R2	68	5.0	0.072	4.4	LOS A	0.3	6.7	0.40	0.28	34.2
Approach		936	4.1	0.841	21.6	LOS C	11.4	294.1	0.88	0.94	27.7
All Vehicles		2575	2.8	0.917	22.4	LOS C	14.8	379.2	0.85	1.00	27.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	732	48	236	869	233	70	328	132	214	285	70
Future Volume (vph)	162	732	48	236	869	233	70	328	132	214	285	70
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.7	5.0		4.7	5.0		4.7	5.0		4.7	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1662	1671		1662	1647		1583	1636		1630	1733	1410
Flt Permitted	0.10	1.00		0.09	1.00		0.36	1.00		0.16	1.00	1.00
Satd. Flow (perm)	179	1671		160	1647		606	1636		272	1733	1410
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	171	771	51	248	915	245	74	345	139	225	300	74
RTOR Reduction (vph)	0	2	0	0	10	0	0	14	0	0	0	56
Lane Group Flow (vph)	171	820	0	248	1150	0	74	470	0	225	300	18
Confl. Peds. (#/hr)	1					1	1		1	1		1
Confl. Bikes (#/hr)						1						1
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%	5%	2%	1%	2%	1%	3%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	45.4	39.1		56.0	45.0		28.9	23.9		31.5	25.2	25.2
Effective Green, g (s)	45.4	39.1		56.0	45.0		28.9	23.9		31.5	25.2	25.2
Actuated g/C Ratio	0.45	0.39		0.56	0.45		0.29	0.24		0.31	0.25	0.25
Clearance Time (s)	4.7	5.0		4.7	5.0		4.7	5.0		4.7	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	173	647		270	734		221	387		169	432	352
v/s Ratio Prot	0.06	0.49		c0.11	c0.70		0.02	0.29		c0.08	0.17	
v/s Ratio Perm	0.38			0.40			0.08			c0.33		0.01
v/c Ratio	0.99	1.27		0.92	1.57		0.33	1.21		1.33	0.69	0.05
Uniform Delay, d1	24.0	30.9		29.0	28.0		27.4	38.5		32.6	34.4	28.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	64.4	132.0		33.6	261.7		0.9	117.5		183.8	4.8	0.1
Delay (s)	88.4	162.9		62.6	289.6		28.3	156.0		216.4	39.2	28.8
Level of Service	F	F		E	F		C	F		F	D	C
Approach Delay (s)		150.1			249.6			139.1			104.5	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	180.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.47		
Actuated Cycle Length (s)	100.9	Sum of lost time (s)	19.4
Intersection Capacity Utilization	131.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	171	822	248	1160	74	484	225	300	74
v/c Ratio	0.98	1.25	0.91	1.54	0.31	1.24	1.33	0.69	0.15
Control Delay	88.0	156.0	60.7	276.6	26.5	162.0	212.5	44.5	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.0	156.0	60.7	276.6	26.5	162.0	212.5	44.5	0.7
Queue Length 50th (ft)	60	~663	108	~1051	32	~377	~144	179	0
Queue Length 95th (ft)	#198	#898	#255	#1304	65	#577	#298	#300	0
Internal Link Dist (ft)		5185		1541		2675		2548	
Turn Bay Length (ft)	225		275		125		150		150
Base Capacity (vph)	174	655	274	751	240	390	169	436	486
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	1.25	0.91	1.54	0.31	1.24	1.33	0.69	0.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	848	9	294	1133	386	21	219	196	258	180	107
Future Volume (vph)	146	848	9	294	1133	386	21	219	196	258	180	107
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3223		1662	3292	1414	1662	1733	1468	1662	1733	1467
Flt Permitted	0.13	1.00		0.12	1.00	1.00	0.64	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	224	3223		212	3292	1414	1115	1733	1468	635	1733	1467
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	155	902	10	313	1205	411	22	233	209	274	191	114
RTOR Reduction (vph)	0	1	0	0	0	188	0	0	162	0	0	83
Lane Group Flow (vph)	155	911	0	313	1205	223	22	233	47	274	191	31
Confl. Peds. (#/hr)	3		2	2		3	1		1	1		1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	5%	3%	0%	0%	1%	3%	0%	1%	0%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	36.2	29.7		47.8	36.8	43.3	22.0	19.6	19.6	30.2	23.7	23.7
Effective Green, g (s)	36.2	29.7		47.8	36.8	43.3	22.0	19.6	19.6	30.2	23.7	23.7
Actuated g/C Ratio	0.41	0.34		0.55	0.42	0.50	0.25	0.22	0.22	0.35	0.27	0.27
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	193	1095		341	1386	773	295	388	329	295	469	397
v/s Ratio Prot	0.06	0.28		c0.14	0.37	0.02	0.00	0.13		c0.07	0.11	
v/s Ratio Perm	0.27			c0.36		0.14	0.02		0.03	c0.25		0.02
v/c Ratio	0.80	0.83		0.92	0.87	0.29	0.07	0.60	0.14	0.93	0.41	0.08
Uniform Delay, d1	18.8	26.6		22.3	23.1	13.0	24.8	30.4	27.2	27.2	26.1	23.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.9	5.5		28.5	6.1	0.2	0.1	2.6	0.2	33.8	0.6	0.1
Delay (s)	39.7	32.1		50.9	29.2	13.2	24.9	33.0	27.4	61.0	26.7	23.8
Level of Service	D	C		D	C	B	C	C	C	E	C	C
Approach Delay (s)		33.2			29.3			30.1			42.4	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	87.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	155	912	313	1205	411	22	233	209	274	191	114
v/c Ratio	0.78	0.81	0.89	0.84	0.46	0.06	0.68	0.46	1.00	0.39	0.22
Control Delay	43.4	32.6	49.1	29.3	3.7	19.2	41.7	7.6	82.9	28.9	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.4	32.6	49.1	29.3	3.7	19.2	41.7	7.6	82.9	28.9	2.5
Queue Length 50th (ft)	36	224	111	287	8	8	116	0	116	76	0
Queue Length 95th (ft)	#155	#372	#302	#482	57	23	190	53	#274	156	17
Internal Link Dist (ft)		394		1820			1014			2700	
Turn Bay Length (ft)	225		200		200	200		175	250		250
Base Capacity (vph)	200	1146	351	1444	903	349	657	686	275	657	658
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.80	0.89	0.83	0.46	0.06	0.35	0.30	1.00	0.29	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	1065	59	47	1384	48	278	86	82	37	36	90
Future Volume (vph)	48	1065	59	47	1384	48	278	86	82	37	36	90
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.98			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1662	3204		1662	3243			1625			1559	
Flt Permitted	0.08	1.00		0.12	1.00			0.69			0.86	
Satd. Flow (perm)	143	3204		208	3243			1161			1353	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	1158	64	51	1504	52	302	93	89	40	39	98
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	9	0
Lane Group Flow (vph)	52	1222	0	51	1553	0	0	484	0	0	168	0
Confl. Peds. (#/hr)	1		8	8		1	6		1	1		6
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	1%	3%	0%	0%	0%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	49.0	49.0		49.0	49.0			41.8			41.8	
Effective Green, g (s)	49.0	49.0		49.0	49.0			41.8			41.8	
Actuated g/C Ratio	0.50	0.50		0.50	0.50			0.42			0.42	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	70	1589		103	1608			491			572	
v/s Ratio Prot		0.38			c0.48							
v/s Ratio Perm	0.36			0.25				c0.42			0.12	
v/c Ratio	0.74	0.77		0.50	0.97			0.99			0.29	
Uniform Delay, d1	19.9	20.3		16.6	24.1			28.2			18.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	34.2	2.3		3.7	15.0			36.6			0.3	
Delay (s)	54.1	22.6		20.3	39.1			64.8			19.1	
Level of Service	D	C		C	D			E			B	
Approach Delay (s)		23.9			38.5			64.8			19.1	
Approach LOS		C			D			E			B	

Intersection Summary			
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	52	1222	51	1556	484	177
v/c Ratio	0.73	0.77	0.50	0.97	0.99	0.30
Control Delay	78.5	24.7	38.1	41.0	67.1	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.5	24.7	38.1	41.0	67.1	18.7
Queue Length 50th (ft)	25	325	21	490	294	65
Queue Length 95th (ft)	#101	414	#77	#672	#509	116
Internal Link Dist (ft)		1820		1191	423	675
Turn Bay Length (ft)	125		125			
Base Capacity (vph)	71	1588	102	1610	505	597
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.77	0.50	0.97	0.96	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	855	384	0	0	0	0	0	0	14	86	0
Future Volume (vph)	0	855	384	0	0	0	0	0	0	14	86	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		1.00									1.00	
Flpb, ped/bikes		1.00									1.00	
Frt		0.95									1.00	
Flt Protected		1.00									0.99	
Satd. Flow (prot)		3096									3302	
Flt Permitted		1.00									0.99	
Satd. Flow (perm)		3096									3302	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	929	417	0	0	0	0	0	0	15	93	0
RTOR Reduction (vph)	0	46	0	0	0	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	1300	0	0	0	0	0	0	0	0	94	0
Confl. Peds. (#/hr)							3					3
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA								Perm	NA	
Protected Phases		2									4	
Permitted Phases										4		
Actuated Green, G (s)		37.7									5.6	
Effective Green, g (s)		37.7									5.6	
Actuated g/C Ratio		0.73									0.11	
Clearance Time (s)		4.5									4.0	
Vehicle Extension (s)		3.0									3.0	
Lane Grp Cap (vph)		2253									356	
v/s Ratio Prot		c0.42										
v/s Ratio Perm											0.03	
v/c Ratio		0.58									0.26	
Uniform Delay, d1		3.3									21.2	
Progression Factor		1.00									1.00	
Incremental Delay, d2		0.4									0.4	
Delay (s)		3.7									21.6	
Level of Service		A									C	
Approach Delay (s)		3.7			0.0			0.0			21.6	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	5.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	51.8	Sum of lost time (s)	8.5
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SBT
Lane Group Flow (vph)	1346	108
v/c Ratio	0.56	0.22
Control Delay	4.3	20.1
Queue Delay	0.0	0.0
Total Delay	4.3	20.1
Queue Length 50th (ft)	66	13
Queue Length 95th (ft)	123	36
Internal Link Dist (ft)	1097	269
Turn Bay Length (ft)		
Base Capacity (vph)	3098	1491
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.43	0.07

Intersection Summary

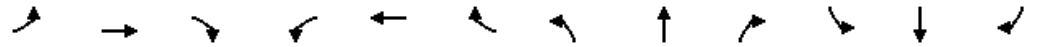
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	866	0	0	0	0	0	508	144	0	0	0
Future Volume (vph)	38	866	0	0	0	0	0	508	144	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5						4.5	4.5			
Lane Util. Factor		0.95						0.95	1.00			
Frpb, ped/bikes		1.00						1.00	1.00			
Flpb, ped/bikes		1.00						1.00	1.00			
Frt		1.00						1.00	0.85			
Flt Protected		1.00						1.00	1.00			
Satd. Flow (prot)		3250						3260	1488			
Flt Permitted		1.00						1.00	1.00			
Satd. Flow (perm)		3250						3260	1488			
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	41	931	0	0	0	0	0	546	155	0	0	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	70	0	0	0
Lane Group Flow (vph)	0	964	0	0	0	0	0	546	85	0	0	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	4%	2%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Turn Type	Perm	NA						NA	Perm			
Protected Phases		2						8				
Permitted Phases	2								8			
Actuated Green, G (s)		24.6						16.3	16.3			
Effective Green, g (s)		24.6						16.3	16.3			
Actuated g/C Ratio		0.49						0.33	0.33			
Clearance Time (s)		4.5						4.5	4.5			
Vehicle Extension (s)		3.0						3.0	3.0			
Lane Grp Cap (vph)		1602						1064	486			
v/s Ratio Prot								c0.17				
v/s Ratio Perm		0.30							0.06			
v/c Ratio		0.60						0.51	0.17			
Uniform Delay, d1		9.1						13.6	12.0			
Progression Factor		1.00						1.00	1.00			
Incremental Delay, d2		0.6						0.4	0.2			
Delay (s)		9.8						14.0	12.2			
Level of Service		A						B	B			
Approach Delay (s)		9.8			0.0			13.6			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	49.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	NBT	NBR
Lane Group Flow (vph)	972	546	155
v/c Ratio	0.61	0.52	0.28
Control Delay	11.5	16.7	7.8
Queue Delay	0.0	0.0	0.0
Total Delay	11.5	16.7	7.8
Queue Length 50th (ft)	94	64	10
Queue Length 95th (ft)	194	141	53
Internal Link Dist (ft)	460	568	
Turn Bay Length (ft)			175
Base Capacity (vph)	3043	2567	1193
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.32	0.21	0.13

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱							↰	↑↑	
Traffic Volume (vph)	0	884	69	0	0	0	0	0	0	168	589	0
Future Volume (vph)	0	884	69	0	0	0	0	0	0	168	589	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0							4.0	4.0	
Lane Util. Factor		0.95	1.00							1.00	0.95	
Frpb, ped/bikes		1.00	0.99							1.00	1.00	
Flpb, ped/bikes		1.00	1.00							1.00	1.00	
Frt		1.00	0.85							1.00	1.00	
Flt Protected		1.00	1.00							0.95	1.00	
Satd. Flow (prot)		3260	1469							1657	3292	
Flt Permitted		1.00	1.00							0.95	1.00	
Satd. Flow (perm)		3260	1469							1657	3292	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	931	73	0	0	0	0	0	0	177	620	0
RTOR Reduction (vph)	0	0	30	0	0	0	0	0	0	67	0	0
Lane Group Flow (vph)	0	931	43	0	0	0	0	0	0	110	620	0
Confl. Peds. (#/hr)									4	4		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type		NA	Perm							Perm	NA	
Protected Phases		2									4	
Permitted Phases			2							4		
Actuated Green, G (s)		25.7	25.7							19.9	19.9	
Effective Green, g (s)		25.7	25.7							19.9	19.9	
Actuated g/C Ratio		0.48	0.48							0.37	0.37	
Clearance Time (s)		4.0	4.0							4.0	4.0	
Vehicle Extension (s)		3.0	3.0							3.0	3.0	
Lane Grp Cap (vph)		1563	704							615	1222	
v/s Ratio Prot		c0.29									c0.19	
v/s Ratio Perm			0.03							0.07		
v/c Ratio		0.60	0.06							0.18	0.51	
Uniform Delay, d1		10.2	7.5							11.3	13.1	
Progression Factor		1.00	1.00							1.00	1.00	
Incremental Delay, d2		0.6	0.0							0.1	0.3	
Delay (s)		10.8	7.5							11.5	13.4	
Level of Service		B	A							B	B	
Approach Delay (s)		10.5			0.0			0.0			13.0	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	SBL	SBT
Lane Group Flow (vph)	931	73	177	620
v/c Ratio	0.60	0.10	0.26	0.51
Control Delay	13.0	4.4	7.6	16.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.0	4.4	7.6	16.0
Queue Length 50th (ft)	99	2	13	73
Queue Length 95th (ft)	217	24	62	166
Internal Link Dist (ft)	782			261
Turn Bay Length (ft)		100	150	
Base Capacity (vph)	2939	1330	1269	2474
Starvation Cap Reductn	0	0	0	102
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.32	0.05	0.14	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	407	658	0	0	0	0	0	324	51	0	0	0
Future Volume (vph)	407	658	0	0	0	0	0	324	51	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5						4.5				
Lane Util. Factor	0.91	0.91						0.95				
Frt	1.00	1.00						0.98				
Flt Protected	0.95	1.00						1.00				
Satd. Flow (prot)	1513	3114						3257				
Flt Permitted	0.95	1.00						1.00				
Satd. Flow (perm)	1513	3114						3257				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	438	708	0	0	0	0	0	348	55	0	0	0
RTOR Reduction (vph)	153	8	0	0	0	0	0	15	0	0	0	0
Lane Group Flow (vph)	219	766	0	0	0	0	0	388	0	0	0	0
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA						NA				
Protected Phases		8						6				
Permitted Phases	8											
Actuated Green, G (s)	21.7	21.7						11.5				
Effective Green, g (s)	21.7	21.7						11.5				
Actuated g/C Ratio	0.51	0.51						0.27				
Clearance Time (s)	4.5	4.5						4.5				
Vehicle Extension (s)	3.0	3.0						3.0				
Lane Grp Cap (vph)	778	1601						887				
v/s Ratio Prot								c0.12				
v/s Ratio Perm	0.15	0.25										
v/c Ratio	0.28	0.48						0.44				
Uniform Delay, d1	5.8	6.6						12.7				
Progression Factor	1.00	1.00						1.00				
Incremental Delay, d2	0.2	0.2						0.3				
Delay (s)	6.0	6.8						13.0				
Level of Service	A	A						B				
Approach Delay (s)		6.6			0.0			13.0			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	42.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	NBT
Lane Group Flow (vph)	372	774	403
v/c Ratio	0.40	0.49	0.45
Control Delay	2.9	7.9	15.3
Queue Delay	0.1	0.0	0.0
Total Delay	3.0	7.9	15.3
Queue Length 50th (ft)	6	52	37
Queue Length 95th (ft)	43	114	94
Internal Link Dist (ft)		156	664
Turn Bay Length (ft)	75		
Base Capacity (vph)	1480	3030	2867
Starvation Cap Reductn	225	495	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.30	0.31	0.14

Intersection Summary

MOVEMENT SUMMARY

Site: [29 - SE 9th St @ OR 126]

Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SE 9th St											
3	L2	36	1.0	0.191	8.6	LOS A	0.8	19.1	0.66	0.66	32.6
8	T1	33	1.0	0.191	8.6	LOS A	0.8	19.1	0.66	0.66	32.5
18	R2	43	1.0	0.191	8.6	LOS A	0.8	19.1	0.66	0.66	31.6
Approach		112	1.0	0.191	8.6	LOS A	0.8	19.1	0.66	0.66	32.2
East: OR 126											
1	L2	30	1.0	0.535	9.5	LOS A	3.7	96.9	0.49	0.32	32.9
6	T1	415	4.0	0.535	9.5	LOS A	3.7	96.9	0.49	0.32	32.8
16	R2	160	6.0	0.535	9.5	LOS A	3.7	96.9	0.49	0.32	31.8
Approach		605	4.4	0.535	9.5	LOS A	3.7	96.9	0.49	0.32	32.5
North: SE 9th St											
7	L2	180	6.0	0.433	10.1	LOS B	2.3	59.3	0.66	0.68	31.2
4	T1	24	1.0	0.433	10.1	LOS B	2.3	59.3	0.66	0.68	31.3
14	R2	138	4.0	0.433	10.1	LOS B	2.3	59.3	0.66	0.68	30.4
Approach		342	4.8	0.433	10.1	LOS B	2.3	59.3	0.66	0.68	30.9
West: OR 126											
5	L2	82	2.0	0.621	12.0	LOS B	5.2	131.8	0.67	0.56	31.5
2	T1	540	3.0	0.621	12.0	LOS B	5.2	131.8	0.67	0.56	31.5
12	R2	27	1.0	0.621	12.0	LOS B	5.2	131.8	0.67	0.56	30.7
Approach		649	2.8	0.621	12.0	LOS B	5.2	131.8	0.67	0.56	31.5
All Vehicles		1709	3.6	0.621	10.5	LOS B	5.2	131.8	0.61	0.51	31.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	31	57	22	30	1	117	396	18	4	248	80
Future Volume (vph)	35	31	57	22	30	1	117	396	18	4	248	80
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	0.99		1.00	0.96	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1559			1709		1614	1722		1662	1665	
Flt Permitted		0.90			0.85		0.38	1.00		0.50	1.00	
Satd. Flow (perm)		1419			1479		650	1722		872	1665	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	39	34	63	24	33	1	130	440	20	4	276	89
RTOR Reduction (vph)	0	39	0	0	1	0	0	2	0	0	15	0
Lane Group Flow (vph)	0	97	0	0	57	0	130	458	0	4	350	0
Confl. Peds. (#/hr)	1		1	1		1						
Confl. Bikes (#/hr)						1						1
Heavy Vehicles (%)	3%	0%	4%	0%	0%	0%	3%	1%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		2			6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		8.9			8.9		28.1	22.9		19.3	18.5	
Effective Green, g (s)		8.9			8.9		28.1	22.9		19.3	18.5	
Actuated g/C Ratio		0.20			0.20		0.62	0.50		0.42	0.41	
Clearance Time (s)		4.0			4.0		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		276			288		510	864		382	675	
v/s Ratio Prot							c0.03	c0.27		0.00	0.21	
v/s Ratio Perm		c0.07			0.04		0.13			0.00		
v/c Ratio		0.35			0.20		0.25	0.53		0.01	0.52	
Uniform Delay, d1		15.9			15.4		4.2	7.7		7.6	10.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.8			0.3		0.3	0.6		0.0	0.7	
Delay (s)		16.6			15.7		4.5	8.3		7.6	10.9	
Level of Service		B			B		A	A		A	B	
Approach Delay (s)		16.6			15.7			7.5			10.8	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	45.6	Sum of lost time (s)	13.0
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	136	58	130	460	4	365
v/c Ratio	0.41	0.19	0.24	0.50	0.01	0.58
Control Delay	16.4	18.4	5.3	9.4	4.2	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	18.4	5.3	9.4	4.2	15.2
Queue Length 50th (ft)	18	12	11	46	0	66
Queue Length 95th (ft)	70	44	33	197	3	152
Internal Link Dist (ft)	1098	1419		1239		2675
Turn Bay Length (ft)			75		125	
Base Capacity (vph)	946	969	552	1604	555	1540
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.06	0.24	0.29	0.01	0.24

Intersection Summary

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	41	2	18	0	2	13	11	370	11	14	257	47
Future Vol, veh/h	41	2	18	0	2	13	11	370	11	14	257	47
Conflicting Peds, #/hr	4	0	0	0	0	4	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	0	0
Mvmt Flow	44	2	19	0	2	14	12	394	12	15	273	50

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	765	759	300	762	778	403	325	0	0	405	0	0
Stage 1	330	330	-	423	423	-	-	-	-	-	-	-
Stage 2	435	429	-	339	355	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	323	338	744	324	330	652	1246	-	-	1165	-	-
Stage 1	687	649	-	613	591	-	-	-	-	-	-	-
Stage 2	604	587	-	680	633	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	306	328	743	307	320	650	1246	-	-	1161	-	-
Mov Cap-2 Maneuver	306	328	-	307	320	-	-	-	-	-	-	-
Stage 1	677	637	-	606	584	-	-	-	-	-	-	-
Stage 2	580	580	-	650	622	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.7	11.5	0.2	0.4
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1246	-	-	371	571	1161	-	-
HCM Lane V/C Ratio	0.009	-	-	0.175	0.028	0.013	-	-
HCM Control Delay (s)	7.9	0	-	16.7	11.5	8.1	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.1	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	219	129	139	385	212	131	268	89	185	356	10
Future Volume (vph)	9	219	129	139	385	212	131	268	89	185	356	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1661	1699	1473	1646	3228	1438	1646	1733	1444	3193	1726	
Flt Permitted	0.52	1.00	1.00	0.40	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	902	1699	1473	699	3228	1438	1646	1733	1444	3193	1726	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	9	228	134	145	401	221	136	279	93	193	371	10
RTOR Reduction (vph)	0	0	80	0	0	146	0	0	55	0	1	0
Lane Group Flow (vph)	9	228	54	145	401	75	136	279	38	193	380	0
Confl. Peds. (#/hr)	3					3	3		1	1		3
Heavy Vehicles (%)	0%	3%	1%	1%	3%	1%	1%	1%	2%	1%	1%	0%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5	2	3	1	6		3	8	1	7	4	
Permitted Phases	2		2	6		6			8			
Actuated Green, G (s)	20.2	19.2	30.3	30.4	25.4	25.4	11.1	23.4	30.6	8.7	21.0	
Effective Green, g (s)	20.2	19.2	30.3	30.4	25.4	25.4	11.1	23.4	30.6	8.7	21.0	
Actuated g/C Ratio	0.27	0.26	0.41	0.41	0.34	0.34	0.15	0.31	0.41	0.12	0.28	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	254	437	678	376	1100	490	245	544	670	372	486	
v/s Ratio Prot	0.00	c0.13	0.01	c0.04	0.12		c0.08	0.16	0.01	0.06	c0.22	
v/s Ratio Perm	0.01		0.03	0.12		0.05			0.02			
v/c Ratio	0.04	0.52	0.08	0.39	0.36	0.15	0.56	0.51	0.06	0.52	0.78	
Uniform Delay, d1	19.9	23.7	13.6	14.8	18.5	17.1	29.4	20.9	13.2	30.9	24.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	1.1	0.1	0.7	0.2	0.1	2.7	0.8	0.0	1.2	8.0	
Delay (s)	20.0	24.8	13.6	15.5	18.7	17.2	32.1	21.7	13.3	32.2	32.7	
Level of Service	B	C	B	B	B	B	C	C	B	C	C	
Approach Delay (s)		20.7			17.7			23.0			32.5	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	74.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	9	228	134	145	401	221	136	279	93	193	381
v/c Ratio	0.03	0.61	0.19	0.41	0.35	0.34	0.54	0.49	0.14	0.50	0.75
Control Delay	17.4	34.7	3.6	21.8	20.8	5.4	39.7	22.7	3.2	37.9	33.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	34.7	3.6	21.8	20.8	5.4	39.7	22.7	3.2	37.9	33.9
Queue Length 50th (ft)	2	91	0	43	64	0	55	96	0	41	149
Queue Length 95th (ft)	13	189	31	102	150	54	135	182	23	92	284
Internal Link Dist (ft)		693			446			553			1860
Turn Bay Length (ft)	125		200	175		150	225		125	250	
Base Capacity (vph)	366	765	778	354	1455	768	334	932	670	417	803
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.30	0.17	0.41	0.28	0.29	0.41	0.30	0.14	0.46	0.47

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	108	319	287	307	147	379	1676	134	59	1313	51
Future Volume (vph)	65	108	319	287	307	147	379	1676	134	59	1313	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1661	1683	1464	1583	3072		1646	3059		1599	3068	
Flt Permitted	0.25	1.00	1.00	0.50	1.00		0.06	1.00		0.06	1.00	
Satd. Flow (perm)	434	1683	1464	837	3072		102	3059		106	3068	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	70	116	343	309	330	158	408	1802	144	63	1412	55
RTOR Reduction (vph)	0	0	31	0	41	0	0	3	0	0	2	0
Lane Group Flow (vph)	70	116	312	309	447	0	408	1943	0	63	1465	0
Confl. Peds. (#/hr)	7					7			2	2		
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	4%	1%	5%	2%	3%	1%	7%	12%	4%	8%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	27.5	22.4	47.0	34.3	25.8		92.5	78.6		72.8	63.4	
Effective Green, g (s)	27.5	22.4	47.0	34.3	25.8		92.5	78.6		72.8	63.4	
Actuated g/C Ratio	0.20	0.16	0.34	0.25	0.19		0.67	0.57		0.53	0.46	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	5.0		4.5	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	132	274	548	255	576		345	1749		158	1415	
v/s Ratio Prot	0.02	0.07	0.10	c0.07	0.15		c0.21	0.64		0.03	0.48	
v/s Ratio Perm	0.09		0.11	c0.23			c0.58			0.18		
v/c Ratio	0.53	0.42	0.57	1.21	0.78		1.18	1.11		0.40	1.04	
Uniform Delay, d1	46.3	51.7	36.9	51.3	53.0		47.1	29.4		28.5	37.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.0	1.1	1.4	125.9	6.5		107.9	58.6		1.7	33.6	
Delay (s)	50.4	52.8	38.3	177.2	59.5		155.0	88.0		30.2	70.6	
Level of Service	D	D	D	F	E		F	F		C	E	
Approach Delay (s)		43.1			105.1			99.6			69.0	
Approach LOS		D			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	85.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	137.4	Sum of lost time (s)	18.5
Intersection Capacity Utilization	103.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	116	343	309	488	408	1946	63	1467
v/c Ratio	0.47	0.44	0.65	1.25	0.78	1.17	1.10	0.33	1.04
Control Delay	49.7	55.9	35.6	181.9	56.1	141.0	81.6	22.1	70.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	55.9	35.6	181.9	56.1	141.0	81.6	22.1	70.4
Queue Length 50th (ft)	48	93	208	~317	199	~387	~1074	18	~743
Queue Length 95th (ft)	89	155	310	#520	263	#652	#1332	60	#977
Internal Link Dist (ft)		446			2921		4483		2738
Turn Bay Length (ft)	175			150		150		175	
Base Capacity (vph)	148	452	528	247	907	349	1777	197	1414
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.26	0.65	1.25	0.54	1.17	1.10	0.32	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Intersection Delay, s/veh	11.6
Intersection LOS	B

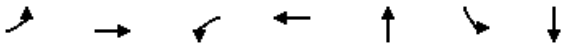
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	32	119	149	92	246	64
Future Vol, veh/h	32	119	149	92	246	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	3	9	5	9	4	4
Mvmt Flow	35	129	162	100	267	70
Number of Lanes	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.1	11.7	12.7
HCM LOS	A	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	79%	0%	0%	62%
Vol Thru, %	0%	100%	0%	38%
Vol Right, %	21%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	310	32	119	241
LT Vol	246	0	0	149
Through Vol	0	32	0	92
RT Vol	64	0	119	0
Lane Flow Rate	337	35	129	262
Geometry Grp	2	7	7	5
Degree of Util (X)	0.474	0.055	0.184	0.386
Departure Headway (Hd)	5.059	5.734	5.128	5.302
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	708	618	691	671
Service Time	3.134	3.533	2.927	3.39
HCM Lane V/C Ratio	0.476	0.057	0.187	0.39
HCM Control Delay	12.7	8.9	9.1	11.7
HCM Lane LOS	B	A	A	B
HCM 95th-tile Q	2.6	0.2	0.7	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	586	3	267	349	37	0	5	92	119	10	37
Future Volume (vph)	13	586	3	267	349	37	0	5	92	119	10	37
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0		5.0	5.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99			0.86		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1630	1695		1630	1647			1457		1630	1514	
Flt Permitted	0.52	1.00		0.12	1.00			1.00		0.43	1.00	
Satd. Flow (perm)	891	1695		204	1647			1457		736	1514	
Peak-hour factor, PHF	0.92	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.93	0.92	0.92	0.92
Adj. Flow (vph)	14	630	3	287	375	40	0	5	99	129	11	40
RTOR Reduction (vph)	0	0	0	0	2	0	0	90	0	0	31	0
Lane Group Flow (vph)	14	633	0	287	413	0	0	14	0	129	20	0
Heavy Vehicles (%)	2%	3%	40%	2%	5%	2%	0%	2%	3%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	29.8	28.7		49.9	43.8			7.0		15.9	15.9	
Effective Green, g (s)	29.8	28.7		49.9	43.8			7.0		15.9	15.9	
Actuated g/C Ratio	0.40	0.38		0.67	0.59			0.09		0.21	0.21	
Clearance Time (s)	5.0	5.0		5.0	5.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	365	650		444	964			136		215	321	
v/s Ratio Prot	0.00	c0.37		c0.14	0.25			0.01		c0.04	0.01	
v/s Ratio Perm	0.01			0.29						c0.09		
v/c Ratio	0.04	0.97		0.65	0.43			0.10		0.60	0.06	
Uniform Delay, d1	13.7	22.7		15.3	8.6			31.0		25.4	23.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.0	28.6		3.2	0.3			0.3		4.5	0.1	
Delay (s)	13.7	51.3		18.5	8.9			31.4		29.9	23.6	
Level of Service	B	D		B	A			C		C	C	
Approach Delay (s)		50.5			12.8			31.4			28.1	
Approach LOS		D			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	74.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	14	633	287	415	104	129	51
v/c Ratio	0.03	1.07	0.62	0.40	0.44	0.53	0.14
Control Delay	8.0	84.2	18.7	9.8	15.1	32.6	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.0	84.2	18.7	9.8	15.1	32.6	11.4
Queue Length 50th (ft)	2	~318	67	73	2	47	4
Queue Length 95th (ft)	9	#615	156	213	46	101	31
Internal Link Dist (ft)		2626		631	1973		4566
Turn Bay Length (ft)	150		150			100	
Base Capacity (vph)	814	593	611	1034	564	243	545
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	1.07	0.47	0.40	0.18	0.53	0.09

Intersection Summary

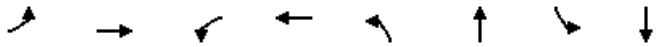
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	59	30	90	126	89	62	430	74	38	270	5
Future Volume (vph)	15	59	30	90	126	89	62	430	74	38	270	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.94		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1660	1650		1645	1596		1662	1697		1662	1711	
Flt Permitted	0.61	1.00		0.54	1.00		0.49	1.00		0.23	1.00	
Satd. Flow (perm)	1061	1650		930	1596		853	1697		399	1711	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	17	67	34	102	143	101	70	489	84	43	307	6
RTOR Reduction (vph)	0	22	0	0	28	0	0	7	0	0	1	0
Lane Group Flow (vph)	17	79	0	102	216	0	70	566	0	43	312	0
Confl. Peds. (#/hr)	3		1	1		3						
Heavy Vehicles (%)	0%	0%	0%	1%	1%	3%	0%	1%	0%	0%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	14.7	13.9		22.7	17.9		29.3	26.4		28.3	25.9	
Effective Green, g (s)	14.7	13.9		22.7	17.9		29.3	26.4		28.3	25.9	
Actuated g/C Ratio	0.22	0.21		0.35	0.27		0.45	0.40		0.43	0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	245	350		374	436		417	683		218	676	
v/s Ratio Prot	0.00	0.05		c0.02	c0.14		c0.01	c0.33		0.01	0.18	
v/s Ratio Perm	0.01			0.07			0.07			0.08		
v/c Ratio	0.07	0.23		0.27	0.49		0.17	0.83		0.20	0.46	
Uniform Delay, d1	19.9	21.3		15.0	20.0		10.6	17.5		12.2	14.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.3		0.4	0.9		0.2	8.2		0.4	0.5	
Delay (s)	20.0	21.7		15.4	20.9		10.8	25.7		12.6	15.1	
Level of Service	C	C		B	C		B	C		B	B	
Approach Delay (s)		21.4			19.3			24.1			14.8	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	65.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	17	101	102	244	70	573	43	313
v/c Ratio	0.05	0.31	0.27	0.49	0.14	0.77	0.14	0.43
Control Delay	19.2	23.3	20.8	22.7	9.0	25.3	9.4	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	23.3	20.8	22.7	9.0	25.3	9.4	16.8
Queue Length 50th (ft)	5	27	31	67	11	188	7	88
Queue Length 95th (ft)	19	71	71	168	38	#417	26	194
Internal Link Dist (ft)		602		599		2595		1305
Turn Bay Length (ft)	100		100		75		75	
Base Capacity (vph)	335	771	374	820	503	1120	307	1104
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.13	0.27	0.30	0.14	0.51	0.14	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	216	0	543	0	339	166	316	340	0
Future Volume (vph)	0	0	0	216	0	543	0	339	166	316	340	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					5.0	5.0		5.0	5.0	5.0	5.0	
Lane Util. Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes					1.00	0.98		1.00	1.00	1.00	1.00	
Flpb, ped/bikes					0.99	1.00		1.00	1.00	1.00	1.00	
Frt					1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1641	1436		1733	1473	1662	1733	
Flt Permitted					0.76	1.00		1.00	1.00	0.31	1.00	
Satd. Flow (perm)					1308	1436		1733	1473	549	1733	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	225	0	566	0	353	173	329	354	0
RTOR Reduction (vph)	0	0	0	0	0	327	0	0	120	0	0	0
Lane Group Flow (vph)	0	0	0	0	225	239	0	353	53	329	354	0
Confl. Peds. (#/hr)	4		10	10		4	3					3
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	1%	1%	0%	1%	0%
Turn Type				Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)					14.9	14.9		17.0	17.0	30.8	30.8	
Effective Green, g (s)					14.9	14.9		17.0	17.0	30.8	30.8	
Actuated g/C Ratio					0.27	0.27		0.31	0.31	0.55	0.55	
Clearance Time (s)					5.0	5.0		5.0	5.0	5.0	5.0	
Vehicle Extension (s)					2.0	2.0		3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)					349	384		528	449	479	958	
v/s Ratio Prot								0.20		c0.11	0.20	
v/s Ratio Perm					c0.17	0.17			0.04	c0.27		
v/c Ratio					0.64	0.62		0.67	0.12	0.69	0.37	
Uniform Delay, d1					18.1	17.9		16.9	13.9	8.2	7.0	
Progression Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2					3.0	2.2		3.2	0.1	3.3	0.2	
Delay (s)					21.1	20.2		20.1	14.1	11.4	7.2	
Level of Service					C	C		C	B	B	A	
Approach Delay (s)		0.0			20.4			18.1			9.2	
Approach LOS		A			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	55.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

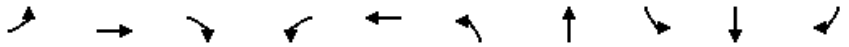
Lane Group	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	225	566	353	173	329	354
v/c Ratio	0.65	0.80	0.68	0.31	0.69	0.37
Control Delay	29.0	14.9	25.5	4.8	18.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.0	14.9	25.5	4.8	18.2	9.3
Queue Length 50th (ft)	67	32	101	0	54	58
Queue Length 95th (ft)	146	#162	206	37	#152	134
Internal Link Dist (ft)	931		2881			465
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	533	850	773	752	487	996
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.67	0.46	0.23	0.68	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	282	21	218	15	33	21	409	1903	16	13	1491	319
Future Volume (vph)	282	21	218	15	33	21	409	1903	16	13	1491	319
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	6.0		5.0	6.0	5.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1563	1579	1436	1661	1594		1646	3194		1662	3107	1426
Flt Permitted	0.52	0.52	1.00	0.65	1.00		0.06	1.00		0.06	1.00	1.00
Satd. Flow (perm)	853	848	1436	1135	1594		96	3194		104	3107	1426
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	300	22	232	16	35	22	435	2024	17	14	1586	339
RTOR Reduction (vph)	0	0	59	0	17	0	0	0	0	0	0	100
Lane Group Flow (vph)	159	163	173	16	40	0	435	2041	0	14	1586	239
Confl. Peds. (#/hr)	1		1	1		1	2		1	1		2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	1%	0%	3%	0%	0%	7%	1%	4%	0%	0%	7%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	8	1	7	4		1	6		5	2	3
Permitted Phases	8		8	4			6			2		2
Actuated Green, G (s)	27.3	27.3	46.1	15.2	12.9		98.4	90.4		70.3	67.3	76.7
Effective Green, g (s)	27.3	27.3	46.1	15.2	12.9		98.4	90.4		70.3	67.3	76.7
Actuated g/C Ratio	0.20	0.20	0.34	0.11	0.09		0.72	0.66		0.51	0.49	0.56
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	6.0		5.0	6.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	219	219	536	135	150		365	2112		87	1529	800
v/s Ratio Prot	0.05	c0.05	0.06	0.00	0.02		c0.23	0.64		0.00	0.51	0.02
v/s Ratio Perm	0.09	c0.10	0.06	0.01			c0.63			0.08		0.15
v/c Ratio	0.73	0.74	0.32	0.12	0.27		1.19	0.97		0.16	1.04	0.30
Uniform Delay, d1	50.1	51.4	33.7	54.5	57.5		47.2	21.7		22.3	34.7	15.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	11.3	12.8	0.4	0.4	1.0		110.3	12.5		0.9	33.3	0.2
Delay (s)	61.4	64.2	34.0	54.9	58.4		157.5	34.2		23.2	68.0	16.0
Level of Service	E	E	C	D	E		F	C		C	E	B
Approach Delay (s)		50.8			57.7			55.9			58.6	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	56.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	136.7	Sum of lost time (s)	21.0
Intersection Capacity Utilization	98.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	159	163	232	16	57	435	2041	14	1586	339
v/c Ratio	0.79	0.81	0.41	0.09	0.35	1.14	0.92	0.09	1.04	0.37
Control Delay	76.3	78.5	19.9	43.3	44.5	130.0	27.8	10.1	66.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.3	78.5	19.9	43.3	44.5	130.0	27.8	10.1	66.5	6.0
Queue Length 50th (ft)	129	132	77	11	31	~385	603	3	~758	39
Queue Length 95th (ft)	#207	#215	162	31	74	#670	#1259	12	#1026	110
Internal Link Dist (ft)		931			261		4040		4483	
Turn Bay Length (ft)	150		125	150		100		150		275
Base Capacity (vph)	201	287	564	170	394	380	2213	153	1529	912
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.57	0.41	0.09	0.14	1.14	0.92	0.09	1.04	0.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	13	1	46	10	66	6	380	94	72	194	8
Future Volume (vph)	4	13	1	46	10	66	6	380	94	72	194	8
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		3.5			3.5		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.93		1.00	0.97		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1718			1592		1662	1698		1662	1660	
Flt Permitted		0.94			0.88		0.63	1.00		0.33	1.00	
Satd. Flow (perm)		1632			1435		1098	1698		573	1660	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	4	13	1	47	10	68	6	392	97	74	200	8
RTOR Reduction (vph)	0	1	0	0	55	0	0	11	0	0	1	0
Lane Group Flow (vph)	0	17	0	0	70	0	6	478	0	74	207	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		2			6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		8.5			8.5		21.3	20.5		27.3	23.5	
Effective Green, g (s)		8.5			8.5		21.3	20.5		27.3	23.5	
Actuated g/C Ratio		0.18			0.18		0.46	0.44		0.59	0.51	
Clearance Time (s)		3.5			3.5		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		299			263		514	751		427	842	
v/s Ratio Prot							0.00	c0.28		c0.01	c0.12	
v/s Ratio Perm		0.01			c0.05		0.01			0.09		
v/c Ratio		0.06			0.27		0.01	0.64		0.17	0.25	
Uniform Delay, d1		15.6			16.2		6.8	10.0		4.8	6.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.5		0.0	1.8		0.2	0.2	
Delay (s)		15.7			16.8		6.8	11.8		5.0	6.6	
Level of Service		B			B		A	B		A	A	
Approach Delay (s)		15.7			16.8			11.7			6.1	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	46.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	18	125	6	489	74	208
v/c Ratio	0.06	0.37	0.01	0.65	0.14	0.23
Control Delay	19.4	14.7	3.7	15.6	4.1	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	14.7	3.7	15.6	4.1	6.4
Queue Length 50th (ft)	4	14	1	102	5	16
Queue Length 95th (ft)	20	61	3	219	19	79
Internal Link Dist (ft)	831	737		9408		839
Turn Bay Length (ft)			250		250	
Base Capacity (vph)	1083	975	641	1504	557	1506
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.13	0.01	0.33	0.13	0.14

Intersection Summary

MOVEMENT SUMMARY

Site: [40 - SW 27th @ SW Wickiup]

Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SW 27th											
3	L2	195	2.0	0.671	12.4	LOS B	6.4	161.6	0.62	0.41	31.1
8	T1	586	1.0	0.671	12.4	LOS B	6.4	161.6	0.62	0.41	31.1
18	R2	12	0.0	0.671	12.4	LOS B	6.4	161.6	0.62	0.41	30.3
Approach		792	1.2	0.671	12.4	LOS B	6.4	161.6	0.62	0.41	31.1
East: SW Wickiup											
1	L2	9	0.0	0.265	9.5	LOS A	1.1	27.6	0.68	0.68	32.9
6	T1	141	0.0	0.265	9.5	LOS A	1.1	27.6	0.68	0.68	32.9
16	R2	8	0.0	0.265	9.5	LOS A	1.1	27.6	0.68	0.68	32.0
Approach		158	0.0	0.265	9.5	LOS A	1.1	27.6	0.68	0.68	32.8
North: SW 27th											
7	L2	4	0.0	0.323	7.2	LOS A	1.6	41.3	0.55	0.46	34.2
4	T1	271	1.0	0.323	7.2	LOS A	1.6	41.3	0.55	0.46	34.1
14	R2	34	3.0	0.323	7.2	LOS A	1.6	41.3	0.55	0.46	33.1
Approach		309	1.2	0.323	7.2	LOS A	1.6	41.3	0.55	0.46	34.0
West: SW Wickiup											
5	L2	34	3.0	0.191	5.3	LOS A	0.9	22.3	0.45	0.34	34.6
2	T1	101	1.0	0.191	5.3	LOS A	0.9	22.3	0.45	0.34	34.6
12	R2	60	0.0	0.191	5.3	LOS A	0.9	22.3	0.45	0.34	33.6
Approach		195	1.0	0.191	5.3	LOS A	0.9	22.3	0.45	0.34	34.3
All Vehicles		1453	1.1	0.671	10.0	LOS B	6.4	161.6	0.59	0.44	32.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [41 - SW 27th @ SW Canal Blvd]

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SW Canal Dr											
3	L2	191	5.0	0.594	12.6	LOS B	4.5	115.5	0.73	0.73	30.7
8	T1	221	1.0	0.594	12.6	LOS B	4.5	115.5	0.73	0.73	30.7
18	R2	127	3.0	0.594	12.6	LOS B	4.5	115.5	0.73	0.73	29.9
Approach		538	2.9	0.594	12.6	LOS B	4.5	115.5	0.73	0.73	30.5
East: SW Yew Ave											
1	L2	110	0.0	0.976	46.6	LOS E	25.2	633.0	1.00	1.63	21.3
6	T1	602	1.0	0.976	46.6	LOS E	25.2	633.0	1.00	1.63	21.3
16	R2	141	0.0	0.976	46.6	LOS E	25.2	633.0	1.00	1.63	20.9
Approach		853	0.7	0.976	46.6	LOS E	25.2	633.0	1.00	1.63	21.2
North: SW Canal Blvd											
7	L2	101	0.0	0.722	25.8	LOS D	5.3	132.4	0.87	1.06	26.3
4	T1	210	1.0	0.722	25.8	LOS D	5.3	132.4	0.87	1.06	26.2
14	R2	77	0.0	0.722	25.8	LOS D	5.3	132.4	0.87	1.06	25.7
Approach		388	0.5	0.722	25.8	LOS D	5.3	132.4	0.87	1.06	26.1
West: SW 27th St											
5	L2	17	0.0	0.391	8.5	LOS A	2.1	51.5	0.62	0.57	33.4
2	T1	266	0.0	0.391	8.5	LOS A	2.1	51.5	0.62	0.57	33.3
12	R2	66	0.0	0.391	8.5	LOS A	2.1	51.5	0.62	0.57	32.4
Approach		350	0.0	0.391	8.5	LOS A	2.1	51.5	0.62	0.57	33.1
All Vehicles		2130	1.1	0.976	28.0	LOS D	25.2	633.0	0.85	1.13	25.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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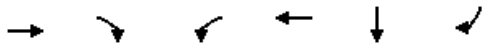
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	256	232	352	741	0	0	0	0	109	0	183
Future Volume (vph)	0	256	232	352	741	0	0	0	0	109	0	183
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1667	1423	1567	1733						1662	1458
Flt Permitted		1.00	1.00	0.47	1.00						0.95	1.00
Satd. Flow (perm)		1667	1423	776	1733						1662	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	278	252	383	805	0	0	0	0	118	0	199
RTOR Reduction (vph)	0	0	144	0	0	0	0	0	0	0	0	91
Lane Group Flow (vph)	0	278	108	383	805	0	0	0	0	0	118	108
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	0%	5%	2%	6%	1%	0%	0%	0%	0%	0%	0%	2%
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		23.0	23.0	34.0	34.0						9.7	9.7
Effective Green, g (s)		23.0	23.0	34.0	34.0						9.7	9.7
Actuated g/C Ratio		0.43	0.43	0.63	0.63						0.18	0.18
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		713	609	579	1097						300	263
v/s Ratio Prot		0.17		0.07	c0.46							
v/s Ratio Perm			0.08	0.34							0.07	c0.07
v/c Ratio		0.39	0.18	0.66	0.73						0.39	0.41
Uniform Delay, d1		10.5	9.5	5.5	6.7						19.4	19.5
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.1	2.8	2.6						0.9	1.0
Delay (s)		10.9	9.6	8.3	9.3						20.3	20.5
Level of Service		B	A	A	A						C	C
Approach Delay (s)		10.3			9.0			0.0			20.4	
Approach LOS		B			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	53.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	278	252	383	805	118	199
v/c Ratio	0.39	0.34	0.66	0.73	0.39	0.56
Control Delay	13.4	3.3	13.6	13.4	23.6	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	3.3	13.6	13.4	23.6	16.5
Queue Length 50th (ft)	56	0	46	137	35	25
Queue Length 95th (ft)	127	37	#141	#429	72	75
Internal Link Dist (ft)	1380			488	462	
Turn Bay Length (ft)		75	150			200
Base Capacity (vph)	750	777	579	1137	935	868
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.32	0.66	0.71	0.13	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	250	0	0	662	188	430	1	247	0	0	0
Future Volume (vph)	115	250	0	0	662	188	430	1	247	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.85				
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)	1599	1667			1683	1395	1630	1431				
Flt Permitted	0.12	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	205	1667			1683	1395	1630	1431				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	272	0	0	720	204	467	1	268	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	60	0	173	0	0	0	0
Lane Group Flow (vph)	125	272	0	0	720	144	467	96	0	0	0	0
Confl. Peds. (#/hr)	3		1	1		3						
Heavy Vehicles (%)	4%	5%	0%	0%	4%	4%	2%	0%	4%	0%	0%	0%
Turn Type	pm+pt	NA			NA	Perm	Perm	NA				
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	37.3	37.3			27.8	27.8	25.8	25.8				
Effective Green, g (s)	37.3	37.3			27.8	27.8	25.8	25.8				
Actuated g/C Ratio	0.51	0.51			0.38	0.38	0.35	0.35				
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	190	850			640	530	575	505				
v/s Ratio Prot	c0.04	0.16			c0.43			0.07				
v/s Ratio Perm	0.29					0.10	c0.29					
v/c Ratio	0.66	0.32			1.12	0.27	0.81	0.19				
Uniform Delay, d1	15.6	10.5			22.6	15.7	21.5	16.4				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	8.0	0.2			75.2	0.3	8.6	0.2				
Delay (s)	23.6	10.7			97.8	15.9	30.0	16.6				
Level of Service	C	B			F	B	C	B				
Approach Delay (s)		14.8			79.8			25.1			0.0	
Approach LOS		B			E			C			A	

Intersection Summary			
HCM 2000 Control Delay	47.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	73.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	125	272	720	204	467	269
v/c Ratio	0.66	0.32	1.13	0.35	0.81	0.40
Control Delay	31.9	13.4	103.8	11.9	33.3	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.9	13.4	103.8	11.9	33.3	4.1
Queue Length 50th (ft)	30	71	~399	33	186	0
Queue Length 95th (ft)	#94	139	#660	91	296	43
Internal Link Dist (ft)		488	979			520
Turn Bay Length (ft)	150			100		
Base Capacity (vph)	190	849	637	588	740	796
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.32	1.13	0.35	0.63	0.34

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

MOVEMENT SUMMARY

Site: [44 - SW 19th @ SE Airport Way]

Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SW 19th St											
3	L2	267	0.0	0.329	7.8	LOS A	1.6	40.7	0.60	0.55	31.5
18	R2	21	8.0	0.329	7.8	LOS A	1.6	40.7	0.60	0.55	30.5
Approach		288	0.6	0.329	7.8	LOS A	1.6	40.7	0.60	0.55	31.4
East: SE Airport Way											
1	L2	10	0.0	0.536	10.4	LOS B	3.5	90.7	0.61	0.50	32.7
6	T1	527	5.0	0.536	10.4	LOS B	3.5	90.7	0.61	0.50	32.5
Approach		537	4.9	0.536	10.4	LOS B	3.5	90.7	0.61	0.50	32.5
West: SE Airport Way											
2	T1	428	3.0	0.427	7.0	LOS A	2.8	73.7	0.09	0.02	34.2
12	R2	123	16.0	0.427	7.0	LOS A	2.8	73.7	0.09	0.02	32.9
Approach		551	5.9	0.427	7.0	LOS A	2.8	73.7	0.09	0.02	33.9
All Vehicles		1376	4.4	0.536	8.5	LOS A	3.5	90.7	0.40	0.32	32.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: [45 - SW Helmholtz @ SW Canal]

Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
NorthEast: SW Canal											
6x	T1	198	1.0	0.240	6.9	LOS A	1.1	27.3	0.58	0.53	34.3
16x	R2	2	0.0	0.240	6.9	LOS A	1.1	27.3	0.58	0.53	33.4
Approach		200	1.0	0.240	6.9	LOS A	1.1	27.3	0.58	0.53	34.3
NorthWest: SW Helmholtz											
7x	L2	7	0.0	0.221	5.4	LOS A	1.0	27.0	0.39	0.26	34.9
14x	R2	233	4.0	0.221	5.4	LOS A	1.0	27.0	0.39	0.26	33.7
Approach		239	3.9	0.221	5.4	LOS A	1.0	27.0	0.39	0.26	33.8
SouthWest: SW Canal											
5x	L2	479	1.0	0.636	10.3	LOS B	7.1	179.4	0.12	0.02	31.3
2x	T1	388	0.0	0.636	10.3	LOS B	7.1	179.4	0.12	0.02	31.3
Approach		867	0.6	0.636	10.3	LOS B	7.1	179.4	0.12	0.02	31.3
All Vehicles		1307	1.2	0.636	8.9	LOS A	7.1	179.4	0.24	0.14	32.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix G Redmond Airport Master Plan Update

Redmond Municipal Airport Master Plan as of 2020:

http://www.flyrdm.com/images/uploads//Policies/Master%20Plan%202019/RDM%20MP%20Chapters%20Combined.pdf

This plan is maintained and regularly updated by the City of Redmond.

Appendix H Identification of Preferred and Cost-Constrained Alternatives

Date:	June 26, 2019
To:	Project Management Team
From:	Julia Kuhn & Matt Kittelson
Subject:	TM# 7: Identification of Preferred and Cost-Constrained Alternatives

Based on the evaluation of transportation system needs and alternatives, this memorandum presents the list of cost-constrained projects and associated planning-level cost estimates needed to fulfill the Redmond Transportation System Plan (TSP) goals and policies. This memorandum fulfills Task 5.1 of the TSP Work Scope.

The recommended multimodal transportation projects are organized into the following categories for implementation based on complexity, likely availability of funding, and assessment of need:

- Strategic Street Capacity Investment Corridors
- New Planned Streets
- Intersection Capacity Improvements
- Grade-Separated Intersection Improvements
- Key Multi-Use Pathways
- Key Bicycle Corridors
- Key Pedestrian Improvements

Some projects may be accelerated and others postponed due to changing conditions, funding availability, public input, or more detailed study performed during programming and budgeting processes. Further, the projects included in the preferred TSP list represent the best estimation for appropriate design available at this time. Because the TSP is being drafted at a citywide scale, project design may change before construction commences as public input, available funding, and unique site conditions are taken into consideration. Projects identified herein may be funded through a variety of sources including federal, state, or local transportation funds, system development charges (SDCs), through partnerships with private developers, or a combination of these sources.

PROJECT COSTS

The estimated construction costs for each project are provided in the subsequent tables. These costs are order-of-magnitude (e.g., planning-level) estimates that account for right-of-way, design engineering, and construction and generally include a 30 percent contingency factor. The costs were calculated for each project using the methodology and procedures recommended by the American Association of Cost Engineers (Class 5 estimates). All costs are rounded to the nearest $100,000 and provided in 2018 dollars.

Detailed cost estimate sheets are included in Appendix A. The detailed costs include all estimation assumptions as well as any deviations related to unique topographic, right-of-way, or other constraints.

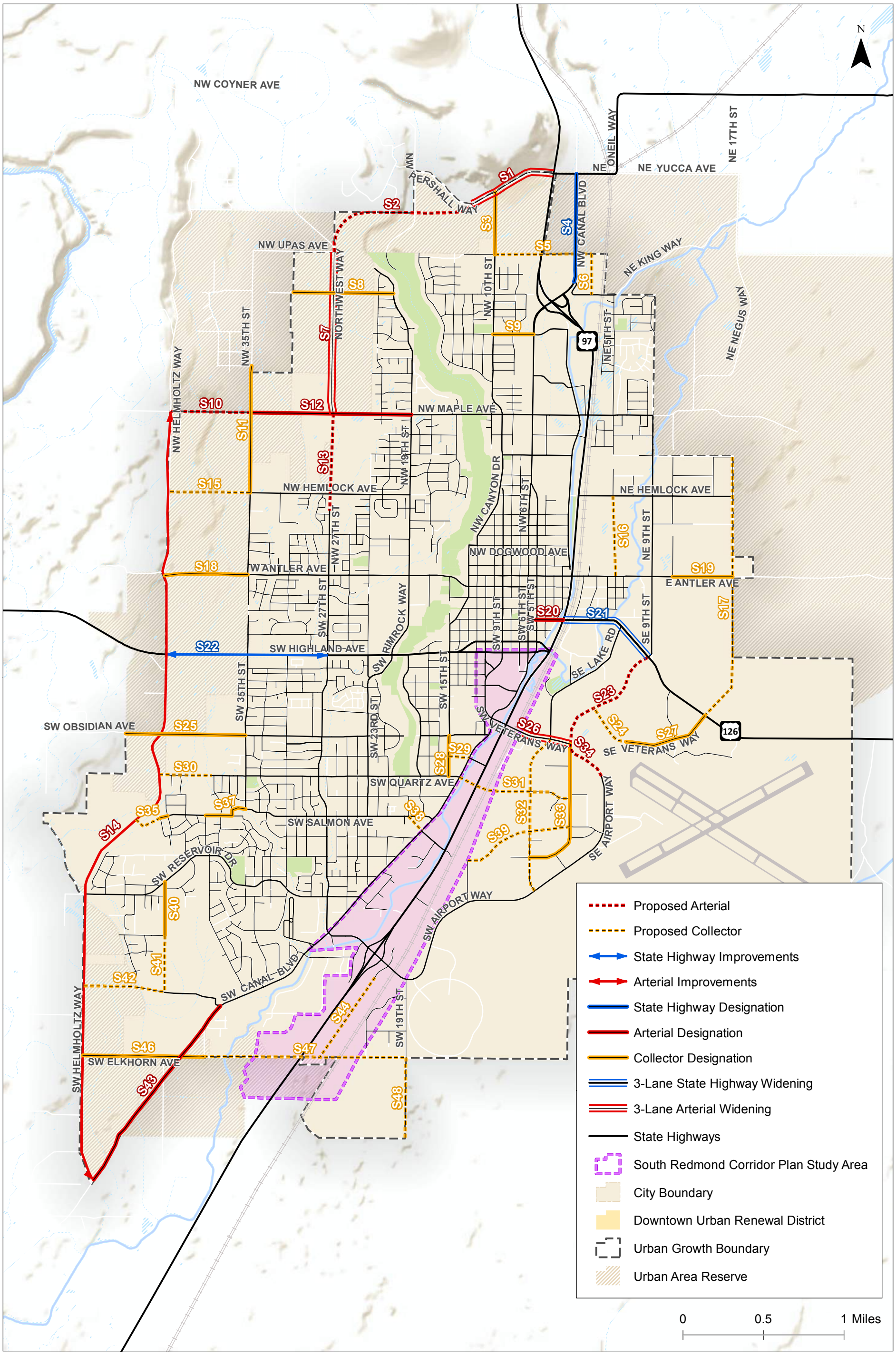
Costs for individual transit corridors are not provided. The City and Cascades East Transit are working to refine the transit corridors and identify a list of capital improvements and strategic policies that can help implement more robust transit service within Redmond. These efforts are currently ongoing and the results can be incorporated into future updates of the TSP.

STRATEGIC STREET CAPACITY INVESTMENT CORRIDORS

The projects shown in Table 1 represent the City's current priorities for street capacity investments. Improvements to these key corridors help accommodate growth and economic development in the region and continue to shape the urban context for the City. Such improvements can strengthen mobility and connectivity as well as create opportunities to incorporate bicycle, pedestrian, and transit facilities where they do not exist. These projects are illustrated in Figure 1.

Table 1: Priority Street Capacity Investments

Map ID	Corridor	S-W Limit	E-N Limit	Improvement	Length (miles)	2018 Cost Estimates
S1	Pershall Way	New Pershall Arterial	US 97	Widen to 3-Lane Arterial	0.6	$3.1M
S7	Northwest Way	Maple Ave	NW Upas Ave	Widen to 3 Lanes	1.0	$5.6M
S14	SW/NW Helmholtz Way	SW Canal Boulevard	NW Maple Avenue	Widen roadway to add center turn lane	5.0	$27.8M
S21	OR 126	US 97	SE 9th St	Widen to 3 Lanes	0.6	$5.2M
S22	OR 126	SW Helmholtz Way	SW 27th St	Upgrade roadway as necessary	1.0	$8.4M
S26	SW Veterans	Railroad	SE 1st St	Widen to 3 Lanes (turn lanes where needed)	0.4	$2.0M
Total Priority Street Capacity Investments						$52.1M



Planned Roadway Projects
Redmond, Oregon

Figure **1**

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Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

NEW PLANNED STREETS

The projects shown in Table 2 represent the City's current priorities for planned new streets to improve connectivity between and within existing neighborhoods, employment, and commercial areas; provide connections to newly developed or developing areas; and to provide alternative travel routes for all modes to existing streets. These projects are illustrated in Figure 1.

Table 2: Priority Planned New Streets

Map ID	Corridor	S-W Limit	E-N Limit	Improvement	Length (miles)	2018 Cost Estimates
S2	NW Pershall Way	NW Upas Way	NW Pershall Way	Proposed 3-Lane Arterial	1.0	$8.6M
S5	NW Upas Ave	NW 10th St	East of NW Canal Blvd	Proposed Collector & Overcrossing	0.6	$10.6M
S6	NE 3rd	King Way	UGB	Proposed Collector	0.3	$1.4M
S10	NW Maple Ave	SW Helmholtz Way	NW 35th St	Proposed 3-Lane Arterial	0.5	$4.1M
S13	NW 27th St	NW Greenwood Ave	NW Maple Ave	Proposed Arterial	0.6	$5.0M
S15	NW Hemlock Ave	NW Helmholtz Way	NW 35th St	Proposed Collector	0.5	$2.8M
S16	NE 5th St	E Antler Ave	NE Hemlock Ave	Proposed Collector	0.5	$2.8M
S17	SE/NE 17th St	OR 126	NE Kingwood	Proposed Collector	1.7	$9.3M
S23	SE 9th St	Veterans Way	OR 126	Proposed Arterial	0.8	$6.5M
S24	SE Veterans Way	SE 1st St	SE Veterans Way	Proposed Collector	0.4	$2.0M
S29	SW Pumice Ave	SW 15th St	SW Canal Blvd	Proposed Collector	0.1	$0.7M
S30	SW Quartz Ave	SW Helmholtz Way	SW 37th St	Proposed Collector	0.3	$1.8M
S31	SW Quartz Ave	SW Canal Blvd	S 1st St	Proposed Collector	0.7	$6.9M
S32	SW 6th St	SE Airport Way	SE Veterans Way	Proposed Collector	1.0	$3.5M
S34	SE Airport Way	SE Airport Way	SW Veterans Way	Proposed Arterial	0.3	$2.2M
S35	SW 45th St	SW Salmon Ave	SW Helmholtz Way	Proposed Collector	0.1	$0.6M
S38	SW Odem Medo	SW Canal Blvd	SW 19th St	Proposed Collector	0.1	$0.7M
S39	SE Salmon Drive	13th Street	S 1st St	Proposed Collector	0.7	$3.9M
S41	SW 43rd St	SW Badger Ave	SW Yew Ave	Proposed Collector	0.4	$1.9M
S42	SW Badger Ave	SW Helmholtz Way	SW 43rd St	Proposed Collector	0.5	$2.8M
S44	SW 21st St	SW Elkhorn Ave	south of SW Airport Ave	Proposed Collector	0.6	$3.3M

Map ID	Corridor	S-W Limit	E-N Limit	Improvement	Length (miles)	2018 Cost Estimates
S47	SW Elkhorn Ave	SW 39th St	SW 19th St	Proposed Collector and Overcrossing	1.3	$25.0M
S48	SW 19th St	UGB	SW Elkhorn Ave	Proposed Collector	0.5	$3.2M
Total New Planned Streets						$109.6M

INTERSECTION CAPACITY IMPROVEMENTS

The projects shown in Table 3 and Table 4 represent the City's current priorities for intersection capacity improvements. The TSP is not inclusive of all of the intersection projects that the City will pursue over the next twenty years. Rather, these are those that the City can pursue to strategically improve the operational efficiency of specific intersections and important roadways. These projects can enhance system operations and can be completed as opportunities arise. In all cases, the City will review the appropriate intersection control options at the time of project development and delivery. These projects are illustrated in Figure 2.

Table 3: Priority Intersection Capacity Improvements

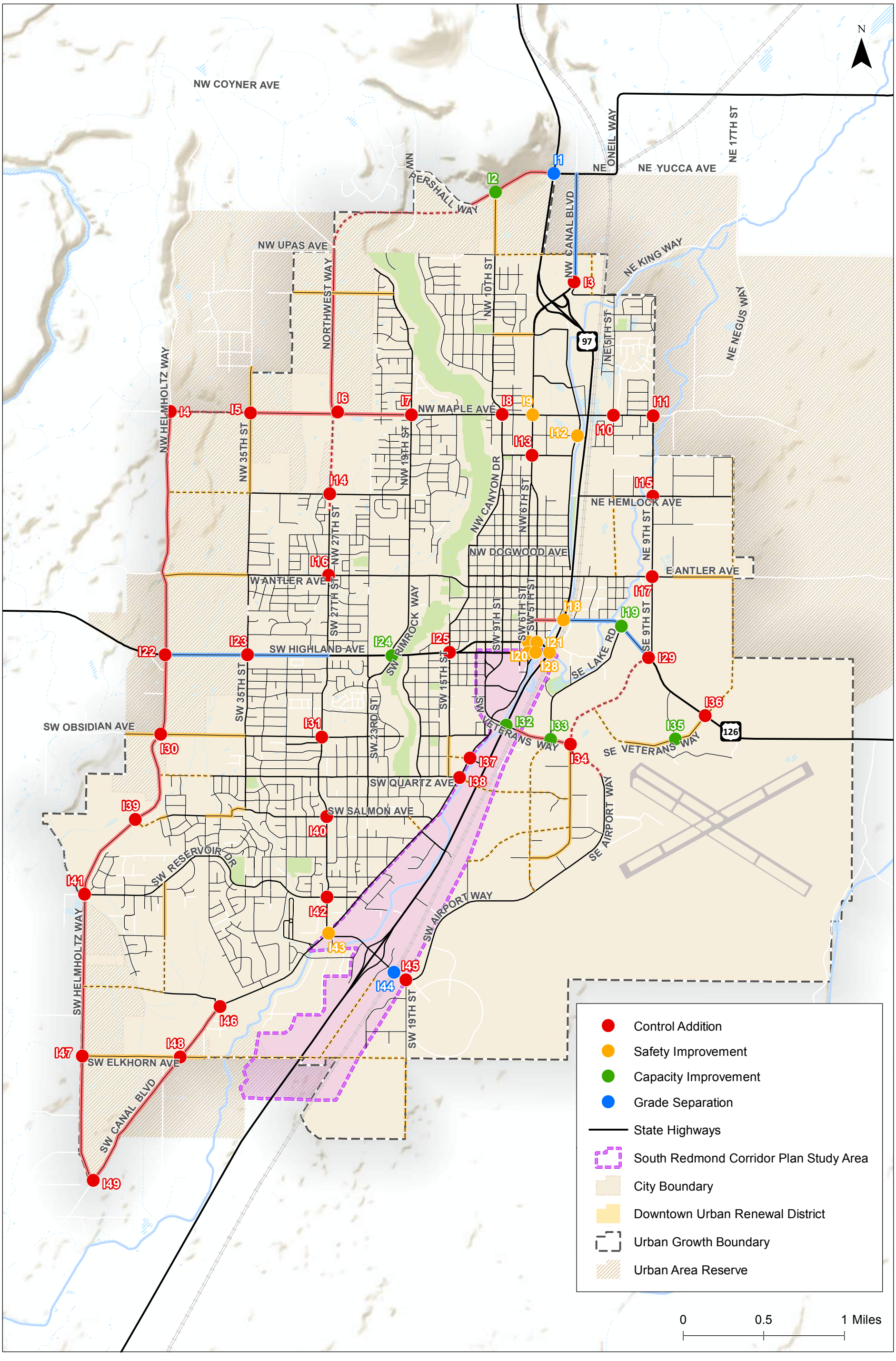
Map ID	N-S Street	E-W Street	Improvement	Description	2018 Cost Estimates
I3	NW Canal Blvd	NE King Way	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I4	NW Helmholtz Way	NW Maple Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.1M (roundabout)
I5	NW 35th St	NW Maple Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I6	NW 27th St	NW Maple Ave	Consider traffic signal or roundabout	Roundabout Preferred	$3.1M
I7	NW 19th St	NW Maple Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I8	NW 9th St	NW Maple Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I10	NE 5th St	NE Maple Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.1M (roundabout)
I11	NE 9th St	NE Maple Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.1M (roundabout)
I13	NW 6th St	NW Kingwood Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I14	NW 27th St	NW Hemlock Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M

Map ID	N-S Street	E-W Street	Improvement	Description	2018 Cost Estimates
I15	NE 9th St	NE Hemlock Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I16	NW 27th St	W Antler Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I17	NE 9th St	E Antler Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I22	SW Helmholtz Way	OR 126	Consider traffic signal or roundabout	Roundabout Preferred	$3.1M
I23	SW 35th St	OR 126	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I25	SW 15th St	OR 126	Consider traffic signal modification or roundabout	-	$0.5M (signal) or $3.1M (roundabout)
I29	SE 9th St	OR 126	Consider traffic signal or roundabout	Roundabout Preferred	$3.1M
I30	SW Helmholtz Way	SW Obsidian Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.1M (roundabout)
I31	SW 27th St	SW Obsidian Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I34	SE 9th St	SW Veterans Way	Consider traffic signal or roundabout	Roundabout Preferred	$3.1M
I36	SE Veterans Way	OR 126	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I37	SW Canal Blvd	SW Pumice	Consider traffic signal or roundabout	Disconnect SW Obsidian Ave	$0.5M (signal) or $3.1M (roundabout)
I38	SW Canal Blvd	SW Quartz Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I39	SW Helmholtz Way	SW Salmon Ave	Consider traffic signal or roundabout		$0.5M (signal) or $3.1M (roundabout)
I40	SW 27th St	SW Salmon Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I41	SW Helmholtz Way	SW Wickiup Ave	Consider traffic signal or roundabout	Signal Preferred	$0.5M
I42	SW 27th St	SW Wickiup Ave	Consider traffic signal or roundabout	Roundabout Preferred	$3.1M
I45	SW 19th St	SW Airport Way	Consider traffic signal or roundabout	Roundabout Preferred	$3.1M
I46	SW Canal Blvd	SW Badger Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.1M (roundabout)

Map ID	N-S Street	E-W Street	Improvement	Description	2018 Cost Estimates
I47	SW Helmholtz Way	SW Elkhorn Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.1M (roundabout)
I48	SW Canal Blvd	SW Elkhorn Ave	Consider traffic signal or roundabout	-	$0.5M (signal) or $3.1M (roundabout)
I49	SW Helmholtz Way	SW Canal Blvd	Consider traffic signal or roundabout	Roundabout Preferred	$3.1M
Total Intersection Capacity Improvements					$34.2M to $60.2M depending on control type selected

Table 4: Other Priority Intersection Capacity Improvements

Map ID	N-S Street	E-W Street	Improvement	Description	2018 Cost Estimates
I2	NW 10th St	NW Pershall Way	Consider Additional Lanes	Add Eastbound Right-Turn	$0.3M
I19	SE Lake Rd	OR 126	Consider Access Management	Create Right-In/Right-Out in Conjunction with 9th Street Project	$0.1M
I24	SW Rimrock Way	OR 126	Consider Additional Lanes	Carry Westbound Lane through Intersection; Add Southbound and Westbound Right-Turns	$0.7M
I32	US 97	Veterans Way	Improvement to be identified by South Corridor Project		-
I33	SW Lake Rd	SW Veterans Way	Consider Access Management	Create Right-In/Right-Out in Conjunction with 9th Street Project	$0.1M
I35	SE 10th St	SE Veterans Way	Consider Intersection Control Change	Remove Stop Signs on Veterans in Conjunction with 9th Street Project	$0.5M (signal) or $3.1M (roundabout)
Total for Other Intersection Capacity Improvements					$1.7M to $4.3M depending on intersection control type selected



Planned Intersection Projects
Redmond, Oregon

Figure **2**

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Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

GRADE-SEPARATED INTERSECTION IMPROVEMENTS

Three intersections were identified for grade separation to eliminate conflict points and improve traffic flows. One intersection was identified for future evaluation. These are identified in Table 5 and shown in Figure 1 and Figure 2. A brief description of each is included below:

- **US 97/O'Neil Highway:** The Interchange Area Management Plan (IAMP) for this location identified the need to provide a grade-separated overcrossing of US 97 that would connect O'Neil Highway to Pershall Way. An interim option is to restrict the US 97/O'Neil Highway intersection to right-in, right-out.
- **Airport Way Rail Crossing:** Airport Way connects US 97 to the Redmond Airport. US 97 and the Redmond Airport are both critical statewide infrastructure as identified in the Oregon Resilience Plan. The planned grade-separation would eliminate the at-grade rail crossing between the highway and airport.
- **US 97/Elkhorn Avenue:** Construct overcrossing of US 97 as part of the Elkhorn Avenue extension from Canal Boulevard to SW 19th Street.
- **US 97/Hemlock Avenue:** Conduct a study to evaluate a possible grade-separated crossing of US 97.

Table 5: Identified Grade Separation Projects

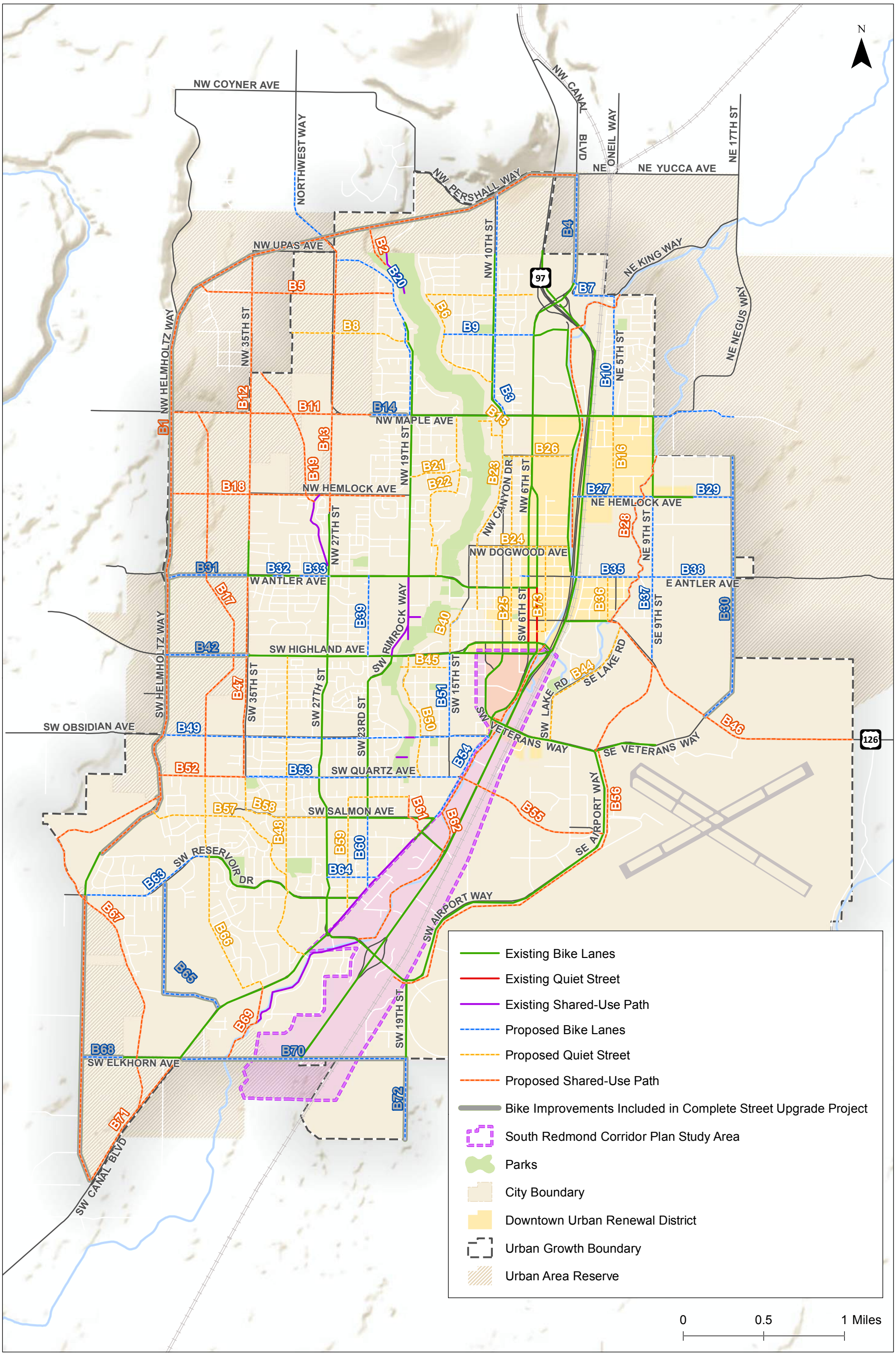
Map ID	N-S Street	E-W Street	Improvement	Description	2018 Cost Estimates
I1	US 97	O'Neil Hwy	North Interchange IAMP Project	Interim project would modify US 97/O'Neil Hwy intersection to right-in/right-out; eventual project would result in grade-separation	$0.1M
I44	Railroad	SW Airport Way	Grade Separated Crossing	Remove Existing At-Grade Rail Crossing	$16.2M
S47	US 97	Elkhorn Avenue	Grade Separated Crossing	Construct US 97 overcrossing at part of roadway extension.	$25.0M
Total Grade-Separated Intersection Improvements					$41.3M

KEY MULTI-USE PATHWAYS

The projects shown in Table 6 represent the City's current priorities for multi-use pathways. The multiuse pathway system is intended to improve continuity for bicyclists and pedestrians to move freely throughout the transportation network and help to eliminate north-south barriers for east-west access, particularly through the Dry Canyon and across US 97. These projects are shown in Figure 3. Table 6 identifies the associated costs.

Table 6: Priority Multi-Use Pathways

Map ID	Corridor	S-W Limit	E-N Limit	Length (miles)	2018 Cost Estimates
B1	SW/NW Helmholz Way	SW Canal Blvd	NW Canal Blvd	8.0	Costs included in S14
B2	NW Pershall Way	Dry Canyon Trail	B1	0.3	$0.9M
B5	NW Spruce Ave	NW Helmholtz Way	NW 19th St	1.2	$4.5M
B11	NW Maple Ave	NW Helmholtz Way	west of NW 22nd St	1.2	$4.5M
B12	NW 35th St	NW Dogwood Ave	NW Upas Way	1.8	$6.5M
B13	NW 27th St	NW Greenwood Ave	NW Upas Way	1.7	$6.4M
B17	SW 39th St	SW Quartz Ave	NW Maple Ave	2.4	$8.9M
B18	NW Hemlock Ave	NW Helmholtz Way	NW 19th St	1.4	$5.3M
B19	NW 29th St	NW Hemlock Ave	UGB	0.9	$3.4M
B28	Lateral E Pilot Butte Canal	OR 126	NE Kingwood Ave	1.2	$4.6M
B46	OR 126	SE Jackson St	UGB	1.8	$6.7M
B47	SW 35th St	SW Quartz Ave	W Antler Ave	1.2	$4.5M
B52	SW Quartz Ave	SW Helmholtz Way	SW 35th St	0.5	$2.0M
B55	SW Quartz Ave	SW Canal Blvd	SE Airport Way	1.0	$7.3M
B56	SE Airport Way/SE 9th St	Railroad	OR 126	3.0	$11.0M
B61	SW 19th St	SW Canal Blvd	SW Reindeer Ave	0.3	$1.0M
B62	SW Canal Blvd/Pilot Butte Canal	SW 27th St	NE King Way	2.4	$8.7M
B67	SW Helmholtz Way	SW Canal Blvd	SW Reservoir Dr	2.5	$9.4M
B69	Pilot Butte Canal	SW Elkhorn Ave	SW Canal Blvd	0.5	$1.9M
B71	SW Canal Blvd	SW Helmholtz Way	SW Elkhorn Ave	0.9	$3.4M
Total Multi-Use Pathways					$71.3M



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Existing and Planned Bicycle Facilities
Redmond, Oregon

Figure **3**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

KEY BICYCLE CORRIDORS

More than forty bicycle corridors were identified as the City's current priorities for inclusion into the TSP. Crossing improvements, though not specifically identified in the TSP, may be provided when bicycle facilities are constructed that cross major roads. The need for and type of crossing treatments will be evaluated at the time of project development and design. Further, the City of Redmond will consider upgrades to existing bicycle facilities (such as including a marked buffer) on a case-by-case basis. Such upgrades typically occur in conjunction with scheduled maintenance operations.

These projects are shown in Figure 3. Table 7 identifies the associated costs.

Table 7: Current Bicycle Corridor Priorities

Map ID	Corridor	S-W Limit	E-N Limit	Improvement	Length (miles)	2018 Cost Estimates
B3	NW 10th St	NW Maple Ave	NW Pershall Way	Bike Lanes	1.0	$0.2M
B6	NW Canyon Dr/NW Spruce Ave	NW 10th St	US 97	Quiet Street	1.4	$0.4M
B7	NE King Way	NW Canal Blvd	NE 5th St	Bike Lanes	0.3	$0.5M
B8	NW Quince Ave	UGB	NW 19th St	Quiet Street	0.7	$0.2M
B9	NW Quince Ave	NW Canyon Dr	NW 6th St	Bike Lanes	0.3	$0.5M
B10	NE 5th St	NE Negus Way	NE King Way	Bike Lanes	0.7	$1.0M
B15	NW 10th St/NW Larch/NW Rockcrest Ct	Dry Canyon Trail	NW 9th St	Quiet Street	0.2	$0.1M
B16	NE 5th St	NE Hemlock Ave	NE Maple Ave	Quiet Street	0.5	$0.1M
B20	NW 19th St	NW Maple Ave.	Northwest Way	Bike Lanes	0.7	$0.5M
B21	NW Ivy Ave	NW 19th St	NW Rimrock Ct	Quiet Street	0.3	$0.1M
B22	NW 17th St/NW Rimrock Ct	W Antler Ave	NW Maple Ave	Quiet Street	1.2	$0.3M
B23	NW Canyon Dr	SW Deschutes Ave	NW Maple Ave	Quiet Street	1.2	$0.3M
B24	NW Dogwood Ave	NW Canyon Dr	NW Canal Blvd	Quiet Street	0.5	$0.2M
B25	SW 8th St	SW Evergreen Ave	NW Kingwood Ave	Quiet Street	1.0	$0.3M
B26	NW Kingwood Ave	NW Canyon Dr	NW Canal Blvd	Quiet Street	0.4	$0.1M
B27	NE Hemlock Ave	NW Canal Blvd	NE 9th St	Bike Lanes/Crossing	0.5	$0.7M
B29	NE Hemlock Ave	west of NE 15th St	NE 17th St	Bike Lanes	0.2	$0.1M
B32	W Antler Ave	NW 32nd Ct	SW 31st St	Bike Lanes	0.1	$0.1M
B33	W Antler Ave	NW 29th St	SW 27th St	Bike Lanes	0.2	$0.3M
B35	E Antler Ave	SW 7th St	NE 17th St	Bike Lanes/Crossing	0.8	$1.1M
B36	SE Jackson St	OR 126	E Antler Ave	Quiet Street	0.3	$0.1M
B37	SE 9th St	OR 126	NE Hemlock Ave	Bike Lanes	1.0	$1.4M
B38	E Antler Ave	SE 9th St	NE 17th St	Bike Lanes	0.1	$0.2M
B39	SW 23rd St	SW Highland Ave	W Antler Ave	Bike Lanes	0.5	$0.1M

Map ID	Corridor	S-W Limit	E-N Limit	Improvement	Length (miles)	2018 Cost Estimates
B40	SW 15th St	SW Highland Ave	SW Deschutes Ave	Quiet Street	0.3	$0.1M
B44	SW Lake Rd	SW Veterans Way	OR 126	Quiet Street	0.9	$0.3M
B45	SW Juniper Ave	Dry Canyon Trail	SW 15th St	Quiet Street	0.3	$0.1M
B48	SW 31st St	SW Canal Blvd	SW Highland Ave	Quiet Street	2.0	$0.1M
B49	SW Obsidian Ave	SW Helmholtz Way	SW Canal Blvd	Bike Lanes	1.4	$0.3M
B50	SW Canyon Dr	SW Quartz Ave	SW Highland Ave	Quiet Street	0.8	$0.2M
B51	SW 15th St	SW Obsidian Ave	SW Highland Ave	Bike Lanes	0.5	$0.7M
B53	SW Quartz Ave	SW 35th St	SW Canal Blvd	Bike Lanes	1.3	$0.3M
B54	SW Canal Blvd	SW Salmon Ave	SW Obsidian Ave	Bike Lanes	0.6	$0.8M
B57	SW Salmon Ave/SW Valleyview Dr/SW 32nd Ct	SW Helmholtz Way	SW 31st St	Quiet Street	0.9	$0.2M
B58	SW 35th St/SW Salmon Ave	SW Quartz Ave	SW 27th St	Quiet Street	0.7	$0.2M
B59	SW 25th St/SW Reindeer Ave	SW Canal Blvd	Dry Canyon Trail/SW 19th St	Quiet Street	1.1	$0.3M
B60	SW 23rd St	SW Canal Blvd	SW Salmon Ave	Bike Lanes	0.4	$0.6M
B63	SW Reservoir Dr	SW Helmholtz Way	SW 39th St	Bike Lanes	0.8	$1.1M
B64	Volcano Avenue	27th Street	SW Canal Boulevard	Bike Lanes	0.3	$0.2M
B66	SW Cascade Vista Dr/SW Antelope Ave	SW Canal Blvd	SW Quartz Ave	Quiet Street	1.5	$1.3M
B73	SW 4th St/SW Forest/SW 5th	SW Highland	SW Dogwood Ave	Quiet Street	0.6	$0.2M
Total Bicycle Corridors						$15.9M

KEY PEDESTRIAN IMPROVEMENTS

Key priority sidewalk investment areas are intended to prioritize new sidewalk facilities along ADA routes and provide key missing connections in the pedestrian system. Pedestrian crossing improvements at intersections, though not specifically identified, may be provided when pedestrian facilities are constructed that cross major roads. The need for and type of crossing treatments will be evaluated at the time of project development and design.

These projects are shown in Figure 4. Table 8 and Table 9 identify the associated costs.

Table 8: Priority New Sidewalk Facilities along ADA Routes

Map ID	Corridor	S-W Limit	E-N Limit	Street Side	Note	Length (miles)	2018 Cost Estimates
P4	NW 10th St	NW 9th St	NW Quince Ave	West	Add Sidewalk or Ramps	0.4	$0.4M
P8	NW 9th St	NW Hemlock Ave	NW Maple Ave	Both	Add Sidewalk or Ramps	0.9	$0.9M

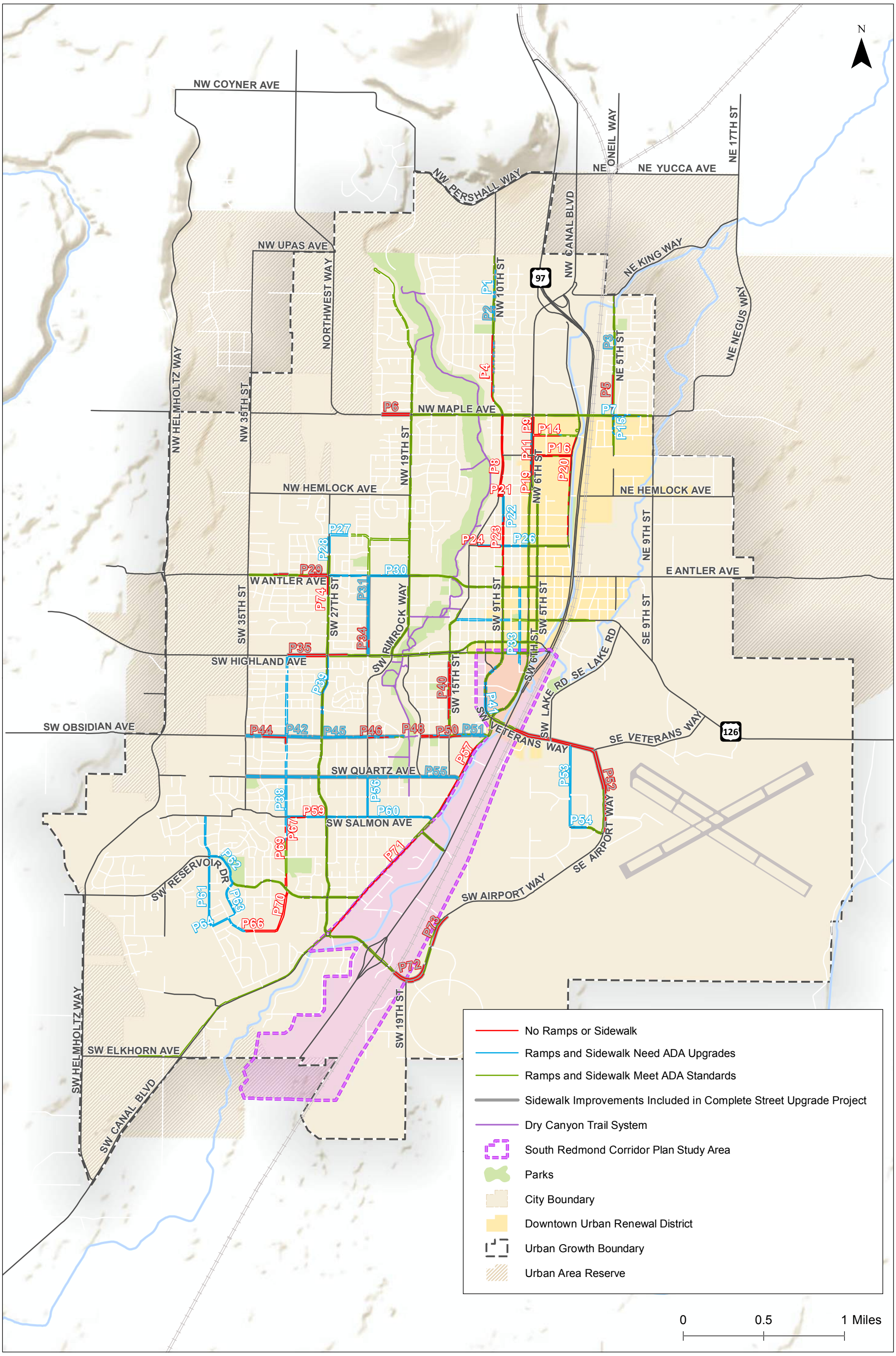
Map ID	Corridor	S-W Limit	E-N Limit	Street Side	Note	Length (miles)	2018 Cost Estimates
P9	NW 6th St	North of NW Larch Ave	NW Maple Ave	Both	Add Sidewalk or Ramps	0.2	$0.2M
P11	NW 6th St	NW Jackpine Ave	NW Larch Ave	East	Add Sidewalk or Ramps	0.1	$0.1M
P12	NW 6th St	South of NW Kingwood Ave	South of Larch Ave	West	Add Sidewalk or Ramps	0.1	$0.1M
P13	NW Larch Ave	NW 6th St	NW 4th St	Both	Add Sidewalk or Ramps	0.1	$0.1M
P14	NW Larch Ave	NW 4th St	West of NW Canal Blvd	South	Add Sidewalk or Ramps	0.1	$0.1M
P16	NW Kingwood Ave	NW 6th St	NW Canal Blvd	Both	Add Sidewalk or Ramps	0.4	$0.4M
P18	NW 6th St	North of NW Jackpine Ave	South of NW Kingwood Ave	West	Add Sidewalk or Ramps	0.04	<$0.1M
P19	NW 6th St	NW Jackpine Ave	NW Kingwood Ave	East	Add Sidewalk or Ramps	0.1	$0.1M
P20	NW Canal Blvd	NW Elm Ave	NW Larch Ave	West	Add Sidewalk or Ramps	0.4	$0.4M
P21	NW Hemlock Ave	NW Canyon Dr	NW 9th St	Both	Add Sidewalk or Ramps	0.03	<$0.1M
P23	NW 9th St	W Antler Ave	NW Greenwood Ave	Both	Add Sidewalk or Ramps	0.5	$0.4M
P24	NW Dogwood Ave	NW Canyon Dr	NW 10th St	South	Add Sidewalk or Ramps	0.1	$0.1M
P37	SW Highland Ave	SW Indian Cir	SW 27th St	South	Add Sidewalk or Ramps	0.1	$0.1M
P57	SW Canal Blvd	North of SW Salmon Ave	South of SW Obsidian Ave	West	Add Sidewalk or Ramps	0.4	$0.4M
P59	SW Salmon Ave	SW 31st St	SW 29th St	South	Add Sidewalk or Ramps	0.1	$0.1M
P66	SW Xero Ln	West of SW 34th St	SW 31st St	Both	Add Sidewalk or Ramps	0.3	$0.3M
P67	SW 31st St	SW 33rd St	SW Savannah Ct	West	Add Sidewalk or Ramps	0.03	<$0.1M
P69	SW 31st St	SW Timber Ct	SW 33rd St	East	Add Sidewalk or Ramps	0.1	$0.1M
P70	SW 31st St	SW Xero Ln	SW Volcano Way	Both	Add Sidewalk or Ramps	0.5	$0.5M
P71	SW Canal Blvd	SW 27th St	SW Timber Ave	East	Add Sidewalk or Ramps	0.8	$0.7M
Total New Sidewalk Facilities							$5.4M

Table 9: Identified Priority Pedestrian Improvements – Sidewalk and Ramp ADA Upgrades

Map ID	Corridor	S-W Limit	E-N Limit	Street Side	Note	Length (miles)	2018 Cost Estimates
P1	NW 10th St	NW Redwood Ave	NW Teak Ave	West	Upgrade Sidewalk or Ramps	0.1	$0.1M
P7	NE Negus Way	NE 5th St	NE 7th St	Both	Upgrade Sidewalk or Ramps	0.1	$0.1M

Map ID	Corridor	S-W Limit	E-N Limit	Street Side	Note	Length (miles)	2018 Cost Estimates
P10	NW 6th St	North of NW Kingwood Ave	North of NW Larch Ave	West	Upgrade Sidewalk or Ramps	0.1	$0.1M
P15	NE 5th St	NE Larch Ave	NE Negus Way	Both	Upgrade Sidewalk or Ramps	0.1	$0.1M
P17	NW 6th St	NW Jackpine Ave	NW Kingwood Ave	West	Upgrade Sidewalk or Ramps	0.03	<$0.1M
P22	NW 9th St	NW Fir Ave	NW Hemlock Ave	Both	Upgrade Sidewalk or Ramps	0.3	$0.3M
P25	NW Dogwood Ave	NW Canyon Dr	NW 10th St	North	Upgrade Sidewalk or Ramps	0.1	$0.1M
P26	NW Dogwood Ave	NW 10th St	NW 6th St	Both	Upgrade Sidewalk or Ramps	0.3	$0.3M
P27	NW Elm Ave	NW 27th St	NW 25th St	Both	Upgrade Sidewalk or Ramps	0.2	$0.2M
P28	NW 27th St	NW Cedar Ave	NW Elm Ave	Both	Upgrade Sidewalk or Ramps	0.2	$0.2M
P30	W Antler Ave	SW 27th St	SW Rimrock Way	Both	Upgrade Sidewalk or Ramps	0.8	$0.8M
P32	W Evergreen Ave	SW Canyon Dr	SW 8th St	Both	Upgrade Sidewalk or Ramps	0.6	$0.5M
P33	SW 7th St	SW Indian Ave	SW Black Butte Blvd	Both	Upgrade Sidewalk or Ramps	0.7	$0.7M
P36	SW Highland Ave	SW 31st St	SW Indian Cir	South	Upgrade Sidewalk or Ramps	0.1	$0.1M
P38	SW 31st St	SW Savanna Ct	SW Highland Ave	Both	Upgrade Sidewalk or Ramps	1.6	$1.5M
P39	SW 27th St	SW Metolius Ave	SW Highland Ave	East	Upgrade Sidewalk or Ramps	0.3	$0.3M
P41	SW Veterans Way	SW Canal Blvd	SW Indian Ave	Both	Upgrade Sidewalk or Ramps	0.4	$0.4M
P53	S 1st St	SE Salmon Dr	SW Veterans Way	Both	Upgrade Sidewalk or Ramps	0.9	$0.9M
P54	SE Salmon Dr	S 1st St	West of Timber Ave	Both	Upgrade Sidewalk or Ramps	0.2	$0.2M
P56	SW 23rd St	SW Salmon Ave	SW Quartz Ave	Both	Upgrade Sidewalk or Ramps	0.5	$0.4M
P58	SW Salmon Ave	SW 31st St	SW Canal Blvd	North	Upgrade Sidewalk or Ramps	0.8	$0.7M

Map ID	Corridor	S-W Limit	E-N Limit	Street Side	Note	Length (miles)	2018 Cost Estimates
P60	SW Salmon Ave	SW 29th St	SW Canal Blvd	South	Upgrade Sidewalk or Ramps	0.7	$0.6M
P61	SW 39th St	SW 35th St	SW Salmon Ave	Both	Upgrade Sidewalk or Ramps	1.2	$1.1M
P62	SW Reservoir Dr	SW 39th St	SW 36th St	Both	Upgrade Sidewalk or Ramps	0.5	$0.5M
P63	SW 36th St	SW 35th St	SW Reservoir Dr	Both	Upgrade Sidewalk or Ramps	0.4	$0.3M
P64	SW 35th St	SW Cascade Vista Dr	SW 36th St	Both	Upgrade Sidewalk or Ramps	0.2	$0.2M
P65	SW Xero Ln	SW 35th St	West of SW 34th St	Both	Upgrade Sidewalk or Ramps	0.2	$0.2M
Total Sidewalk and ADA Ramp Upgrades							$11.0M



Priority (ADA) Pedestrian Routes and Projects
Redmond, Oregon

Figure **4**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

H:\17\17720 - Redmond Transportation System Plan\gis\Priority Sidewalk Gaps mkb.mxd - mbarrus - 11:32 AM 6/26/2019

SOUTH REDMOND TRANSPORTATION NEEDS

The Oregon Department of State Lands (DSL), in partnership with the City, Deschutes County, and the Oregon Military Department, pursued an amendment to the City's UGB to allow annexation of 949 acres for expansion of the Deschutes County Fairgrounds, potential National Guard and military maintenance facilities, and 789 acres of future large lot industrial uses. To support development of these lands, the following transportation improvements were identified for implementation within the TSP:

- SW 19th Street/Airport Way – installation of a roundabout; this improvement is included in the list of prioritized intersection improvements identified in the above section of priority improvements.
- OR 126/Veterans Way – installation of a traffic signal; this improvement is included in the list of prioritized intersection improvements identified in the above section of priority improvements.
- SE 9th Street Extension
    - Airport Way extended north to connect with OR 126/SE 9th Street; this improvement is included in the above section of priority projects.
    - Veterans Way/Airport Way/SE 9th Street – installation of a roundabout; this improvement is included in the improvement is included in the above section of priority projects.
    - OR 126/SE 9th Street – installation of a traffic signal; this improvement is included in the list of prioritized intersection improvements.
- A future northbound connection at OR 126/Veterans Way to provide access to industrial lands; this improvement is included in the list of prioritized new street improvements identified above.
- SW 21st Avenue/SE Airport Way – construction of a raised median to limit movements SW 21st Street to right-in-right-out; the construction of a median at this location will need to consider how local properties are provided access and the timing of roundabout construction at SW 19th Avenue/SE Airport Way.
- Canal Boulevard/Yew Avenue – potential expansion of this roundabout; the operational benefits of an improvement should be balanced against the cost and potential impacts to adjacent properties.

TRANSPORTATION FUNDING

Today's fiscal environment is beset by uncertainty about future federal, state, and local funding for transportation projects. This uncertainty provides challenges to accurately forecast the amount of funding available for transportation investments and what projects or programs will receive funding. In this context, the TSP provides a prudent and conservative list of capital construction projects, an emphasis on lower cost methods of improving personal mobility within the City, and an increased reliance on technologies that can improve the efficiencies of our streets.

Further, the City policies and priorities seek to include strategic investments that support mixed-use, pedestrian-friendly neighborhoods, increase use of active modes of transportation, and reduce reliance on travel by single-occupant automobile. These priorities include improved convenience and safety for walking and biking; and continued support for the economic health and prosperity of the region.

The highest priority projects for strategic investments are those that (1) protect the existing system and (2) improve the efficiency and safety of existing multimodal facilities. These projects are to be implemented first unless a lower priority measure is demonstrated to be more cost-effective or is one that better supports safety, growth management, or other livability and economic considerations. Further, the list of projects identified above are intended to make streets safer for all users as well as more efficient with use of emerging technologies.

The timing of project implementation will depend on future policy direction and funding availability at the federal, state, or local level; changes in local development priorities; or the formation of public-private or public-public partnerships.

Transportation Revenue

Revenue forecasts from the City provided a basis for extrapolating an estimate of revenues that might be available for transportation projects over the next twenty years. Table 10 summarizes the potential revenue forecast and sources for the identified list of strategic priorities.

Table 10: Forecast Revenue Sources

Revenue Source	Average Annual Revenue	20-Year Revenue Forecast
SDC Improvement Sub-Fund	$1.02M	$20.35M
SDC Reimbursement Sub-Fund	$0.12M	$2.35M
Capital Projects Sub-Fund	$0.85M	$17.07M
Total Revenue	$1.99M	$39.77M

Summary of Transportation System Costs

Table 11 summarizes the total cost by category of recommended multimodal transportation projects.

Table 11: Project Costs

Project Category	Total Cost ($2018)
Strategic Street Capacity Investment Corridors	$52.1M
New Planned Streets	$109.6M
Intersection Capacity Improvements	$34.2M to $60.2M depending on intersection control type selected
Other Priority Intersection Capacity Improvements	$1.7M to $4.3M depending on intersection control type selected
Grade-Separated Intersection Improvements	$41.3M
Key Multi-Use Pathways	$71.3M
Key Bicycle Corridors	$15.9M
New Sidewalk Facilities along ADA Routes	$5.4M
Sidewalk and ADA Ramp Upgrades	$11.0M
Total Cost	$342.5M to $371.1M depending on intersection control type selected

Funding Gap

Comparing Tables 10 and 11 demonstrate that City funding alone is insufficient to address the TSP needs. As such, the City will need to partner with other agencies, the private development community and pursue alternative funding sources to address the 20-year list of prioritized projects.

Potential Funding Sources

While highway user taxes and fees, including Oregon State fuel taxes, licensing, and registration fees, as well as local fuel taxes, are available to fund transportation-related projects in the City, per local policy these sources have increasingly been devoted to operations, maintenance, and preservation. This practice diverts funds away from capacity development or expansion projects. The City will need to develop a strategy to fund the improvements identified in the TSP. Possible elements of this strategy are outlined below.

Local Funding Mechanisms

Table 12 outlines potential funding sources at the local level that either can currently be used to fund future projects or that the City Council may want to consider adopting as a new funding source. The City has used some of these funding mechanisms in the past; others would be new. Inclusion of this table in the TSP does not create a new funding source but rather is intended to the various funding sources that local governments throughout Oregon utilized. In general, local funding sources are more flexible than funding obtained from state or federal grant sources.

Table 12: Potential Local Funding Mechanisms

Funding Source	Description	Potential Application
Street Utility Fees (also called road maintenance fees)	A fee based on the number of automobile trips a particular land use generates; usually collected through a regular utility bill. Fees can also be tied to the annual registration of a vehicle to pay for improvements, expansion, and maintenance of the street system.	System-wide transportation facilities including streets, sidewalks, bike lanes, and shared use paths.
Transportation Systems Development Charge (SDC)	SDCs are impact fees assessed to development for the capacity demand it creates on public infrastructure systems. SDCs may be an improvement fee, a reimbursement fee, or a combination thereof. Reimbursement fee revenues are dedicated to capital projects that increase capacity to meet the needs of growth. SDC credits are provided to developers for public improvements they construct which add capacity to the system beyond that required to serve their development. SDC credits may also be given for development provisions that reduce vehicular capacity demand on the transportation system, such as providing end-of-trip bike facilities within the new development.	The City currently has an SDC program. They may update the SDC to reflect the adoption of projects included in the updated TSP after adoption.
Stormwater SDCs, grants, and loans	SDCs, grants, loans, and stormwater improvement fees can be obtained for improving stormwater management facilities constructed as part of transportation system improvements.	SDCs may only be used for that portion of transportation improvements which generate additional stormwater management capacity related to growth.
Local gas tax	A local tax can be assessed on the purchase of gas within the City. This tax is added to the cost of gasoline at the pump, along with the state and federal gas taxes.	System-wide transportation facilities including streets, sidewalks, and bike lanes.
Parking in-lieu fees	Parking in-lieu fees are developer fees paid if they cannot or do not want to provide on-site parking for the development. The idea behind these fees is to decrease the amount of off-street, private parking and consolidating parking supplies on-street or in parking garages as a way to decrease parking demand on the development	System-wide transportation facilities including streets, sidewalks, bike lanes, shared use paths, and transit.

	site. In-lieu fees may benefit developers by reducing costs and allowing more intensive development on a site.	
Incentives	The City provides enticements such as bonus densities and flexibility in design in exchange for a public benefit. Examples might include a commute trip reduction (CTR) program or transit facilities in exchange for bonus densities. Incentives may be used with SDC methods to reduce transportation impacts from new development.	System-wide transportation facilities including streets, sidewalks, bike lanes, shared use paths, and transit.
Public/private partnerships	Public/private partnerships have been used around the country to provide public transportation amenities within the public right-of-way in exchange for operational revenue from the facilities. These partnerships could be used to provide services such as vehicle charging stations, public parking lots, bicycle lockers, or car share facilities.	System-wide transportation facilities including streets, sidewalks, bike lanes, shared use paths, and transit.
Tax Increment Financing (TIF)	TIF is a tool that cities may use to create special districts (tax increment areas) where public improvements are made to generate private-sector development. During a defined period, the City freezes the tax base at the pre-development level. Property taxes for that period can be waived or paid, but taxes derived from increases in assessed values (the tax increment) resulting from new development can go into a special fund created to retire bonds issued to originate the development or leverage future improvements. A number of small-to-medium sized communities in Oregon have implemented, or are considering implementing, urban renewal districts that will result in a TIF revenue stream.	System-wide transportation facilities including streets, sidewalks, bike lanes, shared use paths, and transit.
Streets District	Oregon state law (Oregon Revised Statute [ORS] 371) allows for the formation of special streets taxing districts for purposes of constructing and maintaining streets within the taxing district boundaries. A Streets District would be a separate entity from the City of Redmond, with its own property tax levy rate and an elected board of commissioners. Those within the potential district boundaries must vote on the creation of a Streets District.	Roadway improvement projects.
Revenue and general obligation bonds	Bonding allows municipal and county government to finance construction projects by borrowing money and paying it back over time, with interest. Financing requires smaller regular payments over time compared to paying the full cost at once, but financing increases the total cost of the project by adding interest. General obligation bonds are often used to pay for construction of large capital improvements and must be approved by a public vote. These bonds add the cost of the improvement to property taxes over time.	Construction of major capital improvement projects within the city, street maintenance and incidental improvements.
Reimbursement Districts	Also called Zones of Benefit or Advance Financed Districts, a city determines the boundary of the district. Property owners of new development or large redevelopment permits pay a fee for the installation of public improvements. They then recover some portion of the cost over a period of years (often 15).	Construction of major capital improvement projects within the city (possibly in Study Areas).

State and Federal Grants

In addition to local funding sources, the City can seek to leverage opportunities for funding from grants at the state and federal levels for specific projects. Table 13 outlines state and federal sources and their potential applications.

Potential state funding sources are extremely limited, with some having significant competition. Any future improvements that rely on state funding may require City and regional consensus that these improvements are more important than transportation needs elsewhere in the region and the state. It will likely be necessary to combine multiple funding sources to pay for a single improvement project (*e.g.*, combining state, regional, or City bicycle and pedestrian funds to pay for new bike lanes and sidewalks).

Table 13: Potential State and Federal Grants

Funding Source	Description	Potential Application
Statewide Transportation Improvement Program (STIP)	STIP is the State of Oregon's four-year transportation capital improvement program. ODOT's system for distributing these funds has varied over recent years. Generally, local agencies apply in advance for projects to be funded in each four-year cycle.	Projects on any facility that meet the benefit categories of the STIP.
Statewide Transportation Improvement Program-Urban (STIP-U)	STIP-U is the State of Oregon's four-year transportation capital improvement program for urban areas. ODOT's system for distributing these funds has varied over recent years. Generally, local agencies apply in advance for projects to be funded in each four-year cycle.	Projects on any facility that meet the benefit categories of the STIP-U.
Transportation and Growth Management (TGM) Grants	TGM Grants are planning grants administered by ODOT and awarded on an annual basis. The TGM grants are generally awarded to projects that will lead to more livable, economically vital, transportation efficient, sustainable, and pedestrian-friendly communities. The grants are awarded in two categories: transportation system planning and integrated land use/transportation planning.	Refinement of any identified study projects.
Transportation Alternatives Program (TAP)	TAP is a federal program that provides funding for pedestrian and bicycle facilities, projects for improving public transit access, safe routes to schools, and recreational trails. Local governments, regional transportation authorities, transit agencies, school districts or schools, natural resource or public land agencies, and tribal governments are all eligible to receive TAP funds.	Bicycle and pedestrian facilities, shared use paths.
All Roads Transportation Safety Program (ARTS)	The federal Highway Safety Improvement Program is administered as ARTS in Oregon. ARTS provides funding to infrastructure and non-infrastructure projects that improve safety on all public roads. ARTS requires a data-driven approach and prioritizes projects in demonstrated problem areas.	Areas of safety concerns within the city, consistent with Oregon's Transportation Safety Action Plan.
Immediate Opportunity Fund (IOF)	This fund is discretionary and provides funding for transportation projects essential for supporting site-specific economic development projects. These funds are distributed on a case-by-case basis in cooperation with the Oregon Economic and Community Development Department. These funds can only be used when other sources of financial support are insufficient or unavailable. These funds are reserved for projects where a documented transportation problem exists or where private firm location decisions hinge on the immediate commitment of road construction. A minimum 50 percent match is required from project applications.	Any identified projects that would improve economic development in the city and where there are documented transportation problems.
Connect Oregon	Lottery-backed bonds distributed to air, marine, rail, transit, and pedestrian and bicycle projects statewide. No less than 10 percent of Connect Oregon IV funds must be distributed to each of the five regions of the state, if there are qualified projects in the region. The objective is to improve the connections between the highway system and other modes of transportation.	System-wide transportation facilities including, shared use paths, and transit.
Oregon Parks and Recreation Local Government Grants	Oregon Parks and Recreation Department administers this program using Oregon Lottery revenues. These grants can fund acquisition, development, and major rehabilitation of public outdoor parks and recreation facilities. A match of at least 20 percent is required.	Trails and other recreational facility development or rehabilitation.
Oregon Transportation Infrastructure Bank (OTIB)	A statewide revolving loan fund is available to local governments for many transportation infrastructure improvements, including highway, transit, and non-motorized projects. Most funds made available through this program are federal; streets must be functionally classified as a major collector or higher to be eligible for loan funding.	Infrastructure improvements to major collectors or higher classified roads for vehicle, transit, and non-motorized travel.
State highway gas tax increase or user fee	ODOT is currently researching a state user fee for drivers to address steady or declining state gas tax revenues. An increase in the state gas tax or a user fee would need to pass through state legislation and would increase the state's transportation funds.	System-wide transportation facilities including streets, sidewalks, bike lanes, and transit.

Appendix A Cost Estimate Sheets

Planned Roadway Projects

Project S1 - Pershall Way (New Pershall Arterial - US 97)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**	2950	$ 3,097,500.00
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 3,097,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assumes widening to north at 10th Street to avoid assumed utility structure.

Project S2 - NW Pershall Way (NW Upas Way - NW Pershall Way)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*	5440	$ 8,568,000.00
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 8,568,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Requires cut/fill or realignment due to plateau.

Project S3 - NW 10th St (NW Upas Way - NW Pershall Way)	LINEAR FT	Total Cost
New 2 lane Collector*	2040	$ 2,142,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 2,142,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: No reconstruction of irrigation canal crossing approximately 615 feet south of NW Parshall Way/NW 10th St Intersection

Project S4 - NW Canal Blvd (NE King Way - NE Oneil Way)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*	3540	$ 5,575,500.00
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 5,575,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: No canal/ditch reconstruction.

Project S5 - NW Upas Ave (NW 10th St - East of NW Canal Blvd)	LINEAR FT	Total Cost
New 2 lane Collector*	3180	$ 3,339,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing	1	$ 3,570,000.00
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	SF	
New Bridge	7020	$ 3,685,500.00
	TOTAL	$ 10,594,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assume length of bridge is 135 feet, with 48 feet collector cross section plus 4' for bridge railings.

Project S6 - NE 3rd (King Way - UGB)	LINEAR FT	Total Cost
New 2 lane Collector*	1340	$ 1,407,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,407,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S7 - Northwest Way (Maple Ave - NW Upas Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**	5320	$ **5,586,000.00**
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **5,586,000.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assumes no reconstruction of irrigation canal crossing approximately 750 feet north of Northwest Way/NW Maple Ave Intersection.

Project S8 - NW Spruce Ave (NW 31st - NW 22nd St)	LINEAR FT	Total Cost
New 2 lane Collector*	2780	$ 2,919,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 2,919,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assume full reconstruction of unpaved NW Spruce Ave.

Project S9 - NW Quince Ave (NW 10th St - NW 6th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill	1330	$ **349,125.00**
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **349,125.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S10 - NW Maple Ave (SW Hemholtz Way - NW 35th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*	2620	$ 4,126,500.00
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 4,126,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Steep grades likely require road meandering or significant cut/fill.

Project S11 - SW 35th St (NW Hemlock - NW Oak Ave)	LINEAR FT	Total Cost
New 2 lane Collector*	4160	$ 4,368,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 4,368,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assumes no impacts to irragation canal along the west side of SW 35th St.

Project S12 - NW Maple Ave (NW 35th St - NW 19th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*	5270	$ 8,300,250.00
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 8,300,250.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S13 - NW 27th St (NW Greenwood Ave - NW Maple Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*	3180	$ 5,008,500.00
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 5,008,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Not a significant canal crossing; culvert is sufficient.

Project S14 - SW Helmholtz Way (SW Canal Blvd - NW Maple Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**	26500	$ **27,825,000.00**
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **27,825,000.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S15 - NW Hemlock Ave (NW Helmholtz Way - NW 35th St)	LINEAR FT	Total Cost
New 2 lane Collector*	2680	$ 2,814,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 2,814,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S16 - SE 5th St (E Antler Ave - NE Hemlock Ave)	LINEAR FT	Total Cost
New 2 lane Collector*	2650	$ 2,782,500.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 2,782,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Right-of-way impacts not included.

Project S17 - NW 17th St (OR 126 - UGB)	LINEAR FT	Total Cost
New 2 lane Collector*	8830	$ 9,271,500.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 9,271,500.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S18 - W Antler Aver (SW Helmholtz Way - SW 35th St)	LINEAR FT	Total Cost
New 2 lane Collector*	2720	$ 2,856,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 2,856,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assumes full construction of existing pavement.

Project S19 - E Antler Ave (11thSt - NE 17th St)	LINEAR FT	Total Cost
New 2 lane Collector*	1970	$ 2,068,500.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 2,068,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assumes full construction of existing pavement.

Project S20 - SW Evergreeen Ave (SW 6th St - US 97)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*	1150	$ 1,811,250.00
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,811,250.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Right-of-way impacts not included.

Project S21 - OR 126 (US 97 - SE 9th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*	3320	$ **5,229,000.00**
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **5,229,000.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S22 - OR 126 (SW Helmholtz Way - SW 27th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*	5320	$ 8,379,000.00
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 8,379,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Improvements calls for "Upgrade roadway as necessary" (State highway improvements).

Project S23 - SE 9th St (Veterans Way - OR 126)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*	4120	$ 6,489,000.00
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 6,489,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S24 - Veterans Way (1st St - Vererans Way)	LINEAR FT	Total Cost
New 2 lane Collector*	1880	$ 1,974,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,974,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S25 - SW Obsidian Ave (UGB - SW 35th St)	LINEAR FT	Total Cost
New 2 lane Collector*	3940	$ 4,137,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 4,137,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assumes full reconstruction of existing pavement.

Project S26 - SW Veterans Way (Railroad - SE 1st St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**	1870	$ 1,963,500.00
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,963,500.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S27 - SE Veterans Way (east of SE Airport Way - OR 126)	LINEAR FT	Total Cost
New 2 lane Collector*	2950	$ 3,097,500.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 3,097,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assume full reconstruction of existing pavement.

Project S28 - SW 15th St (SW Quartz - SW Obsidian Ave)	LINEAR FT	Total Cost
New 2 lane Collector*	1330	$ 1,396,500.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,396,500.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S29 - SE Pumice Ave (SW 15th St - SW Canal Blvd)	LINEAR FT	Total Cost
New 2 lane Collector*	680	$ 714,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 714,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S30 - Quartz Ave (SW Helmholtz Way - SW 37th St)	LINEAR FT	Total Cost
New 2 lane Collector*	1730	$ 1,816,500.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,816,500.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S31 - Quartz Ave (SW Canal Blvd - SE 1st St)	LINEAR FT	Total Cost
New 2 lane Collector*	3770	$ 3,958,500.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing	1	$ 2,975,000.00
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 6,933,500.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S32 - 6th St (Airport Way - Veterans Way)	LINEAR FT	Total Cost
New 2 lane Collector*	3000	$ 3,150,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	2260	$ 395,500.00
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 3,545,500.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S33 - SE 1st St (SW 6th St - SE Veterans Way)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill	4690	$ 1,231,125.00
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,231,125.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S34 - SW Airport Way (SE Airport Way - SW Veterans Way)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*	1550	$ 2,170,000.00
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 2,170,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S35 - SW 45th St (SW Salmon Ave - SW Helmholtz Way)	LINEAR FT	Total Cost
New 2 lane Collector*	580	$ 609,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 609,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S36 - SW Salmon Ave (SW Forked Horn Butte - SW 43rd St)	LINEAR FT	Total Cost
New 2 lane Collector*	260	$ 273,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 273,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assume full reconstruction of existing pavement (in conjuction of Project S35).

Project S37 - SW Salmon Ave (SW 39th St - SW 35th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	1520	$ **266,000.00**
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **266,000.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S38 - SW Odem Medo (SW Canal Blvd - Sw 19th St)	LINEAR FT	Total Cost
New 2 lane Collector*	640	$ 672,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 672,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Right-of-way imacts not included.

Project S39 - SE Salmon Dr (SW 13th St - S 1st St)	LINEAR FT	Total Cost
New 2 lane Collector*	3670	$ 3,853,500.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 3,853,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note:

Project S40 - SW 43rd St (SW Yew Ave - SW Reservoir Dr)	LINEAR FT	Total Cost
New 2 lane Collector*	1760	$ 1,848,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,848,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assume full recontruction of existing pavement.

Project S41 - SW 43rd St (SW Badger Ave - SW Yew Ave)	LINEAR FT	Total Cost
New 2 lane Collector*	1850	$ 1,942,500.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,942,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assume full recontruction of existing pavement.

Project S42 - SW Badger Road (SW Helmholtz Way - SW 43rd St)	LINEAR FT	Total Cost
New 2 lane Collector*	2670	$ 2,803,500.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 2,803,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assume full recontruction of existing pavement.

Project S43- SW Canal Blvd (SW Helmholtz Way - SW Badger Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**	7070	$ 7,423,500.00
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 7,423,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assume full recontruction of existing pavement.
Assume no reconstruction of existing canal culverts.

Project S44 - SW 21st St (SW Elkhorn Ave - South of SW Airport Ave)	LINEAR FT	Total Cost
New 2 lane Collector*	3190	$ 3,349,500.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 3,349,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assume full recontruction of existing pavement.
Right-of-way impacts not included.

Project S46 - SW Elkhorn Ave (SW Helmholtz Way - SW 39th St)	LINEAR FT	Total Cost
New 2 lane Collector*	1800	$ 1,890,000.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing	1	$ 2,975,000.00
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 4,865,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project S47 - SW Elkhorn Ave (SW 39th St - SW 19th St)	LINEAR FT	Total Cost
New 2 lane Collector*	6630	$ 6,961,500.00
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing	1	$ 2,975,000.00
RR Overpass	1	$ 11,375,000.00
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	SF	
New Bridge	7020	$ 3,685,500.00
	TOTAL	$ 24,997,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Assume length of bridge is 135 feet, with a 48 feet collector cross section plus 4 feet for bridge railings.

Project S48 - SW 19th St (UGB - SW Elkhorn Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*	2650	$ 3,246,250.00
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 3,246,250.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Planned Intersection Projects

Project I2 - NW 10th St at NW Pershall Way	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps	900	$ 315,000.00
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 315,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project I19 - SE Lake Rd at OR 126	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill	190	$ **49,875.00**
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **49,875.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project I24 - SW Rimrock Way at OR 126	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps	2000	$ **700,000.00**
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **700,000.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project I44 - Railroad Crossing with SW Airport Way	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*	2000	$ 2,450,000.00
New 2 lane Arterial*		$ -
New 3 lane Arterial*	1500	$ 2,362,500.00
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass	1	$ 11,375,000.00
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 16,187,500.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Existing and Planned Bicycle Facilities

Project B1 - SW/NW Helmholz Way (SW Canal Blvd - NW Canal Blvd)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	42330	$ **29,631,000.00**
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **29,631,000.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Does not include bridges

Project B2 - NW Pershall Way (Dry Canyon Trail - Project B1)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	1300	$ **910,000.00**
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **910,000.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B3 - NW 10th St (NW Maple Ave - NW Pershall Way)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)	5340	$ 233,625.00
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 233,625.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Length partially overlaps Project S3, therefore has been deducted.

Project B5 - NW Spruce Ave (NW Helmholtz Way - NW 19th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	6360	$ 4,452,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 4,452,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Bike path meanders down from plateau for grade.

Project B6 - NW Canyon Dr/NW Spruce Ave (NW 10th St - US 97)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	7620	$ 400,050.00
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 400,050.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B7 - NW King Way (NW Canal Blvd - NW 5th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps	1760	$ **462,000.00**
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **462,000.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B8 - NW Quince Ave (UGB - NW 19th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	3850	$ 202,125.00
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 202,125.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B9 - NW Quince Ave (NW Canyon Dr - NW 6th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps	1760	$ **462,000.00**
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **462,000.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Length partially overlaps Project S9, therefore has been deducted.

Project B10 - NW 5th St (NE Negus Way - NW King Way)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps	3850	$ 1,010,625.00
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,010,625.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B11 - NW Maple Ave (NW Helmholtz Way - West of NW 22nd St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	6450	$ 4,515,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 4,515,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B12 - NW 35th St (NW Dogwood Ave - NW Upas Way)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	9250	$ 6,475,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 6,475,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B13 - NW 27th St (NW Greenwood Ave - NW Upas Way)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	9080	$ 6,356,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 6,356,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B15 - NW 10th St - (Dry Canyon Trail - NW 9th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	1210	$ 63,525.00
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 63,525.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B16 - NE 5th St (NE Hemlock Ave - NW Maple Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	2560	$ 134,400.00
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 134,400.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B17 - SW/NW 39th St (SW Quartz Ave - NW Maple Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	12690	$ 8,883,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 8,883,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B18 - NW Hemlock Ave (NW Helmholtz Way - NW 19th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	7570	$ **5,299,000.00**
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **5,299,000.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B19 - NW 29th St (NW Hemlock Way - UGB)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	4790	$ 3,353,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 3,353,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B20 - NW 19th St (NW Maple Ave - Northwest Way)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)	2440	$ **106,750.00**
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps	1510	$ **396,375.00**
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **503,125.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B21 - NW Jackpine Ave (NW 19th St - NW Rimrock Ct)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	1660	$ 87,150.00
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 87,150.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B22 - NW 17th St/NW Rimrock Ct (W Antler Ave - NW Maple Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	6310	$ 331,275.00
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 331,275.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B23 - NW Canyon Dr (SW deschutes Ave - NW Maple Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	6480	$ 340,200.00
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 340,200.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B24 - NW Dogwood Ave (NW Canyon Dr - NW Canal Blvd)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	2780	$ **145,950.00**
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **145,950.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B25 - SW 8th St (SW Evergreen Ave - NW Kingwood Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	5410	$ 284,025.00
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 284,025.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B26 - NW Kingwood Ave (NW Canyon Dr - NW Canal Blvd)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	2160	$ 113,400.00
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 113,400.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B27 - NW Hemlock Ave (NW Canal Blvd - NE 9th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps	2560	$ 672,000.00
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 672,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B28 - Lateral E Pilot Butte Canal (OR 126 - NE Kingwood Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	6530	$ 4,571,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 4,571,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B29 - NE Hemlock Ave (West of NE 15th St - NE 17th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)	1250	$ 54,687.50
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 54,687.50

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B32 - W Antler Ave (NW 32nd Ct - SW 31st St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps	310	$ 81,375.00
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 81,375.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B33 - W Antler Ave (west of NW 29th St - SW 27th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps	970	$ **254,625.00**
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **254,625.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B34 - SW 7th St (SW Glacier Ave - NW Dogwood Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)	3140	$ 137,375.00
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 137,375.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B35 - W Antler Ave (SW 7th St - NE 17th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)	280	$ 12,250.00
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps	4100	$ 1,076,250.00
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,088,500.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B36 - SE Jackson St (OR 126 - E Antler Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	1370	$ **71,925.00**
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **71,925.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B37 - SE 9th St (OR 126 - NE Hemlock Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps	5270	$ 1,383,375.00
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,383,375.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B38 - E Antler Ave (SE 9th St - NE 17th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps	670	$ 175,875.00
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 175,875.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Length partially overlaps Project S19, therefore has been deducted.

Project B39 - SW 23rd St (SW Highland Ave - W Antler Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)	2620	$ 114,625.00
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 114,625.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B40 - SW 15th St (SW Highland Ave - SW Deschutes Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	1510	$ **79,275.00**
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **79,275.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B41 - SW Deschutes Ave (Dry Canyon Trail - SW 4th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	3060	$ **160,650.00**
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **160,650.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B43 - SW Indian Ave (SW Veterans Way - SW Highland Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)	660	$ 28,875.00
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 28,875.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B44 - SW Lake Rd (SW Veterans Way - OR 126)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	4690	$ **246,225.00**
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **246,225.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B45 - SW Juniper Ave (Dry Canyon Trail - SW 15th Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	1490	$ **78,225.00**
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **78,225.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B46 - OR 126 (SE Jackson St - UGB)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	9610	$ 6,727,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 6,727,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B47 - SW 35th St (SW Quartz Ave - W Antler Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	6450	$ 4,515,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 4,515,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B48 - SW 31st St (SW Canal Blvd - SW Highland Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	640	$ **448,000.00**
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	10040	$ **527,100.00**
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **975,100.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B49 -SW Obsidian Ave (SW Helmholtz Way - SW Canal Blvd)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)	7340	$ 321,125.00
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 321,125.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Length partially overlaps Project S25, therefore has been deducted.

Project B50 - SW Canyon Dr (SW Quartz Ave - SW Highland Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	4110	$ **215,775.00**
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **215,775.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B51 - SW 15th St (SW Obsidian Ave - SW Highland Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps	2660	$ **698,250.00**
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **698,250.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B52 - SW Quartz Ave (SW Helmholtz Way - SW 35th Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	2840	$ 1,988,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,988,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B53 - SW Quartz Ave (SW 35th St - SW Canal Blvd)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)	6690	$ 292,687.50
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 292,687.50

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B54 - SW Canal Blvd (SW Salmon Ave - SW Obsidian Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps	3190	$ 837,375.00
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 837,375.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B55 - SW Quartz Ave (SW Canal Blvd - SE Airport Way)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	5260	$ 3,682,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing	1	$ 3,570,000.00
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 7,252,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Length partially overlaps Project S31, therefore has been deducted.
Canal crossing at Canal Blvd., cost covers canal crossing and at-grade US97 crossing.

Project B56 - SE Airport Way/SE 9th St (Railroad - OR 126)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	15660	$ 10,962,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 10,962,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B57 - SW Salmon Ave/SW Valleyview Dr/SW 32nd Ct	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	4510	$ 236,775.00
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 236,775.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Length partially overlaps Project S36 and S37, therefore has been deducted.

Project B58 - SW 35th St/SW Salmon Ave (SW Quartz Ave - Sw 27th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	3730	$ 195,825.00
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 195,825.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B59 - SW 25th St/SW Reindeer Ave (SW Canal Blvd - Dry Canyon Trail/S	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	5590	$ 293,475.00
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 293,475.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B60 - SW 23rd St (SW Canal Blvd - SW Salmon Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps	2330	$ 611,625.00
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 611,625.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B61 - SW 19th ST (SW Canal Blvd - SW Reindeer Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	1370	$ **959,000.00**
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **959,000.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B62 - SW Canal Blvd (SW 27th St - NW King Way)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	12460	$ 8,722,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 8,722,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B63 - SW Reservoir Dr (SW Helmholtz Way - SW Canal Blvd)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps	4380	$ 1,149,750.00
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,149,750.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B64 - SW Volcano Ave (SW 27th St - SW Canal Blvd)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)	1000	$ **43,750.00**
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps	660	$ **173,250.00**
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **217,000.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B66 - SW Cascade Vista Dr/SW Antelope Ave	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	1300	$ **910,000.00**
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	6700	$ **351,750.00**
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **1,261,750.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B67 - SW Helmholtz Way (SW Canal Blvd - SW Reservoir Dr)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	13440	$ 9,408,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 9,408,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B69 - Pilot Butte Canal (SW Elkhorn Ave - SW Canal Blvd)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	2680	$ 1,876,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,876,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B71 - SW Canal Blvd (SW Helmholtz Way - SW Elkhorn Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps	4820	$ 3,374,000.00
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 3,374,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project B73 - SW 4th St (SW 5th St/SW Forest Ave - SW Dogwood Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
Bike Boulevard	3060	$ **160,650.00**
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **160,650.00**

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Priority Pedestrian Routes and Projects

Project P1 - NW 10th St (NW Redwood Ave - NW Teak Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	460	$ 80,500.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 80,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on west side of the road.
East side upgrades overlap with B3, therefore not included in this length.

Project P4 - NW 10th St (NW 9th St - NW Quince Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	2040	$ 357,000.00
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 357,000.00

*Includes curbs, sidewalks and bike lanes both directions

**Includes Sidewalks on both sides

Project P7 - NW Negus Way (NW 5th St - NW 7th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	590	$ 103,250.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 103,250.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on both sides of the road.

Project P8 - SW 9th St (NW Hemlock Ave - NW Maple Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	4870	$ 852,250.00
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 852,250.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on both sides of the road.

Project P9 - NW 6th St (North of NW Larch Ave - NW Maple Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	1010	$ **176,750.00**
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **176,750.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on both sides of the road.

Project P10 - NW 6th St (North of NW Kingwood Ave - North of NW Larch Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	430	$ **75,250.00**
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **75,250.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on west side of road.

Project P11 - NW 6th St (NW Jackpine Ave - NW Larch Ave	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	550	$ **96,250.00**
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **96,250.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on east side of the road

Project P12- NW 6th St (South of NW Kingwood Ave - South of Larch Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	390	$ **68,250.00**
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **68,250.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on west side of road.

Project P13- NW Larch Ave (NW 6th St - NW 4th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	530	$ **92,750.00**
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **92,750.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on both sides of the road.

Project P14- NW Larch Ave (NW 4th St -West of NW Canal Blvd)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	390	$ **68,250.00**
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **68,250.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on south side of the road.

Project P15 - NE 5th St (NW Larch Ave - NE Negus Way)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
r	510	$ 89,250.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 89,250.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on both sides of the road.

Project P16 - NW Kingwood Ave (NW 6th St - NW Canal Blvd	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	2100	$ 367,500.00
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 367,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on both sides of the road.

Project P17 - NW 6th St (NW Jackpine Ave - NW Kingwood Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	140	$ **24,500.00**
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **24,500.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on west side of the road.

Project P18 - NW 6th St (North of NW Jackpine Ave - South of NW Kingwood Av	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	190	$ 33,250.00
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 33,250.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on west side of the road.

Project P19 - NW 6th St (NW Jackpine Ave - NW Kingwood Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	580	$ 101,500.00
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 101,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on east side of the road.

Project P20 - NW Canal Blvd (NW Elm Ave - NW Larch Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	2200	$ 385,000.00
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 385,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on west side of the road.

Project P21 - NW Hemlock Ave (NW Canon Dr - NW 9th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	180	$ 31,500.00
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 31,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill for both sides of the road.

Project P22 - NW 9th St (NW Fir Ave - NW Hemlock Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	1470	$ 257,250.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 257,250.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades for both sides of the road.

Project P23 - NW 9th St (W Antler Ave - NW Greenwood Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	2530	$ 442,750.00
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 442,750.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on both sides of the road.

Project P24 - NW Dogwood Ave (NW Canyon Dr - NW 10th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	500	$ **87,500.00**
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **87,500.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on south side of the road.

Project P25 - NW Dogwood Ave (NW Canyon Dr - NW 10th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	500	$ 87,500.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 87,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on north side of the road.

Project P26 - NW Dogwood Ave (Nw 10th St - NW 6th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	1670	$ 292,250.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 292,250.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on both sides of the road.

Project P27 - NW Elm Ave (NW 27th St - NW 25th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	1100	$ **192,500.00**
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **192,500.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades for both sides of the road.

Project P28 - NW 27th St (NW Cedar Ave - NW Elm Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	1080	$ **189,000.00**
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **189,000.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades for both sides of the road.

Project P30 - W Antler Ave (SW 27th St - SW Rimrock Way)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	4320	$ **756,000.00**
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **756,000.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades for both sides of the road.

Project P32 - W Evergreen Ave (SW Canyon Dr - SW 8th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	2930	$ **512,750.00**
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **512,750.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on both sides of the road.

Project P33 - SW 7th St (SW Indian Ave - SW Black Butte Blvd)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	3930	$ 687,750.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 687,750.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp updgrades on both sides of the road.

Project P36 - SW Highland Ave (SW 32st St - SW Indian Cir)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	600	$ **105,000.00**
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **105,000.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on south side of the road.

Project P37 - SW Highland Ave (SW Indian Cir - SW 27th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	620	$ 108,500.00
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 108,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on south side of the road.

Project P38 - SW 31st St (SW Timber Ct - SW Highland Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	8500	$ 1,487,500.00
Upgrade 2 to 5 lane arterial		$ 5.00
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,487,505.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrade on both sides of the road.

Project P39 - SW 27th St (SW Metolius Ave - SW Highland Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	1470	$ **257,250.00**
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **257,250.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrade on east side of the road.

Project P41 - SW Veterans Way (SW Canal Blvd - SW Indian Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	2050	$ 358,750.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 358,750.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on both sides of the road.

Project P53 - S 1st St (SE Salmon Dr - SW Veterans Way)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	5010	$ 876,750.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 876,750.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on both sides of the road.

Project P54 - SE Salmon Dr (S 1st St - West of Timber Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	1010	$ 176,750.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 176,750.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on both sides of the road.

Project P56 - SW 23rd St (SW Salmon Ave - SW Quartz Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	2360	$ 413,000.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 413,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on both sides of the road.

Project P57 - SW Canal Blvd (North of SW Salmon Ave - South of SW Obsidian	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	2230	$ 390,250.00
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 390,250.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on west side of the road.

Project P58 - SW Salmon Ave (SW 31st St - SW Canal Blvd)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	3990	$ **698,250.00**
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **698,250.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on north side of the road.

Project P59 - SW Salmon Ave (SW 31st St - SW 29th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	410	$ 71,750.00
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 71,750.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on south side of the road.

Project P60 - SW Salmon Ave (SW 29th St - SW Canal Blvd)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	3620	$ **633,500.00**
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **633,500.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on south side of the road.

Project P61 - SW 39th St (SW 35th St - Sw Salmon Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	6470	$ 1,132,250.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 1,132,250.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on both sides of the road

Project P62 - SW Reservoir Dr (SW 39th St - SW 36th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	2550	$ 446,250.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 446,250.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on both sides of the road.

Project P63 - SW 36th St (SW 35th St - SW Reservoir Dr)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	1900	$ 332,500.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 332,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on both sides of the road.

Project P64 - SW 35th St (SW Cascade Vista Dr - SW 36th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	1290	$ **225,750.00**
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **225,750.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on both sides of the road.

Project P65 - SW Xero Ln (SW 35th St - West of SW 34th St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	1250	$ 218,750.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 218,750.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on both sides of the road.

Project P66 - SW Xero Ln (West of SW 34th St - SW 31st St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	1810	$ 316,750.00
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 316,750.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on both sides of the road.

Project P67 - SW 31st St (SW 33rd St - SW Savannah Ct)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	180	$ 31,500.00
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 31,500.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on west side of the road.

Project P68 - SW 31st St (SW 33rd St - SW Savannah Ct)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps		$ -
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps	320	$ 56,000.00
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 56,000.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp upgrades on east side of the road.

Project P69 - SW 31st St (SW Tmber Ct - SW 33rd St)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	390	$ **68,250.00**
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **68,250.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on east side of the road.

Project P70 - SW 32st St (SW Xero Ln - SW Volcano Way)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	2680	$ **469,000.00**
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **469,000.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on both sides of the road.

Project P71 - SW Canal Blvd (SW 27th St - SW Timber Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	3950	$ **691,250.00**
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ **691,250.00**

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on east side of the road.

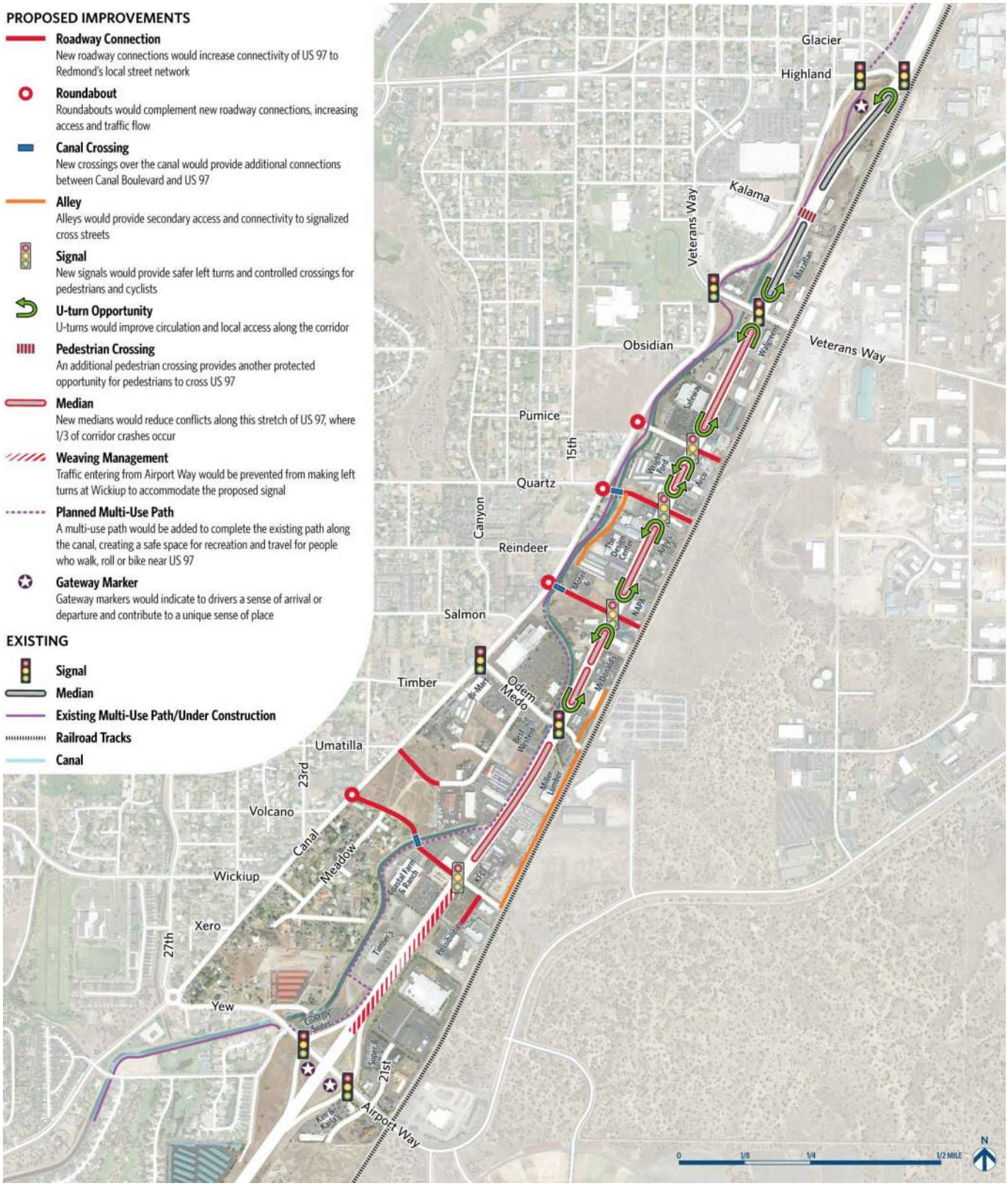
Project P74 - SW 27th St (SW Redwood Ave - NW Teak Ave)	LINEAR FT	Total Cost
New 2 lane Collector*		$ -
New 3 lane Collector*		$ -
New 2 lane Arterial*		$ -
New 3 lane Arterial*		$ -
New 5 lane Arterial*		$ -
Bike Lane Infill (Parking Removal)		$ -
Bike Lane Infill (Parking Removal), Sidewalk Infill & ADA Ramps		$ -
Bike Lanes, Sidewalk Infill & ADA Ramps		$ -
Capacity Three Lane Arterial**		$ -
Common turn lane, Sidewalk Infill & Ramps		$ -
Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Curb, Sidewalk Infill and ADA Ramps	570	$ 99,750.00
Multi-use Trail, Curb, Sidewalk Infill and ADA Ramps		$ -
New Channelization, Sidewalk infill		$ -
New Frontage		$ -
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps		$ -
Sidewalk Infill and ADA Ramps		$ -
Upgrade 2 to 5 lane arterial		$ -
	EACH	
Canal Crossing		$ -
RR Overpass		$ -
New Roundabout		$ -
Roundabout Reconstruct		$ -
Signal Upgrade		$ -
	TOTAL	$ 99,750.00

*Includes curbs, sidewalks and bike lanes both directions
**Includes Sidewalks on both sides

Note: Sidewalk/ramp infill on west side of the road.

Appendix I South Corridor Recommendations

Figure 46. Recommended Concept



Appendix K Quarry Avenue Analysis

Technical Memorandum: Quarry Interchange Connection Analysis

Date:	July 20, 2020	Project #: 17720 ODOT PA #27456
To:	Redmond TSP Project Management Team (PMT)	
From:	Julia Kuhn, PE, Matt Kittelson, PE, and Miranda Barrus	
Subject:	Quarry Interchange Connection Analysis (Task 4.6 and 4.7)	

To serve the urbanization of lands in the south part of the existing Urban Growth Boundary (UGB) and to alleviate travel demands at the Yew Avenue/US 97 interchange, the City, County and ODOT have explored the need to replace the existing at-grade SW Quarry Avenue/US 97 intersection with a new interchange. Homes and businesses within the existing UGB could have access to this interchange via SW Canal Boulevard and the extension of SW 19th Street.

The new interchange and the north-south connections into the UGB could provide a number of benefits to the transportation such as:

- Serve future development areas, especially the large lot industrial lands located near the Fairgrounds;
- Provide alternative grade-separated access to US 97, especially for travelers between Redmond and Bend and other destinations to the south; and
- Increase access to the Airport and provide alternative travel routes to US 97 in accordance with the City's Transportation System Plan (TSP) Policy 2.2 and the Oregon Resilience Plan.

ANALYSIS OVERVIEW & PLANNING CONTEXT

This memorandum summarizes an evaluation of the need for the new Quarry Avenue interchange by 2040 (i.e., the planning horizon of the Redmond TSP). As part of this evaluation future year conditions with and without[1] the interchange were analyzed at the following intersection:

- Canal Boulevard/Helmholtz Way
- Canal Boulevard/27th Street/Yew Avenue

[1] The without interchange scenario is based on analysis presented in *Technical Memorandum #6: Alternatives Analysis.*

- Yew Avenue/US 97 Southbound Ramps
- Yew Avenue/US 97 Northbound Ramps
- Airport Way/19th Street

Providing an interchange at SW Quarry Avenue and extending SW 19th Street to the south would occur outside of the UGB; because these roadways would serve land uses within the City, Oregon's Transportation Planning Rule (TPR) Section 660-012-0070 requires approval of an "Exception for Transportation Improvements on Rural Lands." Such goals exceptions required a specific process and coordination amongst affected agencies.

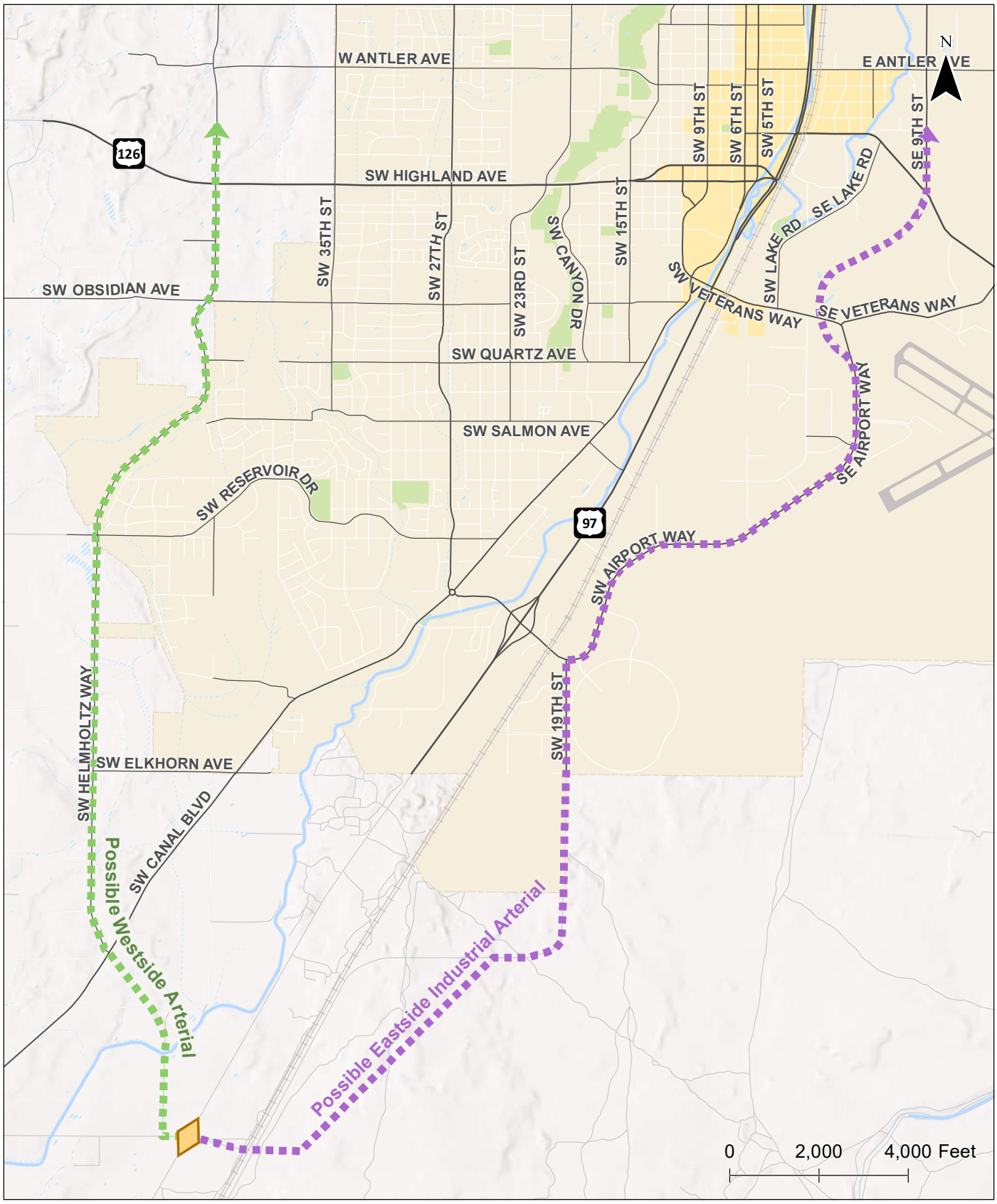
A first step in evaluating the need a goal exception in the case of the US 97/Quarry Avenue interchange would be to determine if the facility is needed to support an identified need within Redmond's UGB within the 20-year planning horizon. Figure 1 illustrates the potential interchange-related changes to the transportation system.

OVERVIEW OF FINDINGS

Findings presented herein show that the US 97/Quarry Avenue interchange:

- Will not measurably reduce traffic volumes anticipated on the arterial and collector streets in the south part of the City or at the US 97/Yew Avenue interchange;
- Can provide an alternative connection to US 97 for the large lot industrial lands near the Fairgrounds; however, the majority of the traffic anticipated from these lands over the next 20 years is anticipated to use the Yew Avenue Interchange; and
- The SW Quarry Avenue Interchange is not needed to meet the identified transportation needs within the TSP and would therefore be considered part of a "illustrative list" of potential projects for the City to consider at a future date.

Based on these findings, it does not appear that the requirements of a "Goal Exception" per the TPR is warranted at this time nor should the SW Quarry Avenue/US 97 Interchange be included in the list of reasonably funded TSP projects.



Quarry Interchange and Possible Arterials
Redmond, Oregon

Figure **1**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl
Data Source: Delete if there isn't one.

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US 97 QUARRY INTERCHANGE OPERATIONAL ANALYSIS

Year 2040 conditions were evaluated based on forecasts from Bend-Redmond Travel Demand Model (BRM) to understand the effectiveness of this roadway network at addressing identified transportation needs within the City of Redmond.

Improvements identified within the Draft TSP at the study intersections are show in Table 1.

Table 1. Identified TSP Improvements at Study Intersections

Intersection	Existing Control	Identified TSP Improvement
Canal Boulevard/Helmholtz Way	Side-street stop controlled	Consider traffic control or roundabout (roundabout preferred)
Canal Boulevard/27th Street/Yew Avenue	Single lane roundabout	Safety improvements
Yew Avenue/US 97 Southbound Ramps	Traffic signal	No improvement identified (forecasted to meet operational standards in 2040)
Yew Avenue/US 97 Northbound Ramps	Traffic signal	No improvement identified
Airport Way/19th Street	Side-street stop controlled	Consider traffic control or roundabout (roundabout preferred)

QUARRY INTERCHANGE EFFECT ON TRAVEL DEMAND

Figure 2 shows the net changes in 2040 network demand with and without the US 97/Quarry Avenue interchange and supporting roadway network. This analysis is based on the difference between 2040 forecasts with and without the interchange.

As shown, the modeling analysis indicates that the interchange and street connection would have little to no change in overall network travel demand, including at roadway segments within the Redmond UGB. Overall segment demand change would be less than 1 percent in most places, which is well within typical variation levels in a travel demand model as well as within the daily fluctuations in average travel.

Travel demand at the US 97/Quarry Avenue interchange is forecast to be low in 2040 with less than 400 PM peak hour trips expected to utilize the facility if it were constructed. Travel demand would be higher west of the highway where existing homes and businesses primarily outside of the UGB would utilize the interchange to access US 97. Travel demand east of the interchange, which would provide access to large lot industrial lands[2], would be less based on expected development that could occur over the next 20-

[2] Travel demand to the area east of the US 97/Quarry Avenue intersection will be highly dependent on development of the large lot industrial lands. Current 2040 travel demand forecasts are based on coordinated population and

years. Most trips to or from these lands are expected to access US 97 via the Yew Avenue interchange based on the proximity of potential development to that existing facility.

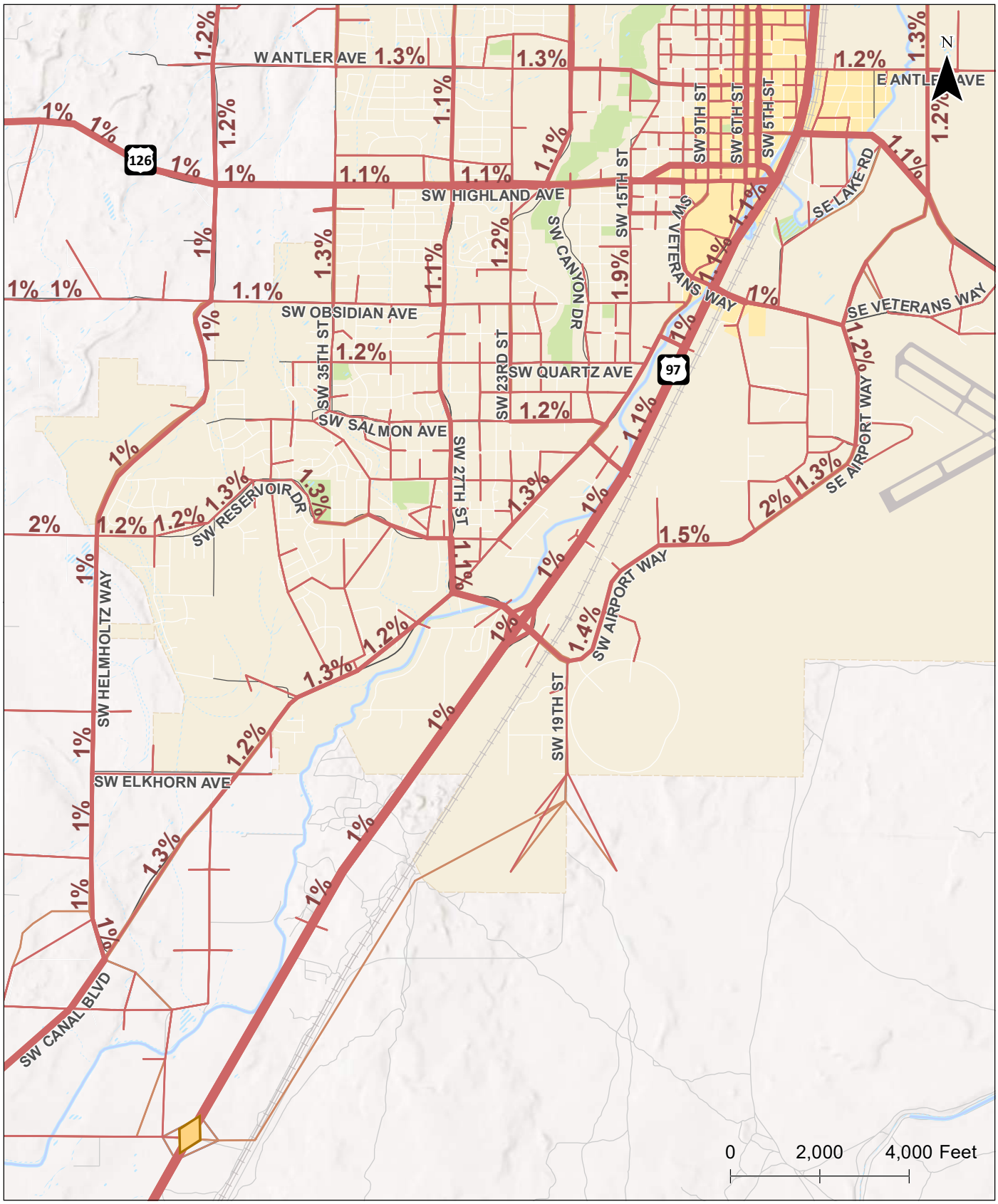
2040 Traffic Volume Development

For the purposes of the intersection analyses, forecast traffic volumes were developed by applying the post-processing methodology identified in the National Cooperative Highway Research Program (NCHRP) Report 255. The methodology combines existing traffic volumes with base and future year traffic volume projections and derives forecast traffic volumes along the study area roadways and at the study intersections.

Figure 3 summarizes the year 2040 traffic volumes developed at the study intersections with and without the Quarry Avenue Interchange.

As shown, turning movement forecasts are similar within each scenario. Minor differences in forecasts are due to subtle model fluctuations and post-processing, not significant changes in travel demand as discussed in the previous section. Notably, travel demand increases on Airport Way east of the 19th Street intersection under the "with interchange" scenario. However, this change in travel demand is the result of model revisions that have occurred since the 2040 TSP Build Scenario (which is the basis of the "without interchange" scenario) that are reflected in the updated travel demand model analysis (with is the basis of the "with interchange" scenario), not the addition of the interchange at Quarry Avenue.

employment forecasts for Redmond. Development beyond these forecasts could change expected travel demands throughout the study area.



Change in 2040 Peak Hour Travel Demand with Quarry Avenue Interchange Redmond, Oregon

Figure **1**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl
Data Source: Delete if there isn't one.

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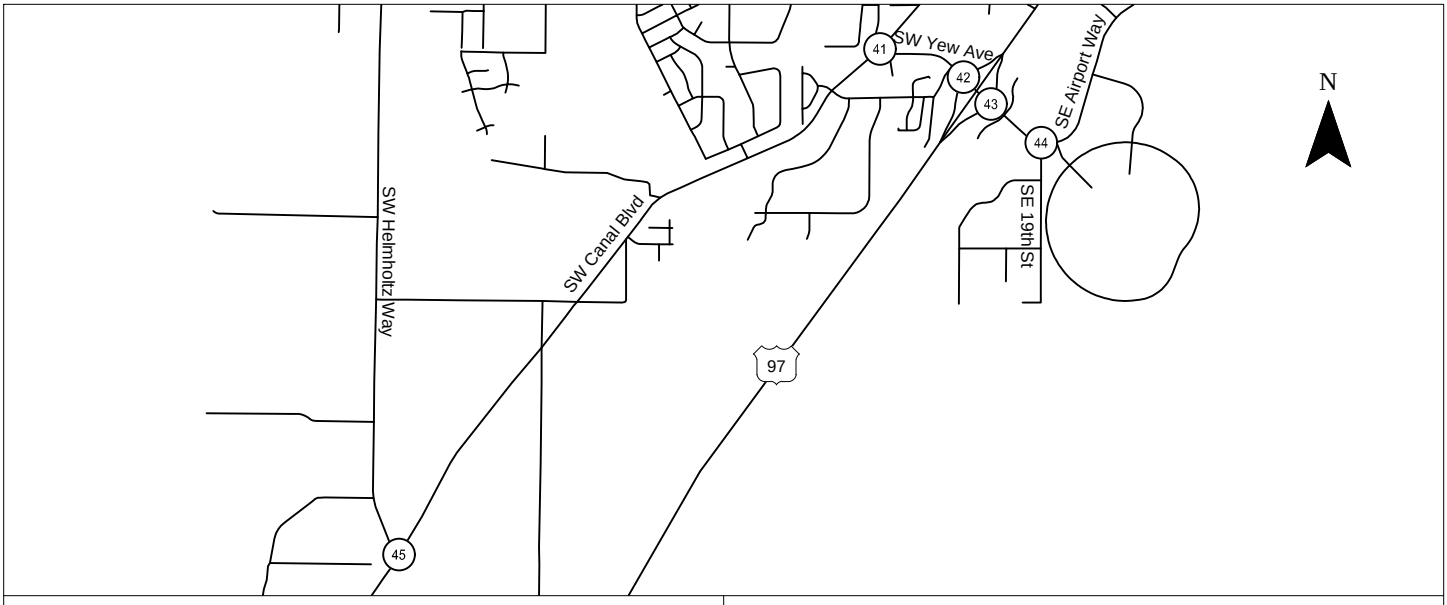
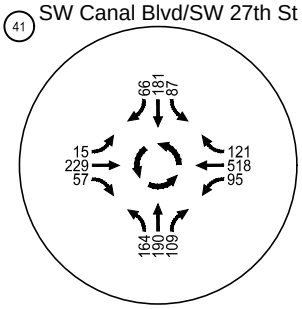
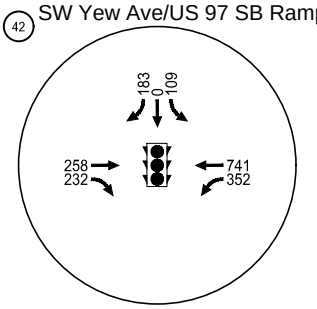


Without Interchange

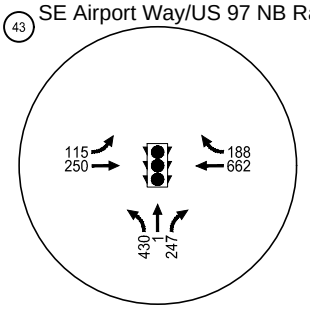
41 SW Canal Blvd/SW 27th St



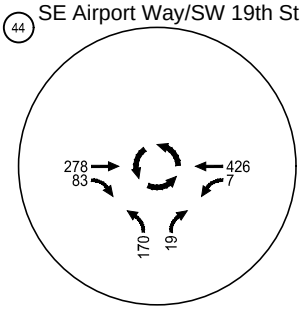
42 SW Yew Ave/US 97 SB Ramps



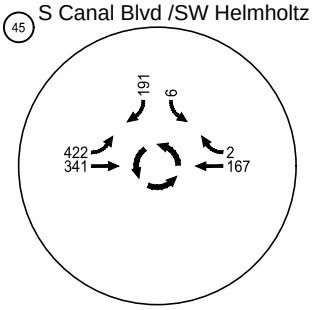
43 SE Airport Way/US 97 NB Ramps



44 SE Airport Way/SW 19th St

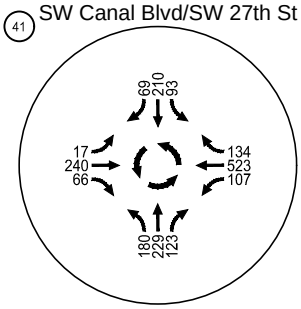


45 S Canal Blvd /SW Helmholtz Way

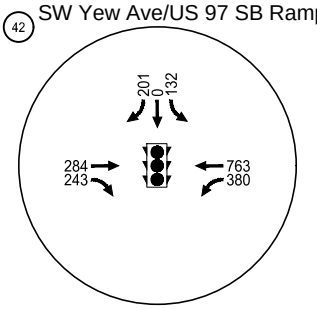


With Interchange

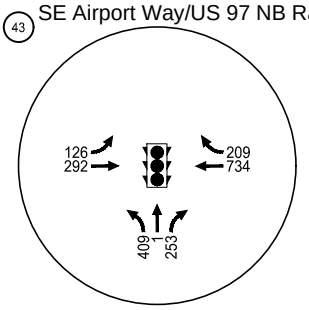
41 SW Canal Blvd/SW 27th St



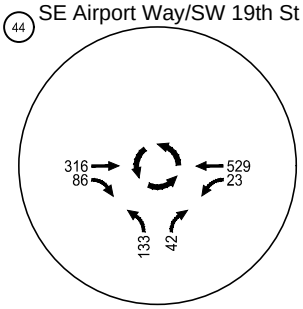
42 SW Yew Ave/US 97 SB Ramps



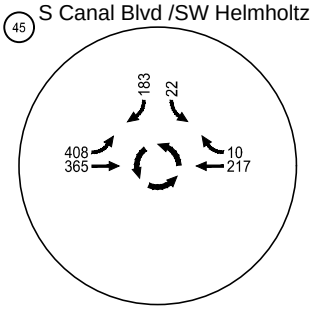
43 SE Airport Way/US 97 NB Ramps



44 SE Airport Way/SW 19th St



45 S Canal Blvd /SW Helmholtz Way



- Traffic Signal
- Roundabout

Future 2040 Turning Volumes
Redmond, Oregon

Figure 3

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KITTELSON & ASSOCIATES

Intersection Operations Analysis

The intersection operations analysis was conducted using Synchro 10 and SIDRA 7, software tools designed to assist with operations analysis in accordance with Highway Capacity Manual (HCM) methodologies. The analysis results include level-of-service (LOS) and volume-to-capacity (v/c) at all intersections regardless of jurisdiction, which are reported for the overall intersection.

Table 3 summarizes the intersection operations analysis results for the "without interchange" and "with interchange" scenarios and compares them to the applicable performance standards established as part of the TSP (*Technical Memorandum #4: Existing Conditions Analysis)*. As shown, SW Canal Boulevard/SW 27th Street and SE Airport Way/ US 97 NB Ramps are forecast to exceed their applicable performance standards under both scenarios. *Attachment A contains the "with interchange" traffic conditions worksheets. Analysis worksheets for the "without interchange" scenario have been previously summarized in the TSP's Technical Memorandum #6: Alternatives Analysis.*

Table 3. Future Intersection Operations with and without the Interchange and Street Connection

Intersection	Jurisdiction	Proposed Control	Performance Standard	Without Interchange	With Interchange
				Performance	Performance
SW Canal Blvd/SW 27th St	City	Roundabout	LOS E, v/c<0.90	LOS D **v/c = 0.98**	LOS E **v/c > 1.00**
SW Yew Ave/US 97 SB Ramps	ODOT	Signalized	v/c<0.80	LOS B v/c = 0.75	LOSE B v/c = 0.78
SE Airport Way/US 97 NB Ramps	ODOT	Signalized	v/c<0.80	LOS D **v/c = 0.95**	LOS E **v/c = 1.00**
SE Airport Way/SW 19th St	City	Roundabout	LOS E, v/c<0.90	LOS A v/c = 0.43	LOS A v/c = 0.53
S Canal Blvd/SW Helmholtz Way	City	Roundabout	LOS E, v/c<0.90	LOS A v/c = 0.61	LOS A v/c = 0.63

Note: consistent with traffic operations analyses conducted for the Redmond TSP Update, HCM 2000 results are reported for signalized intersections and HCM 6th Edition results are reported for roundabout operations.

As shown, construction of a US 97/Quarry Avenue interchange and associated arterial connections has little effect on expected 2040 operational conditions at the study intersections. Specifically, we observe the following:

- All study intersections are expected to operate at the same level of service (LOS) or within one level of service grade in either scenario;
- Travel demand is relatively unchanged at the Yew Avenue interchange. The "with interchange" scenario forecasts a slight degradation of operations at the ramp terminals, which could be attributable to modifications to the overall travel demand assumptions in between the two scenarios or general "noise" within the analysis tool.

- Travel demand increases slightly along the Canal Boulevard corridor and 19th Street corridor under the "with interchange" scenario, which is consistent with the eastside and westside arterial road improvements assumed. However, the increases result in a change in volume-to-capacity ratios of less than 0.02 along the Canal Boulevard corridor and about 0.10 at the Airport Way/19th Street intersection. The latter operates at LOS A under both scenarios.

FINDINGS

As presented in this memorandum, the US 97 Quarry Avenue interchange and associated eastside and westside arterials:

- Would require an "Exception for Transportation Improvements on Rural Lands" per Oregon's Transportation Planning Rule (TPR) Section 660-012-0070;
- Will not measurably reduce traffic volumes anticipated on the arterial and collector streets in the south part of the City or at the US 97/Yew Avenue interchange;
- Can provide an alternative connection to US 97 for the large lot industrial lands near the Fairgrounds; however, the majority of the traffic anticipated from these lands over the next 20 years is anticipated to use the Yew Avenue Interchange; and
- The SW Quarry Avenue Interchange is not needed to meet the identified transportation needs within the TSP and would therefore be considered part of a "illustrative list" of potential projects for the City to consider at a future date.

Based on these findings, it does not appear that the requirements of a "Goal Exception" per the TPR is warranted at this time nor should the SW Quarry Avenue/US 97 Interchange be included in the list of reasonably funded TSP projects.

Accordingly, the City, County and ODOT should monitor the need for planning, designing and constructing a SW Quarry Avenue as part of TSP implementation. This interchange is not part of the 20-year list of projects considered to be reasonably likely to be funded within the TSP.

Attachment A Traffic Operations Worksheets

MOVEMENT SUMMARY

Site: 101 [41 - SW 27th @ SW Canal Blvd]

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SW Canal Dr											
3	L2	209	5.0	0.698	16.4	LOS C	6.6	168.6	0.83	0.90	29.2
8	T1	266	1.0	0.698	16.4	LOS C	6.6	168.6	0.83	0.90	29.3
18	R2	143	3.0	0.698	16.4	LOS C	6.6	168.6	0.83	0.90	28.5
Approach		619	2.8	0.698	16.4	LOS C	6.6	168.6	0.83	0.90	29.1
East: SW Yew Ave											
1	L2	124	0.0	1.089	80.0	LOS F	43.7	1098.5	1.00	2.39	16.2
6	T1	608	1.0	1.089	80.0	LOS F	43.7	1098.5	1.00	2.39	16.2
16	R2	156	0.0	1.089	80.0	LOS F	43.7	1098.5	1.00	2.39	16.0
Approach		888	0.7	1.089	80.0	LOS F	43.7	1098.5	1.00	2.39	16.2
North: SW Canal Blvd											
7	L2	108	0.0	0.788	30.6	LOS D	6.7	167.3	0.91	1.16	24.9
4	T1	244	1.0	0.788	30.6	LOS D	6.7	167.3	0.91	1.16	24.9
14	R2	80	0.0	0.788	30.6	LOS D	6.7	167.3	0.91	1.16	24.4
Approach		433	0.6	0.788	30.6	LOS D	6.7	167.3	0.91	1.16	24.8
West: SW 27th St											
5	L2	20	0.0	0.439	9.7	LOS A	2.5	62.8	0.67	0.67	32.9
2	T1	279	0.0	0.439	9.7	LOS A	2.5	62.8	0.67	0.67	32.8
12	R2	77	0.0	0.439	9.7	LOS A	2.5	62.8	0.67	0.67	31.9
Approach		376	0.0	0.439	9.7	LOS A	2.5	62.8	0.67	0.67	32.6
All Vehicles		2315	1.1	1.089	42.4	LOS E	43.7	1098.5	0.88	1.48	22.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	284	243	380	763	0	0	0	0	132	0	201
Future Volume (vph)	0	284	243	380	763	0	0	0	0	132	0	201
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1667	1423	1567	1733						1662	1458
Flt Permitted		1.00	1.00	0.44	1.00						0.95	1.00
Satd. Flow (perm)		1667	1423	731	1733						1662	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	309	264	413	829	0	0	0	0	143	0	218
RTOR Reduction (vph)	0	0	137	0	0	0	0	0	0	0	0	83
Lane Group Flow (vph)	0	309	127	413	829	0	0	0	0	0	143	135
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	0%	5%	2%	6%	1%	0%	0%	0%	0%	0%	0%	2%
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		24.1	24.1	35.1	35.1						10.6	10.6
Effective Green, g (s)		24.1	24.1	35.1	35.1						10.6	10.6
Actuated g/C Ratio		0.43	0.43	0.63	0.63						0.19	0.19
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		721	615	550	1092						316	277
v/s Ratio Prot		0.19		0.08	c0.48							
v/s Ratio Perm			0.09	0.39							0.09	c0.09
v/c Ratio		0.43	0.21	0.75	0.76						0.45	0.49
Uniform Delay, d1		11.0	9.8	6.7	7.3						20.0	20.1
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.2	5.7	3.1						1.0	1.3
Delay (s)		11.4	10.0	12.4	10.4						21.0	21.5
Level of Service		B	B	B	B						C	C
Approach Delay (s)		10.8			11.1			0.0			21.3	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	55.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	309	264	413	829	143	218
v/c Ratio	0.43	0.35	0.75	0.76	0.45	0.60
Control Delay	14.4	4.1	19.1	15.1	24.4	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.4	4.1	19.1	15.1	24.4	18.6
Queue Length 50th (ft)	66	4	54	154	42	34
Queue Length 95th (ft)	148	46	#201	#469	85	88
Internal Link Dist (ft)	1380			488	462	
Turn Bay Length (ft)		75	150			200
Base Capacity (vph)	719	749	550	1090	896	834
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.35	0.75	0.76	0.16	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	292	0	0	734	209	409	1	253	0	0	0
Future Volume (vph)	126	292	0	0	734	209	409	1	253	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.85				
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)	1599	1667			1683	1395	1630	1431				
Flt Permitted	0.12	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	205	1667			1683	1395	1630	1431				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	317	0	0	798	227	445	1	275	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	60	0	180	0	0	0	0
Lane Group Flow (vph)	137	317	0	0	798	167	445	96	0	0	0	0
Confl. Peds. (#/hr)	3		1	1		3						
Heavy Vehicles (%)	4%	5%	0%	0%	4%	4%	2%	0%	4%	0%	0%	0%
Turn Type	pm+pt	NA			NA	Perm	Perm	NA				
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	37.3	37.3			27.8	27.8	24.9	24.9				
Effective Green, g (s)	37.3	37.3			27.8	27.8	24.9	24.9				
Actuated g/C Ratio	0.52	0.52			0.39	0.39	0.34	0.34				
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	192	861			648	537	562	493				
v/s Ratio Prot	c0.04	0.19			c0.47			0.07				
v/s Ratio Perm	0.32					0.12	c0.27					
v/c Ratio	0.71	0.37			1.23	0.31	0.79	0.19				
Uniform Delay, d1	15.5	10.4			22.2	15.5	21.3	16.6				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	11.8	0.3			117.3	0.3	7.5	0.2				
Delay (s)	27.3	10.7			139.5	15.8	28.8	16.8				
Level of Service	C	B			F	B	C	B				
Approach Delay (s)		15.7			112.1			24.2			0.0	
Approach LOS		B			F			C			A	

Intersection Summary			
HCM 2000 Control Delay	63.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	137	317	798	227	445	276
v/c Ratio	0.71	0.37	1.24	0.38	0.79	0.41
Control Delay	36.3	13.6	144.6	12.7	32.3	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	13.6	144.6	12.7	32.3	4.2
Queue Length 50th (ft)	31	82	~461	39	174	0
Queue Length 95th (ft)	#109	164	#750	106	278	44
Internal Link Dist (ft)		488	979			520
Turn Bay Length (ft)	150			100		
Base Capacity (vph)	193	860	645	595	750	807
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.37	1.24	0.38	0.59	0.34

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

MOVEMENT SUMMARY

Site: [44 - SW 19th @ SE Airport Way]

Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SW 19th St											
3	L2	145	0.0	0.202	5.8	LOS A	0.9	23.1	0.50	0.40	32.7
18	R2	46	8.0	0.202	5.8	LOS A	0.9	23.1	0.50	0.40	31.6
Approach		190	1.9	0.202	5.8	LOS A	0.9	23.1	0.50	0.40	32.4
East: SE Airport Way											
1	L2	25	0.0	0.528	9.3	LOS A	3.7	95.1	0.48	0.31	33.1
6	T1	575	5.0	0.528	9.3	LOS A	3.7	95.1	0.48	0.31	32.9
Approach		600	4.8	0.528	9.3	LOS A	3.7	95.1	0.48	0.31	33.0
West: SE Airport Way											
2	T1	343	3.0	0.344	6.0	LOS A	2.0	52.0	0.14	0.04	34.7
12	R2	93	16.0	0.344	6.0	LOS A	2.0	52.0	0.14	0.04	33.4
Approach		437	5.8	0.344	6.0	LOS A	2.0	52.0	0.14	0.04	34.4
All Vehicles		1227	4.7	0.528	7.6	LOS A	3.7	95.1	0.36	0.23	33.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: H:\17\17720 - Redmond Transportation System Plan\Task 4- Future Conditions\quarry road\ops\Future Alternative Conditions (Updated Model)_QR.sip7

MOVEMENT SUMMARY

Site: [45 - SW Helmholtz @ SW Canal]

Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
NorthEast: SW Canal											
6x	T1	236	1.0	0.285	7.2	LOS A	1.3	33.9	0.58	0.53	34.1
16x	R2	11	0.0	0.285	7.2	LOS A	1.3	33.9	0.58	0.53	33.2
Approach		247	1.0	0.285	7.2	LOS A	1.3	33.9	0.58	0.53	34.1
NorthWest: SW Helmholtz											
7x	L2	24	0.0	0.213	5.4	LOS A	1.0	25.6	0.42	0.30	34.6
14x	R2	199	4.0	0.213	5.4	LOS A	1.0	25.6	0.42	0.30	33.5
Approach		223	3.6	0.213	5.4	LOS A	1.0	25.6	0.42	0.30	33.6
SouthWest: SW Canal											
5x	L2	443	1.0	0.627	10.2	LOS B	6.7	167.5	0.24	0.08	31.4
2x	T1	397	0.0	0.627	10.2	LOS B	6.7	167.5	0.24	0.08	31.4
Approach		840	0.5	0.627	10.2	LOS B	6.7	167.5	0.24	0.08	31.4
All Vehicles		1310	1.1	0.627	8.8	LOS A	6.7	167.5	0.34	0.20	32.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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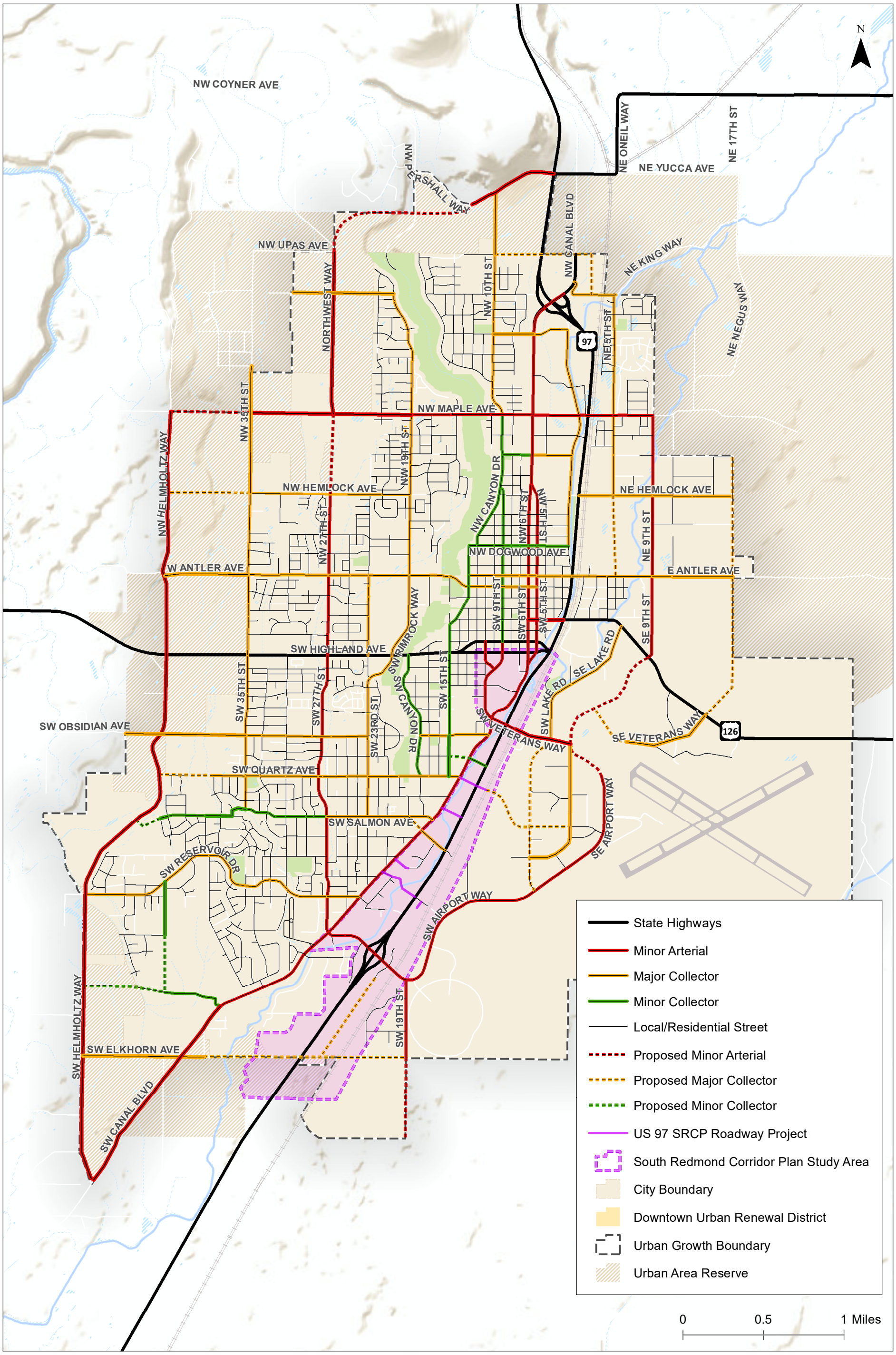
Redmond TSP Update – Errata Table

#	TOPIC	SOURCE	COMMENT	PROPOSED CHANGE
1	Functional Classification Map	City of Redmond Staff	Update Functional Classification map to reflect recent roadway constructions	Update GIS base layer to show completed roads, such as 27th Street just south of Hemlock Avenue
2	5th Street Extension: Maple Avenue to Hemlock Avenue	City of Redmond Staff	Add future 5th Street Extension (Major Collector) between Maple Avenue and Hemlock Avenue	Modify Functional Classification Map and add Roadway Project to reflect proposed extension.
3	Quartz Avenue Extension: East of Railroad Tracks	City of Redmond Staff	Modify proposed east-west collectors between Airport Way and Veterans Way (two collectors currently shown) to show a single east-west connection between future Quartz Avenue extension and existing Salmon Drive.	Modify Functional Classification Map and Roadway Project lists to reflect proposed collector.
4	19th Street Functional Classification	City of Redmond Staff	Modify 19th Street Functional Classification from Major Collector to Minor Arterial. 19th Street will provide key north-south connection for future development in Redmond.	Update Functional Classification Map to show 19th Street as a Major Arterial.



Functional Classification
Redmond, Oregon

Figure
X

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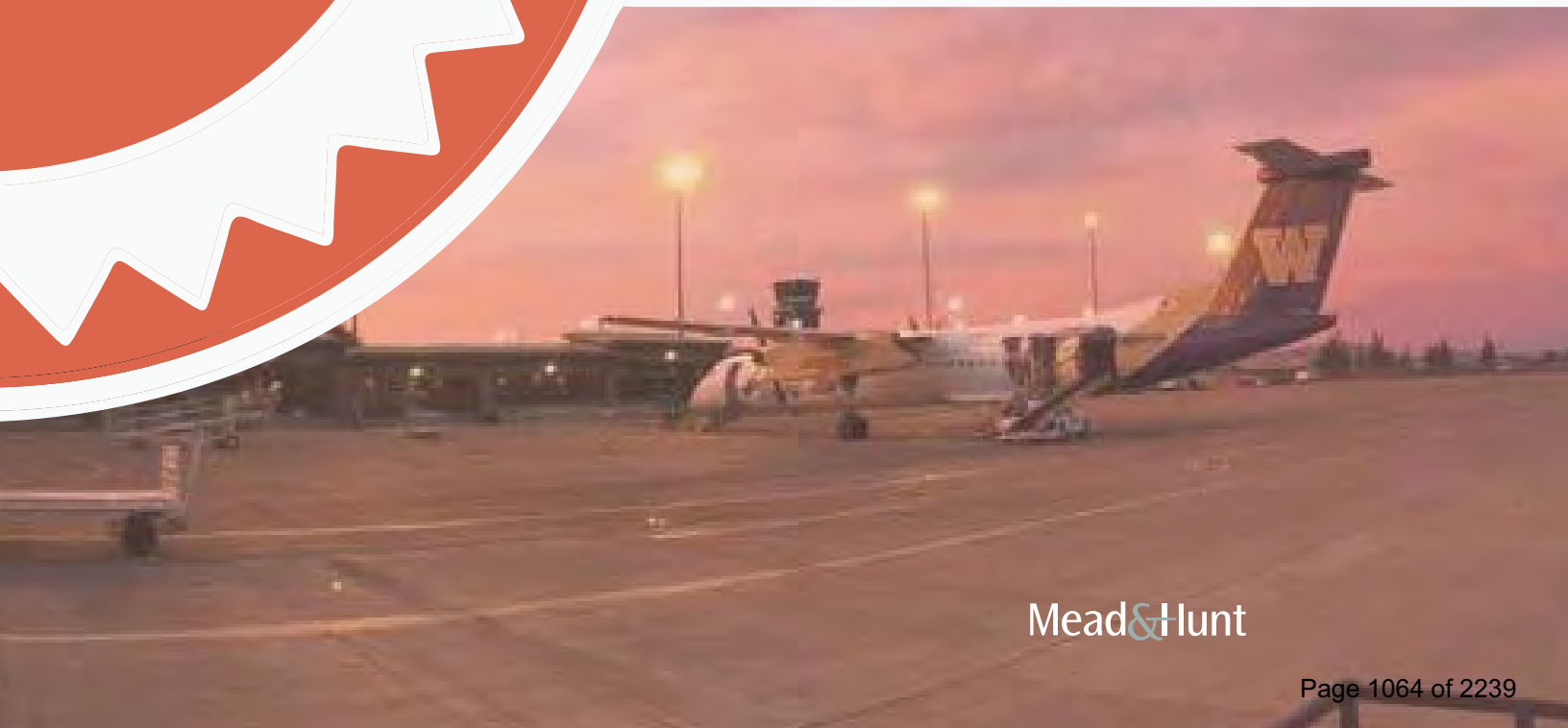
Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

REDMOND MUNICIPAL AIRPORT MASTER PLAN

2018



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REDMOND MUNICIPAL
AIRPORT MASTER PLAN

MARCH 2018

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Chapter Overview

The City of Redmond (City) initiated an update to the Airport Master Plan ("Plan") to assess the facility and service needs of the Redmond Municipal Airport ("the Airport") throughout the next 20 years. The Plan serves as a roadmap for bringing projects, people, and funding together in a coordinated manner, and provides strategic direction regarding the Airport's 20-year capital development plan and investment of resources.

The Plan is conducted in accordance with Federal Aviation Administration (FAA) guidance, as prescribed by grant assurances and mandated by regulatory standards. Conformance with FAA standards enables the City of Redmond to apply for federal and state funding in order to support the maintenance, expansion, and upgrade of airport facilities as demand warrants and funding is available.

Study Introduction

The Airport is owned by the City of Redmond, Oregon. The City of Redmond is a key stakeholder in the Plan. The Aviation Program Manager, Nettice Honn, is the daily project manager for the City. The City's planning and engineering departments are represented on the Planning Advisory Committee (PAC).

The Plan evaluates the Airport's needs over a 20-year planning period for airfield, airspace, terminal area, and landside facilities. The goal is to document the orderly development of Airport facilities essential to meeting City needs, in accordance with FAA standards, and in a manner complementary with community interests. The Plan results in a 20-year development strategy envisioned by the City, reflective of the updated Airport Capital Improvement Program (CIP), and graphically depicted by the Airport Layout Plan (ALP) drawings. The approved Plan allows the City to satisfy FAA assurances, and seek project funding eligible under the respective federal and state airport aid program.

The Master Plan will have the following core components, in accordance with FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans:*

1: Study Design
2: Project Management
3: Stakeholder Coordination and Outreach
4: Airports Geographic Information Systems
5: Airport Inventory
6: Demand Forecasts
7: Facility Requirements
8: Improvement Alternatives
9: Financial Feasibility
10: Implementation Plan
11: Airport Layout Plan
12: Documentation

Why is it Time for a Master Plan?

The Airport Master Plan was last updated in 2005, with the ALP drawings last revised in November 2013. Since the 2005 Master Plan, the FAA has updated airfield design standards and aviation activity trends have changed. The 2005 Master Plan does not include important developments as envisioned by the City. This Plan is funded by the City with a grant from the FAA Airport Improvement Program (AIP).

Airport master plans are generally updated every 10 years, depending on the planning outlook and complexity of the airport. The aviation market has seen major changes since 2005, with fuel prices increasing, Next Generation navigation technologies becoming commonplace, the demand for pilots growing worldwide, the accelerated development of unmanned aerial systems, and new FAA policies on airport development. The assumptions and facts that formed the basis for recommendations in the 2005 Master Plan are in need of an update to reflect an evolving marketplace.

The changes in the community around Redmond reinforce the need for a new master plan to reexamine growth projections and future facility needs. The Airport is centrally-located in Central Oregon, an area that has been experiencing unprecedented growth in population and business interests. The region's physical location on the east side of the Cascade Mountains contributes to the favorable weather experienced year round. This is a major factor in the attractiveness to both young families and those looking to retire. These growth patterns will be evaluated in the Plan and included in all facility design and analysis for the Airport's 20-year plan.

Study Goals and Process

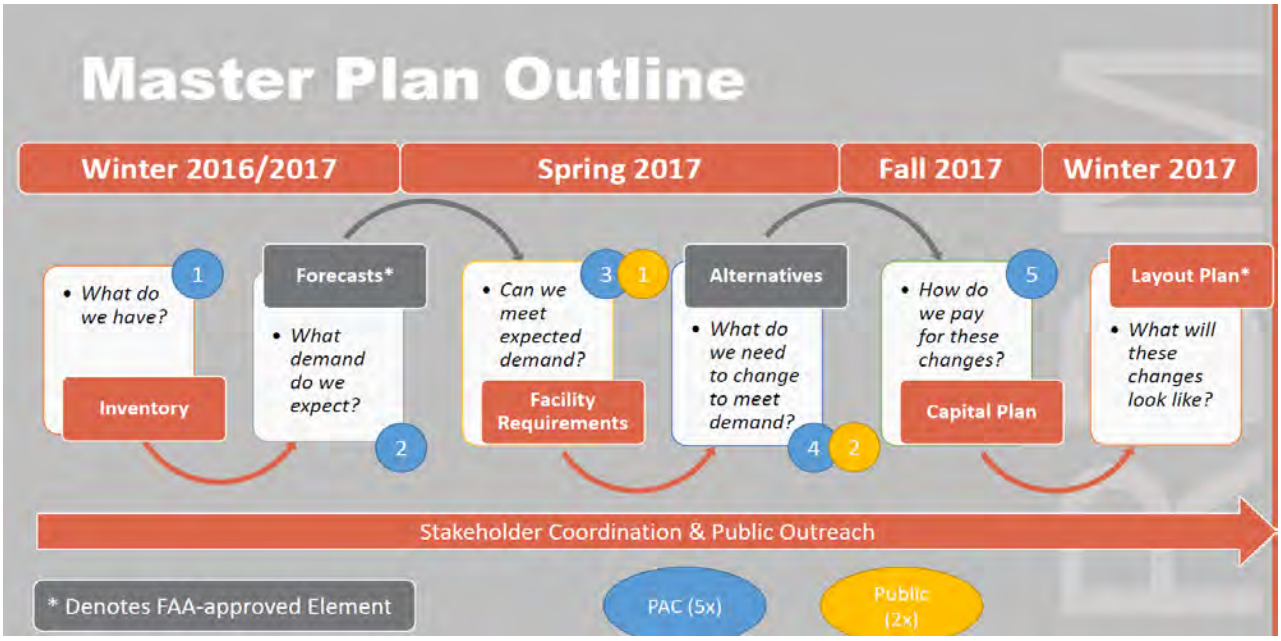
Master Plan Goals / Central Questions of the Master Plan

The core questions for this Plan include the following:

- ✓ How will Central Oregon's growth continue in the future, and what will the impact be on aviation activity?
- ✓ What role will General Aviation (GA) and United States Forest Service (USFS) activities play in the future?
- ✓ Is a runway extension justified, and if so, how long should it be, and in what direction?
- ✓ What is the viability of runway and terminal improvements previously depicted on the ALP?
- ✓ How can the passenger terminal and associated facilities accommodate continued passenger growth and additional carriers?
- ✓ What are the opportunities for increased airport revenue generation?
- ✓ How much property will be needed to satisfy the demand for future aviation use?
- ✓ What future changes in critical aircraft should the Airport plan for?
- ✓ Are aviation facilities adequate to meet the needs of the growing community?

The Planning Process and Timeline

FIGURE I-1: PROJECT TIMELINE & ROADMAP



Plan Participation

As a strategic visioning process, the Plan is structured to be responsive to Airport needs while being inclusive of broader community considerations. This approach builds stakeholder support for Plan recommendations and facilitates acceptance. The Plan's public involvement program is targeted to engage key Airport stakeholders (City and County elected officials, community leaders, on- and off-Airport stakeholders), address comments, and actively encourage public participation.

Agency Coordination

The FAA Seattle Airport District Office (ADO) is the primary external reviewing agency for this Plan. A representative from the Seattle ADO will be provided Plan deliverables and invited to attend PAC and public meetings. A visit will be made to the Seattle ADO two times during the Plan development to review key deliverables since the FAA is not always able to travel to Airport events.

The Oregon Department of Aviation (ODA) is a key stakeholder in the Plan. The Consultant and the Airport will keep ODA updated on Plan progress through routine communication, including scheduled teleconferences, and transmittal of Plan chapters.

Airport Committee

The purpose of the Airport Committee is to advise the City Council regarding issues that concern the development of the Airport. The Airport Committee supported Plan visioning, provided feedback on the Plan elements at key milestones, and will be essential to the Airport's ability to move forward with Plan recommendations.

Planning Advisory Committee

The PAC consists of aviation and non-aviation constituents selected to provide well-rounded Plan perspectives. The PAC serves in an advisory capacity to collectively review Plan recommendations and provide feedback to the Airport and Consultant. PAC input will be used to guide Plan developments. The PAC consists of members representing the following interests:

- ✓ USFS
- ✓ Redmond Economic Development, Inc.
- ✓ Redmond Chamber of Commerce
- ✓ Airport Tenant (GA Representative)
- ✓ Deschutes County
- ✓ City of Redmond Engineering Dept.
- ✓ City of Redmond Planning Division

- ✓ City of Bend
- ✓ Prineville (S39) Airport Management

The Airport project manager serves as an ex-officio member of the PAC. The FAA and ODA are informed of PAC meetings and invited to attend in an observer role.

Key Technical Stakeholders

While the PAC will provide a continuous sounding board throughout the Plan, there are some stakeholders that are expected to be interested in specific Plan elements and disinterested in others. The Consultant will meet with these stakeholders to collect their feedback on Plan elements that are of interest to them. These include:

Plan Element	Key Technical Stakeholders
Airport Inventory	Control Tower Law enforcement Passenger and Cargo Airlines Transportation Security Administration (TSA) Aircraft rescue and firefighting (ARFF) Businesses on airport property Airport hangar tenants
Demand Forecasts	Passenger and cargo airlines Control tower
Improvement Alternatives	Control tower TSA ARFF Deschutes County

Also, the City of Redmond is completing a Comprehensive Plan update and roadway engineering projects in the vicinity of the Airport concurrent with the Airport Master Plan. Close coordination between the Airport and community planning and development projects were pursued to help efforts of both organizations support common goals.

Public Outreach

This public involvement process is used to inform, educate, and solicit feedback from the public regarding the Plan process, major findings, and conclusions. Conducting public outreach meetings in an "open house" format provides the general public the opportunity to interact with the Airport and Consultant, ask questions, communicate concerns, and provide feedback.

The two (2) public meetings occur at the following Plan milestones.

- ✓ Facility Requirements and Initial Improvement Alternatives
- ✓ Refined Alternatives and Preliminary Capital Improvement Plan

A summary of public involvement is included as a Plan appendix.

SWOT Analysis

As part of the strategic planning process, a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis was conducted with the PAC to determine the appropriate strategic visions for the Airport, and specific goals and objectives to be addressed throughout the Plan. SWOT is a process for synchronizing strategic decision-making factors, and helps categorize the Airport's internal and external characteristics, qualities, and merits. When compiled, the SWOT factors help formulate Plan goals, provide the basis to pragmatically assess recommendations, and guide the Plan's overall developmental policy. The following SWOT factors were identified by the Planning Advisory Committee during the project kick-off meeting held November 5, 2016.

SWOT TABLE

		Helpful	Harmful
		To Achieving the Objective	To Achieving the Objective
Internal Origin	Attributes Within Airport Influence	Strengths	Weaknesses
External Origin	Attributes Outside of Airport Influence	Opportunities	Threats

Strengths:	characteristics that provide an advantage over others.
Weaknesses:	characteristics that create a disadvantage compared to others.
Opportunities	outside potential that the Airport could capitalize on.
Threats:	outside risks that could be detrimental to the Airport.

Strengths:

- ✓ Runway wind coverage and physical access
- ✓ Runway length
- ✓ Central location
- ✓ ARFF presence
- ✓ New terminal
- ✓ Security
- ✓ Business and tourist economy
- ✓ Size of Airport-owned property
- ✓ Frequency of flights
- ✓ Air Traffic Control Tower presence
- ✓ FAA grant assurances in place to keep the Airport intact

Weakness:

- ✓ TSA and security requirements to adhere to
- ✓ Limited infrastructure availability
- ✓ USFS airside expansion potential limited by lack of available land adjacent to current taxiways

Opportunities:

- ✓ Business and industry diversity in the area
- ✓ Hotel availability
- ✓ Transportation network companies (Uber)
- ✓ Transportation systems/multi-use path
- ✓ Terminal – Jet Bridges
- ✓ East bound flights
- ✓ Additional connections
- ✓ Time of flights (more at night)
- ✓ Emergency preparedness
- ✓ Airport land owned north of airfield (golf course area)
- ✓ Airport name/branding
- ✓ Improving access to the airfield particularly on the north side

Threats:

- ✓ Not isolated from national/international threats
- ✓ Availability of skilled workforce or higher education opportunities
- ✓ Lack of FBO maintenance technicians and training
- ✓ BLM and other open lands where transient population tends to gravitate
- ✓ GA competition in the region – users could go elsewhere
- ✓ Cascadia earthquake
- ✓ Could overshoot growth estimates and overbuild

1.0 AIRPORT INVENTORY

This Inventory Chapter documents 2016 conditions at the Redmond Municipal Airport (the Airport) and provides a foundation for the overall planning analysis in the subsequent chapters of the RDM Master Plan. The Inventory Chapter includes an overview of environmental conditions and land uses at and surrounding the Airport to provide a basis for evaluating planned improvements.

1.1 INTRODUCTION TO THE INVENTORY

This section summarizes the purpose and organization of this chapter, and defines the key elements that are included in the investigation.

1.1.1 CHAPTER PURPOSE AND ORGANIZATION

The Inventory Chapter looks at the physical layout of the Airport and documents 2016 conditions in terms of airfield design standards and aviation activity. The Master Plan does not address management policies and procedures, staffing or operational rules and regulations. These topics are addressed in other airport documents.

The chapter begins with an overview of the Airport that covers location, history, role in the community, property interests, and the components of airport operation. The Airport is a complex operation with three major facility areas: airside, landside, and the terminal building. The Inventory Chapter documents each of these three areas in terms of use, design, and condition.

- ✓ Airside facilities are those areas that are restricted from general public access – sometimes called "inside the fence." This includes runways and taxiways, facilities for general aviation parking and maintenance, air cargo and other private business facilities with direct access to the runway, airport safety and maintenance facilities and the area used by the United States Forest Service (USFS).
- ✓ Landside facilities are those that support airport activities without direct access to the airfield. They include internal roadways, parking areas, and non-aeronautical development areas.
- ✓ The terminal building provides a transition between the airside and landside areas for commercial airline passengers and provides spaces for the traveling public, airline and airport administration, and the Transportation Security Administration (TSA).

The chapter will cover airport activity and design standards, which will be used in later plan chapters to address the need for improvements, improvements that may be recommended, and as a basis for design alternatives.

The chapter looks beyond the boundaries of the Airport to consider surrounding land uses that are subject to aircraft overflight, and the catchment area from where the Airport draws its passengers and users. The Airport serves the businesses and residents of the City of Redmond, the nearby City of Bend, and Deschutes, Crook, and Jefferson counties. The community around the Airport drives the demand for commercial air service, general aviation, and air cargo. Other airports serving the region are documented as they impact demand at the Airport.

Environmental factors are inventoried as they influence aircraft flight. Weather factors, such as temperature and wind direction, impact aircraft performance and drive facility design considerations. Environmental conditions such as wetlands, air quality, and aircraft noise are documented so future development can be evaluated in terms of potential environmental impacts.

Information was collected in several ways, including a site visit to the Airport in October 2016; review of documents and records provided by the Airport, the City of Redmond, the FAA, and other public agencies; and interviews with the Airport tenants. Results are presented in the following sections:

- ✓ Airport Overview
- ✓ Airside Facilities
- ✓ Landside Facilities
- ✓ Terminal Building
- ✓ Aeronautical Setting
- ✓ Community Setting
- ✓ Aviation Activity
- ✓ Airport Economic & Financial Conditions
- ✓ Environmental Conditions

1.2 AIRPORT OVERVIEW

This section gives an overview of the Airport that covers location, history, role in the community, property interests, and the components of airport operation.

1.2.1 AIRPORT LOCATION

The Airport is in central Oregon's high desert just east of the Cascade mountain range. The Airport is the only commercial service airport in the region, located 150 miles from Eugene to the west, 150 miles from Portland to the northwest, and 220 miles from Pendleton to the northeast. The Airport is located in Deschutes County, in the City of Redmond. Redmond's location has been important to its growth and prosperity in terms of the area's population and economy. Redmond has been the hub of the local transportation network since the railroad arrived in 1911. Today, Redmond's location at the intersection of Oregon's Highways 126 and 97 provides driving connections in four directions including to Interstate 5 to the west and Interstate 84 to the north, as shown in **Figure 1-1**.

1.2.2 AIRPORT AND COMMUNITY HISTORY

The first runways were constructed in 1929 with the support of Redmond Ray Johnson American Legion Post and Redmond Commercial Club, which has since evolved into the Redmond Chamber of Commerce. The Works Progress Administration improved the Airport during the 1930s, and during World War II, the US Army Air Corps used the Airport for training B-17 and P-38 pilots. The first commercial flight at the Airport was in 1946. After its service during the war, the Airport was sold to the City of Redmond.

1.2.3 AIRPORT PROPERTY

Airport property includes 2,518 acres surrounding two runways oriented in an "X" configuration. The passenger terminal area is southwest of the runway intersection. Aviation uses have been developed on the west and north side of the Airport along the major access routes of SE Airport Way, SE Veterans Way, and Highway 126. Property uses and development areas are shown on **Figure 1-2,** and key airport facilities are shown in **Figure 1-3**.

Figure 1-1
REDMOND LOCATION MAP

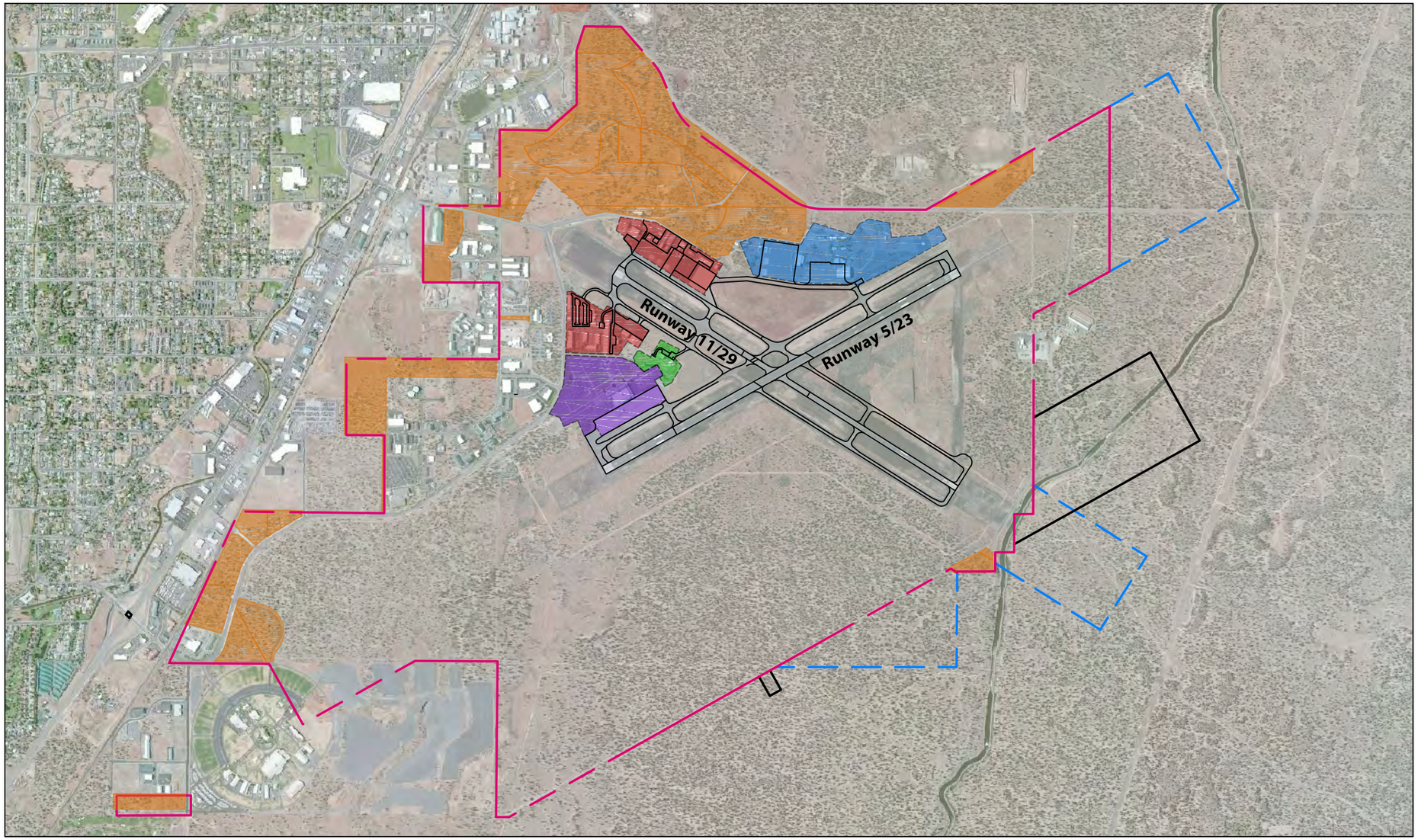


Figure 1-2
Property Map

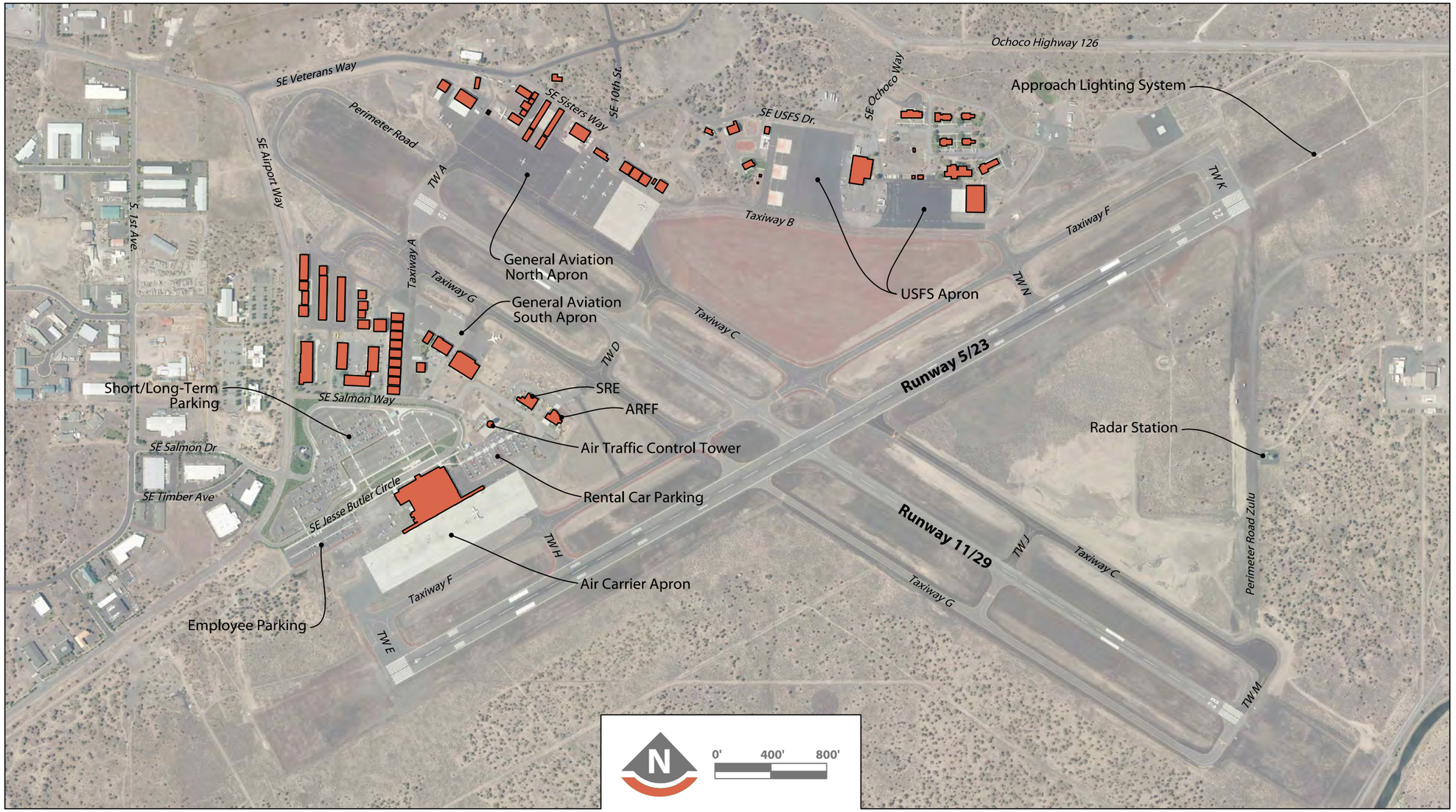


Figure 1-3
AIRPORT FACILITIES

1.2.4 OPERATIONAL OVERVIEW

MANAGEMENT

The Airport is owned by the City of Redmond. The Airport Director reports to the City Manager, and City employees are responsible for daily operations, programs, and services. City Council members, elected by the citizens of Redmond, are the City's policy makers. The City established an Airport Committee in 1991 to act in an advisory role to the City Council on airport-related matters. The Committee is composed of nine members: five appointed by Redmond; one appointed by the City of Bend; one appointed by Deschutes County; one appointed by Jefferson County; and one appointed by Crook County. Redmond recently instituted an Ex-Officio Youth member to help foster interest in aviation for young adults.

FUNCTIONAL CLASSIFICATIONS

The Airport is a public-use facility supporting commercial, general aviation, military, and USFS users. The Federal Aviation Administration (FAA) National Plan of Integrated Airport Systems (NPIAS) classifies the Airport as a non-hub primary commercial service airport. The NPIAS is updated every two years and uses predetermined evaluation criteria including commercial service enplanements, proximity to other airports, and number of based aircraft to identify airports that are of importance to the national air transportation system. Airports that are included in the NPIAS are eligible for FAA Airport Improvement Program (AIP) funding. Classification as a non-hub airport is based on the Airport having more than 10,000 annual passenger enplanements, but less than 0.05 percent of total national commercial passenger enplanements.

Under the Code of Federal Regulations (CFR), the Airport is certified as a Class I FAA Part 139 facility, which means that the Airport maintains facilities intended to serve scheduled passenger aircraft with 30 or more passenger seats.

The Oregon Department of Aviation classifies the Airport as a Category I - Commercial Service Airport. Airports in this category have scheduled commercial air carrier service. The Airport Reference Code (ARC), described in greater detail in **Section 1.3.3**, is C-III, which means that facilities are designed for medium-sized commercial aircraft like the Boeing 737 and Airbus A320. **Table 1-1** describes key facility attributes.

Table 1-1. Airport Data

Airport Owner	City of Redmond
NPIAS Airport Category	Non-Hub
Airport Reference Code	C-III
Airport Acreage	2,518 acres
Airport Reference Point Coordinates	N 44° 15.24' W 121° 08.99'
Airport Elevation	3080 feet Above Mean Sea Level (AMSL)
Airport Traffic Control Tower	Open 14 hours daily (0500-1900 local time)

Sources: FAA Airport Master Record (Form 5010), Airport Website, Airport Directory, NPIAS.

1.3 AIRSIDE FACILITIES

"Airside" is a collective term for those areas of the Airport that are accessible to aircraft including runways, taxiways, aprons, and hangar areas. Facilities that directly support aviation activity include:

- ✓ Pavement: runways, taxiways and aprons
- ✓ Structures: aircraft storage and maintenance hangars, fixed base operators (FBOs), fuel storage, snow removal equipment (SRE) storage, and an aircraft rescue and firefighting facility (ARFF)
- ✓ Navigation aids: airfield and approach lighting, weather monitoring systems, radio beacons
- ✓ Airfield signage and markings: (indicators for precision and non-precision instrument runways)
- ✓ Airport traffic control tower (ATCT)
- ✓ Terminal building: Passenger support and services and administrative areas
- ✓ Safety areas: Property set aside to comply with FAA-mandated setbacks and clear zones

1.3.1 RUNWAY SYSTEM

Runways are numbered using a system that assigns a number to each runway end based on its magnetic alignment. The Airport's primary runway, Runway 5-23, is aligned in a northeast/southwest fashion and the crosswind runway, Runway 11-29, is aligned in a northwest/southeast fashion.

Precision instrument runway:
A runway end having an instrument approach procedure that provides course and vertical path guidance conforming to Instrument Landing System (ILS) or Microwave Landing System (MLS) precision approach standards.

Non-precision instrument runway:
A runway end having an instrument approach procedure that provides course guidance without vertical path guidance.

RUNWAY 5-23

Runway 5-23 is 7,038 feet long and 150 feet wide. The runway has an asphalt surface that is transverse-grooved to improve aircraft braking action, reduce hydroplaning, and improve directional control for aircraft when the pavement is wet and icy. The runway was reconstructed in 2016 and is in excellent condition. Runway 5-23 is served by a full-length parallel taxiway on the west side. The runway to parallel taxiway separation is 400 feet, which meets C-III design standards.

Runway 5-23 is a precision instrument runway with high-intensity runway lights (HIRL) and medium-intensity approach lighting system with runway alignment indicator lights (MALSR). These lights provide pilots with visual guidance for landings at night and during poor weather conditions.

RUNWAY 11-29

Runway 11-29 is 7,006 feet long and 100 feet wide. The runway has an asphalt surface and is transverse-grooved. Runway 11-29 is served by two full-length parallel taxiways on the north and south sides. The runway to parallel taxiway separation is 400 feet, which meets B-III design standards.

Runway 11-29 is a non-precision instrument runway with medium-intensity runway lights (MIRL).

Table 1-2 presents data for Runway 5-23 and **Table 1-3** presents data for Runway 11-29. NAVAIDs are defined in **Sections 1.3.6 and 1.3.7**.

Table 1-2. Runway 5-23 Data

Dimensions	Length: 7,038 feet, Width: 150 feet
Bearing	060/240 (True)
Effective Gradient	0.3%
Weight Bearing Capacity	Single-wheel: 68,000 lbs., Double-wheel: 110,000 lbs.
Surface	Asphalt-grooved. Good condition.
Markings	Precision instrument approach. Good condition
Lighting	High-Intensity Runway Edge Lights Runway End Identifier Lights (REIL) – Runway End 05 Visual Approach Slope Indicator (VASI) – Runway End 05 Precision Approach Path Indicator (PAPI) – Runway End 23 1,400 foot MALSR – Runway End 23
Signage	Distance To Go Signs

Sources: FAA Airport Master Record (Form 5010), Airport website.

Table 1-3. Runway 11-29 Data

Dimensions	Length: 7,006 feet, Width: 100 feet
Bearing	122/302 (True)
Effective Gradient	0.5%
Weight Bearing Capacity	Single-wheel: 28,000 lbs., Double-wheel: 40,000 lbs.
Surface	Asphalt-grooved. Good condition.
Markings	Non-precision instrument approach. Good condition
Lighting	Medium Intensity Runway Edge Lights REIL VASI – Runway End 11 PAPI – Runway End 29
Signage	Distance to Go Signs

Sources: FAA Airport Master Record (Form 5010), Airport website.

HELIPAD

The Airport has one helipad, which is used by the USFS and not available for public use. The helipad is 48 feet x 48 feet and has a concrete surface. Military and GA helicopters land on the runways and hover taxi to the FBO aprons to park.

1.3.2 TAXIWAY SYSTEM

Parallel taxiways:
Taxiways that run alongside runways.

Connector taxiways:
All other taxiways that connect the aircraft to all facilities.

Hot spots:
Areas where incidents are more likely to occur because of airfield geometry.

The Airport has an extensive system of 12 asphalt taxiways that provides access between the runways and aircraft parking and storage facilities. Taxiways C, F, and G are parallel to the runways and the rest are connector taxiways. The parallel taxiways are 50 feet wide and the connector taxiways are 75 feet wide. Taxiway C and Taxiway G west of Runway 5-23 were reconstructed in 2011 and are in excellent condition. Taxiway C east of Runway 5-23 was constructed in 2013.

There are two areas on the airfield that the FAA has labeled as potential "hot spots," which is defined in FAA Advisory Circular 150/5300-13A, Change 1, *Airport Design* (AC-13A) as "a location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary." These two areas are the intersection of Taxiways F and G, and the intersection of Taxiways C and F.

The airfield's original design was in compliance with FAA standards of the time; however, FAA standards have since changed. Some existing taxiway connectors do not meet FAA guidance defined in AC-13A. These standards seek to promote safer operations by simplifying airfield geometry, and reducing the risk that a pilot will accidentally taxi onto a runway. Examples of non-standard conditions are Taxiway A's direct access from the North General Aviation Apron to Runway 11-29, and Taxiway H and E's direct access from the Air Carrier Apron to Runway 5-23. As these taxiways are reconstructed, they will need to be built to the latest design standards.

1.3.3 AIRFIELD DESIGN STANDARDS

The Airport is required to maintain facilities in line with FAA standards as part of an agreement for accepting FAA grant money. FAA design standards for runways are determined by the FAA coding system called the Runway Design Code (RDC), shown in **Table 1-4**. The RDC is made up of the aircraft approach category (AAC), the airplane design group (ADG), and the runway approach visibility minimums. The most demanding AAC and ADG at an airport sets the ARC. The FAA codes taxiways using a standard called the Taxiway Design group (TDG).

RUNWAY CLASSIFICATION AND DESIGN

The design aircraft is an aircraft that uses an airport on a regular basis, which the FAA defines as more than 500 operations per year. The Bombardier Q400 (operated by Alaska Airlines) is the most demanding aircraft that exceeds 500 annual operations. The Q400 has an approach speed of 120 knots, a wingspan of 93.3 feet, and tail height 27.4 feet. Per AAC and ADG standards, the Q400 is classified as a B-III aircraft. **Table 1-4** depicts the Airport's RDC, as indicated in bold font.

Runway Design Code (RDC):
The FAA coding system comprised of three standards that determine the ARC: the Aircraft Approach Category, Airplane Design Group, and Approach Visibility Minimums.

Aircraft Approach Category (AAC):
This first standard is based on the approach speed (in knots) of the design aircraft.

Airplane Design Group (ADG):
This second standard is based on the wingspan and the tail height (in feet) of the design aircraft.

Approach Visibility Minimums:
These are based on runway visual range (RVR), the approximate visibility (in feet) as measured by the RVR light transmission/reception equipment or equivalent weather observer report measurements. The depicted numerical value for RVR relates to runway visibility minimums represented in feet or forward visibility that have statute mile equivalents (4000 RVR = ¾ mile).

Table 1-4. Runway Design Code System

Aircraft Approach Category (AAC)		
AAC	Approach Speed	
A	Approach Speed less than 91 knots	
B	Approach speed 91 knots or more but less than 121 knots	
C	**Approach speed 121 knots or more but less than 141 knots**	
D	Approach speed 141 knots or more but less than 166 knots	
E	Approach speed 166 knots or more	
Airplane Design Group (ADG)		
Group Number	Wingspan (in feet)	Tail Height (in feet)
I	< 49'	< 20'
II	49' - < 79'	20' - < 30'
III	**79' - < 118'**	**30' - < 45'**
IV	118' - < 171'	45' - < 60'
V	171' - < 214'	60' - < 66'
VI	214' - < 262'	66' - < 80'
Approach Visibility Minimums		
RVR (ft.)	Flight Visibility Category (statue miles)	
VIS	Runways designed for visual approach use only	
5000	Not lower than 1 mile	
4000	Lower than 1 mile but not lower than ¾ mile	
2400	**Lower than ¾ mile but not lower than ½ mile**	
1600	Lower than ½ mile but not lower than ¼ mile	
1200	Lower than ¼ mile	

Source: FAA AC 150/5300-13A Airport Design.

RUNWAY SAFETY AREAS

The FAA defines the Runway Safety Area (RSA) as a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft in the event of an aircraft undershoot, overshoot, or excursion from the runway. The runways at the Airport each have different RSA design standards. Runway 5-23 is designed to C-III standards, which is the Airport Reference Code as of 2016 and the standard needed for commercial aircraft such as the Boeing 737. Runway 11-29 is designed to B-III standards, suitable for handling aircraft with slower approach speeds. **Table 1-5** depicts runway RSA dimensions.

Table 1-5. Runway Safety Areas

	5-23	11-29
Runway Design Standard	C-III	B-III
Width	500’	400’
Length	9,038’	8,206
Length Beyond Runway Ends	1,000’	600’

RUNWAY PROTECTION ZONES

Runway Protection Zone (RPZ):
A trapezoid-shaped area off the end of each runway defined by the FAA as a zone to enhance the protection of people and property on the ground.

The Runway Protection Zone (RPZ) is a trapezoidal area off the end of the runway. This area is designated to enhance safety for aircraft operations and for people and objects on the ground. The FAA recommends that incompatible land uses, objects, and activities be located outside of the RPZ. The FAA has issued a Memo titled *Interim Guidance on Land Uses Within a Runway Protection Zone* to help airport sponsors understand what land uses are and are not compatible within the RPZ. The FAA recommends that an airport operator maintain full control of an RPZ, ideally through fee simple property acquisition. If this is not feasible, land use control may be achieved through the use easements. Highway 126 goes through the RPZ at the approach end of Runway 23. Veterans Way and Airport Way pass through the RPZ at the Runway 11 approach end. Since these roads are existing features, current FAA guidance does not require the roads to be moved. Actions that would introduce new incompatible land uses to the RPZ, either by airport or neighboring jurisdiction action, require coordination with FAA Headquarters. **Table 1-6** depicts RPZ standards for the Airport.

Table 1-6. Runway Protection Zone Dimensions for Runway Ends

	Length (ft.)	Inner Width (ft.)	Outer Width (ft.)	Acreage
5	1,700	500	1,010	29.465
23	2,500	1,000	1,750	78.914
11	1,700	500	1,010	29.465
29	1,700	500	1,010	29.465

Source: Airport ALP, AC-13A

TAXIWAY DESIGN AND STANDARDS

The TDG determines taxiway design standards. The TDG relates to the undercarriage dimensions of aircraft, based on the overall Main Gear Width and the Cockpit to Main Gear Distance. TDG also determines the taxiway edge safety margin and shoulder width of taxiways. Taxiway protection is determined by the ADG of the design aircraft. The ADG of an aircraft determines the taxiway protection areas, taxiway separation, and required wingtip clearance for aircraft using the taxiways. The TDG and ADG are determined by critical aircraft, the Q400. The Q400 has a TDG of three and ADG of III. **Table 1-7** depicts TDG three and ADG III standards.

Table 1-7. TDG 3 And ADG III Taxiway Standards	
Taxiway Width	50’
Taxiway Edge Safety Margin	10’
Taxiway Shoulder Width	20’
ADG III Standards	
Taxiway Protection	
Taxiway Safety Area (TSA)	118’
Taxiway Object Free Area (OFA)	186’
Taxilane OFA	162’
Taxiway Separation	
Taxiway Centerline to Parallel Taxiway/Taxilane Centerline	152’
Taxiway Centerline to Fixed or Movable Object	93’
Taxilane Centerline to Parallel Taxilane Centerline	140’
Taxilane Centerline to Fixed or Movable Object	81’
Wingtip Clearance	
Taxiway Wingtip Clearance	34’
Taxilane Wingtip Clearance	27’
Source: AC-13A	

1.3.4 AIRCRAFT APRONS

The Airport has four apron areas: the Air Carrier Apron, General Aviation North Apron, General Aviation South Apron, and the USFS Apron. The aprons serve the landside facilities including the passenger terminal building, the general aviation hangar facilities and FBOs, cargo facilities, and the USFS.

The Airport's aprons locations, sizes, and surface pavements are listed below:

- ✓ Air Carrier Apron, west of the runway intersection (378,675 square feet; concrete)
- ✓ General Aviation North Apron, northwest of the runway intersection (672,003 square feet; asphalt and concrete)
- ✓ General Aviation South Apron, north of the Air Carrier Apron and west of the runway intersection (110,475 square feet; asphalt)
- ✓ USFS, north of the runway intersection (473,175 square feet; asphalt and concrete)

1.3.5 FIXED BASE OPERATORS

FBOs support a wide range of GA aeronautical activities, providing services to aircraft and to pilots, the traveling public, and the airlines. There is one FBO at the Airport. The FBO is located on the North GA Apron, and on the South GA Apron. The FBO offers full service operations which include the following services:

- ✓ Aircraft ground handling
- ✓ Aircraft parking (ramp or tiedown)
- ✓ Fuel (100LL and Jet A)
- ✓ Hangars
- ✓ Nitrogen
- ✓ GPU/Power cart
- ✓ Passenger terminal and lounge
- ✓ Aerial tours/aerial sightseeing
- ✓ Aircraft charters
- ✓ Aircraft maintenance
- ✓ Aircraft cleaning/washing/detailing
- ✓ Aircraft parts
- ✓ Catering
- ✓ Rental cars
- ✓ Courtesy cars (free for pilots to use in the local area
- ✓ Public telephone
- ✓ Computerized weather
- ✓ Flight planning facilities
- ✓ Internet access
- ✓ Restrooms
- ✓ De-ice truck and De-ice Cart (type 1)

1.3.6 AIRCRAFT STORAGE

HANGARS

The Airport has box hangars and T-hangars on the north and south aprons. T-hangars store one aircraft while box hangars can accommodate multiple aircraft. Aircraft have direct access to Taxiway G for the south apron and Taxiway C for the north apron. Both taxiways are parallel to Runway 11-29 and have access to Runway 05-23. **Figures 1-4 and 1-5** show examples of hangars at the Airport. **Figure 1-6** shows the airport building layout.

Figure 1-4. Box Hangars

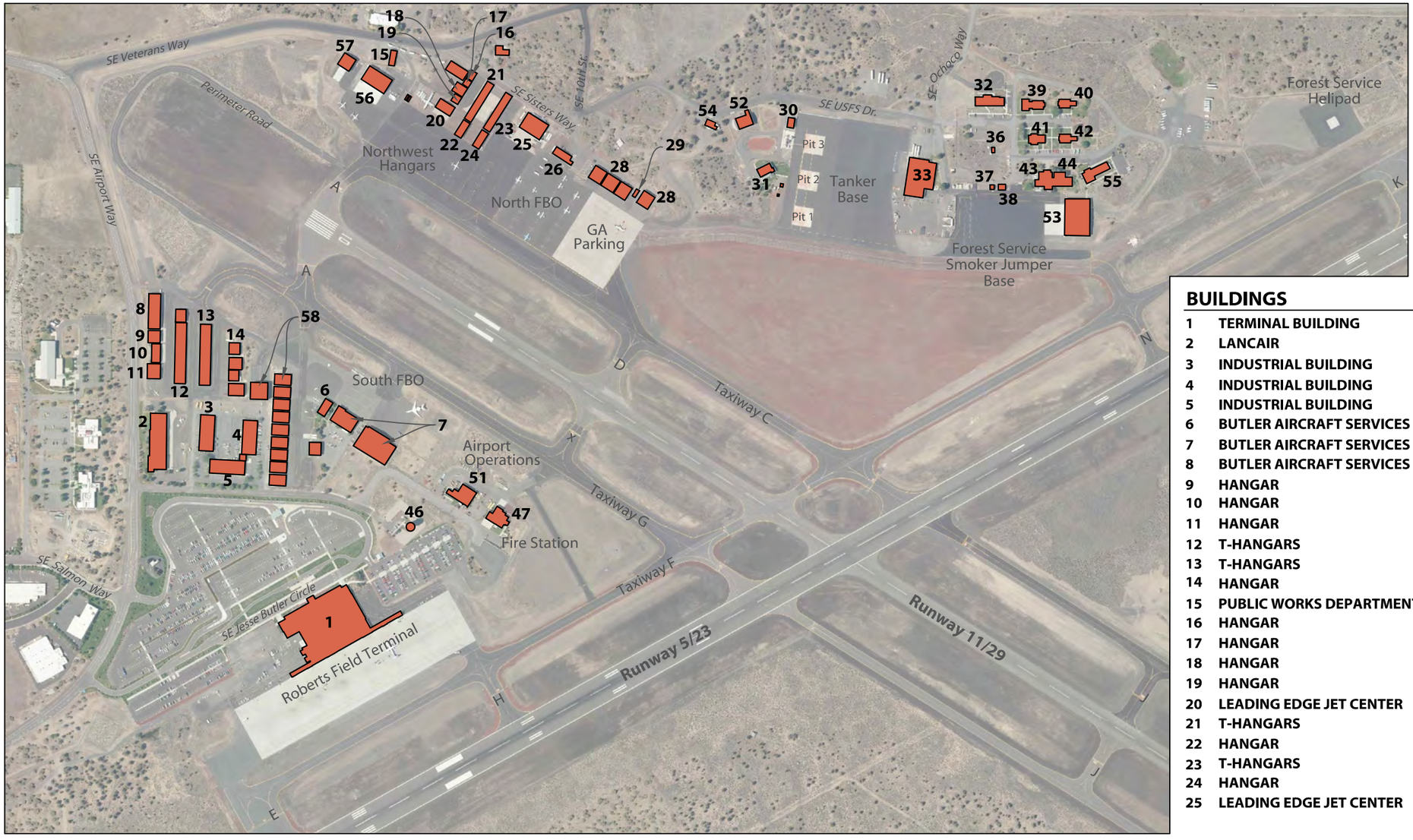
Figure 1-5. T-Hangars

1.3.7 SUPPORT FACILITIES

MAINTENANCE AND SNOW REMOVAL

The Airport has one support facility that houses airport maintenance and Snow Removal Equipment (SRE). The facility is located next to the ARFF and its bays face Taxiway G for quick access. The three storage bays contain plows and other SRE. The storage bay section of the building is approximately 85 feet by 45 feet. The Airport owns and operates the following SRE equipment:

- One 1995 Oshkosh model "HB" all wheel drive
- One 1976 Huber Grader, with a 12' reversible blade
- One 1985 Case Front End Loader
- One 2006 Cat Front End Loader
- Two 20' Pro-Tec snow pushers to attach to a front end loader
- One 12” Pro-Tec snow pusher to attach to a front end loader
- One 22’ reversible ramp plow
- One 2000 Oshkosh model “P” series six wheel, all steer, all wheel drive truck
- Two Bowmonk AFM2 Airfield Friction Meter Mark 3.
- One 1984 Oshkosh model WT-2206 all wheel drive with a 2009 slide in power plant and 20” rotary broom.
- One 2007 Ford F-550 deicing unit.
- One 2014 Wausau SnoDozer 3131



BUILDINGS

1	TERMINAL BUILDING
2	LANCAIR
3	INDUSTRIAL BUILDING
4	INDUSTRIAL BUILDING
5	INDUSTRIAL BUILDING
6	BUTLER AIRCRAFT SERVICES
7	BUTLER AIRCRAFT SERVICES
8	BUTLER AIRCRAFT SERVICES
9	HANGAR
10	HANGAR
11	HANGAR
12	T-HANGARS
13	T-HANGARS
14	HANGAR
15	PUBLIC WORKS DEPARTMENT
16	HANGAR
17	HANGAR
18	HANGAR
19	HANGAR
20	LEADING EDGE JET CENTER
21	T-HANGARS
22	HANGAR
23	T-HANGARS
24	HANGAR
25	LEADING EDGE JET CENTER
26	LEADING EDGE JET CENTER
28	HANGARS
29	AIRFIELD LIGHTING BUILDING
30	FOREST SERVICE
31	AIR TANKER BASE
32	FOREST SERVICE
33	FOREST SERVICE CASHE BLDG.
36	BUILDING
37	WELL PUMP HOUSE
38	STORAGE BUILDING
39	U.S. FOREST SERVICE AIR CENTER
40	U.S. FOREST SERVICE AIR CENTER
41	U.S. FOREST SERVICE AIR CENTER
42	U.S. FOREST SERVICE AIR CENTER
43	FOREST SERVICE
44	FOREST SERVICE
46	AIR TRAFFIC CONTROL TOWER
47	AIRPORT RESCUE & FIRE FIGHTING
51	SNOW EQUIP. & MAINT. STORAGE
52	WAREHOUSE
53	USFS HANGAR
54	SMOKEY HALL
55	FOREST SERVICE OFFICE BUILDING
56	LES SCHWAB HANGAR
57	BPA HELICOPTER HANGAR
58	HANGAR

Figure 1-6
HANGAR BUILDING PLAN

Airport personnel maintain the airfield and Airport-owned buildings. **Figure 1-7** shows the support facility used for maintenance and SRE. The support facility is in good condition. There is space between the support facility and the ARFF for future expansion of either facility should it be necessary.

Figure 1-7. SRE and Maintenance Support Facility

AIRCRAFT RESCUE AND FIRE FIGHTING

The Airport is required to maintain ARFF under Federal Aviation Regulation (FAR) Part 139, which governs the operation of airports with scheduled or unscheduled passenger service by aircraft of more than 30 seats. The Airport is classified with an ARFF Index B designation which applies to airports serving only aircraft that are shorter than 126 feet. The Index B designation specifies equipment types that must be on hand to respond to an aircraft accident. The Airport's ARFF facility is centered between the passenger terminal and the south GA apron with access to Taxiway G. ARFF vehicles include two crash trucks, one ambulance, and a mass casualty incident vehicle. The City of Redmond staffs the ARFF station with one active duty fire fighter at all times.

FUEL FACILITIES

Fuel is offered by the FBO to GA, airlines, military, and USFS. Both 100 low-lead (LL) and Jet A fuel are available from the FBO via full service fuel trucks as shown in **Figure 1-8**, and self-service 100LL is available on the South GA Apron. A list of fuel tanks, their ownership, and fuel type are listed below.

- At SRE building, diesel fuel tank used for SRE and maintenance
- South GA Apron, four tanks. Two are 20,000 gallons with Jet A fuel. One 500-gallon 100 LL fuel.
- North GA Apron, seven tanks. One private use 20,000 gallon Jet A. Two are out of commission and will eventually be removed. Two are out of commission and can be brought back if needed. One is a 20,000-gallon Jet A tank and one 12,000-gallon 100LL tank.

Figure 1-8. Fuel Trucks

UNITED STATES FOREST SERVICE (USFS) REDMOND AIR CENTER

The USFS Redmond Air Center plays a major role in supporting firefighting efforts in Oregon, Alaska, and Washington. Operations depend on the severity of the fire season, which generally lasts from May to October, so the number of operations varies annually. The base typically experiences approximately 780-800 operations per season.

Aircraft operating in and out of the base include C130s, RJ 85s, King Airs, and Sherpas (A and B versions). The USFS has also acquired 16 C130s (H/Q models) that are expected to arrive once reconstruction of Taxiway B is complete in 2017. The base has two aprons capable of accommodating the C130s. The station has an air tanker base on their leased property; hosts training for firefighting and prevention; and processes firefighters and sends them to incidents throughout the service region.

The FBO services the USFS base. The base has and will continue to be visited by traffic from other governmental organizations. Previous visitors include politicians, the Federal Bureau of Investigation, and Air Force One. The base is classified as a hub of operations, incident support base and critical asset for the Federal Emergency Management Agency (FEMA) and related emergency efforts in the event of a large scale natural disaster in the Pacific Northwest, such as an earthquake in the Cascadia subduction zone.

The USFS is planning for an expansion of its facilities to include a visitor center and fire cache on the leased property. The major improvements the base facility needs are improvements to the old roads that lead to the station and the utilities.

1.3.8 PAVEMENT

Pavement management reports are periodically updated to assist airports in the ongoing maintenance of airfield pavements. An airport Pavement Management Program (PMP) assesses the relative condition of the pavement sections and identifies pavement repair and rehabilitation needs and guides capital planning.

Airfield pavements are assessed using a scale known as the Pavement Condition Index (PCI). The PCI inspection assesses the types, severities, and amounts of distress observed in the pavements through a visual inspection. The evaluation is quantified using a scale from 0 (failed) to 100 (new) with ratings applied to individual pavement sections, providing an overall condition report for the Airport. The condition is an indication of the needs for maintenance and/or repair that will be required over a seven-year period. The most recent PCI values at the Airport were calculated in August 2010, and have been updated to reflect construction that has occurred since.

PAVEMENT STRENGTH

An airfield's required pavement strength is determined by aircraft fleet mix. There are two pavement strength classifications, "Utility" and "Other than Utility." Utility pavements are capable of handling aircraft up to 12,500 pounds maximum gross weight (MGW), while Other than Utility pavements can handle aircraft over 12,500 pounds MGW. When the design aircraft exceeds 12,500 pounds as the case at the Airport, the Aircraft Classification Number (ACN)-Pavement Classification Number (PCN) method is used to calculate what the pavement is capable of accommodating.

ACN:
The number that expresses the relative effect of an aircraft at a given configuration on a pavement structure for a specified standard of subgrade strength.

PCN:
A number that expresses the load-carrying capacity of a pavement for unrestricted operations.

The ACN-PCN method of determining pavement strength is intended to be used to report relative pavement strength, and not to be used for pavement design.

Table 1-8 illustrates the standard ACN-PCN reporting format, as described in AC 150/5335-5, *Standardized Method of Reporting Airport Pavement Strength - PCN*.

Table 1-8. Standard ACN-PCN Reporting Format				
	Pavement Type	Subgrade Strength (CBR)	Tire Pressure (psi)	Method of Determination
Numerical Value	R - Rigid	A - High (≥ 13 CBR)	W – no limit	T – Technical Study
		B – Medium (>8 but < 13 CBR)	X – 182-254	
	F - Flexible	C – Low (>4 but ≤ 8 CBR)	Y – 74-181	U – Using Aircraft
		D – Ultralow (≤ 4 CBR)	Z – 0-73	
### / R or F / A, B, C, or D / W, X, Y, or Z / T or U				
Source: Airport Records				

Table 1-9 includes the 2016 published weight bearing capacities for Runway 5-23 and Runway 11-29.

Table 1-9. Published Weight Bearing Capacity			
Runway	Published Weight Bearing Capacity		
	Single Wheel (SW)	Dual Wheel (DW)	Dual Tandem Wheel (DTW)
Runway 05-23	68,000 lbs.	110,000 lbs.	200,000 lbs.
Runway 11-29	28,000 lbs.	40,000 lbs.	N/A
Source: Airport Records			

Table 1-10 includes the recommended weight bearing capacity for Runway 05-23 and Runway 11-29 after using the ACN-PCN method for evaluating pavements.

Table 1-10. Recommended Weight Bearing Capacity – ACN-PCN Method			
Runway	Recommended Weight Bearing Capacity		
	SW	DW	DTW
Runway 05-23	120,000 lbs.	250,000 lbs.	-
Runway 11-29	94,000 lbs.	150,000 lbs.	-
Source: Airport Records			

Other airfield pavements' weight bearing and PCNs are included in **Table 1-11**.

Table 1-11. Other Pavements' Weight Bearing Capacity

Pavement	Weight Bearing Capacity		PCN
	SW	DW	
Taxiway A	68,000 lbs.	91,000 lbs.	26/F/C/X/T
Taxiway B	68,000 lbs.	91,000 lbs.	26/F/C/X/T
Taxiway C	74,000 lbs.	109,000 lbs.	28/F/A/X/U
Taxiway D	74,000 lbs.	109,000 lbs.	28/F/A/X/U
Taxiway E	120,000 lbs.	191,000 lbs.	54/F/C/X/T
Taxiway F	120,000 lbs.	191,000 lbs.	54/F/C/X/T
Taxiway G (East)	81,000 lbs.	121,000 lbs.	29/F/A/X/T
Taxiway G (West)	74,000 lbs.	109,000 lbs.	28/F/B/X/U
Taxiway H	120,000 lbs.	191,000 lbs.	54/F/C/X/T
Taxiway J (South)	81,000 lbs.	121,000 lbs.	29/F/A/X/T
Taxiway J (North)	74,000 lbs.	109,000 lbs.	28/F/B/X/U
Taxiway K	120,000 lbs.	191,000 lbs.	54/F/C/X/T
Taxiway M (South)	81,000 lbs.	121,000 lbs.	29/F/A/X/T
Taxiway M (North)	74,000 lbs.	109,000 lbs.	28/F/B/X/U
Taxiway N	120,000 lbs.	191,000 lbs.	54/F/C/X/T
Air Carrier Apron	76,000 lbs.	100,000 lbs.	29/F/C/X/U
GA North Apron	74,000 lbs.	109,000 lbs.	28/F/B/X/U
GA South Apron	23,000 lbs.	-	8/F/C/X/T

Source: Airport Records

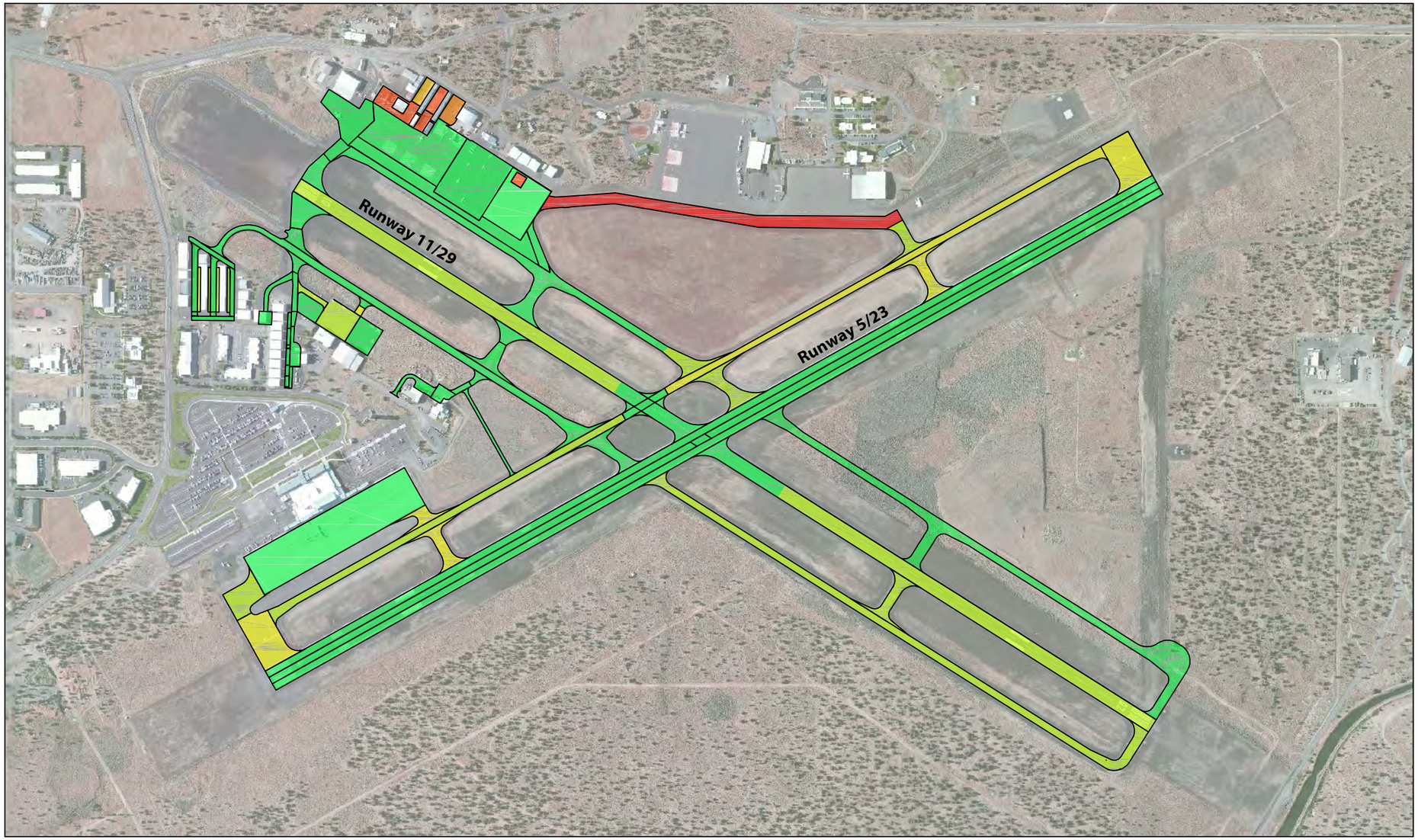


Figure 1-9
PCI Map

1.3.9 NAVIGATIONAL AIDS AND INSTRUMENT PROCEDURES

Aircraft taking off and landing at the Airport rely on instrument procedures, flight patterns, instrument and visual approach aids, and weather observation and communication for safe operations. This section describes these factors in greater detail.

INSTRUMENT PROCEDURES

Aircraft that use the Airport operate under both visual flight rules (VFR) and instrument flight rules (IFR). The Airport has established instrument approach (landing) and departure (take off) procedures that are provided by the ATCT to pilots as they arrive or depart the Airport. Instrument approach procedures are a series of predetermined maneuvers established by the FAA using electronic NAVAIDS. The procedures assist pilots in locating and landing at an airport during low visibility and cloud ceiling conditions. The eleven instrument approach procedures and one instrument departure procedure in effect at the Airport are summarized in **Table 1-12.**

Instrument Meteorological Conditions (IMC):
When visibility is poor and cloud ceilings are below a defined threshold, those are considered instrument meteorological conditions (IMC).

FAA regulations refer to flight relying on instruments as instrument flight rules (IFR), and IMC is occasionally referred to as "IFR conditions."

When visibility and cloud ceiling are above IMC, pilots may elect to fly using IFR or visual flight rules (VFR), which is where the pilot uses visual cues to safely operate the aircraft.

Table 1-12. Instrument Approach & Departure Procedures		
Approach Procedures	**Visibility (Nautical Miles, NM)**	**Descent Minimums (Feet)**
ILS OR LOC RWY 23	½	200
RNAV (RNP) Z RWY 05	7/8	276
RNAV (RNP) Z RWY 23	½	250
RNAV (GPS) RWY 11	7/8	250
RNAV (GPS) Y RWY 05	¾	250
RNAV (GPS) Y RWY 23	½	200
RNAV (GPS) Y RWY 29	1	480
RNAV (GPS) Z RWY 29	1	286
VOR/DME RWY 23	1 ¼	935
VOR-A	1	580
JUNIPER VISUAL RWY 23	Visual	Visual
Departure Procedure	**Takeoff Minimums**	
REDMOND THREE		
✓ RWY 5	Minimum climb of 390 feet per nautical mile (NM) to 13000	
✓ RWY 11	Minimum climb of 406 feet per NM to 13000	
✓ RWY 23	Minimum climb of 356 feet per NM to 13000	
✓ RWY 29	Minimum climb of 358 feet per NM to 13000	

In addition to the published instrument procedures, airlines generally have their own instrument procedures that are tailored to their operations specifications, aircraft types, and levels of crew certification. Airline-specific instrument procedures are proprietary and not used by the public, therefore, they are not included in the Inventory Chapter.

FLIGHT PATTERNS

Flight patterns at the Airport are depicted in **Figure 1-10** (Arrival), **Figure 1-11** (Departure), and **Figure 1-12** (Local). Arrival and departure routes show the typical flight patterns aircraft use when approaching or departing the Airport. Local patterns represent operations that occur around the Airport such as touch and go operations. The tracks shown in the figures represent the majority of flight patterns at the Airport. Weather, wind, ATCT direction, and pilot preference determine flight tracks and which runway end aircraft can use for arrivals and departures. .

Touch and Go
An aircraft maneuver where an aircraft lands, slows, then accelerates and takes off without leaving the runway. It is counted as two operations.

INSTRUMENT AND VISUAL APPROACH AIDS

NAVAIDs are visual and electronic guides that assist pilot navigation. Visual NAVAIDs include lights and wind indicators that can be seen through aircraft windows. Reliance on sight limits the utility of visual NAVAIDs when visibility is poor and at great distances. Electronic NAVAIDs are acquired by instruments onboard aircraft and help pilots navigate and land when it is not possible to do so through visual cues alone. Electronic NAVAIDs include terrestrial antennae that use radio frequencies and satellites that use the global positioning system (GPS). NAVAIDs can be used during all flight conditions and must be used when visibility and cloud ceilings are low enough to be considered instrument meteorological conditions (IMC). NAVAIDs for the Airport are listed in **Table 1-13**, and described in more detail in the section that follows.

- ✓ GPS: A satellite based navigational system
- ✓ MALSR: Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
- ✓ ILS: Instrument Landing System – ground based landing system
- ✓ REIL: Runway End Identifier Lights
- ✓ NDB: Non-Directional Beacon
- ✓ PAPI: Precision Approach Path Indicator
- ✓ VOR/DME: a VHF omnidirectional range (VOR) and distance measuring equipment (DME)

Table 1-13. Navigational Aids Summary by Runway

5-23	11-29
high intensity runway edge lights	medium intensity runway edge lights
Runway End 5	**Runway End 11**
REIL	REIL
VASI	VASI
Runway End 23	VOR A (Category A)
PAPI	GPS overlay
1,400 foot MALSR	**Runway End 29**
ILS	REIL
NDB	PAPI
VOR/DME	GPS

Source: FAA Airport Facility Directory

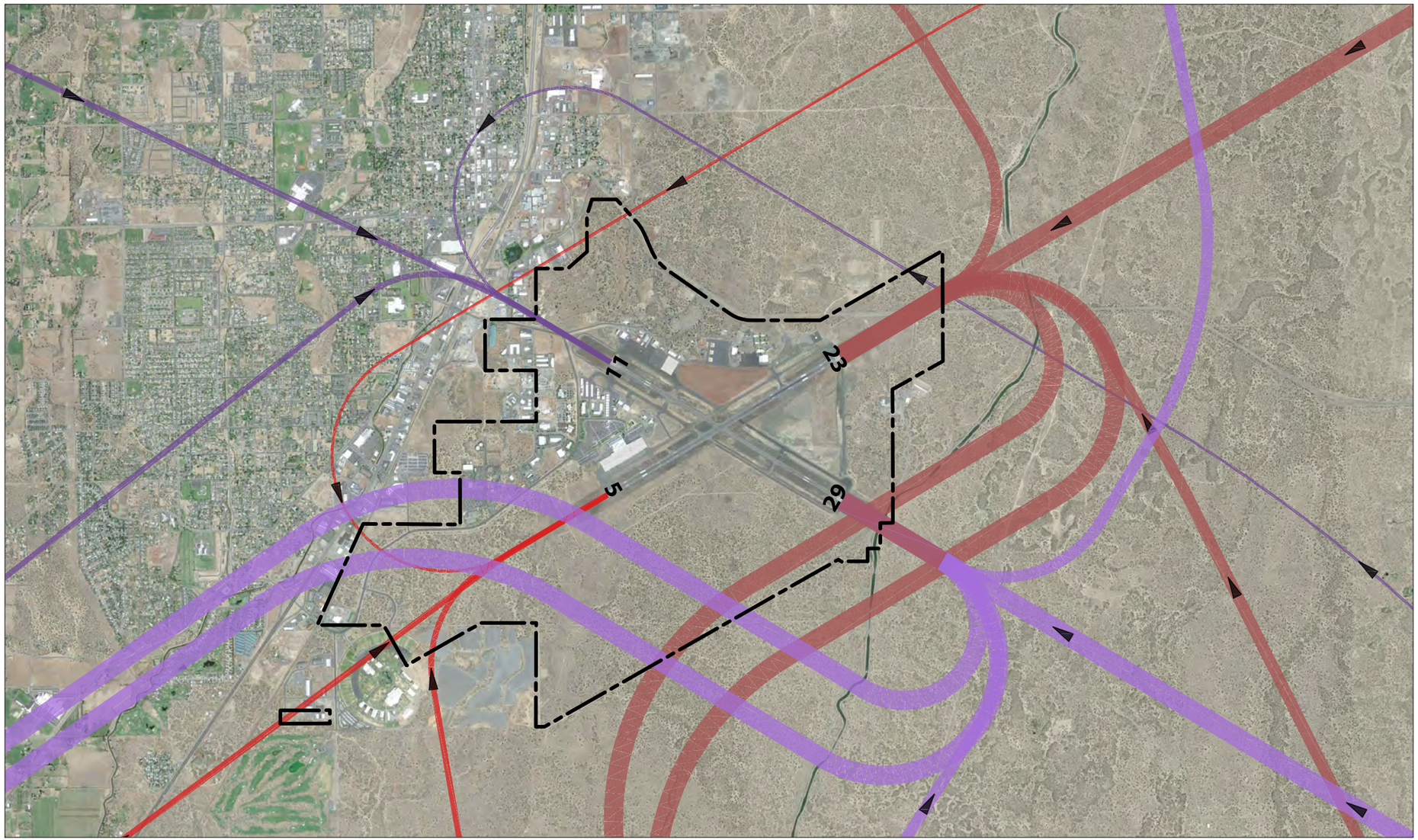
The Airport is equipped with two wind cones, which provide pilots with an indication of wind direction and speed. One wind cone is located next to the intersection of Taxiways F and G and is lighted. The second wind cone is located between the GA north apron and Runway 11-29 and is not lighted.

AIR TRAFFIC CONTROL AND COMMUNICATIONS

FAA's Air Traffic Services division manages the National Airspace System (NAS) using a series of control centers that have control or authority over different segments of aircraft travel:

- ✓ Airport Traffic Control Tower (ATCT)
  - May be run by FAA, or Contractor (The RDM ATCT is run by SERCO)
  - The vicinity of the airport
- ✓ Terminal Radar Approach Control facilities (TRACON)
  - Multiple airports (The Airport approach/departure control is operated by Seattle Center)
- ✓ Air Route Traffic Control Centers (ARTCC)
  - Regional area (The Airport controlled by Seattle Center)
  - Controls aircraft en-route

Airspace administered by the FAA is classified as either "controlled" or "uncontrolled," and defined as one of six classifications. Airspace designated as Class A, B, C, D, and E is controlled airspace, and Class G airspace is uncontrolled airspace. Class F airspace is not used in the United States. **Figure 1-13** depicts the airspace and aeronautical setting surrounding the Airport.



Property Line

Arrival Flight Track Track (Runway 11)

Arrival Flight Track Track (Runway 29)

Arrival Flight Track Track (Runway 5)

Arrival Flight Track Track (Runway 23)

N

0' 1,500' 3,000'

Figure 1-10
ARRIVAL FLIGHT PATTERNS

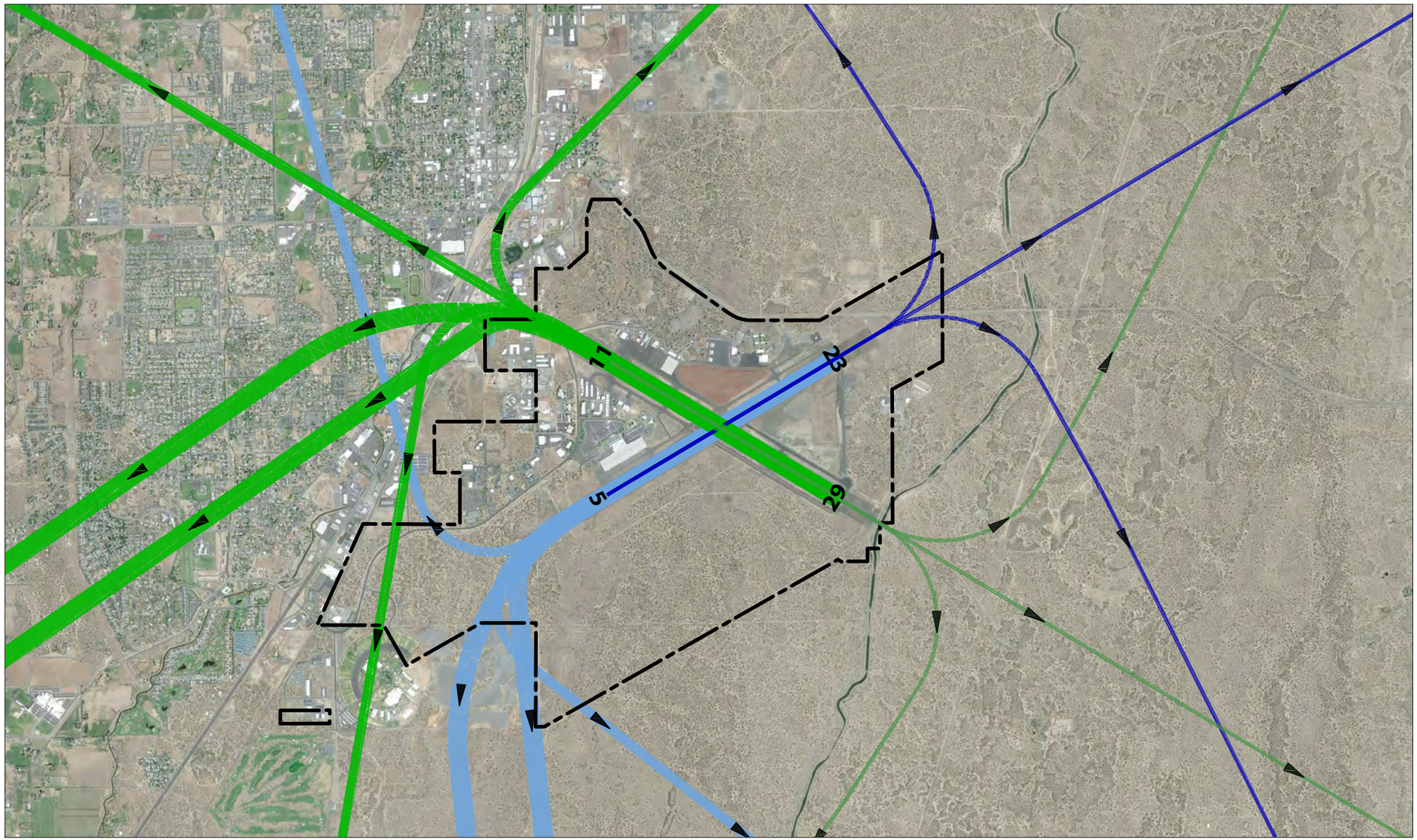


Figure 1-11
DEPARTURE FLIGHT PATTERNS

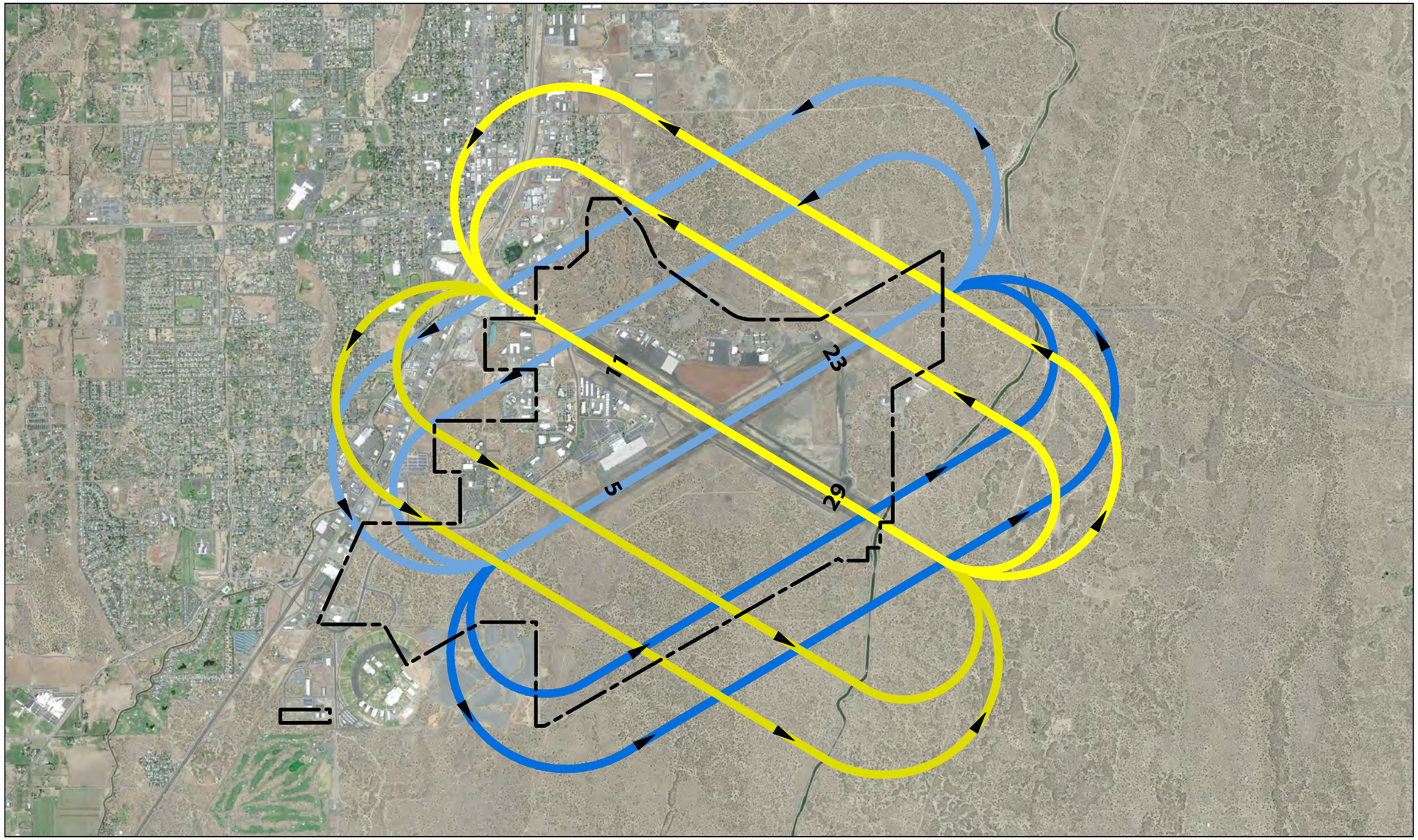
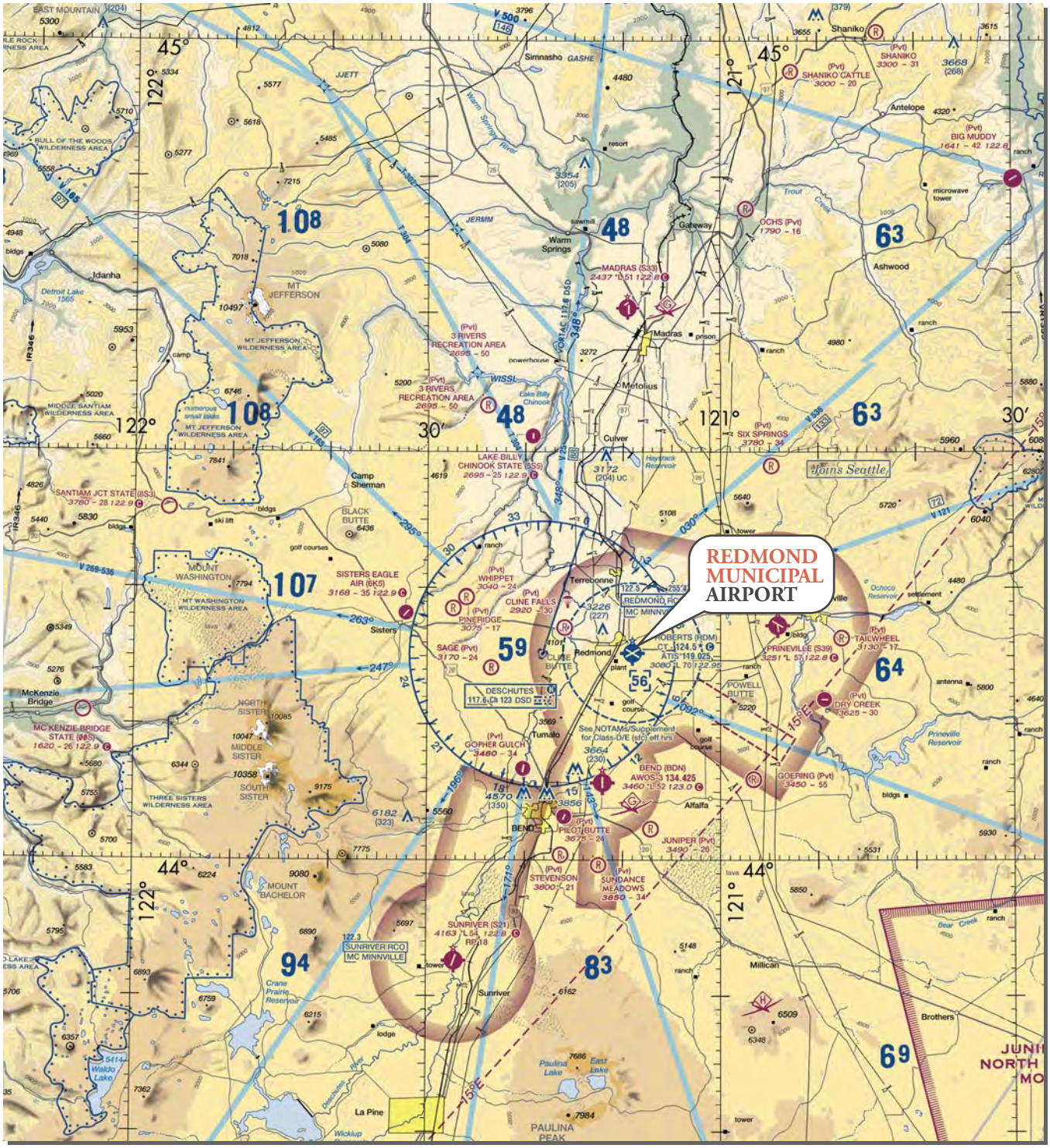


Figure 1-12
LOCAL FLIGHT PATTERNS



Source: *Sectional Aeronautical Chart: Seattle (December 2016, Klamath Falls (March 2017)*

Figure 1-13
AIRSPACE/NAVAIDS SUMMARY

The ATCT, located just to the northeast of the terminal, is a contract tower run by a private company. It is not owned by the FAA and the staff are not FAA employees. The airspace around The Airport is Class D airspace when the ATCT is in service. When the ATCT is not in service, the Airport operates under a Class E airspace designation. IFR operations in vicinity of the Airport are in contact with the Seattle ARTCC, which provides pilots with altitude, aircraft separation, and route guidance.

Pilots flying to the Airport are able to gather information about the Airport from a variety of information sources. The McMinnville Flight Service Station (FSS), another part of FAA's Air Traffic system, provides pilots with pre-flight briefings, assistance with opening and closing flight plans, pilot reports, weather reports, and notices to airmen. Weather information at RDM is broadcast by the automated surface observation system (ASOS).

1.3.10 CLIMATE – WIND AND WEATHER CONDITIONS

WIND

Wind observation data comes from the ASOS. The wind rose shows that prevailing winds come from the northwest and the south-south east. **Figure 1-14** illustrates the all-weather wind rose for the Airport. Inner circle increments that expand outwards represent the total number of observations. Numbers on the outside of the circle from 0 to 36 represent the direction from which the wind is prevailing. Colors represent the speed of the wind in knots. Colors will stretch out towards the edge of the circle for directions from which the wind is prevailing during observations. The observations occurred between 2006 and 2015.

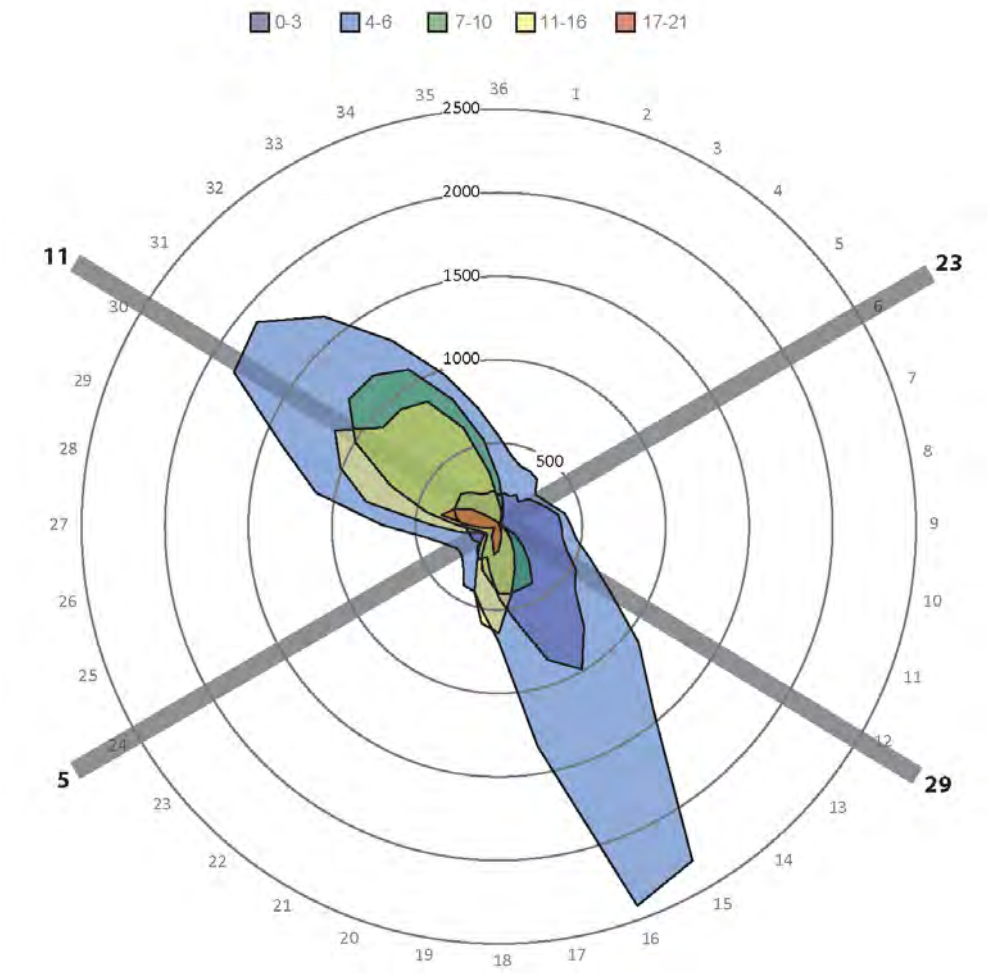
Wind data is vital for aircraft operations. Aircraft performance is enhanced when taking off and landing into the wind, and there are limits to how much crosswind and tailwind aircraft can handle. Wind direction and speed information helps pilots and air traffic control select the most appropriate runway for operation.

FAA standards for crosswind coverage are one of several factors that go into determining how many runways are needed, and what direction they should face. FAA standards state that runways should provide at least 95-percent coverage for aircraft that are expected to use the airport at least 500 times per year. Crosswind runways may be employed to improve wind coverage throughout the year and meet FAA criteria. The allowable crosswind component for each Runway Design Code is included in the **Table 1-14** below:

Table 1-14. Crosswind Component	
Runway Design Code	**Allowable Crosswind Component**
A-I and B-I*	10.5 knots
A-II and B-II	13 knots
A-III, B-III, C-I through C-III, D-I through D-III	16 knots
A-IV and B-IV, C-IV through C-VI, D-IB through D-VI	20 knots
E-I through E-VI	20 knots

*Includes A-I and B-I small aircraft

Figure 1-14. All Weather Wind Rose



Source: FAA Airports Wind Rose Generator.

WEATHER

In addition to wind, temperature and precipitation affect aircraft operation. For example, high temperatures can increase required takeoff distance, which could alter takeoff power settings and require payload reduction. Precipitation can negatively impact braking during landing. The frequency and amount of snow influences the type and number of SRE necessary, which has equipment and material storage implications. Weather data comes from the ASOS at the Airport to provide an idea of the local climate in the area. Key weather conditions are listed in **Table 1-15** below.

Table 1-15. Weather Conditions

Average Annual Temperature	Maximum	62.1° F
	Minimum	32.7° F
	Average Hottest Month	July: 85.5° F
	Average Coldest Month	January: 22.2° F
Precipitation	Average Annual Total	8.64 Inches
	Average Monthly Maximum	January/December: 1.60 Inches
Snowfall	Average Annual Total	19.7 Inches

Source: Western Regional Climate Center, Redmond ASOS Station Data 1948 – 2016.

WEATHER OBSERVATION AND COMMUNICATION

Information about weather conditions is important to pilots as they make navigation decisions. The weather system in place at The Airport is an Automated Surface Observing System (ASOS). The monitoring units in this system are operated jointly by the National Weather Service, the FAA, and the Department of Defense.

When the ATCT is closed, there are communication systems in place to help pilots communicate with each other and gather information about the conditions at the airport and in the surrounding area. These include:

- Common Traffic Advisory Frequency (CTAF): A radio frequency, specific to each airport, used for communication between pilots operating at, and in the vicinity of, an Airport. The frequency for The Airport is 124.5. The CTAF is used during hours that the ATCT is closed.

- ✓ Universal Communication (UNICOM) station: An air-to-ground communication facility. The frequency for The Airport is 122.95. A pilot might use a UNICOM to communicate fuel needs or other requests to a FBO.
- ✓ Automatic terminal information service (ATIS): A continuous broadcast of recorded information, such as weather, active runways, available approaches and NOTAMs information, on a frequency specific to each airport. The frequency for The Airport is 119.025.

1.3.11 AIRFIELD MARKING AND LIGHTING

Airfield marking and lighting enhance pilot situational awareness and wayfinding. FAA guidance for airfield markings is defined in AC 150/5340-1, *Standards for Airport Markings* and AC 150/3540-30H *Design and Installation Details for Airport Visual Aids.* This section describes these elements.

RUNWAY MARKINGS

Runway markings are white in color and schematics depend on the approach category of the runway. The markings include the runway end designator, centerline, a threshold bar, aiming point, touchdown zone, and runway edge markings. Runway 05-23 is marked with precision instrument runway (PIR) markings and Runway 11-29 is marked with non-precision instrument runway (NPI) markings.

Table 1-16 lists the runway markings for Runway 05-23 and 11-29.

Runway end designator:
Numbers that identify the magnetic heading of a runway.

Centerline:
Dashed markings that denote the center of the runway.

Threshold bar:
Denotes the beginning of the runway available for landing.

Aiming point:
Provides a visual aiming point for landing operations.

Touchdown zone:
For landing operations, identifies the touchdown zone along a precision runway in 500-foot increments.

Runway edge markings:
Provide enhanced visual contrast between the runway edge and the surrounding terrain or runway shoulders and delineates the width of the suitable paved area for runway operations.

Table 1-16. Runway Markings

Marking	Runway 05-23 (PIR)	Runway 11-29 (NPI)
Runway end designator	X	X
Centerline	X	X

Threshold bar	X	X
Aiming point	X	X
Touchdown zone	X	
Runway edge markings	X	

Source: Airport Pavement and Marking Plan

TAXIWAY MARKINGS

Taxiway markings consist of yellow centerline and enhanced centerline markings, and hold position signs painted with white inscriptions on red backgrounds.

Centerline:
Continuous markings that denote the center of the taxiway.

Enhanced centerline:
Additional dashed markings on both sides of the centerline to provide visual cues of an upcoming runway hold position.

RUNWAY LIGHTING

Runway 05-23 has high-intensity runway edge lighting (HIRL), consistent with the runway's precision instrument approach capability. Runway 05 is equipped with a four-box visual approach slope indicator (VASI). Runway 23 is equipped with a four-box precision approach path indicator (PAPI).

Runway 11-29 has MIRL. Runway 11 is equipped with a four-box VASI and Runway 29 is equipped with a four-box PAPI. Both runway ends are equipped with REIL, where the pilot sees all red lights when the approach is too low, all white lights when the approach is too high, and both red and white lights when on the appropriate glide path.

HIRL/MIRL:
High/Medium Intensity Runway Lights include white edge lights (with amber lights near the runway ends to indicate runway remaining) and runway threshold lights. The threshold fixtures have split lenses (green/red) indicating the beginning (green) and end (red) of the runway.

REIL:
Runway End Identifier Lights are two synchronized unidirectional flashing lights that help to identify the runway when it is less distinct from its surroundings or during periods of low visibility.

VASI:
VASI project a beam of light having a white segment in the upper part of the beam and red segment in the lower part of the beam. VASIs perform a function similar to the PAPI.

PAPI:
PAPI project light along a standard glide path to a runway end, with red and white colored lights indicating the aircraft's vertical position (above, below, or on glide path) relative to the defined glide path.

TAXIWAY LIGHTING

The taxiways at the Airport are equipped with blue medium-intensity taxiway edge lighting.

OTHER LIGHTING

The Airport has a rotating beacon mounted on a tower support on the north side of the airfield. Rotating beacons are used to indicate the location of an airport to pilots flying at night or during reduced visibility. The beacon provides sequenced white and green flashing lights that rotate 360 degrees.

The Airport has a lighted wind cone located on the west corner of the Taxiway G and Taxiway F intersection.

Additional overhead lighting is located in the terminal area, aircraft parking aprons, and in the hangar areas. There are red obstructions lights mounted on the top of several airport structures and on near-airport obstructions including street lights.

1.3.12 OTHER AIRSIDE FACILITIES

Fencing and gates and service roads are airside facilities that fall outside of these previous categories are briefly discussed in this section.

FENCING AND GATES

The Airport has perimeter chain-link fencing with barbwire around the airfield perimeter to help prevent unauthorized access. Security gates provide access to the FBO, GA hangars, USFS, and controlled movement areas of the airfield.

SERVICE ROADS

The Airport has a system of service roads that extend around the property perimeter to provide access to the various NAVAIDs and weather system and to transition between landside facilities.

The air carrier apron has a white painted two-lane vehicle service road along the northwest side of the apron that provides access the terminal building. A paved vehicle service road extends from the south side of Taxiway A around the Runway 11 end to the north side of Taxiway A. An additional paved service road connects the ARFF station to Taxiway F.

The Airport has a gravel perimeter road that follows the perimeter fence around the Airport operations area. Additional gravel vehicle service roads provide access to the runway approach lighting systems, NAVAIDs, weather observation system, and the airport surveillance radar.

1.4 LANDSIDE FACILITIES

1.4.1 AIRPORT ACCESS AND VEHICLE PARKING

LOCAL ROAD NETWORK

The Airport is served by local two-lane, paved roads referred to as the local road network. Airport Way, which is the main road serving the Airport, intersects Highway 97 south of the Airport at the Deschutes County Fairgrounds. Airport Way connects with Veterans Way near the northwest corner of the Airport. Veterans Way connects to Highway 97 approximately one-half mile west of the Airport and is the Airport's main access point.

VEHICLE CIRCULATION FOR NON-AVIATION FACILITIES

The primary roads serving the Airport include Airport Way and Veterans Way runs along the west side of the Airport. Additionally, a network of paved local streets serves the nearby non-aviation uses. **Table 1-17** summarizes the Airport roadways, organized by classification.

Table 1-17. Airport Roadways By Classification		
Roadway Classification	**Roadway Name**	**Airport Development Area**
Major Arterial	OR Highway 126 (Ochoco Highway)	North Development Parcel North Business Park USFS Campus
Minor Arterial	19th Street	Fairgrounds Industrial Subarea
Minor Arterial	Airport Way	Airport Way Subarea Fairgrounds Industrial Subarea South Apron Side GA Subarea West Business Park
Minor Arterial	Veterans Way	North Business Park North Development Parcel West Business Park
Major Collector	Salmon Drive	West Business Park
Major Collector	Veterans Way	North Business Park
Local Street	1st Street	West Business Park
Local Street	2nd Court	West Business Park
Local Street	4th Street	West Business Park
Local Street	6th Street	South Apron Side GA Subarea West Business Park
Local Street	10th Street	North Business Park
Local Street	21st Street	Fairgrounds Industrial Subarea
Local Street	23rd Street	Fairgrounds Industrial Subarea
Local Street	Badger Avenue	Fairgrounds Industrial Subarea
Local Street	College Way	West Business Park
Local Street	Deerhound Avenue	Fairgrounds Industrial Subarea
Local Street	Mt. Hood Drive	Airport Way Subarea
Local Street	Lake Road	North Development Parcel
Local Street	Ochoco Way	USFS Campus
Local Street	Pumice Avenue	West Business Park
Local Street	Reindeer Avenue	West Business Park
Local Street	Salmon Avenue	South Apron Side GA Subarea West Business Park
Local Street	Sisters Way	North Business Park USFS Campus
Local Street	Tamarack Court	West Business Park
Local Street	Timber Avenue	West Business Park
Local Street	Umatilla Avenue	West Business Park
Local Street	USFS Drive	USFS Campus
Local Street	Wickiup Avenue	Airport Way Subarea

The intersection at Veterans Way and Airport Way is planned to be realigned as part of a separate project. Preliminary designs by the City of Redmond propose a new roundabout near the intersection of 1st Street and Veterans Way to provide expanded access and service to the North Development Parcel.

AUTOMOBILE PARKING FOR NON-AVIATION FACILITIES

Parking requirements for non-aviation uses at the Airport are defined by the City of Redmond Development Code, Section 8.0500. The City requires developments to provide a minimum number of parking spaces based on land use and specifies the dimensions of the standard parking and compact parking spaces as well as the width of the aisles.

TERMINAL AREA AUTO PARKING AND GROUND TRANSPORTATION

The passengers departing from the Airport have multiple options to access the terminal building. They may use the public parking lot for their private vehicles, can be dropped off at the curb by personal vehicles, or be delivered by taxis or shuttles. The employees have a separate parking area near the terminal separate from the passenger lot and the Airport vendors also have assigned parking separate from employee parking.

The long and short term parking lot (combined facility) accommodates 1,083 vehicles at a rate of $1.00 for each half hour, up to a daily maximum of $10.00. The seventh day is free.

The employee parking lot accommodates 189 vehicles and the vendor lot can accommodate 6 vehicles in marked parking stalls. The vendor lot can accommodate more vehicles besides the marked parking stalls.

GENERAL AVIATION AND OTHER FACILITIES AUTO PARKING

Table 1-18 lists the various aviation related parking areas at the Airport and provides a breakdown of the vehicle parking spaces by standard and the Americans with Disabilities Act (ADA) compliant spaces.

Table 1-18. Vehicle Parking

Location Identifier	Facility	Parking Spaces	
		Standard	ADA
1	FAA Airport Traffic Control Tower	8	1
2	South Apron Private Hangar – RDD Enterprises	21	2
3	Aircraft Rescue and Firefighting (ARFF)	10	2
4	Snow Removal Equipment (SRE)	3	1
5	South GA Apron FBO Building #1	35	1
6	South GA Apron FBO Building #2	6	0
7	Public Works Department	15	1
8	North GA Apron FBO	15	0
9	North Apron Private Hangars – BPA and Les Schwab	28	3
10	USFS	228	6

1.4.2 UTILITIES

Utilities are significant elements in the immediate and long-range planning for the Airport. The Airport's location on the eastern edge of the City of Redmond city limits is in a generally commercial and light industrial region. The Airport currently holds several property interests both adjoining the Airport facility and in the surrounding vicinity. To consider these properties for future expansions would require analysis of the existing utilities and the potential of utility enhancements. This section of the report addresses the location, size, and general feasibility of using existing Airport property utilities for new airport development alternatives.

Figure 1-15 identifies development areas the Airport is considering for future development alternatives:

- USFS Campus: The northern area servicing the Redmond Air Center and Forest Service operations adjacent to Taxiway B.
- North Side GA: The apron, FBO, and hangars along the north side of the Airport, accessed by and south of SW Sisters Avenue.
- North Business Park: The area south of Hwy 126 and north of SW Sisters Avenue characterized by rocky juniper and sage terrain with sparse existing development.
- North Development Parcel: The old Redmond golf course land bound on the northwest by SE Lake Road, on the northeast, by Hwy 126, and to the south, by Veterans Way.
- South Side GA: The hangars, FBO, and businesses bound to the west by Airport Way, to the south, by Salmon Avenue, and accessing the Airport by Taxiways A and G.
- Terminal: The terminal area.
- West Business Park: The commercial/light industrial area to the west of Airport Way in which the Airport holds several property interests.
- Airport Way Subarea: The area of land west of Airport Way and immediately north of the Deschutes County Fairgrounds.
- Fairgrounds Industrial Subarea: The area of land west of 19th Street and south of Airport Way.

The sub-areas identified for this report and designated for potential future expansion appear to have sufficient existing utilities in close proximity. The USFS Campus and potentially parts of the North Side GA are the exception. Most of the utilities in this area appear to be insufficient for future expansion because they were sized to serve only the area of the USFS Campus.

The following sections discuss each utility providing service on or in the vicinity of the Airport as depicted in **Figure 1-16 through 1-19.**

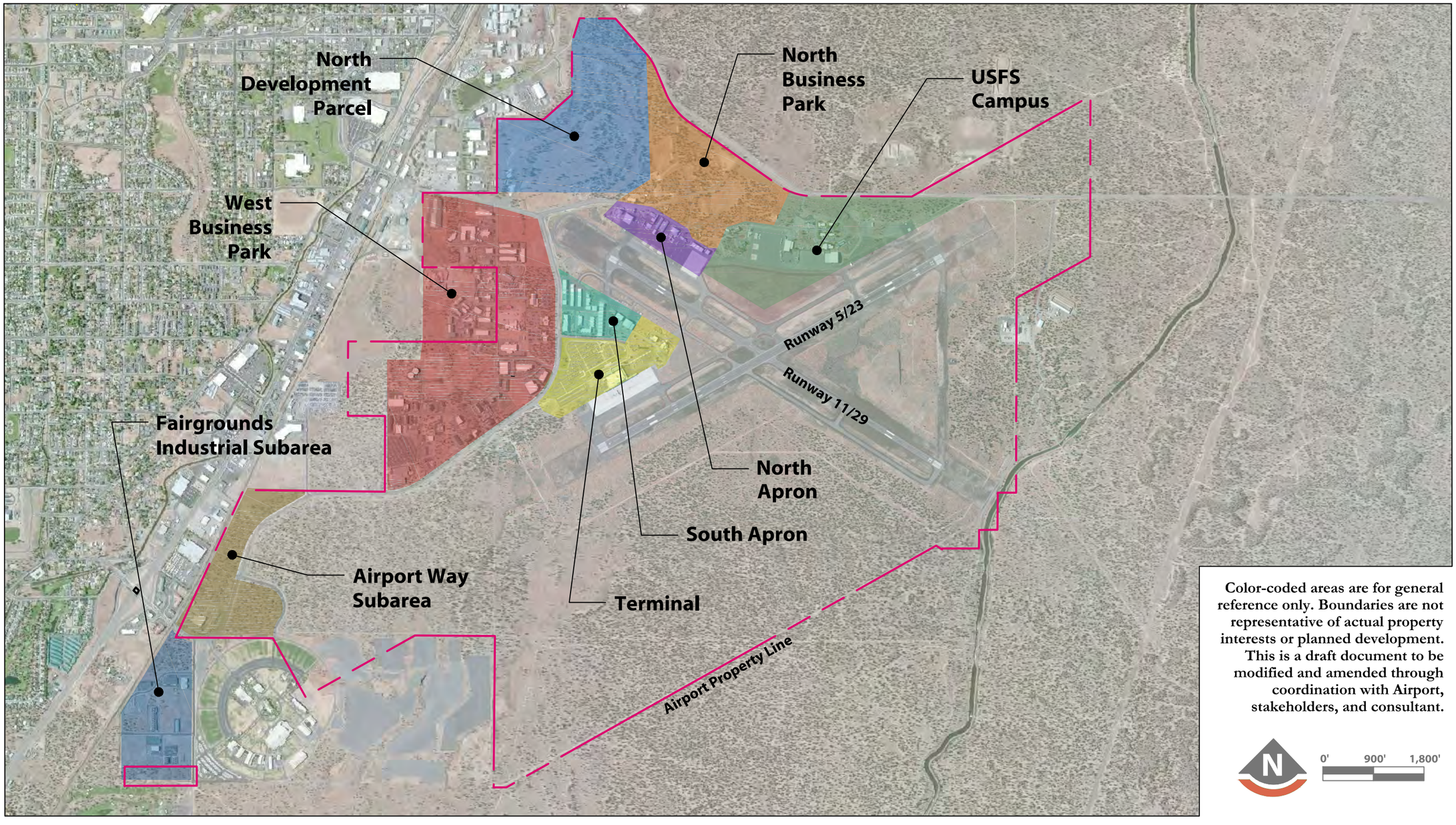
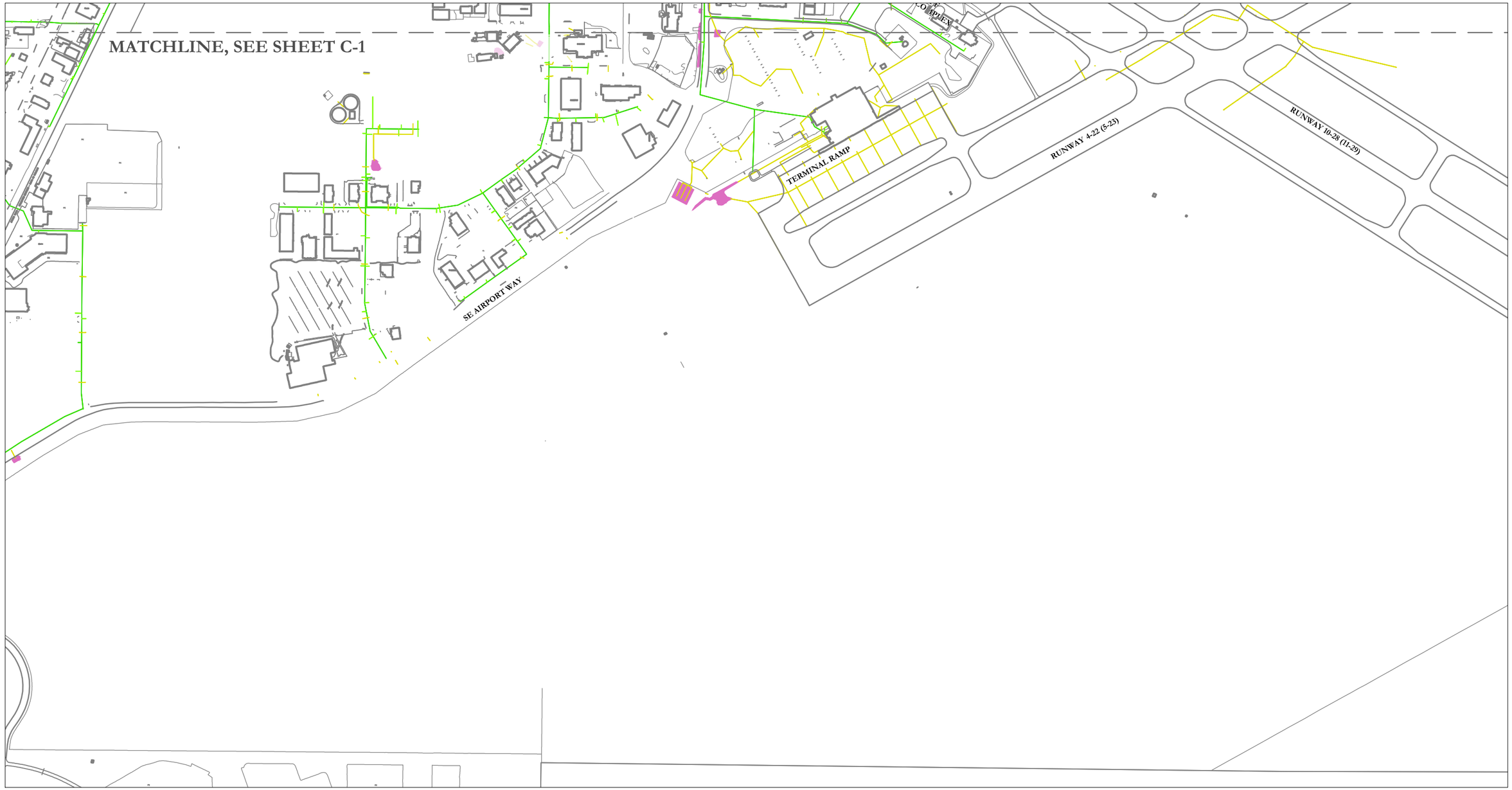


Figure 1-15
Development Areas

LEGEND:

- STORM PIPE
- SEWER MAIN
- SEWER LATERAL
- STORM DETENTION BASIN

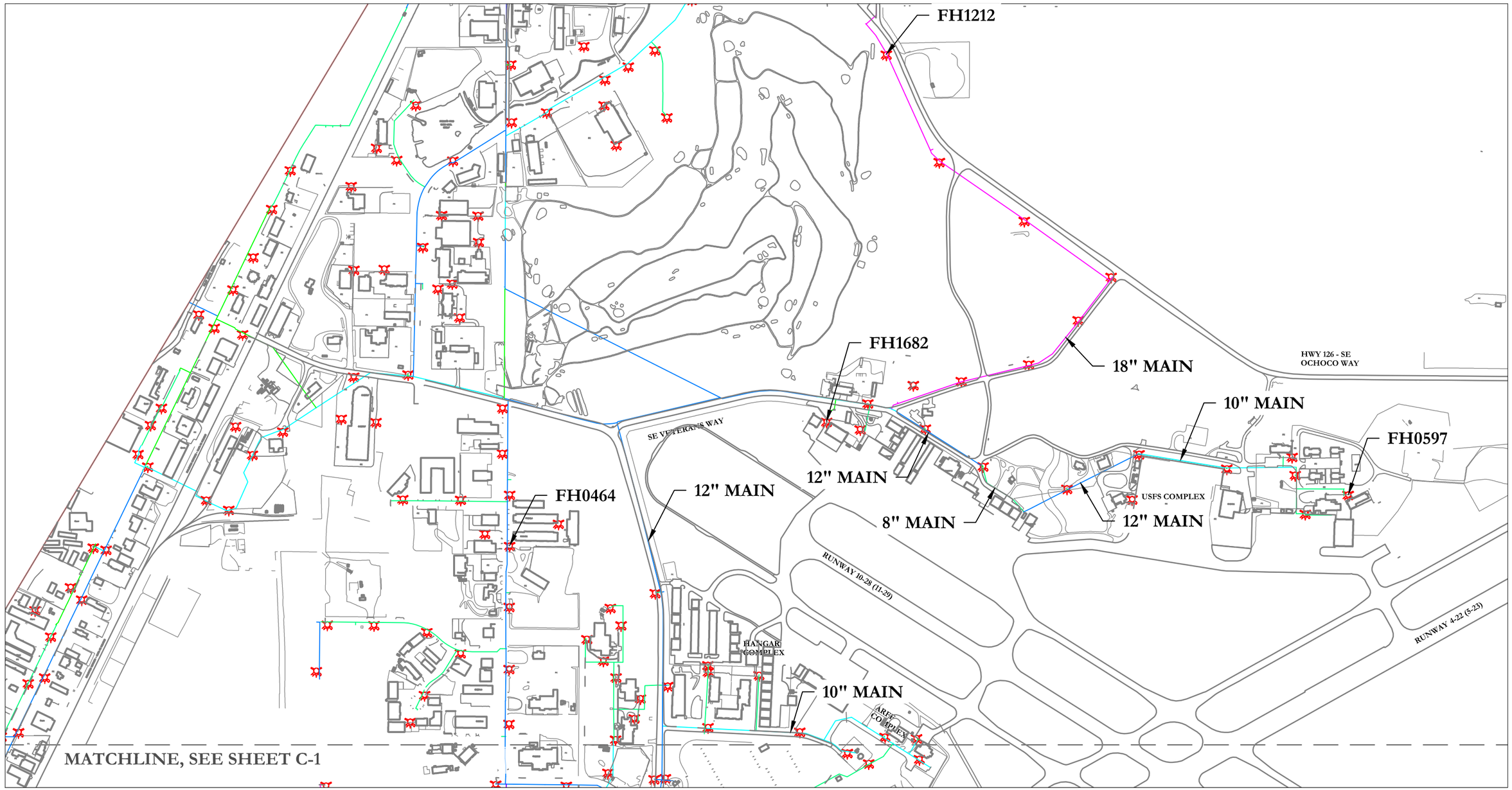
Figure 1-16
EXISTING STORM AND SEWER MAINS AND LATERALS



LEGEND:

- STORM PIPE
- SEWER MAIN
- SEWER LATERAL
- STORM DETENTION BASIN

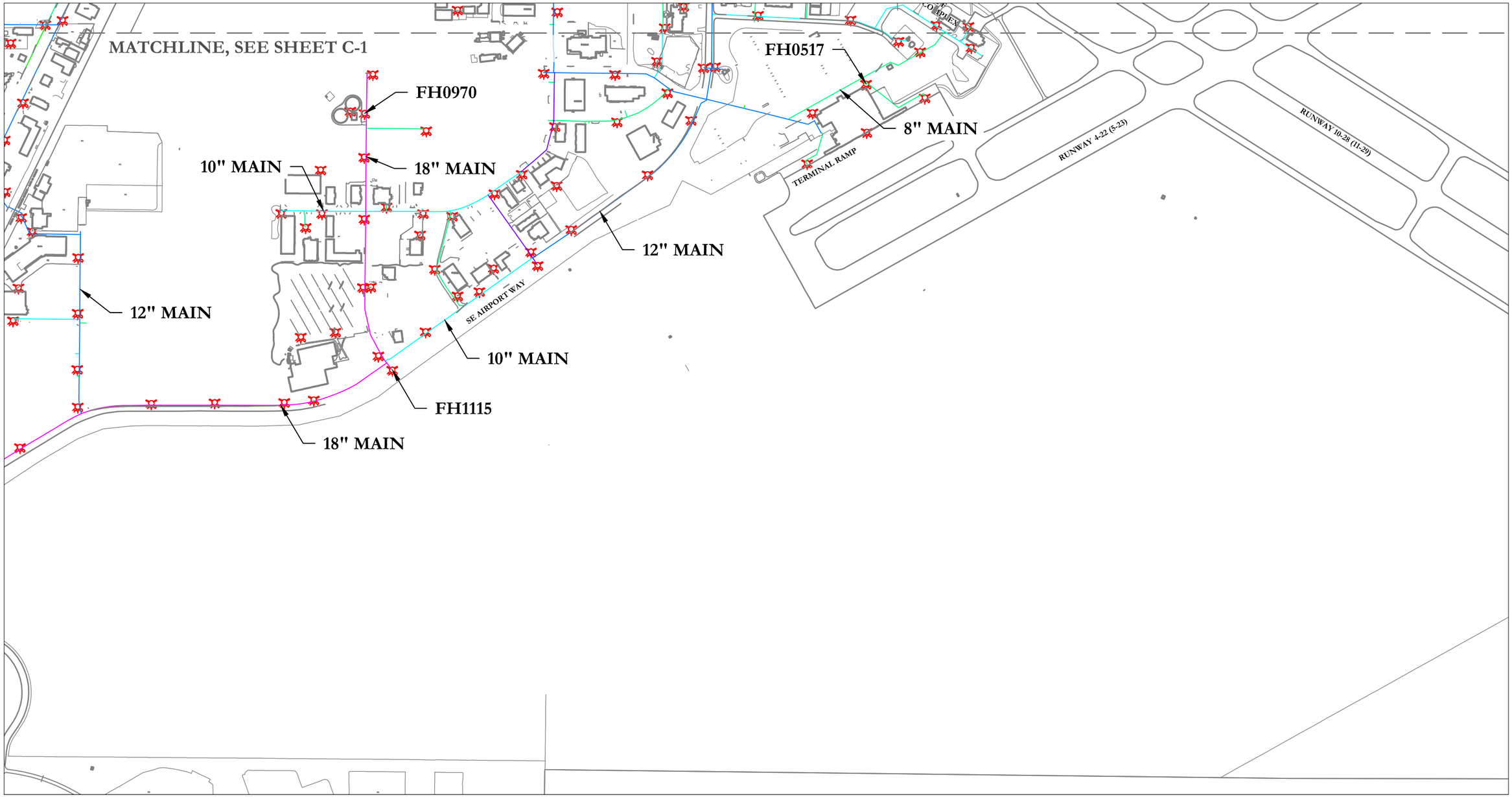
Figure 1-17
EXISTING STORM AND SEWER MAINS AND LATERALS



LEGEND:

- 6" MAIN
- 8" MAIN
- 10" MAIN
- 12" MAIN
- 14" MAIN
- 16" MAIN
- 18" MAIN
- EXISTING HYDRANT

Figure 1-18
EXISTING WATER
MAINS AND LATERALS



LEGEND:

- 6" MAIN
- 8" MAIN
- 10" MAIN
- 12" MAIN
- 14" MAIN
- 16" MAIN
- 18" MAIN
- EXISTING HYDRANT

Figure 1-19
EXISTING WATER MAINS AND LATERALS

ELECTRIC

Pacific Power (PPL) provides electrical service to the Airport. Discussions with representatives of PPL for this report did not reveal imminent plans for expansion of services beyond the existing overhead and buried circuits servicing the Airport and its surrounding area. As of 2016, one circuit feeds the airport area. A second circuit around the fairground area may be able to be extended to airport, if needed. PPL's position is Airport load growth would drive any expansion. The suggestion is the 2016 level of electrical service in the vicinity of the Airport should suffice for some expansion alternatives, though development beyond the current reach of PPL's circuits would require extension. In the event of development plans proceeding, early coordination with PPL would be required to discuss load growth in a specific location. At that time, PPL would determine whether or not a system impact study is needed, along with a re-evaluation the system.

SEWER

The City of Redmond provides sanitary sewer service to the Airport and its surrounding areas. Redmond's Water Pollution Control Facility is located in the northwest corner of the City. **Figures 1-16 and 1-17** show the gravity mains that serve the areas considered for this report. Mains that follow Airport Way to Veterans Way heading northwest serve the West Business Park, Terminal, and South Side GA areas. A main that runs along Veterans Way and Sisters Avenue serves the North Side GA and abuts the southern edge of both the North Business Park and the North Development Parcel. Another main that originates at the USFS Campus before heading north to intersect Hwy 126 then runs northwest in parallel serves the northern edges of these two development areas. As with the water service at the USFS Campus, additional development adjacent to or requiring use of that area's sewer system would benefit from further analysis.

WATER

The City of Redmond provides water service to the Airport and its surroundings. All of Redmond's water is produced from subsurface wells, stored in reservoirs, and distributed throughout the city through its system of booster pump stations and pipes. The City's Public Works Department monitors, tests, and maintains this water system and stores utility inventory data on the department's Esri-based GIS mapping database. The development areas considered for this report except for the Fairgrounds Industrial Subarea are served by the City's Pressure Zone 2.

Discussion with the Public Works Department indicates that the areas on and around the Airport are adequately served with water for the needs. As depicted in **Figures 1-18** and **1-19**, a water system consisting of pipes ranging in diameter from 12-inches to 18-inches serves the majority of the development areas under consideration. An 18-inch main extends north along Airport Way until SW 6th Street where it extends to the street's terminus. This large-diameter main serves the Airport Way Subarea and the West Business Park.

A 12-inch main follows Airport Way from the intersection of Airport Way and 6th Street through the intersection with Veteran's Way. This 12-inch main and several 10-inch branches along their entire route effectively serve the Terminal area and the South Side GA area, and borders the southern edge of the North Development Parcel and the western edge of the North Side GA. An 18-inch main running parallel to Hwy 126 and angling south along Veterans Way serves the remainder of the North Development Parcel and the North Business Park. All of these areas are anticipated to accommodate development of future water demand.

The USFS Campus and potentially parts of the North Side GA are the exception to sufficiency of the 2016 service capacity for future expansion. An inconsistent series of pipes ranging between eight and 12 inches in diameter serves the USFS Campus. Fire hydrant flow testing performed by the City of Redmond Public Works Department in December 2016 confirmed that flows are approximately 1,100 gallons per minutes (gpm) for hydrants throughout the development areas under consideration. The USFS Campus, however, sees flows of approximately 850 gpm, which is insufficient for expansion of water demand without upgrades to the water infrastructure in this area as of 2016. The Public Works Department recognizes this area as one that most likely would require water infrastructure upgrades prior to any future expansion.

Table 1-19 summarizes the fire flows determined through hydrant testing for this report.

Table 1-19. RDM Fire Hydrant Flow Test Inventory

Hydrant ID	Static Pressure (ft)	Flow (gpm)	Location
FH1212	58	1175	Hwy 126 (300' S of SE 9th St.)
FH0597	50	856	USFS NE of Paraloft (Inside FS fence)
FH1682	55	1162	Les Schwab Hangar (Inside fence)
FH0464	69	1256	1842 SE 1st St.
FH0517*	53	1300	Airport (N end of Terminal)
FH0970	60	1175	2551 SW 6th St. (Innovation Park)
FH1115	56	1138	SW Airport Way & SW 6th St.
FH1122	54	1175	SW Airport Way (400' NE of Mt. Hood Dr.)

***Test data from 2006, all other locations tested December 2016.

TELECOMMUNICATIONS

The Airport is adjacent to the commercial and light industrial operations of the West Business Park, thus the area is well-served by telecommunications and fiber optic providers. CenturyLink, Bend Broadband, and LSNetworks are the primary providers in the Redmond area, though several smaller providers are also available.

NATURAL GAS

Cascade Natural Gas serves the Redmond area. As of 2016, existing pressure mains run adjacent to each of the potential development areas being considered. The existing infrastructure, with extensions as needed, is considered capable of accommodating most future proposed development.

STORM DRAINAGE

Storm drainage on the Airport is contained within the Airport property. The majority of storm drainage, including that of the infield storm system, daylights to an open swale or regional low point, with two notable exceptions. Two large boulder-filled infiltration galleries accommodate storm drainage from the Terminal area and the South Side GA area. One of these is adjacent the north edge of the South Side GA area, and the other is at the southern tip of the Terminal area. These systems are considered to be fixed in their purpose, and not suited for future expansion.

The remaining development areas would likely be subject to the stormwater development requirements of the City of Redmond. These requirements draw largely from the Central Oregon Stormwater Manual (COSM), which outlines Best Management Practices for stormwater management. Given the basaltic subsurface conditions known to define Central Oregon, surface treatment of stormwater, such as swales and drainage basins, is a common management practice. Refer to **Figures 1-16** and **1-17** for locations of stormwater management facilities.

1.4.3 NON-AVIATION FACILITIES

The existing non-aviation developments owned by the Airport and adjacent to airport property are detailed in A**ppendix A.** The information includes known projects in the planning and design stage that may impact the Airport. Airports often own non-aviation parcels as a way to promote development that is compatible with aircraft operations, and to diversify revenue. The non-aviation facilities are divided into the following subareas based on their location:

- ✓ North Development Parcel Subarea
- ✓ North Business Park Subarea
- ✓ South Side GA Subarea
- ✓ West Business Park Subarea
- ✓ Airport Way Subarea
- ✓ Fairgrounds Industrial Subarea

1.4.4 ON-AIRPORT ZONING AND LEASE RESTRICTIONS

Appendix A includes a detailed listing of City of Redmond Zoning designations which occur in the Airport vicinity. The zoning information includes the "zone description" and a listing of permitted uses.

1.5 TERMINAL BUILDING

The terminal building is a modern, well maintained facility built in 2009. With the passenger enplanement growth and the expansion of services since it was built, the terminal will need expansion and alteration for more efficient use and adaptability for future growth. This section describes the terminal facilities that exist in 2016. **Figures 1-20** through **1-25** show the terminal building floor plan by level.

1.5.1 TERMINAL BUILDING

TERMINAL BUILDING FUNCTIONAL COMPONENTS

PARKING / GROUND TRANSPORT

The passengers departing from the Airport have multiple options to access the terminal. They may use the public parking lot for their private vehicles, can be dropped off at the curb by personal vehicles, or be delivered by taxis or shuttles. The employees have a parking area near the terminal separate from the passenger lot, and the Airport vendors also have assigned parking separate from employee parking.

PRE-SECURE AREA

The pre-secure area of the terminal is that portion of the building that precedes the TSA screening. The pre-secure area is comprised of administration offices, airline ticketing and offices, baggage claim, meeter/greeter lounge, food and retail convenience store, rental car agencies, and restrooms.

ADMINISTRATION SPACE

The airport management space is comprised of a reception area, six offices and a conference room.

LAW ENFORCEMENT OFFICERS (LEO) AREAS

RAMS Specialized Security Service, Inc., who provides security for both pre-secure and secure areas, has an office adjacent to the security checkpoint. The City of Redmond Police Department also has an office in the terminal for officers to perform routine duties. While this police office is not staffed full-time, it allows officers to be nearby if needed for an emergency at the Airport.

TICKETING

There are ten ticketing counters, and each airline has dedicated counter(s) with separate queuing lines and ticketing kiosks. Passengers can check in at either the counter or kiosks; however, only the Alaska kiosks allow passengers to tag their own checked baggage. As of 2016, there are three unoccupied counters available. Airline offices and storage spaces serving the airlines are located directly behind the ticketing counters.

MEETER/GREETER LOUNGE

A meeter/greeter lounge immediately follows the inbound passengers' exit from the secure area. It is adjacent to baggage claim and the rental car counters. The waiting area provides seating and a children's play area.

BAGGAGE CLAIM

The baggage claim consists of two baggage carousels and an oversize baggage claim area. A dedicated inbound baggage drop off area on the exterior of the terminal building serves these carousels.

RENTAL CARS

RDM has five counters for six rental car agencies with an office behind each counter. The agencies keep the rental vehicles in a parking lot adjacent to the terminal. Renters access the rental lot via a marked walkway. The rental car agencies are:

- ✓ Alamo
- ✓ Avis
- ✓ Budget
- ✓ Enterprise
- ✓ Hertz
- ✓ National

CONCESSIONS

A single news and gifts concession space is located in the pre-secure area. The plumbing for this space supports beverage service, but no cooking or food preparation takes place as of 2016.

UNFINISHED SPACE

As of 2016, approximately 3,178 square feet of unfinished space is available for future tenant improvement located along the pre-secure central corridor area.

SECURE AREA

The two-story area beyond the TSA checkpoint is referred to as "secure," meaning passengers and employees have gone through TSA screening, or possess required credentials for access. The basement contains baggage screening, the TSA office suite, a maintenance shop, storage, and breakroom. The first floor houses a convenience store and holdroom for passengers, and the second floor contains a bar, restaurant, and

another holdroom. There are restrooms on both the first and second floors. Access to the second floor is provided by two sets of stairs and an elevator.

SECURITY CHECKPOINT

The TSA screening area bridges the pre-secure and secure areas. The TSA operation has two lanes for screening passengers in an area approximately 75 feet long and 40 feet wide. Typically, both lanes are in operation daily during peak screening times – from 7 to 8 a.m. and from 12-1 p.m. As of 2016, TSA does not implement a pre-check lane.

The space for TSA screening may need an expansion due to increasing passenger enplanements. There appears to be sufficient space to accommodate an adding an additional lane by opening the space to the east, but this would require the removal of the existing exit passageway. As modifications of TSA guidelines are updated periodically, any future design will have to be mindful of possible changes to current standards.

TSA ADMINISTRATIVE AREA

The TSA support areas are in need of expansion. The Airport was reclassified to a Category 2 airport by the TSA in March 2016, after surpassing 250,000 annual enplanements for the three previous fiscal years. The enhanced classification increases the budget for staff and equipment. An increase in staff would necessitate improvements in the training areas, locker room space, and offices.

BAGGAGE SCREENING

As of 2016, baggage screening is located in the basement. The baggage handling system takes baggage from behind the airline ticketing counters, through the TSA screening equipment in the basement, and back up to the baggage make-up area, defined in the next paragraph. Alterations or reconfigurations to this area to meet updated TSA guidelines need to be balanced against the available basement area.

BAGGAGE MAKE-UP

Baggage make-up is where the airlines retrieve screened baggage. The baggage make-up system is one, large carousel with tug access to four sides. Some congestion at the baggage make-up has been noted. Adding another belt for outbound baggage screening would reduce congestion, and that addition would necessitate a building expansion.

GATES

The Airport has six gates, Gates A-F, for departing passengers. Gates serviced by the airlines are listed below:

- ✓ A – Alaska
- ✓ B – Alaska
- ✓ C – United
- ✓ D – Delta
- ✓ E – American
- ✓ F – Unassigned

HOLDROOMS

The holdrooms are the areas for passengers waiting to board their flights. The first floor area is a one-story space with a two-story circulation space leading to the second floor. The first floor contains seating with approximately 220 seats. The first floor holdroom area acts as a single space. Gate areas are loosely defined by their proximity to the airline gate kiosk. While this provides efficient use of the overall space, it makes it difficult to consolidate passengers with the airline they are flying.

The second floor holdroom has a high, vaulted ceiling with excellent daylighting and good views. There is ample space with approximately 50 chairs. No gates are directly associated with the second floor area.

PASSENGER BOARDING BRIDGES

All aircraft at the Airport are ground boarded, with no passenger boarding bridges (PBBs). Boarding bridges can facilitate passenger boarding and deplaning especially in conjunction with the anticipated airline fleet expansion. The addition of PBBs could make better use of the underutilized second floor holdroom and should lighten the first floor holdroom congestion. The second floor has the space to accommodate additional gates served by PBBs. Installing the PBBs at this location would require extensive modifications to the building. An exiting path likely containing escalators or additional elevators for deplaning passengers would need to be added to direct traffic to the secure exit.

INTERIOR PASSAGEWAY TO AIRCRAFT RAMP

Boarding passengers move through the holdroom gates to an enclosed passageway. The passageway contains access to eight ramp doors that open to the aircraft ramp. The passengers board the aircraft using movable stairs or ramps. Deplaning passengers enter the passageway from the exterior and proceed to a secure exit that leads to baggage claim, rental car counters and the meeter/greeter lounge.

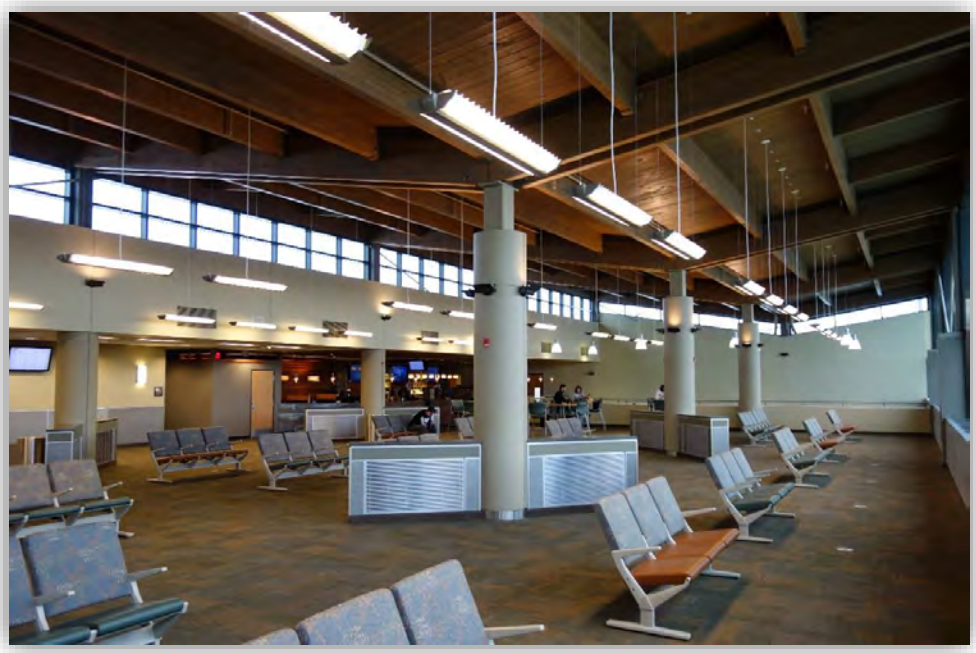
CONCESSIONS

The first floor contains a small convenience store. There is inadequate storage/support space for this area, and the concessionaire has difficulty maintaining stock throughout the day. The second floor has a bar, restaurant and kitchen, with high chair seating at the bar, and table and chair seating near the serving area. As there are no gates on the second floor, the restaurant/bar area is removed from primary holdroom activity.

Existing retail areas could be expanded to provide a broader range of merchandise and facilitate customer movement within the stores, especially when customers enter with luggage. Concessions storage is limited, which leads to shortages and stock shortages during peak periods. There is a lack of cold storage for the food, and getting supplies through TSA screening is time-consuming. There is an opportunity for improved concession revenue with the addition of food service in the pre-secure area of the terminal. A coffee/sandwich shop would serve those waiting for passengers, as well as employees. Electrical and mechanical systems

need improvement to address issues related to the circuit breaker for the restaurant refrigerator, and the availability of hot water in the restaurant.

Figure 1-20. Second Level of Passenger Terminal



AIRLINE TICKETING OFFICES (ATO)

As of 2016, the space for offices and storage behind the ticket counters is at capacity. Some of the ATO space is used for storage. An expansion of this area is needed to ease current constrictions and provide for future growth.

GENERAL TERMINAL SYSTEMS/AREAS

BUILDING STORAGE

The terminal building lacks sufficient space for on-site storage. Maintenance equipment, supplies and other materials used at the terminal have to be held in mechanical rooms or remote locations, which is an inconvenience to terminal personnel.

DEDICATED DELIVERY ENTRY

As of 2016, when deliveries are made to the terminal items must be transported from curbside through the public space of the building to their destination. A dedicated delivery entry and unloading area would be more efficient, with distribution through a back-of-house passageway. This could eliminate congestion in the public spaces and provide a more secure entry for goods.

IMPROVED SIGNAGE

The secure passageway leading to the gates could use clearer gate markings in conjunction with destinations indicated at each ramp exit door. The use of video monitors would aid in providing clear direction and information that could change with each flight. The expanded use of informational display units at the holdroom gates and other strategic locations could provide weather information, flight information, and advertisement space.

PUBLIC ADDRESS SYSTEM

The PA system provides an inconsistent level of performance in the holdroom. It has been reported that announcements are difficult to hear.

POWER ISSUES AT GATE AREA

As of 2016, the gates have no back-up power. The gates doors stay in whatever position they are in when the power fails creating a security issue as well as access disruption. There is a desire to expand electrical power to the seating in the terminal.

REVOLVING DOORS

The revolving doors at secure exiting creates a queue as passengers must wait for the slowdown of traffic created by these doors. It was also noted that finding replacement parts for these doors is difficult.

ELECTRIC GROUND SUPPORT EQUIPMENT

The airlines are moving to the implementation of an all-electric fleet for their Ground Support Equipment. Provisions to locate charging stations and provide power to these units need to be developed.

GROUND SETTLEMENT

Some settlement has been noted at gates 1 and 2. These areas should be monitored to see if the settlement has subsided or presents an ongoing issue..

ENERGY EFFICIENCY

The community has expressed an interest in energy efficiency. Where systems need to be update or replaced, energy efficiency should be a priority. There are currently photovoltaic panels on the terminal roof. There is further interest increasing solar generated power.

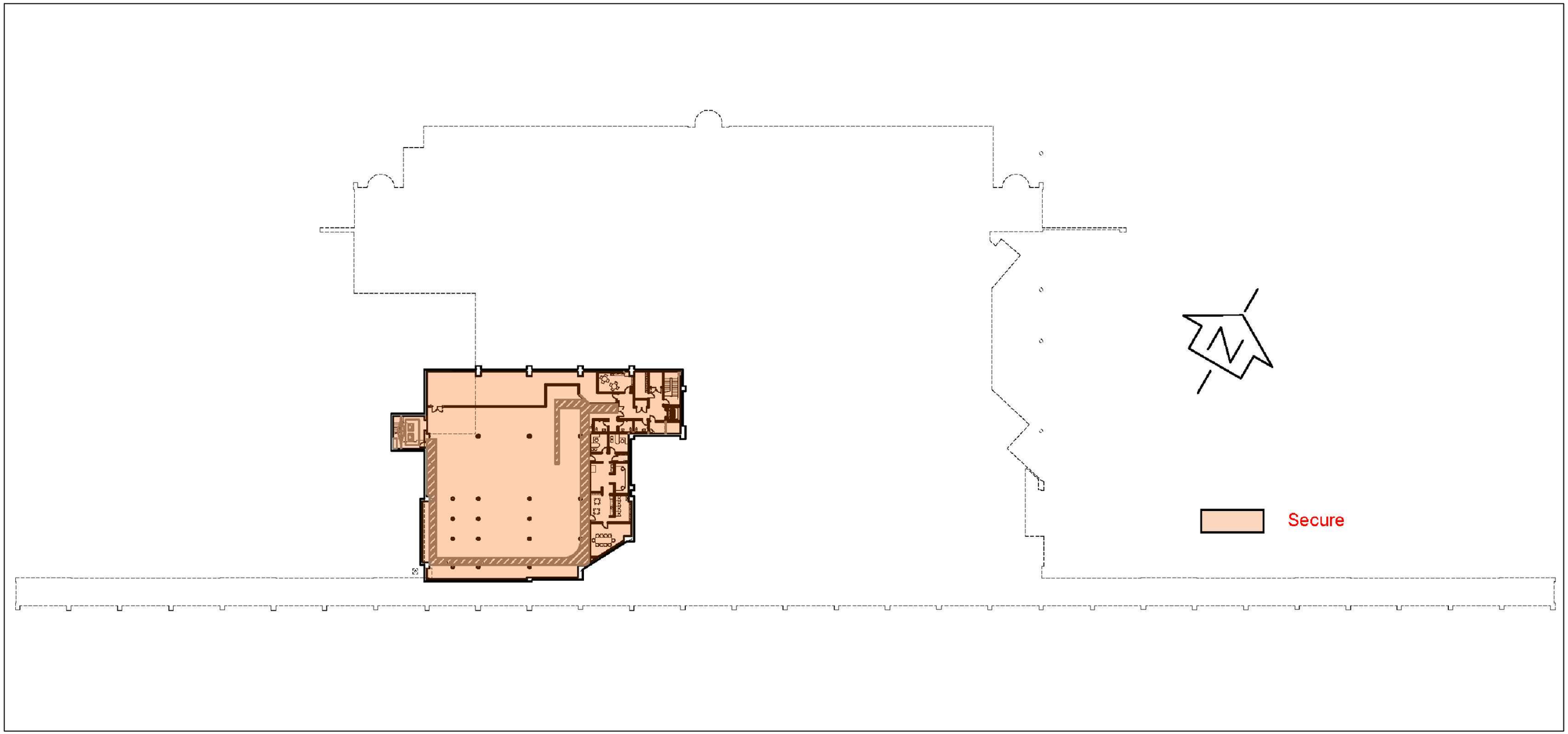


Figure 1-21
BASEMENT FLOOR PLAN

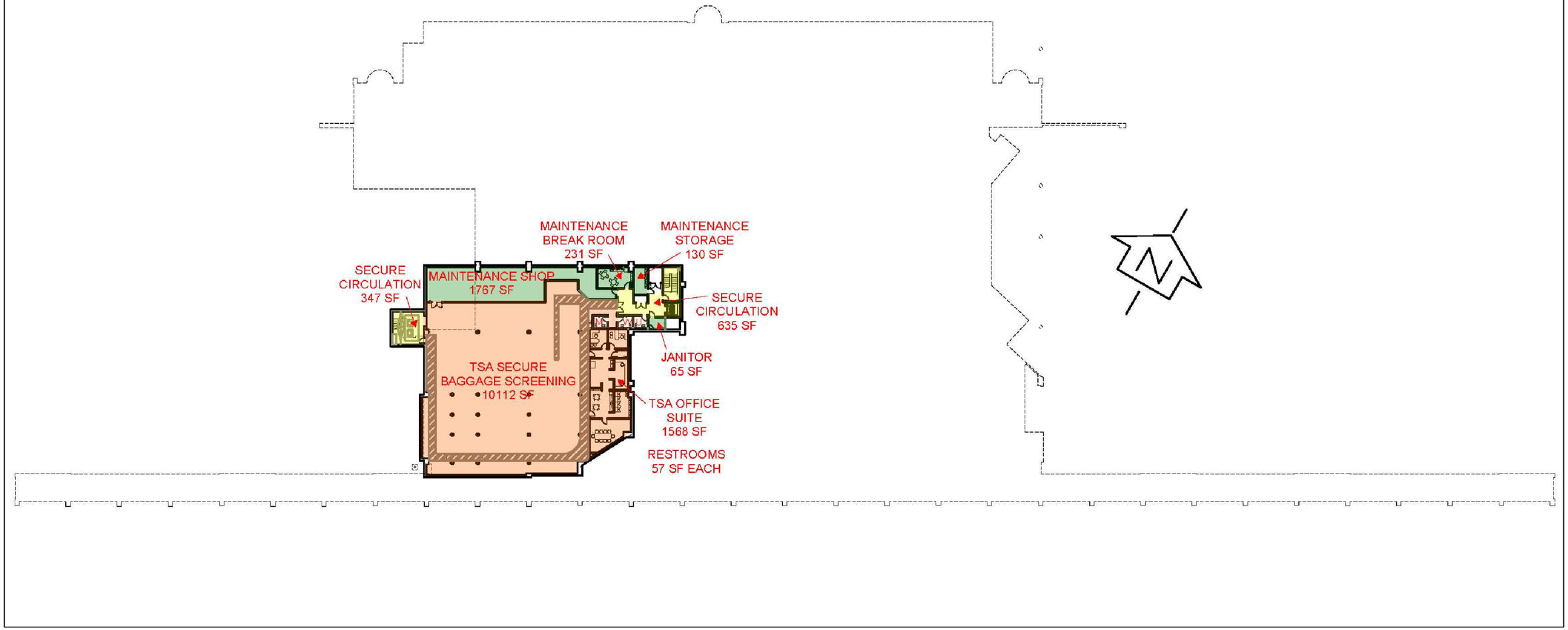


Figure 1-22
BASEMENT FLOOR PLAN

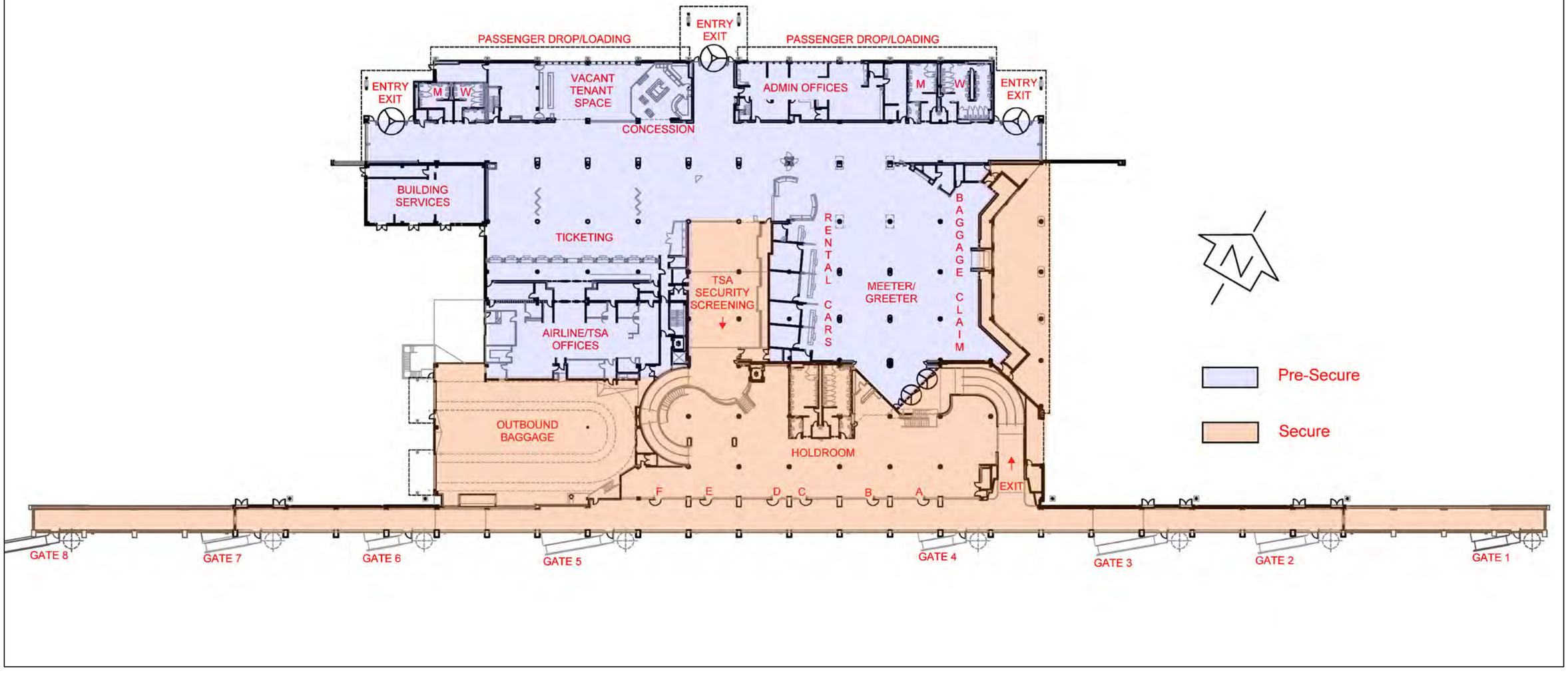


Figure 1-23
GROUND FLOOR PLAN

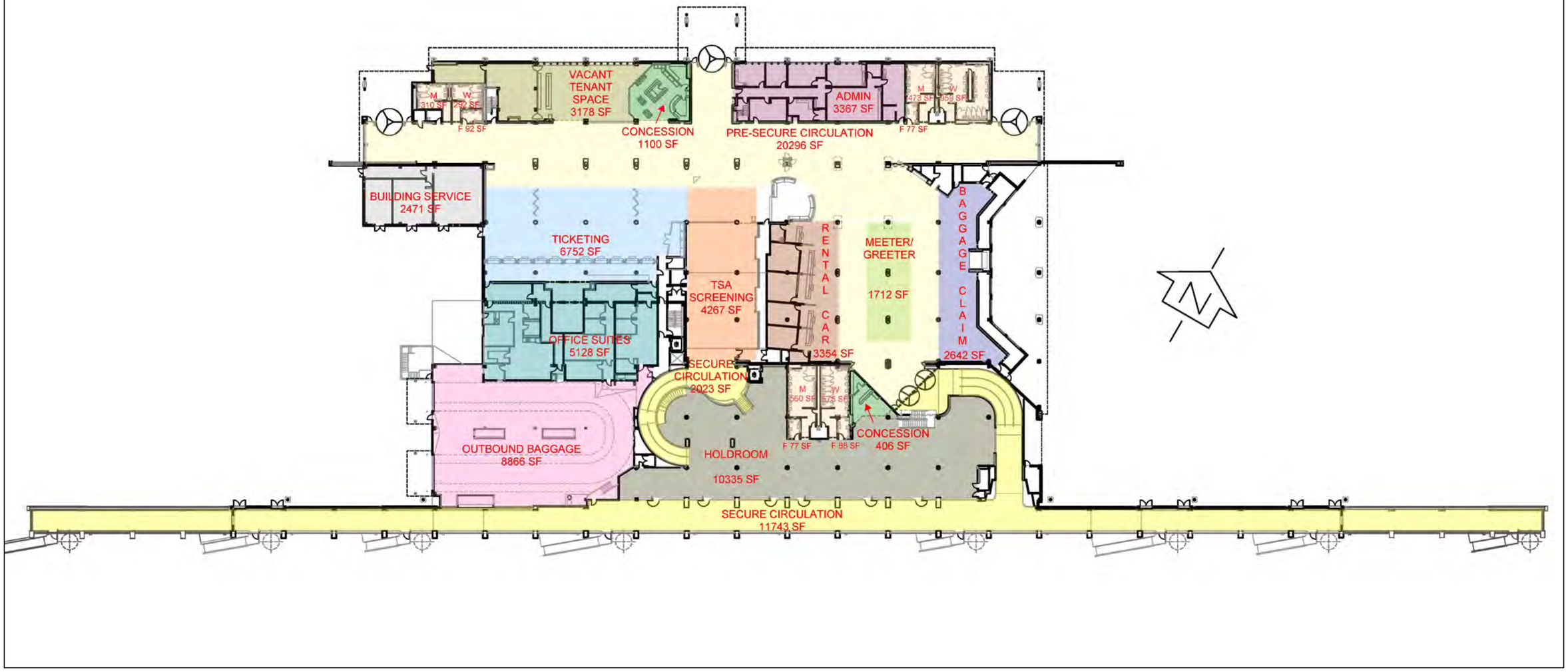


Figure 1-24
GROUND FLOOR PLAN

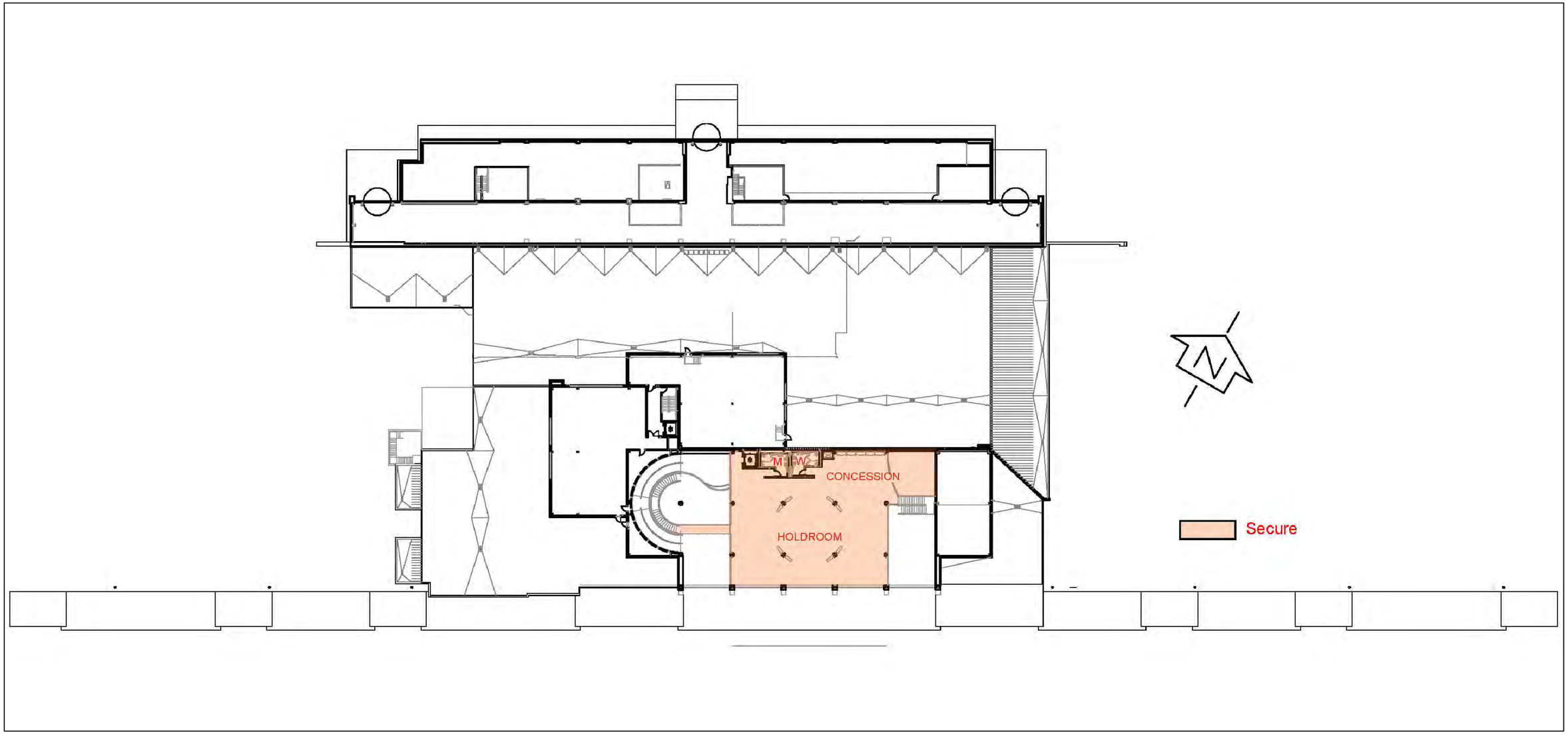


Figure 1-25
SECOND FLOOR PLAN

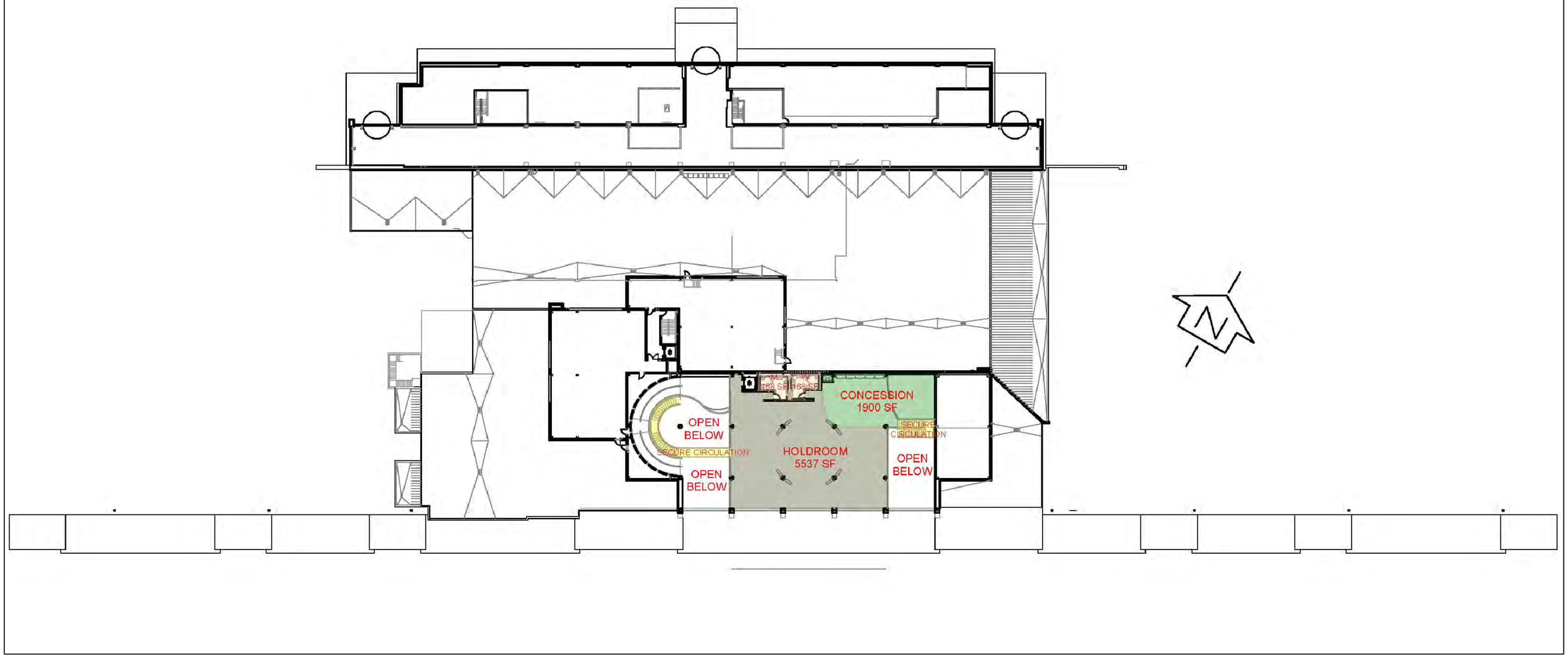


Figure 1-26
SECOND FLOOR PLAN

1.6 AVIATION ACTIVITY

Aviation activity for the Airport is shown below for based aircraft, annual operations (itinerant and local), passenger enplanements, cargo volume (cargo in and cargo out), and flight patterns. This information serves as the baseline for aviation activity forecasts that will help determine the proper facilities needed to serve future aviation activity and demand. Aviation activity is described in detail in **Chapter 2**, **Aviation Activity Forecasts.** A summary of 2016 activity levels is presented in Table **1-20**.

Table 1-20. Aviation Activity for Fiscal Year 2016*	
Activity Measure	**Totals**
Aircraft Operations*	40,162
Air Carrier (Itinerant)	5,127
Air Taxi (Itinerant)	6,340
General Aviation (Itinerant)	10,985
General Aviation (Local)	16,829
Military (Itinerant and Local)	881
Passenger Enplanements**	322,176
Cargo Volume (Tons)**	970.1
Number of Airlines	4
Non-stop Destinations	7
Based Aircraft* **	
Aircraft Type	**Totals**
Single-Engine	64
Multi-Engine	4
Jet	6
Helicopters	6
Other	0
Total Based Aircraft	**80**
The airport was closed for one month in 2016 for runway construction. *Sources: *Terminal Area Forecast 2016, **RDM Monthly Report, RDM Performance Metrics, ***RDM Based Aircraft Survey 2016*	

Annual totals are reported by FAA Fiscal Year, which runs from October 1 to September 30. Aviation activity measures reflect one month of airport closure during the reconstruction of Runway 5-23. The aviation activity forecasts will provide additional historical data and investigate changes in aviation activity over the most recent ten year period.

1.7 AERONAUTICAL SETTING

This section details the aeronautical setting surrounding the Airport, including details about neighboring airports and their facilities.

1.7.1 COMMERCIAL SERVICE AIRPORTS

PORTLAND INTERNATIONAL AIRPORT

Portland International Airport (PDX) is the largest airport in the state, located 150 miles from RDM. PDX offers domestic and international flights, and there are four non-stop flights a day from the Airport to PDX.

OTHERS

Four other airports in the greater region are air carrier airports: Eugene Airport (EUG), Rouge Valley International-Medford Airport (MFR), Eastern Oregon Regional Airport (PDT), and Crater Lake Klamath Regional Airport (LMT). EUG is 135 miles west of the Airport, MFR is 189 miles southwest of the Airport, PDT is 221 miles northeast of the Airport, and LMT is 160 south of the Airport. RDM does not have direct flights to these other Oregon airports.

1.7.2 GENERAL AVIATION AIRPORTS

Five general aviation airports are located within 30 nautical miles of the Airport: Bend Municipal (BDN), Madras Municipal (S33), Prineville (S39), Sunriver Airport (S21), and Sisters Eagle Air Airport (6K5). None of these have commercial service as of 2016 and have no future plans for commercial service. BDN has 203 fixed wing based aircraft and S39 has 122 fixed wing based aircraft. These two airports represent the greatest concentration of based aircraft in Crook, Deschutes, and Jefferson Counties.

BEND MUNICIPAL AIRPORT

BDN is 10 nautical miles south of the Airport, and has one 5,200-foot by 75-foot north-south lighted runway with non-precision instrument approach capability. The airport accommodates the highest volume of general aviation activity among all airports in Central Oregon, including flight training and an active glider community. BDN also has 19 helicopters based at the airport due to an extremely large volume of helicopter training activity. A number of small aviation businesses are located at the airport, including the Epic Aircraft manufacturing facility, which manufactures the Epic E1000 single engine turboprop aircraft. Aviation businesses located at BDN total approximately 300 employees. A future extension of Runway 16-34 to an ultimate length of 6,260 feet is proposed based on the approved Airport Layout Plan for BDN.

MADRAS MUNICIPAL AIRPORT

S33 is 25 nautical miles north of the Airport, and has two runways. Runway 16-34, the primary runway, is 5,089 feet long by 75 feet wide with medium intensity lights and existing visual approach capabilities. Runway 4-22, the crosswind runway, is 2,701 feet long by 50 feet wide. Runway 4-22 is primarily used by small, single-engine general aviation aircraft.

Erickson Aero Tankers, who contracts with the USFS and other entities for aerial firefighting aircraft, uses the S33 as a maintenance base for their fleet. The fleet consists of three DC-7 and seven MD-87 air tankers. In addition, Daimler Corporation is constructing a new truck model testing site at S33. As of 2016, this facility is under construction and will include two new test tracks that simulate road conditions for heavy duty trucks.

PRINEVILLE AIRPORT

S39 is 11 nautical miles east of the Airport with two runways. Runway 10-28, the primary runway, is 5,751 feet long by 75 feet wide with MIRL and non-precision instrument approach capability. Runway 15-33, the crosswind runway is 4,054 feet long with a non-standard, 40-foot width, and is limited to aircraft with a maximum takeoff weight of 5,000 pounds or less. This secondary runway has low intensity runway lighting (LIRL) with only visual approach capability.

S39 accommodates a fairly substantial on-site commercial pilot fixed wing training operation and a joint use Bureau of Land Management (BLM) helibase that is home to the Central Oregon Interagency Helitack Crew. Corporate traffic at S39 has increased as a result of the development of data centers for Facebook and Apple in Prineville. Hillsboro Aviation is a Fixed Base Operation at S39 that supports a growing pilot training operation.

SUNRIVER AIRPORT

S21 is approximately 26 nautical miles south/southwest of the Airport and has a single runway. Runway 16-34 is 5,461 feet long by 75 feet wide with LIRL and non-precision instrument approach capability. This airport is privately-owned by Sunriver Resort, LLC, and is for public use. The airport primarily serves residents and visitors to the 3,300-acre Sunriver Resort, which is a planned, fully-contained private residential and resort community. The resort itself is bordered on the north, east, and west by the Deschutes National Forest and the unincorporated community of Three Rivers on the south.

SISTERS EAGLE AIR AIRPORT

6K5 is approximately 20 nautical miles west of the Airport and has a single runway, 2-20. Runway 2-20 is 3,460 feet long and 60 feet wide with visual approach capability only. The airport is privately-owned by Sisters Eagle Air, Inc., and is for public use. The airport primarily serves residents and general aviation pilots who fly in the vicinity of the airport. The runway surface is made of asphalt and the airport has 100LL fuel.

Table 1-21 lists the nearby airports with a summary of available facilities and activity information. Airport locations are shown in **Figure 1-27**.

Table 1-21. Nearby Airports, Primary Runways, and Activity

Element	Bend Municipal Airport (BDN)	Madras Municipal Airport (S33)	Prineville Airport (S39)	Sunriver Airport (S21)	Sisters Airport (6K5)
Runway Designation	16-34	16-34	10-28	18-36	2-20
Runway Length	5,200’	5,089’	5,751’	5,461’	3,460’
Runway Width	75’	75’	75’	75’	60’
Pavement Strength (000)	30 S	75 S, 120 D, 180 2D	30 S	30 S	4 S
Runway Composition	Asphalt	Asphalt	Asphalt	Asphalt	Asphalt
Runway Lighting	MIRL	MIRL	MIRL	LIRL	N.A
Taxiway Lighting	Reflectors	N.A.	N.A.	Reflectors	N.A
Approach Aids	REIL, PAPI-4L	REIL, VASI-4L	PAPI-4L	VASI-2L	N.A
Weather	AWOS	AWOS	AWOS	N.A.	AWOS
Airport Beacon	Clear/Green	Clear/Green	Clear/Green	Clear/ Green	N.A
Approach Capability					
Existing	Non-Precision	Visual	Non-Precision	Non-Precision	Non-Standard
Future	Non-Precision	Non-Precision	Non-Precision	Non-Precision	Non-Standard
2015 Annual Operations*					
Local	70,030	9,192	29,437	2,518	400
Itinerant	70,044	6,128	17,613	3,671	1000
Total Operations	**140,074**	**15,320**	**47,050**	**6,189**	**1,400**
2015 Based Aircraft**					
Single engine	177	40	115	26	15
Multi-Engine	16	0	5	11	2
Jet	10	0	2	4	0
Fixed Wing	**203**	**40**	**122**	**41**	**17**
Rotor	19	1	1	0	0
Gliders	8	0	0	2	0
Ultra-Light	3	2	2	0	0
Total Based	**233**	**43**	**125**	**43**	**17**

*: Bend = 2015 EA; Madras = 2010 Madras Master Plan Interpolated; Prineville = 2016 Prineville Master Plan Interpolated; Sisters = FAA 5010 Airport Master Record; Sunriver = 2015 FAA Terminal Area Forecast (TAF).

**: BDN, S33, S21, 6K5 = FAA 5010 Airport Master Record, Prineville based aircraft = 2016 Airport Master Plan interpolated.

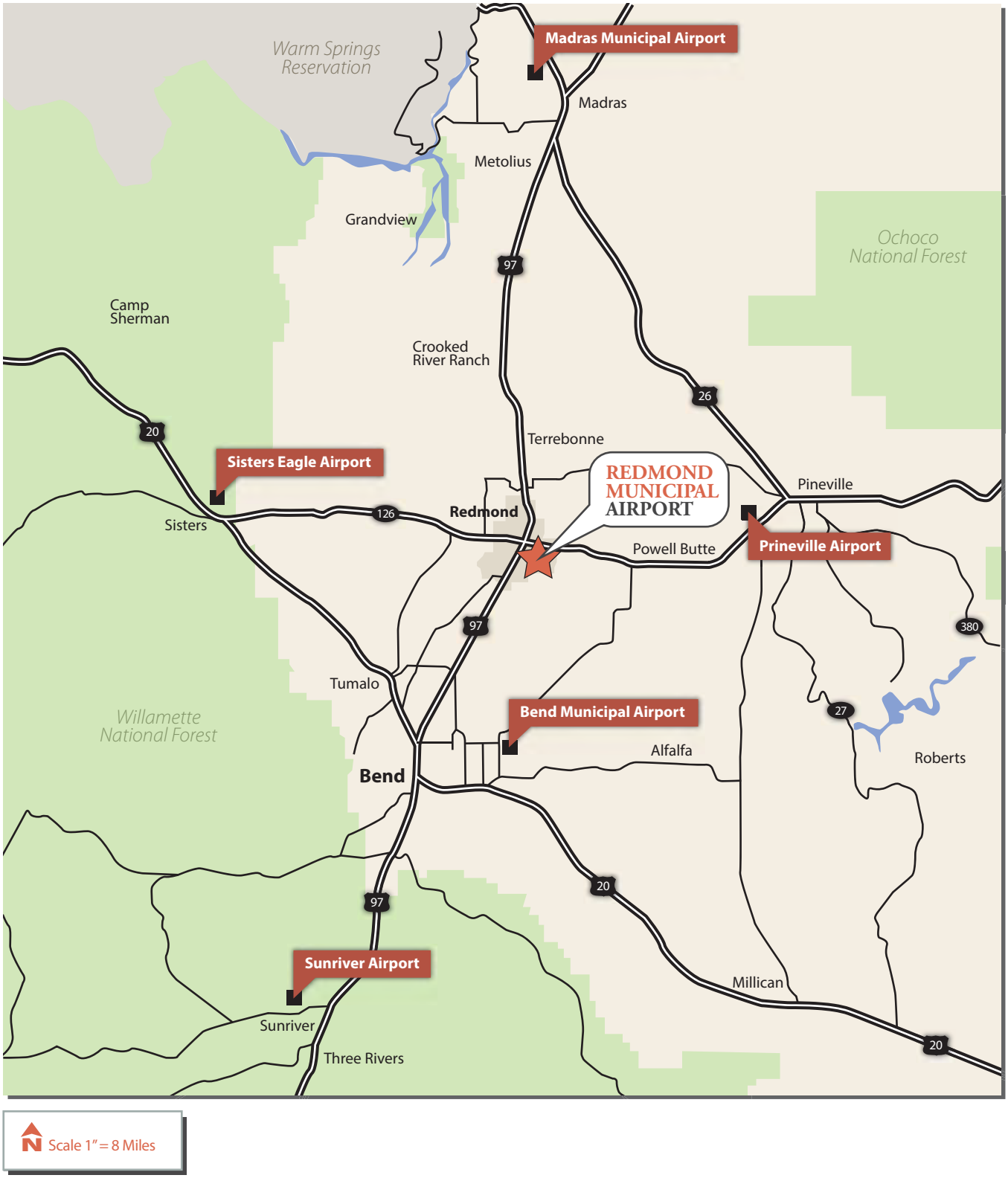


Figure 1-27
SURROUNDING AIRPORTS

1.8 COMMUNITY SETTING

This section presents socioeconomic data to provide a profile of the airport users and the community served by the Airport. Socioeconomic data is used to guide aviation activity forecasts in **Chapter 2**.

1.8.1 SOCIOECONOMIC DATA

In order to define an area of analysis, socioeconomic data was gathered by using data compiled by Woods & Poole Economics, Inc. Woods & Poole categorizes Deschutes County and the cities located in the county, including Redmond, as the Bend-Redmond Metropolitan Statistical Area (MSA). The Bend-Redmond MSA is the area of analysis because it includes data for all of Deschutes County where the Airport is located. The study comprised these socioeconomic indicators to help determine trends in the Bend-Redmond MSA:

The data range was from 2006 to 2015. A longer period of time, rather than one or two years, is helpful for indicating trends more accurately, which is why a ten-year period was used. The accuracy of trends is critical, since trends are used to help determine future forecasts for airports. The selection of this ten-year period incorporates periods of growth and decline, such as the 2008 recession and the strong growth the Airport has seen since 2012. **Table 1-22** shows the socioeconomic data for the Bend-Redmond MSA during 2006 to 2015.

Table 1-22: Socioeconomic Data for Bend-Redmond MSA

Indicator	Population	Employment	Earnings	Income/Capita	GRP	Retail Sales
2006	143,860	91,910	$4,045	$40,619	$6,876	$3,262
2007	147,240	91,670	$4,004	$40,368	$7,052	$3,282
2008	150,690	91,420	$3,964	$40,118	$7,232	$3,301
2009	154,220	91,180	$3,924	$39,869	$7,417	$3,321
2010	157,840	90,930	$3,885	$39,622	$7,607	$3,341
2011	159,800	92,310	$3,868	$40,532	$7,620	$3,518
2012	161,890	93,940	$3,978	$41,377	$7,847	$3,650
2013	165,950	97,710	$4,195	$41,539	$8,202	$3,816
2014	169,160	99,890	$4,373	$42,257	$8,411	$3,958
2015	172,500	102,090	$4,515	$42,975	$8,622	$4,071

Source: Woods & Poole (2016)
Note: Total Earnings (in millions, adjusted to 2016 dollars), Total Personal Income Per Capita (adjusted to 2016 dollars), GRP (in millions, adjusted to 2016 dollars), Total Retail Sales (in millions, adjusted to 2016 dollars).

1.9 AIRPORT FINANCIAL OVERVIEW & ECONOMIC CONTRIBUTION

Commercial service airports are economic engines in the communities that they serve, facilitating the movement of goods and people to and from the community. Airports serve as employment centers, and as municipal entity that leases property and enters into contracts with private enterprise, their financial structure differs from other municipal departments. This section describes the revenues and expenses associated with airport operation, and the economic contribution that the Airport makes to the community it serves through jobs and wages, and business sales.

1.9.1 HISTORICAL FINANCIAL INFORMATION

The Airport generates revenue to cover its expenses and operates as an airport enterprise fund (AEP), which means that it maintains separate accounting from the City of Redmond general fund. The AEP is primarily funded through revenue from passengers and airlines. Grants from the FAA Airport Improvement Program help offset much of the cost of eligible capital improvements. The AEP is organized into three cost-centers: the Terminal Program, the Airfield Program, and the General Operations program. There are three additional sub-funds for debt service, passenger facility charges, and capital projects that are separated out to keep these capital improvement and financing funds from comingling with operating funds.

The Terminal Program uses a cost-recovery rates and charges basis, where the Airport looks to recover investment in facilities from users and tenants. The scope of this program includes the passenger terminal building. The Airfield Program covers operations and maintenance of the airfield, and rates and charges are set on a cost recovery basis. The General Operations Program includes hangars, parking lots, roadways, and non-aviation development, and uses a market rate basis to set rates and charges. The General Operations program helps the Airport diversify revenue streams to guard against slowdown in the aviation industry. A summary of the AEP is presented in **Table 1-23**.

Table 1-23: Airport Financial Overview				
Year	FY2013/14	FY2014/15	FY2015/16	FY2016/17
Type	Actual	Actual	Budget	Budget
Total Resources	**$15,105,114**	**$18,742,348**	**$37,122,840**	**$24,355,420**
General Operations	$7,757,230	$8,754,158	$9,713,972	$8,570,154
Terminal Operations	$1,565,455	$1,624,505	$1,547,364	$1,853,345
Airfield Operations	$1,282,264	$1,174,730	$1,237,932	$1,349,270
Debt Service Reserve	$2,247,694	$2,350,098	$2,539,651	$2,539,651
Passenger Facility Charge	$1,082,796	$1,138,806	$933,921	$1,100,000
Capital Projects	$1,169,675	$3,700,051	$21,150,000	$8,943,000
Total Expenditures	**$9,542,577**	**$13,124,756**	**$37,122,840**	**$24,355,420**
General Operations	$4,952,535	$5,923,221	$9,665,236	$8,848,222
Terminal Operations	$1,226,044	$1,079,200	$1,536,043	$1,575,277
Airfield Operations	$1,138,805	$1,233,063	$1,297,989	$1,349,270
Debt Service Reserve	$-	$-	$2,539,651	$2,539,651
Passenger Facility Charge	$988,743	$1,036,438	$933,921	$1,100,000
Capital Projects	$1,236,450	$3,852,834	$21,150,000	$8,943,000
Net Program	**$5,562,537**	**$5,617,592**	**$-**	**$-**
General Operations	$2,804,695	$2,830,937	$48,736	$(278,068)
Terminal Operations	$339,411	$545,305	$11,321	$278,068
Airfield Operations	$143,459	$(58,333)	$(60,057)	$-
Debt Service Reserve	$2,247,694	$2,350,098	$-	$-
Passenger Facility Charge	$94,053	$102,368	$-	$-
Capital Projects	$(66,775)	$(152,783)	$-	$-
Source: City of Redmond FY2016/17 Budget				

1.9.2 AIRPORT ECONOMIC IMPACTS

The Airport is included in the 2014 Oregon Department of Aviation (ODA) Economic Impact Statement for NPIAS Airports. This report identifies the economic contributions of airports to the Oregon economy through on and off airport activities, the jobs created due to the airports, and the total payroll of the jobs created. **Table 1-24** represents the economic impact of the Airport on the Oregon economy is 2012 dollars.

Table 1-24. RDM 2014 Economic Impact		
Jobs	**Payroll**	**Business Sales**
810	$24,735,000	$81,561,000
Source: 2014 ODA Economic Impact Statement for NPIAS Airports		

1.10 ENVIRONMENTAL CONDITIONS

The following sections are included to provide a baseline of the existing environmental conditions on and around the Airport. The information presented is a high level overview provided for planning purposes and is not intended to satisfy the requirements of the National Environmental Policy Act (NEPA).

1.10.1 AIR QUALITY

The Airport and surrounding areas are located within a National Ambient Air Quality Standards (NAAQS) Attainment area for the State of Oregon (Oregon Department of Environmental Quality [DEQ], 2016). The EPA established NAAQS for a limited number of pollutants in response to enactment of the Clean Air Act of 1970 and the Amendments of 1975 and 1977. The pollutants of most concern in an arid environment such as Redmond are particulates. The primary impacts to local air quality created by aircraft occur when planes are at or close to ground level during takeoff, landing, and taxiing. Airports have numerous other sources of pollutants including automobile traffic, service trucks, fuel trucks, and auxiliary equipment such as emergency generators. Aircraft engines emit carbon monoxide, carbon dioxide, particulate matter, volatile organic compounds, and oxides of nitrogen and sulfur. Fossil-fuel engines that combust diesel, aviation fuel, and gasoline fuels emit a variety of toxic compounds, which are primarily formaldehyde, benzene, and heavy metals.

Changes in aircraft operations or development at the Airport would require air quality modeling to evaluate the emission of priority pollutants to see if they will approach or exceed the NAAQS. Air quality impacts will be modeled in conjunction with aircraft noise. The FAA Aviation Environmental Design Tool (AEDT) is the required model for aviation noise and air quality modeling and will be used to quantify those impacts for the Airport.

1.10.2 COMPATIBLE LAND USE

Several factors can go into the analyses of whether or not a proposed land use is compatible with an airport. For Redmond Airport, the factors the City has to measure against are provided through the following three avenues:

Noise contours will be created for the Airport in a subsequent chapter of this Master Plan in conjunction with the forthcoming forecasted aviation activity. Once created, the noise contours will provide one factor for reviewing proposed land uses against. The FAA considers the DNL 65 dB an acceptable level at which residential land uses are compatible. Oregon Administrative Rule 340-035-0045 contains State of Oregon criteria for airport noise. The State of Oregon uses the 55 DNL contour to represent the “airport noise criterion.” The airport noise criterion does not indicate liability or legal obligation on the part of the airport; instead it defines the “airport noise impact boundary,” which is used to identify noise sensitive properties near the airport that may experience regular aircraft noise exposure. Local jurisdictions may also implement tighter restrictions.

Airport airspace surfaces as defined in FAR Part 77 *Safe, Efficient Use, and Preservation of the Navigable Airspace* will be depicted in the Airspace Plan, a component of the Airport Layout Plan set. These airspace surfaces should be used by the City of Redmond as a basis for protecting the Airport against incompatible development on the basis of height.

The FAA's Memorandum *Interim Guidance on Land Uses Within a Runway Protection Zone* should serve as a guidance document for allowable land uses within a RPZ.

1.10.3 HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

APPLICABLE REGULATIONS

The following state laws protect archaeological sites and cultural resources in Oregon: Indian Graves and Protected Objects (ORS 97.740-97.760) and Archaeological Objects and Sites (ORS 358.905-358.961). In order to conduct a survey for archaeological sites, the Oregon State Historic Preservation Office (SHPO) requires an archaeological permit (ORS 390.235). If an archaeological site is recorded on public land, an archaeological permit is required to conduct ground disturbing activities within site boundaries.

Under ORS 358.653 the City is required to consult with the SHPO to avoid inadvertent impacts to historic properties for which they are responsible; this relates primarily to buildings and structures which are listed on the National Register of Historic Places or eligible for listing. Generally, eligible historic properties are at least 50 years old, retain their historic appearance, and meet one of four National Register significance criteria. Airport buildings and structures may also be subject to the City of Redmond Historic Preservation Ordinance.

BACKGROUND RESEARCH METHODS

This effort consisted of a literature review of all areas within one mile of the Airport to identify cultural resources within the study area. The purpose of the review was to identify any cultural resources including Traditional Cultural Properties within the Study Area. The study area has already experienced 36 previous cultural resources studies in support of infrastructure and utility improvements (highway, road, trail, gas, and fiber optic and transmission lines), land exchanges, testing at training centers, and the Redmond Caves. One archaeological survey previously conducted within the Airport boundaries used pedestrian survey methods and did not identify any archaeological resources, as documented in *Redmond Municipal Airport Taxiway "B" Rehabilitation Project - Phase I Field Survey and Section 106*, prepared by Scott E. in 2016 for Morrison Maierle. Reviewed information included recorded cultural resources, historic register-listed properties, ethnographic studies, historical maps, government landowner records, aerial photographs, regional histories, geological maps, soils surveys, and environmental reports. Relevant documents were examined at the Oregon SHPO via the GIS System for Archaeological Records Data and online research library. This literature review did not include fieldwork.

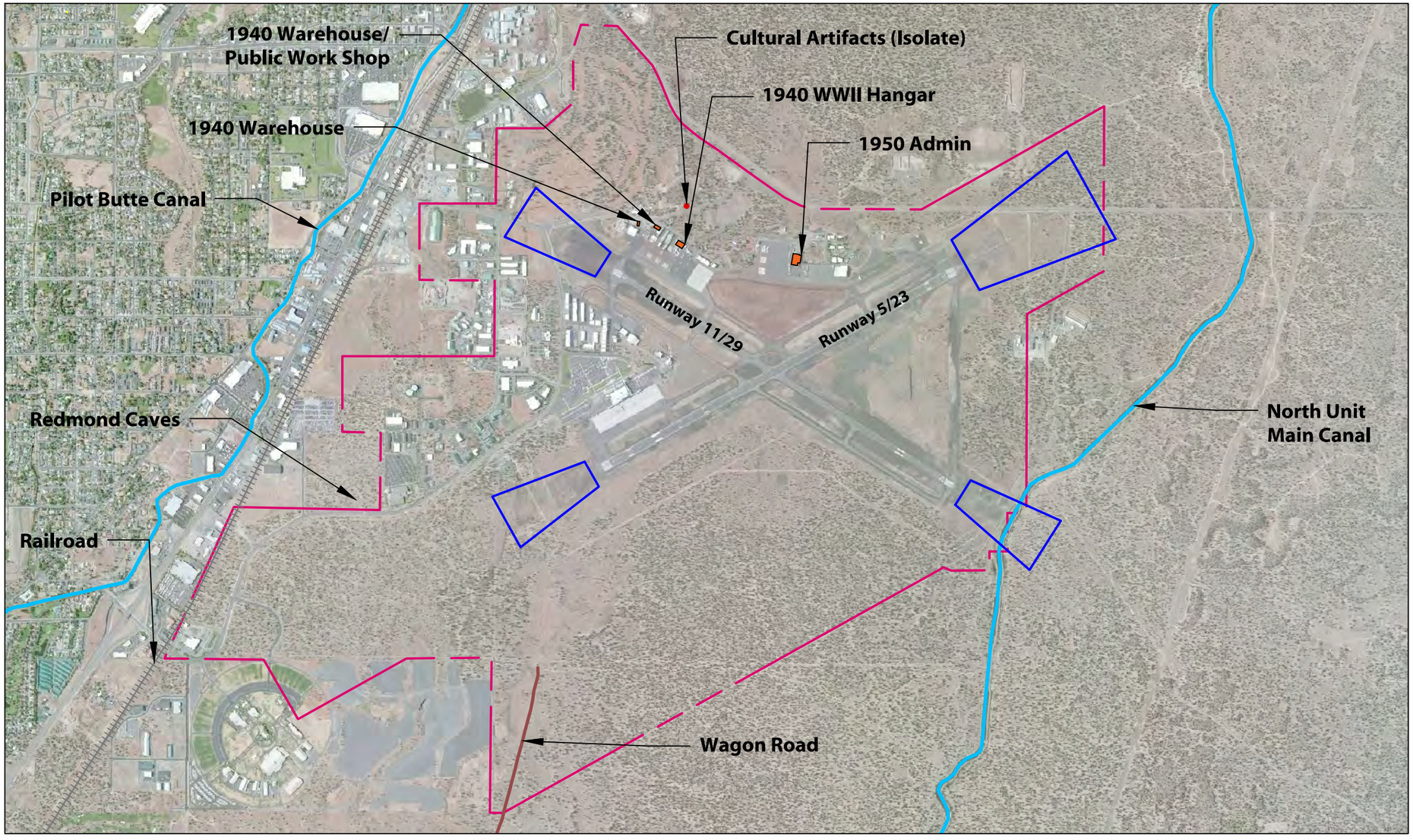


Figure 1-28
Environmental Conditions

CULTURAL SETTING

The type of soils at the Airport have the potential to contain buried cultural remains that were present prior to the eruption of Mount Mazama over 7,500 years ago leaving what is now Crater Lake.

Non-Native explorers arrived in central Oregon in the 1820s under contract with the Hudson's Bay Company. Migration to Oregon began in the 1840s and followed the Oregon Trail. Frank and Josephine Redmond, who arrived in the area in 1904, founded the City of Redmond. Settlers constructed irrigation canals soon after and the town incorporated in 1910. Records of the Greater Redmond Historical Society accessed in 2013 state that, the following year, the Oregon Trunk Railroad was completed and provided improved economic and passenger transportation opportunities for city residents.

Efforts to build an airport began in 1928 and the first runways were constructed in 1929. The Works Progress Administration carried out improvements to the Airport during the 1930s, and during World War II, the US Army Air Corps used the Airport for training activities. The first commercial flight at the Airport was in 1946, as shown in **Figure 1-29**.

Figure 1-29 First Commercial Flight at the Redmond Airport 1946

Source City of Redmond 2016.

United States Geological Survey data from 1962a, 1962b, and 1975 indicates development in the vicinity of the Airport after 1950 has been minor, with some new construction on the northern boundary of the Airport.

PREVIOUS INVESTIGATIONS

A 2016 records search of SHPO's online GIS System for Archaeological Records Data was performed to identify any previously recorded historic or cultural resources surveys within the study area. A review of the Oregon Historic Sites Database was conducted to identify any recorded historic buildings within or directly adjacent to the study area.

RECORDED CULTURAL RESOURCES IN THE STUDY AREA

There are 48 recorded archaeological sites within the study area. They include isolated archeological artifacts, rockshelters (caves), rock alignments; and a historic-era homestead, wagon road, canals, and railway. In addition to these recorded sites, more than 20 isolated precontact-era and historic-era sites are mapped in the SHPO database that do not have Smithsonian site numbers. One, a single obsidian flake, was identified within the Airport boundaries near the intersection of SE Veterans Way and SE Sisters Ave. Sixteen other isolated finds are adjacent to the Airport boundaries. There is the potential for additional precontact archaeological sites to be discovered through an archeological survey of the Airport. An archaeological survey was not part of this study.

The sites listed below are protected under the National Historic Preservation Act. These sites could be affected by changes in airport operations or development. Projects that could affect these sites will require consultation with the SHPO to determine the potential project effects.

REDMOND CAVES SITE (35DS173)

The Redmond Caves Site is immediately adjacent to the Airport's western boundary, along SE Airport Way between SW 13th St and SW 6th St. During investigations in 1941, a sage bark sandal and projectile points were collected. Radiocarbon dating placed the sandal from approximately 1700 to 1900 years old, as noted on the US Bureau of Land Management website, accessed in December 2016. The site integrity has been impacted by looting and recreational use, as recorded by Lee R. Lyman on the form entitled, *Oregon Archaeological Survey, Site 35DS173 – Redmond Caves,* filed in 1983.

REDMOND MUNICIPAL AIRPORT

The Airport itself has been determined eligible for listing in the NRHP. Inventory and recording of buildings on the Airport property in 1997 led to five structures on the property being recommended as contributing to the Airport's historical significance: the Administration Building (1950), Warehouse #1 (1940), Warehouse #2/City of Redmond Public Works Shop (1940), the World War II Hangar (1940), and a storage shed (no construction date provided).

HUNTINGTON WAGON ROAD

East of the County Fairgrounds and south of the Airport boundary is an intact segment of the Huntington Wagon Road (c.1845), which is recorded as archaeological site 35DS2579. This resource extends northward through the airport property in a gentle southwest-northeast trajectory, extending between in sections 33, 27, 22, 15, and 10, recorded on the 1872 map accessed through the US Surveyor General website. The Huntington Wagon Road was part of the section of Oregon Trail (c.1845) between Bend and The Dalles (Cunninghame 1976). In 1864 J.P. Huntington, Oregon Superintendent of Indian Affairs, used the route to travel between Fort Dalles and Fort Klamath.

IRRIGATION CANALS

The North Unit Main Canal (1938), which has been determined eligible for listing in the NRHP, is immediately east of the Airport's eastern boundary. This resource is within a future RPZ.

HISTORIC PROPERTIES ON AIRPORT

Based on a review of an Airport property schedule and a 1997 historic inventory, there are at least five historic buildings within the Project Area as of 2016. **Table 1-25** summarizes the information on the Airport property schedule.

Table 1-25. Airport Buildings 50 years or older

Description	Construction Year
Old Administration	1950
World War II Hangar	1940
Warehouse #1	1940
Warehouse #2	1940
Storage Shed	Unlisted

1.10.4 SECTION 4(f) PROPERTY

Section 4(f) of the U.S. Department of Transportation Act of 1966 protects significant publicly-owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. Under Section 4(f), the Secretary of Transportation may approve a transportation program or project requiring the use of such sites only if there is no feasible and prudent alternative to using that land, and the program or project includes all possible planning to minimize harm resulting from the use.

Section 4(f) properties include:

- ✓ Parks and recreational areas of national, state, or local significance that are both publicly-owned and open to the public;
- ✓ Publicly-owned wildlife and waterfowl refuges of national, state, or local significance that are open to the public; and
- ✓ Historic sites of national, state, or local significance in public or private ownership regardless of whether they are open to the public.

PARKS AND RECREATIONAL AREAS

The Redmond Caves are a group of five caves formed by volcanic flows of molten lava from the Newberry Caldera. They are immediately adjacent to the western boundary of the Airport, along SE Airport Way between SW 13th St and SW 6th St, and the caves are located inside the Redmond city limits. The Bureau of Land Management (BLM) in partnership with the City of Redmond manages the caves, which are open to the public.

The collapse of a single lava tube created these five caves. The largest opening, Cave 1, enters a fairly deep and expansive cave, while Cave 3 has two openings joined by a narrow but easily passable connection. Caves 1, 3, and 4 are accessible and have deep, sandy soils, with scattered boulders and ceiling blocks.

Native Americans used the caves, at least periodically, over the past 6,000 years. Today, the Redmond Caves are managed as a unique site where visitors can learn about geology, wildlife, and past human use. A Section 4(f) analysis may be needed to assess the potential effects to users of the caves as a result from changes to airport operations.

WILDLIFE AND WATERFOWL REFUGES

There are no publicly-owned wildlife or waterfowl refuges within the study area.

HISTORIC SITES

A literature review of all areas within one mile of the Airport indicates significant historic resources in the study area, as listed below, that would be considered Section 4(f) properties in or near the study area:

- ✓ Five structures on airport property may contribute to the Airport's historical significance: the Administration Building (1950); Warehouse #1 (1940); Warehouse #2/City of Redmond Public Works Shop (1940); the World War II Hangar (1940); and a storage shed (no construction date provided).
- ✓ Huntington Wagon Road
- ✓ Two irrigation Canals: the North Unit Main Canal, which has been determined eligible for listing in the NRHP and is on airport property, and the Pilot Butte Canal, which has also been determined eligible for listing in the NRHP but is not on airport property.
- ✓ Redmond Caves, which are near, but not on, airport property.
- ✓ Oregon Trunk Railroad

A Section 4(f) analysis may be needed to assess the potential effects to these resources as a result from changes to airport operations or development.

1.10.5 THREATENED AND ENDANGERED SPECIES

An official species list was obtained from the U.S. Fish and Wildlife Service (USFWS) website (2016). The only species listed under the Endangered Species Act with the potential to occur in the study area is the gray wolf. The Oregon Biodiversity Information Center (ORBIC) database also was queried to obtain records of known sensitive, threatened and endangered plant and animal species within a two-mile radius of the Airport (ORBIC 2016). There are no documented records of species listed as endangered or threatened, proposed for listing, or candidate for listing as occurring within a two-mile radius of the Airport. There is no designated Critical Habitat for any species within the study area.

According to the USFWS website accessed in 2016, the Airport is in the East Wolf Management Zone where wolves are listed as Endangered. As of USFWS data in 2015, there are no recorded areas of wolf activity in the Redmond area, but given the 2016 population according to the USFWS website and the dispersal capabilities of wolves, at this point it is possible for a wolf to show up in almost any part of the state.

Contact with the USFWS again prior to future development at the Airport is recommended to ensure no species listed under the Endangered Species Act are in the development area.

1.10.6 WATER QUALITY

The City of Redmond has an Underground Injection Control (UIC) Management Plan that documents the City's stormwater management program. The plan also explains how the City protects groundwater quality from stormwater impacts of UIC facilities in compliance with their UIC Water Pollution Control Facility (WPCF) Permit (No. 103050). The City has no naturally occurring surface water within the Urban Growth Boundary, where the highest density development is, so the City's stormwater outfall systems uses drywells, drill holes, injection galleries, and outfalls to vegetated swales and infiltration basins.

WETLANDS AND OTHER WATERS

The following sections provide an overview of known wetlands and other waters on and surrounding the Airport property.

APPLICABLE LAWS AND REGULATIONS

Wetlands are protected under the State of Oregon Removal Fill Law and Section 404 of the Clean Water Act. Wetlands are under the jurisdiction of both Oregon Department of State Lands (DSL) and the US Army Corps of Engineers (Corps). Both agencies use the 1987 *Corps of Engineers Wetlands Delineation Manual* and the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* to determine what a wetland is and its extent. An area is determined to be a wetland if it has a dominance of plants that grow in wet conditions (called hydrophytic vegetation), hydric soils, and positive wetland hydrology.

BACKGROUND RESEARCH

A literature review covered areas extending one mile in every direction from the study area. Reviewed information included the US Department of Agriculture Natural Resources Conservation Service (NRCS) Soil Survey, the USFWS National Wetlands Inventory, the Department of State Lands Local Wetlands Inventory, and Deschutes County online property database. A site reconnaissance was performed on October 24, 2016.

The National Wetlands Inventory shows the following wetlands within the study area:

- ✓ Two wetlands on the former Juniper Golf Course;
- ✓ Lateral E Canal and North Unit Main Canal; and
- ✓ Two wetlands on the Forest Service Rappel Base Helipad.

The two wetlands indicated on the former golf course are man-made water features and are not drained. These areas no longer meet the criteria of a wetland because the hydrology is no longer met. Both irrigation canals are not waterbodies under the jurisdiction of either DSL or the Corps because the canals are used for irrigation water conveyance and are turned on and off seasonally. The two wetlands indicated at the Forest Service Rappel Base are paved areas.

The Project Area is situated within the semi-arid shrub-steppe province (Franklin and Dyrness 1988). Vegetation is dominantly western juniper (*Juniperus occidentalis*) and big sagebrush (*Artemisia tridentata*), but also includes rabbitbrush (*Chrysothamus* and *Ericameria* spp.), bitterbrush (*Purshia tridentata*), low sagebrushes (*Artemisia* spp.), and grasses, such as Idaho fescue (*Festuca idahoensis*), needlegrass (*Achnatherum* spp.), squirreltail (*Sitanion hystrix*), and Sandberg bluegrass (*Poa secunda*).

The NRCS maps soils as Deschutes-Stukel complex, dry and Stukel-Rock outcrop-Deschutes complex, dry. Neither of these soils series are classified as nor considered hydric soils. This further indicates that wetlands are unlikely to occur in the study area.

A site reconnaissance performed on October 24, 2016, identified no wetlands or waters of the State/US within the study area. The undeveloped areas of the Airport support an upland plant community of western juniper/gray rabbitbrush/cheatgrass. During this same site reconnaissance, neither primary nor secondary indicators of wetland hydrology were observed.

1.10.7 FARMLAND

Review of the 2016 NRCS Soil Survey of Deschutes County helped evaluate the presence of prime, unique, state or locally important farmland in the project area. The survey indicated the Airport property and study area do not contain soil types classified as “prime farmland.” As of 2016, no property within the study area is being used or was recently used or zoned for farming purposes.

1.10.8 CRITICAL AREAS

Local jurisdictions may have critical areas that relate to Oregon's State-wide Land Use Goals. There are no Critical Areas in the City of Redmond's Comprehensive Plan or Development Code.

1.10.9 FLOODPLAINS

FEMA maps floodplains all across the U.S. Specifically, the FEMA Flood Map Service Center collects data from Flood Insurance Rate Maps (FIRMs) and incorporates all the data into a national flood hazard layer to map where floodplains are. There are no floodplains on airport property.

1.10.10 RECYCLING PLAN

The FAA Modernization and Reform Act of 2012 (FRMA) expanded the definition of airport planning to include "developing a plan for recycling and minimizing the generation of airport solid waste" and added a provision requiring airports that prepare a master plan to address issues related to solid waste recycling.

A site visit and staff interviews took place on December 15, 2016, to collect information about recycling at the Airport. The study team toured the passenger terminal, airport offices, airline and other tenant spaces, SRE and ARFF facilities, and other airport buildings. Interviews of the staff from airport management and the facilities department clarified details about the recycling program in place in 2016.

The Airport has an active recycling program; the Airport does not have a written recycling plan. Under this master plan project, a recycling plan document will be developed that describes the existing program and recommends strategies to improve recycling and waste management at the facility. The recycling plan will be an appendix to this master plan report.

1.11 CONCLUSION AND SUMMARY

The facilities and conditions described in this chapter form the baseline of the Airport Master Plan. The research put into preparing this document will support further analysis and recommendations that will occur in subsequent chapters. A summary of key facilities is presented in **Table 1-26**.

Table 1-26. Inventory Chapter Summary

Runways

- Runway 5-23: 7,038 ft. x 150 ft.
- Runway 11-29: 7,006 ft. x 100 ft

Runways and Navigational Aids

- Runway 5-23
  - Good Pavement Condition
  - High Intensity Runway Lights (HIRL)
  - Precision Runway Markings
- Runway End 5
  - Runway End Identifier Lights (REIL)
  - Visual Approach Slope Indicator (VASI)
- Runway End 23
  - Precision Approach Path Indicator (PAPI)
- Runway 11-29
  - Good Pavement Condition
  - Medium Intensity Runway Lights (MIRL)
  - Non-precision Runway Markings
- Runway End 11
  - VASI
- Runway End 29
  - PAPI

Airport Navigational Aids

- VHF Omni-directional Range with Distance Measuring Equipment (VOR/DME)
- Non-Directional Beacon (NDB)
- Automated Surface Observing System (ASOS)
- Two Wind Socks

Emergency

- ARFF Index B

FAA Certification

- Part 139

Instrument Procedures

- Runway 5
  - RNAV (RNP)
  - RNAV (GPS)
  - REDMOND THREE
- Runway 23
  - ILS
  - VOR/DME
  - VOR-A
  - NDB
  - RNAV (RNP)
  - RNAV (GPS)
  - REDMOND THREE
  - Visual
- Runway 11
  - VOR A (Category A)
  - GPS
  - REDMOND THREE
- Runway 29
  - GPS
  - RNAV (GPS)
  - REDMOND THREE

Building Area

- Passenger Terminal and TSA
- Airport Traffic Control Tower
- Aircraft Maintenance
- Aircraft Fuel (Full Service & Self Service FBOs)
- Hangars and Tie-downs
- Snow Removal Equipment and Maintenance
- Aircraft Rescue and fire Fighting (ARFF)
- United States Forest Service (USFS)
- Business Park

2.0 FORECAST SUMMARY

Central Oregon is growing across all indicators. In the ten years between 2006 and 2016, the population of Deschutes County has grown by 23 percent, gross regional product has grown by 20 percent, and employment has recovered to pre-recession levels. Permanent migrants are drawn by the quality of life and comparatively lower cost of living when compared to Western Oregon and California, and tourists come throughout the year to partake in the tax-free shopping and outdoor activities.

This regional growth has been reflected in the strong uptick in aviation activity. Passenger enplanements have grown at an annual average of 2.1 percent per year, and 2016 enplanements are 66 percent above 2006 levels. Deschutes County has some of the fastest growing communities in the country, and RDM is one of the nation's fastest growing Airports. Historical and FAA-projected growth exceed the levels for Oregon and the U.S.

Air cargo volume has declined by 40 percent over the last ten years. This decline is largely because of a global movement towards electronic substitutes for mail, and high fuel prices, and increased air cargo screening pushing cargo on to trucks. General aviation has spread to other airports in the region, and much flight training relocated from Redmond to Bend. Redmond, with its airport traffic control tower (ATCT), instrument landing system, and two fixed base operators, remains the primary regional airport for jet traffic. A summary of the demand forecasts is presented in **Table 2-1**.

Table 2-1: Forecast Summary

Category	2006	2016	2036	CAGR 2016-2036
Enplanements	**197,223**	**298,322**	**680,750**	**4.2%**
Air Cargo (Tons)	**1,612.8**	**970.1**	**1,000**	**0.2%**
Aircraft Operations	**68,388**	**40,162**	**47,740**	**0.9%**
Itinerant Operations				
Air Carrier	1,433	5,127	13,140	4.8%
Commuter / Air Taxi	16,803	6,340	2,100	-5.4%
General Aviation	22,170	10,985	14,000	1.2%
Military	366	341	300	-0.6%
Local Operations				
General Aviation	27,376	16,829	18,900	0.6%
Military	240	540	500	-0.4%
Based Aircraft	**129**	**80**	**127**	**2.3%**
Single-Engine Piston	92	64	78	1.0%
Multi-Engine Piston	31	6	2	-5.3%
Jet & Turbo-Prop	3	4	30	10.6%
Helicopter	3	6	12	3.5%
Other	0	0	5	N/A

Year corresponds to FAA Fiscal Year, October to September. Airport was closed for three weeks in 2016 for construction.
2016: Enplanements and Air Cargo – RDM Monthly Report and RDM Performance Metrics, Aircraft Operations – Terminal Area Forecast 2016, Based Aircraft – Airport Management Records 2016, CAGR: Compound Annual Growth Rate

2.1 INTRODUCTION TO FORECASTS

Aviation activity forecasts evaluate the future demand at the Airport. This chapter forecasts the following:

- ✓ Passenger Enplanements
- ✓ Cargo Volume
- ✓ Based Aircraft
- ✓ Aircraft Operations (Itinerant and Local)

Forecasts have a base year of 2016, and use the Federal Aviation Administration (FAA) fiscal year (October to September). The forecast period is 20 years with reporting intervals of every five years. Multiple forecasting methodologies are used with each activity, and are compared with the FAA Terminal Area Forecast (TAF).

Forecasts help determine if existing airport facilities are sufficient to handle future demand (passengers, cargo, operations, and based aircraft), or if facilities need to be modified to meet future demand. The FAA Seattle Airports District Office will review forecasts for rationality and comparison to the FAA TAF.

The chapter is organized in the following sections:

- ✓ Community Profile
- ✓ Aviation Activity Profile
- ✓ Scheduled Service Forecasts
- ✓ General Aviation Forecasts
- ✓ Peaking and Critical Aircraft
- ✓ Forecast Summary

TERMINOLOGY

Aircraft Operation: A count of a takeoff, landing, or touch-and-go. Each time an aircraft touches the runway to takeoff or land, it counts as an operation.

Aircraft Approach Category (AAC): Classification of an aircraft by approach speed, with "A" being the slowest and "E" being the fastest.

Airplane Design Group (ADG): Classification of an aircraft by its size (wingspan and tail height) with "I" being the smallest and "VI" being the largest.

Airport Reference Code (ARC): Used to determine facility size and setback requirements. The airport reference code is a composite of the approach category and design group of the critical aircraft.

Based Aircraft: Aircraft that are stored at RDM. These aircraft may be stored full-time or seasonally.

Critical Aircraft: The most demanding aircraft (in terms of size and/or speed) to use an airport more than 500 times a year or to have scheduled operations at an airport.

Enplanement: The act of a passenger boarding a scheduled or charter aircraft operated by a passenger airline.

General Aviation (general aviation): Aviation activities conducted by recreational, business, and charter users not operating as airlines under FAR Part 121, Part 135, or military regulations.

Itinerant Operation: An operation that originates and terminates at different airports. An example is an aircraft flying from RDM to another airport.

Local Operation: An operation that originates and terminates at the same airport. An example is an aircraft taking off from RDM, remaining near the airport to practice flight maneuvers, and then landing at RDM.

Touch-and-Go: A maneuver where an aircraft lands and takes off without leaving the runway. A touch-and-go counts as two aircraft operations.

Table 2-2 describes the data sources used in this chapter.

Table 2-2: Description of Data Sources

Source	Description
FAA TAF	The FAA TAF, published in January 2017, provides historical records and forecasts for passenger enplanements, aircraft operations and based aircraft at RDM. These forecasts serve as a comparison for forecasts prepared as part of this planning effort, and provide historical information on aircraft activity. The TAF is included in **Appendix B** as **Attachment 1**.
FAA Aerospace Forecast	The Aerospace Forecast 2016-2036 is a national-level forecast of aviation activity. The Aerospace Forecast helps guide local forecasts by serving as a point of comparison between local trends and national trends.
FAA Traffic Flow Management System Counts Data (TFMSC)	The TFMSC includes data collected from flight plans. These operations are categorized by aircraft type, and used to identify trends in the RDM fleet mix. The advantage of the TFMSC data is its degree of detail and its insights into the itinerant users of RDM. A disadvantage of TFMSC data is it does not include local operations or operations that did not file a flight plan. As such, the utility of TFMSC data is limited to larger aircraft, including scheduled commercial passenger, cargo, and charter operators, and private business jets.
U.S. Department of Transportation (USDOT) T-100 Database	Scheduled, charter passenger, and air cargo airlines fill out the T-100 form monthly. The T-100 database is an online repository of the data recorded on the forms, such as number of seats sold, number of seats available, freight transported, aircraft used, and departures performed. The T-100 provides a detailed look at the operations of passenger and cargo airlines.
U.S. Census Bureau	U.S. Census Bureau data was used to compare growth in Deschutes County to other communities across the country. Highlights from the Census Bureau are included in **Appendix B** as **Attachment 2**.
Airline Ticket Data	Airline ticket data was used to identify the catchment area and fare trends at RDM. Two sources were used: The Airline Reporting Corporation (ARC) and Market Information Data Tapes. These sources provide insight on the zip codes (based on billing information) that RDM travelers came from, which defines the catchment area. This information was then used to see where else travelers in the catchment area fly from, and determine how many potential RDM passengers chose to fly from other airports.

---- Continued on Next Page ----

Table 2-2: Description of Data Sources – Continued

Source	Description
Socioeconomic Data	Socioeconomic data is provided by data vendor Woods & Poole, Inc. (W&P), and the Portland State University College of Urban & Public Affairs: Population Research Center (PRC). The local municipalities use PRC data for population projections. The City of Redmond Comprehensive Plan was consulted; however, it is dated and does not reflect the best available information. The City of Redmond's Comprehensive Plan was last completed in 2001 (with updates through 2015), and will be fully updated in 2017/2018. The Deschutes County Comprehensive Plan was adopted in 2012. W&P provides data for gap years in the U.S. Census. The W&P dataset considers the Bend-Redmond Metropolitan Statistical Area (MSA), and provides 124 data categories with records from 1970 to 2016, and forecast through 2040. Data categories considered include population, employment, earnings and income, and gross regional product.
Local Economic Development Data	Economic development data helps tell the story behind the community's recent growth and shows where the community is focusing its efforts in terms of business recruitment. Data was provided by the Central Oregon Visitors Association (COVA), Redmond Economic Development, Inc. (REDI), and the Central Oregon Association of Realtors (COAR). Presentations prepared by these groups are included in **Appendix B** as **Attachment 3.**
State Plans	The Oregon Aviation System Plan (OASP) was last prepared in 2007, and projects aviation activity through 2025. The forecast base year was 2005. The OASP projected that RDM would grow from 174,008 enplanements to 537,400 enplanements, based aircraft were expected to grow from 117 to 197, and total operations were going to grow from 62,708 to 95,330. In 2015, OASP enplanement projections were 19 percent higher than actual enplanements, operations projections were 21 percent higher, and based aircraft projections were 14 percent higher .
Stakeholder Interviews	The aviation forecasting team collected data firsthand from airport stakeholders and community members during a series of interviews conducted October 24 and 25, 2016. Interviews were performed with representatives from the following groups • Airport Management • Airport Security • United States Forest Service • American Airlines • Delta Air Lines • Alaska Airlines • Redmond Police • SERCO (Air Traffic Control) • Leading Edge Jet Center • Butler Aircraft Services • Transportation Security Administration

Part of the master planning process includes getting the best available data for development of forecasts, and evaluating the quality of this data to address anomalies. Common forecast methods, such as regression analysis and time-series evaluation can be thrown off by anomalies in historical data. One such anomaly is the three-week airport closure that occurred in May for runway construction. The closure interrupted normal operations and reduced enplanement totals and operations counts. Extended closures are not part of normal operations for the Airport; therefore, it is important to understand how many operations might have occurred had the Airport not been closed for three weeks. The calculation for the effect of this closure is shown in **Table 2-3**.

Table 2-3: Data Adjustment for Three Week Airport Closure

Category	May Count	Adjust Method	May Adjust
Enplanements	**7,113**	**Load Factor**	**20,274**
Operations	**1,910**	**Sum**	**3,826**
Air Carrier	166	Same as April	520
Air Taxi	154	Same as April	352
Itinerant GA	440	% of Year	881
Local GA	1,107	% of Year	1,874
Military	43	N/A	43

Passenger Enplanements: Alaska: 157 additional departures at 78 percent load factor. American: 20 additional departures at 75 percent load factor, Delta: 38 additional departures at an 84 percent load factor. United: 84 additional departures at an 87 percent load factor.
May operations: Averaged 8.84 percent of annual operations from 2006-2015.
Air Taxi Operations: Include passenger and air cargo.
Military operations: Not adjusted.
Sources: Airport management records from airlines and ATCT, FAA OPSNET database, FAA Terminal Area Forecast.

Passenger enplanements were calculated based on the number of scheduled operations that were canceled during the closure, using the average annual load factor to estimate number of passengers that would have been on the flights. Air carrier and air taxi operations were based on the prior month's schedule. Air taxi operations include both scheduled passenger and air cargo operations.

General aviation operations were estimated through a multi-step process.

1. May 2016 operations were calculated by based on the percent of operations that occurred in May from 2006 to 2015. Records from the ATCT show that an average of 8.8 percent of annual operations occur in May. This means that 3,826 operations were likely to occur in May 2016.
2. Subtracting the air carrier, air taxi, and military operations leaves 2,755 general aviation operations.
3. The FAA Operations Network (OPSNET) database shows that there were 440 itinerant operations and 1,107 local operations classified as general aviation in May 2016. This ratio was applied to the 2,755 expected general aviation operations, producing 881 itinerant operations and 1,874 local operations.

The adjusted enplanement and operations totals were used in forecast models to project future activity. Data reported in the chapter for 2016 matches FAA TAF values. Airport management did not report that based aircraft totals were impacted by the closure. Some tenants relocated their aircraft temporarily; however, overall based aircraft did not change before and after the closure.

2.2 COMMUNITY PROFILE

Community profile describes the location of the Airport, and the community it serves. The Airport is located within Bend-Redmond Metropolitan Statistical Area (MSA) and serves the Central Oregon region. There are five other general aviation (general aviation) airports within 30 nautical miles of the Airport: Bend Municipal Airport (BDN), Madras Municipal Airport (S33), Prineville Airport (S39), Sunriver Airport (S21), and Sisters Eagle Air Airport (6K5). RDM is the only commercial service airport in Central Oregon. This section describes the community population, employment and economic development, gross regional product (GRP), the activities of the US Forest Service (USFS), tourism, the regional airports already mentioned, and the catchment areas and competition. These characteristics comprehensively form RDM's community profile.

2.2.1 POPULATION

Table 2-4 shows the population records from 2006 to 2016 and the Portland State University Population Research Center (PRC) forecast through 2036. The PRC gathers population data on and collaborates with the state of Oregon, the counties, and cities within the state to create the forecast. The MSA grew at a compound annual growth rate (CAGR) of two percent from 2006 and 2015, increasing the total population by more than 33,000. The MSA population is forecasted to grow at a CAGR of 1.8 percent, reaching more than 252,000 by 2036.

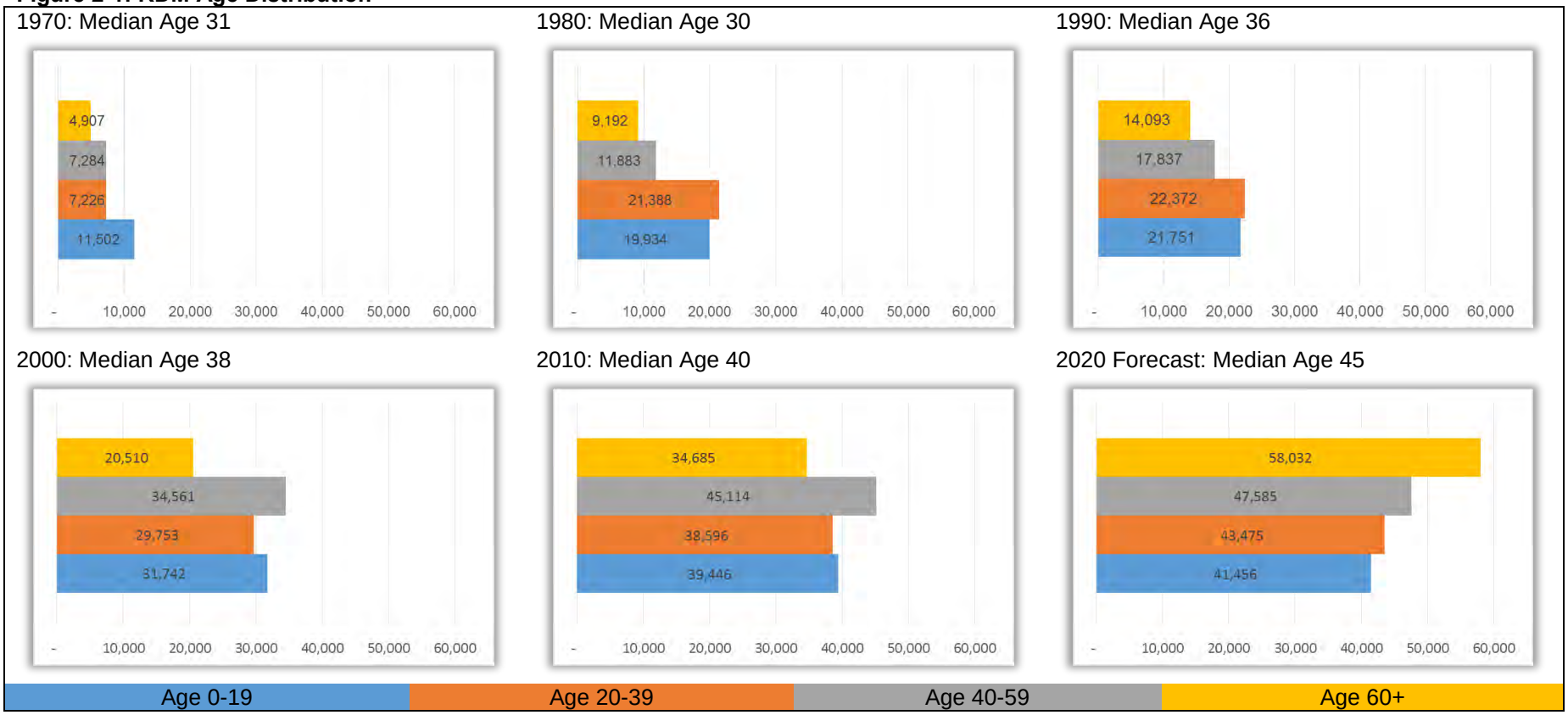
Table 2-4: Bend-Redmond MSA Population

Calendar Year	Population	Percent Change
2006	143,316	-
2011	158,875	10.9%
2016	**176,635**	**11.2%**
2021	194,593	10.2%
2026	214,606	10.3%
2031	234,022	9.0%
2036	252,681	8.0%
CAGR (2006-2016)	2.0%	N/A
CAGR (2016-2036)	1.8%	N/A

CAGR = Compound Annual Growth Rate
Source: Portland State University Population Research Center

The U.S. Census Bureau ranked the Bend-Redmond MSA as the seventh fastest growing metro area in the U.S. in 2014, and the 3rd fastest growing metro area in the U.S. in 2016 (**Appendix B, Attachment 2 – Census Data**). Population growth is driven by two primary factors: job availability attracting workers and their families, and quality-of-life factors attracting retirees. **Figure 2-1** shows the population distribution of the MSA from 1970 through to the forecast for 2020. From 1970 to 2020, the median age increases from 31 to 45, and the percent of population over the age of 60 grows from 16 percent to 30 percent. Working age population, particularly the more experienced workers between the ages of 40 and 59, have grown by a total of 40,301 during the same period.

Figure 2-1: RDM Age Distribution

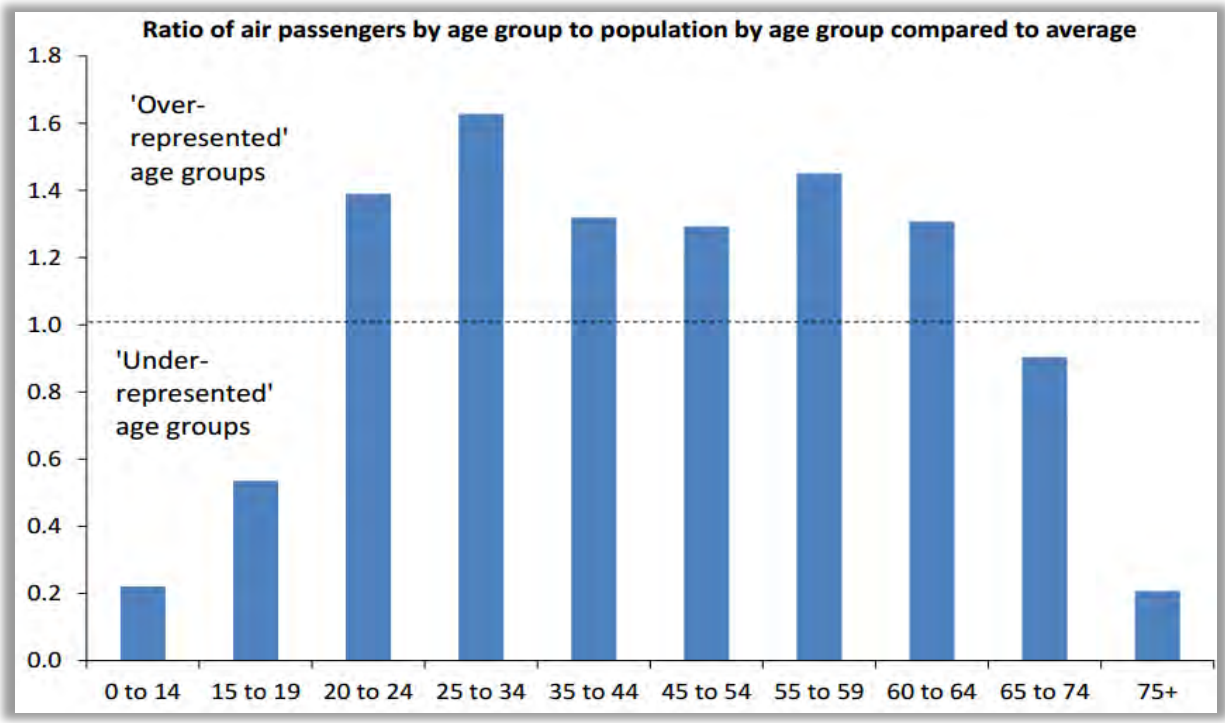


Source: Woods & Poole, 2014

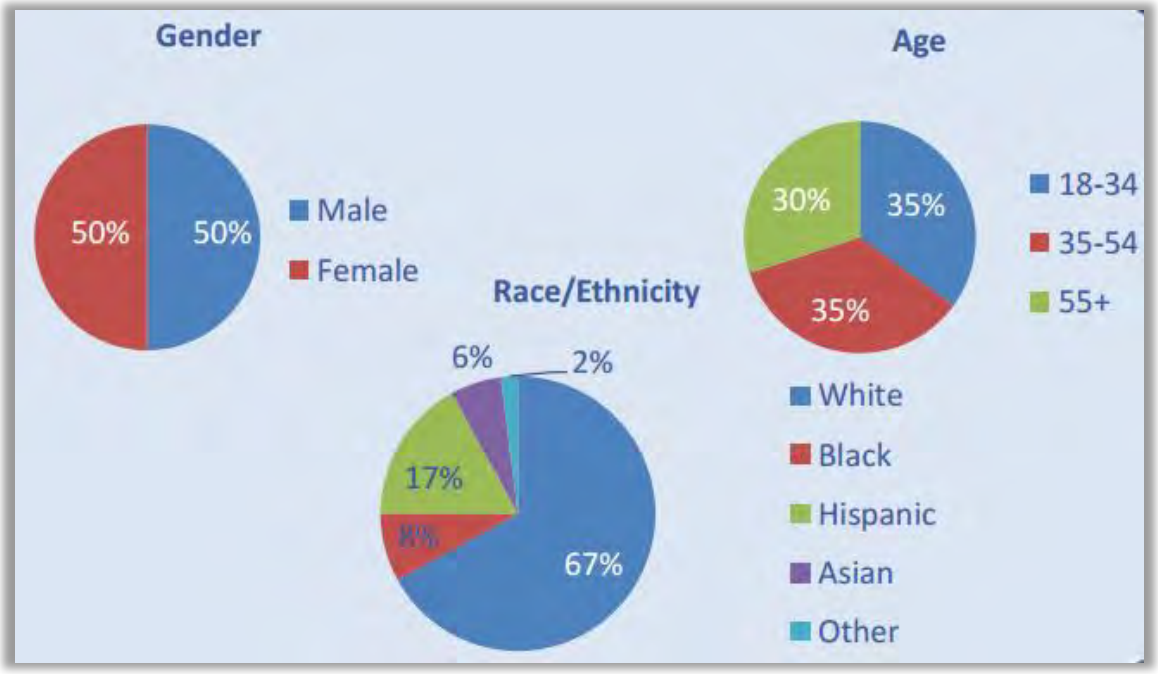
The changing demographics have significance for the incidence of air travel within the community. The 2014 *Shape of Air Travel Markets Over the Next 20 Years* report by the International Air Transportation Association (IATA) shows that working age travelers tend to fly more frequently than the population under the age of 19 and over the age of 65. Population growth, partially spurred by job growth and economic diversification discussed in **Section 3.2**, helps drive up the number of average trips per capita in RDM.

A 2015 survey by Airlines for America (A4A), presented in the 2016 report *Status of Air Travel in the USA*, conforms that working-age U.S. travelers (age 18-54) make up 70 percent of adult travelers. A point of distinction between the IATA and A4A reports is that the A4A report does not address trip frequency amongst the population directly, and does not include children. Travel by age group from the IATA and A4A reports are presented in **Figure 2-2**

Figure 2-2: Air Passenger Trips per Capita by Age



U.S. Air Traveler Composition



Source: IATA, 2014, Airlines for America, 2016

2.2.2 EMPLOYMENT AND ECONOMIC DEVELOPMENT

Per Woods and Poole data, the economy of the Redmond MSA has exhibited recovery since the end of 2007-2009 recession with total employment growing at an annual average rate of one percent from 2009 to 2016. Because of the recession, the MSA employment dropped by a total of 41 percent between 2006 and 2011. Industries that saw the greatest decline in employment were construction with a 14 percent decline, manufacturing with a 7.5 percent decline, and mining with a four percent decline. Professional services, such as finance, insurance, real estate, and professional and technical services were more resilient and posted employment growth between 2006 and 2011.

Economic recovery and diversification have been occurring since the end of the recession. Top industries by total employment in 2006 were construction (13 percent of jobs), retail (12 percent of jobs), and healthcare (10 percent of jobs). By 2016, top industries were healthcare (12 percent of jobs) and retail (12 percent of jobs), while construction dropped to sixth place with seven percent of jobs. MSA employment fluctuates by 6,000 jobs over the course of the year due to the seasonal nature of the ski season. Employment has kept pace with population growth, and the employment per capita ratio was 0.59 in 2016. The decline from 2006 to 2011 is indicative of population growth, coupled by a decline in labor intensive industries (construction and mining) and growth in more automated industries like healthcare and professional services. Total employment and employment per capita are presented in **Table 2-5**. Top industries by employment and sales are presented in **Table 2-6**.

Table 2-5: Bend-Redmond MSA Employment			
Calendar Year	**Total Employment**	**Percent Change**	**Employment/Capita**
2006	98,159		0.68
2011	92,312	-6.0%	0.58
2016	**104,289**	**13.0%**	**0.59**
2021	115,293	10.6%	0.59
2026	126,746	9.9%	0.59
2031	138,395	9.2%	0.59
2036	151,019	9.1%	0.60
Compound Annual Growth Rates			
'06 - '16	0.6%	N/A	-1.5%
'16 - '36	1.9%	N/A	0.1%

Jobs Per Capita = Total Employment / Total Population.
MSA Population included in **Table 2-3**.
Sources: Employment: Woods & Poole, Population: Portland State University

Job diversity has seen growth as the population and number of people employed has increased. Growing job sectors include aviation, engineering, health, technology, and social media. Below are examples of companies in the MSA that have shown recent growth:

- ✓ RDD – Provider of major systems and components for experimental aircraft.
- ✓ Stratos Aircraft – Located on Airport, Stratos designs, manufactures, and maintains the Stratos 714,
  a very light jet.
- ✓ Bend Research – Medical and pharmaceutical research company.
- ✓ Patheon – A supply-chain oriented pharmaceutical and biopharmaceutical company.
- ✓ Facebook – A social network that houses a server hub in nearby Prineville.
- ✓ Les Schwab Tires – A tire retail chain with a hangar on the Airport and headquarters in Redmond.
- ✓ PCC Structurals, Inc. – Global manufacturer of components are used in aircraft engines, airframes, power generation equipment, armaments, and commercial and medical needs.
- ✓ Nanometrics – Provider of advanced, high performance process control metrology and inspection systems used in the fabrication of products like semiconductors and solid-state devices.

Table 2-6: Bend-Redmond MSA Top 5 Industries by Employment and Sales 2006 – 2016

Top Industries by Employment

Rank	2006		2011			2016		
	Industry	Jobs	Industry	Jobs	Δ	Industry	Jobs	Δ
1	Construction	12,492	Retail Trade	11,382	(6.3%)	Health Care	13,035	18.0%
2	Retail Trade	12,145	Health Care	11,043	16.5%	Retail Trade	12,939	13.7%
3	Health Care	9,476	Accom. + Food Serv.	8,369	0.2%	Accom. + Food Serv.	9,476	13.2%
4	Accom. + Food Serv.	8,352	State and Local Gov.	7,355	11.1%	State and Local Gov.	7,935	7.9%
5	Manufacturing	6,940	Real Estate	7,212	15.2%	Real Estate	7,924	9.9%

Top Industries by Retail Sales

Rank	2006		2011			2016		
	Industry	Sales ($M)	Industry	Sales ($M)	Δ	Industry	Sales($M)	Δ
1	Motor Vehicles	$786.5	Gen. Merchandise	$703.9	7.6%	Motor Vehicles	$950.4	35.1%
2	Gen. Merchandise	$654.1	Motor Vehicles	$703.5	(10.6%)	Gen. Merchandise	$772.9	9.8%
3	F&B Retail	$419.1	F&B Retail	$474.9	13.3%	F&B Retail	$533.7	12.4%
4	Building Materials	$353.6	Restaurants	$339.2	12.9%	Restaurants	$407.0	20.0%
5	Restaurants	$300.5	Gasoline Stations	$271.1	34.1%	Building Materials	$327.1	35.9%

Bend-Redmond MSA Top 5 Industries by Employment and Sales 2016 – 2036

Top Industries by Employment

Rank	2016		2026			2036		
	Industry	Jobs	Industry	Jobs	Δ	Industry	Jobs	Δ
1	Health Care	13,035	Health Care	17,981	37.9%	Health Care	23,629	31.4%
2	Retail Trade	12,939	Retail Trade	15,289	18.2%	Retail Trade	17,475	14.3%
3	Accom. + Food Serv.	9,476	Accom. + Food Serv.	11,375	20.0%	Accom. + Food Serv.	12,883	13.3%
4	State and Local Gov.	7,935	Real Estate	9,561	20.7%	Real Estate	11,310	18.3%
5	Real Estate	7,924	State and Local Gov.	9,344	17.8%	Prof. and Tech Serv.	10,994	22.0%

Top Industries by Retail Sales

Rank	2016		2026			2036		
	Industry	Sales ($M)	Industry	Sales ($M)	Δ	Industry	Sales($M)	Δ
1	Motor Vehicles	$950.4	Motor Vehicles	$1,222.4	28.6%	Motor Vehicles	$1,462.2	19.6%
2	Gen. Merchandise	$772.9	Gen. Merchandise	$1,025.4	32.7%	Gen. Merchandise	$1,338.4	30.5%
3	F&B Retail	$533.7	F&B Retail	$634.7	18.9%	Restaurants	$745.3	35.1%
4	Restaurants	$407.0	Restaurants	$551.9	35.6%	F&B Retail	$744.3	17.3%
5	Building Materials	$327.1	Building Materials	$412.5	26.1%	Building Materials	$522.3	26.6%

Δ = Total percent change from period before (10 years). Retail sales presented in millions of inflation-adjusted 2016 dollars. Accom. + Food Serv. = Accommodation and Food Services (e.g. hotels). Prof. and Tech Serv. = Professional and Tech Services F&B Retail = Food and Beverage Retail (e.g. grocery stores). Gen. Merchandise: = General Merchandise is a wide array of retail with the exception of food and beverage (e.g. clothing, hardware, etc.). Source: Woods & Poole

2.2.3 GROSS REGIONAL PRODUCT

Gross regional product (GRP) is the value of goods and services produced in the MSA. GRP serves as an index for the health of the overall economy. As the economy increases production– both by producing more goods and producing more valuable goods, GRP increases. GRP per Capita shows the impact of the recession on 2011 GRP, which was down compared to 2006 GRP per Capita despite overall GRP being higher. Woods and Poole projections for GRP show that it will increase slightly faster than the MSA population. This is due to increases in efficiency and growth in the healthcare, professional service, and technical manufacturing industries, which produce higher value goods per person than traditional MSA industries that focus on raw material extraction (agriculture, mining, and forestry). **Table 2-7** shows the GRP of the MSA from 2006 to 2036.

Table 2-7: Bend-Redmond Gross Regional Product

Calendar Year	GRP ($M)	Percent Change	GRP ($M) per Capita
2006	$7,356		$0.051
2011	$7,552	2.7%	$0.048
2016	$8,755	**15.9%**	$0.050
2021	$9,812	12.1%	$0.050
2026	$10,924	11.3%	$0.051
2031	$12,103	10.8%	$0.052
2036	$13,302	9.9%	$0.053
Compound Annual Growth Rates			
’06 - ‘16	6.1%	N/A	0.3%
‘’16 - ‘36	2.1%	N/A	0.3%

GRP per Capita = GRP / Total Population.
GRP is inflation-adjusted 2016 dollars
Sources: GRP: Woods & Poole, Population: Portland State University

2.2.4 UNITED STATES FOREST SERVICE

The United States Forest Service (USFS) Redmond Air Center (RAC) plays a major role in supporting firefighting efforts in the region. USFS aviation activities contribute an average of 500 annual operations, which includes flights by helicopters, tankers, and single-engine spotter aircraft., USFS operations are concentrated during the fire season from May to October. Total operations depend on the severity of the fire season, and the Airport has seen as many as 1,000 tanker flights and as few as 300. The RAC expects to see Lockheed C-130 air tankers following the reconstruction of former Taxiway B (now Taxiway D) in 2017.

In addition to aerial response, the RAC hosts firefighting and emergency response training, and acts as a depot for firefighters headed out to events across the northwest. USFS and contract employees generally fly on scheduled commercial flights; however, charter flights have occurred when demand is sufficient.

Governmental organizations, such as national law enforcement and elected officials, use the RAC when in town.

The USFS classifies the RAC as a hub of operations, incident support base, and critical asset for the Federal Emergency Management Agency (FEMA) and related emergency efforts. FEMA and other disaster response agencies will use the RAC for large scale natural disasters in the Pacific Northwest, such as an earthquake in the Cascadia subduction zone.

2.2.5 TOURISM

The Airport receives tourists throughout the year due to the multitude of activities and attractions in the Central Oregon area. The Central Oregon Visitors Association lists golf courses, ski resorts, hiking trails, and the natural beauty of Oregon as tourist attractions. The Central Oregon Golf Trail features more than two dozen golf courses, three of which are ranked by *Golf Digest* and *GOLF Magazine* in the top 100 public courses in the nation. These top golf courses are a strong attraction for visitors to fly to Central Oregon.

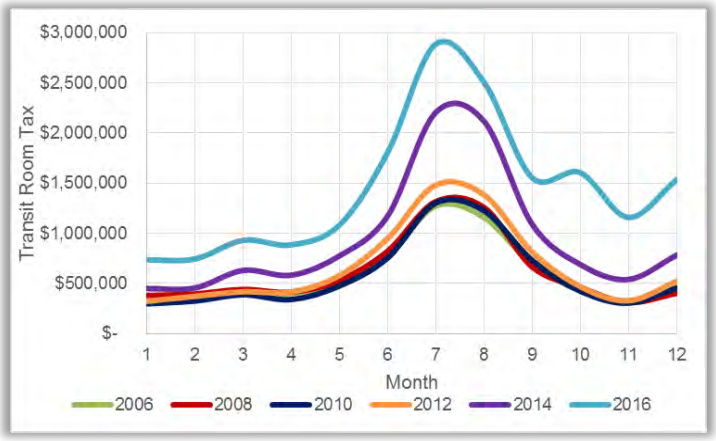
Central Oregon is home to two ski resorts, Mt. Bachelor and Hoodoo where visitors can participate in winter outdoor activities between November and May. Both resorts are also open from June to October for hiking and biking, and complement the trails elsewhere in the community.

Tourism activity is gauged by transit room tax (TRT) collection, which is provided by the Central Oregon Visitors Association (COVA). TRT is a percentage tax charged on hotel rooms. Growth in TRT shows two changes: an increase in average room price, an increase in hotel occupancy, and an increase in the number of rooms available. **Table 2-8** shows that TRT declined during the recession in 2008 and 2009 due to decreased travel, and has grown since. Strong growth from 2013 to 2016 is indicative of new lodging that has been built in response to the demand. Tourism peaks in the summer.

Table 2-8: MSA Transit Room Tax

Fiscal Year	TRT	% Change
2006	$7,159,430	
2007	$7,634,226	6.6%
2008	$7,535,010	-1.3%
2009	$6,560,361	-12.9%
2010	$6,952,963	6.0%
2011	$7,414,547	6.6%
2012	$7,930,881	7.0%
2013	$9,008,940	13.6%
2014	$11,061,570	22.8%
2015	$13,789,892	24.7%
2016	$15,513,984	12.5%
Compound Annual Growth Rate		
'06-'16	8.0%	N/A

TRT Collection by Month



TRT =- Transit Room Tax. TRT adjusted to match FAA fiscal year.
TRT is sum of amount collected by City of Bend, City of Redmond, City of Sisters, and Deschutes County
Months: 1= January, 12 = December
Source: Central Oregon Visitors Association

TRT growth exhibits strong correlation (0.91) with passenger enplanement growth from 2006 to 2016. This is to be expected as both indicators have common drivers. Growth in business and leisure visitors to the community help drive up TRT and passenger enplanement numbers. This, combined with population and employment growth (**Section 3.1** and **3.2**), explain the overall increase in passenger enplanements at RDM.

2.2.6 REGIONAL AIRPORTS

RDM is the only commercial service airport within 100 miles of the main population centers in Central Oregon; however, there are five general aviation airports nearby (Bend (BDN), Madras (S33), Prineville (S39), Sunriver (S21), and Sisters (6K5)). These airports are within 30 miles of RDM and provide general aviation users with choices for aircraft storage and services. A detailed description of the facilities offered at these airports are described in **Chapter 1**. Markets served by each airport are described in **Table 2-9**.

Table 2-9: Regional General Aviation Airports

Airport	Characteristics			Markets Served			
	Runway Length	Instrument Procedure	Jet A & FBO	Large Jets	Small Jets	Turbo-Props	Piston
Redmond	7,038 feet	Precision	Yes	Yes	Yes	Yes	Yes
Bend	5,200 feet	Non-Precision	Yes	No	Yes	Yes	Yes
Madras	5,089 feet	Non-Precision	Yes	No	Yes	Yes	Yes
Prineville	5,751 feet	Non-Precision	Yes	Yes	Yes	Yes	Yes
Sunriver	5,461feet	Non-Precision	Yes	No	Yes	Yes	Yes
Sisters	5,460 feet	Visual	No	No	No	No	Yes

Sources: Airport Facilities: FAA Airport Facilities Directory; Primary Market: Consultant assessment derived from based aircraft records and available facilities (runway length, fuel, instrument procedure)

Determination of market does not indicate the most common aircraft type at an airport, or suggest that a market that is not served will never use an airport. Rather, it reflects the presence of facilities at an airport that cater to the needs of a certain market. For example, piston aircraft are versatile in that they do not need Jet A fuel or a long runway, and due to their susceptibility to strong winds and turbulence, they tend not to be operated when visibility is particularly low due to stormy weather. For this reason, piston aircraft owners have fewer requirements for the airport where they based their aircraft than the owner of a business jet.

Large jets need a long runway to operate at their full potential, and owners generally need the aircraft available to fly regardless of the weather so airport instrumentation is more important. While large jets can use any of the regional airports under the right conditions, owners requiring year-round availability would be unlikely to base their large jet at an airport without the necessary facilities.

2.2.7 CATCHMENT AREAS AND COMPETITION

An airport's "catchment area" is the geographic boundary from which it draws its users, and airport activity is primarily influenced by the movement of people and products to and from the catchment area. Catchment areas are defined by the types of services offered at an airport, proximity of competitor airports, and the tendency of the local population to use the airport. The catchment area for RDM was split up into three different areas: air carrier, business jet, and general aviation. A map of the catchment areas is shown in **Figure 2-3.**

The air carrier catchment area is the largest of the three areas for RDM. The air carrier catchment area includes Central Oregon due to the Airport's location and the distance from other airports. The catchment area boundary is defined by assessing ticket purchases in the area surrounding the Airport, and looking at the zip codes of the passengers that traveled from RDM. The catchment area shows where RDM passengers are likely to come from; however, it should not be misinterpreted to mean that all air travelers in this area use RDM. Some fly from other airport, shown in the next section.

TERMINOLOGY

Air Carrier Catchment Area: Defined by the zip codes passengers live in when they purchase a ticket for an originating flight from the Airport.

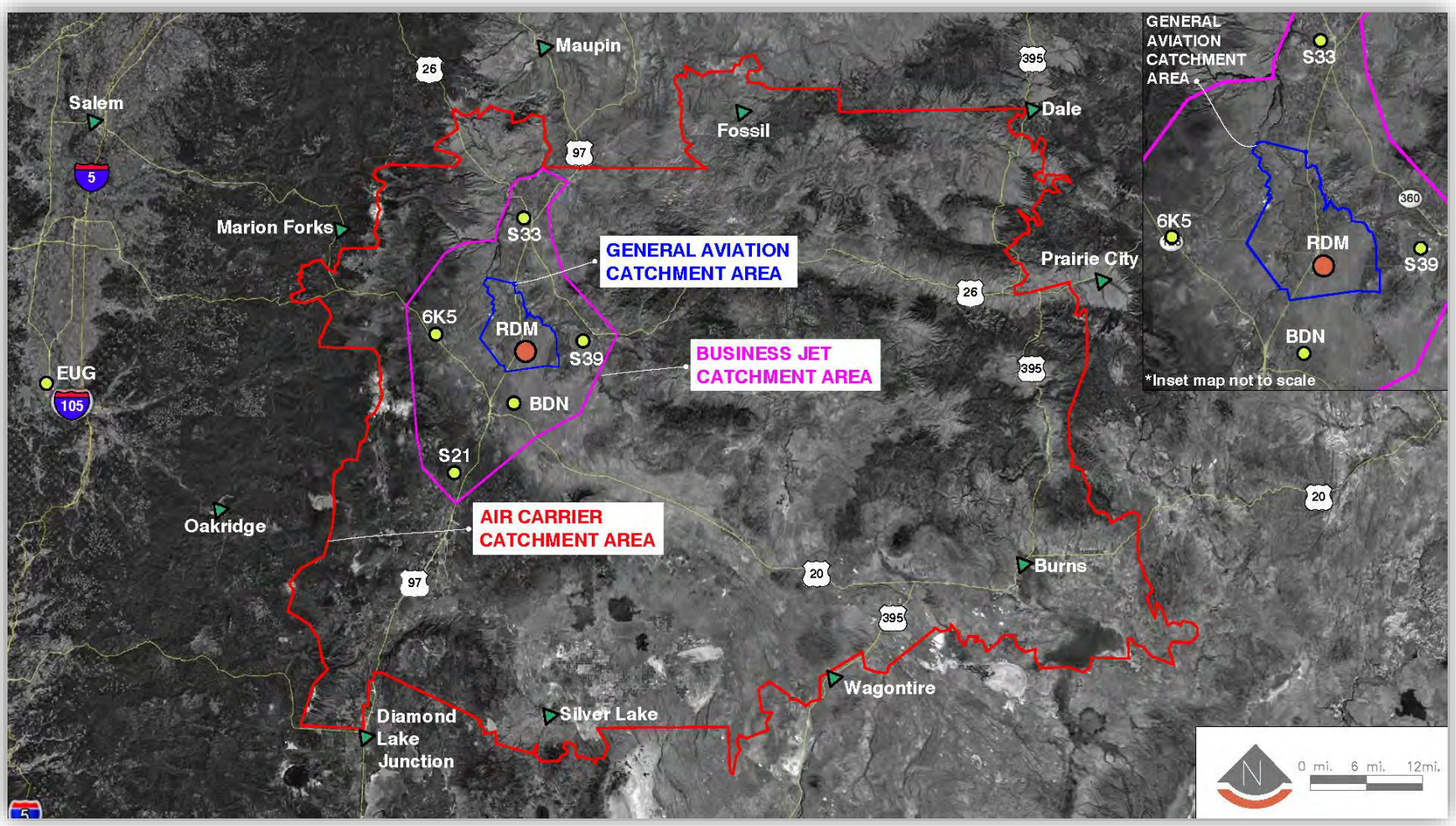
Business Jet Catchment Area: Defined by proximity to other airports capable of handling business jets.

General Aviation Catchment Area: Defined by the towns near the Airport who base general aviation aircraft at RDM.

The business jet catchment area is the second largest of the three areas and extends just past the city limits of Bend, Prineville, Madras, Sisters and Sunriver. This catchment area is based on the primary markets defined in **Table 2-9**. Surrounding airports do not have adequate facilities to serve large business jets throughout the year, which drives the size of the business jet catchment area.

The general aviation catchment area, which is the smallest, includes the City of Redmond and the areas halfway between the airports in Madras, Bend, Sisters, and Prineville. As shown in **Table 2-9**, the nearby airports in these communities have facilities that cater to small jets, turbo props, and piston aircraft. It is expected that aircraft operators will use the facility closest to their home or business provided space is available.

Figure 2-3: Catchment Areas



AIR CARRIER CATCHMENT AREA

The air carrier catchment area was determined based on a sample of passenger tickets issued between June 30th 2015 and June 30th 2016. This sample includes 24,457 tickets out of an estimated 747,325 tickets issued to travelers in the area over this period, meaning that the results are statistically valid at the 95 percent confidence level. *True market* for RDM is 747,325 tickets, which is the total number of tickets sold to the population of the catchment area. The true market includes travelers that used RDM, and travelers that live near RDM and used other airports.

Ticket sales data indicate that 75 percent of the true market used RDM for air travel, 24 percent used Portland (PDX), and the remaining one percent diverted to Eugene (EUG). When assessed based on international and domestic trips, RDM captured 76 percent (527,747) of domestic travelers and 59 percent (32,881) of international travelers. **Table 2-10** shows airport use by communities near the Airport.

Table 2-10: Airport Use by Community[1]

Community	Distance from RDM (Miles)	Year Ending June 30th, 2016 % Airport Use			True Market
		RDM	PDX	EUG	
Bend	17	80	19	1	524,628
Redmond	2	73	26	1	84,581
Sisters	21	69	31	0	33,032
Prineville	20	77	23	1	29,396
Terrebonne	8	72	28	0	17,876
Madras	28	50	49	0	17,448
La Pine	46	74	24	3	11,245
Powell Butte	9	82	17	1	7,486
Culver	21	73	27	0	5,684
Burns	144	56	44	0	2,170
Hines	142	59	41	0	1,711
Silver Lake	95	84	16	0	1,344
Christmas Valley	111	55	45	0	1,283
John Day	135	37	63	0	1,253
Crescent	64	67	28	5	1,192
Mount Vernon	127	48	52	0	947
Camp Sherman	36	75	21	4	856
Warm Springs	52	26	74	0	825
Kimberly	116	57	43	0	703
Canyon City	137	43	52	5	642
Total	**N/A**	**75**	**24**	**1**	**747,325**

1: Does not include markets with fewer than 100 passengers.
Sources: Airline Reporting Corporation, Market Information Data Tapes, and U.S. Department of Transportation

Travelers typically divert to other airports for non-stop flights, lower airfares, and more convenient flight times. Distance from RDM is another factor. **Table 2-10** shows that the Airport retains 72 percent of the true market within 30 miles of the Airport, 58 percent of the true market between 31 and 60 miles, 67 percent of the true market between 61 and 90 miles, and 55 percent of the true market over 91 miles away.

Table 2-10 shows the top 25 destinations true market estimates for passengers daily each way (PDEW) from RDM. PDEW numbers do not justify route existence on their own as many passengers flying from RDM connect in the airline hubs to other destinations. A passenger flying from RDM to Anchorage via Portland is part of the RDM-Anchorage PDEW total, and not part of the RDM-Portland PDEW total. RDM has non-stop service to each of the top five markets, and six of the top ten markets. The Airport uses the information contained in **Table 2-11** to advocate for new routes when meeting with the airlines.

Table 2-11: Top 25 Destinations True Market Estimate And PDEW					
Rank	**Destination**	**RDM Reported PAX**	**Diverted PAX**	**True Market**	**PDEW**
1	Seattle, WA[1]	61,199	4,442	65,641	89.9
2	Los Angeles, CA[1]	39,780	15,751	55,531	76.1
3	San Francisco, CA[1]	39,417	4,626	44,042	60.3
4	Portland, OR[1]	33,032	0	33,032	45.2
5	Phoenix, AZ (PHX)[1]	25,316	7,136	32,452	44.5
6	Las Vegas, NV	19,226	7,076	26,302	36.0
7	San Diego, CA	19,117	6,765	25,883	35.5
8	Denver, CO[1]	20,496	3,219	23,715	32.5
9	Orange County, CA	16,165	4,163	20,328	27.8
10	Chicago, IL (ORD)	10,465	3,357	13,822	18.9
11	Dallas, TX (DFW)	8,887	4,860	13,748	18.8
12	Anchorage, AK	8,642	4,723	13,364	18.3
13	Salt Lake City, UT[1]	10,010	2,624	12,633	17.3
14	San Jose, CA	6,801	5,096	11,896	16.3
15	Kahului, HI	5,947	5,947	11,893	16.3
16	Boston, MA	8,199	3,160	11,358	15.6
17	Minneapolis, MN	7,729	2,540	10,268	14.1
18	Oakland, CA	5,092	3,907	8,999	12.3
19	Sacramento, CA	5,320	3,587	8,907	12.2
20	Ontario, CA	6,293	1,981	8,274	11.3
21	Newark, NJ	6,778	1,450	8,228	11.3
22	Honolulu, HI	4,483	3,665	8,148	11.2
23	Orlando, FL (MCO)	5,169	2,613	7,783	10.7
24	Spokane, WA	5,710	1,404	7,114	9.7
25	Atlanta, general aviation	4,948	1,693	6,640	9.1
Top 25 destinations		**384,217**	**105,784**	**490,002**	**671.2**
Total domestic		**527,747**	**164,405**	**692,152**	**948.2**
Total international		**32,881**	**22,292**	**55,173**	**75.6**
All markets		**560,628**	**186,697**	**747,325**	**1,023.7**

1: Indicates routes with non-stop service.
PDEW: Passengers Daily Each Way
Airport codes used to identify specific airport used in cities with multiple commercial airports.
Sources: Airline Reporting Corporation, Market Information Data Tapes, and U.S. Department of Transportation

2.3 AVIATION ACTIVITY PROFILE

The aviation activity profile is the baseline of the forecasts. The profile shows trends in activity at the Airport and provides context that explains what, how, and why changes in aviation activity have occurred. Sources that have provided information include the FAA, Airport Management, ATCT staff; and airport tenants. This section is organized in the following order:

- ✓ Airline Service (Passenger and Cargo)
- ✓ General Aviation
- ✓ Military
- ✓ Terminal Area Forecast

The ATCT operates and tracks flights from 5 a.m. to 7 p.m. Arrivals and departures that occur outside of these hours are not included in operations records submitted to the FAA. Commercial airline operations are also reported to the U.S. Department of Transportation (USDOT) and operations that occur when the ATCT is closed are captured using USDOT records.

General aviation operations do not have such records; however, flight records captured by FlightAware.com show only 327 general aviation operations occurring outside of ATCT hours. FlightAware records do not capture all operations, only those that file flight plans. However, given the low number of recorded operations, it is expected that total GA operations that occur when ATCT is closed make up a small percentage of overall operations. The absence of a more definite count is not expected to materially impact the forecast. GA operations when the ATCT is closed are shown in **Table 2-12.**

Table 2-12: GA Operations During ATCT Closure

Category	Arrivals	Departures	Total	% of Total Operations
Single Engine Piston	17	8	**25**	**0.06%**
Multi Engine Piston	7	3	**10**	**0.02%**
Jet	110	70	**180**	**0.45%**
Single Engine Turboprop	51	23	**74**	**0.18%**
Multi Engine Turboprop	18	20	**38**	**0.09%**
Total	**203**	**124**	**327**	**0.81%**

Source: FlightAware Fiscal Year 2016 data. ATCT records show **40,162 operations in 2016**

2.3.1 AIRLINE SERVICE

Airline service includes scheduled passenger and cargo flights, and non-scheduled charter flights that operate charters for casinos and the U.S. Forest Service. The sections that follow describe the airline profile, opportunities for new airlines to come to RDM, passenger enplanements, commercial operations, and air cargo service at the Airport.

AIRLINE PROFILE

The Airport has four scheduled passenger airlines: Alaska, United, Delta, and American. In 2017, all flights were operated by regional airlines on behalf of the mainline carriers. Each provides service to their hubs with Alaska flying to Portland and Seattle; America flying to Phoenix and Los Angeles; Delta flying to Salt Lake City and Seattle; and United flying to Denver and San Francisco. Non-stop service to the seven hub airports puts RDM within one stop of many major cities in the world. The 2016 market share for airlines in terms of passengers carried was not evenly divided amongst the airlines: 57 percent of passenger traveled on Alaska, 24 percent on United, 12 percent on Delta, and seven percent on American.

Scheduled cargo service is operated by Ameriflight on behalf of United Postal Service (UPS), and Empire on behalf of Federal Express (FedEx). Alaska Airlines carries cargo on their scheduled passenger flights. The 2016 market share for scheduled cargo carriers in terms of pounds of cargo carried was 51 percent for Ameriflight, 45 percent for Empire, and four percent for Alaska.

The growth in passenger activity at RDM has corresponded with increasing seat capacity on the scheduled carriers. Average seats per departure was 39 in 2006, 70 in 2011 (when Allegiant was operating with 166 seat aircraft), and 64 in 2016 (after Allegiant left the market). Nationally, the FAA Aerospace Forecast 2017-2037 reports that the average seats per departure for regional airlines has grown from 50 in 2006 to 61 in 2016, and is projected to grow to 73 by 2037. The trend of larger aircraft is expected to continue at RDM based on the following fleet decisions made by the major airlines.

Major changes in seat capacity for aircraft operating at RDM are described below.

- ✓ Alaska Airlines replaced the 37-seat Q200 with the 76-seat Q400 in 2008. As a result, flight frequencies in RDM and other markets served by Alaska declined. Passenger numbers also declined at this time; however, this was primarily due to the recession that occurred in 2008-2009.Alaska Airline's passenger numbers returned to growth in 2010 and exceeded 2008 levels in 2014.
- ✓ SkyWest (operating for United and Delta) has been replacing the 50-seat CRJ-200 with the 65 to 70-seat CRJ-700 and the 76 seat CRJ-900 during peak months. In conversations with airport management, United has indicated that the CRJ-200 will leave the RDM market and be replaced by the CRJ-700 and CRJ-900 in 2017, and Delta has indicated that they intend to phase out the CRJ-200 from the RDM market as soon as the CRJ-700 and CRJ-900 become available throughout the year. Delta did not specify a date when this would occur.

Regional airlines are capped at a maximum of 76 seats per the terms of labor agreements between mainline pilot's unions and the airlines. Aircraft operated by regional airlines typically have fewer seats than they are capable of accommodating because of these agreements. For example, the Bombardier CRJ-900 can accommodate 90 seats in an all economy configuration. Airline purchases known as of April 2017 show that interest is focused on aircraft with greater seating capacity. Alaska, American, Delta, and United have indicated in the fiscal year investor filings with the U.S. Securities and Exchange Commission that they are updating their fleets with more fuel efficient narrow body aircraft as described below. This list does not include conventional narrow body aircraft (e.g. A321ceo), and wide body aircraft (e.g. 787-10) that the airlines have on order.

- Alaska: 30 Embraer 175 aircraft (up to 88 seats), 30 A320neo aircraft (up to 186 seats), and 32 Boeing 737 MAX aircraft (up to 200 seats);
- American: 12 Embraer 175 aircraft, 100 Airbus A321neo aircraft (up to 240 seats) and 100 Boeing 737 MAX aircraft;
- Delta: 75 Bombardier CS100 aircraft (up to 135 seats),
- Skywest: 18 Embraer 175 aircraft, 200 Mitsubishi MRJ-90 aircraft (up to 90 seats),
- United: 24 Embraer 175 aircraft, 99 Boeing 737 MAX aircraft

While it is not known how the airlines will deploy these aircraft in their system, it is evident that there are no orders placed for aircraft with fewer than 60 seats. This means that as these smaller aircraft are retired, they will be replaced by larger aircraft. As seen through the retirement of the 37-seat Bombardier Q200 in 2008, communities that cannot fill the larger aircraft will face a reduction in frequency, and potentially lose service all together. The effect that this may have on RDM is discussed in **Section 4.1.3**.

NEW AIR SERVICE OPPORTUNITIES

The most likely new candidate to service the Airport is Allegiant Airlines. As shown in **Table 2-11**, Las Vegas is the market without non-stop service from the Airport. Passengers either connect on flights from RDM, or drive to another airport to fly direct. Allegiant provided service between RDM and Las Vegas between 2007 and 2012, with load factors (number of passengers divided by the number of seats) ranging from 63 percent in 2007 to 81 percent in 2011. Allegiant used the MD-80 aircraft with 166 seats on the Las Vegas route. Allegiant ceased service in 2012 citing rising airport costs as the reason for leaving; however, the Airport and Allegiant are investigating reinstating the service as demand has remained strong.

Allegiant is transitioning from their Boeing MD-80 fleet to a more modern Airbus narrow body fleet. The Airbus aircraft have comparable seating capacity to the MD-80; however, the Airbus are more fuel efficient and can operate on shorter runways at a given takeoff weight than the MD-80. The new aircraft would allow Allegiant to serve RDM throughout the year with a lower weight restriction on hot days, enabling the airline to carry more passengers.

Allegiant is a niche market low-cost carrier that caters to leisure travelers and typically does not offer flights every day of the week, helping keep load factors high. Mainline carriers like Alaska, America, Delta, and United cater to business and leisure travelers and tend to offer multiple daily flight frequencies that coincide with connecting flights at their hubs. The Airport has non-stop service to every mainline airline hub within 1,000 miles. Regional jets that serve the Airport begin to become uneconomical beyond 1,000 miles because they need to remove passengers to take on more fuel. It is not expected that the Airport will see non-stop service to Midwest hubs until airlines begin serving the Airport with larger aircraft such as the Boeing 737 and Airbus A320 series. Entry of these aircraft into the RDM market will depend on the local demand proving that they can fill these larger aircraft reliably.

PASSENGER ENPLANEMENTS AND AIRLINE OPERATIONS

A passenger enplanement is any passenger who boards any aircraft that is considered scheduled commercial and charter aircraft with more than nine seats for turboprops (or any number of seats for jet aircraft). The aircraft must be operating under Title 14 Code of Federal Regulations (CFR) Part 121, which pertains to passenger airlines. Passengers are not counted toward enplanements if they board aircraft that operate under 14 CFR 91, which pertains to general aviation, and 14 CFR 135, which pertains to on-demand air taxis (not airlines). Passenger enplanements include both revenue and non-revenue passengers who paid taxes and passenger facility charges (PFC) for their carriage. Passenger enplanements do not include the flight crew, flight attendants, and any other members of the airline crew.

Passenger enplanements are classified by either *air carrier* or *air taxi/commuter*. Air carrier enplanements are any enplanements that occur on a mainline carrier, such as Delta, United, and American. Air taxi/commuter enplanements are those that occur on a feeder carrier, such as SkyWest Airlines, Mesa Airlines, and Horizon Airlines.

RDM passenger enplanements have increased by 100,000 between 2006 and 2016, which is a CAGR of 4.2 percent. This includes years of decline in 2009, 2012, and 2013. The 2009 decline was caused by the economic recession, and the decline in 2011 and 2012 was caused by Allegiant exiting the market, shown by the drop of air carrier enplanements while Air Taxi/Commuter enplanements grew. RDM enplanements from 2006 to 2016 are shown in **Table 2-13**.

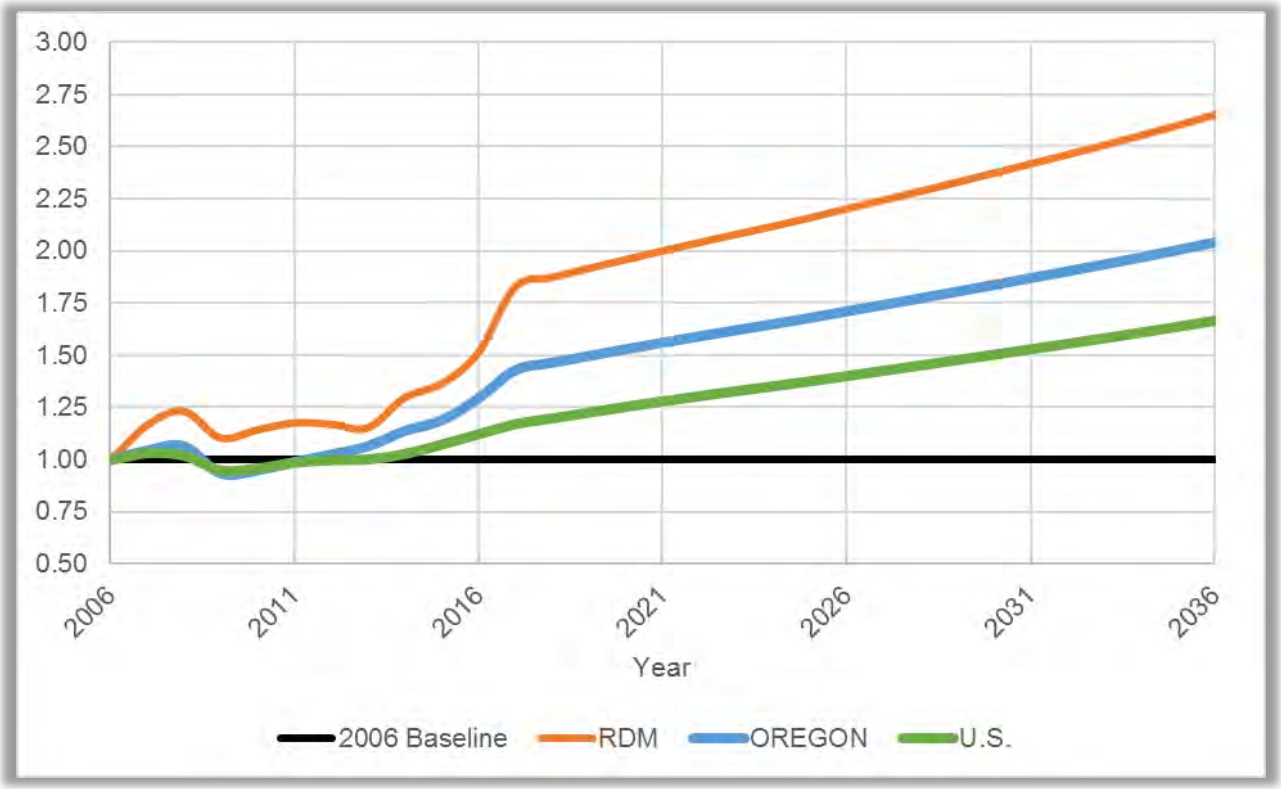
Table 2-13: Passenger Enplanements				
Fiscal Year	Air Carrier	Air Taxi/Commuter	Total	Percent Change
2006	1,427	195,796	197,223	
2007	9,262	220,711	230,033	16.6%
2008	13,886	229,311	243,197	5.7%
2009	26,618	191,208	217,826	-10.4%
2010	28,031	197,530	225,561	3.6%
2011	26,259	205,719	231,978	2.8%
2012	16,660	214,173	230,833	-0.5%
2013	430	226,980	227,410	-1.5%
2014	305	255,560	255,865	12.5%
2015	303	268,829	269,132	5.2%
2016	536	297,786	298,322	19.7%
CAGR	-9.3%	4.2%	4.2%	N/A

CAGR = Compound Annual Growth Rate.
Source: 2016 TAF. 2016 total is impacted by Airport closure in May.

As shown in **Figure 2-4**, growth at RDM exceeded growth experienced by the State of Oregon and the U.S. from 2006 to 2016. The State and the U.S. saw steeper declined during the recession than RDM. Growth at RDM since 2013 has been more pronounced. One reason for the periods of slower decline and more rapid growth over the past ten years is that the local economy has been adding jobs faster than the State and the nation, and the population of the MSA has been growing more quickly.

Forecasts, which come from the FAA TAF published January 2017, project that RDM will grow more quickly than the State and the U.S. through 2036. A key reason behind the higher growth rate is that RDM is an emerging market, whereas the State and the U.S. are mature markets, driven by the medium and large hub airports. PDX made up 88 percent of Oregon passenger enplanements, and medium and large hub airports made up 89 percent of U.S. enplanements in 2016. Hub airports tend to remain more stable than non-hubs, hence the lower historical and projected volatility. The RDM TAF is discussed in **Section 4.4**.

Figure 2-4: Passenger Enplanement Growth



Source: 2017 TAF

Airline operations are categorized as either *air carrier* or *air taxi*. Categorization is based on the seating capacity of an aircraft, regardless of which carrier is operating the aircraft. A seating capacity of 60 seats is the determining factor on how an aircraft is categorized. Aircraft such as 50-seat CRJ-200 with are considered air taxi, and aircraft such as the 76-seat Q400 are considered air carrier.

Total passenger airline operations at RDM have declined by an annual average of 2.2 percent from 2006 to 2016. The largest drop in operations was during the recession; however, total operations numbers have declined every year since except 2010, 2014 and 2016. The primary reason behind the decline in operations is the airline's transition of from *air taxi* aircraft to air carrier aircraft. The greater seating capacity offered by the air carrier aircraft has allowed the airlines to reduce flight frequencies while maintaining or increasing the number of available seats in the market. For example, Alaska cut their operations by a little less than half when they retired the 37-seat Bombardier Q200 in 2008; but they replaced these aircraft with 76-seat Bombardier Q400s, thereby offsetting the decline in operations and maintaining the number of seats available in the market.

Other airlines – American, Delta, and United, have been phasing out the 50-seat CRJ-200, an *air taxi* aircraft, in favor of larger regional jets, which are considered *air carrier* aircraft. These lager jets increase the number of seats available in the market, which has accommodated the growth in passenger enplanements. Passenger airline operations and average seats per departure are shown in **Table 2-14**.

Table 2-14: Passenger Airline Operations

Fiscal Year	Air Carrier	Air Taxi	Total	% Change	Avg. Seats per Departure
2006	360	14,368	14,728		39
2007	2,484	13,792	16,276	10.5%	46
2008	4,782	10,414	15,196	-6.6%	54
2009	5,204	6,360	11,564	-23.9%	67
2010	5,568	6,234	11,802	2.1%	70
2011	4,484	6,248	10,732	-9.1%	70
2012	4,376	6,344	10,720	-0.1%	79
2013	4,276	6,106	10,382	-3.2%	56
2014	5,138	6,440	11,578	11.5%	57
2015	5,292	4,428	9,720	-16.0%	64
2016	6,946	4,796	11,742	20.8%	64
CAGR	34.4%	-10.4%	-2.2%	N/A	N/A

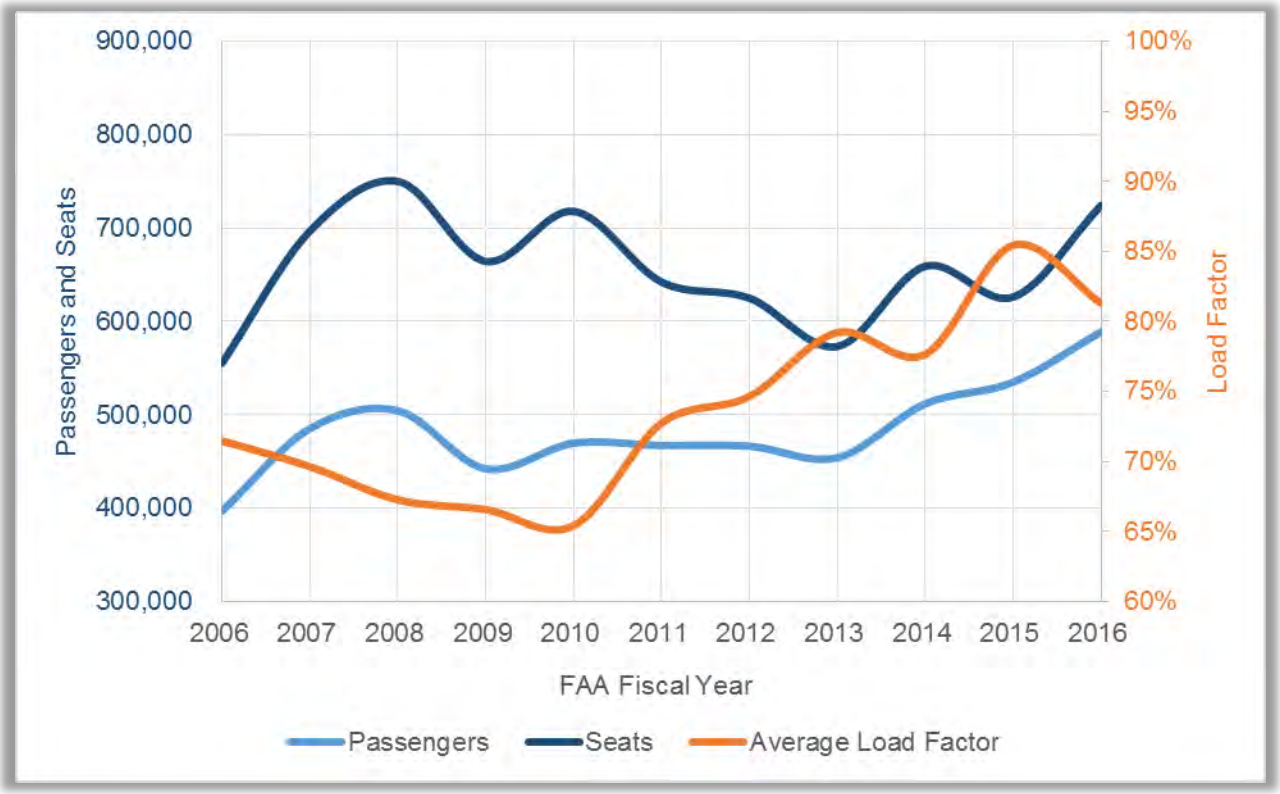
CAGR = Compound Annual Growth Rate.
Sources: 2006-2016 USDOT T-100 Database
Note: TAF and FAA OPSNET counts include Charter, Air Cargo and Forest Service Tanker. Numbers above are for scheduled passenger flights only.

SCHEDULED PASSENGER AIRLINE LOAD FACTOR

Load factor is one metric used by the airlines to assess route performance, and is calculated by dividing the number of passengers by the number of seats available. Available seats represent the supply, and passengers represent the demand. Load factor grows as demand and supply move closer together, and load factor declines when supply grows faster than demand. Airline capacity discipline, which is where airlines reduce seats to a market to increase load factor is evident at RDM from 2010 to 2013, as shown in **Figure 2-5**. The airlines reduced supply by 150,000 seats between 2010 and 2013. Passenger numbers declined by a tenth of this amount during the same period, and average load factor grew from 65 percent to 79 percent. The airlines have added capacity since 2013 and average load factor has remained high. A reason for this is that there is strong demand for air travel in the community, and available seats are being purchased.

The 2017 FAA Aerospace Forecast reports that the average domestic load factor for U.S. regional carriers was 80.1 percent in 2016 and RDM had a load factor of 80.1 percent. Performing at or above industry average helps the Airport market itself to the airlines. As shown in **Table 2-9**, the Airport retains 75 percent of local passengers, and the population and economy of the Redmond MSA are expected to grow. These factors suggest that if RDM is successful in attracting additional air service in the future, the demand will exist to sustain the routes at industry-average load factors.

Figure 2-5: RDM Passengers, Seats, and Average Load



Source: USDOT T-100. Data presented included passengers, seats, and load factors for both inbound and outbound travel.

SCHEDULED PASSENGER AIRLINE AVERAGE FARE AND AVERAGE YIELD

Airfares play an important role in traveler airport selection. Airfares affect an airport's ability to retain passengers, and an airline's desire to increase service to a market. One-way airfares (excluding taxes and PFC) paid by travelers are used to measure the relative fare competitiveness between the Airport and competing airports. **Table 2-15** shows the average airfares of RDM and competing airports for the top 25 destination from RDM.

Multiple factors dictate the price of average airfares: availability of seats, stage length, number of flights, and airline competition. The average one-way airfare for the Airport was $197, which is $32 higher than Portland ($165), and $19 higher than Eugene ($178). Part of Eugene's lower average airfare is due to the presence of Allegiant Airlines, which flies to Los Angeles, Las Vegas, Oakland, and Phoenix. Excluding Allegiant's impact in a few select markets at Eugene, the average one-way fare at RDM was lower than Eugene by $5. The Airport's fare was higher than Portland in every market compared in the analysis. The largest difference was to and from Denver, Chicago-O'Hare and Orlando at more than $70 one-way. When compared to Eugene, the Airport had lower airfares in six markets, including Seattle, San Francisco, Denver, Anchorage, Honolulu, and Atlanta.

Table 2-15 Average Domestic One-Way Fares

Rank	Destination	Average one-way fare			RDM Max Δ
		RDM	PDX	EUG	
1	Seattle, WA	$123	$109	$127	$14
2	Los Angeles, CA	$149	$109	$115	$40
3	San Francisco, CA	$178	$126	$200	$52
4	Portland, OR	$93	-	$81	$12
5	Phoenix, AZ (PHX)	$143	$141	$141	$2
6	Las Vegas, NV	$141	$104	$89	$52
7	San Diego, CA	$158	$122	$152	$36
8	Denver, CO	$208	$128	$211	$80
9	Orange County, CA	$143	$111	$133	$32
10	Chicago, IL (ORD)	$257	$180	$250	$77
11	Dallas, TX (DFW)	$226	$161	$212	$65
12	Anchorage, AK	$206	$167	$212	$39
13	Salt Lake City, UT	$195	$129	$176	$66
14	San Jose, CA	$144	$118	$119	$26
15	Kahului, HI	$272	$259	$270	$13
16	Boston, MA	$262	$228	$239	$34
17	Minneapolis, MN	$235	$202	$234	$33
18	Oakland, CA	$148	$117	$63	$85
19	Sacramento, CA	$168	$111	$161	$57
20	Ontario, CA	$157	$129	$145	$28
21	Newark, NJ	$310	$252	$271	$58
22	Honolulu, HI	$289	$232	$305	$57
23	Orlando, FL (MCO)	$274	$201	$259	$73
24	Spokane, WA	$134	$106	$131	$28
25	Atlanta, general aviation	$294	$253	$296	$41
Average domestic fare		**$197**	**$165**	**$178**	**$32**

Note: YE 2Q 2016; Fares do not include taxes or PFC.
Source: Diio Mi

The average yield, which is measured as revenue per mile flown, is 18.2 cents for RDM. This is 26 percent higher than the national average of 14.5 cents. When comparing the Airport to others in the FAA Northwest Mountain region, the Airport was 31 percent higher than the average of 13.9 cents. Airlines are for-profit businesses and look to add service to markets that produce high yields. Average yields for the airlines that service the Airport are below:

- ✓ Alaska Airlines: 19.2 cents, 44 percent higher than their U.S. average of 13.3 cents.
- ✓ American Airlines: 17.3 cents, 11 percent higher than their U.S. average of 15.6 cents.
- ✓ Delta Airlines: 18.1 cents, 9 percent higher than their U.S. average of 16.6 cents.
- ✓ United Airlines: 17.9 cents, 19 percent higher than their U.S. average of 15.0 cents.

SCHEDULED AIR CARGO

RDM scheduled air cargo volume (expressed in tons) has been highly volatile over the past ten years, with a five percent average annual decline from 2006 to 2016. Operations by dedicated cargo aircraft have declined proportionally, showing a general decline of 4.7 percent per year since 2006. The U.S. domestic cargo market has experienced an average decline of 0.5 percent per year during the same period. The 2017 FAA Aerospace Forecast states that U.S. air cargo has been in decline due to economic uncertainty, high fuel prices, additional security screening requirements, and "a shift from air to other modes (especially truck) […]." Looking forward, the FAA projects that national cargo decline has bottomed out, and will grow slowly into the future. The 2017 Aerospace Forecast states that "the shift from air to ground transportation has occurred."

The FAA Aerospace Forecast indicates that air cargo is strongly linked to grow of gross regional and domestic product. As shown in **Table 2-7**, The MSA GRP has grown by an average of 2.1 percent over the past ten years. The mismatch between local GRP growth and air cargo decline is likely explained by the proximity of RDM to Oregon's cargo hub in Portland. While 75 percent of passengers avoid the three-hour drive to Portland, packages can easily be trucked over the Cascade Mountains. USDOT T-100 data shows that air cargo volumes at PDX have grown by an average of 1.6 percent per year from 2011 to 2016, while RDM air cargo volumes fell by 0.1 percent per year over the same period. Air cargo operations and volumes are shown in **Table 2-16**.

Table 2-16 Cargo Airline Operations and Activity

Fiscal Year	Redmond			U.S. Domestic Market	
	Operations	Total Cargo (Tons)	% Change	Revenue Ton Miles (Millions)	% Change
2006	3,259	1,612.8		12,481	
2007	3,440	1,633.9	1.3%	12,940	3.7%
2008	3,026	1,269.9	-22.3%	12,261	-5.3%
2009	3,340	1,145.1	-9.8%	10,275	-16.2%
2010	3,633	1,087.8	-5.0%	11,243	9.4%
2011	3,252	976.4	-10.2%	10,601	-5.7%
2012	2,815	918.7	-5.9%	10,886	2.7%
2013	3,057	1,003.4	9.2%	10,996	1.0%
2014	1,949	1,035.2	3.2%	11,226	2.1%
2015	1,896	924.5	-10.7%	11,636	3.7%
2016	2,014	970.1	4.9%	11,851	1.8%
CAGR	-4.7%	-5.0%	N/A	-0.5%	N/A

CAGR = Compound Annual Growth Rate.
Sources: RDM: Airport Management and 2006-2016 USDOT T-100 Database; U.S.: FAA Aerospace Forecast 2017-2037

2.3.2 GENERAL AVIATION

General aviation describes flight activities that are not performed by passenger and cargo airlines, and the military. General aviation is broad in scope – activities include, but are not limited to, flight training, recreational flying, private and corporate air transportation, emergency response, and flight testing of new aircraft. This section describes general aviation businesses and activities at RDM.

GENERAL AVIATION BUSINESSES

General aviation businesses include those that offer services to the flying public (e.g. fixed base operators), those that design and construct aircraft, and companies that use aircraft as part of their business (e.g. aerial photography, sightseeing, and employee transport). Key general aviation businesses at RDM are described below.

- There are two fixed base operators at RDM. These businesses sell 100 Low-Lead (LL) and Jet A fuel, and offer aircraft maintenance, de-icing, aircraft detailing and cleaning, an avionics shop, covered aircraft storage, and a pilot's lounge.
- There are two aircraft manufacturers based at RDM: Evolution and Stratos. The Evolution facility specializes in final assembly and maintenance of single engine piston aircraft. Stratos is in the process of building and certifying a very light jet. Evolution is a spin-off company of aircraft manufacturer Lancair.
- There are corporate tenants, such as Les Schwab, that base their business jets at RDM. The aircraft are an integral part of business operations, allowing the companies to move employees around the country
- Flight training occurs at RDM, but the flight school formerly located at the Airport moved to the Bend Airport in 2008. Features of the Airport, such as the airport traffic control tower and the instrument landing system, are attractive to student pilots preparing to become professional pilots. Students from nearby airports fly to RDM to practice from time to time.

ITINERANT GENERAL AVIATION OPERATIONS

Itinerant operations originate and terminate at different airports. Operators include business travelers to the community, student pilots performing cross country training flights, and recreational pilots. Itinerant operations made up 39 percent of overall general aviation operations in 2016, and have been declining at an annual average rate of 6.8 percent since 2006. This decline is more pronounced at RDM than the national decline of two percent per year. Itinerant general aviation operations are shown in **Table 2-17**.

Table 2-17: Itinerant General Aviation Operations				
Year	RDM Operations	% Change	National Operations	% Change
2006	22,170		18,707,000	-0.7%
2007	26,174	18.1%	18,575,000	-5.8%
2008	20,221	-22.7%	17,493,000	-11.0%
2009	16,014	-20.8%	15,571,000	-4.5%
2010	14,767	-7.8%	14,864,000	-2.3%
2011	13,610	-7.8%	14,528,000	0.0%
2012	14,709	8.1%	14,522,000	-2.8%
2013	13,414	-8.8%	14,117,000	-1.0%
2014	12,372	-7.8%	13,979,000	-0.7%
2015	11,551	-6.6%	13,887,000	0.1%
2016	10,985	-1.1%	13,903,000	-0.7%
CAGR	-6.8%	N/A	-2.9%	N/A

CAGR = Compound Annual Growth Rate. Source: FAA Terminal Area Forecast

The decline in itinerant operations is indicative of an industry that is adjusting to modern realities, rather than one that is declining across the board. The 2017 FAA Aerospace Forecast shows that in 2016, aircraft with piston engines made up 72 percent of the national general aviation fleet, and turbine aircraft made up the remaining 18 percent. Hours flown by piston aircraft have declined by an annual average of 1.4 percent since 2010, while hours flown by turbine (jet and turboprop) aircraft have grown by 1.9 percent per year. Similarly, the overall number of active piston aircraft has declined by an annual average of 1.7 percent while total turbine aircraft have grown by an annual average of 1.9 percent.

The general aviation market is readjusting to one with a more even distribution of piston and turbine aircraft, albeit slowly. With the dominant piston market in decline, overall operations will continue to drop; however, there is a growing segment within the itinerant general aviation market.

LOCAL GENERAL AVIATION OPERATIONS

Local general aviation operations originate and terminate at the Airport, and are generally performed by pilots (both student and licensed) that are practicing landings. Local operations are highly sensitive to the level of flight training at an Airport. Touch-and-go landings, which is where the aircraft lands, slows, then accelerates and takes off without leaving the runway, count as two operations. An aircraft practicing touch and goes can perform upwards of six operations in an hour, depending on how busy the traffic pattern is. The flight school, located at RDM from 2007 to 2009 increased local aircraft operations by 79 percent in the first year. Local general aviation operations at RDM and nationally are shown in **Table 2-18**.

The largest decline in local general aviation operations was caused by the departure of the flight school in 2009. Despite the relocation of the school, the Airport still sees student pilots who come from flight schools in Prineville and Bend to practice touch-and-goes in controlled airspace, and to practice using the instrument landing system. The region is attractive for student pilots in the Pacific Northwest because it has more sunshine than areas to the west of the Cascades mountain range.

Nationally, local general aviation operations declined after the recession and have remained essentially flat since 2010. A 2016 Current Market Outlook, produced by aircraft manufacturer Boeing, projects that North America will need 112,000 new pilots between 2016 and 2035. The 2017 FAA Aerospace Forecast projects that student pilots will grow steadily at 0.4 percent per year through 2037, and those entering flight training will primarily do so to earn a sport pilot license (for recreational purposes), or an airline transport pilot (ATP) license (for professional purposes). FAA projections through 2037 have sport pilot license holders growing at 4.1 percent per year and ATP license holders growing at 0.5 percent per year.

Table 2-18: Local General Aviation Operations				
Year	RDM Operations	% Change	National Operations	% Change
2006	27,376		14,365,000	
2007	48,990	79.0%	14,557,000	1.3%
2008	42,519	-13.2%	14,081,000	-3.3%
2009	25,261	-40.6%	12,448,000	-11.6%
2010	22,416	-11.3%	11,716,000	-5.9%
2011	19,554	-12.8%	11,437,000	-2.4%
2012	18,565	-5.1%	11,608,000	1.5%
2013	16,124	-13.1%	11,688,000	0.7%
2014	17,213	6.8%	11,675,000	-0.1%
2015	22,854	32.8%	11,691,000	0.1%
2016	16,829	-23.0%	11,776,000	0.7%
CAGR	-4.7%	N/A	-2.0%	N/A

CAGR = Compound Annual Growth Rate. *Source: FAA Terminal Area Forecast, FAA Aerospace Forecast*

BASED AIRCRAFT

TERMINOLOGY

Single-Engine Piston (SEP): SEP have one piston-powered engine. These aircraft are generally smaller and are often used for flight training and recreational flying. SEP may be used for regional business trips. Depending on weight and operator certification, these aircraft generally require only one pilot.

Multi-Engine Piston (MEP): MEP have two or more engines and are typically larger than SEP. Multiple engines make the aircraft more capable, and require additional flight instruction beyond what is needed to operate an SEP. MEP are primarily used for flight training and business aviation. MEP may require two pilots, but many variants can be operated with one.

Jet: Jet aircraft are characterized for having a turbine engine instead of a piston engine. These aircraft may have turbojets, or a turboprop. Jet aircraft range in size from small four-passenger business jets to the largest airliners. They can generally fly faster and at higher altitudes than SEP and MEP, making them better suited for business travel and emergency response. It is less common, but not unheard of, to see a jet used for recreational flying and flight instruction. Some smaller civilian jets can operate with a single pilot; however, most civilian jet aircraft require two.

Helicopter: Helicopters are characterized by having a rotor mounted above the cabin for lift and propulsion. Helicopters are commonly used for flight training, by law enforcement and emergency response, and by aerial businesses such as pipeline inspection, forestry, and aerial agriculture. Helicopters can be piston or turbine powered, and depending on the complexity of the model, can be operated by one pilot or two.

Other: The category of "Other" includes experimental, sport, glider, and ultralight aircraft. These aircraft are used for recreational flying.

- ✓ Experimental aircraft refer to kit airplanes that are built by users, or third-parties besides the original manufacturer. Experimental aircraft share many characteristics with SEP – the key differentiator is how and where the aircraft is assembled.
- ✓ Sport aircraft are airplanes that have a specific weight and maximum speed in level flight. Sport aircraft require less training and a less strict medical certificate to pilot the aircraft.
- ✓ Gliders are unpowered aircraft that are towed into flight, and use thermal uplift to sustain altitude.
- ✓ Ultralight aircraft weigh less than 155 and do not require the pilot operating the aircraft to have a private pilot's license or medical certificate.

Based aircraft are those that use a hangar and are stored at the Airport. Based aircraft do not include visiting, or itinerant aircraft. The FAA breaks down based aircraft into different categories based on an aircraft's propulsion system, engine configuration, and weight. As of 2016, there are 64 SEP aircraft at the Airport, making up 80 percent of the total based fleet. There are six jets, four MEP aircraft, and six helicopters. There were no "Other" aircraft are based at the Airport from 2006 to 2016. **Table 2-19** shows based aircraft records from 2006 to 2026. The airport's counts for 2016 differ than TAF records for the same year. It is expected that the TAF will be updated with the most recent available information following FAA approval of the forecasts.

Table 2-19: Based Aircraft Fleet

Year	SEP	MEP	Jet	Helicopter	Other	Total	% Change
2006	92	31	3	3	0	129	
2007	92	31	3	3	0	129	0.0%
2008	93	44	4	5	0	146	13.2%
2009	96	23	3	3	0	125	-14.4%
2010	93	14	5	6	0	118	-5.6%
2011	61	5	4	5	0	75	-36.4%
2012	61	5	4	5	0	75	0.0%
2013	64	14	5	8	0	91	21.3%
2014	62	9	3	9	0	83	-8.8%
2015	63	9	3	9	0	83	1.2%
2016	64	4	6	6	0	80	-4.8%
CAGR	-3.6%	-18.5%	7.2%	7.2%	N/A	-4.7%	

CAGR = Compound Annual Growth Rate. *Source: FAA Terminal Area Forecast, FAA Aerospace Forecast*

Based aircraft at RDM have been decreasing since 2006. Factors contributing to declining numbers include the 2009 Recession, rising oil prices, the departure of the flight school, competition from area general aviation airports, growing costs associated with earning a private pilot's license, and growing cost of aircraft ownership. The 2008-2009 recession saw the largest drop in based aircraft, and there was a brief recovery in 2013. RDM hangars are currently at capacity and the Airport has a waiting list for aircraft storage. Uncovered apron space is available, but not desirable due to winter snow and ice.

The 2017 FAA Aerospace Forecast shows SEP and MEP aircraft have been retired and have not been replaced, with the combined fleet declining by 1.7 percent a year from 2010 to 2016. The national turbine fleet has grown by 1.3 percent per year, and the helicopter fleet has grown by one percent per year during this time.

2.3.3 MILITARY

There are no based military aircraft at RDM; however, military units occasionally visit to train and refuel. These operations are typically itinerant; however, some military aircraft perform touch-and-goes while in the area. Military aircraft are generally serviced by the FBO, although they occasionally park on the USFS apron. Unlike other aspects of aviation, military activity is driven by the needs of the U.S. Department of Defense, and does not fluctuate in line with market forces. The Department of Defense does not provide projections of future activity or airport use; therefore, military activity is forecasted to grow or decline like other variables in the forecast. For planning purposes, military activity is considered to remain constant throughout the forecast period. Historic military operations are shown in **Table 2-20**.

Figure 2-20: Military Operations

Fiscal Year	Itinerant	Local	Total	% Change
2006	366	240	606	
2007	306	336	642	5.9%
2008	312	303	615	-4.2%
2009	173	134	307	-50.1%
2010	221	300	521	69.7%
2011	224	96	320	-38.6%
2012	212	371	583	82.2%
2013	323	812	1,135	94.7%
2014	383	406	789	-30.5%
2015	241	214	455	-42.3%
2016	341	540	881	93.6%
CAGR	-0.7%	8.4%	3.8%	

Source: 2017 TAF

2.3.4 FAA TAF

The FAA TAF is the official FAA forecast for airports, and is prepared annually by FAA Headquarters for each airport in the FAA National Plan of Integrated Airport Systems. The TAF uses the FAA fiscal year (October to September). TAF data comes from the USDOT T-100 database, airport traffic control tower records, and FAA Form 5010, which airports submit annually to the FAA.

In *Forecast Process for the 2016 TAF*, the FAA states that passenger enplanement forecasts at airports like RDM are developed by looking at a 10 percent sample of passenger activity per quarter, and performing a "regression analysis using fares, regional demographics, and regional economic factors." Commercial operations are based on USDOT T-100 data for city-pairs (e.g. routes airlines serve from RDM). General aviation activity is based on time-series analysis of past trends.

The FAA reviews forecasts prepared for the Master Plan by comparing them to the TAF. Forecasts that are within 10 percent of the TAF over the five-year period, and 15 percent within the ten-year period can be approved by the Airports District offices. Forecasts outside of these tolerances go to FAA Headquarters for review.

The TAF forecasts passenger enplanements, operations, and based aircraft. The TAF does not forecast operations by aircraft type, peak activity levels, critical aircraft, or air cargo. The TAF used for this forecast was published in January 2017. **Table 2-21** summarizes the TAF for the Airport.

Table 2-21: FAA TAF

Fiscal Year	2016	2021	2026	2031	2036	CAGR
Enplanements	**298,322**	**394,570**	**434,335**	**476,868**	**523,125**	2.8%
Operations	**40,162**	**41,531**	**43,004**	**44,644**	**46,398**	0.7%
Air Carrier	5,127	10,139	11,691	12,835	14,080	5.2%
Air Taxi	6,340	3,699	3,333	3,539	3,758	-2.6%
Itinerant GA	10,985	10,807	10,932	11,057	11,182	0.1%
Itinerant Military	341	341	341	341	341	0.0%
Local GA	16,829	16,005	16,167	16,332	16,497	-0.1%
Local Military	540	540	540	540	540	0.0%
Based Aircraft	**86**	**96**	**109**	**124**	**139**	2.4%
Single Engine Piston	65	75	88	103	118	3.0%
Jet	3	3	3	3	3	0.0%
Multi Engine Piston	9	9	9	9	9	0.0%
Helicopter	9	9	9	9	9	0.0%
Other	0	0	0	0	0	N/A

Other. – Light sport aircraft, gliders, experimental aircraft, ultralights
Source: 2017 TAF

While the TAF is generally a reliable source of information, most recent data tends to lag a year behind airport records. FAA fiscal year 2016 data is marked with an asterisk, meaning that it has not been finalized yet. The 2016 TAF data does not match airport management records in certain areas, shown in **Table 2-22**. Given that Airport Management has the best available data, this information is used to model future scenarios and not the TAF. TAF discrepancies for the main categories (Enplanements, Operations, and Based Aircraft) are within the 10 percent FAA tolerances.

Table 2-22: 2016 Airport Management Records and TAF Differences

Category	Airport Records	TAF	Difference	% Difference
Enplanements	**304,588**	**298,322**	**24,390**	**2.1%**
Operations	**44,015**	**40,162**	**3,853**	**9.6%**
Air Carrier	7,302	5,127	2,175	42.4%
Air Taxi	6,810	6,340	470	7.4%
Itinerant GA	11,426	10,985	440	4.0%
Local GA	17,596	16,829	767	4.6%
Based Aircraft	**80**	**86**	**-6**	**-7.0%**
SEP	64	65	-1	-1.5%
MEP	4	9	-5	-55.6%
Jet	6	3	3	100.0%
Helicopter	6	9	-3	-33.3%

Military operations and "other" based aircraft match TAF records. Sources: Airport records, TAF issued January 2017.

The TAF has exhibited a consistent underreporting of passenger enplanements when compared to Airport records.

Airport records for passengers and commercial operations are presented and compared to the TAF in **Appendix B, Attachment 4**.

2.4 SCHEDULED SERVICE FORECASTS

This section discusses the passenger enplanement forecasts, air cargo volume, and commercial operations. Each sub-section explains the methods used during analysis. Risk and uncertainty are addressed, and comparisons made with the FAA TAF.

2.4.1 PASSENGER ENPLANEMENTS

Use of passenger enplanement forecasts determines the facility requirements for the passenger terminal building and airport parking and street access. The TAF classifies passenger enplanements as Air Carrier and Air Taxi, depending on the role of the airline transporting them. This distinction is more important for keeping records rather than planning facilities; therefore, passenger enplanements are presented in aggregate. The types of aircraft used to transport the passengers are presented in **Section 7**.

METHODS

The passenger demand forecasts employed trend analysis, single-variable regression, and multi-variable regression methods to project passenger enplanements. Regression models used variables that displayed a high level of correlation (greater than 0.8) with passenger enplanements over the past ten years: MSA Population U.S. Gross Domestic Product (GDP), and MSA GRP.

The three variables were checked against passenger enplanements from 2006 to 2016 using regression analysis. The validity of each equation was measured using the R-squared technique, which describes how well the regression equation explains variability in the model. The closer the R-square value is to 1.00, the more confidence can be placed in the equation explaining the historical variability, and it not occurring by chance. **Table 2-23** shows the results of the correlation and regression analyses.

Table 2-23: Enplanement Correlation and Regression Analyses

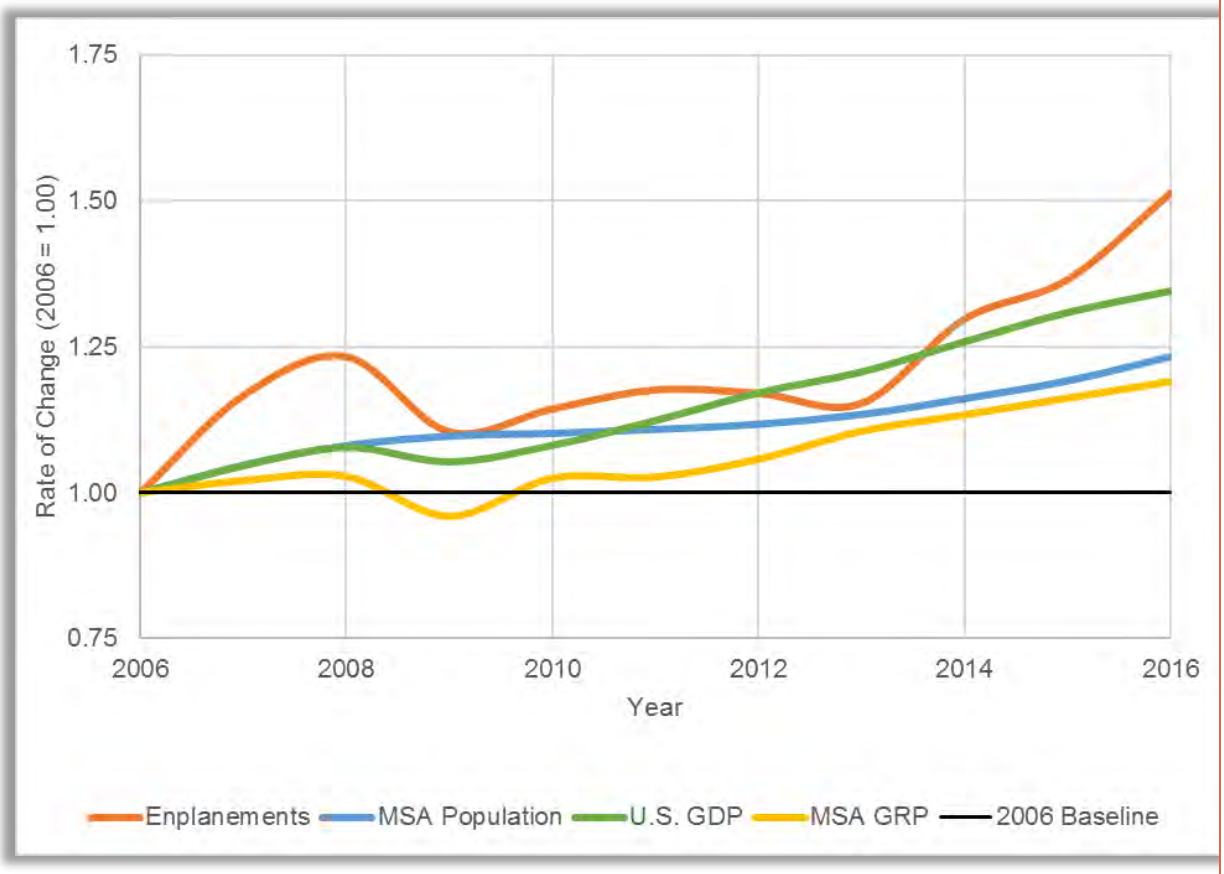
Variable	Correlation Coefficient	Regression R-Square
MSA Population[1]	0.87	0.75
U.S. Gross Domestic Product[2]	0.84	0.71
MSA Gross Regional Product[3]	0.83	0.69

Sources: 1) Portland State University, 2) U.S. Bureau of Economic Analysis, 3) Woods & Poole

The three variables were also arranged into multi-variable equations and run through a regression analysis. This time, the adjusted R-square statistic was used to assess the models as the adjusted R-square considers how many variables are being used. Unadjusted R-squared does not consider multiple variables and can produce misleading results. The results of the multi-variable regression analyses are shown in **Table 2-24.**

Table 2-24: Multi-Variable Regression Analyses

Variables	Adjusted R-Square
Population[1], GRP[3], GDP[2]	0.78
Population[1], GRP[3]	0.72
Population[1], GDP[2]	0.69
GRP[3], GDP[2]	0.65



GRP: MSA Gross Regional Product, GDP: U.S. Gross Domestic Product
Sources: 1) Portland State University, 2) U.S. Bureau of Economic Analysis, 3) Woods & Poole

Based on the results of the regression analyses, the equation accounting for population, GRP, and GDP was selected to prepare passenger enplanement forecasts. The equation is displayed below.

Passenger Enplanement Regression Equation: $y=m_1(x_1)+m_2(x_2)+m_3(x_3)+b$

y = Passenger Enplanements, b = Intercept from Regression Analysis

(4.52 x MSA Population) + (94.49 x MSA Gross Regional Product) + (-46.58 x U.S. Gross Domestic Product) - 730,835.51

Forecasts exist for the three variables considered throughout the forecast period. The MSA Population forecast comes from Portland State University, and is used by the City of Redmond for their long-range planning. The MSA Gross Regional Product Forecast comes from Woods & Poole, and the U.S. Gross Domestic Product Forecast comes from the Organization for Economic Cooperation and Development (OECD). The forecasts for each variable are plugged into the regression equation to produce a passenger enplanement forecast for the next 20 years.

The regression-based method of forecasting incorporates a statistical analysis to give confidence that the variables chosen for forecasting have exhibited a degree of correlation with passenger enplanements in the past. The risk to this method is that future forecasts are ultimately based on one set of external projections. Forecasting, particularly over 20 years, will undoubtedly miss future events that will impact aviation activity at RDM. For this reason, the passenger enplanement regression equation goes through one more level of processing to account for future uncertainty.

ADDRESSING RISK AND UNCERTAINTY

The forecasts developed in **Section 5.1.2** rely on a fixed set of future variables. There is only one projected value for U.S. GDP in 2021 that is considered. The risk to this approach is that if the GDP is different than the forecast in the coming years, then the regression equation developed based on the old forecast is likely no longer useful.

One way to mitigate for this uncertainty about the future value of variables that the passenger enplanement forecast is based on is to incorporate a range of uncertainty into the forecast for each variable. This is accomplished by reviewing the historical volatility of the three variables, and then assuming the future values may deviate from the forecast accordingly.

As an example, the U.S. GDP in 2021 will be $21 trillion dollars based on the OECD forecasts. Historical volatility shows that U.S. GDP could sway by plus or minus $3 trillion dollars, which means that the actual value for 2021 could be as low as $18 trillion (in an economic recession), or as high as $24 trillion (in a period of strong growth). Since the value of U.S. GDP is one of the drivers of the enplanement forecasts, it makes sense to account for this volatility in the future and not assume that the U.S. GDP is guaranteed to grow as it has exhibited contraction in the past. The method chosen to account for this volatility is known as Monte Carlo simulation.

Monte Carlo considers the range of future values for each of the three variables in each forecast year using the process described above for GDP. Historical volatility is applied to the forecast value, which produces a range that the forecast value is likely to be within. Once this range has been established for each variable, thousands of trials are run for each of the forecast years. The three variables are permitted to independently and randomly fluctuate within the defined range for each trial. In some trials the variables all grow, in some they all decline, and in some there's a mix between growth and decline.

Monte Carlo partially mitigates subjectivity when it comes to setting up forecast scenarios. The range that the variables can fluctuate within must be defined, but after this range is established, the model will randomly pick the value of the variables. The Monte Carlo simulation can be run as many times as desired to reduce the impact of outliers (e.g. scenarios where all variables are at their maximums or minimums), and the results are interpreted using percentiles. Percentiles indicate what probability a value has of being higher or lower than the given value. For example, if the 50th percentile value for passenger enplanements in 2021 is 400,000, then this means that, of the thousands of trials run for 2021, 50 percent of the results were below 400,000, and 50 percent were above. Another way of expressing this is that there's a 50 percent probability that 2021 passenger enplanements will be 400,000 or below.

PASSENGER AND TAF COMPARISON

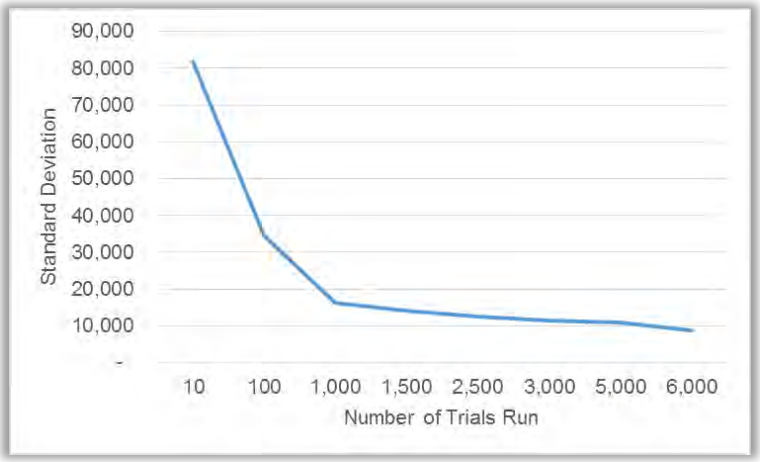
The passenger demand forecasts use the Monte Carlo simulation and the multi-variable regression model based on MSA population, MSA GRP, and U.S. GDP. The three variables are given a range based on historical volatility over the past ten years, which means they consider periods of economic recession and economic growth. The inclusion of local and national variables means that the model includes demand drivers, such as the population and economy driving the need for travel at RDM, and supply drivers, such as the national economy causing people to travel across the country and world.

The Monte Carlo simulation was run 5,000 times to reduce the effect of outliers. Multiple trial runs produce a smoothing effect as the results coalesce around the mean. The law of diminishing returns applies in this situation, and the results differ less and less beyond 1,000 trials. An example of this effect is shown in **Table 2-25**.

The average range of the Monte Carlo trial runs remains near 600,000 after 1,000 trials, and incremental growth slows as more trials are performed. Using this example, it is expected that fewer than 5,000 trials could be run and similar results would be produced; however, running 5,000 trials does not skew the results.

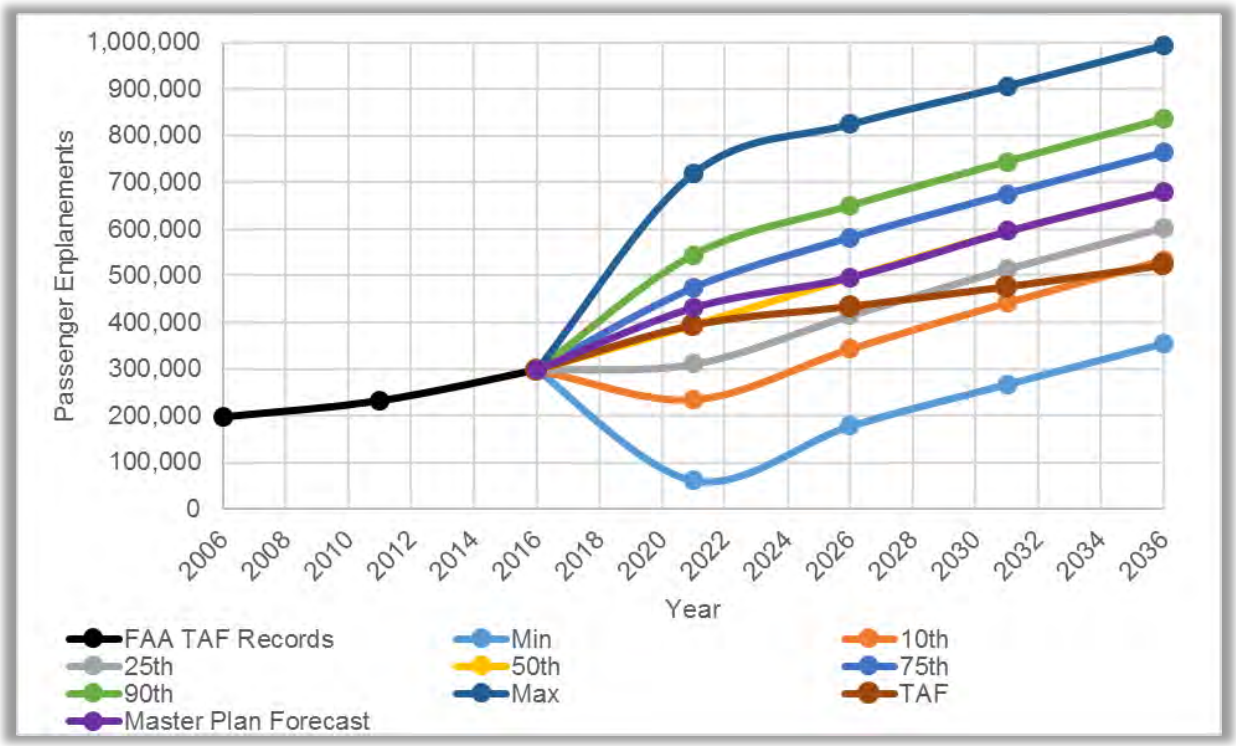
Table 2-25: Effect of Multiple Trials on Monte Carlo Range

Trials	Average Range	Standard Deviation
10	322,000	81,898
100	495,000	34,558
1,000	576,000	16,163
1,500	582,000	14,248
2,500	590,000	12,636
3,000	593,000	11,366
5,000	600,000	11,012
6,000	602,000	8,718



The 5,000 trials are presented using percentiles, minimums, and maximums. A percentile can be any number greater than zero and less than 100; however, presentation becomes less useful if too many percentiles are used. The RDM Enplanement Forecasts are presented for the minimum, 10th, 25th, 50th, 75th, 90th, and maximum percentiles. The results are plotted along with the 2017 TAF for purposes of comparison, and shown in **Figure 2-5**.

Figure 2-5: Passenger Enplanement Forecasts



As stated in **Section 5.1.2**, a key element in addressing risk and uncertainty in demand forecasting is acknowledging that the variable being forecast may decline. Traditional forecasting methods, such as trend analysis and time-series extrapolation, will not decline unless they are building on a model that has been in historical decline. Airport master plan forecasts tend to be more optimistic and project growth. The Monte Carlo analysis provides planners with a "decline" scenario, shown by the minimum, 10th, and 25th percentile results. There are also high-growth scenarios, represented by the maximum, 75th, and 90th percentile results.

The TAF for RDM has a CAGR of 2.8 percent and projects 523,125 enplanements by 2036. This growth rate exceeds the TAF for Oregon, which has a 2.3 percent CAGR, and the 2017 FAA Aerospace Forecast, which has a 1.7 percent CAGR. The higher than average growth rate for RDM reflects strong growth that has occurred over the past ten years, and shows that FAA expects this growth to continue. The passenger enplanement forecast growth rates range between 0.9 percent for the minimum forecast to 6.2 percent for the maximum forecast.

While Monte Carlo helps remove some elements of subjectivity from preparation of forecast scenarios, a decision must still be made on which percentile outputs to use for planning purposes. This decision is made by assembling relevant data that support picking one percentile over the others. TAF and FAA Aerospace Forecast growth rates are in line with the 2.9 percent CAGR of the 25th percentile forecast, while historical growth rates at RDM are between the 50th and 75th percentile forecasts.

Airlines have indicated that they will continue to add seats to the RDM market. Calendar year 2017 schedules from Alaska, American, Delta, and United show that larger aircraft will serve RDM, such as United's transition from the 50-seat CRJ-200 to the 76-seat Embraer 175. Flight frequencies and destinations are planned to increase in 2017, such as Delta's new Seattle service on the 50-seat CRJ-200 and 65-seat CRJ-700.

The True Market assessment, described in **Section 3.7**, shows that RDM retains 75 percent of its true market due to the distance between it and other airports in Oregon. Leakage is primarily to PDX, at 24 percent, and primarily on routes where RDM has limited or non-existent direct air service. These include Los Angeles (28 percent leakage) where RDM has one daily flight, Las Vegas (26 percent leakage) where RDM has no daily flights, and San Diego (27 percent) where RDM has no daily flights. As air service develops and airlines add frequencies and new service, it is expected that market retention will improve. Socioeconomic indicators for the MSA suggest that population and industry (measured by GRP) are expected to grow; therefore, the demand for air travel will continue to increase as these variables have been highly correlated in the past. The Airport actively markets to the airlines to attract additional air service, and has a track record of success with this marketing (new service on American Airlines to LAX and PHX and United adding larger aircraft and more frequencies to DEN and SFO).

Based on available information, historical performance, and known changes for the airlines operating at RDM, the 50th percentile forecast is preferred for long-range (5-20 years) passenger enplanement planning purposes. Due to recent passenger growth at the Airport, the short-range (1-5 year) forecast is expected to be between the 50th and 75th percentiles. The 4.2 percent CAGR is lower than the Airport has historically seen over the past ten years, which hints towards market maturation, but is higher than the national Aerospace Forecast and TAF for the state, which are driven by mature markets. The preferred enplanement forecast is compared to the 2017 TAF in **Table 2-26**.

Table 2-26: Passenger Enplanement Forecasts

Year	TAF	Forecast	Difference	
2016	298,322	298,322	0	0.0%
2021	394,570	431,978	37,408	9.5%
2026	434,335	496,750	62,415	14.4%
2031	476,868	595,800	118,932	24.9%
2036	523,125	680,750	157,625	30.1%
CAGR (16-36)	2.5%	3.7%		

CAGR = Compound Average Growth Rate
1) 2016 value for 2017 TAF updated to reflect airport records.

The passenger enplanement forecasts are reasonable and justified because they are based on variables (MSA population, MSA GRP, and U.S. GDP) that have exhibited a high degree of historical correlation with passenger enplanements. The population forecasts are the same as those used in local planning, meaning that stakeholders making municipal investment decisions at the cities in Deschutes County find them to be reasonable. While airlines are generally reluctant to share much of their long-range plans, what is known about future routes and fleet decisions support the growth in these forecasts. The use of Monte Carlo simulation in the forecasts allows for a sensitivity analysis of the forecasts should the MSA grow more quickly or less quickly than expected. The preferred passenger enplanement forecast is used to derive the scheduled commercial operations in **Section 5.3** and the peak enplanement numbers in **Section 7**.

2.4.2 AIR CARGO

Air cargo volume has declined at a CAGR five percent since 2006, which is a steeper decline than the national CAGR of -0.5 percent over the same period. The FAA Aerospace Forecast suggests that the decline in air cargo volume can be attributed to changing security requirements, use of truck carriers, and the advent of digital substitutes to documents and media that used to be shipped. Air cargo will remain critical for certain items and particularly important for communities like those in the MSA that are separated from other urban areas by great distances.

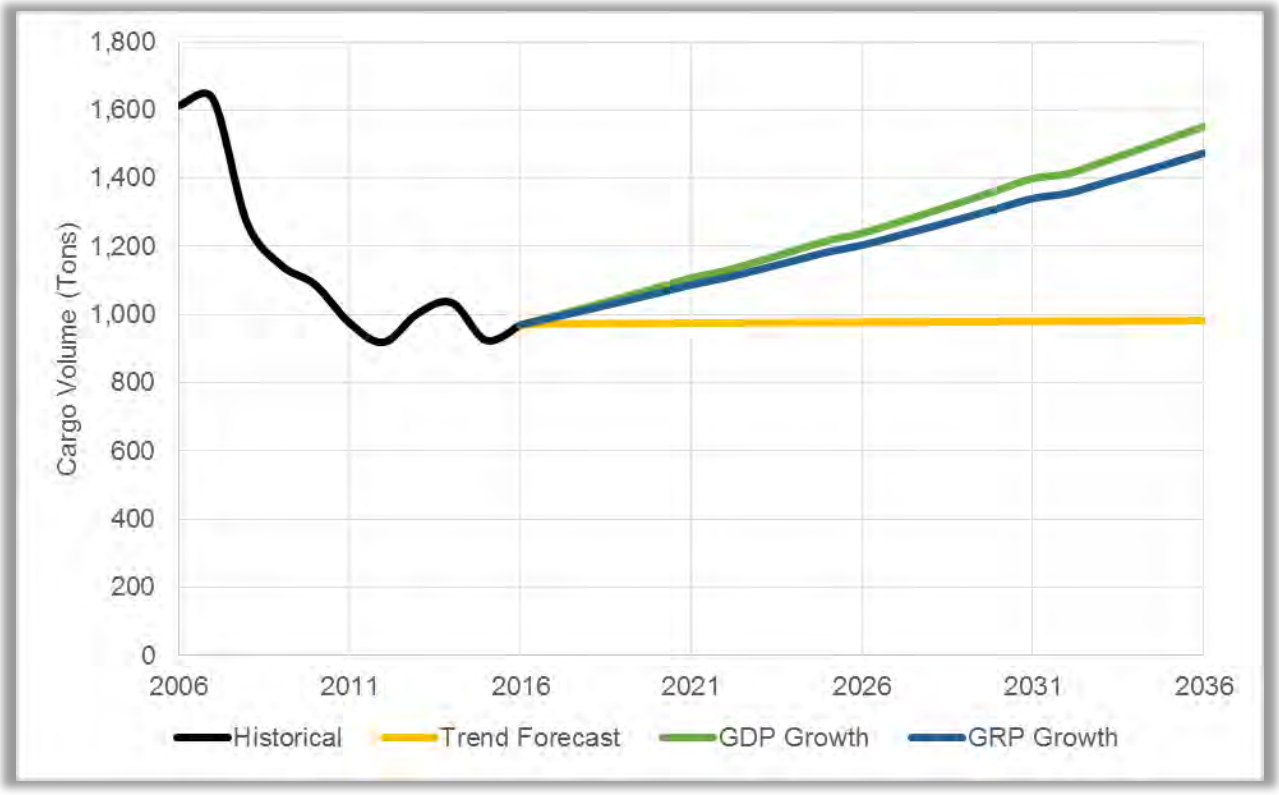
METHODS, FORECAST, AND PREFERRED METHOD

Air cargo at RDM did not exhibit strong historical correlation with any of the variables considered. In the absence of correlated data, the analysis considers variables typically used to forecast cargo volume. The FAA Aerospace Forecast is based on a model that links air cargo to U.S. GDP; therefore, GDP growth is included. MSA GRP is considered as it better reflects the local economy.

Regression analysis for both variables produces forecasts that continue the downward trend experienced since 2006. The FAA Aerospace Forecast suggests that "the shift from air to ground transportation has occurred;" therefore, the decline due to substitution of other methods has likely bottomed out. The decline in cargo volume at RDM was more pronounced from 2006 to 2011 at a CAGR of -9.5 percent than from 2011 to 2016, when the CAGR was -0.1 percent. It is expected that decline in air cargo at RDM has also stabilized.

The three methods considered for air cargo forecast are a trend analysis using 2011 to 2016 data, a time-series analysis using U.S. GDP growth, and a time-series analysis using MSA GRP growth. These methods are presented in **Exhibit 2-6.**

Figure 2-6: Air Cargo Forecasts



The trend methodology has a CAGR of 0.3 percent and projects that air cargo volumes will remain flat, growing from 970 tons to 1,000 tons annually. The GRP growth methodology has a CAGR of 2.1 percent and projects that air cargo volumes will grow from 970 tons to 1,474 tons annually. The GDP growth methodology has a CAGR of 2.4 percent and projects that air cargo volumes will grow from 970 tons to 1,552 tons annually.

As stated in **Section 3.2**, the economy of the MSA is changing and manufacturing is not as prevalent as it once was; however, there are several specialized manufacturers in town, including RDD, Stratos Aircraft, and PCC Structurals. It is expected that these businesses, and those like them, will continue to rely on air cargo for part of their supply chain in addition to rail and truck transport. The growing professional services industry will further support air cargo; however, many items traditionally shipped by lawyers, accountants, and engineers can now be transmitted digitally. It is expected that the volume of air cargo at RDM will remain flat unless the area attracts new manufacturers that are more reliant on just-in-time supply chains, and industries that specialize in logistics and storage outside of those that use truck and rail.

The trend methodology is the preferred air cargo forecast. It is expected that cargo volumes have bottomed out and will remain stable at around 1,000 tons per year into the future. Air cargo operations are expected to remain consistent throughout the forecast period, and will primarily be performed by single- and twin-engine piston and turbo-prop aircraft.

2.4.3 COMMERCIAL OPERATIONS

Commercial operations are those performed by scheduled and charter passenger airlines and cargo aircraft. Operations by business jets that use the FBO and private hangars are not counted towards the commercial operations total, and are instead part of general aviation discussed in **Section 6**.

METHODS

Scheduled passenger and air cargo operations made up 97 percent of the 13,248 commercial operations in 2016, and the remaining three percent were performed by on-demand charter airlines and tankers working for the U.S. Forest Service. Scheduled operations are based on passenger enplanement forecasts in **Section 5.1** and cargo forecasts in **Section 5.2**. Tanker and on-demand operations are expected to remain at their existing levels and growth is expected to be flat into the future. The USFS Redmond Air Center manager indicated that the level of operations will depend on the severity of the fire season, and airport landing records show that there were an average of 550 operations per year from 2006 to 2016.

Scheduled operations are organized based on TAF classifications. The two categories are air carrier, where the aircraft has 60 or more seats, and air taxi/commuter, where the aircraft has less than 60 seats. Forecasts are based on the following assumptions:

- ✓ Scheduled airlines will add service to meet the level of demand expected in the passenger enplanement forecasts.
- ✓ The 50-seat regional jets will be retired by 2026, in line with the FAA Aerospace Forecast projection that "Carriers remove 50 seat regional jets [...] while adding 70-90 seat jets, especially the E-2 family after 2020."
- ✓ As smaller jets are replaced with larger aircraft, average seats per departure will grow. Airlines will adjust flight frequencies and routes to keep load factors at levels similar to what has been experienced in the last five years, more than 80 percent.

The scheduled commercial operations forecasts are presented in **Section 5.3.2**.

SUMMARY AND TAF COMPARISON

Commercial operations are presented in three tables. **Table 2-27** presents scheduled passenger operations only, and does not include air cargo, non-scheduled passenger, and air tanker operations. **Table 2-28** presents total commercial operations, and the **Table 2-29** compares commercial operations to the TAF.

Table 2-27: Scheduled Passenger Operations

Year	Enplanements	Air Carrier			Air Taxi / Commuter			Total Scheduled
			Average			Average		
		Operations	Load Factor	Seats	Operations	Load Factor	Seats	Operations
2006	197,223	360	58%	82	14,368	70%	38	14,728
2011	231,978	4,464	56%	104	6,248	72%	45	10,732
2016	298,322	6,946	84%	74	4,796	90%	50	11,742
2021	391,450	10,000	85%	80	2,000	90%	50	12,000
2026	484,300	11,600	88%	90	1,000	91%	50	12,600
2031	575,350	12,400	86%	108	0	N/A	N/A	12,400
2036	661,600	12,600	84%	125	0	N/A	N/A	12,600
CAGR[1]	4.2%	3.3%	N/A	N/A	-100%	N/A	N/A	0.7%

NOTE – Numbers presented in this table will not match TAF as they contain scheduled passenger operations only, and not charter or air cargo.
1) CAGR from 2016 to 2036 CAGR = Compound Average Growth Rate
Source: USDOT T-100 Database and Airport Records

Table 2-28: Commercial Operations Forecasts

Year	Air Carrier				Air Taxi / Commuter			
	Scheduled Passenger	Non-Scheduled Passenger	Tanker	Sub-Total	Scheduled Passenger	Air Cargo	Sub-Total	Total
2006	209	52	626	887	14,455	3,313	17,768	18,655
2011	4,542	8	514	5,064	6,283	3,333	9,616	14,680
2016	6,254	21	422	6,697	4,522	1,929	6,451	13,148
2021	10,000	40	500	10,540	2,000	2,100	4,100	14,640
2026	11,600	40	500	12,140	1,000	2,100	3,100	15,240
2031	12,400	40	500	12,940	0	2,100	2,100	15,040
2036	12,600	40	500	13,140	0	2,100	2,100	15,240
CAGR[1]	3.6%	3.3%	0.9%	3.4%	-100%	0.4%	-5.5%	0.7%

1) CAGR from 2016 to 2036
CAGR = Compound Average Growth Rate
Source: Historical data comes from airport records, included in **Appendix B** as **Attachment 4**.

Table 2-29: Commercial Operations Forecasts – TAF Comparison

Year	2017 TAF	Forecast	Difference	
2021	13,838	14,640	802	5.8%
2026	15,024	15,240	216	1.4%
2031	16,374	15,040	-1,334	-8.1%
2036	17,838	15,240	-2,598	-14.6%
CAGR[1]	2.2%	0.4%	N/A	N/A

CAGR = Compound Average Growth Rate 1) CAGR for 2016 to 2036
Source: TAF issued January 2017

As with passenger enplanements, the TAF underreports commercial operations. One reason for this is that the ATCT is closed for the earliest and latest operations; therefore, they are not added to FAA OPSNET. Airport records and T-100 data are a more accurate count of operations than the TAF.

2.5 GENERAL AVIATION FORECASTS

General aviation forecasts consider itinerant and local operations, and based aircraft. General aviation covers the aspects of terrestrial flight that are not commercial or military, such as recreational flying, business aviation, flight instruction, and emergency services. General aviation forecasts address itinerant and local aircraft operations, and the number of based aircraft at RDM.

2.5.1 ITINERANT GENERAL AVIATION OPERATION

Itinerant operations are those that begin and end flights at different airports. Itinerant operations are conducted by a wide array of aircraft, from single engine pistons to large private jets.

METHODS

Trends in itinerant general aviation are described in **Section 4.2.2**. Itinerant general aviation operations have exhibited a strong historical correlation with national itinerant general aviation operations (0.97), national local general aviation operations (0.94), and the national single engine fleet (0.86). Strong positive correlation is likely the result of the decline that these indicators have experienced over the past ten years.

RDM and national itinerant general aviation operations have been in decline over the past ten years; however, much of the decline occurred immediately following the 2008-2009 recession. The average annual decline for RDM was -6.4 percent from 2006 to 2016 and -3.4 percent from 2011 to 2016. That national decline slowed from -2.9 percent from 2006 to 2016 to -0.9 percent from 2011 to 2016. The 2017 FAA Aerospace Forecast projects that national itinerant general aviation operations will grow at an average annual rate of 0.3 percent over the next 20 years.

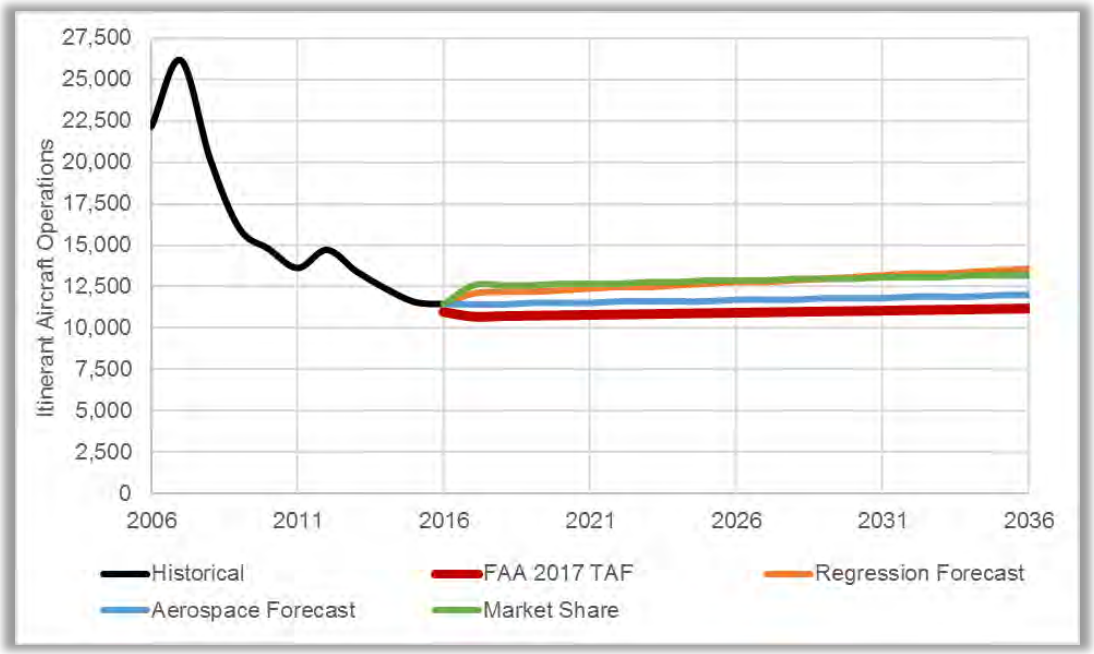
Statistical analysis is only part of the considerations taken into account when establishing a forecast. Local demand drivers, such as those listed below, influence itinerant general aviation traffic at RDM.

- ✓ General aviation businesses, such as those described in **Section 4.2.1**, perform itinerant operations as they move employees and products on their aircraft.
- ✓ Local aircraft manufacturers Stratos and Evolution Aircraft drive itinerant operations through testing and delivery of their aircraft.
- ✓ RDM is a destination market for outdoor recreation, such as golf, winter sports, and hiking. FBO staff indicate that some travelers fly general aviation when visitng the area. The FBO does not keep records on their passengers purposes for visiting the community.
- ✓ The Central Oregon Visitors Association reports that local ski resports have invested $800 million in development over past 10 years to compete with popular areas in other western states. FBO staff indicate that some winter visitors use GA to access the community; however, they do not keep records of who or how many.

Forecasts for itinerant general aviation operations use the following methods: applying the national growth rate from the 2017 Aerospace Forecast and a regression analysis using the top three correlated variables (national itinerant operations, national local operations, and national single engine fleet), using a market share analysis, ansd applying the FAA Aerospace Forecast growth rate. These forecasts are presented along side the 2017 TAF for purposes of comparison in **Table 2-30**.

Table 2-30: Itinerant General Aviation Operations Forecast

Year	Regression	Market Share	Aerospace	TAF
2016	11,426	11,426	11,426	10,985
2021	12,400	12,700	11,600	10,807
2026	12,800	12,900	11,700	10,932
2031	13,200	13,100	11,900	11,057
2036	13,600	13,200	12,100	11,182
CAGR	0.9%	0.7%	0.3%	0.1%



CAGR = Compound Annual Growth Rate. Source for Historical Data: FAA Terminal Area Forecast

PREFERRED AND TAF COMPARISON

There are two reasons that support itinerant operations retuning to growth at RDM: restructuring of the general aviation segments, and regional growth. Itinerant general aviation operations have experienced a period of restructuring following the 2008-2009 recession. As discussed in **Section 4.2.2**, the largest market within general aviation, single engine piston, is in a state of decline. Smaller markets, including turbine, experimental, and light sport are growing. RDM has the longest runway length in the region, which is necessary to accommodate larger jet aircraft, particularly on hot days. The FBO provides the services and facilities needed by these growing markets.

Despite the decline in itinerant operations at RDM over the past ten years, itinerant operations are growing in the Central Oregon region. Data from the TAF for the other airports in the region (Bend (BDN), Sunriver (S21), Madras (S33), and Prineville (S39)), show that the region experienced a six percent annual average growth in itinerant general aviation operations over the past ten years. Itinerant operations declined at RDM, S21, and S39 were offset by growth at BDN and S33. Total itinerant operations within the region more than doubled over the last ten years, as shown in **Table 2-31**.

Table 2-31: Regional Itinerant Operations

Fiscal Year	Bend (BDN)	Redmond (RDM)	Sunriver (S21)	Madras (S33)	Prineville (S39)	Total
2006	27,026	22,170	10,089	2,436	8,450	43,145
2011	49,041	13,610	3,000	4,669	7,000	77,320
2016	71,447	10,985	3,022	4,138	7,142	96,734
2021	80,626	10,807	3,132	4,693	7,847	107,105
2026	90,918	10,932	3,247	5,325	8,555	118,977
2031	102,526	11,057	3,363	6,034	9,314	132,294
2036	115,615	11,182	3,481	6,839	10,133	147,250
CAGR 06-16	6.1%	-4.8%	-11.4%	6.7%	-1.9%	6.0%
CAGR 16-36	2.4%	-0.1%	0.7%	2.5%	1.8%	2.1%

NOTE: Sisters (6K5) is part of RDM's catchment area, but is not part of the TAF. Operations numbers for 6K5 are unknown.
2016 numbers for RDM are adjusted to compensate for the Airport closure in May.
Source: FAA TAF.

Airport location and tenants are key drivers behind the regional growth. U.S. Census records for the City of Bend, where BDN is located, show that the population has grown by six percent from 2010 to 2015. The City is closer to the ski resorts than RDM is, and has facilities capable of serving piston and jet itinerant aircraft in all but the worst weather. The other key factor is tenants – both BDN and S39 have flight schools and the other airports do not. Student pilots perform itinerant operations as part of their training, which is helping drive the overall operations numbers.

Forecasts shown BDN operations continuing to grow, and total airport operations (including local) could reach 230,000 in the next 20 years. BDN has one runway which means that it will be near capacity in 20 years, based on guidance in FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*. As BDN approaches capacity, delays will increase, and the mix of quicker business jets and turbo props with slower fixed wing and helicopter flight training traffic will compound the congestion and delays. This can make BDN a less desirable for some users, and with RDM is 16 miles away, some traffic may choose to avoid the congestion.

The forecast methods considered produce similar results. The range between the lowest and the highest forecast in 2036 is 1,900. Key factors that influence selecting the higher forecast as preferred are described below.

- ✓ The MSA continues to grow, and development pressure in the City of Bend is pushing development in Deschutes County to other communities, such as RDM. As stated in Section 3.6, general aviation users tend to use facilities near their home or business when possible.
- ✓ The City of Redmond has more vacant industrial land with readily available infrastructure than other communities in the region. It is expected that there will be an increase in general aviation traffic from developers and prospective clients inspecting sites, and future tenants as this land develops.
- ✓ Aircraft manufacturer Stratos completed the first flight of its very light jet in November 2016. As the flight testing continues, additional traffic is expected.
- ✓ The FBO is planning to add additional hangars to grow their business, and to be able to accommodate more aircraft. RDM is attractive during the winter because of the instrument landing system; however, more covered aircraft storage is needed. If the FBO can develop more covered storage online, then itinerant operations will grow.

The preferred itinerant operations forecast is the one variable regression forecast, which is based on RDM performing in line with national itinerant general aviation operations. These two variables have exhibited strong historical correlation, and local demand inducing factors, described above, are expected to drive future itinerant general aviation operations. As shown in **Table 2-32**, the preferred itinerant general aviation operations forecast is within seven percent of the TAF in the five- and ten-year reporting periods.

Table 2-32: Itinerant General Aviation Operations Forecasts – TAF Comparison

Year	TAF	Forecast	Difference	
2016	10,985	10,985	0	0.0%
2021	10,807	12,600	1,793	7.3%
2026	10,932	13,000	2,068	7.0%
2031	11,057	13,500	2,443	7.6%
2036	11,182	14,000	2,818	8.2%
CAGR	0.1%	1.2%	N/A	N/A

CAGR = Compound Average Growth Rate
Source: TAF issued January 2017

2.5.2 LOCAL OPERATIONS

Local operations are those that remain in an airport's traffic pattern. These operations are generally by smaller aircraft such as single engine pistons, light sport, and experimental. Local operations are commonly performed by student pilots, recreational pilots, and pilots maintaining proficiency. Pilots flying in the traffic pattern generally land multiple times per hour, which causes high local operations numbers compared to itinerant operations.

METHODS

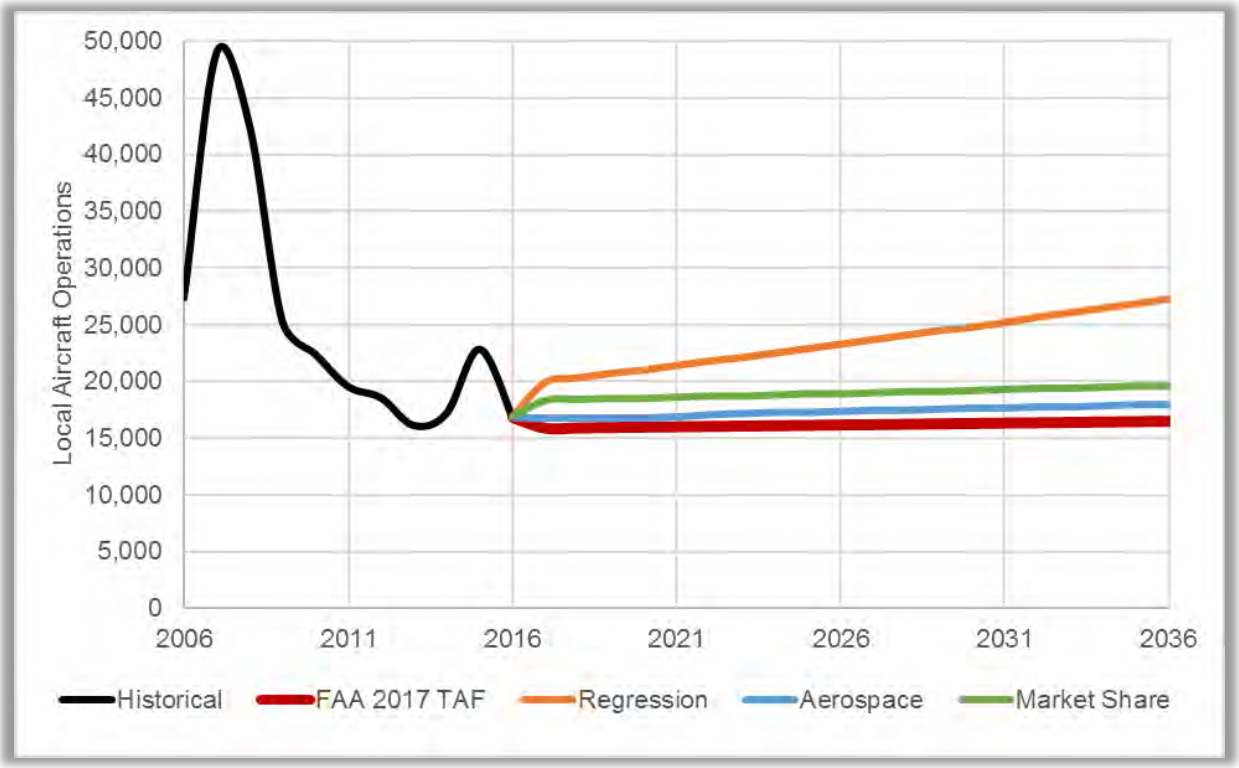
Local general aviation operations saw their peak in 2007 when there was a flight school at RDM. Operations declined substantially in the years that followed due to the recession, airline hiring freezes, and the relocation of the flight school to BDN. Historical factors that have influenced local general aviation operations are described in **Section 4.2.3**.

Local general aviation forecasts employ market share analysis, growth rate analysis, and regression analysis methods. The market share analysis takes the percent of national local operations that have occurred at RDM over the past five years (0.16 percent), and forecasts that future local operations will maintain this ratio to national operations based on the 2017 FAA Aerospace Forecast projections. The growth rate analysis takes the variable that showed the highest degree of historical correlation (national local general aviation operations), and used the growth rates in the 2017 FAA Aerospace forecasts to project future activity. Despite the similar independent variables in the market share and growth rate methods, the outcomes are different.

The regression analysis began with a correlation assessment, which found that local general aviation operations exhibited strong correlation with national local general aviation operations (0.87), national itinerant general aviation operations (0.83), and the national single-engine fleet (0.79). Other indicators did not have a strong enough correlation to be considered for analysis.

Local general aviation operations forecasts are shown in **Table 2-33**.

Table 2-33: Local General Aviation Operations Forecast				
Year	Regression	Market Share	Aerospace	TAF
2016	16,829	16,829	16,829	16,829
2021	21,400	18,600	17,600	16,005
2026	23,300	18,900	18,200	16,167
2031	25,200	19,300	18,500	16,332
2036	27,300	19,600	18,900	16,497
CAGR	2.4%	0.9%	0.3%	-0.1%



CAGR = Compound Annual Growth Rate. *Source: FAA Terminal Area Forecast*

PREFERRED AND TAF COMPARISON

The TAF is forecasting a slight decline in local operations with a CAGR of -0.1 percent over the next 20 years. Given the historically higher levels of local operations activity and the demand for flight training over the next 20 years, it is unlikely that local general aviation operations will remain flat at RDM. The presence of flight schools in Prineville and Bend attract student pilots to the region, and the instrument landing system and airport traffic control tower at RDM are parts of the student's curriculum that are not found at other area airports. As noted in **Section 6.2.1**, the TAF for BDN suggests that the airport's single runway will near capacity over the next 20 years, which will displace some operations to other area airports. Regional local operations and expected growth at two percent per year, and are shown in **Table 2-34**.

Table 2-34: Regional Local General Aviation Operations

Fiscal Year	Bend (BDN)	Redmond (RDM)	Sunriver (S21)	Madras (S33)	Prineville (S39)	Total
2006	40,000	27,376	6,799	7,754	2,112	84,041
2011	50,144	19,554	2,500	8,189	3,000	83,387
2016	72,040	16,829	2,518	6,144	3,062	100,593
2021	81,172	16,005	2,613	6,910	3,371	110,071
2026	91,396	16,167	2,712	7,777	3,681	121,733
2031	102,908	16,332	2,813	8,749	4,013	134,815
2036	115,868	16,497	2,916	9,846	4,371	149,498
CAGR 06-16	2.3%	-4.7%	-9.5%	0.5%	3.6%	-0.1%
CAGR 16-36	2.4%	-0.2%	0.7%	2.4%	1.8%	2.0%

NOTE: Sisters (6K5) is part of RDM's catchment area, but is not part of the TAF. Operations numbers for 6K5 are unknown.
Source: FAA TAF.

Regional local operations growth will be led by BDN and S33 at 2.4 percent per year, then S39 and S21. As stated in the FAA document *Forecast Process for the 2016 TAF,* GA operations are assessed based on past trends. The TAF for RDM is likely so low because of the -3.3 percent average annual drop in local operations that the Airport has seen over the past ten years. Given that the regional market is projecting a two percent average annual growth and BDN is nearing capacity, it is expected that RDM local general aviation operations will grow faster than TAF projections.

The preferred local operations forecast is the one based on the 2017 FAA Aerospace Forecast growth rate. This methodology projects that RDM will see growth in line with national demand. As flight training increases across the country, RDM will see local operations grow in kind. One point for consideration when projecting future local general aviation operations is the location of regional flight schools. Schools have expressed interest in moving to RDM; however, the Airport does not have space to accommodate them. Should the Airport attract a flight school by developing a site for aircraft storage and classrooms, then growth could occur in line with the regression forecast. As shown in **Table 2-35**, the preferred local general aviation operations forecast is within ten percent of the TAF at the five-year reporting period, and within fifteen percent of the TAF at the ten-year reporting period.

Table 2-35: Local General Aviation Operations Forecasts – TAF Comparison

Year	2017 TAF	Forecast	Difference	
2016	16,829	16,829	0	0.0%
2021	16,005	17,600	1,595	10.0%
2026	16,167	18,200	2,033	12.6%
2031	16,332	18,500	2,168	13.3%
2036	16,497	18,900	2,403	14.6%
CAGR	-0.1%	0.4%	N/A	N/A

CAGR = Compound Average Growth Rate
Source: TAF issued January 2017

2.5.3 BASED AIRCRAFT

Based aircraft are those that are stored at the Airport, either in hangars or tie-downs. Scheduled commercial aircraft that visit the Airport routinely and U.S. Forest Service aircraft that are temporarily stored at the Airport during fire season do not count as based. Based aircraft forecasts are primarily used to define aircraft parking and storage needs.

METHODS

Historical trends and the composition of the based aircraft fleet at RDM are discussed in **Section 4.2.4**. Three methods are used to project the size and composition of the based aircraft fleet. The first is a growth rate analysis based on the change by aircraft category (e.g. SEP, MEP, and Jet) from 2011 to 2016. The second is a market share forecast that compares the number of based aircraft at RDM, by category, with the national fleet from 2011 to 2016. The third uses the growth rates for each category of aircraft in the 2017 FAA Aerospace Forecast to project future growth.

PREFERRED AND TAF COMPARISON

Based aircraft forecasts are done at the aircraft category level of detail – SEP growth rates are applied to SEP based aircraft, and jet growth rates are applied to jet aircraft. The 2017 FAA Aerospace Forecast shows that piston aircraft, the most common type at RDM, is expected to decline at -0.8 percent per year into the future. Growth markets include turbine, which are expected to grow at 1.9 percent per year, and helicopters, which are expected to grow at 1.6 percent per year, and Other, which are expected to grow at 1.2 percent per year. Each of the three forecast methods considers the impending change in general aviation fleet composition, and future projections expect that turbine, helicopter, and other aircraft will grow while piston aircraft decline.

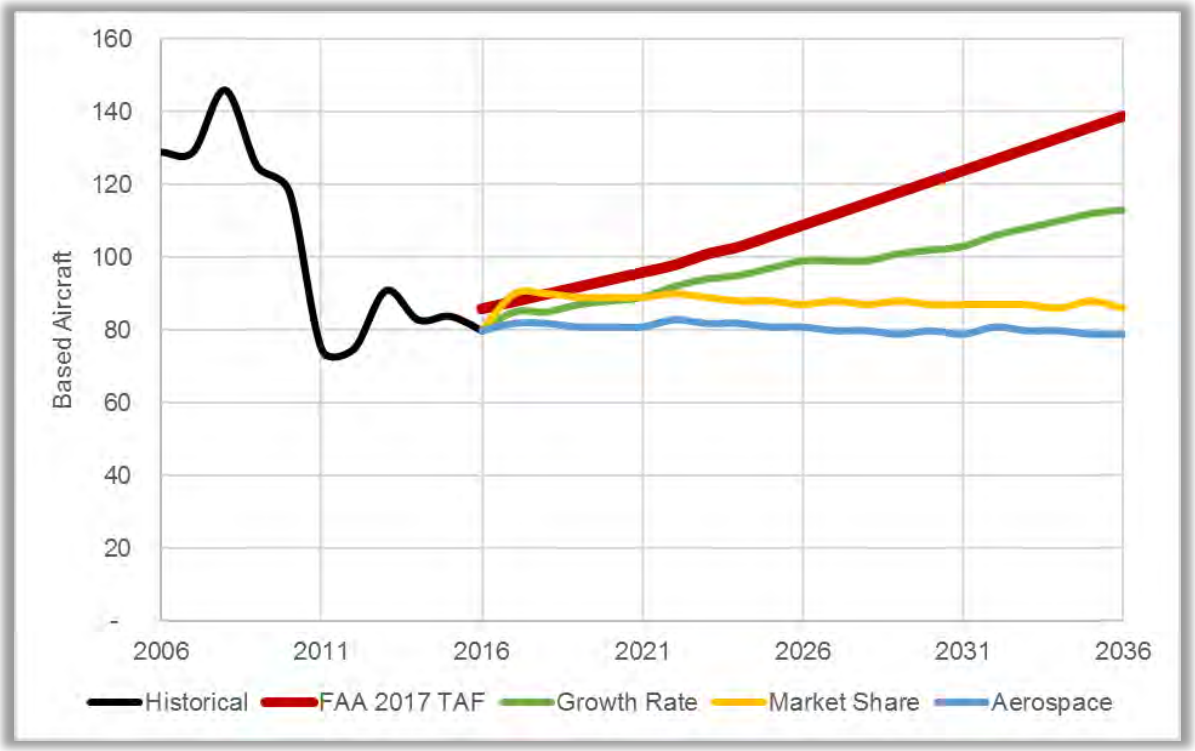
The Growth Rate forecast methodology projects 2.3 percent growth per year. In this methodology, MEP continue to decline, SEP remain stable, and other categories grow. The high growth markets of light sport and experimental aircraft, which were not based at RDM in 2016, are expected to arrive over the next 20 years as the types become more common and replace some of the retired SEP aircraft.

The market share forecast expects that SEP will decline, jet will remain level, and MEP, helicopter, and Other categories will grow. The MEP projection is likely thrown off because RDM had as many as 14 based MEP over the past five years. Since the market share forecast is based on an average market share over the last five years, it may be projecting higher MEP than appropriate.

The 2017 TAF for based aircraft at RDM is uncharacteristically high when compared to the TAF for local and itinerant general aviation operations. While the TAF expects that operations will largely remain flat, the number of aircraft is expected to grow by 2.4 percent per year. As stated in **Section 2**, the TAF based aircraft counts do not match airport management records. The TAF has 86 based aircraft at RDM in 2016 while airport management reports 80. Based aircraft forecasts are shown in **Table 2-36**.

Table 2-36: Based Aircraft Forecasts

Year	Growth Rate	Market Share	Aerospace	TAF
2016	80	80	80	86
2021	89	89	81	96
2026	99	87	81	109
2031	103	87	79	124
2036	113	86	79	139
CAGR	1.7%	0.4%	-0.1%	2.4%



CAGR = Compound Annual Growth Rate. *Source: FAA Terminal Area Forecast*

Based aircraft forecasts are ultimately determined by the amount of space available to park and store new planes. RDM hangars were full in 2016 and the Airport has a waiting list for new space. Although the Airport has held over 140 based aircraft in the past, many of these were parked outside and exposed to the elements. New aircraft have sensitive avionics and are more expensive than their older counterparts were. Aircraft owners prefer covered storage, particularly in climates like RDM where the summer sun and winter rain and snow can damage aircraft.

Airport management and tenants have expressed interest in expanding property for general aviation parking and storage. Location and scale of these improvements will be discussed in **Chapter 4**, Improvement Alternatives. Given that future aircraft storage will not always be constrained by a lack of hangars, that the Airport is in a growing community, and that there are growth markets within general aviation the local growth rate forecast is preferred. A breakdown of the local growth rate forecast by aircraft type is shown in **Table 2-37**.

Table 2-37: Preferred Based Aircraft Forecast

Year	SEP	MEP	Jet	Helicopter	Other	Total
2016	64	4	6	6	-	80
2021	67	3	9	7	3	89
2026	69	3	14	9	4	99
2031	67	2	20	10	4	103
2036	64	2	30	12	5	113
CAGR	0.0%	-3.4%	8.4%	3.5%	N/A	1.7%

SEP: Single Engine Piston
MEP: Multi Engine Piston

The preferred forecast projects strong growth in the number of jets, helicopters, and Other aircraft. The jet category includes both jet and turbo-prop aircraft. The market assessment in **Section 3.6** shows that RDM is the only airport in the region capable of handling large jets on a routine basis. It has the longest runway and only precision approach with a light land in the region, meaning that it offers year-round reliability. **Table 2-38** shows that the preferred forecast is within ten percent of the TAF in five years, and 15 percent of the TAF within ten years.

Table 2-38: Based Aircraft Forecasts – TAF Comparison

Year	2017 TAF	Forecast	Difference	
2016	86	80	-6	-7.0%
2021	96	89	-7	-7.3%
2026	109	99	-10	-9.2%
2031	124	103	-21	-16.9%
2036	139	113	-26	-18.7%
CAGR	2.4%	1.7%	N/A	N/A

CAGR = Compound Average Growth Rate
Source: TAF issued January 2017

2.6 PEAK FORECASTS AND CRITICAL AIRCRAFT

2.6.1 PEAK PERIOD FORECASTS

Peak forecasts estimate when certain airport facilities will be at their busiest. Peak forecasts are used to assess level of service of airfield and terminal facilities and to right-size improvement projects. Improvement projects are not typically designed for the busiest hour of the busiest day of the year because such a design would lead to over-building. Instead, peak forecasts look at a typical busy period throughout the year. Forecasts use historical records to project future peaking; therefore, it is essential that peak forecasts be reevaluated if a change in user or aircraft type occurs. **Table 2-39** presents the peak forecasts.

Table 2-39: Peak Period Forecasts

Category	Period	Factor	2016	2021	2026	2031	2036
Enplanements and Deplanements	Annual	100.0%	298,322	394,500	496,750	595,800	680,750
	Peak Month	10.1%	30,131	39,667	49,948	59,908	68,450
	Peak Day	3.6%	1,085	1,423	1,791	2,148	2,455
	Peak Hour – Enpl.[1]	17.9%	194	219	275	326	388
	Peak Hour – Depl.[1]	15.0%	163	175	252	345	472
Passengers	Annual	100.0%	596,644	789,000	993,500	1,191,600	1,361,500
	Peak Month	10.1%	60,261	79,334	99,897	119,816	136,899
	Peak Day	3.6%	2,169	2,845	3,583	4,297	4,910
	Peak Hour[1]	12.8%	278	393	525	703	940
Aircraft Operations	Annual	100%	40,162	45,540	47,240	47,840	48,940
	Peak Month	10.9%	4,378	4,982	5,168	5,234	5,354
	Peak Day	4.7%	206	233	242	245	251
	Peak Hour	10.0%	21	23	24	25	25

1) Peak hour forecasts adjusted to reflect average load factor, depicted in **Table 2-26**.
Peak Enplanements / Deplanements / Passengers: Month: FAA T-100 Database. Day and Hour: Airline Schedules
Peak Aircraft Operations: Peak Month and Day: FAA OPSNET, Peak Hour: ATCT Staff

2.6.2 CRITICAL AIRCRAFT

The critical aircraft is the most demanding type, or group of aircraft with similar characteristics, to operate more than 500 times per year at an airport. Operations by aircraft type come from Traffic Flow Management System Counts (TFMSC), and the data shows that scheduled commercial and freight aircraft are the critical aircraft at RDM. TFMSC only captures aircraft that file flight plans; therefore, flight training aircraft that operate more frequently than those listed below are not represented. Because flight training aircraft are smaller and slower than the critical aircraft shown, their absence from the TFMSC rankings has no bearing on the critical aircraft selection.

Critical aircraft are categorized by airport reference code (ARC), which is made up of the aircraft approach category (AAC) and airplane design group (ADG), as defined in **Chapter 1** and in the **Terminology** defined in **Section 2.0** of this chapter. The critical aircraft will be used to design and scale improvement projects and setbacks in **Chapter 3**, **Facility Requirements** and **Chapter 4, Improvement Alternatives. Table 2-40** identifies the critical aircraft.

Table 2-40: Existing Critical Aircraft

Rank	Aircraft	Role	Operations	Reference Code
1	Bombardier Q400	Passenger Airline	5,688	B-III
2	Bombardier CRJ-200	Passenger Airline	4,556	C-II
3	Beech Airliner 99	Cargo Airline	914	TBD
4	Cessna 208 Caravan	Cargo Airline	858	B-II
5	Bombardier CRJ-700	Passenger Airline	506	C-II

The existing critical aircraft is the Bombardier Q400, operated by Alaska Airlines. Alaska has announced that it will supplement its fleet of Q400 aircraft with the Embraer 175 regional jet (E175) (reference code C-III), which operates in the same 76-seat configuration as the Q400. Alaska route planning staff and the airport station manager expect that the Q400 will remain in the fleet for at least the next decade and will continue to connect RDM to Alaska hubs in Seattle and Portland. The California market is expected to transition to the E175 in the next five years, and if RDM sees new Alaska routes to California, they may be served by the E175.

As shown in **Table 2-26** in **Section 5.3**, the average seat capacity for air carrier aircraft at RDM is expected to grow from 74 seats in 2016 to 125 seats in 2036. The average will grow if larger narrow-body aircraft, such as the Boeing 737 and Airbus A320 lines, begin service at RDM. These aircraft are typically C-III aircraft apart from the Boeing 737-900, which is a D-III. Exact composition of the future fleet is unknown. What is known is that new Boeing 737 Max and Airbus A320-NEO aircraft will eventually replace existing narrow-bodies. These new aircraft are designed to be more fuel efficient and technologically advanced than their existing counterparts, and have similar physical characteristics. In terms of regional jets, SkyWest (which flies for Alaska, American, Delta, and United) has placed an order for the Mitsubishi Regional Jet (reference code C-III), which can have up to 90 seats. The Bombardier C-Series and second generation of Embraer E-Jets (reference code C-III) are also in early stages of production.

The future air carrier fleet mix will drive the critical aircraft for RDM in the future. Estimates are developed based on enplanement and commercial operations forecasts, aircraft seating capacity, and expected load factor. This estimate does not use aircraft classified as air taxi (less than 60 seats) as these aircraft are expected to be phased out by 2026. The future critical aircraft for Runway 5-23 will be the 737 and A319 (ARC of C-III), and the future critical aircraft for Runway 11-29 will be the Q400 (ARC of B-III). **Table 2-41** shows the projections for the future fleet mix.

Table 2-41: Future Air Carrier Operations by Aircraft Type

Typical Aircraft	Seats	ARC	2021	2026	2031	2036
CRJ-200	<70	C-II	2,260	0	0	0
Q400/E175/CRJ-900	70-90	B-III/C-II/C-III	8,430	8,200	6,000	3,000
MRJ-90	90-110	C-II	56	1,600	2,000	2,400
737-700	110-130	C-III	286	500	2,000	1,800
A319 (Mainline)	130-150	C-III	204	600	1,000	3,600
A319 (Low Cost), 737-800	150-170	C-III	204	500	1,000	1,500
737-900	>170	D-III	40	200	400	300

Parameters: Based on airline order books and aircraft manufacturer production plans current as of April 2017. Operations growth provides sufficient seats to meet passenger enplanement forecasts at load factors >80%.

2.7 FORECAST SUMMARY

The forecast summary is presented in **Figure 2-7** and **Figure 2-8**. Highlights of the forecast are below.

- RDM has experienced strong growth in scheduled airline service because of the migration to Central Oregon and growing tourism demand.
- RDM is the only commercial service airport in central Oregon and retains 75 percent of passengers in its catchment area. The Airport is equipped with an airport traffic control tower, an instrument landing system, two fixed base operators, and two runways that are both over 7,000 feet long. It is the best equipped airport in Central Oregon to handle commercial and business aviation.
- Population is expected to grow at 1.8 percent annually. Median age will increase as retirees and job seekers move the community. Working age population is more likely to travel by air than other population segments.
- The local economy is diversifying, adding jobs in healthcare, technical manufacturing and professional service industries. Tourism and hospitality will remain large employers.
- Passenger enplanement growth is expected to remain strong, driven by population growth and economic development in Deschutes County. Airlines achieve load factors near and above industry averages at RDM, which helps the Airport market the airlines to attract additional routes and frequencies.
- Airlines will continue to increase the average number of seats per departure. This will hold commercial operations steady, which the total number of seats offered increases. Air taxi aircraft (less than 60 seats) will exit the market within 10 years.
- Air cargo will remain level at 1,000 tons a year. Trucks, security screening requirements, and electronic mail substitutes hamper the need for more air cargo.
- Local and itinerant general aviation operations will remain flat; however, if nearby Bend Airport continues to approach capacity on its single runway, RDM may see an increase in general aviation operations.

- Flight schools have expressed interest in locating at RDM as they did in the past. If the Airport develops property to accommodate a flight school, general aviation activity will increase.
- Single-engine and multi-engine piston aircraft will be retired faster than they are replaced. Jet, turbo-prop, helicopter, light sport, and experimental aircraft are growing segments. Growth in based aircraft is largely dependent on the Airport or a private developer preparing a site for new hangars. Existing hangars are at capacity.
- The future ARCs for Runways 5-23 and 11-29 will remain the same. The critical aircraft for Runway 5-23 will be the Boeing 737 and Airbus A319 with ARCs of C-III. The critical aircraft for Runway 11-29 will be the Bombardier Q400 with an ARC of B-III.

Figure 2-7: Forecast / TAF Comparison

AIRPORT NAME: REDMOND MUNICIPAL AIRPORT

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Passenger Enplanements				
Base yr.	2016	298,322	298,322	0.0%
Base yr. + 5yrs.	2021	431,978	394,570	9.5%
Base yr. + 10yrs.	2026	496,750	434,335	14.4%
Base yr. + 15yrs.	2031	595,800	476,868	24.9%
Commercial Operations				
Base yr.	2016	11,467	11,467	0.0%
Base yr. + 5yrs.	2021	14,640	13,838	5.8%
Base yr. + 10yrs.	2026	14,240	15,024	-5.2%
Base yr. + 15yrs.	2031	15,040	16,374	-8.1%
Total Operations				
Base yr.	2016	40,162	40,162	0.0%
Base yr. + 5yrs.	2021	44,840	41,531	8.0%
Base yr. + 10yrs.	2026	45,440	43,004	5.7%
Base yr. + 15yrs.	2031	47,040	44,644	5.4%

NOTES: TAF data is on a U.S. Government fiscal year basis (October through September).

Figure 2-7: TAF Forecast Worksheet

AIRPORT NAME: REDMOND MUNICIPAL AIRPORT **Specify base year:** 2016

						Average Annual Compound Growth Rates			
	Base Yr. Level	Base Yr. + 1yr.	Base Yr. + 5yrs.	Base Yr. + 10yrs.	Base Yr. + 15yrs.	Base yr. to +1	Base yr. to +5	Base yr. to +10	Base yr. to +15
Passenger Enplanements									
Air Carrier	536	22,200	27,600	77,100	211,400	4041.8%	120.0%	64.4%	49.0%
Commuter	297,786	324,200	404,378	419,650	384,400	8.9%	6.3%	3.5%	1.7%
TOTAL	298,322	346,400	431,978	496,750	595,800	16.1%	7.7%	5.2%	4.7%
Operations									
Itinerant									
Air carrier	5,127	8,940	10,540	12,140	12,940	74.4%	15.5%	9.0%	6.4%
Commuter/air taxi	6,340	5,700	4,100	2,100	2,100	-10.1%	-8.3%	-10.5%	-7.1%
Total Commercial Operations	11,467	14,640	14,640	14,240	15,040	27.7%	5.0%	2.2%	1.8%
General aviation	10,985	12,100	12,500	13,000	13,500	10.2%	2.6%	1.7%	1.4%
Military	341	300	300	300	300	-12.0%	-2.5%	-1.3%	-0.9%
Local									
General aviation	16,829	16,800	16,900	17,400	17,700	-0.2%	0.1%	0.3%	0.3%
Military	540	500	500	500	500	-7.4%	-1.5%	-0.8%	-0.5%
TOTAL OPERATIONS	40,162	44,340	44,840	45,440	47,040	10.4%	2.2%	1.2%	1.1%
Instrument Operations	14,197	17,621	17,741	17,491	18,410	24.1%	4.6%	2.1%	1.7%
Peak Hour Operations	21	21	23	23	24	0.0%	1.8%	1.0%	0.9%
Cargo/mail (enplaned+deplaned tons)	970	1,000	1,000	1,000	1,000	3.1%	0.6%	0.3%	0.2%
Based Aircraft									
Single Engine (Nonjet)	64	65	67	69	67	1.6%	0.9%	0.8%	0.3%
Multi Engine (Nonjet)	4	4	3	3	2	0.0%	-5.6%	-2.8%	-4.5%
Jet Engine	6	7	9	14	20	16.7%	8.4%	8.8%	8.4%
Helicopter	6	6	7	9	10	0.0%	3.1%	4.1%	3.5%
Other	0	3	3	4	4	0.0%	0.0%	0.0%	0.0%
TOTAL	80	85	89	99	103	6.3%	2.2%	2.2%	1.7%

B. Operational Factors

	Base Yr. Level	Base Yr. + 1yr.	Base Yr. + 5yrs.	Base Yr. + 10yrs.	Base Yr. + 15yrs.
Average aircraft size (seats)					
Air carrier	74	76	85	102	110
Commuter	50	50	50	N/A	N/A
Average enplaning load factor					
Air carrier	80.5%	85.0%	91.0%	84.0%	87.5%
Commuter	86.3%	83.0%	90.0%	N/A	N/A
GA operations per based aircraft	348	340	330	307	303

3.0 FACILITY REQUIREMENTS

This Facility Requirements Chapter considers the availability and capability of facilities at the Redmond Municipal Airport (RDM or the Airport) to accommodate existing and projected aviation demand over the next 20 years.

3.1 INTRODUCTION TO FACILITY REQUIREMENTS

This chapter compares current and forecasted activity levels (presented in **Chapter 2 Aviation Forecasts**) to the Airport's operational capacity, design requirements, and facility needs. Options for meeting the identified facility needs will be analyzed in **Chapter 4 Alternatives Analysis**.

Facility requirements are presented in the following organizational structure:

- ✓ Airside Facility Requirements
  - Airfield Capacity
  - Airfield Design
  - Runway System
  - Taxiway System
  - General Aviation Facilities
- ✓ Landside Facility Requirements
  - Passenger Terminal Roadway
  - Passenger Terminal Parking Area
  - Rental Car Facilities
  - Non-aviation Revenue Development
- ✓ Terminal Area Facilities
  - Airport Activity
  - Passenger Terminal Building
  - Gate Capacity Requirements
  - Terminal Building Development
  - Conclusions and Recommendations
- ✓ Support Facilities
  - Fixed Base Operators
  - United States Forest Service

Airside Facilities:
Facilities that are accessible to aircraft, such as runways and taxiways.

Landside Facilities:
Facilities that support airside facilities, but are not part of the aircraft movement area, such as terminal buildings, hangars, aprons, access roads, and parking facilities.

Support Facilities:
Facilities that can be either airside or landside facilities that aid in the operation of the airport.

- Cargo Facilities
- Airport Support and Maintenance Facilities
- Conclusions and Recommendations

3.2 AIRSIDE FACILITY REQUIREMENTS

An early step in reviewing an airport's long-term needs is to assess capacity and delay issues because these concerns will influence the direction of airfield planning. An airport's annual capacity, known as the Annual Service Volume (ASV), is the number of flight operations an airfield can accommodate during a year. Existing and forecast annual demand is compared with the ASV to determine the percentage capacity at which the airport is operating and to gauge the timing of future airfield capacity improvements. As annual demand approaches ASV, average delays increase. A typical goal is to construct a new runway prior to time delays averaging 10 to 15 minutes per operation, and this requires the completion of planning, environmental, and design work before delays reach this threshold.

Airfield Capacity:
The maximum number of aircraft operations that a specific airfield configuration can accommodate within a specific time interval of continuous demand.

Annual Service Volume (ASV):
Used by the FAA as an indicator of relative operating capacity, ASV is an estimate of an airport's annual capacity that accounts for differences in runway use, aircraft mix, weather conditions, etc. encountered over a year's time. ASV assumes an acceptable level of aircraft delay as described in FAA Advisory Circular (AC) 150/5060-5, Airport Capacity and Delay.

3.2.1 AIRFIELD CAPACITY

The Airport's ASV and hourly capacity are calculated using the methodology the Federal Aviation Administration (FAA) documented in AC 150/5060-5 *Airport Capacity and Delay*. Calculation in this method requires the mix index and runway-use configuration. The mix index is an equation (C+3D) that determines the percentage of aircraft operations that have a Maximum Takeoff Weight (MTOW) over 12,500 pounds. C represents the percent of aircraft over 12,500 but under 300,000 pounds. D represents the percent of aircraft over 300,000 pounds. Finally, the runway-use configuration for RDM is number 9 for crossing runways, shown in **Figure 3-1**. **Table 3-1** shows the mix index for RDM.

Table 3-1: Mix Index

Landings*	6,079
Operations (> 12.5k lbs.)**	13,148
General Aviation Operations (>12.5k lbs.)***	975
Total RDM 2016 Operations	40,162
C	35.2
D	0.00
Mix Index	35.2

Source: AC 150/5060-5
**Includes air carrier/air taxi/commuter/air tanker/air cargo for aircraft over 12,500 pounds*
***Operations = Landings x 2*
****GA Ops includes Flight Aware data for aircraft over 12,500 pounds.*

Figure 3-1 RUNWAY CONFIGURATION – CAPACITY AND DELAY AC 150/5060-5

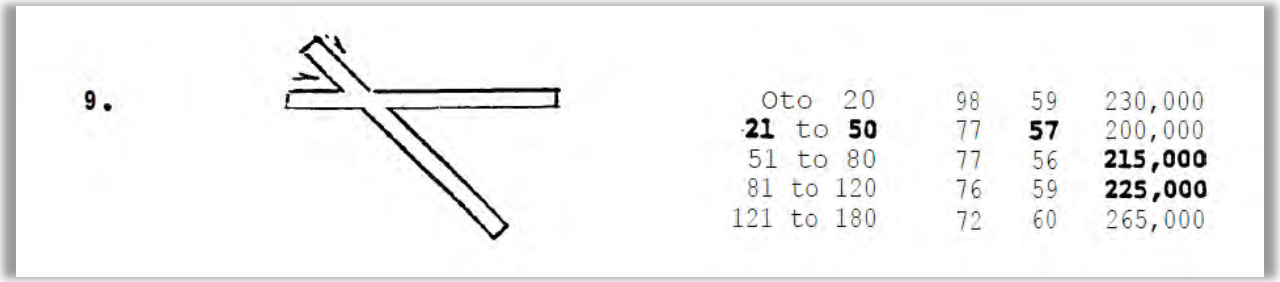


Table 3-2: ASV and Hourly Capacity

Runway Use Configuration	Mix Index (C+3D)	Capacity (Operations/Hour)		Annual Service Volume (Operations/Year)
		VFR	IFR	
#9	0 to 20	98	59	230,000
	21 to 50	**77**	**57**	**200,000**
	51 to 80	77	56	215,000
	81 to 120	76	59	225,000
	121 to 180	72	60	265,000

Source: AC 150/5060-5

Hourly capacity is split into visual flight rules (VFR) and instrument flight rules (IFR) capacity. **Table 3-2** above shows the hourly capacity and ASV for RDM.

Instrument Flight Rules (IFR) Operations:
Aircraft operations conducted by pilots with reference to instruments in the flight deck, with navigation accomplished by reference to electronic signals.

Visual Flight Rules (VFR) Operations:
Operations conducted by pilots with only visual reference to the ground, obstructions, and other aircraft.

AIRFIELD CAPACITY CONCLUSIONS AND RECOMMENDATIONS

The Airport is currently operating at 20 percent of its annual capacity, 27 percent of its VFR hourly capacity, and 36 percent of its IFR hourly capacity. As shown in **Chapter 2 Aviation Activity Forecasts**, the Airport is forecasted to handle 47,740 annual operations by 2036. The associated increases will not significantly change the capacity percentages. No major airfield changes will be required for airport capacity and delay purposes.

3.2.2 AIRFIELD DESIGN

The FAA's design standards, presented in a series of ACs, heavily influence design and construction of airside facilities. The primary AC that addresses airfield design is AC 150/5300-13A, Change 1, *Airport Design* (AC-13A). This section covers the specific design standards that apply to RDM. Additional information related to design standards can be found in **Chapter 1 Introduction**.

DESIGN STANDARDS CONCEPTS AND TERMINOLOGY

The FAA is responsible for the overall safety of civil aviation in the United States; therefore, FAA design standards are primarily driven by safety, with secondary goals including efficiency and utility also reflected in FAA standards and policy. Changes to improve safety and efficiency are constantly evolving as the aviation industry continues to develop, and the expectation is that design standards will continue to evolve alongside technologies and procedures.

CRITICAL AIRCRAFT

The initial step in airside facility planning is to identify the critical aircraft. According to FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)*, paragraph 3-4, the critical aircraft is the most demanding aircraft that operates at the airport more than 500 times per year or an aircraft used for scheduled passenger service. The characteristics used in facility planning include approach speed, wingspan, tail height, main gear width, cockpit to main gear length, aircraft weight, and takeoff and landing distances.

Critical Aircraft:
This is an aircraft with characteristics that determine the application of airport design standards for a specific runway, taxiway, taxilane, apron, or other facility. This can be a specific aircraft model or a composite of several aircraft currently using, expected to use, or intended to use the airport or part of the airport. This is also called the "design aircraft" or "critical design aircraft."

The existing critical aircraft are based on historical operations records and current airline schedules. The future critical aircraft is determined based on projections from **Chapter 2 Aviation Activity Forecasts**.

CURRENT CRITICAL AIRCRAFT

The most demanding aircraft currently using the airport is the Bombardier Q400 and Bombardier CRJ-900. Together, these two aircraft are the critical aircraft for Runway 5-23. The Q400 is also the critical aircraft for Runway 11-29.

FORECAST CRITICAL AIRCRAFT

At RDM, critical air carrier aircraft are expected to follow the general trend in airline operations nationwide, leading to a likely shift in aircraft types over the next 20 years. Routes into and out of RDM will likely shift toward increased aircraft size and reduced frequency. For RDM, this means the potential for a transition to narrow body aircraft. As addressed in the **Chapter 2 Aviation Activity Forecasts**, future critical air carrier aircraft are expected to be a combination of narrow-body jet and turboprop aircraft as shown in **Table 3-3** below.

Table 3-3: Future RDM Air Carrier Operations by Aircraft Type

Typical Aircraft	Seats	ARC	2021	2026	2031	2036
CRJ-200	<70	C-II	2,260	0	0	0
Q400/E175/CRJ-900	70-90	B-III/C-III/C-III	8,430	8,200	6,000	3,000
MRJ-90	90-110	C-II	56	1,600	2,000	2,400
B737-700	110-130	C-III	286	500	2,000	1,800
A319 (Mainline)	130-150	C-III	204	600	1,000	3,600
A319 (Low Cost), B737-800	150-170	C-III	204	500	1,000	1,500
B737-900	>170	D-III	40	200	400	300

Parameters: Based on airline order books and aircraft manufacturer production plans current as of April 2017. Operations growth provides sufficient seats to meet passenger enplanement forecasts at load factors >80%.

AIRPORT REFERENCE CODE (ARC)

The FAA AC-13A uses a coding system to determine design standards for an airport. The coding system is shorthand for the physical and operational characteristics of the most demanding aircraft that routinely use the airport.

Airport Reference Code (ARC): An airport designation that signifies the airport's highest Runway Design Code (RDC), minus the third (visibility) component of the RDC. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely on the airport. Aircraft in parenthesis are representative of the ARC category.

EXISTING ARC

The existing ARC is designated as C-III (E175).

FUTURE ARC

A change in fleet mix associated with the airlines will occur and the A319 will dictate the future ARC. The future ARC will remain C-III.

RUNWAY DESIGN CODE (RDC)

Runway Visual Range (RVR): The range on the centerline of a runway over which the pilot of an aircraft can see the runway surface markings or lights delineating the runway, reported in hundreds of feet. For example, 2400 RVR is equal to one-half mile.

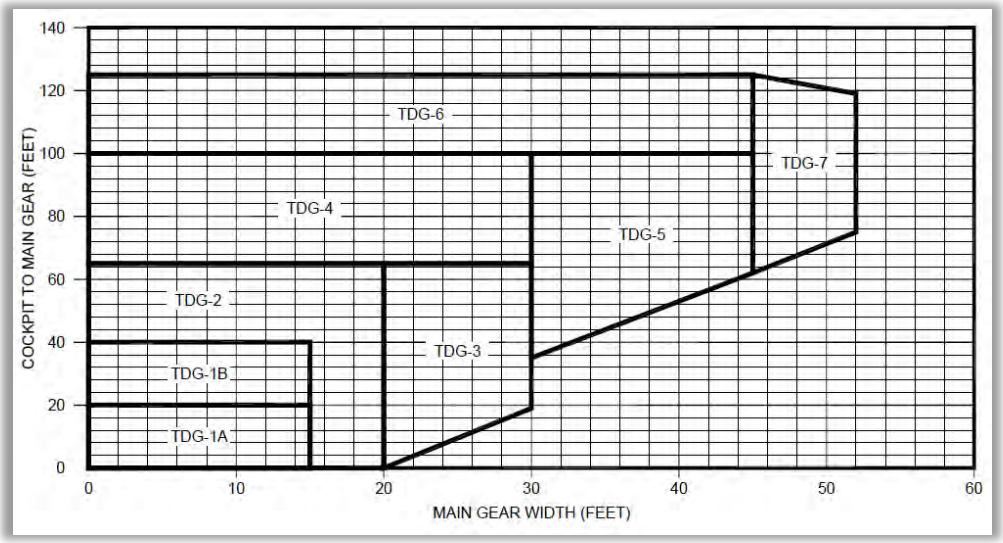
The RDC is a three-component code that defines the design standards applicable to a specific runway. A letter, A-E, depicts the first component and stands for the Aircraft Approach Category (AAC). The AAC relates to the approach speed of the critical aircraft. A Roman numeral, I-VI, depicts the second component, which is the Airplane Design Group (ADG). The ADG relates to the greatest wingspan or tail height of the critical aircraft. The third component relates to runway approach visibility minimums as expressed in Runway Visual Range (RVR) equipment measurements. **Table 3-4** summarizes the RDC classifications. The critical aircraft and RDC determine the scale and setbacks of airfield facilities.

Table 3-4: Runway Design Code					
Runway		**AAC**	**ADG**	**Approach Visibility Minimums**	**Design Aircraft**
11-29	**Existing**	B	III	7/8 mile (2,400')	Q400
	Future	No Change	No Change	No Change	No Change
5-23	**Existing**	C	III	½ mile (2,500')	E175
	Future	No Change	No Change	No Change	A319

TAXIWAY DESIGN GROUP (TDG)

The TDG criteria are a new design standard incorporated into AC-13A. The previous RDM Airport Layout Plan (ALP) and Master Plan did not address this standard. The TDG takes into account the dimensions of the aircraft landing gear to determine taxiway widths and pavement fillets to be provided at taxiway intersections. Fillet pavement accommodates the inner wheel of the airplane as it turns. There are seven (1-7) TDG classifications distinguished by width of the main gear and wheel base (the distance from nose gear to main gear). TDG classifications are presented in **Figure 3-2.**

Figure 3-2 TAXIWAY DESIGN GROUPS



Source: Figure 3-2 from AC 5300-13a, Change1

EXISTING TDG

The Bombardier Q400 is the existing critical aircraft for all taxiways serving the runways. Due to its wide main landing gear, it is a TDG-5 aircraft. No other aircraft now operating at the Airport is above TDG-3.

FUTURE TDG

The aviation activity forecasts indicate the Airbus A319 will become the future critical aircraft if the Q400 is no longer in the fleet. These future aircraft have a narrower main landing gear width, and are both in TDG-3. As of 2017, Alaska has announced it will supplement its fleet of Q400 aircraft with the Embraer 175 regional jet (E175), which operates in the same 76-seat configuration as the Q400. Alaska route planning staff and the airport station manager expect that the Q400 will remain in the fleet for at least the next decade. Alaska Airlines will likely still operate a limited number of Q400s for short haul routes (e.g. RDM-Portland International Airport [PDX]) beyond the next decade. Exactly when the Q400 will be retired from Alaska's fleet is unknown.

There is currently a taxiway construction project for fiscal year 2018 to change the connector taxiways of Runway 11/29 to TDG 4. TDG 4 has the minimum fillet dimensions that will allow the Q400 to taxi at RDM. This allows the Q400 to continue operating at RDM until it retires from service and allows the future critical aircraft (A319) to dictate the future TDG. Therefore, it is recommended that TDG-3 be used for planning, and that standards for TDG-3 should be applied to both runways and all taxiways serving the runways once the Q400 no longer operates at RDM.

WIND COVERAGE

The primary factor influencing runway orientation is wind. The preferred design for runways is to align them so that airplanes take-off and land into a headwind. This minimizes the challenges associated with crosswinds, and provides for more efficient aircraft performance. Small, light aircraft are more affected by crosswinds than larger, heavier ones. FAA runway design criteria state that runway orientation must satisfy 95 percent wind coverage based on annual wind conditions. A crosswind runway may be justified to satisfy the 95 percent wind coverage requirement for the combined runways.

Observations for wind coverage are categorized into all weather, instrument meteorological conditions (IMC), and visual meteorological conditions (VMC). Depending upon the RDC, runways must meet the allowable crosswind component of 10.5, 13, 16, or 20 knots. Runways 5-23 and 11-29 have RDCs of C-III and B-III respectively, and both must meet an allowable crosswind component of 16 knots.

Table 3-5: Wind Coverage				
All Weather				
Runway	**10.5 Knots (12 M.P.H)**	**13 Knots (15 M.P.H.)**	**16 Knots (18.5 M.P.H.)**	**20 Knots (28 M.P.H.)**
11-29	89.63%	94.34%	98.83%	99.87%
5-23	94.85%	97.17%	99.06%	99.79%
Combined	97.65%	99.39%	99.88%	99.99%
Calm Wind Percentage (0-3 knots)			37.40%	
Number of Observations			86,755	
IMC				
Runway	**10.5 Knots (12 M.P.H)**	**13 Knots (15 M.P.H.)**	**16 Knots (18.5 M.P.H.)**	**20 Knots (28 M.P.H.)**
11-29	98.18%	99.12%	99.77%	99.95%
5-23	94.67%	96.94%	99.36%	99.91%
Combined	99.32%	99.83%	99.97%	100.00%
Calm Wind Percentage (0-3 knots)			49.70%	
Number of Observations			7,457	
VMC				
Runway	**10.5 Knots (12 M.P.H)**	**13 Knots (15 M.P.H.)**	**16 Knots (18.5 M.P.H.)**	**20 Knots (28 M.P.H.)**
11-29	94.55%	96.99%	99.00%	99.78%
5-23	89.17%	94.10%	98.78%	99.87%
Combined	97.49%	99.35%	99.88%	99.99%
Calm Wind Percentage (0-3 knots)			36.30%	
Number of Observations			79,413	

Table 3-5 shows annual average wind coverage for each runway direction during three weather conditions: all weather, VMC, and IMC. When calculated individually, neither runway alignment provides 95 percent coverage for operations during 10.5 knots under the three weather conditions. The alignment of Runway 11-29 does not provide the required coverage during 13-knot all weather conditions and Runway 5-23's alignment does not provide the required coverage during 13-knot VMC weather conditions. However, the combined alignment of the two runways provides over 97 percent coverage during each weather condition, justifying the need for continued FAA investment in secondary Runway 11-29 to maintain the required wind coverage.

According to current FAA design standards, the historical wind data reported above does not justify a B-III RDC on the crosswind runway (11-29), however, the Airport has the intention of maintaining the B-III designation throughout the planning period covered under this Master Plan.

OTHER DESIGN CONSIDERATIONS

- ✓ Airspace (approach and departure protection, terrain, and obstructions): Instrument flight procedure minimum descent altitudes, glide paths, and climb gradients are determined by obstacle clearances. Obstacle clearance surfaces extend along the extended runway centerline. Runways are typically aligned to avoid terrain and tall structures that existed at the time of design; however, tall objects and terrain can impose restrictions on aircraft operations if they inhibit the ability for aircraft to safely arrive and depart. Ideally, airports work with nearby communities to adopt land use planning techniques to minimize incompatible development.
- ✓ Independent versus dependent operating streams: Runways that intersect or that have intersecting approach and departure corridors are dependent on each other. During high levels of activity, these dependencies cause delay. As delays increase, establishment of an independent operating stream may be necessary. This can be accomplished by providing a new parallel runway with sufficient lateral separation from existing runways. Airplane wake turbulence and instrument landing capabilities are considerations when determining the amount of space needed between parallel runways.
- ✓ ATCT Line of Sight: Air traffic controllers require an uninterrupted line of sight between the air traffic control tower (ATCT) and approach and departure corridors, runways, taxiways, and aprons. Protection of controller line of sight is considered in airport development.
- ✓ NAVAID critical areas: Electronic equipment used for navigation, communication, security, and surveillance are commonly found throughout airport property. In order to function properly, most of these items require clear and graded areas, setbacks from certain objects and construction materials, and a clear corridor between transmitters and receivers. Development and most activities are restricted in these areas.
- ✓ Visual aids to navigation: Certain visual aids, including the airport beacon, runway approach lighting, and runway glide path indicator lights require unobstructed line of sight from aircraft in flight. This line of sight is considered in the planning and design of airport facilities.

3.2.3 RUNWAY SYSTEM

RUNWAY DESIGN STANDARDS

FAA AC-13A stipulates the design criteria, surfaces, and dimensions for each runway. Dimensions for the design surfaces are based upon the critical aircraft and reference code plus the type of approach instrumentation available. A brief explanation of each design surface is presented below. All runway design surfaces and instrument landing system critical areas are illustrated on **Figure 3-3.** Summary matrices (**Tables 3-7** and **3-8**) are included following the explanations.

RUNWAY SAFETY AREA (RSA)

The RSA provides a graded, clear area for aircraft in case of a runway excursion, and provides greater accessibility for firefighting and rescue equipment during such incidents. The RSA must be clear of all objects and capable of supporting aircraft, maintenance vehicles, and rescue vehicles. The FAA does not grant modifications to RSA standards, meaning that non-standard RSAs must be corrected as soon as possible. RSAs are illustrated with a red line in **Figure 3-3**.

Runway Safety Area (RSA):
A rectangular area surrounding a runway suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway.

Object Free Area (OFA):
A rectangular area centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by remaining clear of objects.

The RSA for each runway meets FAA design standards for the existing configuration. Impacts to the RSA from a potential runway extension will be explored in the **Chapter 4 Alternatives Analysis**. The Airport is required to continue to maintain a clear and graded area for each RSA lateral to, and beyond the runway end. Response to inspections by the FAA Runway Safety Action Team, who conducts inspections on a regular basis, will help maintain required grading. Runway 5-23 has published declared distances of 7,031 feet for the accelerate stop distance available (ASDA) and landing distance available (LDA). Declared distances that do not equal the full length of a runway mean the RSA has a penetration. The object identified as penetrating the RSA was the localizer on Runway End 5. Survey data collected for this master plan shows no objects penetrating any design surfaces of Runway 5-23. The latitude and longitude for the localizer and Runway End 5 were used in the inverse computation provided by the National Geodetic Survey website to determine the distance between the survey points. The distance between both points was greater than 1,000 feet, meaning the localizer did not penetrate the RSA. It is recommended that the declared distances change to the full length of Runway 5-23, 7,038 feet, due to the RSA being clear of objects.

RUNWAY OBJECT FREE AREA (ROFA)

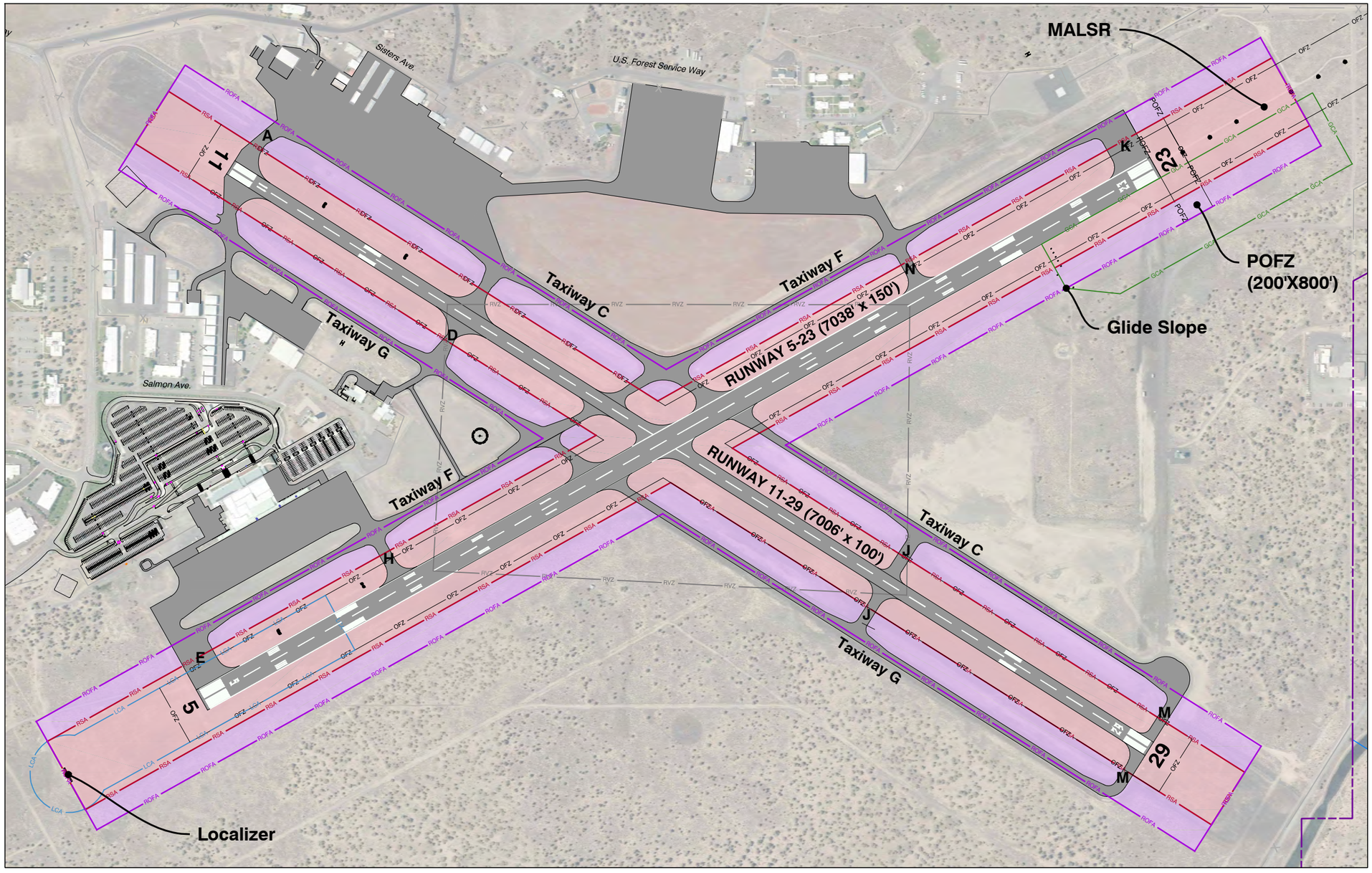
ROFA standards require clearing of above-ground objects protruding above the nearest point of the RSA. Objects non-essential for air navigation must not be placed in the ROFA. Except where precluded by other standards, objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes are allowed to penetrate the ROFA. The ROFAs at RDM are illustrated with a purple line in **Figure 3-3**. The ROFAs for both runways currently meet standards.

RUNWAY OBSTACLE FREE ZONE (ROFZ)

ROFZs are defined three-dimensional volumes of airspace centered above the runway centerline that must be kept clear during aircraft operations. The shape and size of the ROFZ is dependent on the size of aircraft using the runway and the approach minimums for a specific runway end. The ROFZ extends 200 feet beyond each end of each runway. The width of the ROFZs for both runways at RDM is 400 feet. The ROFZs at RDM are illustrated with a black line in **Figure 3-3**. The ROFZs for both runways at RDM meet FAA standards.

INNER-APPROACH OBSTACLE FREE ZONE (IAOFZ)

The IAOFZ only applies to the ends of runways that have an approach lighting system. Therefore, at RDM an IAOFZ only exists in the area before the threshold for Runway 23. IAOFZs begin 200 feet beyond the runway threshold at the same elevation as the runway threshold and extends 200 feet beyond the last light unit in the approach lighting system. The width is the same as the ROFZ (400 feet) and rises at a slope of 50 (horizontal) to 1 (vertical). The IAOFZ is shown with a black line in **Figure 3-3**. The IAOFZ for Runway 23 at RDM meets FAA standards.



LEGEND

- RDM Property Boundary
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (OFZ)
- Precision Obstacle Free Zone (POFZ)
- Glide Slope Critical Area (GCA)
- Localizer Critical Area (LCA)
- Runway Visibility Zone (RVZ)

N

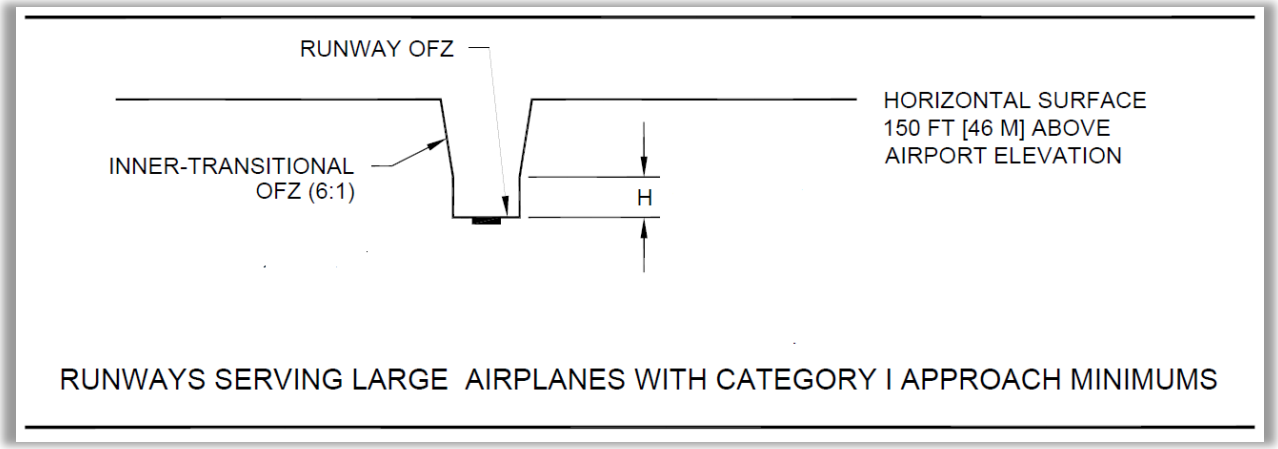
0' 350' 700'

Figure 3-3
RUNWAY DESIGN SURFACES

INNER-TRANSITIONAL OBSTACLE FREE ZONE (ITOFZ)

An ITOFZ exists only for runways with instrument approach visibility minimums of less than ¾ mile. Therefore, at RDM an IAOFZ only applies to Runway 5-23. The ITOFZ is a defined volume of airspace along the sides of the ROFZ and IAOFZ. **Figure 3-4** illustrates the shape of the ITOFZ. The ITOFZ will be shown and analyzed on the Airspace Plan sheets of the ALP, after the alternatives analysis. The ITOFZ meets FAA standards.

Figure 3-4 INNER-TRANSITIONAL OFZ



PRECISION OBSTACLE FREE ZONE (POFZ)

The POFZ is defined as a volume of airspace above an area beginning at the landing threshold, at the elevation of the landing threshold, and centered on the extended runway centerline (200 feet long by 800 feet wide), illustrated on **Figure 3-3** in black. The POFZ is in effect when all three of the following criteria are met:

- ✓ The approach includes vertical guidance;
- ✓ The reported ceiling is below 250 feet or visibility is less than 3/4 statute miles (or RVR is below 4,000 feet); and
- ✓ An aircraft is on final approach within two miles of the runway threshold.

When the POFZ is in effect, the wing of an aircraft on a taxiway waiting for runway clearance may penetrate the POFZ, but the fuselage and tail may not. Runway 23 is the only runway end with a POFZ. It meets FAA standards.

RUNWAY PROTECTION ZONES (RPZ)

Runway Protection Zone (RPZ):
The RPZ is a trapezoidal area with the intention of enhancing the protection of people and property on the ground.

The RPZ is a trapezoidal area at the end of the runway, the purpose of which is to enhance safety for aircraft operations and for people and objects on the ground. The FAA requests that incompatible land uses, objects, and activities be located outside of the RPZ. The FAA also requests that an airport operator maintain full control of an RPZ, ideally through fee simple property acquisition. If this is not feasible, land use control may be achieved through the use easements.

Total acres for the existing RPZs located on and off RDM property are called out in **Figure 3-5**, and documented in summary **Tables 3-7** and **3-8** at the end of this section. The RPZs within the existing airport property and under Airport control are shaded green, and those outside Airport property boundaries are shaded orange.

The FAA provides guidance on RPZ land use compatibility in AC-13A and more extensive guidance in the 2012 memorandum *Interim Guidance on Land Uses within a Runway Protection Zone*. Land uses and structures that are not inherently compatible in the RPZ include: buildings, especially habitable structures or structures of assembly; fuel facilities; hazardous material storage; recreational land uses; and transportation facilities and roads.

The City of Redmond is currently in the design process for a realignment of the intersection of SE Veterans Way and SE Airport Way. This intersection is currently located in the central *controlled access* portion of the Runway 11 approach RPZ (see **Figure 3-6**). FAA standards discourage intersections located in this portion of an RPZ. The design for the proposed realignment shifts the intersection to outside of the controlled access portion of the RPZ and replaces a three-way stop intersection with a roundabout.

The FAA does not have the authority to regulate local land use, so it relies on the airport sponsor to work with local jurisdictions to promote compatible development within the RPZ. Airport actions that introduce incompatible land uses into the RPZ, either by moving a runway end or increasing the size of the RPZ, require coordination with FAA headquarters. This coordination is not needed for existing incompatible land uses if the RPZ does not move or change size. The analysis of runway extension alternatives presented in **Chapter 4** addresses property acquisition that would be required to support each alternative.

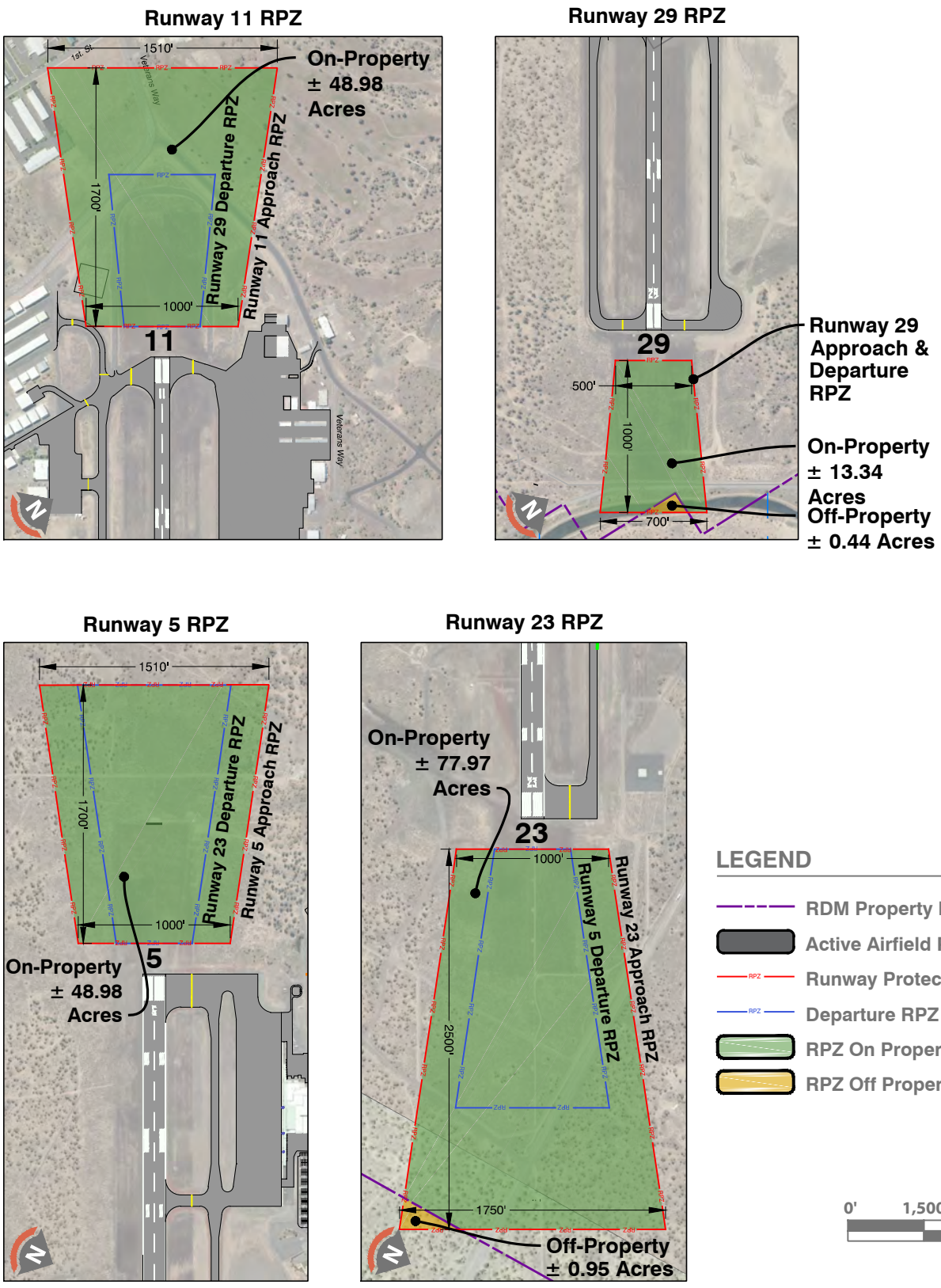
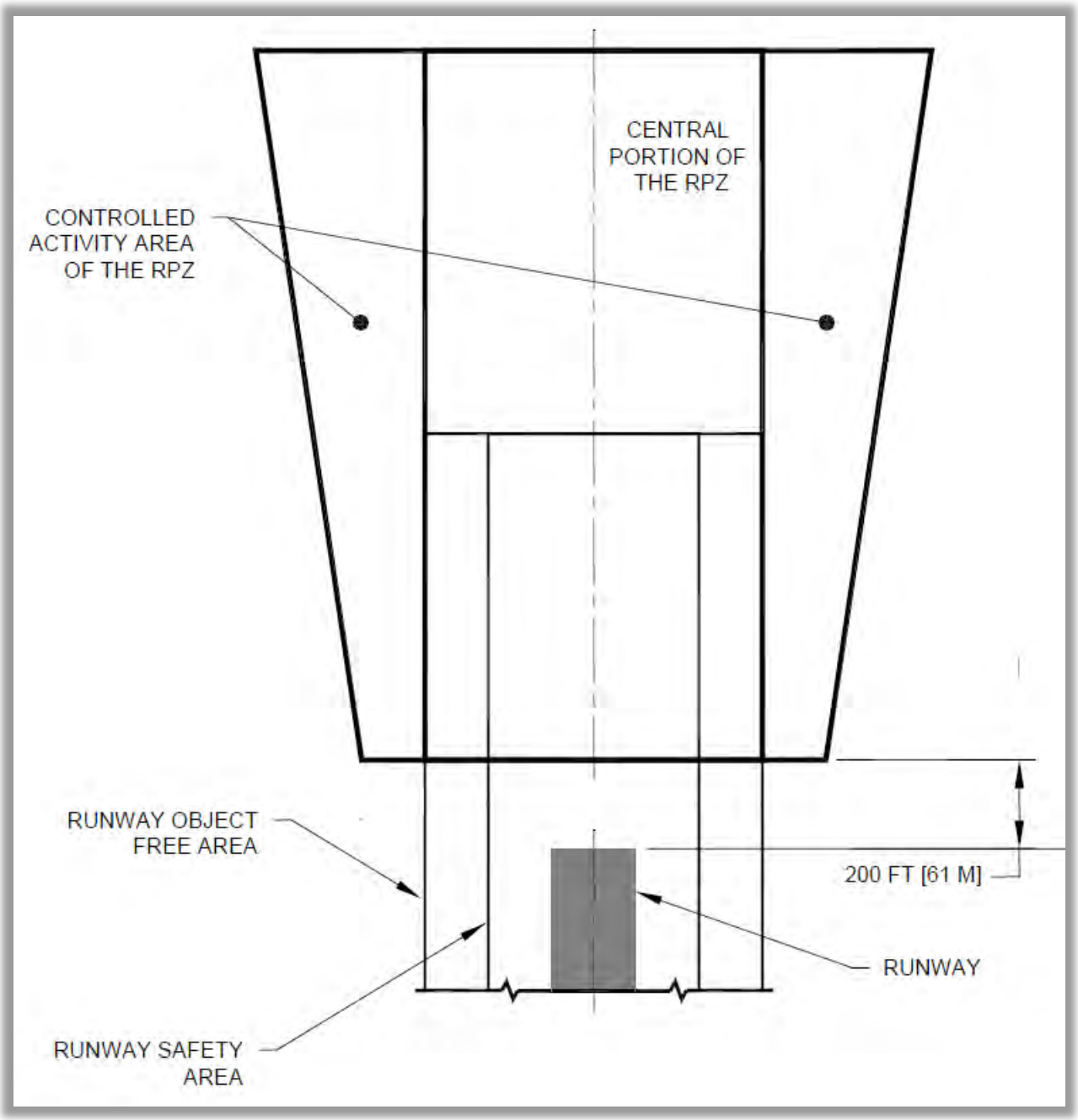


Figure 3-5
RUNWAY PROTECTION ZONES

Figure 3-6 RUNWAY PROTECTION ZONE SUBAREAS



RUNWAY VISIBILITY ZONE (RVZ)

Runway line-of-sight standards indicate intersecting runways must maintain an unobstructed line of sight from any point five feet above the runway centerline to any other point five feet above the intersecting runway centerline within the runway visibility zone (RVZ). The RVZ at RDM is established by points located equidistant from the intersection and the runway ends. The RVZ precludes any fixed or movable objects that may limit line of sight between the runways, and is shown as a blue line in **Figure 3-3**. The RVZ line-of-sight at RDM is unobstructed. It is recommended that RDM continue to limit any permanent structures with the RVZ.

HOLD POSITIONS

RDC determines the holding position distance on each connector taxiway from the runway centerline. AC-13A shows that, for RDC C-III runways such as Runway 5-23, the holding position is 250 feet from the runway centerline. In addition, the distance is increased 1 foot for each 100 feet the airport is above sea level. Using this formula, at 3,080 feet mean sea level (MSL), the required distance for hold positions from the runway centerline is 281 feet on taxiways connecting to Runway 5-23. Currently, the hold lines for Runway 5-23 are located at 200 feet from centerline and do not meet the 281-foot requirement.

As Runway 11-29 is designated as RDC B-III, the elevation factor does not apply and the hold positions should be located 200 feet from the runway centerline. For Runway 11-29, the hold lines are currently located at 206 feet from runway centerline, slightly exceeding the requirement AC-13A.

NAVAID CRITICAL AREAS

Runway 23 is equipped with a glide slope and localizer as part of the instrument landing system (ILS) to the approach end of Runway 23. The FAA requires a critical area at each runway end to remain clear of objects to ensure aircraft using the equipment receive undistorted signals. The critical areas for Runway 23 are the localizer critical area (LCA) and the glide slope critical area (GCA). Dimensions of the GCA are for the "null reference" facility type glide slope. **Table 3-6** shows the dimensions for the LCA and GCA for an ILS category I defined by FAA Order 6750.16D, *Siting Criteria for ILS*. There are no known penetrations to the GCA and LCA (additional information will be provided in the AGIS survey). The FAA requires vegetation not exceed twelve inches in height in the ILS critical areas.

BLAST PADS

Paved runway blast pads provide blast erosion protection beyond runway ends during jet aircraft operations. AC-13A recommends runways serving ADG-III have full-length paved shoulders. In effect, blast pads are an extension of the full-length paved shoulders beyond the runway end.

Table 3-6. Critical Area Dimensions

Area	Length	Width
Localizer Critical Area	2,000 feet	400 feet
Glideslope Critical Area	2,000 feet	200 feet

Source: Order 6750.16D, Siting Criteria for ILS

RDM does not currently have blast pads. Should the Airport determine blast pads to be beneficial in the future, for runways supporting ADG C-III aircraft, blast pads should be 200 feet by 200 feet. For runways supporting ADG B-III aircraft, blast pads should be 140 feet wide and 200 feet long.

The tables below summarize design standards, existing conditions, and any proposed disposition.

Table 3-7. Runway 11-29 Design Standards Matrix

Runway 11-29 RDC:			B-III			
Item	**Existing Conditions**		**FAA Design Standards[1]**		**Meets Standards?**	**Disposition**
Runway Design						
Width	100 ft.		100 ft.		Yes	No Action
Shoulder Width	20 ft.		20 ft.		Yes	No Action
Blast Pad Width	N/A		140 ft.		No	Add to ALP
Blast Pad Length	N/A		200 ft.		No	Add to ALP
Crosswind Component (all weather)	99.13% @ 16 knots		95% @ 16 knots		Yes	No Action
Gradient (maximum)	0.51%		1.5%		Yes	No Action
Runway Protection						
Runway Safety Area (RSA)						
Length beyond departure end	600 ft.		600 ft.		Yes	No Action
Length prior to threshold	600 ft.		600 ft.		Yes	No Action
Width	300 ft.		300 ft.		Yes	No Action
Runway Object Free Area (ROFA)						
Length beyond departure end	600 ft.		600 ft.		Yes	No Action
Length prior to threshold	600 ft.		600 ft.		Yes	No Action
Width	800 ft.		800 ft.		Yes	No Action
Runway Obstacle Free Zone (OFZ)						
Length prior to threshold	200 ft.		200 ft.		Yes	No Action
Width	400 ft.		400 ft.		Yes	No Action
Inner Approach OFZ	N/A		N/A		N/A	N/A
Inner Transitional OFZ	N/A		N/A		N/A	N/A
Precision Obstacle Free Zone (POFZ)	N/A		N/A		N/A	N/A
Approach Runway Protection Zone (RPZ)						
Length	11: 1700 ft.	29: 1000	11: 1700 ft.	29: 1000	Yes	N/A
Inner Width	11: 1000 ft.	29: 500	11 :1000 ft.	29: 500		
Outer Width	11: 1510 ft.	29: 700	11: 1510 ft.	29: 700		
Departure Runway Protection Zone (RPZ)						
Length	1000 ft.		1000 ft.		Yes	No Action
Inner Width	500 ft.		500 ft.		Yes	No Action
Outer Width	700 ft.		700 ft.		Yes	No Action
Runway Separation						
From Runway Centerline to:						
Parallel Runway Centerline	N/A		700 ft.		Yes	No Parallel RWY
Hold Line[2]	200 ft.		200 ft.		Yes	No Action
Parallel Taxiway Centerline	400 ft.		300 ft.		Yes	No Action
Aircraft Parking Area	425 ft.		400 ft.		Yes	No Action

Source: FAA Advisory Circular 150/5300-13A, Change 1 Airport Design (February 2014)

Table 3-8. Runway 5-23 Design Standards Matrix

Runway 5-23 RDC:			C-III			
Item	**Existing Conditions**		**FAA Design Standards[1]**		**Meets Standards?**	**Disposition**
Runway Design						
Width	150 ft.		150 ft.		Yes	No Action
Shoulder Width	25 ft.		25 ft.		Yes	No Action
Blast Pad Width	N/A		200 ft.		No	Add to ALP
Blast Pad Length	N/A		200 ft.		No	Add to ALP
Crosswind Component (all weather)	99.07% @ 16 knots		95% @ 16 knots		Yes	No Action
Gradient (maximum)	0.29%		1.5%		Yes	No Action
Runway Protection						
Runway Safety Area (RSA)						
Length beyond departure end	1000 ft.		1000 ft.		Yes	No Action
Length prior to threshold	600 ft.		600 ft.		Yes	No Action
Width	500 ft.		500 ft.		Yes	No Action
Runway Object Free Area (ROFA)						
Length beyond departure end	1000 ft.		1000 ft.		Yes	No Action
Length prior to threshold	600 ft.		600 ft.		Yes	No Action
Width	800 ft.		800 ft.		Yes	No Action
Runway Obstacle Free Zone (OFZ)						
Length prior to threshold	200 ft.		200 ft.		Yes	No Action
Width	400 ft.		400 ft.		Yes	No Action
Inner Approach OFZ	23: 2500 ft. x 400 ft.		N/A		N/A	N/A
Inner Transitional OFZ	23: 1991 ft		N/A		N/A	N/A
Precision Obstacle Free Zone (POFZ) (Runway 23 only)						
Length	200 ft.		200 ft.		Yes	No Action
Width	800 ft.		800 ft.		Yes	No Action
Approach Runway Protection Zone (RPZ)						
Length	5: 1700 ft.	23: 2500	5: 1700 ft.	23: 2500 ft.	Yes	N/A
Inner Width	5: 1000 ft.	23: 1000	5 :1000 ft.	23: 1000 ft.		
Outer Width	5: 1510 ft.	23: 1750	5: 1510 ft.	23: 1750 ft.		
Departure Runway Protection Zone (RPZ)						
Length	1,700 ft.		1700 ft.		Yes	No Action
Inner Width	500 ft.		500 ft.		Yes	No Action
Outer Width	1,010 ft.		1010 ft.		Yes	No Action
Runway Separation						
From Runway Centerline to:						
Parallel Runway Centerline	N/A		700 ft.		No	No Parallel RWY
Hold Line[2]	250 ft.		250 ft.		Yes	No Action
Parallel Taxiway Centerline	400 ft.		400 ft.		Yes	No Action
Aircraft Parking Area	540 ft.		500 ft.		Yes	No Action

Source: FAA Advisory Circular 150/5300-13A, Change 1 Airport Design (February 2014)

RUNWAY LENGTH

The performance requirements of the critical aircraft designated for a runway determine an airport's recommended runway length. Performance capabilities of individual aircraft are, in turn, affected by factors including the aircraft payload and fuel load, the runway elevation, wind conditions, and air temperature.

Currently, Runway 5-23 is 7,038 feet long and Runway 11-29 is 7,006 feet long. At these lengths, the runways adequately serve the range of piston and jet aircraft now operating at the Airport. RDM has direct flights to seven airline hubs, all under 1,000 nautical miles (nm) from the Airport. With a few aircraft and time of year exceptions, the runway length is generally sufficient[1] for current aircraft and current destinations. However, as new airlines begin serving RDM, and existing airlines change fleets and add new destinations, a wide range of aircraft could serve the Airport in the future. As noted in the discussion of critical aircraft earlier in this chapter, specific fleet mix changes anticipated at the Airport include:

- ✓ Replacement of Q4002 with ERJ-175
- ✓ Regional jet (CRJ-200, 700 and 900) replacement with narrow body aircraft (A319 and B737)

This section examines whether the available runway length meets the needs not only of existing users, but also those of future critical aircraft serving future destinations. To analyze the runway requirements for these new aircraft types, an understanding of the factors that impact aircraft performance is necessary. The following paragraphs explain the terminology and variables used in the runway length assessment.

ELEVATION

RDM has four runway ends from which aircraft can operate, ranging from 3,044 feet above mean sea level (AMSL) to 3,080 feet AMSL, which is the official airport elevation.

INTERNATIONAL STANDARD ATMOSPHERE (ISA)

This mathematical model describes how the earth's atmosphere, or air pressure and density, change depending on altitude. The atmosphere is less dense at higher elevations. ISA is frequently used in aircraft performance calculations because deviation from ISA will change how an aircraft performs. ISA at sea level occurs when the temperature is 59°F. ISA at RDM's 3,080 feet AMSL occurs when the temperature is 48°F.

[1] CRJ-200 operations to certain destinations during summer months are occasionally weight restricted on departure from RDM.
[2] Some Q400 operations associated with short haul routes such as RDM-PDX will remain into the future.

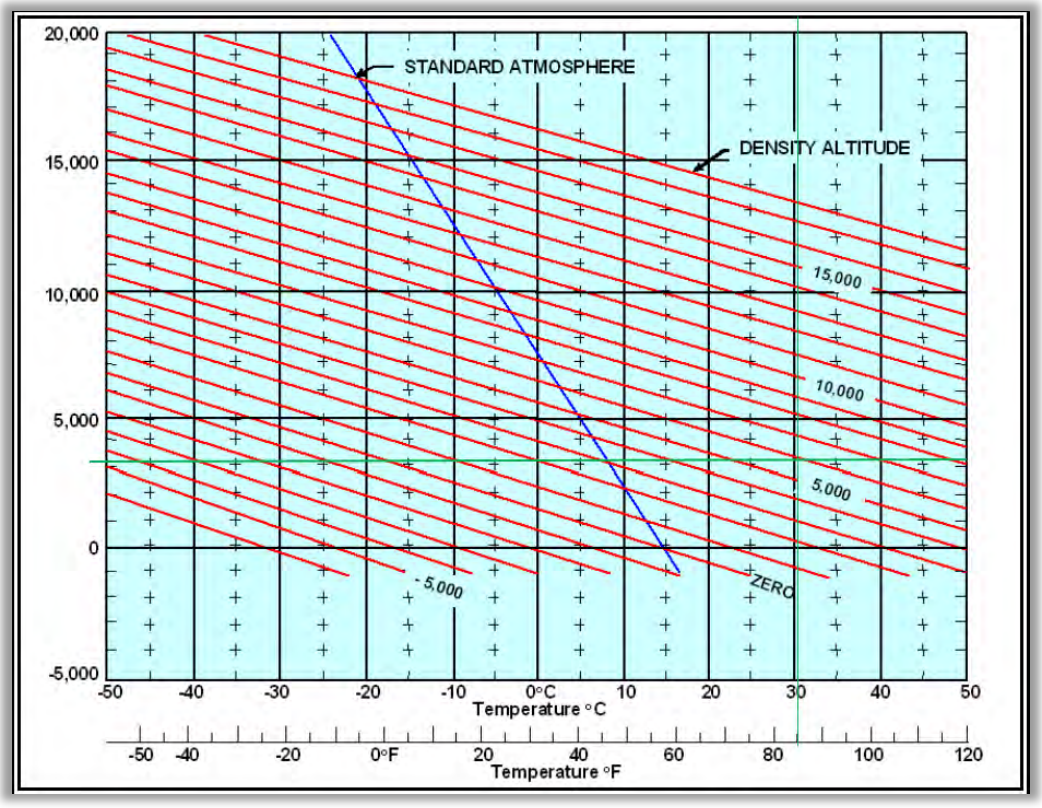
DENSITY ALTITUDE (DA)

This measurement comparing air density at a point in time and specific location to ISA is a critical component of aircraft performance calculations. DA is used to understand how aircraft performance differs than the performance that would be expected under ISA. DA is primarily influenced by elevation and air temperature. To examine the effect of changes to either variable, this calculation holds the other variable constant.

- ✓ When elevation is constant: When air temperature increases, DA increases. When air temperature decreases, DA decreases. This comparison is often used when analyzing aircraft performance at an airport during different times of the day and different days of the year.
- ✓ When temperature is constant: When elevation increases, DA increases. When elevation decreases, DA decreases. This comparison, which is not often used, can be employed to compare aircraft performance at different airports under identical climate conditions.

Figure 3-7 illustrates how DA is impacted when factoring in the average maximum temperature (85.5°F) for Redmond. The result is a density altitude increased to approximately 5,800 feet MSL.

Figure 3-7 DENSITY ALTITUDE FOR RDM AVERAGE MAXIMUM TEMPERATURE



For year-round planning purposes, density altitude of 5,800 feet MSL is assumed for the aircraft performance-based runway length analysis here.

FUTURE FLEET AND DESTINATIONS

DA, aircraft takeoff weight, and aircraft performance are the three primary factors to be considered when determining runway length requirements. Aircraft takeoff weight is directly related to the distance of the flight. For shorter distances, aircraft may be able to depart with a full passenger cabin and less than full fuel tanks. In those instances, the aircraft will typically be departing below MTOW and experience better takeoff performance. Aircraft will typically require a full load of fuel for longer trips. A full passenger cabin and full load of fuel will be close to the aircraft's MTOW.

This runway length analysis looks at the future fleet changes as discussed in **Chapter 2** in conjunction with destinations likely to be served from RDM in the future. Destination distance is a critical factor in this analysis. RDM currently sees non-stop service to the airline hubs within 1,000 nm distance (Seattle-Tacoma International Airport, Portland International Airport, Salt Lake City International Airport, San Francisco International Airport, Los Angeles International Airport, Phoenix Sky Harbor International Airport). The next step beyond those hubs would be direct flights to Midwest or midcontinent hubs such as Minneapolis-Saint Paul, Minnesota; Denver, Colorado; and Houston and Dallas/Fort Worth, Texas. Those cities are all within 1,500 nm, which is a reasonable range for the forecast airline fleet, and likely destinations within the 20-year planning window.

The following analysis documents calculated takeoff weights for each of the air carrier aircraft types to reach a 1,500 nm destination. Those takeoff weights are then used with the aircraft manufacturer's performance tables contained in their respective airport planning manuals to determine a runway length requirement for the future.

RUNWAY LENGTH RECOMMENDATION

Using the 1,500 nm destination, as mentioned above, results in varying takeoff length requirements for the different aircraft types, as shown in **Table 3-9**. The CRJ-200 is not capable of flying for 1,500 nm. For the CRJ-700, 1,500 nm is near the range limits of the aircraft, and it must be weight restricted in order to carry enough fuel for the trip.

The B737-700 and A319 can make the trip with a full passenger load, but not with the current RDM runway length. The CRJ-900, B737-800, and EMB-175 would require some weight adjustments (e.g., blocked seats) in order to make the 1,500 nm trip.

The 1,500 nm destination is near the range limit of the EMB-175. No additional runway length would improve the passenger carrying capacity for the EMB-175 at RDM when adjusted for DA.

Table 3-9. Runway Length Requirements	
Aircraft Type	**Takeoff Length Required for 1,500 NM Trip**
Existing Fleet[1]	
CRJ-200	Out of Range
CRJ-700	9,100 feet[2]
Future Fleet	
CRJ-900	11,000 feet
EMB-175	10,000 feet[3]
B737-700	8,500 feet
B737-800	12,000 feet
A319	9,800 feet

[1] The Q400 has been excluded from this analysis since they will be eliminated from service except for very short haul flights (RDM-PDX).
[2] Weight restricted with a reduction of 10 passengers.
[3] Weight restricted with a reduction of 13 passengers.

Figures 3-8, 3-9, and **3-10** show three options to be considered in preliminary discussions for locating a runway extension: a split extension, northeast extension, and southwest extension. Variations of a 10,000-foot runway are explored in further detail in the **Chapter 4 Alternatives Analysis**.

RUNWAY WIDTH

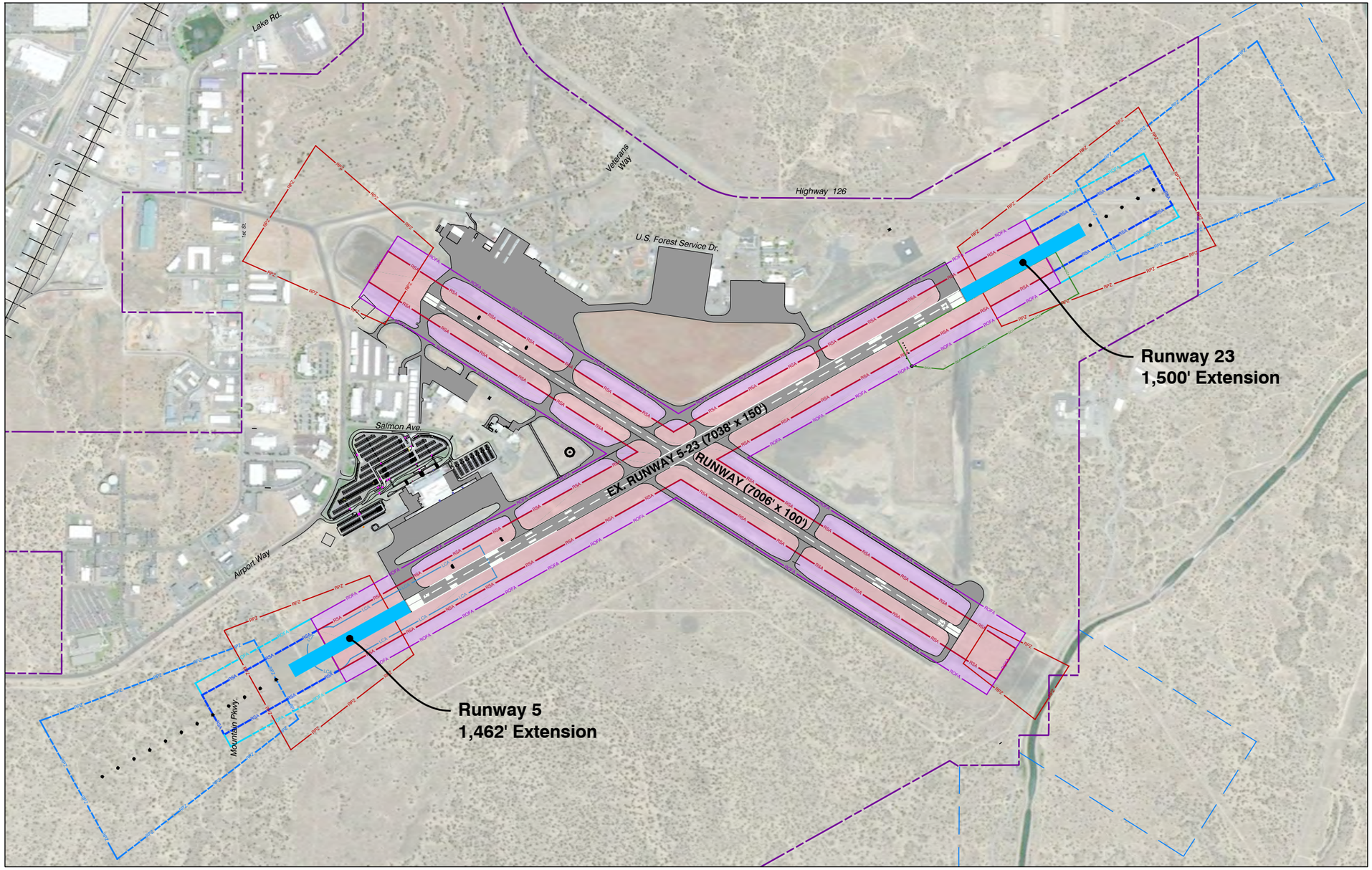
Table 3-10 summarizes the runway width requirements according to RDC compared with the current runway widths.

Table 3-10. Runway Width Requirements					
Runway 11-29			**Runway 5-23**		
B-III Design Width	Existing Width	Meets Standards?	C-III Design Width	Existing Width	Meets Standards?
100’	100’	Yes	150’	150’	Yes

As no changes in RDC code are anticipated within the 20-year planning period, no changes in runway width are required.

RUNWAY PAVEMENT STRENGTH

The FAA provides guidance for classifying and reporting pavement strength in AC 150/5335-5C, *Standardized Method of Reporting Airport Pavement Strength – PCN*. The pavement strength is represented by a value called the Pavement Classification Number (PCN). The PCN is calculated based upon the pavement section, total aircraft operations, and operations by the most demanding aircraft anticipated to utilize the pavement.



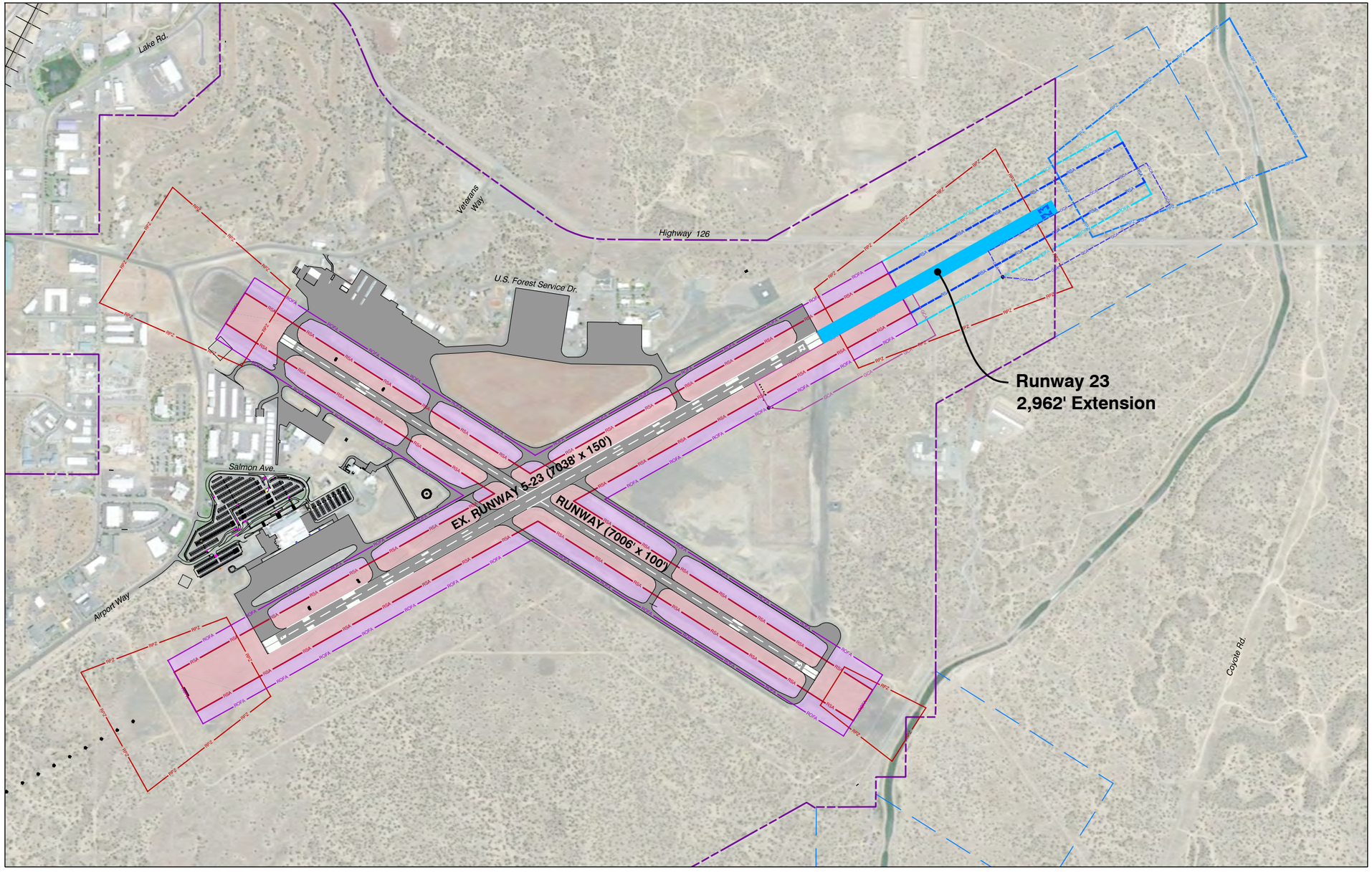
LEGEND

- RDM Property Boundary
- Avigation Easement
- Future Runway Extension
- Runway Safety Area (RSA)
- Future RSA
- Runway Object Free Area (ROFA)
- Future ROFA
- Runway Obstacle Free Zone (OFZ)
- Glide Slope Critical Area (GCA)
- Localizer Critical Area (LCA)
- Runway Protection Zone (RPZ)
- Future RPZ
- Runway Visibility Zone (RVZ)

N

0' 600' 1,200'

Figure 3-8
RUNWAY EXTENSION - SPLIT



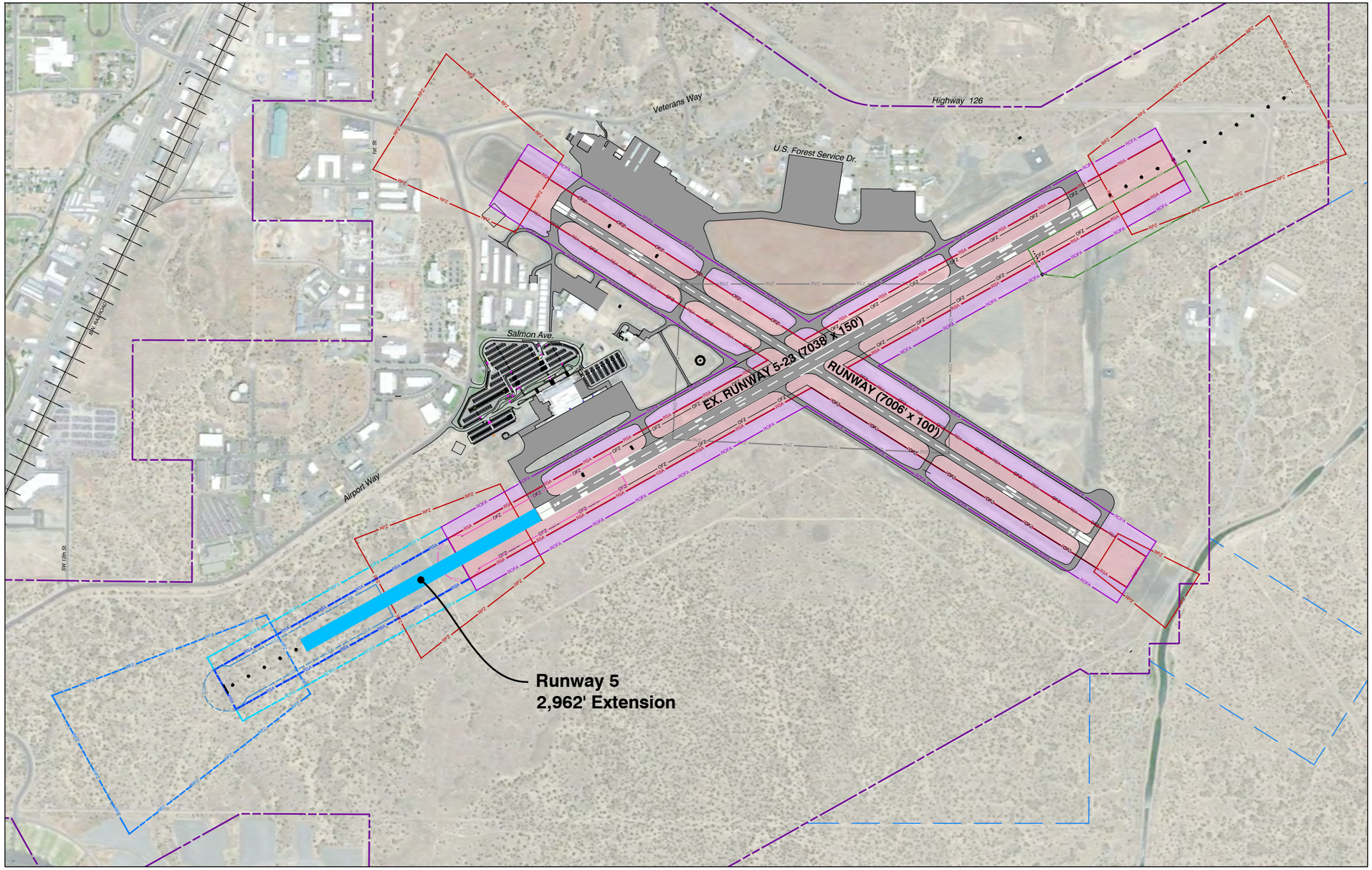
LEGEND

- RDM Property Boundary
- Avigation Easement
- Future Runway Extension
- Runway Safety Area (RSA)
- Future RSA
- Runway Object Free Area (ROFA)
- Future ROFA
- Glide Slope Critical Area (GCA)
- Future GCA
- Localizer Critical Area (LCA)
- Runway Protection Zone (RPZ)
- Future RPZ

N

0' 600' 1,200'

Figure 3-9
RUNWAY EXTENSION - EAST



LEGEND

- RDM Property Boundary
- Avigation Easement
- Future Runway Extension
- Runway Safety Area (RSA)
- Future RSA
- Runway Object Free Area (ROFA)
- Future ROFA
- Glide Slope Critical Area (GCA)
- Localizer Critical Area (LCA)
- Future LCA
- Runway Protection Zone (RPZ)
- Future RPZ

N

0' 600' 1,200'

Figure 3-10
RUNWAY EXTENSION - WEST

Airfield pavements strengths are detailed in **Chapter 1 Airport Inventory**. The aircraft types that currently operate at the airport are under the pavement strength limits for their respective areas on the airfield. However, as the airline fleet transitions away from regional jets to narrow body aircraft (B737 and A319), the pavement ratings will be exceeded. Pavement strength ratings are not necessarily a limit, but rather a design rating. That means aircraft weighing over the design rating will not cause the pavement to immediately fail, but with continued use, the life cycle of the pavement will be reduced. When the Airport does see these larger narrow body airline aircraft increasing in frequency at the airport, pavement strengthening projects should be studied.

INSTRUMENT APPROACHES AND DESIGN SURFACES

Instrument approaches in effect at RDM are described in the **Chapter 1 Airport Inventory**. A summary of the lowest minimum approach procedures are included in **Table 3-11**. The glide slope antenna, localizer antenna and medium intensity approach lighting systems (MALSRs) facilities make up the ILS. This system supports precision instrument approaches to Runway 23. More discussion on these facilities is provided in the Airside Facilities Section of **Chapter 1**.

Table 3-11. Lowest Minimums – Instrument Approach Procedures

Approach Procedures	Visibility (NM)	Descent Minimums (Feet)
ILS OR LOC RWY 23	½	200
RNAV (GPS) RWY 11	7/8	250
RNAV (GPS) Y RWY 05	¾	250
RNAV (GPS) Z RWY 29	1	286

There are three principal standards used to protect the flight corridors to and from runways:

- ✓ Title 14 of the Code of Federal Regulation, Part 77, *Safe, Efficient Use, and Preservation of Navigable Airspace* (Part 77)
- ✓ FAA Order 8260.3C, United States Standard for Terminal Instrument Procedures (TERPS)
- ✓ Threshold siting surfaces (TSS) described in AC-13A

Part 77 and TSS deal with runway threshold location and compatible land use and are used in airport planning. TERPS surfaces deal with instrument procedure development and are not commonly used in airport planning. The TERPS instrument departure surface is cross-referenced as a TSS in AC-13A.

Part 77 imaginary airspace surfaces are determined by the runway type and the type of instrument approach procedure (e.g. visual, non-precision, and precision). Part 77 surfaces are notification surfaces designed to identify and determine obstructions to air navigation. They are advisory, not regulatory; however, Oregon State Code (ORS) 836.530 provides regulatory authority for the State to enforce the standards. Penetrations to Part 77 surfaces can make it difficult for airports to extend or relocate runways, or to add new instrument procedures.

TERPS surfaces are determined by the type of instrument approach procedure (e.g. ILS, global positioning system [GPS], VHF Omnidirectional Range [VOR]). TERPS surfaces are regulatory, and penetrations to TERPS surfaces will result in the modification or cancelation of an instrument approach procedure.

TSS, also known as obstacle clearance surfaces, are determined by the type of instrument procedure and critical aircraft on each runway, and the visibility minimums of the lowest instrument approach. TSS apply to both approach and departure ends of the runway, and determine the location of the runway thresholds. Penetration of TSS will require modification of departure climb gradient for penetrations to departure TSS, and/or relocation of landing thresholds or reduction in approach procedure capability for penetrations to approach TSS. Airspace surfaces are drawn and analyzed as part of the ALP set development.

At this time, an upgraded approach to runway end 5 that supports LPV approach capabilities, similar to the localizer and glideslope of an instrument landing system (ILS) approach into runway end 23, is under consideration.

RUNWAY LIGHTING AND MARKING

Runway 5-23 is equipped with high-intensity runway edge lighting, runway end identifier lights, and a MALSR to the approach end of Runway 23.

Runway 11-29 is equipped with medium-intensity runway edge lighting and runway end identifier lights. No approach lighting system serves either end of Runway 11-29.

Runway 11-29 is marked with non-precision markings and Runway 5-23 is marked with precision markings in accordance with FAA AC 150/5340-1L, *Standards for Airport Markings*.

No major changes, other than periodic maintenance and updates, to the runway markings or lighting systems are recommended within the 20-year planning period.

RUNWAY SYSTEM CONCLUSION AND RECOMMENDATIONS

Runway 5-23 will need an extension to a length of about 10,000 feet to accommodate the future airlines passenger fleet. Alternative means of serving this fleet are explored in the next chapter.

3.2.4 TAXIWAY SYSTEM

Taxiways enable circulation of aircraft from the runways to terminal area facilities and between facilities within the terminal area. FAA design standards and guidelines intended to enhance safety and pilot situational awareness serve as the basis for this review of the adequacy of the RDM taxiway system.

RDM already has full-length parallel taxiways and regularly spaced exit taxiways serving both runways. Therefore, the focus in this master plan has been on refining the layout to meet current FAA design standards and address hot spots (defined below).

TAXIWAY DESIGN STANDARDS

As with runways, taxiways standards are based upon the critical aircraft expected to use each taxiway. The existing critical aircraft are the E175 for Runway 5-23 and the Q400 for Runway 11-29. The E175 is in TDG 3 and the Q400 in TDG 5. Due to the higher TDG of the Q400 and the Q400 operating on both runways, TDG 5 is the existing design standard. As mentioned in section **3.2.2 Airfield Design,** a taxiway construction project for Fiscal Year 2018 will change the connector taxiways of Runway 11-29 to TDG 4 to allow the Q400 to continue operating at RDM until the Q400 is no longer in service and while the future critical aircraft changes to the A319. The A319 is in TDG 3 and will dictate future taxiway design standards. Once the Q400 is no longer in service, the parallel taxiways serving both runways (Taxiway F, G, and C) and all connector/exit taxiways should be designed to accommodate TDG 3. Taxiway standards are shown in **Table 3-11**.

Table 3-11. Taxiway Standards

Taxiway Design Group	Width	Taxiway Edge Safety Margin	Shoulder Width
TDG 5	75	15	30
TDG 4*	50	10	20
TDG 3*	50	10	20

: Please see AC 150/5300-13A for differences in taxiway fillet dimensions.

TAXIWAY GEOMETRY ANALYSIS

AC-13A includes taxiway design recommendations for reducing the potential for runway incursions. The section that follows provides a review of those design standards relevant to the current airfield configuration.

Runway Incursions:
Runway incursions are events when an aircraft or vehicle inadvertently proceeds onto an active runway without air traffic control clearance.

DIRECT ACCESS TO RUNWAYS

One of the ways to reduce runway incursions is to require pilots taxiing aircraft to make distinct, purposeful turns between leaving an apron area and accessing a runway. That is to say, there should not be direct straight-line taxiways leading from an apron to a runway and taxiway turns should be right-angle connectors An example of the direct access issue and resolution is shown below in **Figure 3-11**. An example of a right-angle connector is shown in Figure 3-12. There are several areas on the Airport where direct access currently occurs. These areas are listed below and identified on **Figure 3-13.**

- ✓ Taxiway A (north side): a taxiway centerline stripe leads directly from a tiedown apron across Taxiway C to the threshold for Runway 11

- ✓ Taxiway A (south side): a taxiway centerline stripe leads directly from a row of box hangars across Taxiway G to the threshold for Runway 11
- ✓ Taxiway E: a taxiway centerline stripe leads directly from the commercial apron to the threshold for Runway 5
- ✓ Taxiway H: a taxiway centerline stripe leads directly from the commercial apron to Runway 5-23

Figure 3-11. Example of Direct Access Issue and Resolution

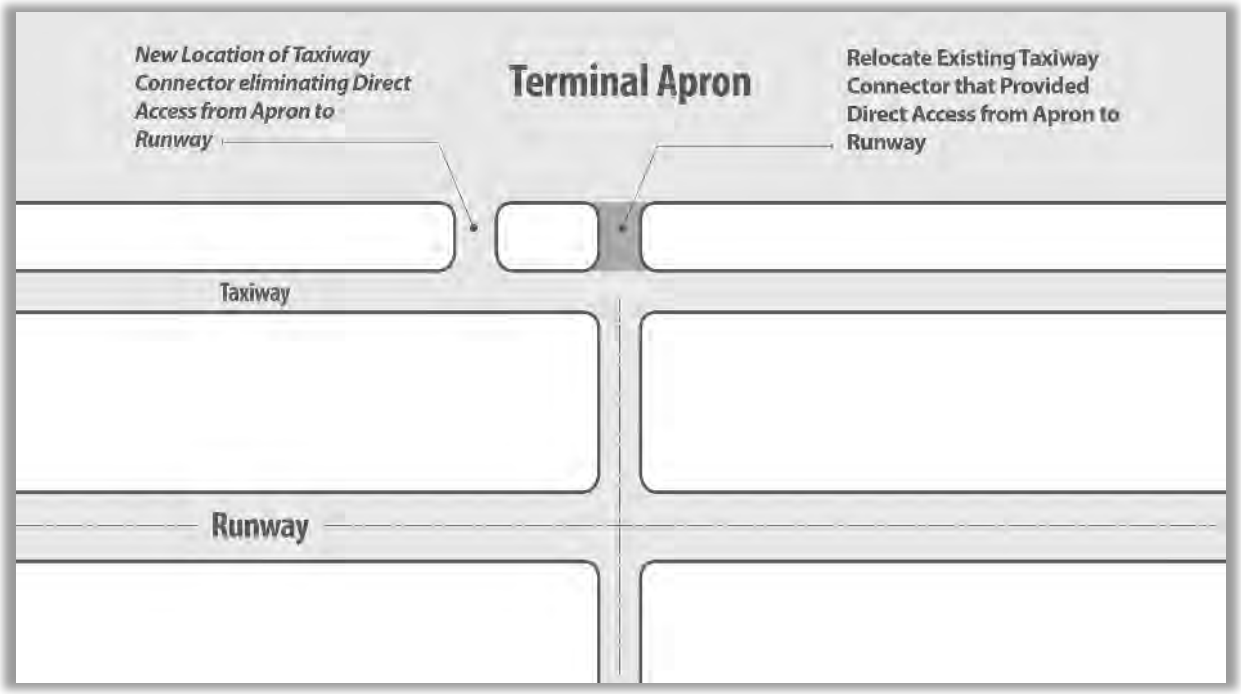
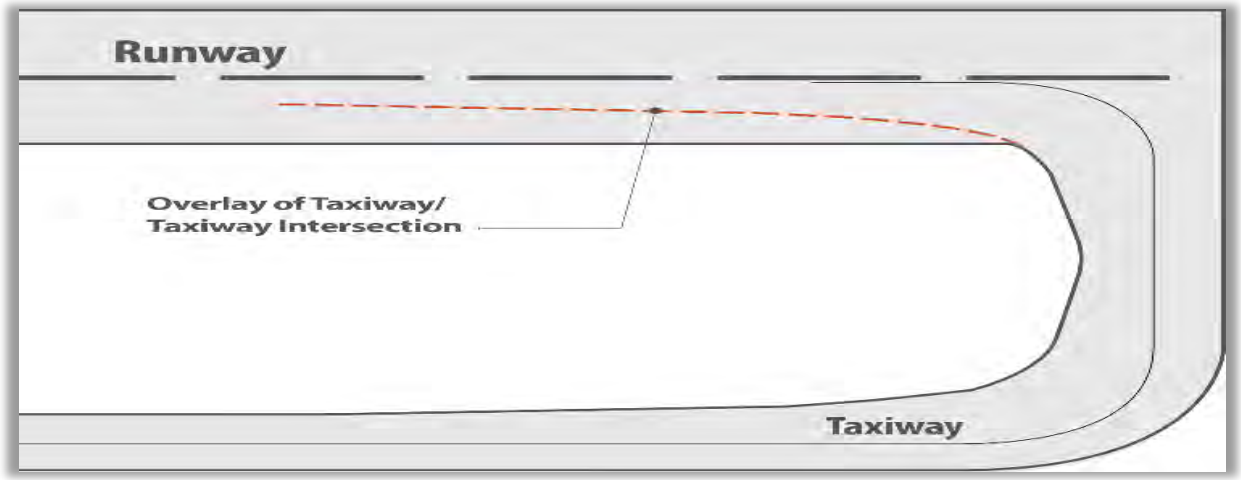
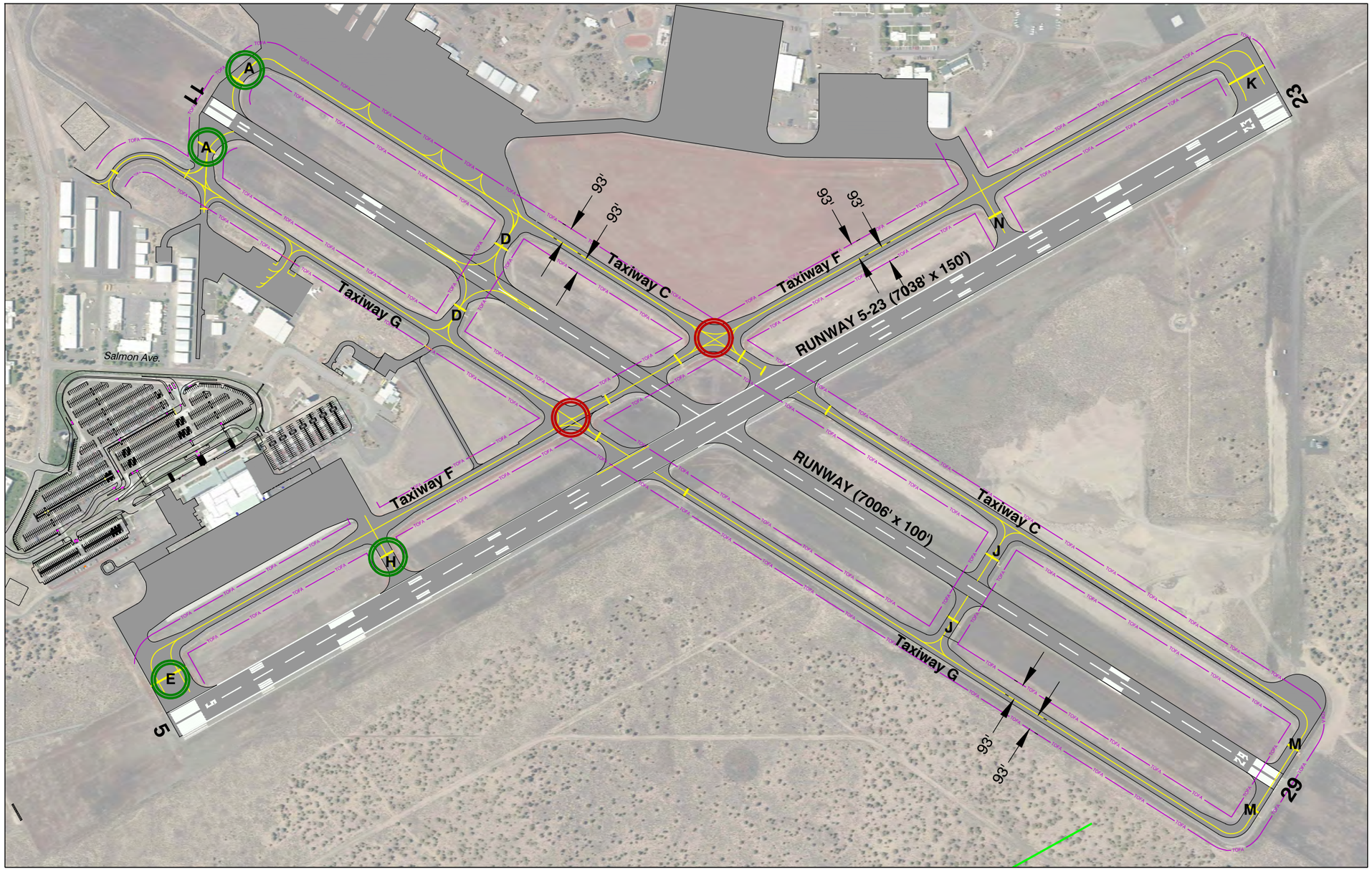


Figure 3-12 Example of Right-Angle Connector





LEGEND

- TOFA — Taxiway Object Free Area
- FAA Taxiway Hot Spot
- Non-Standard Condition

N

0' 300' 600'

Figure 3-13
TAXIWAY DESIGN

COMPLEX INTERSECTIONS

The AC-13A also recommends simplifying complex taxiway intersections. The AC defines complex taxiway intersections as those with more than three nodes (more than three possible directions of travel). No taxiway junctions on the RDM airfield are complex intersections. No changes are required.

HOT SPOT ANALYSIS

Two areas of the airfield have been designated by the FAA as Hot Spots: the Taxiway C intersection with Taxiway F, and the Taxiway F intersection with Taxiway G. Ultimately the FAA will likely require proposed resolutions to these two areas to reduce the risk of runway incursions. **Chapter 4 Alternatives Analysis** will include analysis of potential designs.

Hot Spot:
A hot spot is defined as a location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary.

RUNWAY END CONNECTORS

Another design standard introduced in AC-13A was intended to reduce or eliminate wide expanses of pavement, especially at runway crossing locations. Until recently Taxiway E and K had dual entrance taxiways without “no taxi” islands painted on the pavement. This nonstandard condition was corrected in 2017.

RIGHT-ANGLE TAXIWAY CONNECTORS

The AC recommends that all taxiway connections to runways be 90-degree angles, except for high speed exit taxiways and parallel taxiways associated with one runway crossing another runway. The north and south segments of Taxiway A are both oblique-angled taxiways that do not fall into either of the exception categories just discussed. The modifications to these two segments described above under the ***Direct Access to Runways*** section will provide the recommended right-angle taxiways. An example of a right-angle taxiway connector is shown in **Figure 3-12**.

EXIT TAXIWAY ANALYSIS

The location of exit taxiways can impact a runway’s capacity. The quicker an aircraft can slow to a safe speed and exit the runway, the sooner another can land or takeoff. AC-13A states that, in general, each 100-foot reduction of the distance from the threshold to the exit taxiway reduces the runway occupancy time by approximately 0.75 second for each aircraft using the exit. Conversely, the opposite is true as well, each every 100-foot increase in the distance from the threshold to the exit taxiway increases the runway occupancy time by approximately 0.75 second for each aircraft using the exit. **Table 3-12** below contains the exit taxiway distance from landing threshold for each of the four runways and the corresponding percentage able to use each exit taxiway. The information below is for dry runways only. When wet, the percent of aircraft able to use each taxiway will be reduced as the landing lengths will be increased. Since RDM does not currently and is not forecast to experience a capacity or delay problem, there is no need to adjust the current locations of these exit taxiways.

3-12. Taxiway Exit Utilization (Dry)

Runway 23					
		Percent Able			
Taxiway	Distance	Small Single Engine	Small Twin Engine	Large	Heavy
N	1,660'	40%	0%	0%	0%
C	3,085'	100%	39%	0%	0%
G	4,070'	100%	98%	8%	0%
H	5476'	100%	100%	75%	24%
E	6850'	100%	100%	95%	90%
Runway 5					
		Percent Able			
Taxiway	Distance	Small Single Engine	Small Twin Engine	Large	Heavy
H	1,450'	39%	0%	0%	0%
G	2,800'	95%	35%	0%	0%
C	3,750'	100%	89%	5%	0%
N	5,275'	100%	100%	40%	5%
K	6,850'	100%	100%	95%	90%
Runway 11					
		Percent Able			
Taxiway	Distance	Small Single Engine	Small Twin Engine	Large	Heavy
D	1,700'	80%	1%	0%	0%
F	2,750'	100%	35%	0%	0%
J	5,000'	100%	100%	49%	9%
M	6,850'	100%	100%	95%	90%
Runway 11					
		Percent Able			
Taxiway	Distance	Small Single Engine	Small Twin Engine	Large	Heavy
J	1,950'	84%	1%	0%	0%
F	4,050'	100%	98%	8%	0%
D	5,100'	100%	100%	49%	9%
A	6,850'	100%	100%	95%	90%

**Small Single Engine = 12,000 lbs or less*
Small Twin Engine = 12,500 lbs or less
Large = 12,500 lbs to 300,000 lbs
Heavy = Greater than 300,000 lbs

TAXIWAY PAVEMENT STRENGTH

As discussed under the **Runway Pavement Strength** section above, the forecast airline fleet transitions to narrow body aircraft will exceed the existing pavement strength ratings. When the Airport does see these larger narrow body airline aircraft increasing in frequency at the airport, pavement strengthening projects should be studied.

TAXIWAY SYSTEM CONCLUSION AND RECOMMENDATIONS

The existing taxiway system serves the RDM Airport users well. No major inadequacies exist for the current airfield configuration or activity levels. Some areas are identified below that do not comply with the latest geometry guidance from the FAA. Those areas are analyzed in **Chapter 4** and depicted with solutions on the ALP.

- ✓ Taxiway A (north side): add pavement and restripe to provide a right-angle taxiway

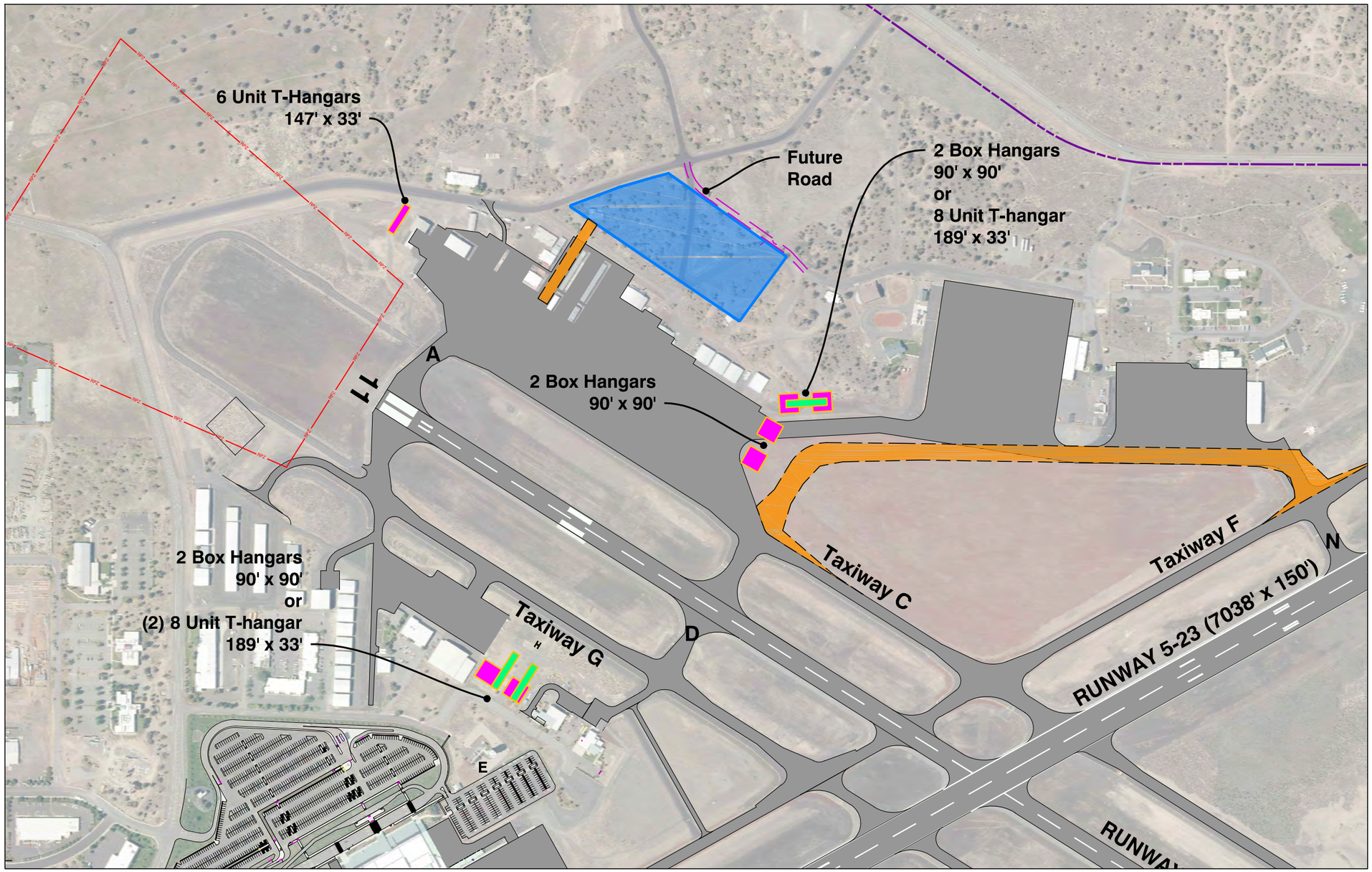
- ✓ Taxiway A (south side): add pavement and restripe to provide a right-angle taxiway
- ✓ Taxiway E: replace existing taxiway segment between the apron and Taxiway F with a new connector taxiway located about 400 feet east of the existing taxiway
- ✓ Taxiway H: replace the existing taxiway segment between the apron and Taxiway F with a new connector taxiway located about 175 feet east of the existing taxiway
- ✓ Taxiway C hot spot: shift segment that crosses Runway 5-23 to the east
- ✓ Taxiway G hot spot: shift segment that crosses Runway 5-23 to the west
- ✓ Runway exit taxiways: retain current locations
- ✓ Pavement strength: evaluate pavement strength requirements when narrow body airline aircraft begin regularly scheduled operations at the Airport

As presented below in the **General Aviation Facilities** section, if the Airport moves forward with developing a new east field GA complex, the airport could ultimately benefit from a full-length parallel taxiway to the east of Runway 5-23. The existing GA facilities at RDM are constrained and a full-length parallel taxiway east of Runway 5-23 will provide access to the airfield for a new GA complex and allow for future airport development on property that is adjacent to the parallel taxiway.

Figure 3-13 (above) highlights non-compliant areas of the airfield.

3.2.5 GENERAL AVIATION FACILITIES

Growth in GA based aircraft at the Airport is contingent upon adequate facilities and easy developable areas. Currently, the general aviation facilities at the airport are somewhat constrained. With a few exceptions, the easily developable areas with access to the airfield are occupied. The remaining areas available can be used for infill hangar development in an effort to accommodate some of the projected 33 new based aircraft at the Airport, which are forecast within the 20-year planning period.
Figure 3-14 depicts conceptual hangar infill sites and one new development area on the north side of the airfield.



LEGEND

- RDM Property Boundary
- Future Hangars Option 1
- Future Hangars Option 2
- Future Taxiway
- Potential Hangar Development Area

N

0' 250' 500'

Figure 3-14
HANGARS

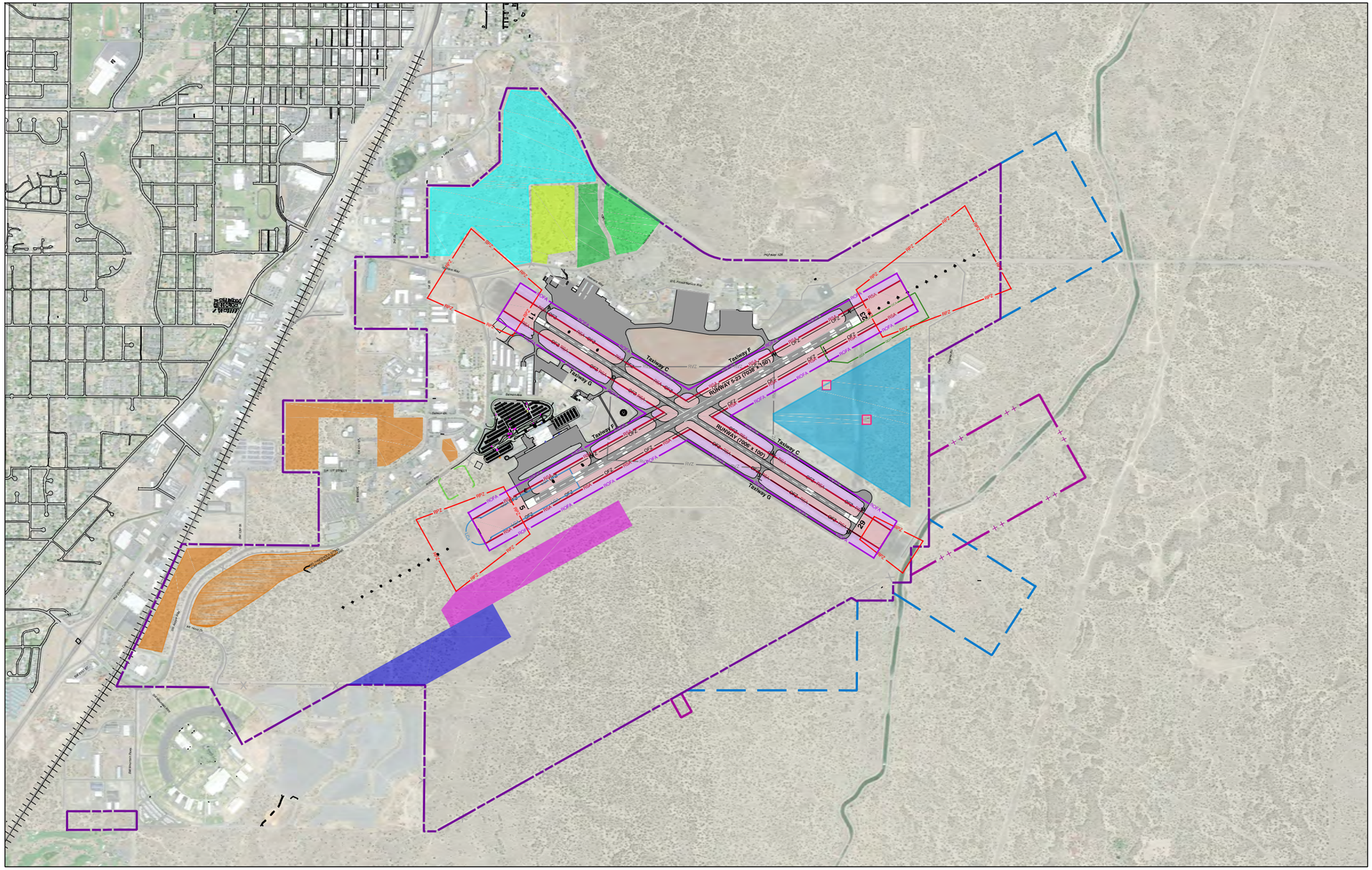


Figure 3-15
DEVELOPMENT AREAS

Chapter 2 Aviation Activity Forecast identifies an increase of 5 single-engine aircraft, 24 jet aircraft, 6 helicopters, and 5 other type aircraft relocating to the Airport within the 20-year planning period. Some of these aircraft could be located in the infill sites as shown in **Figure 3-14**, however, in order to accommodate all 33 aircraft, at least one new GA development area should be planned.

To protect for GA development beyond the 20-year planning period or growth exceeding this plan's forecast, an aviation reserve area is proposed in the east quadrant of the airport between the two runways. **Figure 3-15** shows this location. If another Fixed Base Operator (FBO) is looking to serve the Airport, this would be a suitable location. However, development in this area will be costly due to the lack of infrastructure and the high cost of site preparation.

Variations and alternative configurations of the hangar infill sites and GA development area will be further explored in the **Chapter 4 Alternatives Analysis**.

Itinerant operations are also relevant to this master plan. The Airport is forecast to experience an increase of approximately 3,000 itinerant general aviation operations within the 20-year planning period. The 3,000 annual operations equate to approximately 8 operations per day, or 4 aircraft visiting the airport. The existing FBO can accommodate the increase as currently configured.

Additional support facilities are discussed later in this chapter.

CONCLUSIONS AND RECOMMENDATIONS

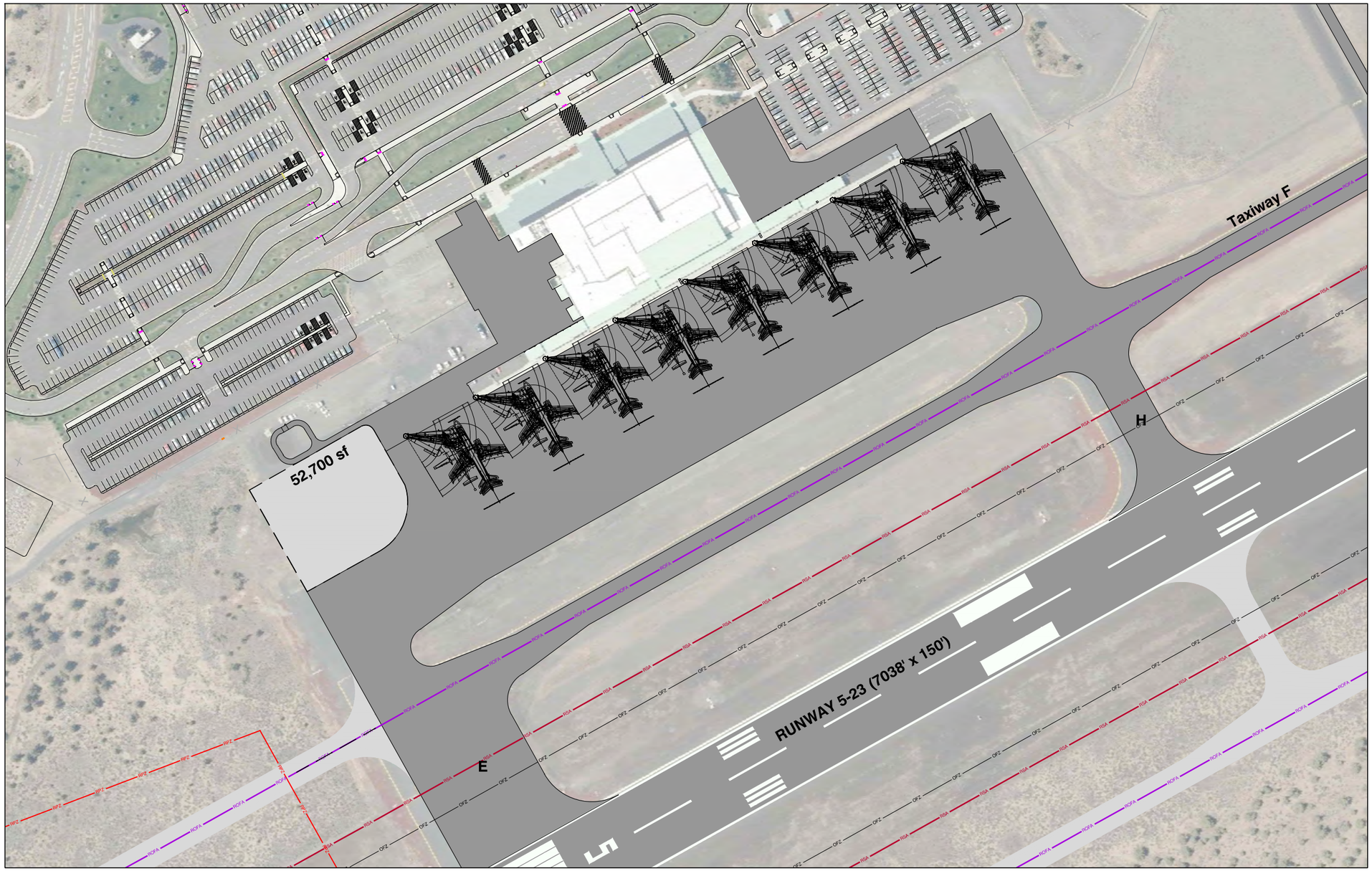
To accommodate the forecast increase in general aviation based aircraft, the following facility improvements should be made:

- ✓ Identification of hangar site alternatives
- ✓ Locate long-term general aviation development area

PASSENGER TERMINAL APRON

The passenger terminal apron is approximately 1,528 feet wide and 297 feet deep (453,816 square feet). Taxiway connectors H and E provide access to parallel taxiway F and Runway 5-23.

The apron accommodates seven aircraft parked at terminal gate positions and one additional parking position. Based on current airline schedules, up to eight aircraft each day are scheduled to remain overnight (RON). As airline operations increase and schedules change this number may increase to 10 RON aircraft. Given that the passenger terminal apron is currently at capacity for RON aircraft, the airport should plan for an apron expansion as soon as practical. **Figure 3-16** illustrates a conceptual apron expansion to accommodate the projected RON demand. Specific locations and alternatives will be explored in the following **Chapter 4 Alternatives Analysis**.



LEGEND

- RDM Property Boundary
- Active Airfield Pavement
- Future Airfield Pavement
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (OFZ)

N

0' 100' 200'

Figure 3-16
TERMINAL AND AIRLINE APRON EXPANSION

3.3 LANDSIDE FACILITY REQUIREMENTS

3.3.1 PASSENGER TERMINAL ROADWAY

With the advent of Transportation Network Companies (TNC) such as Uber and Lyft, the Airport has identified a need for a separate curbside area to consolidate TNC vehicles dropping off and picking up passengers. **Chapter 4 Alternatives Analysis** will include various locations and options for this service.

3.3.2 PASSENGER TERMINAL PARKING AREA – PUBLIC PARKING

At RDM public parking is a single-level uncovered parking lot that accommodates both short- and long-term parking. As of 2017, the terminal parking lot accommodates 1,083 vehicles. This analysis compares parking spaces against enplaned passengers for forecast scenarios to determine whether the parking facilities will require expansion.

ACRP Report No. 25: Airport Passenger Terminal and Design recommends that public parking supply should range from 900 to 1,400 spaces per million enplaned passengers. Based on this guidance, total public parking spaces at RDM exceed the recommended range for current enplanement levels and fall within the recommended range through 2036. However, based on first-hand information supplied by the Airport, the parking lot has exceeded capacity several times in the last year. Given this information, it appears the suggested ratio of 900 to 1,400 spaces per million enplaned passengers is not appropriate for RDM.

Airports Cooperative Research Program (ACRP):
An industry-driven, applied research program managed by the Transportation Research Board (TRB) that develops near-term, practical solutions to problems faced by airport operators.

The Airport has reached parking capacity with current enplaned passenger levels of 322,176. A ratio of 330 parking positions for every 100,000 enplaned passengers is based on capacity being reached in 2016 plus a 10 percent buffer. The Airport's parking lot requires expansion as soon as practical to meet existing demand, as well as projected future growth. Based on the airport-specific ratio of 330:100,000 enplanements, RDM should plan to accommodate an additional 1,100 parking spaces to accommodate demand through the 20-year planning period, shown in **Table 3-13**. The parking expansion can be accomplished with phased development, allowing the Airport to develop smaller portions of the parking expansion as needed. Auto parking areas are shown on **Figure 3-17**. Specific locations and alternatives will be explored in the following **Chapter 4 Alternatives Analysis**.

LEGEND

- RDM Property Boundary
- Area 1 - Hourly & Premium Long-Term Parking
- Area 2 - Original Employee Parking Reduced
- Area 3 - Expanded Vendor Parking as Necessary
- Area 4 - Alternative Employee Parking Expansion

Note: Layout assumes additional off-site long term parking lot. Employee parking would move to off-site parking lot as necessary.

N

0’ 100’ 200’

Figure 3-17
AUTO PARKING AREAS

Table 3-13. Recommended Parking Improvements					
	2016	2021	2026	2031	2036
Enplanements	322,176	391,450	484,300	575,350	661,600
Parking Required[3]	1,083	1,292	1,598	1,899	2,183
Capacity (Deficiency)	0	(209)	(515)	(816)	(1,100)

ACRP recommends 1,000 feet as the maximum walking distance from a parking space to the terminal building before shuttle service should be offered. The farthest point at the northwest end of the parking lot is approximately 1,000 feet, while the farthest point at the southwest end is 1,250 feet. The far limits of the existing parking area are within the limits of pedestrian travel; however, the long walk from the southwest end of the parking lot is farther than desirable.

EMPLOYEE/TENANT PARKING

The employee and tenant parking lot is immediately adjacent to the terminal building on the southwest side and accommodates 195 vehicles. Currently the airport has issued 277 employee and tenant parking passes. If conditions dictate all employees must be present on the same day, the parking lot will be over capacity. As the Airport continues to experience record growth in enplaned passengers, employee and tenant numbers will grow. Additional parking for employees and tenants should be identified. For reference, the current ratio of parking passes allocated is 85.9 passes per 100,000 enplanements. Projecting this ratio out with the forecast enplanements results in a requirement of approximately 500 employee and tenant parking spaces in 20 years. Specific locations and alternatives for employee parking will be explored in the following **Chapter 4 Alternatives Analysis**.

3.3.3 RENTAL CAR FACILITIES

Alamo, Avis, Budget, Enterprise, Hertz, and National car rental agencies offer rental vehicles at the Redmond Airport. Vehicles are picked-up and dropped-off in a 224-space parking lot located immediately northwest of the terminal building. The Airport has near-term development plans for an offsite rental car facility that will include cleaning, storage, and a fueling station. The rental car agencies plan to continue using the 224 parking spaces next to the terminal building for the pick-up and return location. Long-term storage and support services will be accomplished at the future offsite location. Specific locations and alternatives will be explored in the following **Chapter 4 Alternatives Analysis**.

[3] Ratio of parking spots to enplanements is 330 parking positions for every 100,000 enplanements and based off of 2016 enplanements and assumption of a full parking lot with a 10% buffer. Ratio was then applied to forecast enplanement numbers.

3.3.4 NON-AVIATION REVENUE DEVELOPMENT

The consultant conducted an analysis to identify the facility requirements for non-aviation businesses that complement the airport operations and are appropriate for the Redmond market, given local economic conditions. The analysis in its entirety is contained in the Appendix J. A summary of recommended infrastructure upgrades to help facilitate the revenue development are described below.

Non-Aviation Development Target Industries:

- ✓ Accommodation and Food Services
- ✓ Speculative Light Industrial Buildings
- ✓ Construction
- ✓ Manufacturing
- ✓ Wholesalers and Warehousing
- ✓ Public Administration

RECOMMENDED UPGRADES

The following recommendations are offered based on a comparison of the existing utility and transportation facilities and the corresponding demands of the target industries. **Figure 3-18** depicts the nine subareas that are the focus of this section. In all subareas, sewer lines would need to be extended from nearby mains and storm water management facilities would need to be constructed in conjunction with site development. Local streets should be constructed to the local industrial street standard (40-foot paved width with sidewalks) to accommodate necessary truck access for most of the target industry sectors. Improved access to Oregon Route 126 will eventually be required to accommodate future growth with any of the target industry sectors and will likely include added turn lanes and traffic signals. Turn lanes at major intersections may also be needed to serve future development. Necessary improvements would be identified with the preparation of traffic impact studies for specific development proposals.

Specific upgrade requirements for each subarea are noted below.

- ✓ North Development Parcel Subarea: The existing water lines between Lake Road and Veterans Way are not well-connected. A loop system is recommended throughout the subarea to maintain necessary flows for high-demand industrial users. This subarea currently has no existing transportation infrastructure and will need to rely on the construction of new streets. Transportation improvements associated with the Airport Runway Extension will eventually provide access through the subarea. Local streets that provide direct site access will need to be constructed to local industrial standard (40-foot paved width with sidewalks).
- ✓ North Business Park Subarea: The existing water lines between Veterans Way and OR 126 are not well-connected. A loop system is recommended to supply necessary flows for high-demand users. The local streets (10th Street, Sisters Avenue, Ochoco Way) need to be upgraded to current local industrial standard (40-foot paved width with sidewalks). Veterans Way needs to be upgraded to meet the major collector standard (36-foot paved width with sidewalks). At the Veterans Way intersection with OR 126, an eastbound right-turn deceleration lane on OR 126 may be necessary as volumes increase, and separate left- and right-turn lanes may be necessary on the Veterans Way approach. Left-turn lanes on Veterans Way at other intersecting roadways may also be needed.

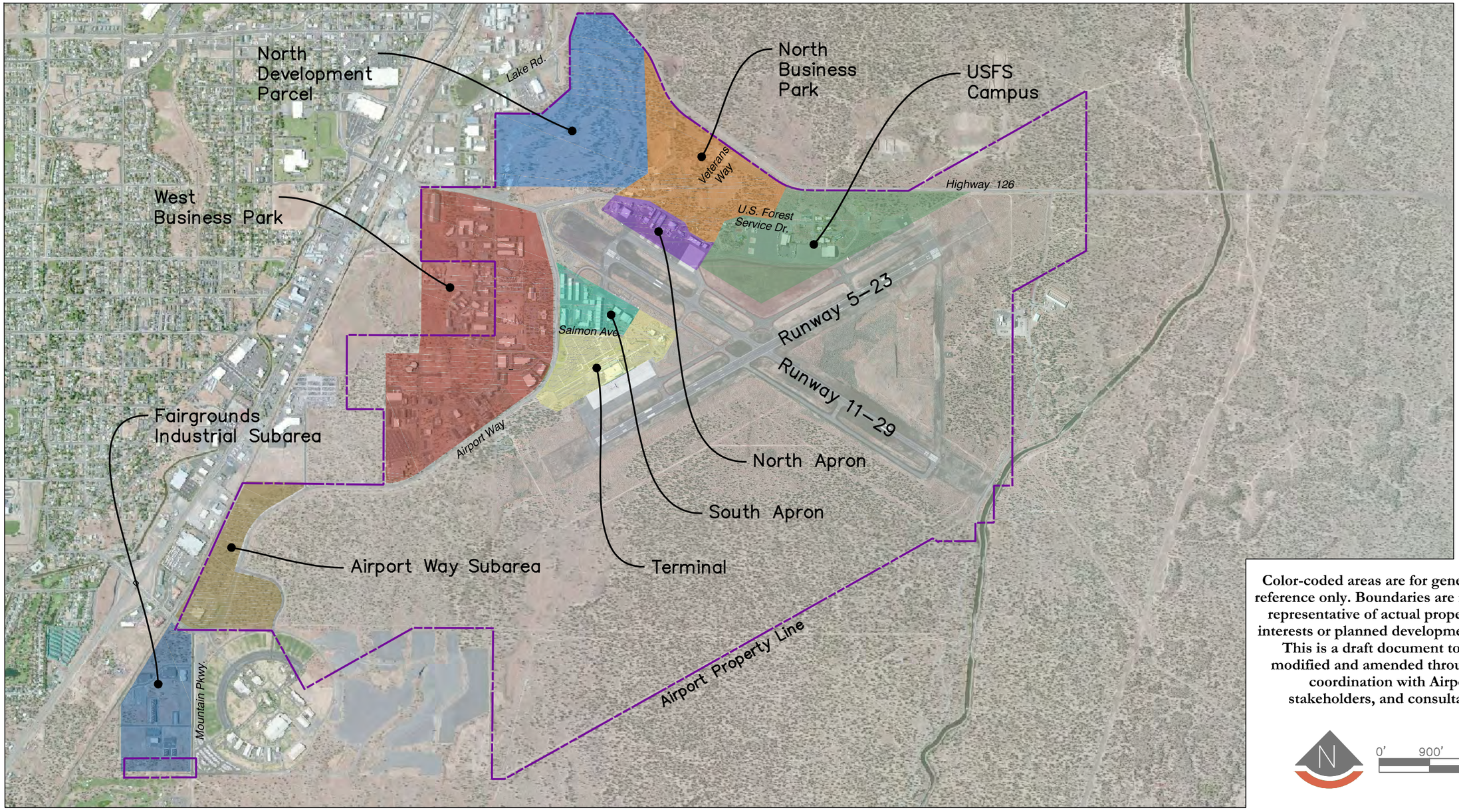


Figure 3-18
Development Areas

- South Apron Subarea: Salmon Avenue needs sidewalks on the north side of the street.
- West Business Park Subarea: Airport Way and Veterans Way need sidewalk infill, primarily along undeveloped property.
- Airport Way Subarea: Airport Way needs sidewalk infill on both sides of the street. Mt. Hood Drive needs sidewalks along both sides of the street. Wickiup Avenue needs to be constructed or upgraded to current local industrial standard (40-foot paved width with sidewalks).
- Fairgrounds Industrial Subarea: Airport Way needs sidewalks on the south side of the street.

3.4 TERMINAL AREA FACILITIES

The existing terminal is a relatively new facility constructed in 2010 to meet the requirements of the community in support of a modernization program that would both attract travelers from the region, including Redmond, and provide a better operating environment for the airlines.

3.4.1 AIRPORT ACTIVITY

The focus of the terminal area facility master plan is to develop additional capacity to meet current trends in airline operations reflected in the activity forecast. A migration to larger aircraft over the planning period is the primary trend. Airlines have been in the process of retiring smaller aircraft, the 35- to 50-seat jet aircraft that have served commuter operations since the mid-1990s, and replacing them with larger 65- to 90-seat aircraft. This trend has also included larger narrow-body aircraft that serve small hub destination airports on specific high demand and seasonal flights.

This section addresses terminal area facility improvements over the next 20 years. Level of service modifications and upgrades to these facilities areas can be built as a series of projects that meet specific needs during the period. **Table 3-14** provides the basis of design for this development, a summary of major airline peaking activity for 2016 and 2036 derived from the aviation forecasts. These peaking characteristics define the operation and are used to calculate operations-based program requirements.

Table 3-14. Airline Operations Peaking Characteristics – 2016 – 2036 Forecast		
Airline Activity Component	**Existing (2016)**	**Forecast (2036)**
Aircraft		
Aircraft	CRJ-700	B737/A319
Average Aircraft Seat Size	69	119
Load Factor	84%	84%
Passengers		
Total Passengers [Enplaned + Deplaned]	644,352	1,323,200
Peak Month Passengers - Enplaned	32,395	66,524
Peak Month Passengers - Enplaned - Percent	10.10%	10.10%
Peak Month Passengers - Deplaned	32,395	66,524
Peak Month Passengers - Deplaned - Percent	10.10%	10.10%
Total Average Day Passengers [Enplaned + Deplaned]	1,765	3,625
Total Peak Day Passengers [Enplaned + Deplaned]	2,324	7,122
Total Peak Hour Passengers	289	1,060
Peak Hour Enplaned Passengers [PHEP]	208	580
Peak Hour Deplaned Passengers [PHDP]	144	560
Enplanements Per Departure [E/D] - Average Annual Day	58	105
Enplanements Per Departure [E/D] - Average Day of Peak Month	60	115
Aircraft Operations		
Total Annual Airline Operations	11,200	12,600
Peak Week Air Carrier Operations	290	414
Total Daily Operations	42	60
Total Daily Flight Departures	21	30
Source: Mead & Hunt Airline Activity Forecasts		

3.4.2 PASSENGER TERMINAL BUILDING

Airlines embarked on a program of consolidation and capacity constraint during and after the 2007–2009 recession. Capacity constraint served to move fuel-inefficient aircraft out of airline fleets, replacing them with aircraft that would provide both fuel savings and increased seating capacity. As the industry recovered and then began to grow, airlines have replaced commuter aircraft with larger narrow-body aircraft. Airport terminal facilities have been straining to meet the demands generated by the new aircraft for landside, terminal building, and ramp apron capacity.

The Redmond terminal building was designed for smaller commuter aircraft, those operating in the 50- to 70-seat range of seat capacity. It was also designed in a more traditional layout, in which a main departures hall serves as a waiting area, similar to a train station, where passengers await a boarding call and then proceed to their designated platform. In the airport terminal, tickets are lifted prior to entering the boarding corridor, which serves as the platform from which passengers are boarded onto the aircraft. These design elements place more limitations on capacity for passenger departures lounges than on other terminal components. One disadvantage to the current layout is that expansion requires moving other components. Expansion of the upper level concourse departures lounge is possible, and would have less impact on functional components, but that expansion is limited to either side, as moving into the ramp apron would reduce space required for larger aircraft.

While this layout has merit in a smaller terminal, it can be counterintuitive to travelers who prefer to be as close to their transport as possible prior to boarding. Proximity provides a sense of calm, as passengers can see their scheduled departure posted at the gate and be readily aware of any airline operations interruption that would require their response. It is more than information, though, as passengers in close physical proximity to their transport often believe they will have some control over responding to any disruption in their schedules.

The present terminal layout might have served the operation longer had the airline industry not evolved so quickly, creating additional demand on terminal buildings throughout the country as well as at Redmond. Terminal expansion in 2010 provided much needed space, which has allowed the facility to absorb an increase in demand at almost all functional components. Future growth forecast for Redmond will require more terminal space to meet passenger demand. Terminal area ramp apron space can be reconfigured to accommodate larger aircraft at more gates than the present six commuter gate hardstands. A summary of the building improvements identified for the planning period are listed by functional component in **Table 3-15**. The recommended areas, when complete, represent a program for the year 2036. Some components will take priority over others in phased development and are listed from higher to lower priority based on passenger demand and available capacity.

Table 3-15. Program Requirements Summary

Second floor concourse and passenger departures lounges	An eight-gate reconfiguration of the second level concourse level including vertical circulation and relocated concessions and toilets. This development will be phased in smaller projects. Vertical circulation for the eight-gate development will be built in the first phase, requiring reconfiguration of the lower level departures lounge and concessions areas.
Ramp apron gate hardstands and passenger boarding bridges	A total of eight ramp apron gate hardstand positions, with corresponding passenger boarding bridges. The ramp apron area contains 243,205 square feet. Each hardstand position will accommodate the largest narrow body aircraft. The boarding bridges will be capable of handling EMB-145/CRJ-200 aircraft, larger commuter jets and up to B737-900Max/A321neo aircraft. These component areas and equipment will be phased in smaller projects over the 20-year period to 2036.
Concessions	Car rental, retail and gifts, food and beverage, goods, stock and cold storage on the non-secure and secure sides of the terminal. Concessions will also include a small, dedicated receiving and security screening area for all concessions stores delivered to the terminal building, plus a small office break room for the concessionaire.

Continued on the next page.

Table 3-15 - continued. Program Requirements Summary	
Departures/Ticket Hall	Ticket hall expansion will involve both ticketing facility and main concourse expansion; the former to meet current and near-term demand in airline ticket office space and greater ticket counter capacity to meet growth in demand, and the latter to meet increases in queueing and gathering of passengers in the main departures hall during seasonal peak travel. Given limits at the terminal curb and roadway, this space could initially be met by relocating some of the functions from the front of the departures hall. Toward the end of the planning period, this requirement can be met through ticket hall expansion and roadway relocation.
Outbound Baggage Make-up	The outbound baggage make-up facility will become constrained as more flights are added to the schedule, requiring more cart staging at the baggage make-up device. Expansion of this area will include an additional make-up device adjacent to the existing device.

Terminal programmatic requirements were identified and calculated for functional components only. **Table 3-16** lists program requirements based on the major components. Administration and ancillary area requirements are included as a percentage of the total programmed space. This includes facilities maintenance and services, workrooms, storage, and janitor closets. Mechanical and electrical support has been programmed as a percentage of the total additional programmed space above the 140,000-square-foot existing building. Other equipment space such as vertical circulation elevators, escalators, and stairs have been identified and included as line items in the program, as their footprints are quantifiable.

Table 3-16. Terminal Building Program Functional Components

Functional Component	Basis of Analysis	Capacity	Demand	Additional Requirements	Number of Processors
Entrance Hall	25 SF/Passenger	420	638	6,000 SF	N/A
Ticket Hall	Queue, Counter, ATO	10	15	5	15
Checked Baggage Screening	Screening Capacity	600 BPH	465 BPH	None	N/A
Outbound Baggage Make-Up	NB EQVFlights	3	8	5	2
Passenger Security Screening	150 Passengers/Hour	300	550	2	2
Passenger Departures Lounge	Peak Hour Seats	220	656	436	N/A
Second Level Concourse Corridor	Peak Hour Passengers	N/A	760	19,000	N/A
Second Level Concourse Toilets	Arriving Passengers	3 Fixt/Gate/Gender	48	48	N/A
Concessions	Individual Airport	N/A	12,800 SF	9,300 SF	N/A
Baggage Claim & Inbound Drop	Checked Baggage	2 NB EQA	4 NB EQA	2 NB EQA	2
Vertical Circulation	2 Esc/Elev/Direction	1 Elevator	2 / Direction	2 Esc/Elev/Direction	N/A

3.4.3 GATE CAPACITY REQUIREMENTS

The airport terminal currently has six commuter aircraft gate hardstand positions, of which five are assigned to air carriers. Future gate requirements have been determined through formulas for growth based on historical measures of annual enplanements and operations per gate. For destination airports such as Redmond, a practical gate capacity can be set based on precedent, geography, markets served, and airline hub operations. Geography marks the distance from major hub markets, which affect the number of flights that can reasonably be scheduled into the airport. Airline hubs operate arrivals and departures banks throughout the day, and flights to and from Redmond are coordinated with these operations. Historical precedent represents airlines' preferences for scheduling at Redmond to take best advantage of hub operations. Adding flights into other periods of the day should follow precedent and can be achieved through limited and/or seasonal scheduling to test markets.

Determining a practical gate capacity provides a framework to indicate a need for additional gates so airlines can schedule into preferred periods of the day. Large hub airports will typically schedule eight to ten turns per gate or more, depending upon airlines' minimum objective ground time and aircraft size. With longer periods of no activity at small hub destination airports, an achievable number of operations per gate may be indicated with as few as five or six before additional gates may be required.

Enplanements and operations per gate show there is more than sufficient capacity through the operating day to add flights. Forecast activity builds on the schedule carriers operate today. Using six aircraft as the current gate requirement, enplanements per gate calculations show that six will serve into the future. With the early morning departures bank activity, a higher number of gates would be supported.

Table 3-17. Airline Gate Demand Forecast - Enplanements Per Gate

Year	Annual Enplaned Passengers	Annual Departures	No. of Gates	Enplanements Per Gate	Enplanements Per Departure
2014	255,654	5,789	6	42,600	44
2015	280,823	4,860	6	46,800	58
2016	322,176	5,600	6	53,700	58
Future Years					
2021	391,450	5,740	6	63,700	68
2026	484,300	5,800	6	78,000	84
2031	575,350	6,200	7	86,700	93
2036	661,600	6,300	7	98,100	105

Source: Mead & Hunt Airline Activity Forecasts & Analysis

Table 3-17 shows a requirement of seven gates based on a measure of enplanements per gate. Using forecasts for the four planning horizons within the period, six gates to represent current airline schedule activity, and enplanements per gate yields a total requirement of seven gates, which supports a close range of variance to meet airline schedule preference. Operations per gate yields a smaller total number of gates based on a higher efficiency in gate use. This method does not take into consideration multiple departures within a short window.

The use of historical precedent is a primary factor in forecasting future operations growth. Current airline schedules serve as records of how airlines prefer to operate based on hub schedules. Airlines may change schedules to manage seasonal time changes, adjusting flight departures and arrivals to meet operational requirements, but their core schedules remain relatively steady over time.

From the airline activity schedule for current operations, early morning comprises the largest block of outbound activity, with seven departures over two hours and eight total during the period. Six of these departures occur within one hour. Overnight there are eight aircraft on the ground. This is anticipated to increase to nine aircraft by the end of the planning period. The terminal building has six gates, five of which are used by the carriers to manage eight aircraft operations in the first departures bank. Based on this schedule precedent and an increase in aircraft size, eight gates would be supported through the planning period. The airlines can manage this activity by towing aircraft from hardstand positions to contact gate positions; however, because there would be closely spaced departures within a limited operations area, a safer option would be to provide additional contact gates. **Table 3-18** shows the design day forecast early morning departures bank.

Table 3-18. Future Schedule Forecast - Early Morning Departures – 2036

RDM	Equipment	Destination	Airline	Aircraft Seat Capacity (Average Number of Seats)	Aircraft Seat Configuration
0510	EMBRAER-175	PDX	ALASKA	70-90	76
0530	AIRBUS-319	SFO	UNITED	130-150	138
0550	MITSUBISHI-90	DEN	UNTED	90-110	100
0555	BOEING-737	SEA	ALASKA	110-130	130
0600	BOEING-737	LAX	AMERICAN	150-170	150
0600	AIRBUS-319	SEA	DELTA	130-170	138
0625	AIRBUS-319	SLC	DELTA	130-170	138
0700	AIRBUS-319	SJC	ALASKA	130-150	138
0722	EMBRAER-175	PDX	ALASKA	70-90	76

Source: Mead & Hunt Airline Activity Forecasts & Analysis

In meeting demand for future activity, eight contact gates with building departures lounges and passenger boarding bridges are supported. This development can be built in phases, with the first phase comprised of building expansion and reconfiguration of existing space and layouts to prepare for a transition to second-level departures lounges. A full complement of gates, departures lounges, and passenger boarding bridges would be supported by the end of the planning period.

The airlines may be forced to operate larger aircraft into their major hub airports sooner in the period due to limited gate resources at these airports. This will likely be evident in the early morning and late afternoon arrivals and departures banks, eventually migrating to midday periods. During this transition, there will still be a need for ground boarding commuter aircraft at hardstand positions, particularly with Alaska/Horizon operating the Q400 aircraft well into the future. Balancing the needs of the air carriers through gate resource planning will be key to meeting growth demands on the terminal building over time.

3.4.4 TERMINAL BUILDING DEVELOPMENT

Figures 3-19 and 3-20 show development of first and second level building improvements to meet demand, including eight gate plans with corresponding departures lounge and aircraft hardstands. **Figures 3-21 and 3-22** show potential phase one improvements.

Figure 3-19 FIRST LEVEL TERMINAL BUILDING MASTER PLAN EXPANSION

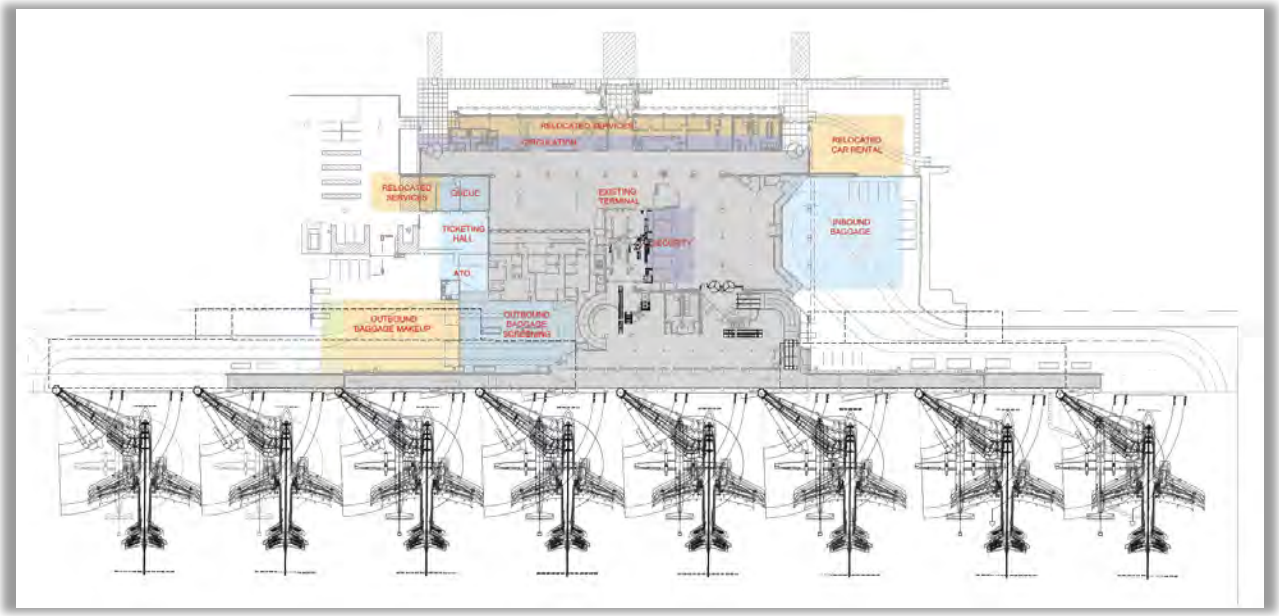


Figure 3-20 SECOND LEVEL TERMINAL BUILDING MASTER PLAN EXPANSION

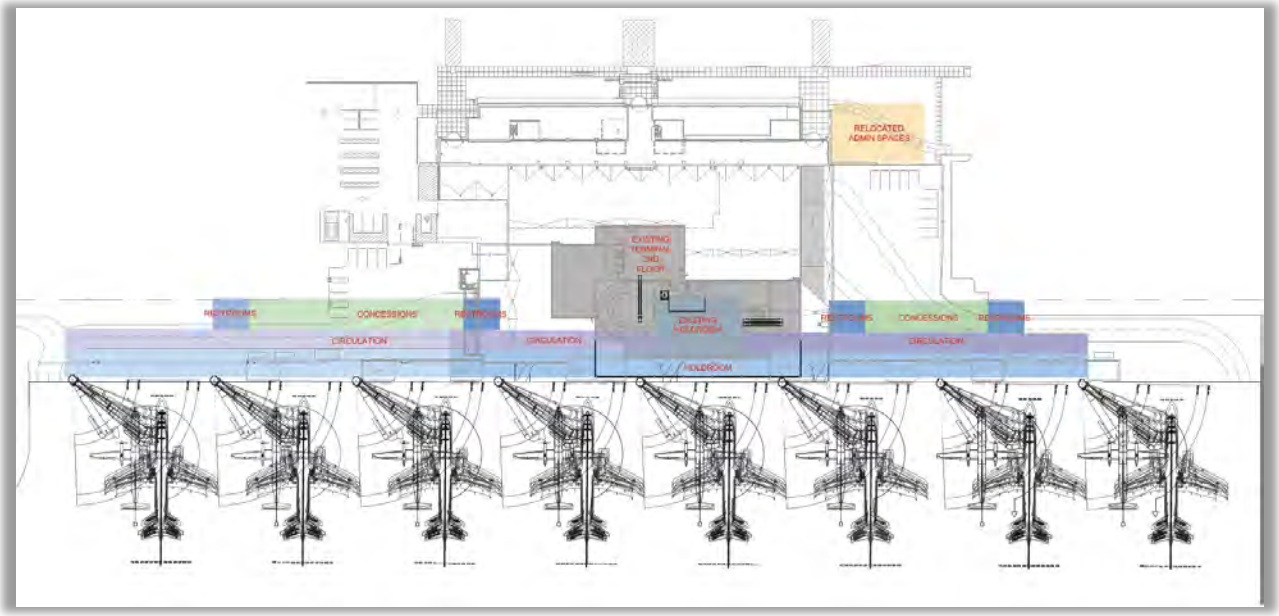


Figure 3-21 FIRST LEVEL TERMINAL BUILDING MASTER PLAN EXPANSION – PHASE ONE

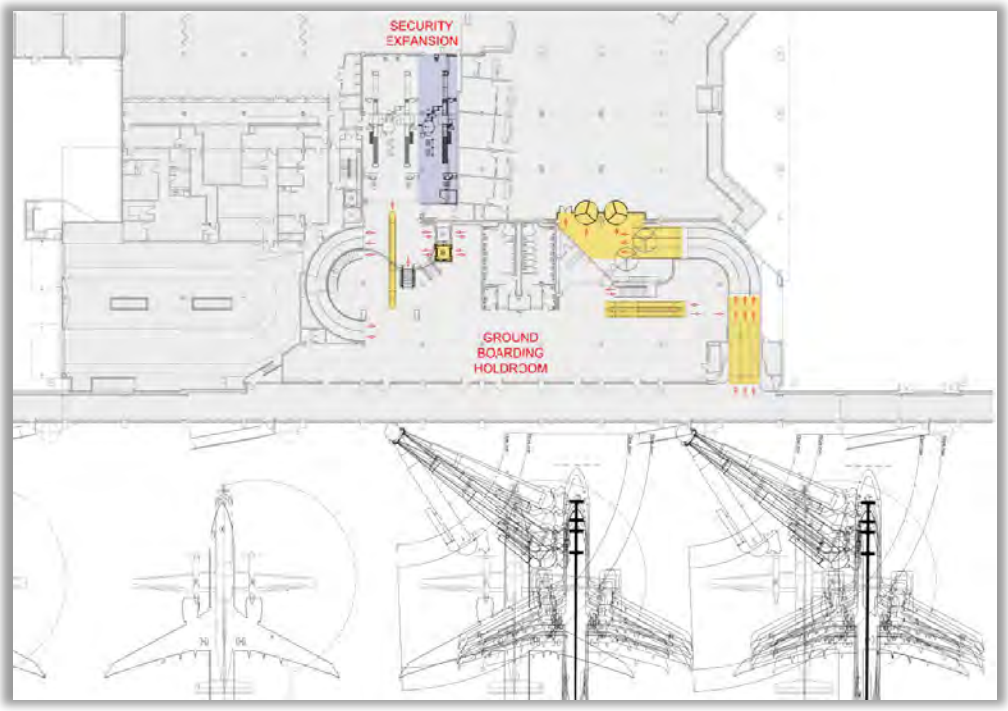
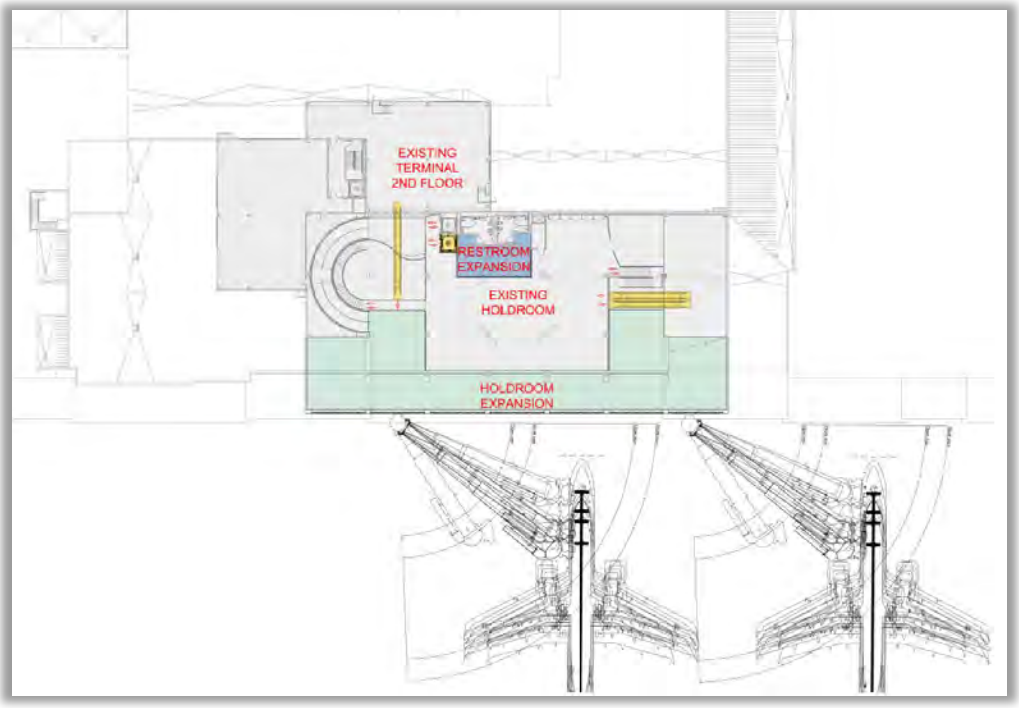


Figure 3-22 SECOND LEVEL TERMINAL BUILDING MASTER PLAN EXPANSION – PHASE ONE



3.4.5 CONCLUSIONS AND RECOMMENDATIONS

- ✓ Reconfigure second floor concourse and passenger departure lounges
- ✓ Construct a total of eight ramp gate hardstand positions with passenger boarding bridges
- ✓ Expansion and reconfiguration of concessions
- ✓ Expansion of ticket hall and main concourse
- ✓ Expansion of the outbound baggage make-up area

3.5 SUPPORT FACILITY REQUIREMENTS

3.5.1 FIXED BASE OPERATOR (FBO)

The Airport is served by one FBO, located on either side of Runway 11-29. The FBO has expressed a desire for expanded facilities, however, the development potential for both areas are limited due to other existing development in the area. The north apron area has the potential for expanded airside development behind the existing building line, but would likely be expensive due to site development costs.

As mentioned previously, the concept of a new separate general aviation development in the east quadrant of the airport could provide multiple new avenues for additional FBOs to be located at the airport.

3.5.2 UNITED STATES FOREST SERVICE (USFS)

The USFS has plans for expansion of their facilities to include additional training facilities, hangars and miscellaneous support facilities. All current plans fall within the USFS leasehold and are not expected to require additional land availability from the Airport.

3.5.3 CARGO FACILITIES

Air cargo operators performed 1,929 operations in 2016 and the forecast shows air cargo remaining flat at 2,100 annual operations through 2036. The proximity to major trucking routes and lack of demand for overnight shipments has not dictated a high amount of air freight. Air cargo operators use the general aviation apron north of Runway 11-29 to load and unload cargo, and handle processing off-site. No need for additional facilities for air cargo purposes are anticipated.

3.5.4 AIR SUPPORT AND MAINTENANCE FACILITIES

SNOW REMOVAL EQUIPMENT (SRE)

The Airport has plans underway to replace and relocate the SRE building to the north side of the airfield. The relocation will allow for an expanded building size and also open up valuable airside land for future aviation related development. The future size and location are being evaluated as of April 2017. The details will be incorporated into the **Chapter 4 Alternatives Analysis**.

AIRPORT RESCUE AND FIRE FIGHTING (ARFF)

The ARFF facility is centrally located northeast of the terminal building. Since RDM is certified under 14 CFR Part 139, it must comply with ARFF equipment, staff, and operational requirements developed by the FAA and the International Civil Aviation Organization Rescue and Fire Fighting Panel. According to Part 139 and FAA AC 150/5220-10E, ARFF equipment and staff requirements are based upon the length of the largest air carrier aircraft that serves an airport with an average of five or more daily departures. **Table 3-20** presents the ARFF Index, aircraft length criteria, and representative air carrier aircraft.

Table 3-20. ARFF Index Requirements

ARFF Index	Aircraft Length Criteria	Representative Aircraft
A	Less than 90 feet	CRJ-200
B	**90 feet but less than 126 feet**	**Q400,B-737, A-319, ERJ-145**
C	126 feet but less than 159 feet	B-757, MD-80, A-310
D	159 feet but less than 200 feet	B-767, DC-10
E	More than 200 feet	B-747, A-380
Source: Code of Federal Regulations, Part 139.315		

RDM currently falls under ARFF Index B based on the longest aircraft operating at the Airport with an average of five or more daily departures. The Airport currently meets the ARFF Index B requirements. No change to the ARFF Index is expected within the 20-year planning window.

AIR TRAFFIC CONTROL TOWER (ATCT)

No changes to the location, size, or function of the existing ATCT are anticipated within the 20-year planning timeframe. The existing ATCT line-of-sight is depicted on **Figure 3-23**. Several known areas of line-of-sight blockage have been depicted. ATC has an operational way of addressing these blocked areas. No new line-of-sight blockages should be created through future on-airport development. The ATCT line-of-sight will be an evaluation factor used in the **Chapter 4 Alternatives Analysis**.

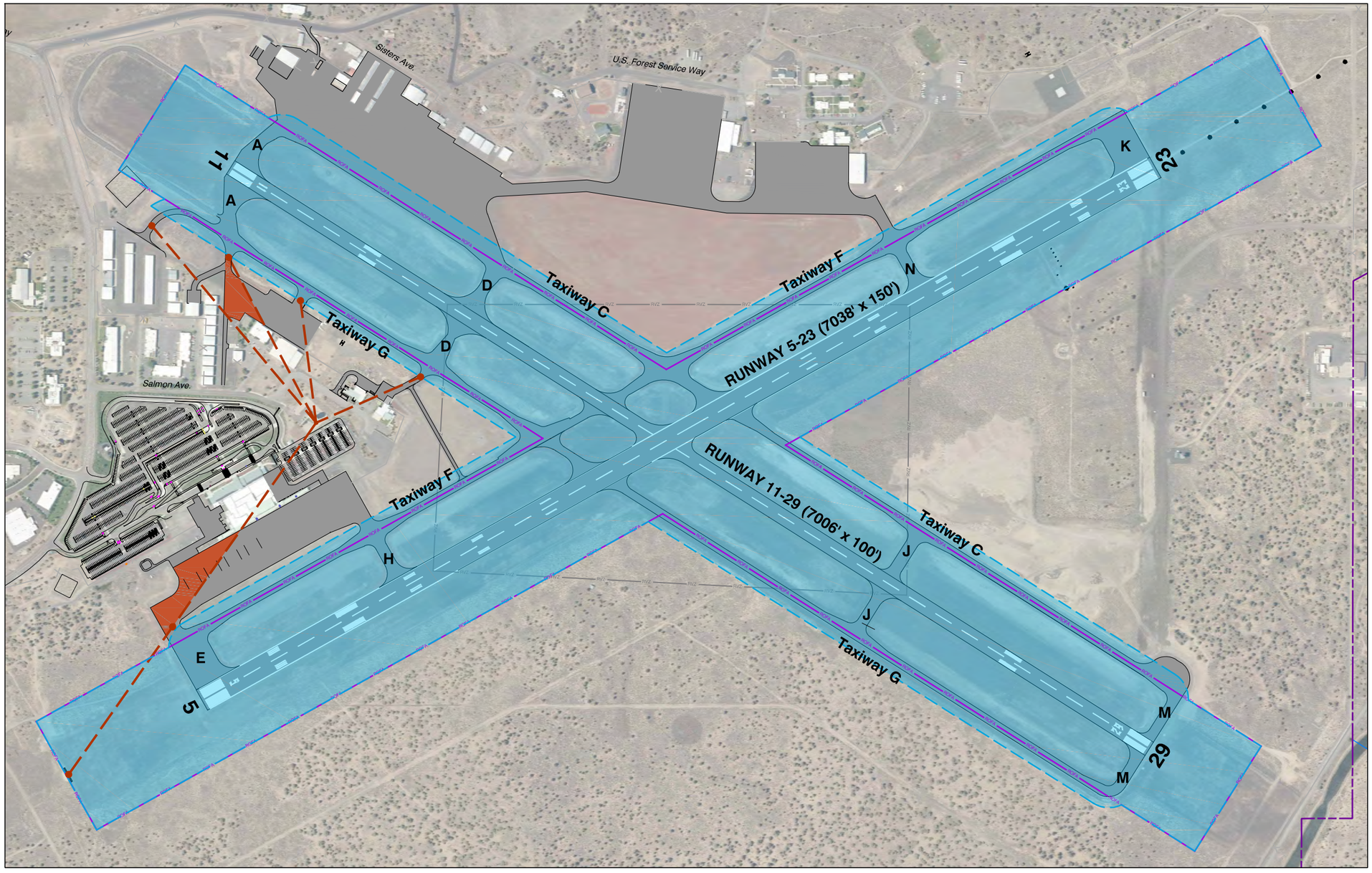


Figure 3-23
ATCT Line Of Sight

AIRPORT SERVICE ROADS

The Airport currently has a well-established network of perimeter service roads of varying types. A combination of dirt and paved service roads allow airport personnel to access all areas of the existing airfield. No changes to the airport service roads are anticipated for the existing airfield layout.

Should the **Chapter 4 Alternatives Analysis** recommend a runway extension or the protection for an ultimate third runway, service roads would need to be reevaluated for those planned improvements.

SECURITY GATES

The perimeter fence line contains multiple gates. There a several types of gates used according to their purpose and need. Gates are located primarily near the north and south general aviation areas of the airport providing access to and from hangars, businesses and general aviation users. No areas of improvement have been identified for the existing airport configuration. As alternative airfield layouts are addressed in Chapter 4, so will the requirements for additional airfield access points.

DISASTER PLANNING FACILITY REQUIREMENTS

In the event of a Cascadia Subduction earthquake event or other similar magnitude disaster event, the Airport could very likely be called to serve as a critical transportation link to help supply people, equipment and supplies necessary to manage the event's aftermath. Preliminary discussion with personnel from the Office of Emergency Management and Oregon Air National Guard have indicated that the Airport could be used as a forward operating base where supplies and people would arrive by air and be redistributed where necessary. Inbound supplies would likely arrive via C-17 and C-130 military transport aircraft. Depending on the source, personnel could also arrive on those military transport aircraft or on chartered commercial flights.

Physical space for both supplies and aircraft will likely be at a premium in the immediate days/weeks following an event. Long-term development plans generated in this Master Plan will consider what areas of the Airport could be used to accommodate the mobilization following a disaster event where RDM serves a critical role.

In the days/weeks immediately following a Cascadia event or similar disaster, it is likely that scheduled airline service would be halted.

3.5.5 CONCLUSIONS AND RECOMMENDATIONS

- ✓ Identify location for relocated SRE building
- ✓ Identify on-airport areas for storage of supplies to assist with the response to a Cascadia Subduction event

3.6 FACILITY REQUIREMENTS SUMMARY

The following summarizes the facility requirements necessary for the Airport to accommodate its projected 20-year growth, increase aviation and non-aviation related revenue generating development, and comply with required airfield design standards.

- ✓ Runway 5-23 will need an extension to a length of about 10,000 feet to accommodate the future airlines passenger fleet
- ✓ The parallel taxiways and runway connector taxiways will be designated as TDG3
- ✓ Taxiway system geometry improvements:
  - Taxiway A (north side): add pavement and restripe to provide a right angel taxiway
  - Taxiway A (south side): add pavement and restripe to provide a right angel taxiway
  - Taxiway E: replace existing taxiway segment between the apron and Taxiway F with a new connector taxiway located about 400 feet east of the existing taxiway
  - Taxiway H: replace the existing taxiway segment between the apron and Taxiway F with a new connector taxiway located about 175 feet east of the existing taxiway
  - Taxiway C hot spot: shift segment that crosses Runway 5-23 to the east
  - Taxiway G hot spot: shift segment that crosses Runway 5-23 to the west
  - Runway exit taxiways: retain current locations
  - Pavement strength: evaluate pavement strength requirements when narrow body airline aircraft begin regularly scheduled operations at the Airport
- ✓ General aviation development:
  - Site aircraft storage hangars to accommodate at least 33 aircraft.
  - Locate additional long-term general aviation development area for future hangars and/or future FBOs
- ✓ Expand passenger terminal apron.
- ✓ Identify an area within the terminal loop road for transportation network companies to pick-up and drop-off passengers
- ✓ Locate parking lot expansion for up to 1,100 parking spaces
- ✓ Locate parking lot expansion for up to 500 employee and tenant parking spaces
- ✓ Evaluate alternative sites for off-site rental car service center

- ✓ Non-aviation revenue generating improvements:
  - North Development Parcel Subarea: Install a loop water line system between Lake Road and Veterans Way are not well-connected. Construct new streets.
  - North Business Park Subarea: Install a loop water system between Veterans Way and Oregon Route 126. Upgrade the local streets (10th Street, Sisters Avenue, Ochoco Way) to current local industrial standard (40-foot paved width with sidewalks). Upgrade Veterans Way to meet the major collector standard (36-foot paved width with sidewalks).
  - South Apron Subarea: Construct sidewalks on the north side of Salmon Avenue
  - West Business Park Subarea: Install sidewalk infill as necessary along Airport Way and Veterans Way
  - Airport Way Subarea: Install sidewalk on both sides of Airport Way and Mt. Hood Drive. Upgrade Wickiup Avenue to current local industrial standard (40-foot paved width with sidewalks).
  - Fairgrounds Industrial Subarea: Install sidewalks on south side of Airport Way
- ✓ Terminal Improvements:
  - Reconfigure second floor concourse and passenger departure lounges
  - Construct a total of eight ramp gate hardstand positions with passenger boarding bridges
  - Expansion and reconfiguration of concessions
  - Expansion of ticket hall and main concourse
  - Expansion of the outbound baggage make-up area
- ✓ Identify location for relocated SRE building
- ✓ Identify on-airport areas for storage of supplies to assist with the response to a Cascadia Subduction event

Chapter 4 details alternative evaluations for each of the above facility requirements.

CHAPTER SUMMARY

This chapter evaluates a series of alternative solutions to satisfy the Redmond Municipal Airport's (RDM or "the Airport") facility requirements, which are described in **Chapter 3 – Facility Requirements**. The purpose of this analysis is to enable development of airport facilities that can realistically accommodate forecasted demand. The process of defining and evaluating alternatives is iterative, beginning with a broad range of possibilities that are then refined based on alternative evaluation criteria and Airport development goals. The alternatives evaluation process is structured to systematically evaluate options and provide the technical basis for arriving at a preferred development concept. Criteria utilized to evaluate development alternatives include:

- ✓ Operational performance
- ✓ Environmental considerations
- ✓ Construction feasibility
- ✓ Financial impacts
- ✓ Stakeholder feedback

Various sets of improvement plans were developed for the Airport's airside, landside and terminal areas to accommodate projected needs throughout the planning period. Although they do not exhaust all the variations, the developed alternatives form an appropriate base to produce a "preferred" plan of development for the airport. The preferred alternative serves as a guide for capital improvement planning and is the basis of the Airport Layout Plan (ALP). A summary of the recommended alternatives is included below. The analysis that led to the selection of a preferred alternative is described in this chapter.

- ✓ **Runway Alternative – Alternative 1**
  The recommended alternative extends Runway 5-23 2,962 feet to the southwest for a total runway length of 10,000 feet, as shown in **Figure 4-2**. The runway extension of Runway End 5 would occur on airport-owned property, requires no additional land acquisition or easements, and does not require building demolition or relocation of existing highways and roads. It is assumed that Runway 5-23 would have an upgraded approach that supports area navigation (RNAV) and localizer performance with vertical guidance (LPV) approach capabilities.
- ✓ **Taxiway Alternative – Alternative 1**
  The recommended alternative, as shown in **Figure 4-8** identifies a new full-length parallel taxiway east of Runway 5-23, addresses Federal Aviation Administration (FAA) "Hot Spots" One and Two, and can be constructed in multiple phases as demand dedicates. Improvements to Taxiway A and Taxiway F are identified to comply with FAA Advisory Circular (AC) 150/5300-13A, Change 1, *Airport Design*.

- **Vehicle Parking Alternative – Alternative 1**
  The recommended alternative, as shown in **Figure 4-10**, adds 4,000 parking stalls and converts the existing hourly terminal parking lot in front of the terminal into a combination of hourly and premium long-term parking. The existing employee vehicle parking lot to the west of the passenger terminal would be reduced to accommodate expanded vendor vehicle parking. A second employee vehicle parking lot would be developed within the central passenger terminal area. Additional long-term vehicle parking would be developed west of SE Airport Way and a remote vehicle parking lot would be developed north of the Deschutes County Fairgrounds Expo Center, along the west side of SE Airport Way. Rental car facilities would be developed just north of the additional long-term vehicle parking lot.
- **General Aviation Development Alternative – Alternative 2**
  The recommended alternative, as shown in **Figure 4-15,** identifies the expansion of aeronautical and non-aeronautical development north from the existing north development area. The resultant expansion would support a new flight school, hangar expansion for both corporate and general aviation users, and support non-aeronautical development.
- **Passenger Terminal Alternative – Alternative 3**
  The recommended alternative, as shown in **Figures 4-24, 4-25,** and **4-26,** identifies expansion of the existing terminal to the west and will expand passenger boarding and holdroom areas, outbound and inbound baggage operations, Transportation Security Administration (TSA) security screening, rental car counters and offices, ticket counters, queuing and airline ticketing offices, administration space, and mechanical support spaces. The terminal expansion supports seven new aircraft gates, with the ability to add an eighth gate, that accommodate Aircraft Design Group (ADG)-III aircraft (Airbus A320 or Boeing B737) served through passenger boarding bridges (PBBs). The proposed expansion stays clear of the Airport's Runway Visibility Zone (RVZ).

4.0 INTRODUCTION

This chapter introduces a variety of alternatives related to the Airport's runways, taxiways, vehicle parking, general aviation (GA) development, location of support facilities, passenger terminal and non-aeronautical development. Alternatives are analyzed using evaluation criteria developed for the Master Plan and were agreed upon during the initial scoping of the project. The outcome of the analysis and the public process is the selection of a preferred alternative for the Master Plan. Each alternative was evaluated according to five categories: alignment with operational performance, environmental considerations, constructability, financial impacts/cost to the Airport, and stakeholder feedback. Feedback was collected throughout the planning process from the Master Plan Planning Advisory Committee (PAC) and the public. The PAC is a diverse group made up of elected officials, on- and off-airport businesses, and members of the broader community. The PAC's role is to help shape the Master Plan into a document that is reflective of community goals and interests while satisfying FAA requirements for airport

development. The preferred alternative identified in **Section 4.6** is used to prepare the implementation plan described in a subsequent chapter. The implementation plan includes phasing of improvements, expected capital costs, and key decision points where the Airport will reevaluate implementation assumptions prior to further development. The preferred alternatives will be shown on the ALP.

The chapter is organized as follows:

4.1 Airport Development Objectives
4.2 Alternatives Development Process
4.3 Evaluation Categories
4.4 Evaluation Process
4.5 Airport Development Alternatives
4.6 Alternatives Summary

4.1 AIRPORT DEVELOPMENT OBJECTIVES

The Master Plan is intended to produce a cohesive set of alternatives that position the Airport to accommodate the forecasted demand over the next 20 years. Prior to developing and evaluating specific alternatives, the Airport's development objectives must be understood. Development objectives for this Master Plan include:

- ✓ Accommodate future demand over the next 20 years and position the Airport to attract additional tenants and businesses
- ✓ Increase revenue generation through the development of non-aeronautical land
- ✓ Provide development area for GA and United States Forest Service (USFS) activities
- ✓ Develop the passenger terminal and associated facilities to provide high levels of service
- ✓ Develop facilities in an environmentally compatible manner
- ✓ Develop facilities in accordance with all federal, state, and local regulations
- ✓ Develop facilities consistent with Stakeholder needs

Development to meet long-term demand requires consideration of both the airside and landside needs of the Airport. Airside facilities include runways, taxiways, support facilities, and non-terminal building areas, while landside facilities include vehicle parking areas, walkways, public access roads, rental car facilities, taxi and ground transportation, hotels, and any other areas accessible to the public. Those needs are presented in the following airside and landside planning sections.

4.1.1 AIRSIDE PLANNING

Airside needs include:

- ✓ Analyze the ability of the Airport to meet design standards identified in the FAA AC 150/5300-13A, Change 1, *Airport Design*
- ✓ Address FAA identified Hot Spots on the taxiways
- ✓ Analyze existing and future capacity constraints, which include an expanded passenger terminal and apron area, additional supporting taxiways, runway extension, and a future parallel runway
- ✓ Provide a variety of aircraft storage options including t-hangars, box hangars, and corporate hangars
- ✓ Identify location for a new fuel farm to support passenger airline and GA operations, and define fuel truck haul routes to minimize taxiway crossings
- ✓ Incorporate a flight school into proposed development
- ✓ Expand property available for development by GA and corporate aviation tenants
- ✓ Identify a storage location for emergency preparedness in support of the Federal Emergency Management Agency (FEMA) or other emergency responding agencies
- ✓ Identify strategic land acquisition to support airport operation and future development

4.1.2 LANDSIDE PLANNING

Landside needs include:

- ✓ Remove roadways within the existing and future runway protection zones (RPZs) when feasible
- ✓ Maximize buildable property for aeronautical and non-aeronautical development
- ✓ Analyze locations for expanded short- and long-term passenger vehicle parking, rental car operators and associated support facilities, Airport employee and vendor parking, and overflow parking
- ✓ Analyze existing landside access and roadway networks to support future development
- ✓ Identify strategic land acquisition to support proposed improvements

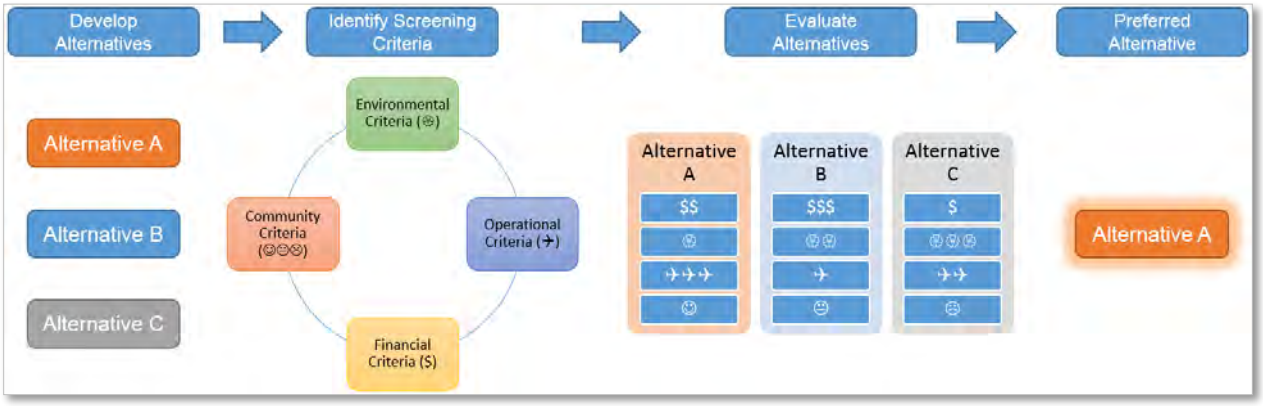
4.2 ALTERNATIVES DEVELOPMENT PROCESS

The framework for the alternatives development was established in **Chapter 1 – Inventory**, **Chapter 2 – Forecast**, and **Chapter 3 – Facilities Requirements**. Information contained in these chapters was used to develop layouts that support the Airport's ability to accommodate forecasted demand and prepare a 20-year facility plan for the Airport moving forward. Developing the alternatives included examining:

- ✓ FAA Airport Design Standards
- ✓ Land Development Strategies
- ✓ Revenue Producing Opportunities
- ✓ Aircraft Operations
- ✓ Passenger Enplanements

These factors provide the framework necessary to formulate feasible development alternatives to meet future demand. The typical alternatives development and evaluation process is illustrated in the following **Figure 4-1**.

Figure 4-1. Typical Alternatives Development Process



4.2.1 AIRPORT MASTER PLAN ADVISORY COMMITTEE INPUT

Throughout this planning process, public involvement and stakeholder outreach has been a continuous process involving educational, listening, and collaborative components. Stakeholder groups include the PAC, Airport Committee, City of Redmond, and members of the public. The feedback received during the process is used to qualitatively compare the alternatives.

4.3 EVALUATION CATEGORIES

The following evaluation categories provide the basis of analysis for each alternative and support a fact-based comparison:

- ✓ Operational Capabilities (Specific to Functional Area)
- ✓ Performance Requirement Benchmarks (Ability to accommodate demand)
- ✓ Land Use Compatibility
- ✓ Environmental Impacts
- ✓ Stakeholder Feedback
- ✓ Constructability
- ✓ Financial Cost/Impacts

These categories were developed to ensure the selected alternative is consistent with the role of the Airport and are described in the following sections.

4.3.1 OPERATIONAL CAPABILITIES

This evaluation category is applied to the alternatives to determine their ability to satisfy the facility requirements identified in **Chapter 3 – Facility Requirements**. An analysis of the demand and capacity requirements, and geometric and other standards that govern the design of airport components, guided development of the facility requirements.

4.3.2 PERFOMANCE REQUIREMENTS BENCHMARKS

This evaluation category is applied to the alternatives to determine their ability to support demand identified in **Chapter 2 – Aviation Activity Forecasts**. Alternatives aligned with the forecasts if they provided the facilities necessary to meet identified demand through 2036.

4.3.3 LAND USE COMPATABILITY

This category evaluates alternatives based on compatible land use and the potential impacts to land or other environmental factors that could influence an alternative. These include noise exposure, wetlands or stream impacts, or other factors that might be unique to developed alternatives.

4.3.4 ENVIRONMENTAL IMPACTS

This category evaluates alternatives based on compatibility with existing environmental assets with the goal of developing in an environmentally sustainable manner. The following impacts to specific environmental elements were considered:

- ✓ Air Quality
- ✓ Biological Resources (including fish, wildlife, and plants)
- ✓ Climate
- ✓ Coastal Resources
- ✓ Department of Transportation Act, Section 4(f)
- ✓ Farmlands
- ✓ Hazardous Materials, Solid Waste, and Pollution Prevention
- ✓ Historical, Architectural, Archaeological, and Cultural Resources
- ✓ Land Use
- ✓ Natural Resources and Energy Supply
- ✓ Compatible Land Use
- ✓ Socioeconomic, Environmental Justice and Children's Environmental Health and Safety Risks
- ✓ Visual Effects (Including Light Emissions)
- ✓ Water Resources (including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)

Early identification of these environmental factors may help avoid impeding future development plans. The analysis is not intended to fulfill the environmental clearance requirements as defined in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act*.

4.3.5 STAKEHOLDER FEEDBACK

Stakeholder input was obtained from the PAC, Airport Advisory Committee, City of Redmond, FAA, various stakeholders, community members, and members of the public to assist in evaluating the alternatives. Public and committee meetings were held on the following dates:

- ✓ Stakeholder Interviews – September 26, 2016
- ✓ Redmond City Council – October 25, 2016
- ✓ PAC Meeting #1 – November 9, 2016
- ✓ Airport Committee – November 10, 2016
- ✓ Redmond City Council – February 7, 2017
- ✓ PAC Meeting #2 – February 8, 2017
- ✓ Redmond City Workshop – April 25, 2017
- ✓ PAC Meeting #3 – June 22, 2017
- ✓ FAA Teleconference – August 4, 2017
- ✓ PAC Meeting #4 and Open House – October 18, 2017
- ✓ Redmond City Council – January 9, 2018
- ✓ PAC Meeting #5 and Open House #2 – Scheduled for Winter 2018

These public meetings were supplemented with presentations, exhibits, and one-on-one interviews. Input was considered and incorporated into the development of the alternatives for RDM.

4.3.6 CONSTRUCTABILITY

This category evaluates alternatives based on implementing the alternative in logical phases. Timing and the sequence of construction can create delays, increase cost, and impact airport operations. Each alternative was examined to determine the degree of its impact on airport operations.

4.3.7 FINANCIAL COSTS/IMPACTS

This category evaluates alternatives based on cost factors to assess feasibility and form a relative basis of comparison. The analysis looks at the following for each alternative:

- ✓ Ability to fund the required capital expenditures
- ✓ Airport operating costs
- ✓ Potential revenues, operating and capital expenses, and potential funding sources for each alternative

Capital expenses include demolition costs, construction and site preparation costs, environmental costs and lease buyouts.

4.4 EVALUATION PROCESS

This section defines the alternatives analysis process utilized in accordance with FAA AC 150/5070-6B, *Airport Master Plans*. Developing multiple alternatives represents the first of a multi-step process that leads to the selection of a preferred alternative. It is important to note that the current FAA-approved ALP identifies future improvements recommended in a prior master planning effort. The master planning process addresses facility needs, but also allows the components of the previous preferred alternative to be retained or modified, if they meet current needs.

Airport development alternatives are created to respond to defined facility needs, with the goal of identifying general preferences for both individual items and the overall concepts being presented. The process will allow the widest range of ideas to be considered and the most effective facility development concept to be defined.

Elements of a preferred alternative will emerge from the evaluation process that can best accommodate all required facility improvements. Parts of the various alternatives will be consolidated into a preferred alternative based on the input of multiple stakeholders. The preferred alternative can be refined further as the City proceeds through the process of finalizing the remaining elements of the airport Master Plan. Public input and coordination with the PAC, FAA, and RDM throughout the evaluation process will also help to shape the preferred alternative.

Once the preferred alternative is selected by RDM, a detailed capital improvement program will be created that identifies and prioritizes specific projects to be implemented. The elements of the preferred alternative will be integrated into the updated ALP drawings that will guide future improvements at the Airport.

4.5 AIRPORT DEVELOPMENT ALTERNATIVES

The initial airport development alternatives are intended to facilitate a discussion and evaluation about the most efficient way to meet the facility needs of the Airport. The facility requirements identified in the previous chapter include a variety of airside, landside, passenger terminal, and other development needs. The airport development alternatives are organized into several groups:

- ✓ Runway Alternatives
- ✓ Taxiway Alternatives
- ✓ GA Development Alternatives
- ✓ Vehicle Parking Alternatives
- ✓ Support Facilities Alternatives
- ✓ Passenger Terminal Alternatives
- ✓ Non-Aeronautical Property Development Alternatives

The airport development alternatives are described below and depicted in **Figures 4-2** through **4-32** to illustrate the key elements of each alternative.

4.5.1 RUNWAY ALTERNATIVES

Runway 5-23 is the Airport's primary runway and is 7,038 feet long and 150 feet wide. The runway has pavement strength of 68,000 pounds for single-wheel gear (SWG) aircraft and 110,000 pounds for dual wheel gear (DWG) aircraft and is designed to C-III Standards. Runway 11-29 is the crosswind runway and is 7,006 feet long and 100 feet wide. The runway has pavement strength of 28,000 pounds for SWG and 40,000 pounds for DWG and is designed to B-III Standards. Additional airfield capacity is not required as the existing primary runway can accommodate future demand through 2036.

Chapter 3 – Facility Requirements explained the potential need for a 2,962-foot-runway extension to Runway 5-23 for a total runway length of 10,000 feet to serve markets in the Midwest. To examine the feasibility of an extension at RDM, six runway extension alternatives have been identified and are evaluated in the following sections. The alternatives assume an upgraded approach to Runway End 5 that supports LPV approach capabilities, similar to the localizer and glideslope of an Instrument Landing System (ILS) approach into Runway End 23. The MALSR (Medium Approach Light System with Runway Alignment Indicator Lights) will remain within the RPZ and on airport property. Earthwork for the runway and supporting taxiway extension alternatives to the southwest requires significant fill due to the uneven terrain and requirements to match existing grades of the runway and taxiway. **Chapter 3** also explained how the existing Runway 5-23 RSA had no penetrations and a recommendation was made to change declared distances to the full length of the runway. To ensure that there are no future RSA penetrations

and that declared distances can stay at 10,000 feet, the RSA around any future extension must remain clear of objects.

None of the alternatives would impact night operations.
Runway extension alternatives consider RPZ requirements in FAA AC 150/5300-13A, Change 1, *Airport Design* and the 2012 memorandum *Interim Guidance on Land Uses within a Runway Protection Zone (2012 RPZ Memo).* Modifications to Runway End 23 will require evaluation of the relocation of Highway 126 to meet FAA design guidance. The alternatives comply with AC 150/5300-13A, Change 1, *Airport Design* standards for the runway safety area (RSA), runway object free area(ROFA), and taxiway object free area (TOFA).

ALTERNATIVE 1 – EXTEND RUNWAY 5-23 SOUTHWEST

This alternative provides a 10,000- foot- long runway by extending Runway 5-23 to the southwest, as shown in **Figure 4-2**. The extension of Runway End 5 will occur on airport-owned property, requires no additional land acquisition or easements, and does not require building demolition or relocation of existing highways and roads. The construction of the proposed runway extension and supporting taxiways would require 79,092 cubic yards (CY) of material excavation and the supporting taxiway would require 10,792 CY of material excavation for 89,884 CY of total material excavation. This alternative would add 77,400 square yards (SY) of additional pavement. FAA runway and taxiway design criteria are met with this alternative.

This alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact on airport operations. The extension would increase the extent of the RVZ by 1,481 feet to the southwest. The aircraft rescue and firefighting (ARFF) building will obstruct the view of aircraft arriving to or from the intersection of the two runways. The ARFF building will relocate to keep the RVZ clear of obstructions.

Four obstructions (trees) have been identified within the future 50:1 Approach Surface, however, these obstructions are on existing airport property and can be mitigated. The extension does not change any instrument approach capabilities and Navigational Aids (NAVAIDs) would be relocated appropriately.

This alternative is estimated at a total project cost of $48,450,000 and includes engineering, environmental compliance, construction management services, relocation of the ARFF building, and extension of Taxiway F to the new end of Runway 5.

ALTERNATIVE 2A – EXTEND RUNWAY 5-23 NORTHEAST

This alternative involves extending Runway 5-23 2,962 feet to the northeast with a parallel taxiway and separate exit and entrance connectors as shown in **Figure 4-3**. The extension of Runway 23 by 2,962 feet requires the relocation and realignment of Highway 126 by 1.75 miles, and 62 acres of additional

property to comply with AC 150/5300-13A and the *2012 RPZ Memo.* The required acquisition off the end of Runway 23 is located outside City Limits and outside the Redmond urban growth boundary (UGB) in unincorporated Deschutes County. The property is zoned Exclusive Farm Use (EFU), for which state law severely restricts non-agricultural uses. As a result, extending the runway outside the UGB or rerouting a portion of Highway 126 outside the UGB would require seeking an Exception to Statewide Planning Goal 3 (Agricultural Lands) and receiving approval from the Board of County Commissioners. To obtain approval, the City would have to demonstrate that it performed an alternatives analysis demonstrating that other options within the UGB were not viable. This could subject the City and the County to potential appeals and project delays.

The North Unit Main Canal, a Section 4(f) historic resource due to its age, would also be located within the RPZ, and FAA may require potential mitigation measures such as the placement of a cap on the canal in the RPZ area. The extension would increase the extent of the RVZ by 1,481 feet to the northeast; however, there would be no additional inclusions of facilities within the RVZ.

The construction of the proposed runway extension and supporting taxiway and connectors would require 1,693 CY of material excavation and the supporting taxiway would require 718 CY of material excavation for 2,411 CY of total material excavation. This alternative would add 77,400 SY of additional pavement. The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations.

The extension does not change any instrument approach capabilities and all NAVAIDs would be relocated appropriately.

No new obstructions to the 50:1 approach surface were identified with the proposed extension.

This alternative is estimated at a total project cost of $37,550,000 and includes engineering, environmental compliance, and construction management services.

ALTERNATIVE 2B – EXTEND RUNWAY 5-23 NORTHEAST

This alternative is a derivative of Alternative 2A and similarly involves extending Runway 5-23 2,962 feet to the northeast with a parallel taxiway and separate exit and entrance connectors as shown in **Figure 4-4**. Instead of relocating Highway 126 outside of critical runway geometric areas, such as the RPZ, Highway 126 would remain in its current alignment and a tunnel would be constructed underneath the Runway 23 to achieve the 2,962-foot extension. This alternative requires 63 acres of additional property to comply with AC 150/5300-13A and the 2012 memorandum *2012 RPZ Memo.* The required acquisition off the end of Runway 23 is located outside City Limits and outside the Redmond UGB in unincorporated Deschutes County. The property is zoned EFU, for which state law severely restricts non-agricultural uses. As a result, extending the runway outside the UGB or rerouting a portion of Highway 126 outside the UGB would require seeking an Exception to Statewide Planning Goal 3 (Agricultural Lands) and

receiving approval from the Board of County Commissioners. To obtain approval, the City would have to demonstrate that it performed an alternatives analysis of other options within the UGB that were not viable. This would be a high bar to meet and could subject the City and the County to potential appeals and project delays.

The North Unit Main Canal will be located within the Runway 23 RPZ for this alternative as discussed in Alternative 2A.

This alternative will require the same amount of material excavation and additional pavement as Alternative 2A. This alternative will also have no effect on instrument approach capabilities, relocates NAVAIDs appropriately, and has no identified obstructions.

This alternative is estimated at a total project cost of $58,440,000 and includes engineering, environmental compliance, and construction management services.

ALTERNATIVE 3A – SPLIT RUNWAY 5-23 EXTENSION

This alternative involves extending Runway 5-23 by 400 feet to the northeast and by 2,562 feet to the southwest for a total runway length of 10,000 feet with a parallel taxiway and separate exit and entrance connectors as shown in **Figure 4-5.** This alternative assumes the FAA would not require RPZ compliance for the existing alignment of Highway 126 through Runway 23's RPZ. Extending Runway End 23 to the northeast utilizes an existing avigation easement for a portion of the land that falls within Runway 23's RPZ. Runway 5-23 extends 400 feet to the northeast in this alternative due to the extent of the OFA stopping prior to Highway 126. Extending Runway End 5 to the southwest would occur on existing airport property and requires no additional land acquisition or easements nor any building demolition or relocation of existing highways or roads.

The construction of the proposed split runway extension and supporting taxiway and connectors would require 72,092 CY of material excavation and the supporting taxiway would require 9,416 CY of material excavation for 81,508 CY of total material excavation. This alternative would add 85,300 SY of additional pavement. This extension would however increase the extent of the RVZ by 1,281 feet and include a portion of the existing passenger terminal aircraft apron and the ARFF building. The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations.

Four obstructions (trees) have been identified within the future 50:1 Approach Surface for the extended Runway 5; however, these obstructions are on existing airport property and could easily be mitigated. The extension does not change any instrument approach capabilities and all NAVAIDs would be relocated appropriately.

This alternative is estimated at a total project cost of $29,319,000 and includes engineering, environmental compliance, and construction management services.

ALTERNATIVE 3B – SPLIT RUNWAY 5-23 EXTENSION

This alternative involves equally extending Runway 5-23 by 1,500 feet to the northeast and by 1,462 feet to the southwest with a parallel taxiway and separate exit and entrance connectors as shown in **Figure 4-6.** The extension of Runway End 23 to the northeast requires relocating and realigning 0.8 miles of Highway 126 0.34 miles north and utilizes an existing avigation easement for a portion of the land that falls within Runway 23's RPZ. The realignment of Highway 126 is 1.25 miles and is outside of the future RPZ for Runway End 23. Extending Runway End 5 to the southwest would occur on existing airport property and does not require additional land acquisition, easements, building demolition, or relocation of existing highways or roads.

The North Unit Main Canal, a Section 4(f) historic resource due to its age, would be located within the Runway End 23 RPZ, and FAA may require mitigation measures such as the placement of a cap on the canal in the RPZ. The extension would increase the extent of the RVZ to the southwest by 731 feet and to the northeast by 750 feet; however, there would be no additional inclusions of facilities within the RVZ.

The construction of the proposed runway extensions and supporting taxiway and connectors would require 11,893 CY of material excavation, and the supporting taxiway would require 6,416 CY of material excavation for 18,309 CY of total material excavation. This alternative would add 81,600 SY of additional pavement. The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations.

This alternative has the same obstructions and mitigation identified in Alternative 3A and also relocates NAVAIDs as needed.

This alternative is estimated at a total project cost of $31,555,000 and includes engineering, environmental compliance, and construction management services.

ALTERNATIVE 3C – SPLIT RUNWAY 5-23 EXTENSION

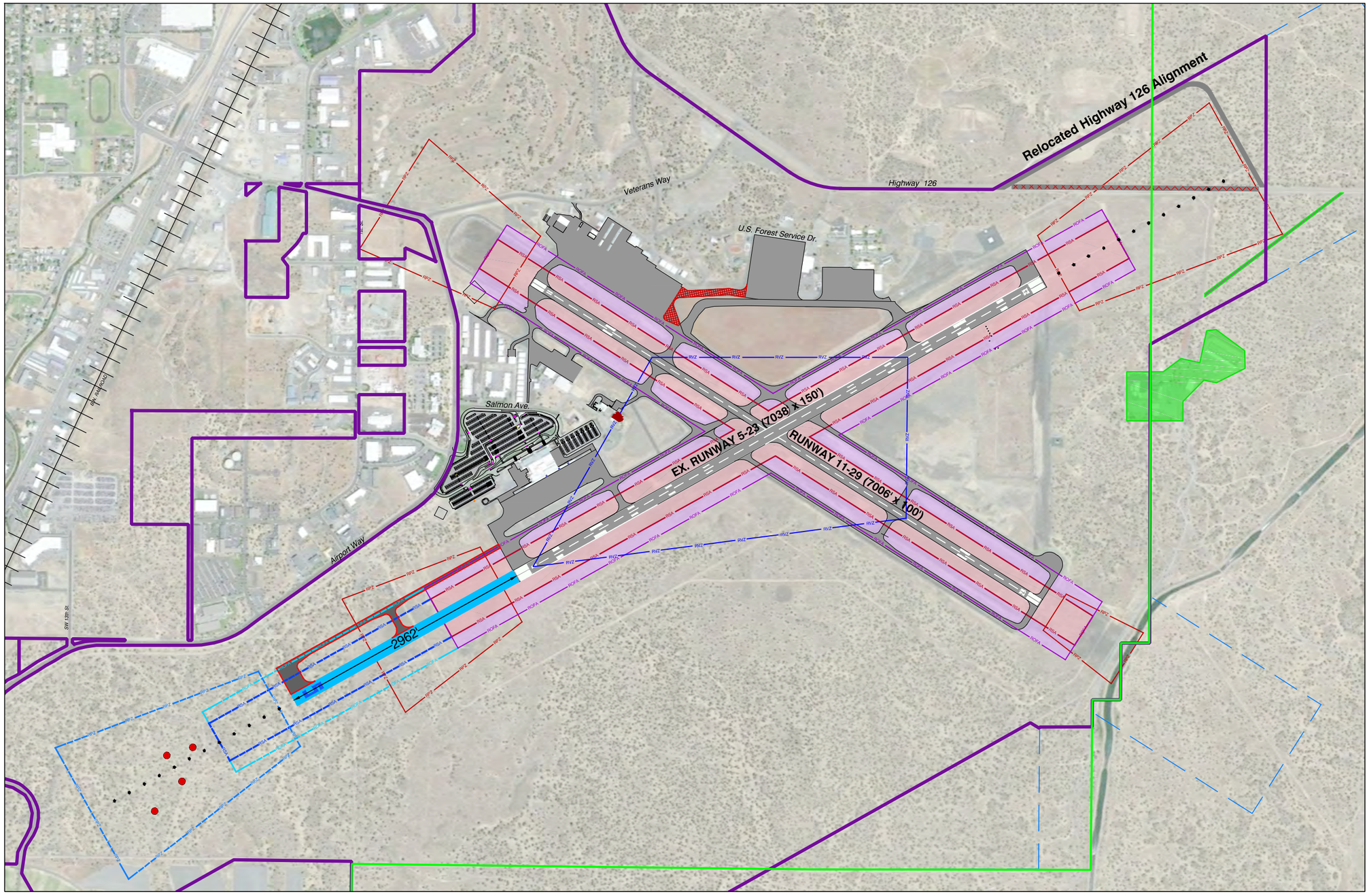
This alternative is a derivative of Alternative 3B and similarly involves extending Runway 5-23 by 1,500 feet to the northeast and by 1,462 feet to the southwest with a parallel taxiway and separate exit and entrance connectors as shown in **Figure 4-7.** The extension of Runway End 23 to the northeast requires relocating and realigning 0.8 miles of Highway 126 0.50 miles north and utilizes an existing avigation easement for a portion of the land that falls within Runway 23's RPZ. The realignment of Highway 126 is 3 miles and is outside of the avigation easement of Runway End 23. Extending Runway End 5 to the southwest would occur on existing airport property and does not require additional land acquisition, easements, building demolition, or relocation of existing highways or roads.

The North Unit Main Canal will be located within the Runway 23 RPZ for this alternative as discussed in Alternative 3B.

The construction of the proposed runway extensions and supporting taxiway and connectors would require 11,893 CY of material excavation, and the supporting taxiway would require 3,416 CY of material excavation for 15,309 CY of total material excavation. This alternative would 81,600 SY of additional pavement. The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations.

This alternative has the same obstructions and mitigation identified in Alternative 3A and also relocates NAVAIDs as needed.

This alternative is estimated at a total project cost of $36,850,000 and includes engineering, environmental compliance, and construction management services.



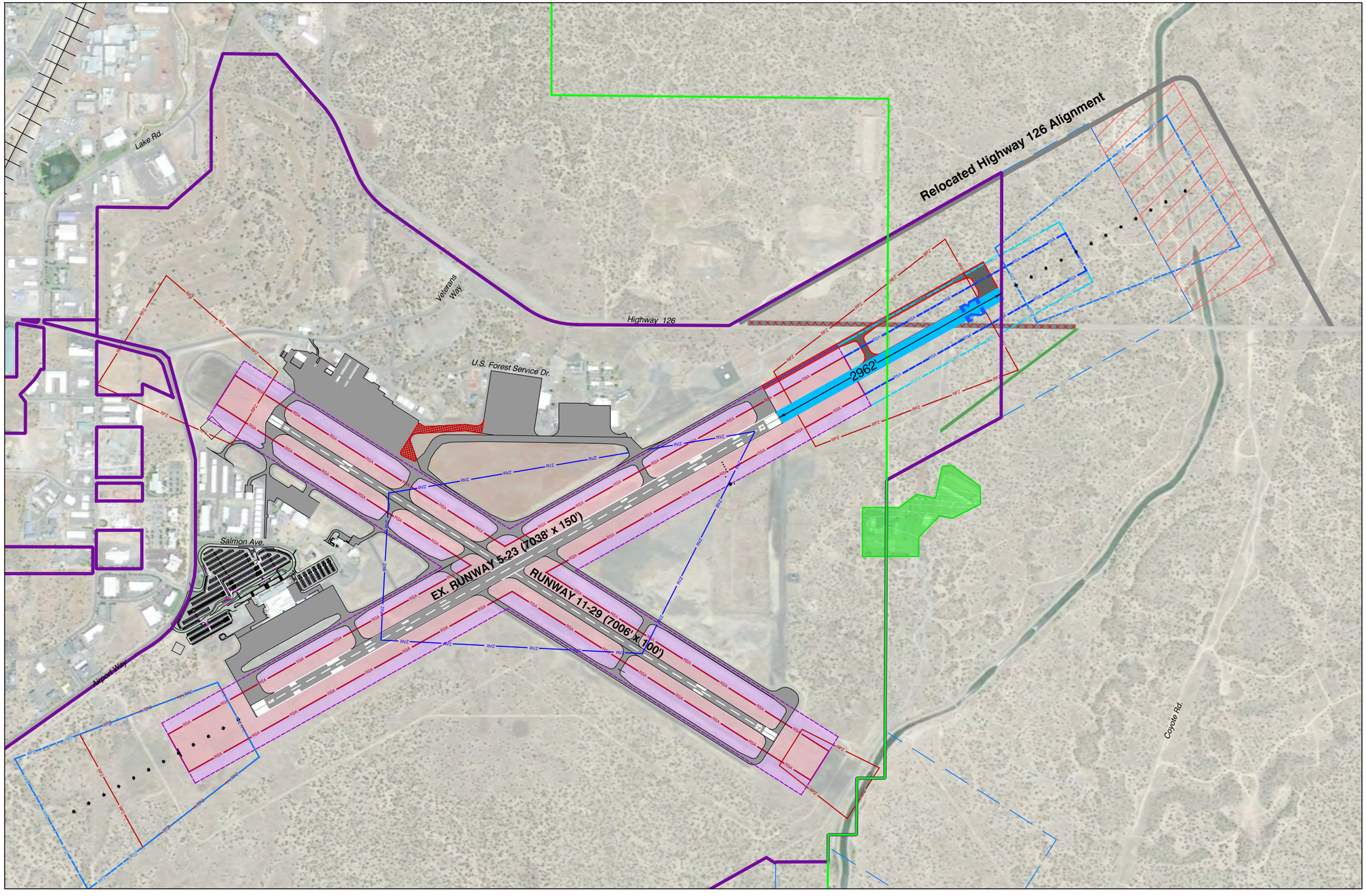
LEGEND

- RDM Property Boundary
- Urban Growth Boundary
- Avigation Easement
- Future Runway Extension
- Runway Safety Area (RSA)
- Future RSA
- Runway Object Free Area (ROFA)
- Future ROFA
- Runway Protection Zone (RPZ)
- Future RPZ
- Highway 126 Relocation Alignment Distance: 0.8 miles
- Highway 126 Removal Removal Distance: 0.55 miles
- Gravel Road Relocation Alignment Distance: 0.4 miles
- Tenant
- ARFF Building
- Future Parallel Taxiway
- Removed Airfield Pavement
- Runway Visibility Zone (RVZ)
- Obstruction to 50:1 Approach Surface
  Total Obstructions: 4

N

0’ 600’ 1,200’

Figure 4-2
Alternative 1 - Extend Runway Southwest



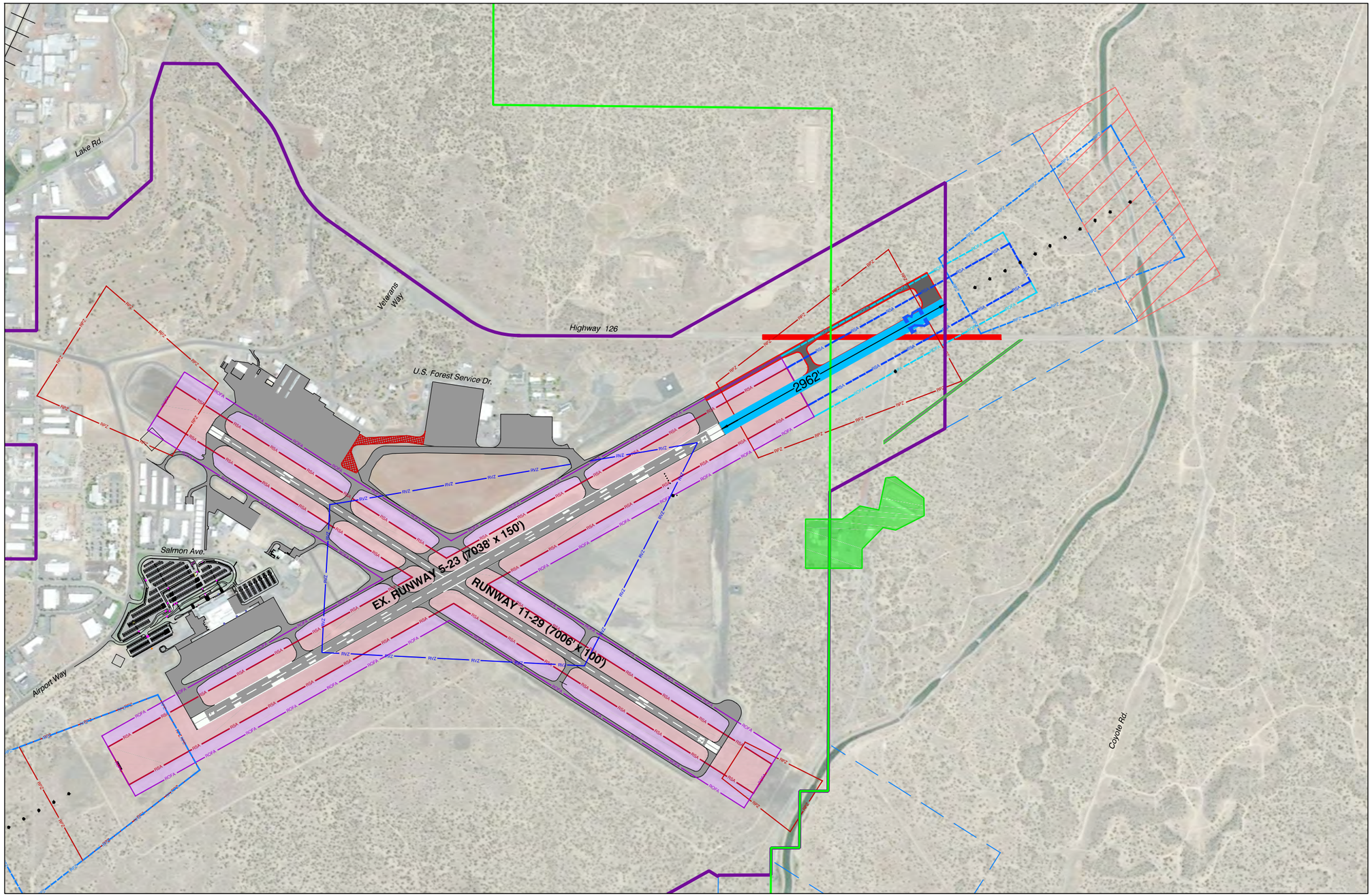
LEGEND

- RDM Property Boundary
- Urban Growth Boundary
- Avigation Easement
- Future Runway Extension
- Runway Safety Area (RSA)
- Future RSA
- Runway Object Free Area (ROFA)
- Future ROFA
- Runway Protection Zone (RPZ)
- Future RPZ
- Highway 126 Relocation
  Alignment Distance: 1.75 miles
- Highway 126 Removal
  Removal Distance: 0.75 miles
- Gravel Road Relocation
  Alignment Distance: 0.4 miles
- Tenant
- Future Land Acquisition (62 acres)
- Future Parallel Taxiway
- Removed Airfield Pavement
- Runway Visibility Zone (RVZ)
- Obstruction to 50:1 Approach Surface
  Total Obstructions: 0

N

0' 600' 1,200'

Figure 4-3
Alternative 2A - Extend Runway Northeast



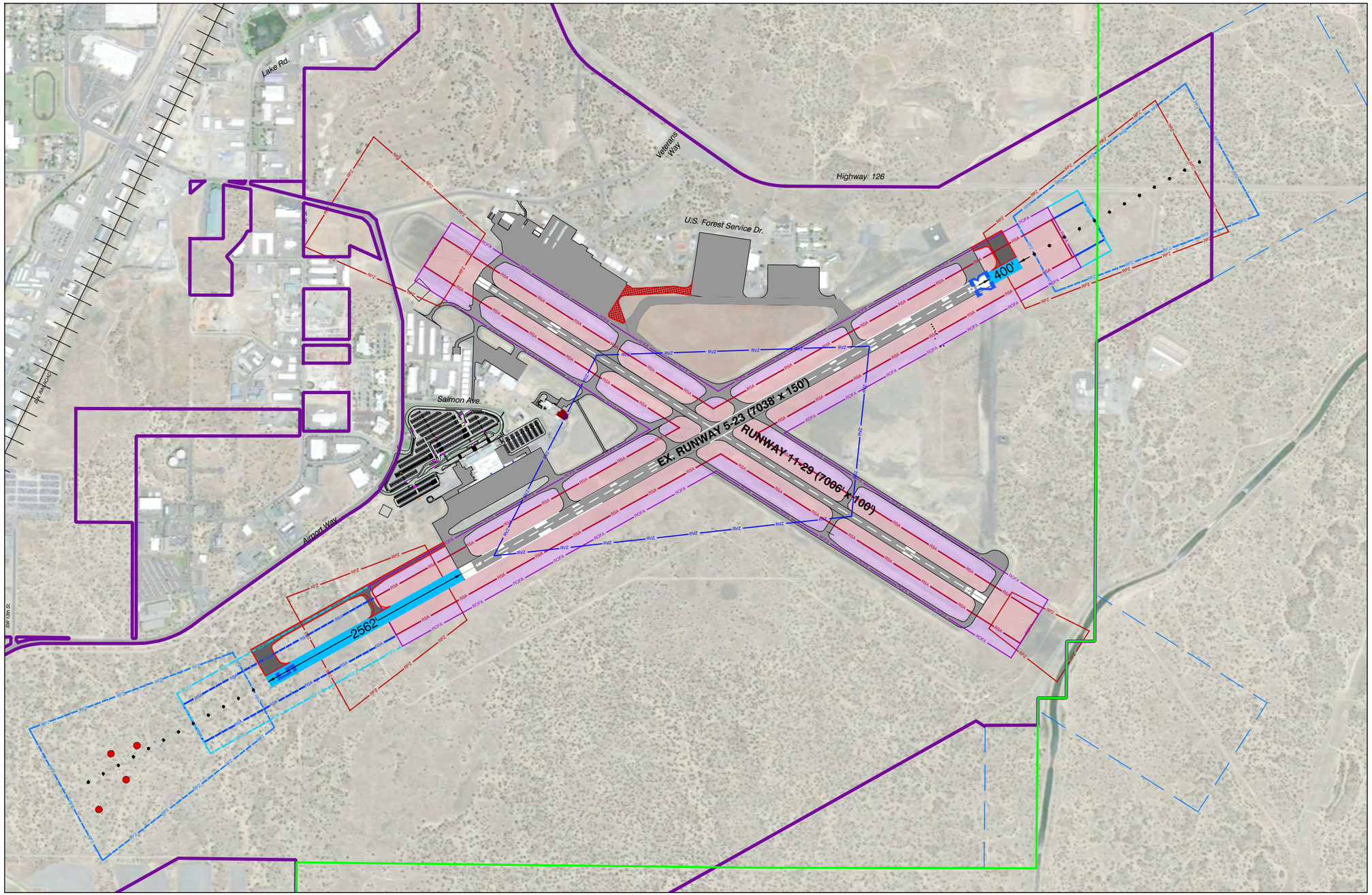
LEGEND

- RDM Property Boundary
- Urban Growth Boundary
- Avigation Easement
- Future Runway Extension
- Runway Safety Area (RSA)
- Future RSA
- Runway Object Free Area (ROFA)
- Future ROFA
- Runway Protection Zone (RPZ)
- Future RPZ
- Gravel Road Relocation
- Alignment Distance: 0.4 miles
- Tenant
- Tunnel
- Future Land Acquisition (63 acres)
- Future Parallel Taxiway
- Removed Airfield Pavement
- Runway Visibility Zone (RVZ)
- Obstruction to 50:1 Approach Surface
  Total Obstructions: 0

N

0' 600' 1,200'

Figure 4-4
Alternative 2B - Extend Runway Northeast



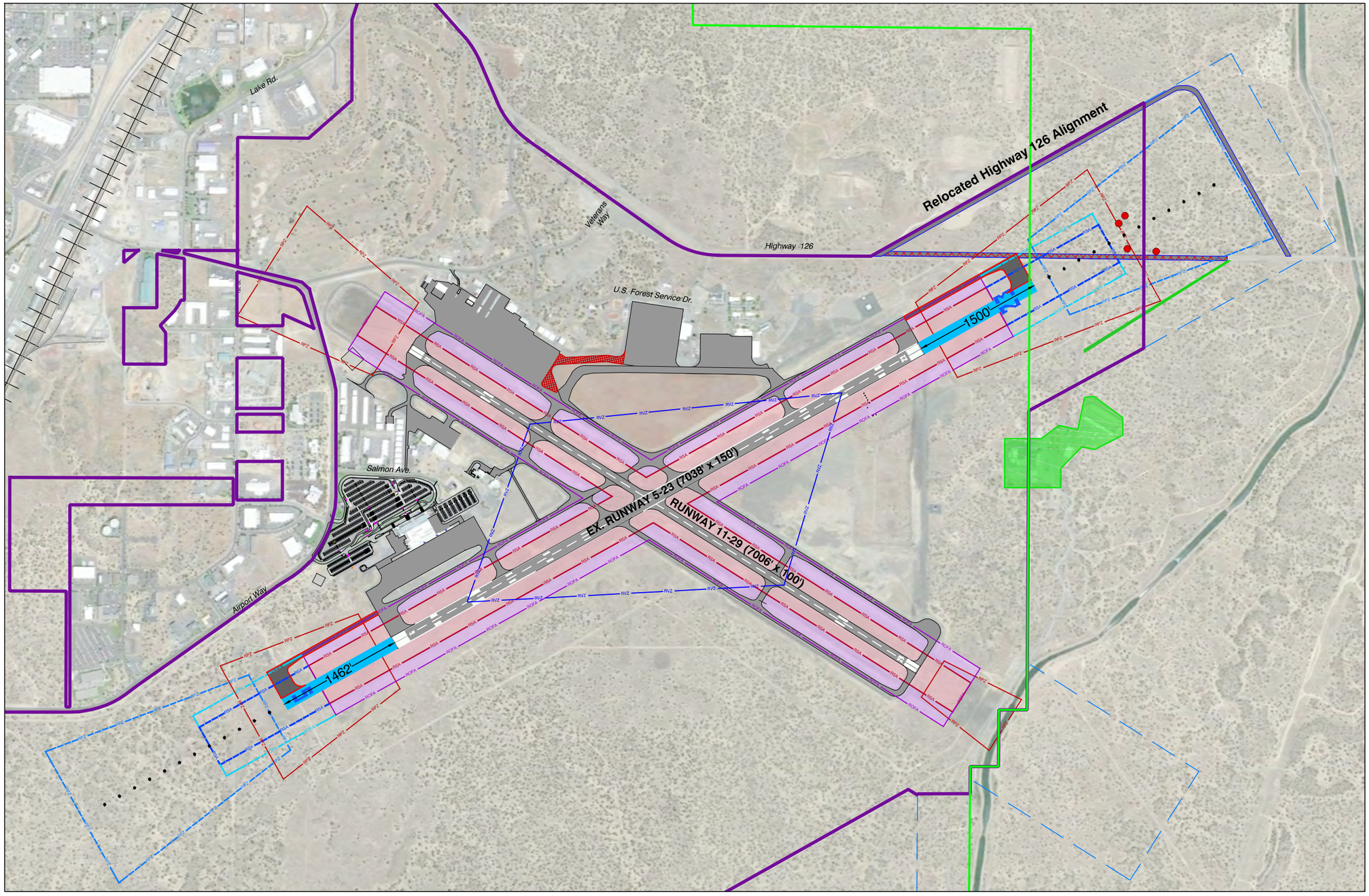
LEGEND

- RDM Property Boundary
- Urban Growth Boundary
- Avigation Easement
- Future Runway Extension
- Runway Safety Area (RSA)
- Future RSA
- Runway Object Free Area (ROFA)
- Future ROFA
- Runway Protection Zone (RPZ)
- Future RPZ
- ARFF Building
- Future Parallel Taxiway
- Removed Airfield Pavement
- Runway Visibility Zone (RVZ)
- Obstruction to 50:1 Approach Surface
  Total Obstructions: 4

N

0' 600' 1,200'

Figure 4-5
Alternative 3A - Split Runway Extension



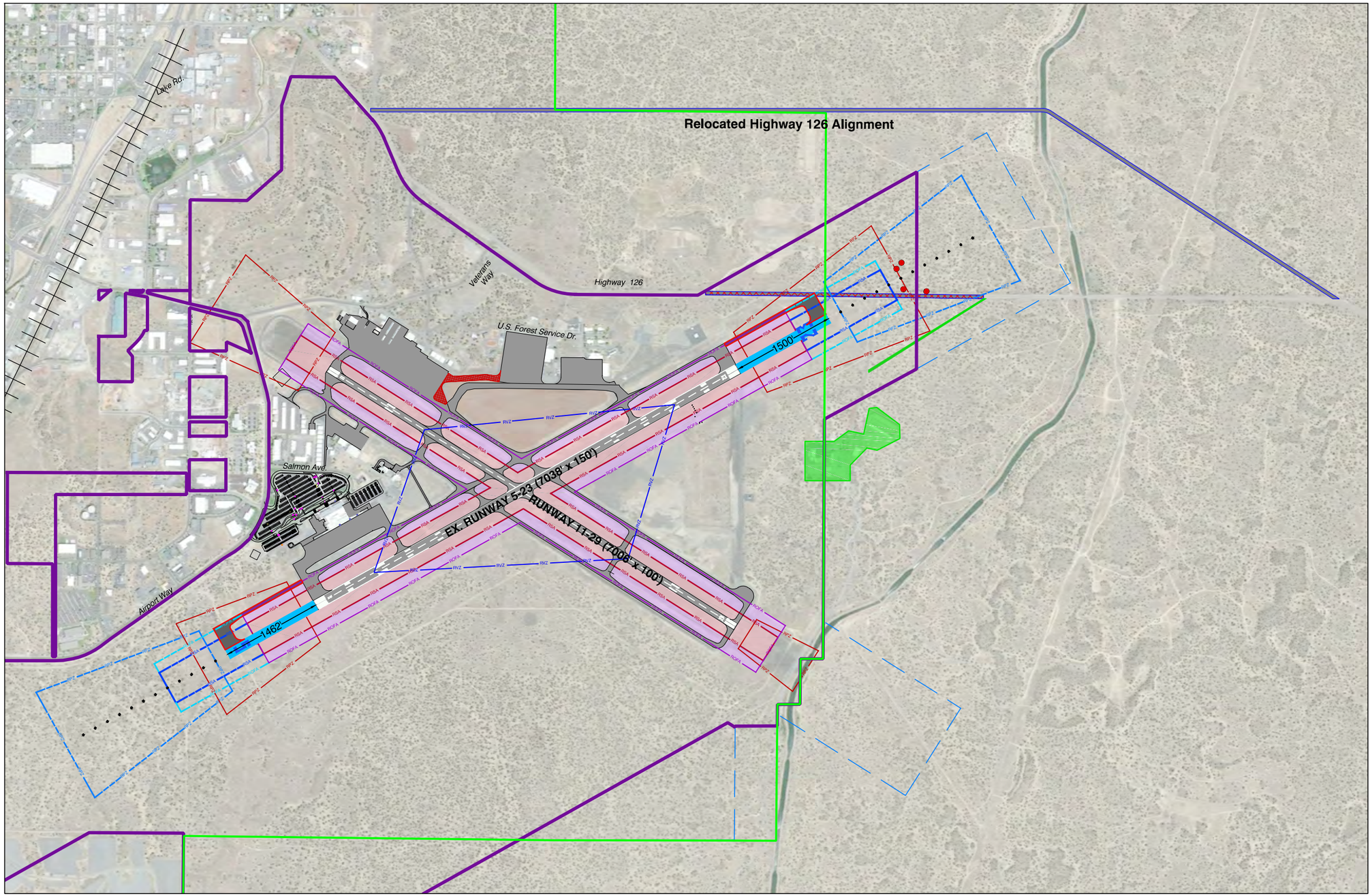
LEGEND

- RDM Property Boundary
- Urban Growth Boundary
- Avigation Easement
- Future Runway Extension
- Runway Safety Area (RSA)
- Future RSA
- Runway Object Free Area (ROFA)
- Future ROFA
- Runway Protection Zone (RPZ)
- Future RPZ
- Highway 126 Relocation
  Alignment Distance: 1.25 miles
- Highway 126 Removal
  Removal Distance: 0.8 miles
- Gravel Road Relocation
  Alignment Distance: 0.4 miles
- Tenant
- Future Parallel Taxiway
- Removed Airfield Pavement
- Runway Visibility Zone (RVZ)
- Obstruction to 50:1 Approach Surface
  Total Obstructions: 4

N

0' 600' 1,200'

Figure 4-6
Alternative 3B - Split Runway Extension



LEGEND

- RDM Property Boundary
- Urban Growth Boundary
- Avigation Easement
- Future Runway Extension
- Runway Safety Area (RSA)
- Future RSA
- Runway Object Free Area (ROFA)
- Future ROFA
- Runway Protection Zone (RPZ)
- Future RPZ
- Highway 126 Relocation
  Alignment Distance: 3 miles
- Highway 126 Removal
  Removal Distance: 0.8 miles
- Gravel Road Relocation
  Alignment Distance: 0.4 miles
- Tenant
- Future Parallel Taxiway
- Removed Airfield Pavement
- Runway Visibility Zone (RVZ)
- Obstruction to 50:1 Approach Surface
  Total Obstructions: 4

N

0' 750' 1,500'

Figure 4-7
Alternative 3C - Split Runway Extension

SUMMARY EVALUATION OF RUNWAY ALTERNATIVES

Table 4-1 presents a summary and an evaluation of the various alternatives for a runway extension at RDM. Alternative 1 is the preferred alternative because the Airport owns the land on which the runway extension will be built.

Table 4-1. Summary Evaluation Matrix of Runway Alternatives

Impact Category	Alternative 1	Alternative 2A	Alternative 2B	Alternative 3A	Alternative 3B	Alternative 3C
Description of Improvement	Extend Runway 5 2,962' to the southwest	Extend Runway 23 2,962' to the northeast	Extend Runway 23 2,962' to the northeast and Highway 126 tunnel under runway and taxiway	Extend Runway 5 2,562' to the southwest and extend Runway 23 400' to the northeast	Extend Runway 5 1,462' to the southwest and extend Runway 23 1,500' to the northeast	Extend Runway 5 1,462' to the southwest and extend Runway 23 1,500' to the northeast
Operational Capabilities						
Attract Larger Airplanes and Operating Weights and Range	Potential with longer published runway length for 5-23	Potential with longer published runway length for 5-23		Potential with longer published runway length for 5-23		
Critical Airspace Approach and Departure Surface Considerations	Instrument approach capabilities added to Runway 5	Instrument approach capabilities added to Runway 5		Instrument approach capabilities added to Runway 5		
Effect on All-Weather Capabilities	No Change	No Change		No Change		
NAVAIDS	Relocate with extension	Relocate with extension		Relocate with extension		
Runway Protection Zone Conflicts	Highway 126 in Runway End 23 RPZ	None	None due to Highway 126 tunnel.	Highway 126 in Runway End 23 RPZ	None	
Surface Transportation	Airport perimeter road in Runway 5 RPZ; Highway 126 in Runway 23 RPZ	None		Airport perimeter road in Runway 5 RPZ; Highway 126 in Runway 23 RPZ	None	
Effect on Night Operations	Instrument lighting proposed for Runway 5	Instrument lighting proposed for Runway 5		Instrument lighting proposed for Runway 5		
Performance Requirements						
Supporting Taxiways	Extend Taxiway F southwest 2,962' to new end of Runway 5	Extend Taxiway F northeast 2,962' to new end of Runway 23		Extend Taxiway F northeast 400' to new end of Runway 23 and 2,562' southwest to new end of Runway 5	Extend Taxiway F northeast 1,500' to new end of Runway 23 and 1,462' southwest to new end of Runway 5	
Obstructions	0 obstructions to NE 4 obstructions to SW	No obstructions		0 obstructions to NE 4 obstructions to SW	4 obstructions to NE 0 obstructions to SW	
Runway Visual Zone	Extends southwest by 1,481'; air carrier apron and ARFF bldg penetrate RVZ	Extends northeast by 1,481', no additional inclusions		Extends southwest by 1,281' and northeast by 200', air carrier apron and ARFF bldg penetrate RVZ	Extends southwest by 731' and northeast by 750', no additional inclusions	
Land Use Compatibility						
Impacts to Off- Airport Land Use	Potential decreased compatibility to the southwest	Potential decreased compatibility to the northeast and relocation of business required	Potential decreased compatibility to the southwest and northeast	Potential decreased compatibility to the southwest and northeast		
Impacts to Airport Property Use	Reduction in available building area southwest of relocated approach end of Runway 5 due to RPZ and approach surface shift	No Change		Reduction in available building area southwest of relocated approach end of Runway 5 due to RPZ and approach surface shift		

Table 4-1. Summary Evaluation Matrix of Runway Alternatives

Impact Category	Alternative 1	Alternative 2A	Alternative 2B	Alternative 3A	Alternative 3B	Alternative 3C
Description of Improvement	Extend Runway 5 2,962' to the southwest	Extend Runway 23 2,962' to the northeast	Extend Runway 23 2,962' to the northeast and Highway 126 tunnel under runway and taxiway	Extend Runway 5 2,562' to the southwest and extend Runway 23 400' to the northeast	Extend Runway 5 1,462' to the southwest and extend Runway 23 1,500' to the northeast	Extend Runway 5 1,462' to the southwest and extend Runway 23 1,500' to the northeast
Environmental Impact Potential						
Property Acquisitions / Easements	None	62 acres (Runway 23 RPZ and property around RPZ)		None		
Historic, Architectural, and Archaeological and Cultural Resources	None	The North Unit Main Canal (Historic Resource) would be located in the RPZ		None	The North Unit Main Canal (Historic Resource) would be located in the RPZ	
Section 4(F) of the Department of Transportation Act	None	The North Unit Main Canal (Section 4(f) Resource) would be located in the RPZ		None	The North Unit Main Canal (Section 4(f) Resource) would be located in the RPZ	
Material Excavation Quantities	Runway: 79,092 CY Taxiway: 10,792 CY Total: 89,884 CY	Runway: 1,693 CY Taxiway: 718 CY Total: 2,411 CY		Runway: 72,092 CY Taxiway: 9,416 CY Total: 81,508 CY	Runway: 11,893 CY Taxiway: 6,416 CY Total: 18,309 CY	Runway: 11,893 CY Taxiway: 3,416 CY Total: 15,309 CY
Impervious Surfaces (Runways and Associated Taxiways)	77,400 SY of additional pavement. (includes extension of Twy F)	77,400 SY of additional pavement. (includes extension of Twy F); 1.75 miles of relocated Highway 126	77,400 SY of additional pavement. (includes extension of Twy F)	85,300 SY of additional pavement. (includes extension of Twy F)	81,600 SY of additional pavement. (includes extension of Twy F); 1.25 miles of relocated Highway 126	
Stakeholder Feedback						
On/Off Airport Related Impacts	Low	Medium	High	Low	Medium	High
Project Risk	Low	High		Low	High	
Implementation Complexity	Low	High		Low	High	
Constructability						
Impact to Airport Operations	Low	Low		Low		
Phasing Complexity	Low	Low	High	Low	Medium	
Financial Costs/Impacts						
Project Cost	$48,450,000	$37,550,000	$58,440,000	$29,319,000	$31,555,000	$36,850,000
ALTERNATIVE EVALUATION						
DETERMINATION	**Favorable**	**Favorable**	**Not Favorable**	**Neutral**	**Not Favorable**	**Not Favorable**

AIRFIELD CAPACITY AND THIRD RUNWAY

As discussed in **Chapter 3 – Facility Requirements**, RDM is currently operating at 20 percent of its annual capacity, 27 percent of its Visual Flight Rules (VFR) hourly capacity and 36 percent of its Instrument Flight Rules (IFR) capacity with the existing runway configuration. Flight school operations are expected to double total operations at RDM but will not change the percentage of the mix index because of the weights of aircraft in the flight school fleet. All aircraft in the flight school fleet weigh below 12,500 pounds, and only aircraft that weigh greater than 12,500 pounds can be used in the mix index equation to determine maximum annual service volume (ASV). Total operations at RDM will approximate to 80,000, only 40 percent of its ASV of 200,000 operations. It is anticipated that the aviation activity forecasted through 2036 will not significantly change airfield capacity thus not justifying the need for additional runway capacity. However, a third parallel runway was identified in the previous April 2005 Airport Master Plan and is included on the FAA-approved current ALP (February 2005). The runway is parallel to Runway 5-23 with 3,700 feet centerline to centerline separation and is to initially be constructed 6,200 feet long and 100 feet wide with supporting taxiways and connectors. The ultimate runway was identified as 8,000 feet long and 100 feet wide.

Though it is not anticipated RDM will need a new third runway through 2036, this improvement will be preserved and carried forward into the preferred alternative. Land use controls are in place to protect the third runway from encroachment by incompatible development. Keeping the runway on the ALP preserves long-range flexibility for the Airport should operations require additional capacity, or airport development moves farther west.

4.5.2 TAXIWAY ALTERNATIVES

Airports should provide a safe and efficient taxiway system to expedite aircraft movements to and from the runways and apron areas. The purpose of taxiway improvements is to develop layouts that are operationally efficient, enhance safety, improve circulation, increase capacity and address needs identified in **Chapter 3 – Facility Requirements**. Alternatives are evaluated in this section and recommended improvements to the taxiway system are identified below.

- ✓ Taxiway A (north side): additional pavement will be added to shift the point at which Taxiway C curves and becomes Taxiway A. Taxiway centerline striping on the apron will be modified to connect to Taxiway C and require an additional turn to access Taxiway A.
- ✓ Taxiway A (south side): pavement will be added to shift the point at which Taxiway A connects to Taxiway G. This will require aircraft using the apron taxilane to taxi on Taxiway G before turning to access Taxiway A.
- ✓ Taxiway E: the existing taxiway segment between the apron and Taxiway F will be removed. It will be replaced with a new connector taxiway located about 400 feet east of the existing taxiway (measured centerline to centerline).

Taxiway H: the existing taxiway segment between the apron and Taxiway F will be removed. It will be replaced with a new connector taxiway located about 175 feet east of the existing taxiway (measured centerline to centerline).

ALTERNATIVE 1 – FULL-LENGTH PARALLEL TAXIWAY

This alternative involves addressing FAA-identified Hot Spots 1 and 2 and refines the Airport's taxiway system to resolve issues related to direct access to the runway from an aircraft apron area and non-standards pavement conditions, as shown in **Figure 4-8**, and as discussed in FAA AC 150/5300-13A, Change 1, *Airport Design*. A new parallel taxiway would be constructed in three phases on the eastside of Runway 5-23 with new taxiway connectors to the runway and Taxiway F. The first phase of construction would add 34,379 SY of additional pavement. The second phase would add 24,765 SY of additional pavement, and the third phase would add 26,067 SY of additional pavement. Pavement from Taxiways C and G between the new parallel taxiway and Taxiway F would be removed to address FAA Hot Spots 1 and 2 and mitigate the potential of a runway incursion. The existing Taxiway H and E intersections that facilitate direct access from the passenger apron to Runway 5-23 would be moved to a location that mitigates the potential for aircraft to accidentally cross Taxiway F and unintentionally enter the runway environment. An additional Taxiway connection to Taxiway F would be constructed to facilitate aircraft movement to and from the apron area. To resolve the non-standard pavement conditions, pavement would be added to both sides of the Taxiway A intersections to form a 90-degree turn and eliminate the wide-pavement areas.

Separately, in-fill pavement would be added to the existing aircraft apron area to increase the size of the apron and provide additional uses to include aircraft parking, ground service equipment staging, and storage or other as-needed storage or staging.

The phased approach to project construction allows the Airport to add additional taxiway pavement as needed and minimizes impact on airport operations during construction. The runways will need to be closed temporarily when connector taxiways are added, and when Phase 2 crosses Runway 11-29. Construction can be scheduled to minimize overall disruption.

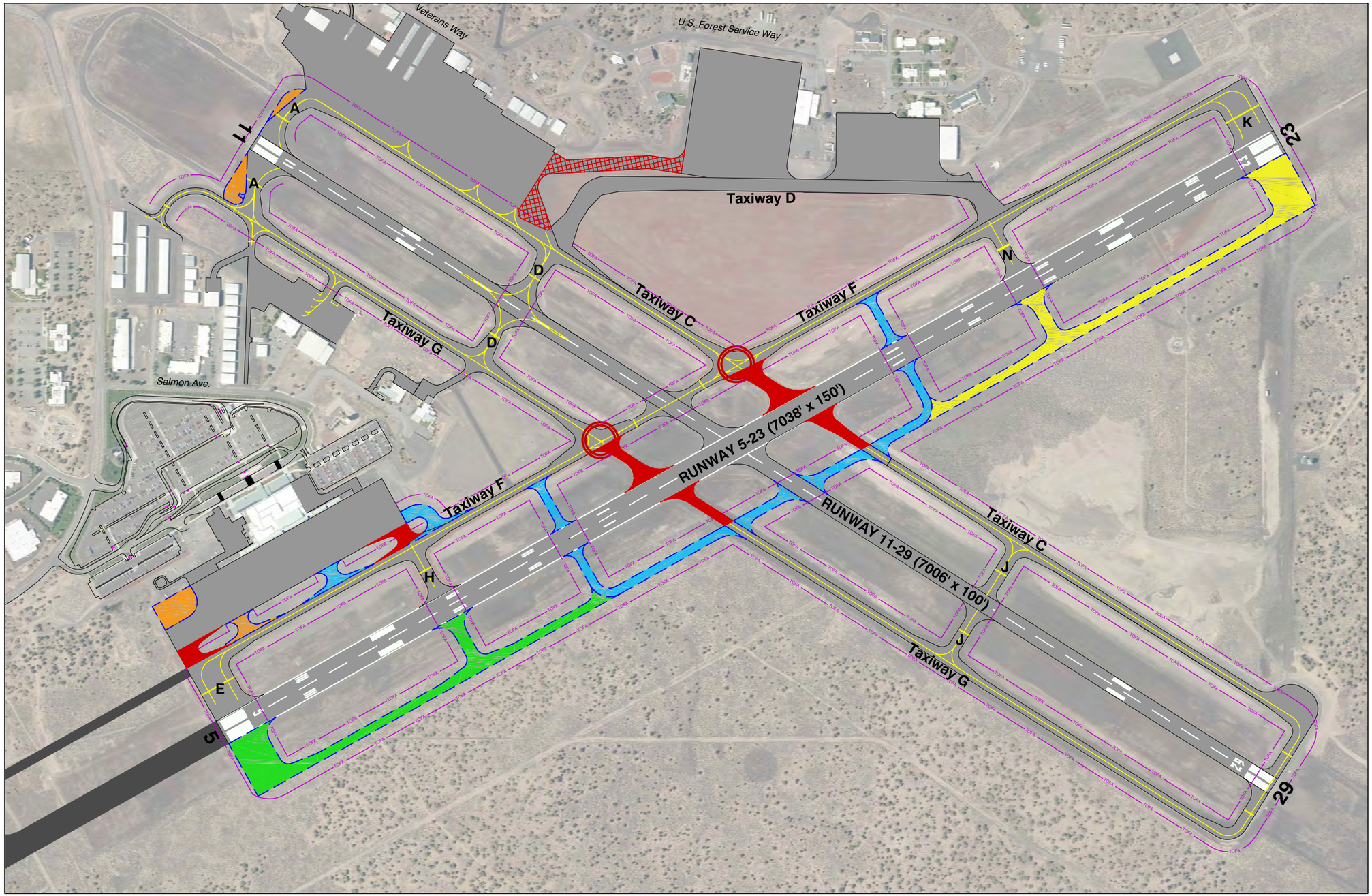
This alternative is estimated at a total project cost of $20,400,00 and includes engineering, environmental compliance, and construction management services.

ALTERNATIVE 2 – PARALLEL TAXIWAY WITH OFFSET

This alternative, as shown in **Figure 4-9**, is a derivative of Alternative 1 and similarly addresses FAA identified Hot Spots 1 and 2 and resolves all pavement conditions identified in FAA AC 150/5300-13A, Change 1, *Airport Design*. The only difference between Alternatives 1 and 2 relate to designing the new parallel taxiway on the eastside of Runway 5-23 and eliminating the taxiway connectors between Taxiway C and G. New taxiway connectors would be constructed to prevent the creation of hot spots similar to the

existing FAA identified Hot Spots 1 and 2 on the opposite side of the airfield. Other conditions remain the same.

This alternative is estimated at a total project cost of $10,913,000 and includes engineering, environmental compliance, and construction management services.



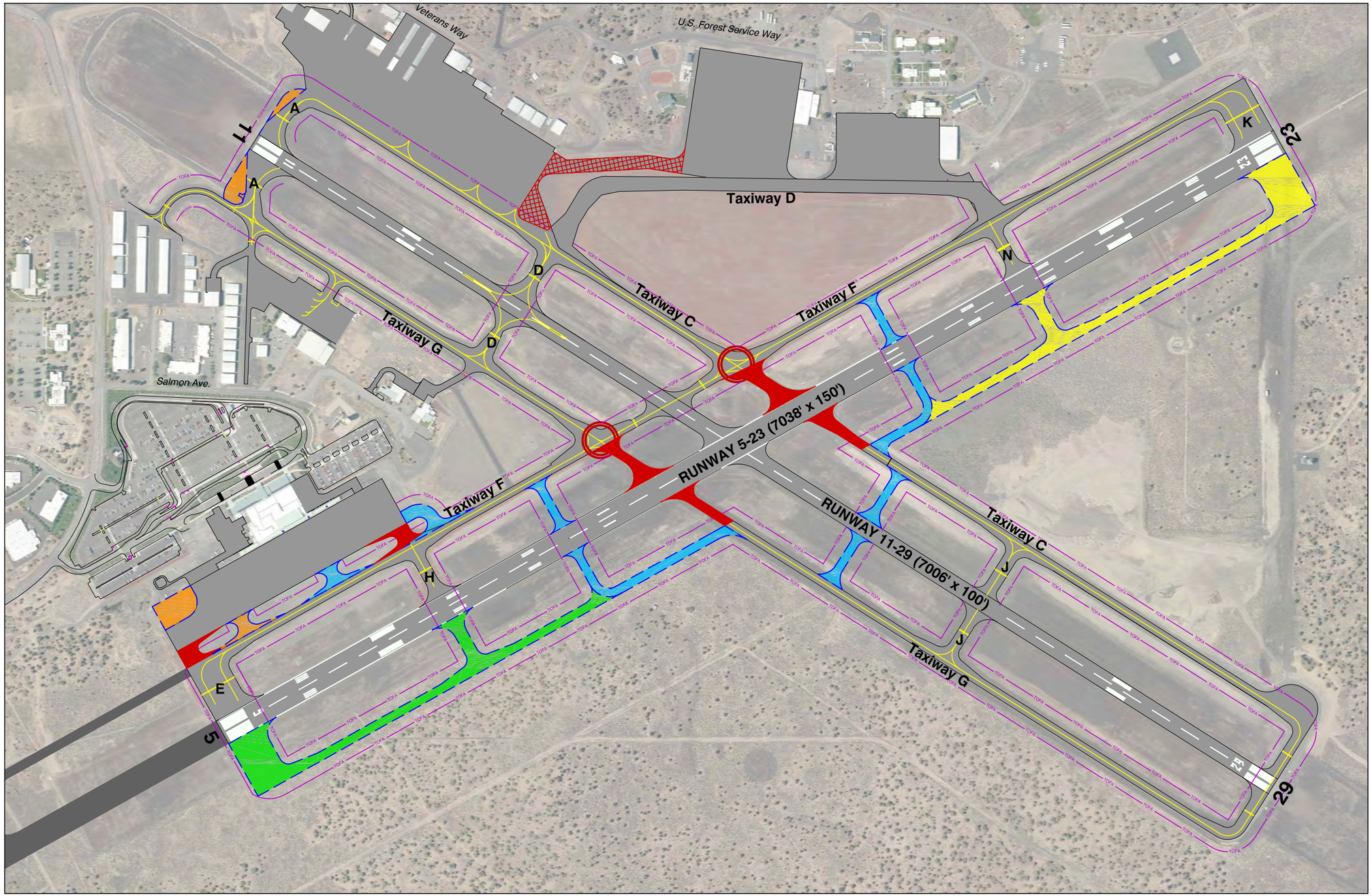
LEGEND

- Taxiway/Taxilane Object Free Area (TOFA)
- Existing Pavement
- Runway Extension - Alternative 1
- Airfield Pavement to be Removed
- Future Taxiway Pavement (Phase 1)
- Future Taxiway Pavement (Phase 2)
- Future Taxiway Pavement (Phase 3)
- Removed Airfield Pavement
- Fiscal Year 2018 project
- Existing Hotspot

N

0' 300' 600'

Figure 4-8
Alternative 1 - Full Length Parallel Taxiway



LEGEND

- Taxiway/Taxilane Object Free Area (TOFA)
- Existing Pavement
- Runway Extension - Alternative 1
- Airfield Pavement to be Removed
- Future Taxiway Pavement (Phase 1)
- Future Taxiway Pavement (Phase 2)
- Future Taxiway Pavement (Phase 3)
- Removed Airfield Pavement
- Fiscal Year 2018 project
- Existing Hotspot

N

0' 300' 600'

Figure 4-9
Alternative 2 - Parallel Taxiway with Offset

SUMMARY EVALUATION OF TAXIWAY ALTERNATIVES

Table 4-2 presents a summary and an evaluation of the various alternatives for taxiway improvements at RDM. Alternative 1 is the preferred alternative due to the taxiway connectors not being offset, resulting in a full length parallel taxiway.

Table 4-2.Summary Evaluation Matrix of Taxiway Alternatives

Impact Category	Alternative 1	Alternative 2
Description of Improvement	Parallel taxiway on east side of RWY 5-23.	Parallel taxiway on east side of RWY 5-23.
Operational Capabilities		
Airfield Operability & Access	New east and west access to RWY 5-23	New east and west access to RWY 5-23
Presents Solution for FAA Identified Hot Spots 1 & 2	Yes	Yes
Airline and GA Aircraft Separation	Yes	Yes
Performance Requirements		
Reduces Aircraft Taxi Times	TBD	TBD
Increases Potential for Development	Yes	Yes
Expansion Capabilities	Project can be completed in multiple phases	Project can be completed in multiple phases
AC 150/5300-13A Deficiencies	Resolved	Resolved
Complies with Current Design Criteria	Yes	Yes
Land Use Compatibility		
Impacts to Airport Property Use	New airside or landside development area east of RWY 5-23	New airside or landside development area east of RWY 5-23
Aviation Compatible Use	Yes	Yes
Environmental Impact Potential		
Property Acquisitions / Easements	None	None
Impervious Surfaces	Additional Pavement: Phase 1: +/- 34,379 SY Phase 2: +/- 24,765 SY Phase 3: +/- 26,067 SY	Additional Pavement: Phase 1: +/- 34,379 SY Phase 2: +/- 24,765 SY Phase 3: +/- 26,067 SY
Constructability		
Impact to Airport Operations	Low	Low
Phasing Complexity	Low	Low
Financial Costs/Impacts		
Project Cost	$20,400,000	$10,913,000
ALTERNATIVE EVALUATION		
DETERMINATION	**Favorable**	**Favorable**

4.5.3 AIRPORT VEHICLE PARKING ALTERNATIVES

Chapter 3 – Facilities Requirements identified the need for additional vehicle parking. The airport reached the terminal parking lot capacity of 1,083 vehicles multiple times in 2016 and had to utilize overflow parking lots. An additional 1,100 parking stalls will be needed to meet demand through 2036. This section analyzes landside alternatives through options focused on adding hourly and premium vehicle parking, long-term vehicle parking, remote vehicle employee vehicle parking, vendor vehicle parking, and rental car facilities.

It is noted that the Airport has begun to see service by transportation network companies (TNCs) like Lyft and Uber. Service by TNCs could theoretically reduce future parking demand if passengers opt to take TNCs to and from the Airport rather than using their own vehicles. It is recommended that the Airport monitor how TNCs impact parking demand and adjust planning assumptions accordingly. Since each community is different and TNCs are a relatively new entrant to the RDM market, it is unknown how much impact they will have on parking demand.

A passenger vehicle parking garage was not considered as part of the alternatives analysis due to the abundance of available vacant land, operational impacts during construction, costs associated with long-term operations and maintenance, and impacts to the scenic views to and from the passenger terminal building.

ALTERNATIVE 1 – SOUTHWEST DEVELOPMENT

This alternative adds an estimated 4,000 parking stalls, as shown in **Figure 4-10**, and involves converting the existing hourly terminal parking lot into a combination of hourly and premium long-term parking. The estimate for the number of parking stalls is based on the average space for stalls and circulation.

Additional hourly and premium long-term parking would be developed directly adjacent to the existing hourly terminal parking. This vehicle parking lot would require the relocation of existing tenants and building demolition. The existing employee vehicle parking lot to the west of the passenger terminal would be converted to hourly or premium long-term parking. A new employee vehicle parking lot would be developed off Salmon Avenue, between the south GA apron and snow removal equipment building. Additional long-term vehicle parking would be developed west of SE Airport Way, and a remote vehicle parking lot would be developed north of the Deschutes County Fair Grounds Expo Center, along the west side of SE Airport Way. Rental car facilities would be developed just north of the additional long-term vehicle parking lot.

For the Airport to provide service to these new areas, the Airport would need to implement a bus operation as the distance to the new passenger parking lot from the passenger terminal ranges from 1.2 to 1.5 miles. This would increase costs due to the need for procurement of a bus fleet, and the on-going costs for fuel, maintenance, and drivers.

The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas and would have minimal impact to airport operations. Potential exists for the discovery of archaeological resources in the project area, and it is recommended that a field survey be conducted prior to any construction.

This alternative is estimated at a total project cost of $21,400,000 and includes engineering, environmental compliance, and construction management services.

ALTERNATIVE 2A – SE AIRPORT WAY DEVELOPMENT

This alternative adds an estimated 3,100 parking stalls, as shown in **Figure 4-11**, and involves converting the existing hourly terminal parking lot into a combination of hourly and premium long-term parking. The estimate for the number of parking stalls is based on the average space for stalls and circulation.

The existing employee vehicle parking lot to the west of the passenger terminal would be converted to hourly or premium long-term parking. A new employee vehicle parking lot would be developed off Salmon Avenue, between the south GA apron and snow removal equipment building. Additional remote and long-term vehicle parking would be developed closer to the central passenger terminal area east of SE Airport Way and outside of critical Runway 5-23 design surfaces. Rental car facilities would be developed just north of the additional long-term vehicle parking lot adjacent to the central passenger terminal area.

For the Airport to provide service to these new areas, the Airport would need to implement a bus operation as the distance to the new passenger parking lot ranges from half a mile to one mile. This would increase costs due to the procurement of a bus fleet, fuel, maintenance, and drivers.

The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations. A potential exists, however, for the discovery of archaeological resources in the area of this alternative, and it is recommended a survey be conducted prior to any construction.

This alternative is estimated at a total project cost of $13,692,000 and includes engineering, environmental compliance, and construction management services. It does not include increased operational costs or vehicle costs associated with bus service.

ALTERNATIVE 2B – SE AIRPORT WAY DEVELOPMENT

This alternative adds an estimated 1,600 parking stalls, as shown in **Figure 4-12**, and is derived from Alternative 2A. Alternative 2B involves converting the existing hourly terminal parking lot into a combination of hourly and premium long-term parking. The estimate for the number of parking stalls is based on the average space for stalls and circulation.

The existing employee vehicle parking lot to the west of the passenger terminal would be converted to hourly or premium long-term parking. A new employee vehicle parking lot would be developed off Salmon Avenue, between the south GA apron and snow removal equipment building.

Additional long-term vehicle parking would be developed in multiple phases, with the first phase on property west of SE Airport Way on a vacant parcel within an industrial complex. The second phase would be on property east of SE Airport Way close to the terminal area. Additional remote vehicle parking and rental car facilities would be developed closer to the central passenger terminal area west of SE Airport Way and outside of critical Runway 5-23 design surfaces. These facilities would be adjacent to the second phase for long-term vehicle parking.

For the Airport to provide service to these new areas, a similar type of bus operation as Alternative 2A would need to be implemented by the Airport as the distance to the new passenger parking lot from the passenger terminal ranges from half a mile to one mile.

The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations. A potential exists, however, for the discovery of archaeological resources in the area of this alternative, and it is recommended a survey be conducted prior to any construction.

This alternative is estimated at a total project cost of $10,678,000 and includes engineering, environmental compliance, and construction management services. It does not include increased operational costs or vehicle costs associated with bus service.

ALTERNATIVE 2C – SE AIRPORT WAY DEVELOPMENT

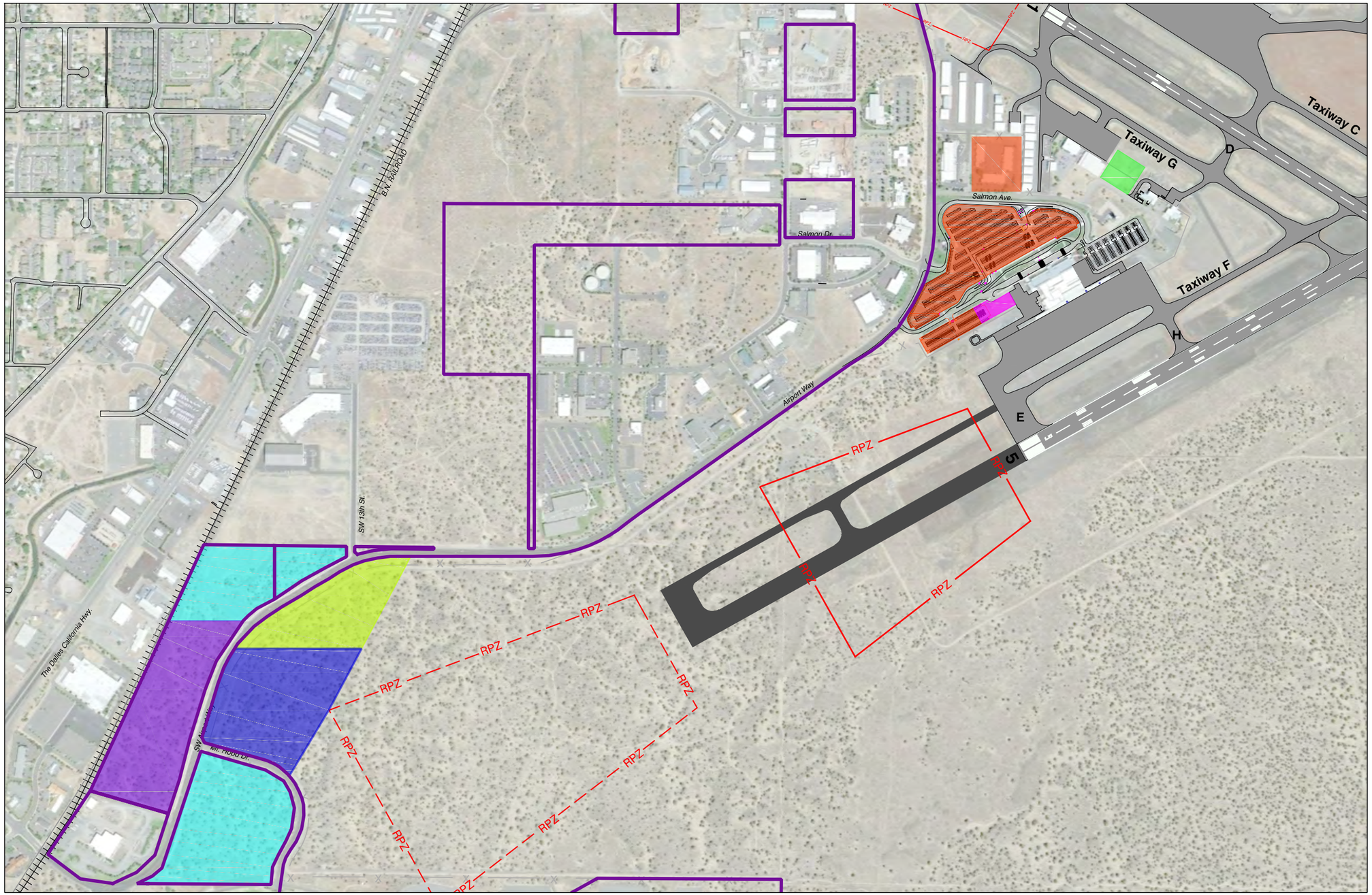
This alternative adds an estimated 1,700 parking stalls, as shown in **Figure 4-13,** and is derived from Alternatives 2A and 2B. Alternative 2C involves converting the existing hourly terminal parking lot into a combination of hourly and premium long-term parking. The estimate for the number of parking stalls is based on the average space for stalls and circulation.

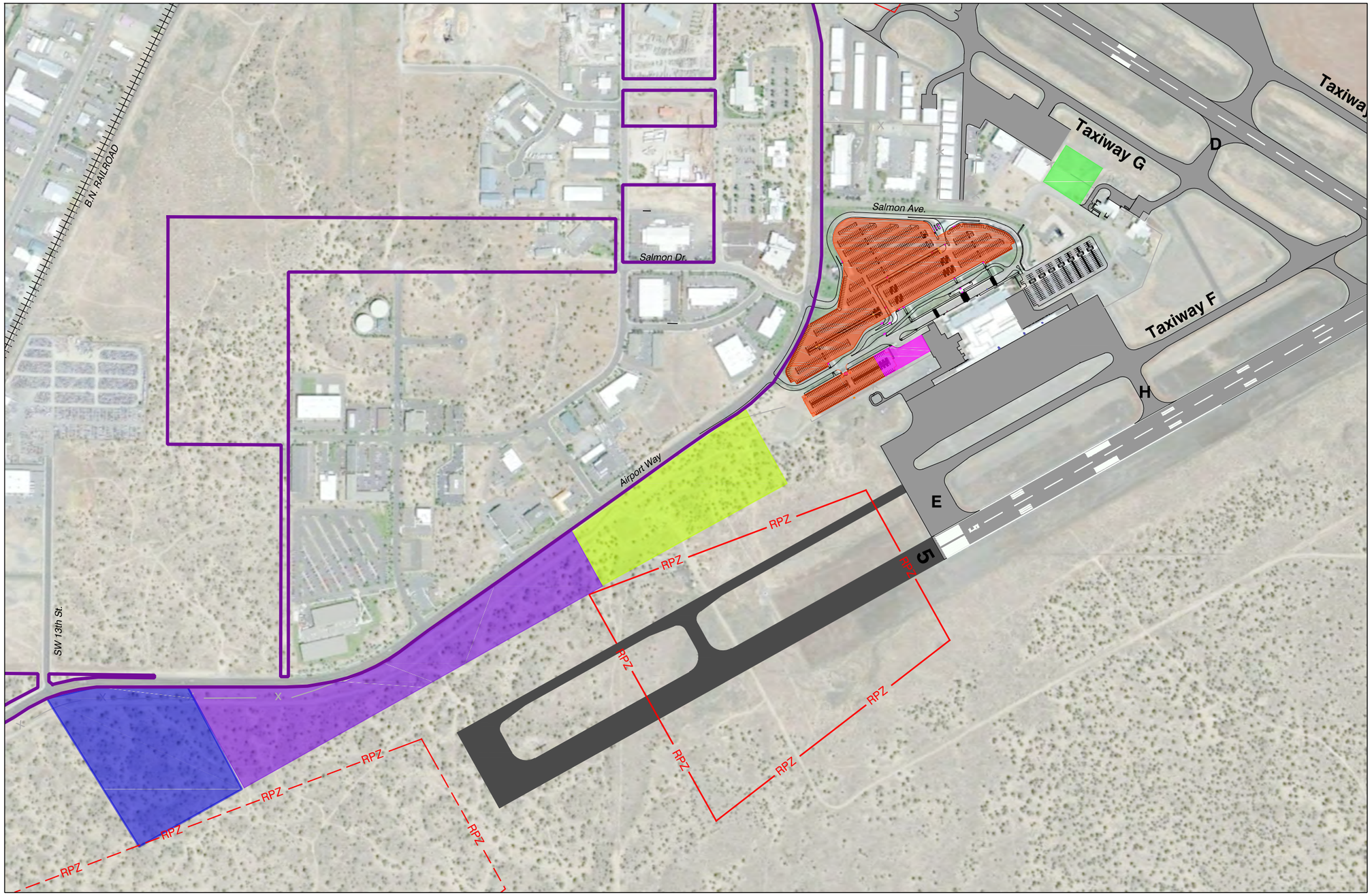
The existing employee vehicle parking lot to the west of the passenger terminal would be converted to hourly or premium long-term parking. A new employee vehicle parking lot would be developed off Salmon Avenue, between the south GA apron and snow removal equipment building. Additional long-term vehicle parking would be developed in multiple phases with the first phase on property east of SE Airport Way. The second phase would require the relocation of existing tenants and building demolition; however, this parcel of land is close to the terminal area. Tenants would be relocated to a vacant parcel within an industrial complex. Additional remote vehicle parking and rental car facilities would be developed closer to the central passenger terminal area west of SE Airport Way and outside of critical Runway 5-23 design surfaces. These facilities would be adjacent to the initial phase for long-term vehicle parking.

For the Airport to provide service to these new areas, the Airport would need to implement a bus operation as the distance to the new passenger parking lot from the terminal building ranges from one half to one mile. This would increase costs due to the need for procurement of a bus fleet, and the on-going costs for fuel, maintenance, and drivers.

The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations. A potential exists, however, for the discovery of archaeological resources in the area of this alternative, and it is recommended a survey be conducted prior to any construction.

This alternative is estimated at a total project cost of $16,222,000 and includes engineering, environmental compliance, and construction management services. It does not include increased operational costs or vehicle costs associated with bus service.


B.N. RAILROAD
Salmon Ave.
Salmon Dr.
Airport Way
SW 13th St.
Taxiway C
Taxiway G
Taxiway F
D
H
E
5
RPZ
RPZ
RPZ



LEGEND

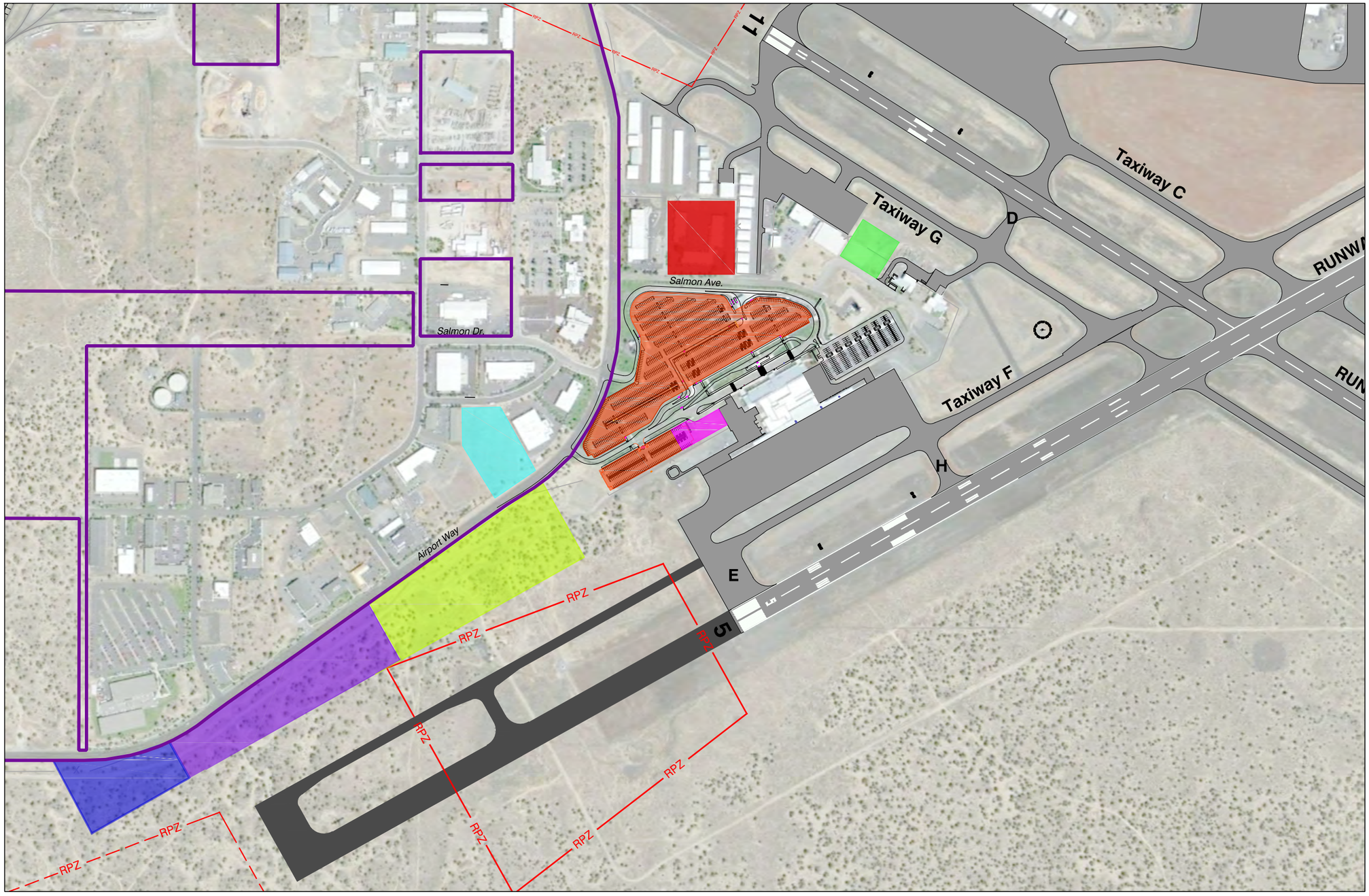
- RDM Property Boundary
- Runway Protection Zone (RPZ)
- Runway Extension - Alternative 1
- Future RPZ
- Rental Car Facilities
- Long Term Parking
- Remote Parking
- Area 1 - Hourly & Premium Long-Term Parking
- Area 2 - New Employee Parking
- Area 3 - Expanded Vendor Parking as Necessary

N

0’ 300’ 600’

Figure 4-11
Alternative 2A - SE Airport Way Development

T1
Taxiway C
Taxiway G
D
RUNW
Salmon Ave.
Salmon Dr.
Taxiway F
H
RUN
Airport Way
E
E1
S
RPZ
RPZ
RPZ



LEGEND

- RDM Property Boundary
- Runway Protection Zone (RPZ)
- Runway Extension - Alternative 1
- Future RPZ
- Rental Car Facilities
- Long Term Parking Phase 1
- Long Term Parking Phase 2
- Remote Parking
- Area 1 - Hourly & Premium Long-Term Parking
- Area 2 - New Employee Parking
- Area 3 - Expanded Vendor Parking as Necessary
- Relocated Tenants

N

0’ 300’ 600’

Figure 4-13
Alternative 2C - SW Airport Way Development

SUMMARY EVALUATION OF VEHICLE PARKING ALTERNATIVES

Table 4-3 presents a summary and an evaluation of the various alternatives for vehicle parking at RDM. Alternative 1 is the preferred alternative because of the increase in the amount of parking stalls (estimated increase of 4,000) and the minimal impact to airport operations.

Table 4-3. Vehicle Parking Alternatives Summary Evaluation Matrix

Impact Category	Alternative 1	Alternative 2A	Alternative 2B	Alternative 2C
Description of Improvement	Reorganization of existing vehicle parking and additional long term/remote vehicle parking lots	Reorganization of existing vehicle parking and additional long term/remote vehicle parking lots		
Operational Capabilities				
Operability & Access to Terminal	Increases existing parking stalls by 314%.	Increases existing parking stalls by 287%.	Increases existing parking stalls by 153%.	Increases existing parking stalls by 161%.
Surface Transportation	Passengers are transported via bus to/from the terminal.	Passengers are transported via bus to/from the terminal.		
Transportation Cost	Increased cost for procurement of bus fleet, fuel and continued maintenance	Increased cost for procurement of bus fleet, fuel and continued maintenance		
Performance Requirements				
Addition or Subtraction of Vehicle Parking Stalls	Estimated 4,052 additional stalls	Estimated 3,109 additional stalls	Estimated 1,667 additional stalls	Estimated 1,744 additional stalls
Estimated Distance from Terminal to Vehicle Parking Lot	6,500' to 8,000'	2,000' to 5,000'	1,500' to 4,000'	1,000' to 4,000'
Conforms to FAA Standards	No Parking in RPZ.	Future parking in RPZ and no height conflicts with critical surfaces.		
Land Use Compatibility				
Impacts to Airport Property Use	Undeveloped property repurposed into vehicle parking.	None		Business relocation to repurpose land into vehicle parking.
Property Acquisition	None	None	Yes	
Business Relocation	Yes	None		Yes
Impacts to Off- Airport Land Use	None	None	Vacant property repurposed into vehicle parking.	Vacant property repurposed for Commercial/Industrial use.
Environmental Impact Potential				
Property Acquisitions / Easements	None	None	Yes	
Historic, Architectural, and Archaeological and Cultural Resources	Potential exists for discovery of archaeological resources	Potential exists for discovery of archaeological resources		
Threatened and Endangered Species	Requires Contact of USFWS - East Wolf Mgmt. Zone.	Requires Contact of USFWS - East Wolf Mgmt. Zone.		
Stakeholder Feedback				
Supporting Services	Required	Required		
Compatible w/Existing Development	Above Average	Excellent	Above Average	Above Average
Protection of Scenic View (Terminal)	No Impact	No Impact		
Constructability				
Impact to Airport Operations	Minimal	Construction near SE Airport Way and Central Terminal Area		
Building Demolition	Yes	No		Yes
Phasing Complexity	Low	Medium		
Financial Costs/Impacts				
Project Cost	$21,400,000	$13,692,000	$10,678,000	$16,222,000
OVERALL EVALUATION				
DETERMINATION	**Favorable**	**Favorable**	**Not Favorable**	**Not Favorable**

4.5.4 GENERAL AVIATION DEVELOPMENT ALTERNATIVES

As discussed in **Chapter 4 – Facility Requirements**, the existing GA facilities are constrained and lack easily developable areas with airfield access. Demand forecasts project additional based aircraft, corporate aviation related activities, and a potential flight school. This section analyzes GA development alternatives focused on accommodating anticipated demand with a maximum build potential.

ALTERNATIVE 1 – CENTRAL DEVELOPMENT AREA

This alternative, as shown in **Figure 4-14**, focuses on the development of a vacant 37.6-acre parcel of land southeast of the proposed taxiway parallel to Runway 5-23. This parcel has been identified for future aviation use and can be developed to accommodate many GA activities. This site does penetrate the existing RVZ and has direct access to Runway 5-23.

The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations. Earthwork is a significant factor due to the significant grades and known presence of rock in the area that requires excavation and embankment quantities of 9,200 CY and 151,000 CY, respectively.

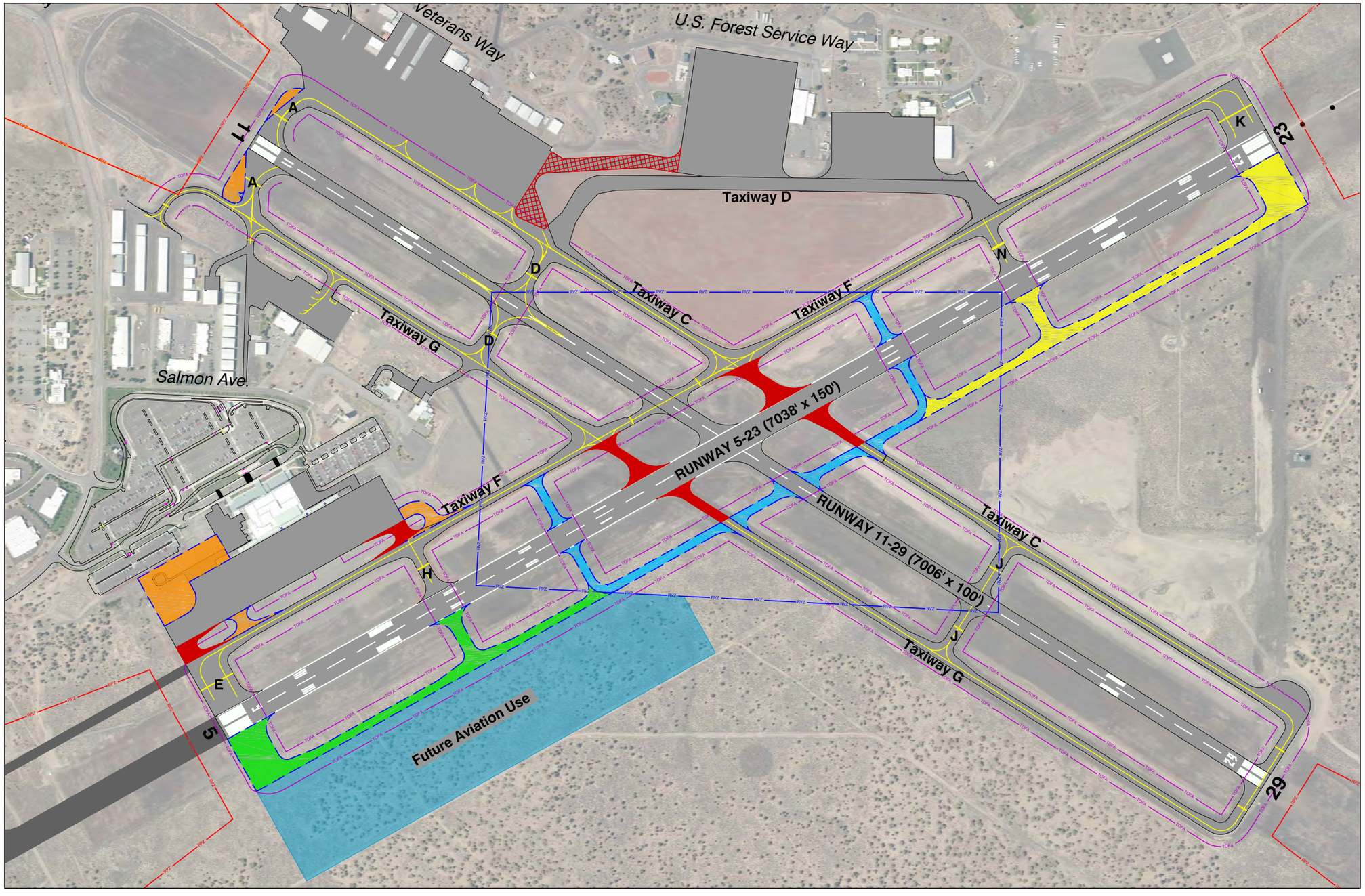
This alternative is estimated at a total project cost of $19,491,000 and includes engineering, environmental compliance, and construction management services.

ALTERNATIVE 2 – NORTH DEVELOPMENT AREA

This alternative, as shown in **Figure 4-15,** focuses on the redevelopment of existing GA facilities on the northwest side of the Airport while maximizing the development of vacant land north and south of SE Veterans Way for a total of 60 acres.

Future aviation development would occur north of existing GA facilities and south of Highway 126. The development would require relocating segments of SE Airport Way, SW Sisters Avenue, and SE Sisters Avenue and provide new access to existing buildings, leasehold areas, and new facilities. The future aviation development would be the potential site for a new flight school, or fixed-base operator (FBO). A new single engine air tanker (SEAT) Base would be located adjacent to existing USFS buildings. New commercial development would surround proposed aviation development and border, but not impact, Highway 126. It is recommended that all Airport property on the north side of the Airport, that is outside of the RPZ for Runway End 11, the USFS lease and GA development areas, be rezoned for airport compatible general commercial zoning.

This alternative is estimated at a total project cost of $72,000,000 and includes engineering, environmental compliance, and construction management services. Total project cost reflects the full buildout of this alternative.



LEGEND

- Taxiway/Taxilane Object Free Area (TOFA)
- Runway Protection Zone (RPZ)
- Runway Visibility Zone (RVZ)
- Existing Pavement
- Runway Extension - Alternative 1
- Removed Airfield Pavement
- Airfield Pavement to be Removed
- Future Taxiway Pavement (Phase 1)
- Future Taxiway Pavement (Phase 2)
- Future Taxiway Pavement (Phase 3)
- Fiscal Year 2018 project
- Central GA Development Area: 1,642,054 Sq. FT.

N

0' 300' 600'

Figure 4-14
Alternative 1 - Centralized Development Area

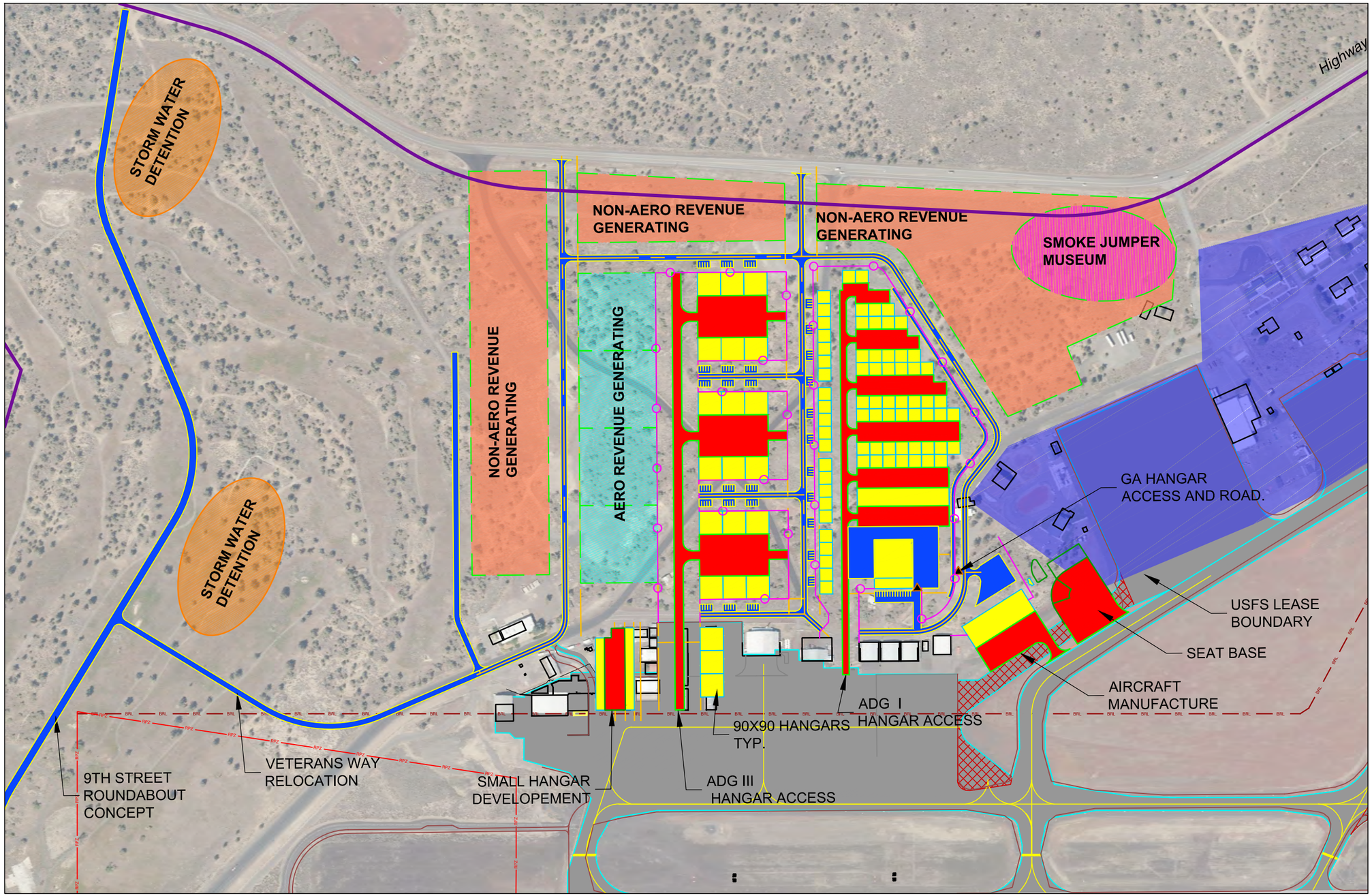


Figure 4-15
Alternative 2 - North Development Area

SUMMARY EVALUATION OF GA DEVELOPMENT ALTERNATIVES

Table 4-4 presents a summary and an evaluation of the various alternatives for GA development at RDM. Alternative 2 is the preferred alternative because development of the north area will have minimal impacts to airport operations and the airfield and will help meet demand for future based aircraft.

Table 4-4. General Aviation Development Alternatives Summary Evaluation

Impact Category	Alternative 1	Alternative 2
Description of Improvement	Expand GA development east of RWY 5-23.	Expand north GA area for future based aircraft.
Operational Capabilities		
Operability & Access	Accommodates anticipated demand. New roadways required.	Accommodates anticipated demand. Roadway relocations required.
Airfield Impacts	Low	Low
Airline and GA Aircraft Separation	Yes	Yes
Hangar and Building Facility Additions	Greenfield site - potential multiple uses.	New flight school, FBO and hangar facilities for corporate and general aviation users
Performance Requirements		
Expansion Capabilities	Estimated 1,642,054 Sq. FT. of new development	Estimated 2,574,000 Sq. FT. of new development
Increases Potential for Development	Yes	Yes
Land Use Compatibility		
Impacts to Airport Property Use	Undeveloped land repurposed into aviation use.	Undeveloped land repurposed into aviation use.
Impact to Other Facilities	None	Demolition of older hangar facilities
Environmental Impact Potential		
Impervious Surfaces	Unknown	Estimated 46,350 SY of additional airfield pavement and 34,350 SY of additional roadway pavement
Property Acquisitions / Easements	None	Relocation of Veterans Way and 10th Street
Historic, Architectural, and Archaeological and Cultural Resources	None	Removal of two of four historic structures on airport property (Warehouse #1 and #2, circa 1940)
Section 4(F) of the Department of Transportation Act	None	Potential removal of an identified Section 4(f) resource
Tenant Relocation Required	No	Yes
Threatened and Endangered Species	Requires Contact of USFWS - East Wolf Mgmt. Zone.	Requires Contact of USFWS - East Wolf Mgmt. Zone.
Constructability		
Impact to Airport Operations	Low	Low
Grading/Soil Conditions	Complex	Complex
Facilities Demolition	None	Yes
Phasing Complexity	Low	Medium
Financial Costs/Impacts		
Project Cost	$19,491,000	$72,000,000
OVERALL EVALUATION		
DETERMINATION	**Favorable**	**Favorable**

4.5.5 AVIATION SUPPORT FACILITIES ALTERNATIVES

This section develops and evaluates alternatives for fuel farm expansion and the identification of fuel truck routes that minimize taxiway crossings. Aviation support facilities such as fuel farms are necessary to serve existing users but also encourage growth in aviation-related activities. Another important factor is the identification of a dedicated on-airport fuel truck haul route to expedite the delivery of fuel and provide for the highest level of safety by minimizing airfield crossings.

FUEL FARM

During the busiest times of the year, the Airport requires multiple Jet A fuel deliveries per day to keep up with demand. The lack of storage capacity is operationally inefficient and puts the Airport at risk of not being able to meet demand should the supply chain be disrupted by a fuel shortage or natural disaster. Analysis considers an expanded fuel farm location that would increase Jet A fuel storage capacity. For planning purposes, all fuel farm alternatives include five 20,000-gallon Jet A tanks. This order of magnitude increase in fuel storage would allow the Airport to have approximately fifteen days of fuel capacity during the very busiest times of year, which meets the needs projected in the demand forecasts, and is similar to the storage capacity of other airports with a similar amount of jet and turbo-prop operations. There is potential for the development of two fuel farm locations to expedite delivery and minimize the crossing of Runway 11-29, with one site to potentially serve the north GA users, and a second to support airline operations. All fuel farm alternatives can be expanded as demand dictates.

All alternatives are estimated at a total project cost of $5,200,000 that includes site work, concrete pad, containment, five 20,000 United States Gallon (USG) tanks, permitting, paved vehicle access, and other associated costs.

Each of the alternatives involve the construction of a fuel farm. The proposed fuel farm can accommodate five 20,000 USG Jet A fuel tanks to increase Jet A fuel capacity by 100,000 USG over the Airport's existing capacity of 44,000 USG. The existing airfield perimeter fence will need to be reconfigured to account for two new access gates that allow the ingress and egress of fuel trucks to access the secure airside of the Airport, but with access limited to only the fuel farm. The fuel farm can be expanded to accommodate additional Jet A tanks or other types of fuel.

ALTERNATIVE 1 – SE AIRPORT WAY

This alternative, as shown in **Figure 4-16**, involves the construction of a fuel farm off Airport Way, south of the existing parking lots. This proposed location of a new fuel farm does not penetrate the existing or any future RVZ for Runway 5-23.

The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas and would have minimal impact to airport operations.

ALTERNATIVE 2 – NORTH DEVELOPMENT AREA: VETERANS AVENUE

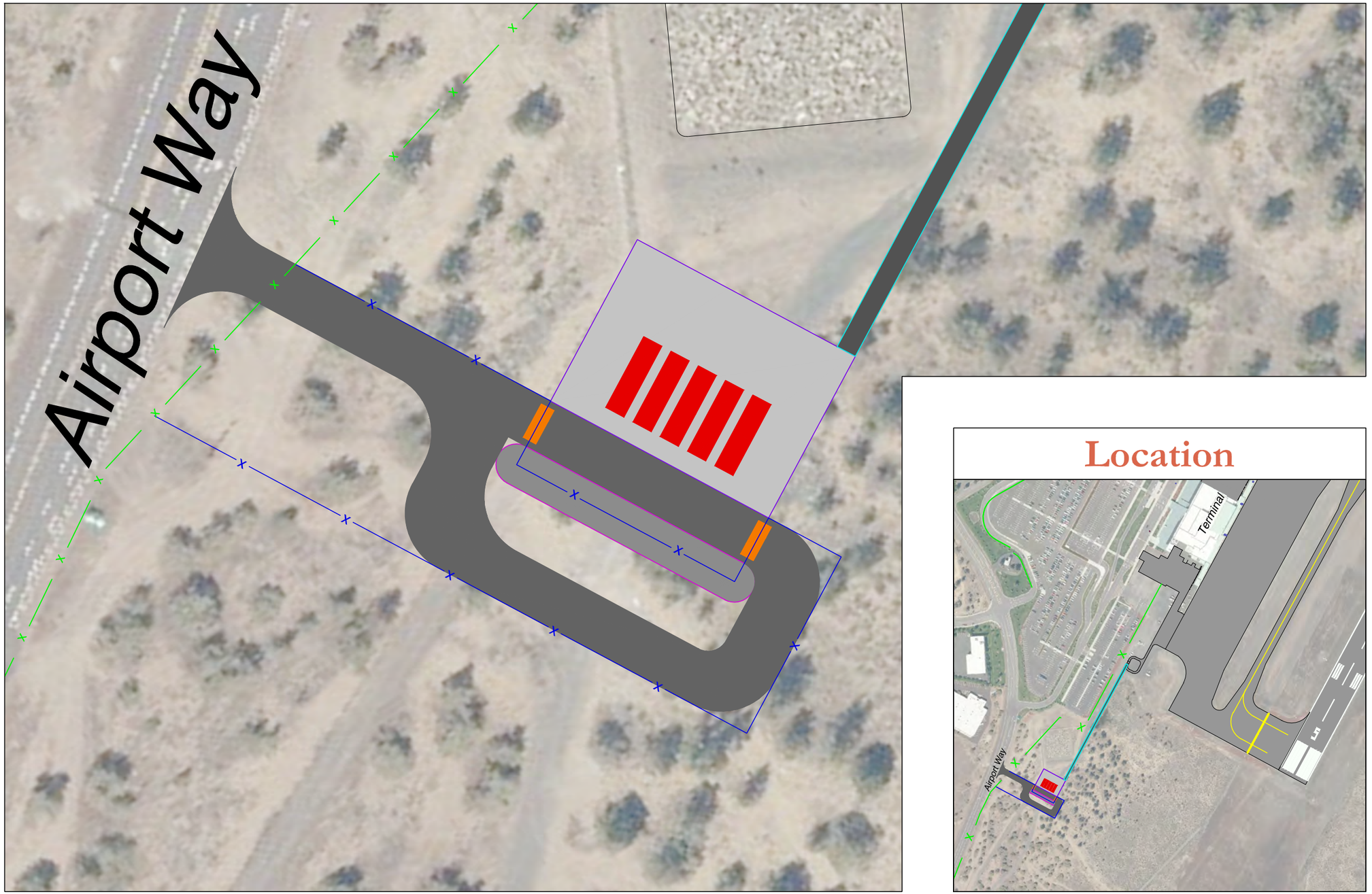
This alternative, as shown in **Figure 4-17**, involves the construction of a fuel farm off Veterans Avenue, on the north GA apron. This proposed location of a new fuel farm does not penetrate the existing or any future RVZ for Runway 5-23.

Construction of this alternative requires the demolition of an existing building that has been identified as a Section 4(f) historic resource (Warehouse #2, circa 1940). The method of construction is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations. A potential exists, however, for the discovery of archaeological resources in the area of this alternative, and it is recommended a survey be conducted prior to any construction.

ALTERNATIVE 3 – NORTH DEVELOPMENT AREA: SISTERS AVENUE

This alternative, as shown in **Figure 4-18**, involves the construction of a fuel farm off Sisters Avenue, on the north GA apron. This proposed location of a new fuel farm does not penetrate the existing or any future RVZ for Runway 5-23.

The complexity of constructing this alternative is straightforward relative to project phasing, contractor mobilization, and staging areas, and would have minimal impact to airport operations. A potential exists, however, for the discovery of archaeological resources in the area of this alternative, and it is recommended a survey be conducted prior to any construction.



LEGEND

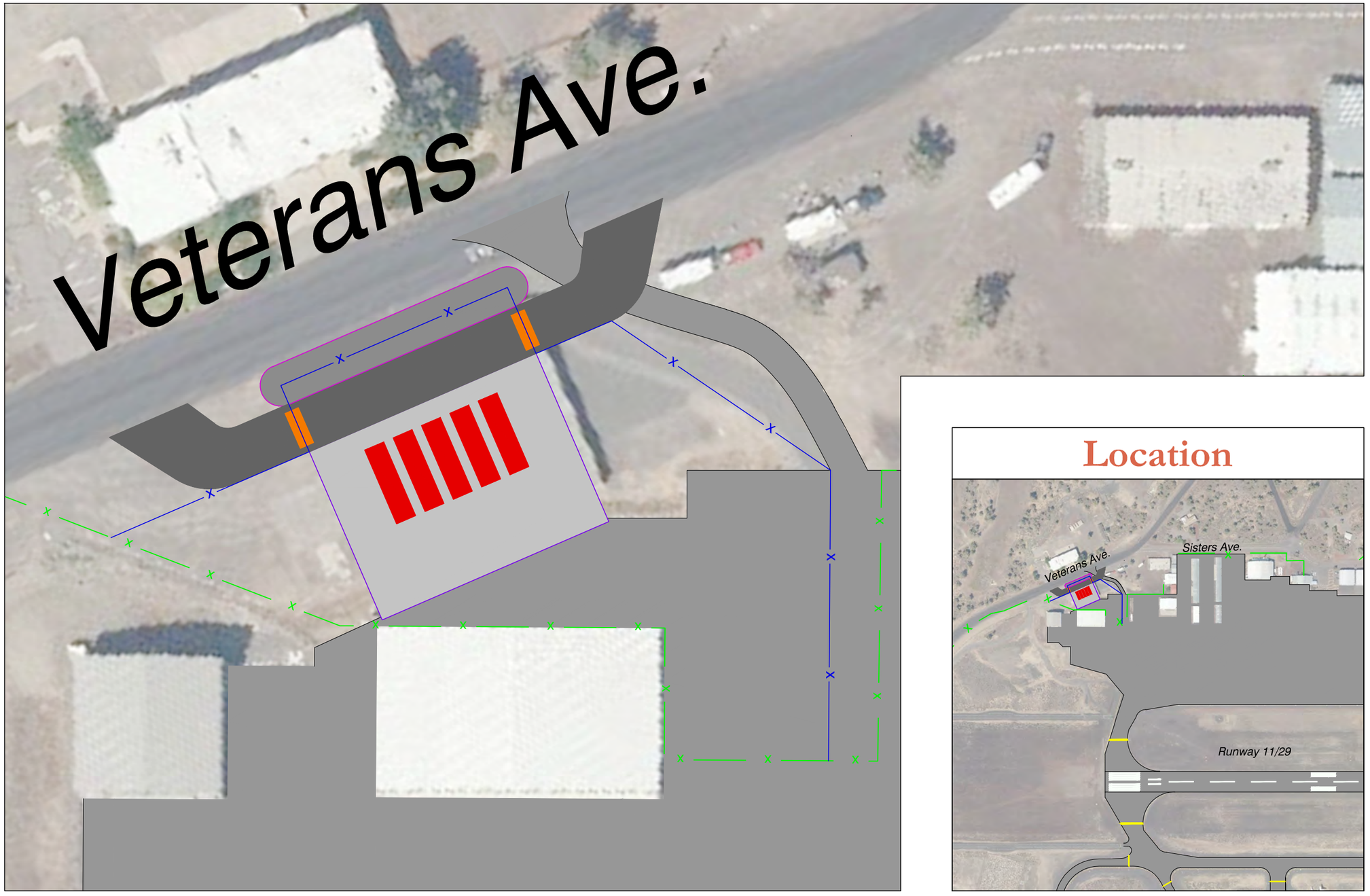
- Existing Fence Line
- Adjusted Fence Line
- Fuel Farm Gate
- Paved Area around Fuel Farm
- Curb
- Road/Loop to Fuel Farm
- Fuel Truck Road
- Fuel Tanks (Jet A)
  Five 20,000 Gallon Tanks
  Total: 100,000 Gallons

N

0’ 25’ 50’

Location

Figure 4-16
Alternative 1 - SE Airport Way



LEGEND

- Existing Fence Line
- Adjusted Fence Line
- Fuel Farm Gate
- Paved Area around Fuel Farm
- Curb
- Road/Loop to Fuel Farm
- Fuel Truck Road
- Fuel Tanks (Jet A)
  Five 20,000 Gallon Tanks
  Total: 100,000 Gallons

N

0’ 25’ 50’

Location

Figure 4-17
Alternative 2 - North Development Area: Veterans Ave.

LEGEND

- Existing Fence Line
- Adjusted Fence Line
- Fuel Farm Gate
- Paved Area around Fuel Farm
- Curb
- Road/Loop to Fuel Farm
- Fuel Truck Road
- Fuel Tanks (Jet A)
  Five 20,000 Gallon Tanks
  Total: 100,000 Gallons

N

0’ 25’ 50’

Location

Figure 4-18
Alternative 3 - North Development Area: Sisters Ave.

SUMMARY EVALUATION OF FUEL FARM EXPANSION ALTERNATIVES

Table 4-5 presents a summary and an evaluation of the various alternatives for the expansion of the fuel farm at RDM. Alternative 1 is the preferred alternative because of the low impact to the airfield and airport operations. The location of the fuel farm is beneficial for commercial operations because fuel trucks will have a short commute time between the fuel farm and commercial apron, and the addition of Jet A fuel tanks near the commercial apron will negate the need for a fuel truck haul route.

Constructability Impact Category	Alternative 1	Alternative 2	Alternative 3
Description of Improvement	Construction of five 20,000 USG Jet A fuel tanks (100,000 USG)	Construction of five 20,000 USG Jet A fuel tanks (100,000 USG)	Construction of five 20,000 USG Jet A fuel tanks (100,000 USG)
Operational Capabilities			
Airfield Operability & Access	Serves Jet A users only. No 100 LL or mogas tanks. Tanker entrance off of Airport Way.	Serves Jet A users only. No 100 LL or mogas tanks. Tanker entrance off of Veterans Ave.	Serves Jet A users only. No 100 LL or mogas tanks. Tanker entrance off of Sisters Ave.
Airfield Impacts	None	None	None
Performance Requirements			
Level of Service	15 day fuel reserve	15 day fuel reserve	15 day fuel reserve
Expansion Capabilities	Additional tanks can be added in the future.	Additional tanks can be added in the future.	Additional tanks can be added in the future.
Land Use Compatibility			
Impact to Other Facilities	None	Demolition of existing building	Demolition of older hangar buildings.
Impacts to Airport Property Use	None	None	None
Environmental Impact Potential			
Permits/Code Requirements	Federal, State, City permits and Code Requirements	Federal, State, City permits and Code Requirements	Federal, State, City permits and Code Requirements
Historic, Architectural, and Archaeological and Cultural Resources	None	Removal of one of four historic structures on airport property (Warehouse #2, circa 1940). Potential exists for discovery of archaeological resources.	Potential exists for discovery of archaeological resources.
Section 4(F) of the Department of Transportation Act	None	Potential removal of an identified Section 4(f) resource	None
Tenant Relocation	No	Yes	Yes
Property Acquisitions / Easements	No	No	No
Constructability			
Impact to Airport Operations	Low	Low	Low
Facilities Demolition	No	Yes	Yes
Phasing Complexity	Low	Low	Low
Financial Costs/Impacts			
Project Cost	$5,200,000	$5,200,000	$5,200,000
OVERALL EVALUATION			
DETERMINATION	**Favorable**	**Favorable**	**Favorable**

ON-AIRPORT FUEL TRUCK HAUL ROUTES

Fuel trucks currently travel from the north GA apron to the commercial terminal apron to refuel aircraft because Jet A fuel is only stored at the north GA apron. Travel between both aprons requires fuel trucks to travel on taxiways that are in the movement area. Fuel truck haul route alternatives are designed to allow fuel trucks to deliver fuel from the north GA apron to the commercial apron and to stop fuel trucks from traveling on taxiways or runways.

Fuel truck haul route alternatives can be ignored if Jet A fuel tanks are built on both sides of Runway 11-29. If Jet A tanks are built south of Runway 11-29, in proximity to the commercial apron, fuel trucks will be able to deliver fuel to the commercial apron without having to travel on taxiways or runways.

ALTERNATIVE 1 – INNER ROUTE

This alternative, as shown in **Figure 4-19**, involves the construction of a road for fuel trucks to deliver fuel to aircraft on the commercial apron without crossing or traveling on a taxiway or runway. The proposed road starts at the north GA apron and connects with the service road that exists around Runway 11 to avoid the TOFA. It then continues off the service road outside of the RPZ and crosses three taxiway connectors as the road avoids the TOFA. The road stays parallel with Runway 11-29 until it crosses in front of the segmented circle at the intersection of Runways 11-29 and 5-23, and then it turns running parallel with Runway 5-23, continuing straight to the commercial apron, and staying outside of the TOFA.

This alternative is estimated at a total project cost of $514,200 and includes engineering, environmental compliance, and construction management services.

ALTERNATIVE 2 – CENTRAL ROUTE

This alternative, as shown in **Figure 4-20,** involves the construction of a road for fuel trucks to deliver fuel to aircraft on the commercial apron without crossing or traveling on a taxiway or runway. The road begins at the north GA apron and connects with the existing service road around Runway End 11 to avoid the TOFA. It then continues off the service road while in the RPZ and continues along the Airport's perimeter to the south GA apron and parallels Runway 11-29 to the area of the segmented circle and follows the same route to the commercial apron that is shown for Alternative 1.

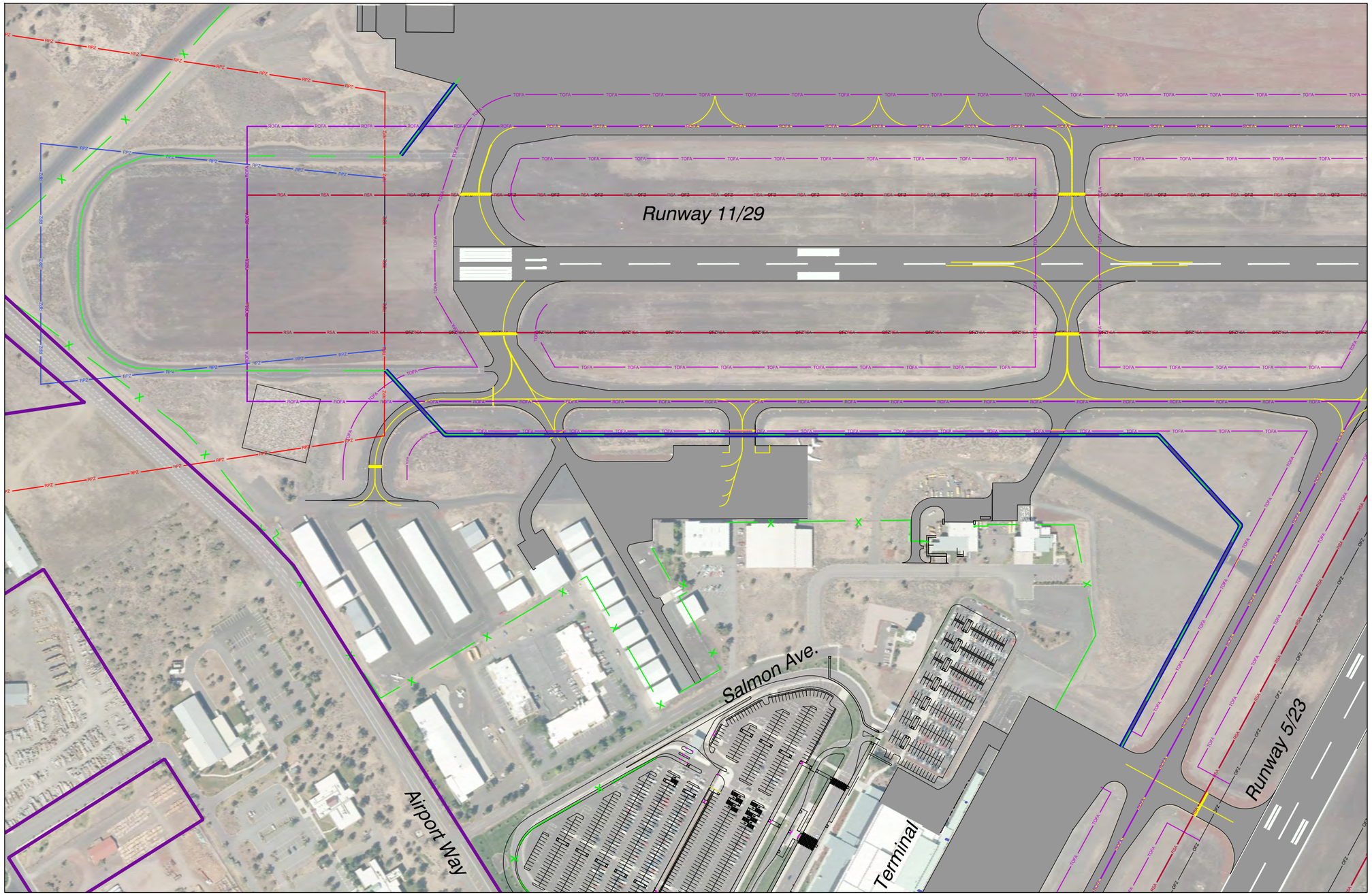
This alternative is estimated at a total project cost of $162,000 and includes engineering, environmental compliance, and construction management services.

ALTERNATIVE 3 – OUTER ROUTE

This alternative, as shown in **Figure 4-21,** involves the construction of a road for fuel trucks to deliver fuel to aircraft on the commercial apron without crossing or traveling on a taxiway or runway. The proposed

road follows the same route as Alternative 2 until it reaches the ARFF. It then follows the existing perimeter fence to the commercial apron.

This alternative is estimated at a total project cost of $183,000 and includes engineering, environmental compliance, and construction management services.



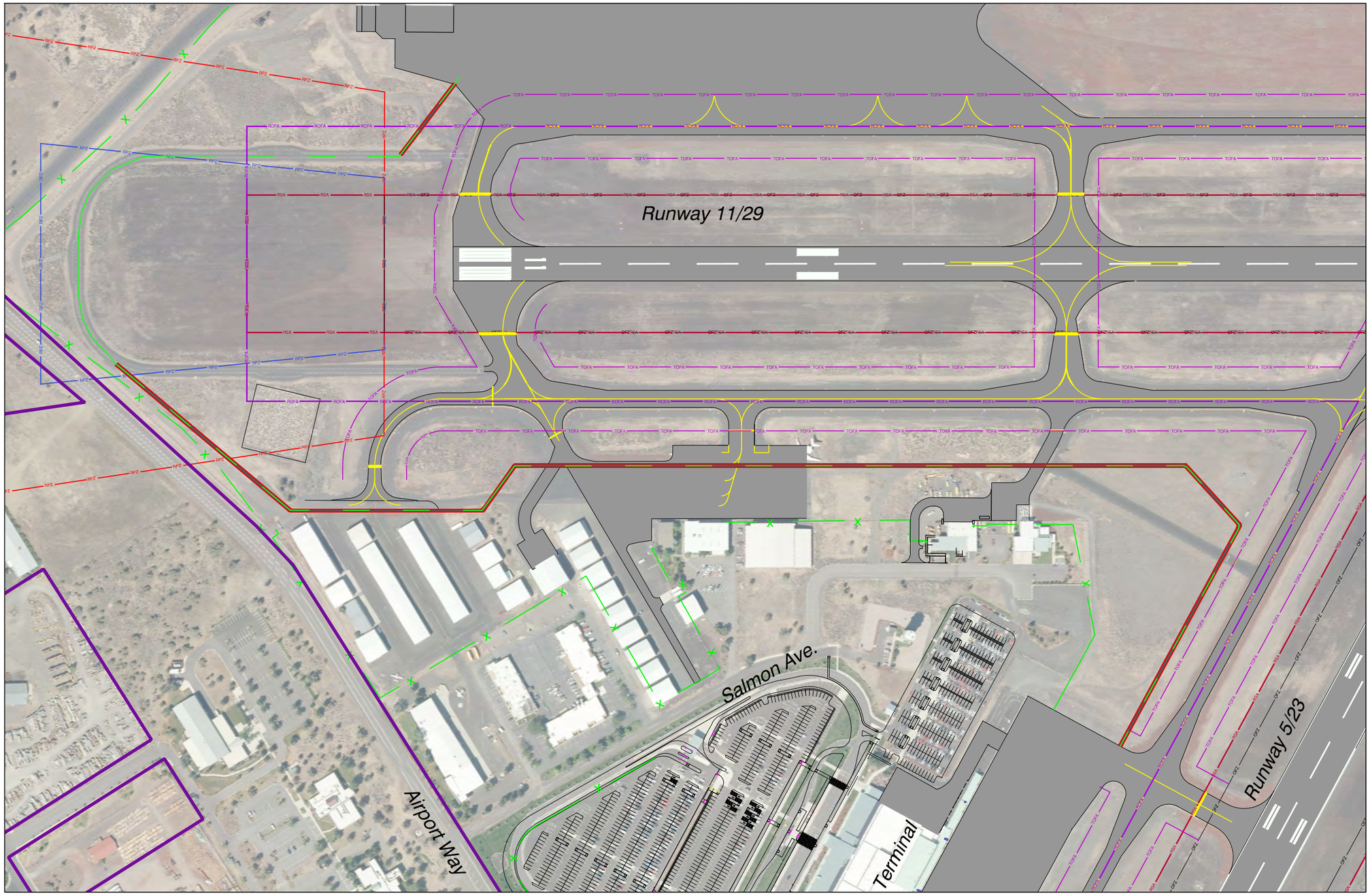
LEGEND

- Airport Property Line
- Runway Protection Zone (RPZ)
- Departure RPZ
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Taxiway/Taxilane Object Free Area (TOFA)
- Fuel Truck Route
- Fuel Truck Road Alternative 1

N

0’ 150’ 300’

Figure 4-19
Alternative 1 - Inner Route



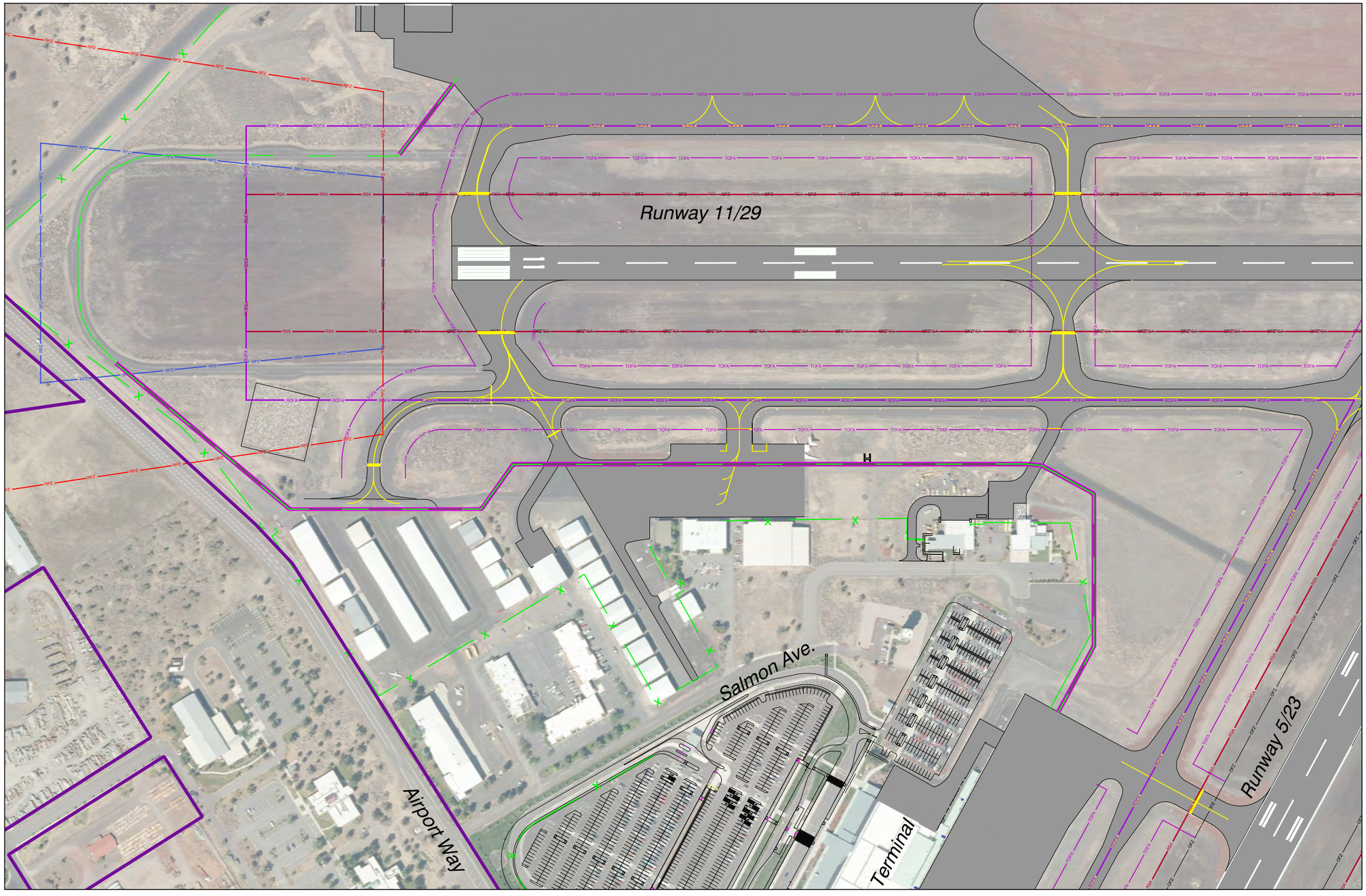
LEGEND

- Airport Property Line
- Runway Protection Zone (RPZ)
- Departure RPZ
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Taxiway/Taxilane Object Free Area (TOFA)
- Fuel Truck Route
- Fuel Truck Road Alternative 2

N

0’ 150’ 300’

Figure 4-20
Alternative 2 - Central Route



LEGEND

- Airport Property Line
- Runway Protection Zone (RPZ)
- Departure RPZ
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Taxiway/Taxilane Object Free Area (TOFA)
- Fuel Truck Route
- Fuel Truck Road Alternative 3

N

0’ 150’ 300’

Figure 4-21
Alternative 3 - Outer Route

SUMMARY EVALUATION OF FUEL TRUCK HAUL ROUTE ALTERNATIVES

Table 4-6 presents a summary and an evaluation of the various alternatives for the construction of a fuel truck haul route at RDM. Alternative 1 is the preferred alternative because of the minimal impact to airport operations and facilities.

Table 4-6. Fuel Truck Haul Routes Alternatives Summary Evaluation Matrix

Impact Category	Alternative 1	Alternative 2	Alternative 3
Description of Improvement	Construction of a two way on-airport fuel truck haul route to eliminate the crossing of active runways/taxiways.	Construction of a two way on-airport fuel truck haul route to eliminate the crossing of active runways/taxiways.	Construction of a two way on-airport fuel truck haul route to eliminate the crossing of active runways/taxiways.
Operational Capabilities			
Airfield Operability & Access	Connects North GA, Central GA and Airline Operations.	Connects North GA, Central GA and Airline Operations.	Connects North GA, Central GA and Airline Operations.
Airfield Operational Impacts	Minimal	Minimal	Minimal
Performance Requirements			
Route Alignment	Eliminates taxiway and runway crossings. Penetrations to the TOFA and ROFA. Crosses four taxilane connectors.	Eliminates taxiway and runway crossings. Penetrations to the TOFA and ROFA. Crosses four taxilane connectors.	Eliminates taxiway and runway crossings. Penetrations to the TOFA and ROFA. Crosses four taxilane connectors.
Land Use Compatibility			
Impacts to Airport Property Use	None	None	None
Impact to Other Facilities	None	Crosses South GA Apron	Crosses South GA Apron
Environmental Impact Potential			
Property Acquisitions / Easements	None	None	None
Tenant Relocation Required	None	None	None
Constructability			
Impact to Airport Operations	Minimal	Minimal	Minimal
Facilities Demolition	None	None	None
Phasing Complexity	Low	Low	Low
Financial Costs/Impacts			
Project Cost	$514,200	$162,000	$183,000
OVERALL EVALUATION			
DETERMINATION	**Favorable**	**Neutral**	**Neutral**

4.5.6 PASSENGER TERMINAL ALTERNATIVES

As discussed in **Chapter 3 – Facility Requirements**, the existing passenger terminal was originally designed for smaller commuter aircraft with 35 to 50 seats. As airlines retired these aircraft to focus on more fuel-efficient aircraft with 65 to 90 seats, existing facilities have struggled to meet the existing passenger demand. The forecasted growth in passengers requires additional space in almost every functional terminal component. The following areas are specifically addressed in this chapter:

- ✓ Passenger boarding and holdrooms
- ✓ Outbound and inbound baggage operations
- ✓ TSA security screening
- ✓ Rental car counters and offices
- ✓ Ticket counters, queuing, and airline ticketing offices
- ✓ Administration space
- ✓ Mechanical support spaces

It is anticipated that airlines will operate even larger aircraft at the Airport within the 20-year forecast horizon to include variants of the Airbus A320 or Boeing 737, ADG-III aircraft. This section develops and evaluates alternatives for the expansion of the current passenger terminal to serve the anticipated demand in passengers and larger aircraft.

ALTERNATIVES 1 & 2 – WEST & EAST EXPANSIONS

PASSENGER BOARD BRIDGES AND HOLDROOMS

With the projected increase in passengers, and the airlines' planned transition from regional aircraft to larger and more efficient jets, the terminal will need physical improvements to accommodate these changes. The use of passenger boarding bridges (PBBs) provides a more efficient and comfortable way to board the larger aircraft. Smaller regional jets, like the CRJ 200, can be accessed from the current boarding floor with bridges, but larger jets can only be served from the second floor waiting area. The holdrooms and associated support spaces (e.g., restrooms, concession, etc.) will need expansion to meet the larger passenger capacity of the aircraft.

By 2026 it is anticipated that five passenger boarding bridges will be needed, and by 2036, an additional three bridges will be needed. To handle this expansion, the first and second floor holdrooms will need to increase in size.

There is only one recommended boarding bridge layout for 2026. The second floor will be slightly expanded over the existing ground floor concourse to accommodate two boarding bridges. These PBBs will service larger ADG-III aircraft such as the A320 or a 737. The lower level gates 3, 5, and 6 will be reconfigured to house PBBs that will service small regional aircraft. Gates 2, 4, and 7 will remain as ground floor boarding.

Two alternatives exist for the 2036 expansion. The first, identified in **Figure 4-22**, is to expand the terminal's second floor towards the west over an expanded baggage make-up area and the existing first floor passenger holdroom. In this alternative, five additional PBBs will be installed for aircraft boarding from the second floor. Gate 3 will remain as a first level accessed PPB.

A second alternative, identified in **Figure 4-23**, is to expand the terminal's second floor towards the east over an expanded first floor holdroom and incoming baggage. Four additional PBBs will be added to provide aircraft boarding from the second floor. Gates 5 and 6 will remain as first floor accessed PPBs.

The expansion of the gate and holdroom areas for both options is projected to be approximately 35,000 square feet (sf).

OUTBOUND AND INBOUND BAGGAGE OPERATIONS

By 2019, it is expected that the outbound baggage system will be at capacity due to the increased passenger enplanements. In addition to the increase in enplanements, the first floor holdroom expansion to the west will occupy a portion of the existing outbound baggage system. The outbound baggage system will require an expansion of approximately 3,500sf.

Inbound baggage operations will also need expansion. The existing baggage claim has two baggage carousels. It is anticipated that two additional carousels will be needed to meet the increased passenger load. This expansion will move towards the east. The expansion of the inbound baggage area is projected to be an additional 7,800sf.

TRANSPORTATION SECURITY ADMINISTRATION SECURITY SCREENING

The current Transportation Security Administration (TSA) screening area at the Airport consists of two screening lanes and will be at maximum capacity in five to six years. The expected need, by 2036, is for four lanes to provide uncongested screening. The increased area needed for this expansion will be accomplished by appropriating the area currently occupied by the rental car counters and offices. Future screening options may also provide a separate screening lane for security badged personnel.

The additional space required for the expanded TSA screening area will be 4,500sf.

RENTAL CAR COUNTERS AND OFFICES

To accommodate the expansion of TSA screening, the rental car counters and offices will require relocation. Rental car operations will expand to the northeast corner of the terminal. This area will be directly connected to baggage claim and sized to meet the future needs of the Rent-A-Car (RAC) operations.

TICKET AGENT POSITIONS, QUEUING, AND AIRLINE TICKET OFFICES

There are currently 20 agent positions at the ticketing counters with an anticipated need to add an additional four positions by 2026 and an additional nine positions by 2036, for a total of 33 positions. Additional queuing space will also be required for the 13 new positions. A westward expansion will allow for these future needs. To support the expanded ticketing operation, additional Airline Ticket Offices (ATOs) will be necessary.

The additional space required for the expanding ticketing operations and ATO offices is projected to be 10,800sf.

ADMINISTRATION SPACE

As the terminal expands, additional administrative space will be required to accommodate the growing staff. It is anticipated that a future administrative space would be provided on the second floor above the planned RAC expansion.

MECHANICAL, ELECTRICAL, IT, AND OTHER SUPPORT SPACE

To support the expansion of the terminal, additional space will be needed for mechanical, electrical, IT, and support space.

ALTERNATIVE 3 – NEW CONCOURSE EXPANSION

Development of Alternative 3 is based on comments about Alternative 1 from airport management and the general public from the open house meeting on October 18, 2017. Alternative 3 provides details on each phase of the terminal expansion.

To facilitate future passenger capacity and the ability to handle large jet aircraft, renovations to the existing terminal would proceed in three phases: 1) renovating the existing ground floor holdroom (identified in **Figure 4-24)**; 2) expanding the terminal west and adding a new concourse adjacent to the existing second floor holdroom (identified in **Figure 4-25)**; and 3) expanding the remaining areas of the terminal (identified in **Figure 4-26)**.

PASSENGER BOARD BRIDGES AND HOLDROOMS

Phase one will include reconfiguring the boarding corridor into extra passenger holdroom space to increase seating capacity. An expansion of the passenger holdroom will extend east past the exit lane. The ground floor of the passenger holdroom expansion will be 5 feet higher than the existing holdroom to facilitate PBBs. The extra 5 feet allows PBBs to reach the larger aircraft on the apron. Three PBBs are anticipated in the holdroom expansion. The exit lane will receive renovations to handle an increase in passengers. No renovations will occur on the second floor.

TERMINAL EXPANSION AND NEW CONCOURSE

Phase two will expand the terminal west and add a new concourse adjacent to the existing second floor holdroom. In the interest of fiscal responsibility, avoiding construction-related congestion, and alleviating space needs in the terminal, a new building will be built adjacent to and connected to the west side of the terminal. The new building will house the ticket hall and larger baggage handling area on the ground floor. The second floor of the new building will contain a new concourse that is adjacent to the existing second floor holdroom. Access to the concourse will be possible with escalators and elevators that will be in the ground floor holdroom. The new concourse will have four PBBs. Once the new ticket hall is operational, a portion of the existing ticket hall and ticket offices will be repurposed as the new security checkpoint to accommodate passenger capacity needs. Mechanical facilities will be relocated to the new building. Renovations will occur to the existing second floor holdroom to connect to the new concourse.

TERMINAL EXPANSION OF REMAINING AREAS

In Phase three, RAC operations will relocate to the existing airport administration area, baggage claim will expand into the area previously occupied by RAC operations, and the existing TSA security checkpoint will be reconfigured into a new exit lane. Completion of phase three of Alternative 3 will provide space for the expansion of program areas in order of emerging need in the future. There will be two possible configurations for aircraft boarding, the first being seven PBBs and three ground boarding positions, and the second being eight PBBs and one ground boarding position. **Figure 4-26** shows the first configuration for boarding. This configuration, when upgrading to an eighth PBB, will remove two of the three ground boarding positions and allow for the additional PBB to facilitate boarding from the ground floor holdroom or from the second floor holdroom.

This alternative is estimated at a total project cost of 110,698,900 and includes engineering, environmental compliance, and construction management services. Total project cost includes the cost of the northeast terminal apron reconstruction alternative.

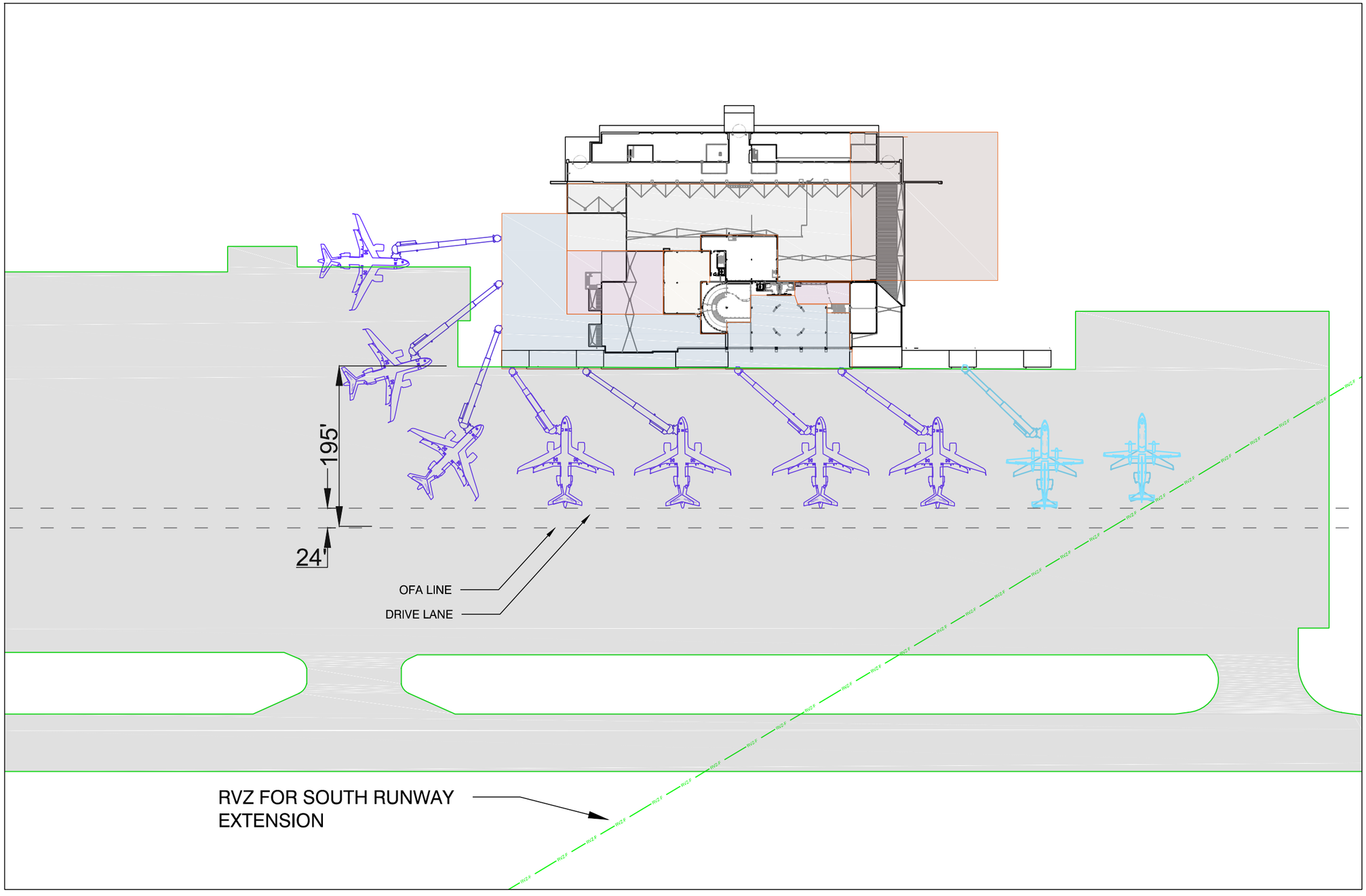


Figure 4-22
Alternative 1 - Forecast 2036 West Aircraft Boarding Expansion

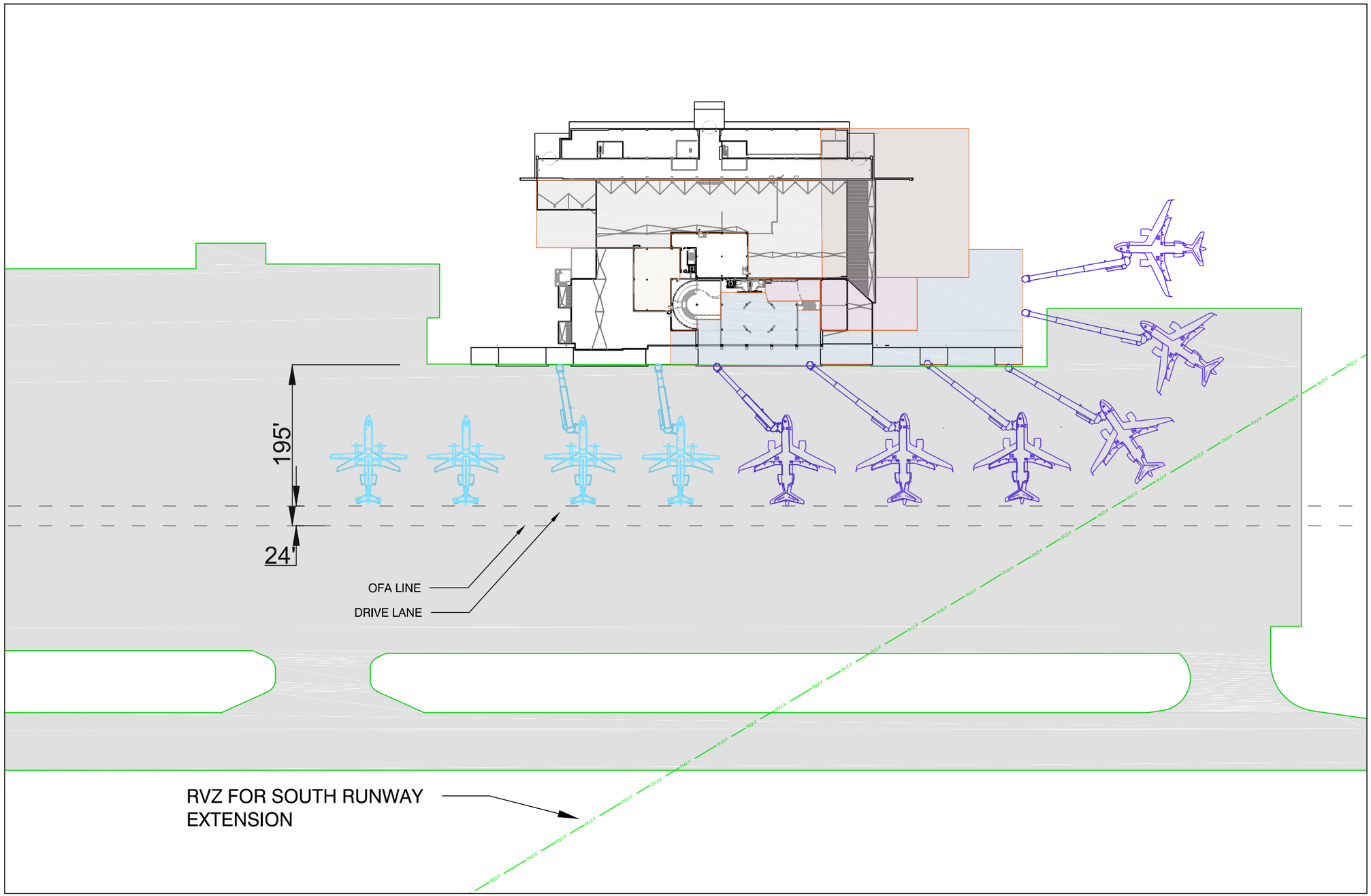


Figure 4-23
Alternative 2 - Forecast 2036 East Aircraft Boarding Expansion

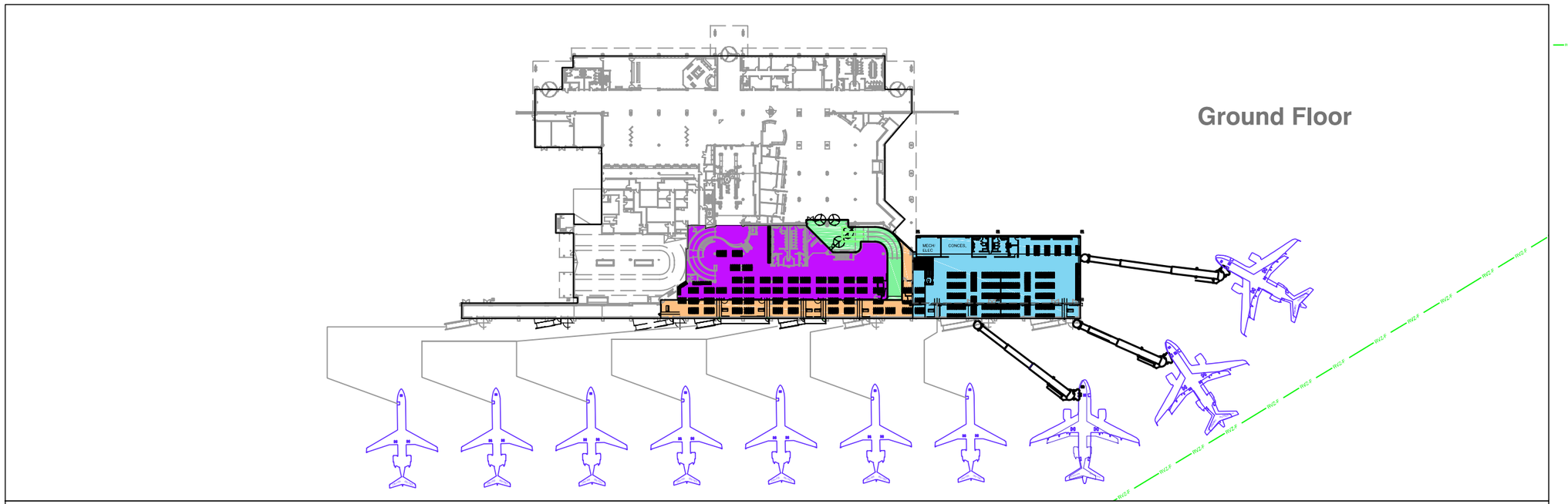
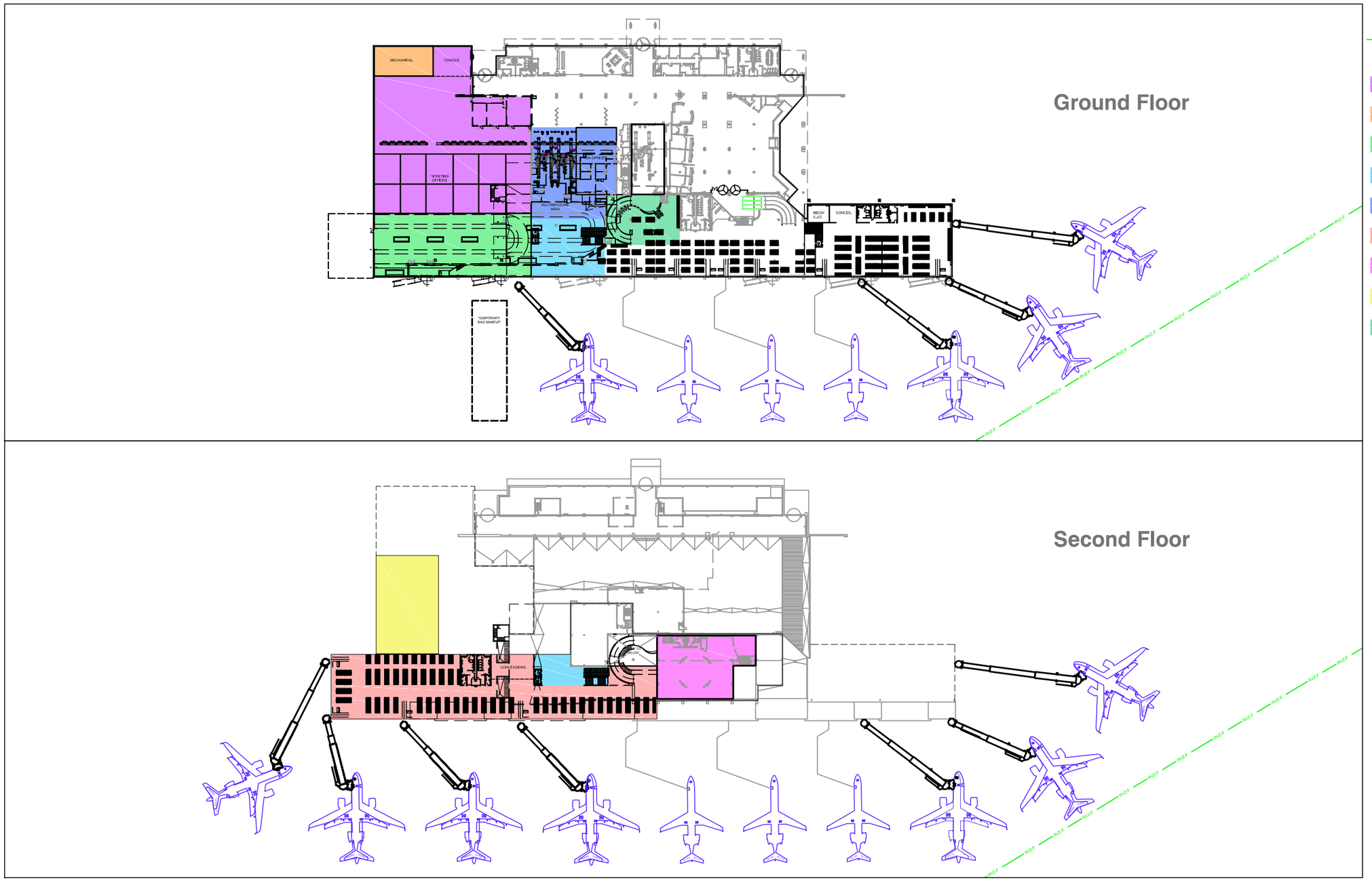


Figure 4-24
Alternative 3 - Forecast 2036 New Concourse Expansion - Phase 1



LEGEND

- Runway Visibility Zone (RVZ)
- Ticket Hall (31,940 Square Feet)
- Relocated Mechanical (2,710 Square Feet)
- Baggage Make-up (14,690 Square Feet)
- Vertical Circulation (6,290 Square Feet)
- Renovation of Ticket Hall into Security Point (11,220 Square Feet)
- Second Level Concourse (26,840 Square Feet)
- Renovation of Existing Second Level Concourse (8,620 Square Feet)
- Office Area (9,100 Square Feet)
- Partial Renovation of Existing Ground Level Concourse (5,530 Square Feet)

Figure 4-25
Alternative 3 - Forecast 2036 New Concourse Expansion - Phase 2

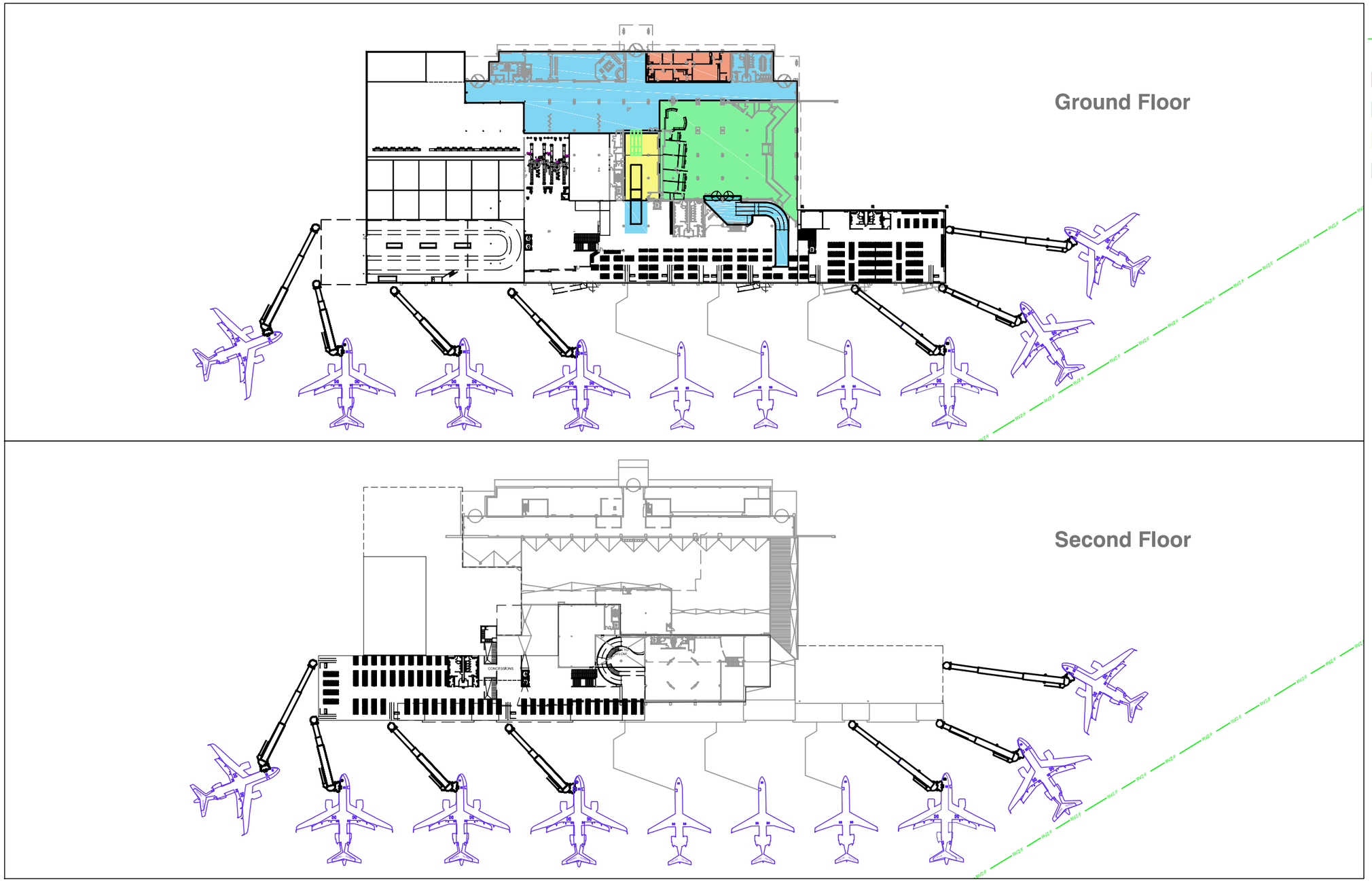


Figure 4-26
Alternative 3 - Forecast 2036 New Concourse Expansion - Phase 3

SUMMARY EVALUATION OF PASSENGER TERMINAL ALTERNATIVES

Table 4-7 presents a summary and an evaluation of the various alternatives for improvements to the passenger terminal at RDM. Alternative 3 is the preferred alternative because expanding the existing terminal to the west provides greater flexibility for future growth.

Table 4-7. Passenger Terminal Alternatives Summary Evaluation Matrix

Impact Category	Alternative 1	Alternative 2	Alternative 3
Description of Improvement	Expansion of existing terminal facilities to the west	Expansion of existing terminal facilities to the east	Expansion of existing terminal facilities and new concourse
Operational Capabilities			
Operability & Access	Reconfiguration of internal building space and temporary placement of facilities	Reconfiguration of internal building space and temporary placement of facilities	Reconfiguration of internal building space and temporary placement of facilities
Operational Impacts	Runway 5 expansion to the SE increases extent of the RVZ but does not include aircraft parking positions	Runway 5 expansion to the SE increases extent of the RVZ to include aircraft parking	Runway 5 expansion to the SE increases extent of the RVZ to include aircraft parking
Performance Requirements			
Accommodates Anticipated Passenger Demand	Yes	Yes	Yes
Accommodates Anticipated ADG-III Aircraft (A320 / B737)	Yes	Yes	Yes
Land Use Compatibility			
Impacts to Airport Property Use	Yes	Yes	Yes
Impact to Other Facilities	Yes	Yes	Yes
Environmental Impact Potential			
Property Acquisitions / Easements	None	None	None
Tenant Relocation Required	Yes	Yes	Yes
Constructability			
Impact to Airport Operations	Minimal	Minimal	Minimal
Facilities Demolition	Yes	Yes	Yes
Phasing Complexity	Low	Low	Low
Financial Costs/Impacts			
Project Cost	In Progress	In Progress	$110,698,900
OVERALL EVALUATION			
DETERMINATION	**Favorable**	**Not Favorable**	**Favorable**

4.5.7 NON-AERONAUTICAL DEVELOPMENT ALTERNATIVES

The economic benefits generated from an airport's commercial, industrial, and aviation-related tenants provide substantial tax revenues and employment opportunities for the surrounding communities. Thus, it is in the Airport's best interest to develop future commercial/industrial uses, in addition to aviation-related activities, where feasible. Development around the Airport will diversify revenue streams and promote compatible development. Multiple subareas on and around the Airport were analyzed to examine their development potential to include the:

- ✓ Fairgrounds Industrial Subarea
- ✓ Airport Way Subarea
- ✓ West Business Park
- ✓ North Business Park
- ✓ North Apron
- ✓ South Apron
- ✓ North Development Parcel
- ✓ USFS Campus
- ✓ Terminal

Non-aeronautical alternatives were developed for the Fairgrounds Industrial and Airport Way Subareas in addition to the West and North Business Parks. The remaining potential development areas were excluded from non-aeronautical concept planning due to their planned aviation use or other exclusive uses (e.g., USFS use of its campus and potential emergency response training facility in the North Development Parcel).

Non-aeronautical landside alternatives were developed to illustrate the following potential uses:

- ✓ Accommodation and food services
- ✓ Industrial (which includes speculative light industrial buildings, construction firms, manufacturing, and wholesalers and warehousing)
- ✓ Gas station/ convenience store
- ✓ Office/flex (only in the North Business Park)

Conceptual building footprints were developed for the City-owned parcels within the Fairgrounds Industrial Subarea, Airport Way Subarea, West Business Park, and North Business Park. Additional buildings are likely to be constructed on privately held land as well, though those have not been illustrated within the development alternatives prepared for this Master Plan.

Table 4-8 summarizes the approximate size of the resulting non-aviation building floor areas that could be accommodated on City-owned land within each of the four subareas and further described in the subsequent alternatives.

Table 4-8. Summary of Non-Aviation Building Areas by Subarea (Square Feet)

Use	Subarea			
	Fairgrounds Industrial	Airport Way	West Business Park	North Business Park
Accommodations	0	130,000	0	0
Food/restaurant	0	11,000	0	0
Gas station/ convenience store[1]	0	4,500	0	0
Industrial buildings[2]	70,000	299,500	123,000	0
Office/flex[3]	0	0	0	289,000

Notes:

[1] Gas station/convenience store is not a permitted use in the M-1 Light Industrial zone so a zone change or code amendment would be necessary to accommodate this use.

[2] Industrial buildings include light industrial buildings, construction firms, manufacturing uses, wholesalers, and warehouse use.

[3] The illustrated portion of the North Business Park is zoned C-5 Tourist Commercial, which does not permit industrial uses. Office uses have been illustrated in this area as they are permitted in the zone.

As a subsequent effort to the Master Plan update, the City may wish to consider amending the zoning near the Airport to accommodate a wider range of airport-compatible uses, including commercial, industrial, and institutional uses. Currently, nearby zones include Airport, Light Industrial (M-1), Tourist Commercial (C-5), Open Space Park Reserve (OSPR), Park, and Public Facility (PF), each of which has its own set of permitted uses and development standards. Some communities have been able to capitalize on their public airports by applying zoning designations that allow for a wide range of uses so long as they do not affect aviation operations. Permitting a variety of uses and imposing regulations to limit impacts on aviation may be a way for the City to stimulate economic development while maintaining and enhancing the viability of the Airport. To implement this option, the City may need to amend the Comprehensive Plan and Comprehensive Plan Map, Development Code, and Zone Map.

FAIRGROUNDS INDUSTRIAL SUBAREA

The Fairgrounds Industrial Subarea is zoned Light Industrial (M1) and the majority is privately owned. The southernmost lot in this subarea is an 8-acre City-owned lot. The concept plan illustrates the potential for 70,000sf of industrial buildings on the City parcel. While not pictured on the diagrams, the privately owned land has the potential for up to 200,000sf of additional industrial buildings and 15,000-20,000sf of supporting commercial uses (e.g., restaurants).

AIRPORT WAY SUBAREA

The Airport Way Subarea is zoned Light Industrial (M1) and the land is owned by the City. The southern 9 acres are currently developed with Peterson Caterpillar's facility. The concept plan illustrates nearly

300,000sf of industrial buildings, plus 15,500sf of supporting commercial (gas station and restaurants) and a five-story, 130,000sf hotel (hotels may require additional soundproofing measures due to proximity to the railroad and runway). Of this, a hotel, 4,000sf of restaurant, and 195,000sf of industrial buildings are depicted west of Airport Way. If the land west of Airport Way is needed for rental car facilities and airport parking as envisioned in some aviation alternatives, then some or all these non-aviation uses would not be possible at this location. East of Airport Way, the concept plan illustrates 7,000sf of restaurant, 4,500sf of gas station/convenience store, and 104,500sf of industrial buildings. Due to the large parcel size east of Airport Way, an internal circulation network with private roadways has also been illustrated.

WEST BUSINESS PARK

The West Business Park area contains multiple zoning designations, including Light Industrial (M1), Public Facility, and Park. The concept plan illustrates 123,000sf of industrial buildings on City-owned land within the M1 zone. Potential building locations were selected to avoid the future westward extension of Salmon Drive and the future realignment of the Airport Way-Veterans Way intersection. While not pictured on the diagrams, the privately owned land has the potential for up to 375,000sf of additional industrial buildings.

NORTH BUSINESS PARK

The North Business Park area contains multiple zoning designations, including Light Industrial (M1), Tourist Commercial (C5), and Open Space Park Reserve (OSPR). As the southern portion of this subarea is anticipated to be used for aviation purposes, only the northern portion by Highway 126 is available for non-aeronautical development. This northern portion is zoned C5 and industrial uses are not allowed, so the concept plan illustrates 289,000sf of office buildings. The C5 zone would also permit food services and accommodations, which have not been illustrated but may be considered if such uses are not developed along Airport Way south of the Airport.

SITE, TRANSPORTATION, AND UTILITY CONSTRUCTION COST ESTIMATES

Based on the illustrated non-aeronautical development, this section describes order-of-magnitude site preparation costs as well as transportation and utility costs that can be anticipated to serve the developments.

In general, the site preparation costs include site clearing and grading, stormwater management, installation of utilities, and construction of new roadways. Site development costs have been estimated on a square-foot basis and assume typical construction methods and design for commercial and industrial developments.

The overall public utility systems within the non-aeronautical development areas appear to have capacity to accommodate the proposed uses, so a need for upgrades to existing utilities are not expected to be necessary. Some of the study areas require public utility extensions to serve new development.

FAIRGROUNDS INDUSTRIAL SUBAREA

Site preparation for the Fairgrounds Industrial Subarea is expected to include extension of SW Elkhorn Avenue to connect to the southern terminus of SW Badger Way, which will include 8" sewer and 12" water public utility extensions within the new roadway.

Site preparation construction costs are expected to total over $4 million, as outlined below:

- ✓ On-site earthwork, parking, and private roadways - $1,232,900
- ✓ On-site private utilities - $818,900
- ✓ Public roadways - $960,000
- ✓ Public utilities - $1,160,000
- ✓ Total site development costs: $4,171,800

AIRPORT WAY SUBAREA

Site preparation for the Airport Way Subarea is expected to include extension of 12" public water lines along Mt Hood Drive and within the southern on-site private roadway, as well as extension of 8" public sewer lines within the southern private roadway.

Site preparation construction costs are expected to total nearly $13 million, as outlined below:

- ✓ On-site earthwork, parking, and private roadways - $6,536,800
- ✓ On-site private utilities - $5,528,200
- ✓ Public roadways - $0
- ✓ Public utilities - $855,000
- ✓ Total site development costs: $12,920,000

WEST BUSINESS PARK

Site preparation for the West Business Park Subarea is expected to include extension of SE Salmon Drive to the western edge of the subarea, which will include 12" water and 8" sewer public utility extensions within the new roadway. The proposed realignment of the intersection of SE Airport Way and SE Veterans Way is not included in the non-aeronautical site development roadway costs listed below.

Site preparation construction costs are expected to total over $8 million, as outlined below:

- ✓ On-site earthwork, parking, and private roadways - $3,277,700
- ✓ On-site private utilities - $2,651,600
- ✓ Public roadways - $850,000
- ✓ Public utilities - $1,232,500
- ✓ Total site development costs: $8,011,800

NORTH BUSINESS PARK

Site preparation for the North Business Park Subarea is expected to include upgrades of the existing SE 10th Street and SE Veterans Way to meet city standard road sections, which will include 12" water and 8" sewer public utility extensions within 10th Street. SE Veterans Way includes public utilities that do not need upgrades or extensions. The proposed realignment of the intersection of SE Airport Way and SE Veterans Way is not included in the non-aeronautical site development roadway costs listed below.

Site preparation construction costs are expected to total over $8 million, as outlined below:

- ✓ On-site earthwork, parking, and private roadways - $3,045,400
- ✓ On-site private utilities - $2,396,200
- ✓ Public roadways - $470,000
- ✓ Public utilities - $451,300
- ✓ Total site development costs: $6,392,900

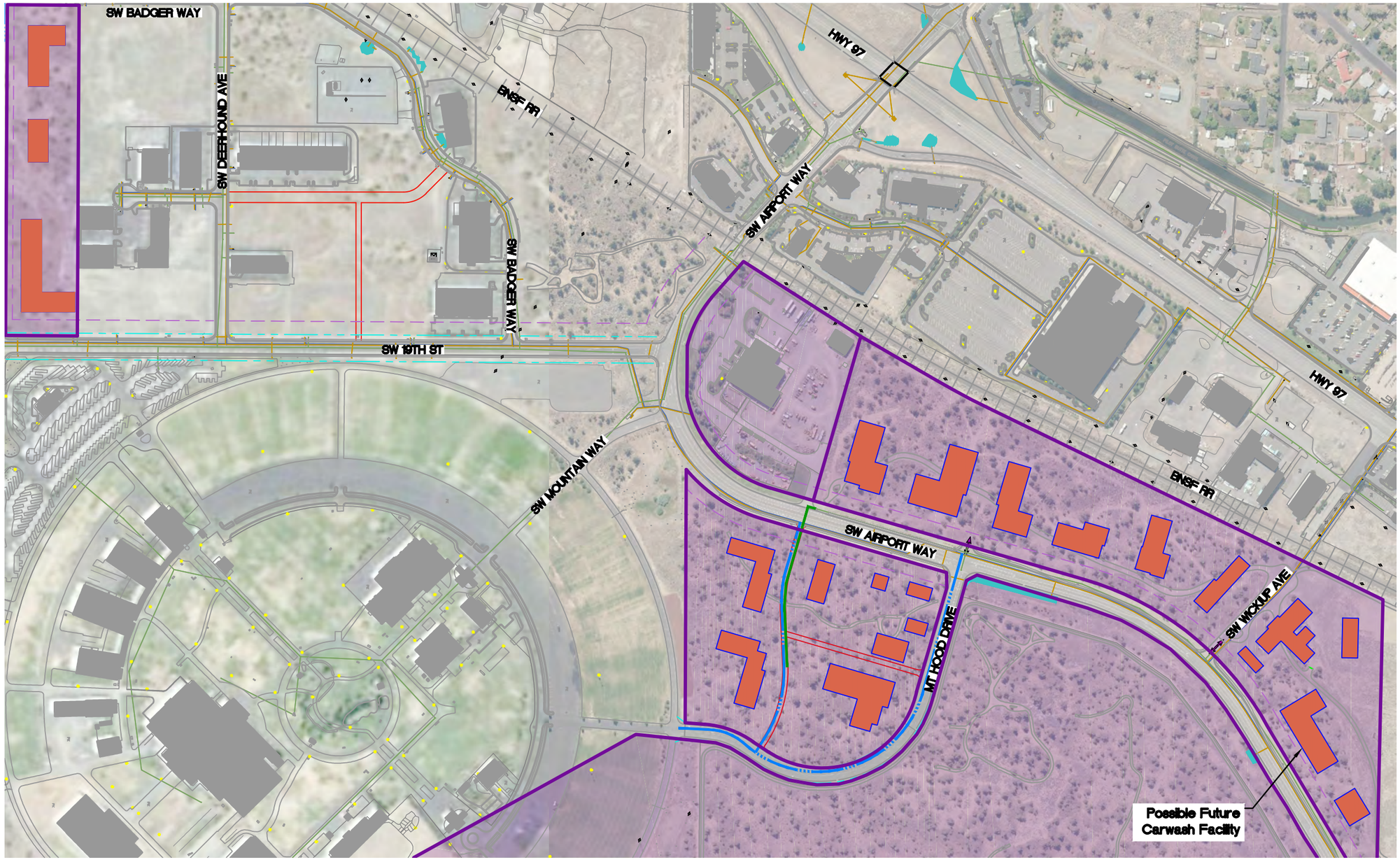
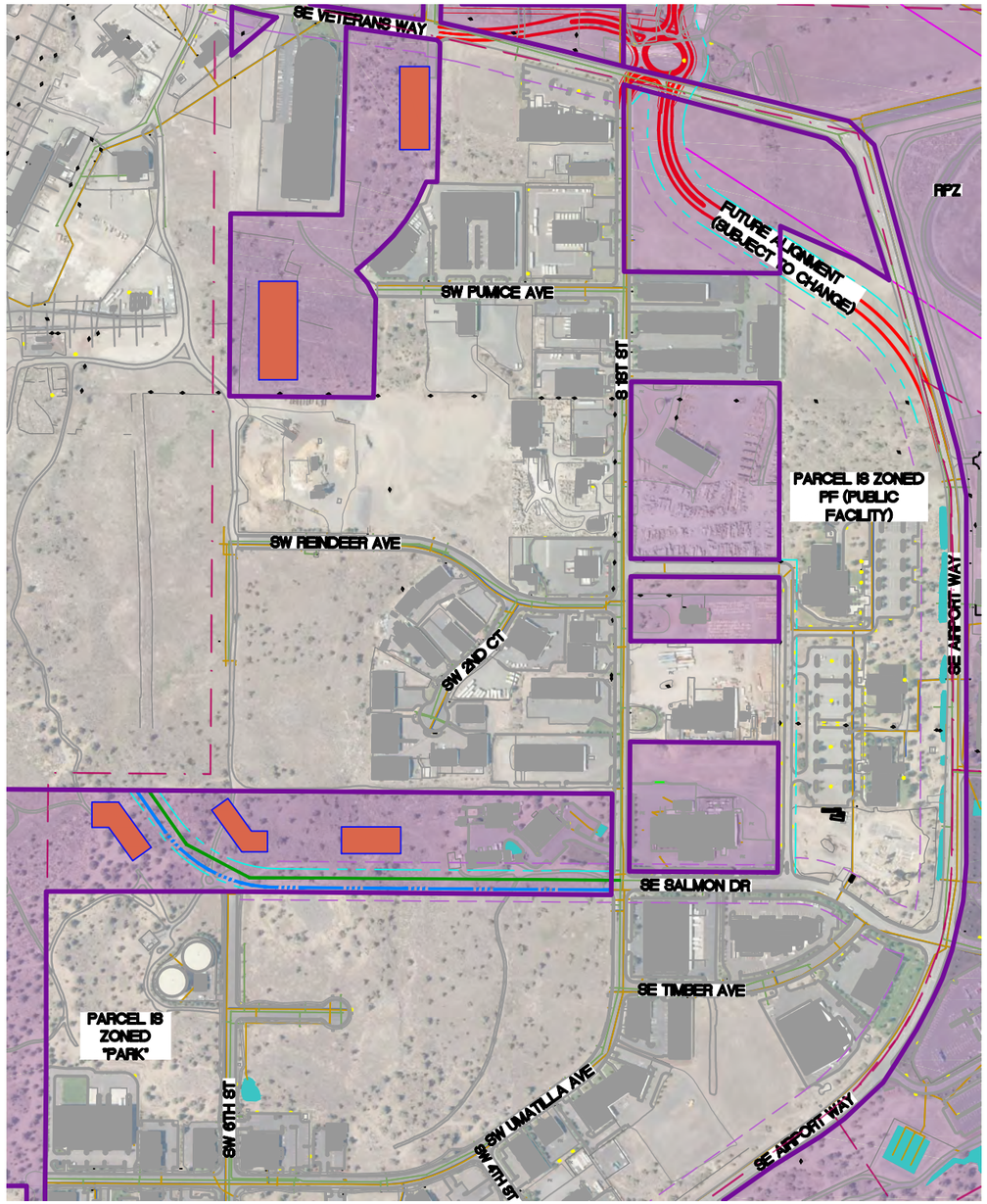
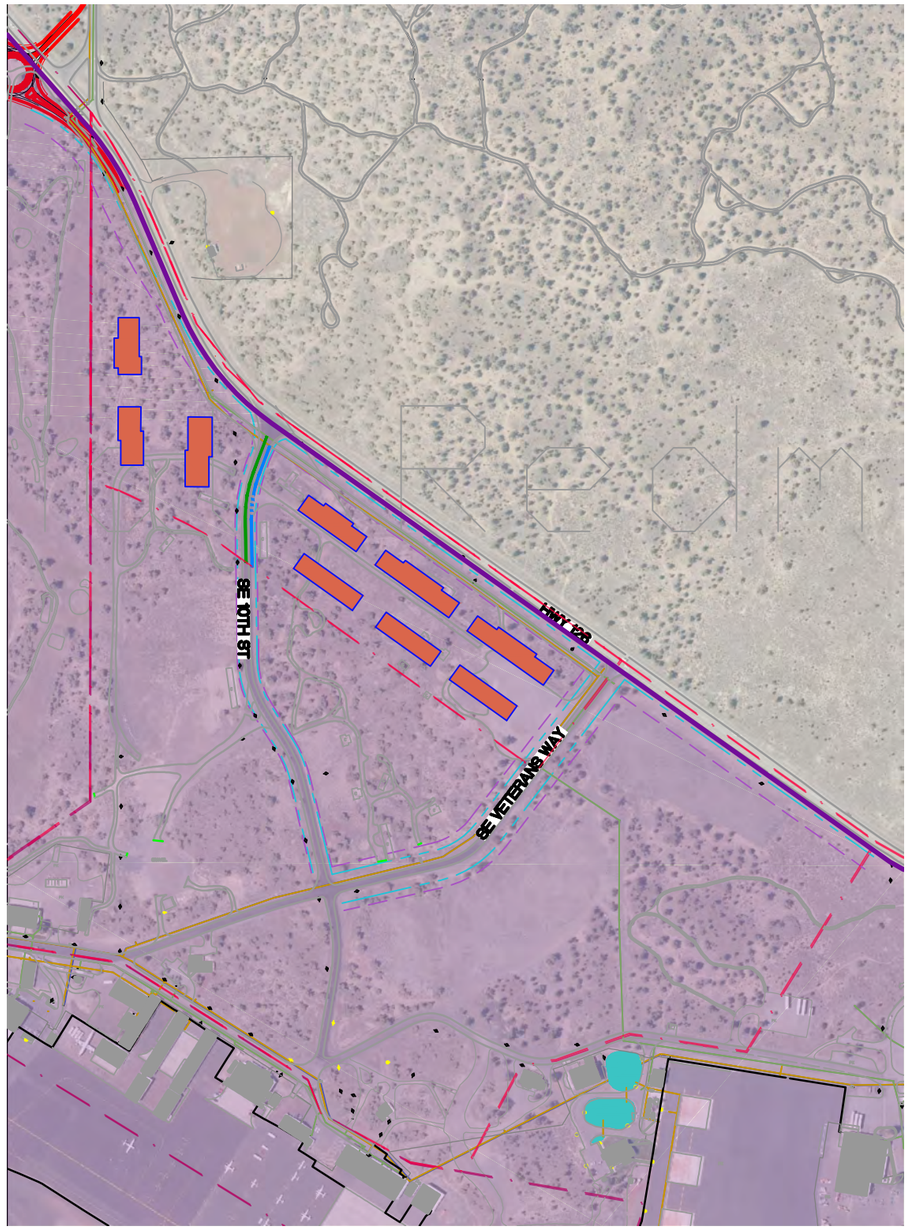


Figure 4-27
Alternatives - Fairgrounds Industrial & Airport Way Subareas





LEGEND

- RDM Property Boundary
- Right Of Way Line
- Runway Protection Zone (RPZ)
- R.O.W. Dedication
- Setback
- Future Road
- Existing Storm
- Existing Sewer
- Existing Water
- Future Sewer
- Future Water
- Existing Building
- Potential Building
- Existing Detention Pond
- RDM Property

N

0' 250' 500'

Figure 4-28
Alternatives - West & North Business Park Subareas

4.5.8 AIRCRAFT RESCUE & FIRE FIGHTING BUILDING ALTERNATIVES

The FAR Part 139 establishes certification requirements for airports serving scheduled air carrier operations. As an FAR Part 139 certified airport, RDM must provide Aircraft Rescue and Firefighting (ARFF) services in support of scheduled air carrier service. Part 139 requires that ARFF services must be able to meet a three-minute response time where an ARFF vehicle must reach the midpoint of the farthest runway serving air carrier aircraft from its assigned post or reach any other specified point of comparable distance on the movement area that is available to air carriers and begin application of an extinguishing agent. The existing ARFF building will lie within the future RVZ if Runway 5-23 extends to the southwest; in this scenario, the ARFF site would need to be relocated. The relocated site must remain clear of all FAR Part 77 surfaces, existing, and future RVZ and not impact FAA Air Traffic Control Tower (ATCT) line of site. Three possible locations were identified for the ARFF building, as described below.

ARFF RELOCATION SITE 1

This alternative, as shown in **Figure 4-29**, involves demolishing the existing ARFF facility and the construction of a new ARFF facility on a portion of the former footprint of the existing site, while shifting the future building a sufficient distance to remain clear of FAR Part 77 and the RVZ. The new ARFF location remains clear of all FAR Part 77 surfaces, does not impact the existing or future RVZ, and does not impact the existing ATCT line of site.

This alternative is estimated at a total project cost of $3,250,000 and does not include demolition, engineering, environmental compliance, or construction management services.

ARFF RELOCATION SITE 2

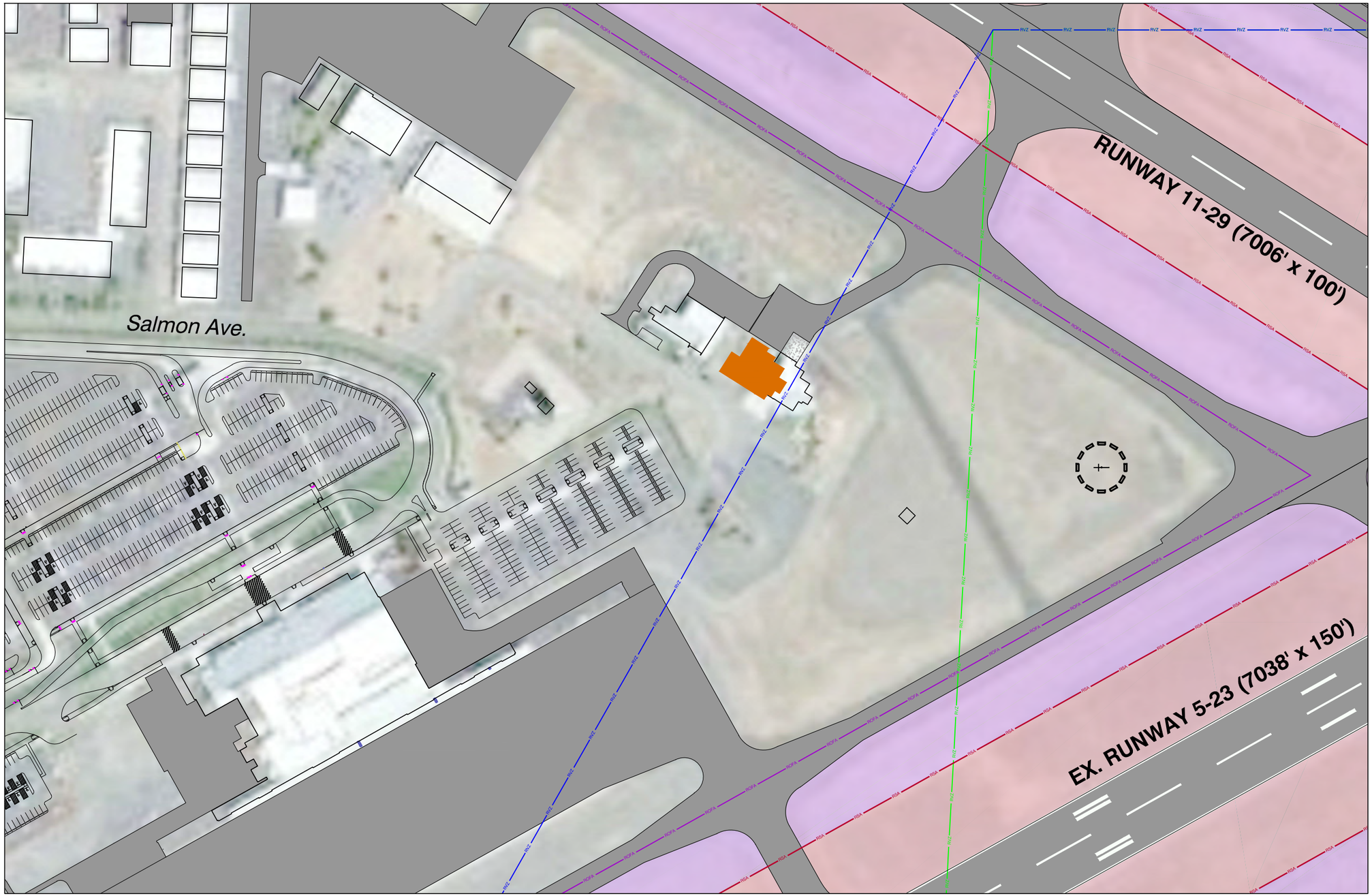
This alternative, as shown in **Figure 4-30,** involves the construction of a relocated ARFF building on a vacant parcel of land, northeast of the ATCT, adjacent to the existing Snow Removal Equipment (SRE) building. The new ARFF location remains clear of all FAR Part 77 surfaces, does not impact the existing or future RVZ, and does not impact the existing ATCT line of site.

This alternative is estimated at a total project cost of $2,877,280 and does not include engineering, environmental compliance, or construction management services.

ARFF RELOCATION SITE 3

This alternative, as shown in **Figure 4-31,** involves converting the existing SRE building into the ARFF building. The new ARFF location remains clear of all FAR Part 77 surfaces, does not impact the existing or future RVZ, and does not impact the existing ATCT line of site.

This alternative is estimated at a total project cost of $2,877,280 and does not include engineering, environmental compliance, or construction management services.



LEGEND

- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- ARFF Building Relocation Site 1
- Existing Runway Visibility Zone (RVZ)
- Future (RVZ)

N

0' 100' 200'

Figure 4-29
Alternative 1A - ARFF Relocation Site 1

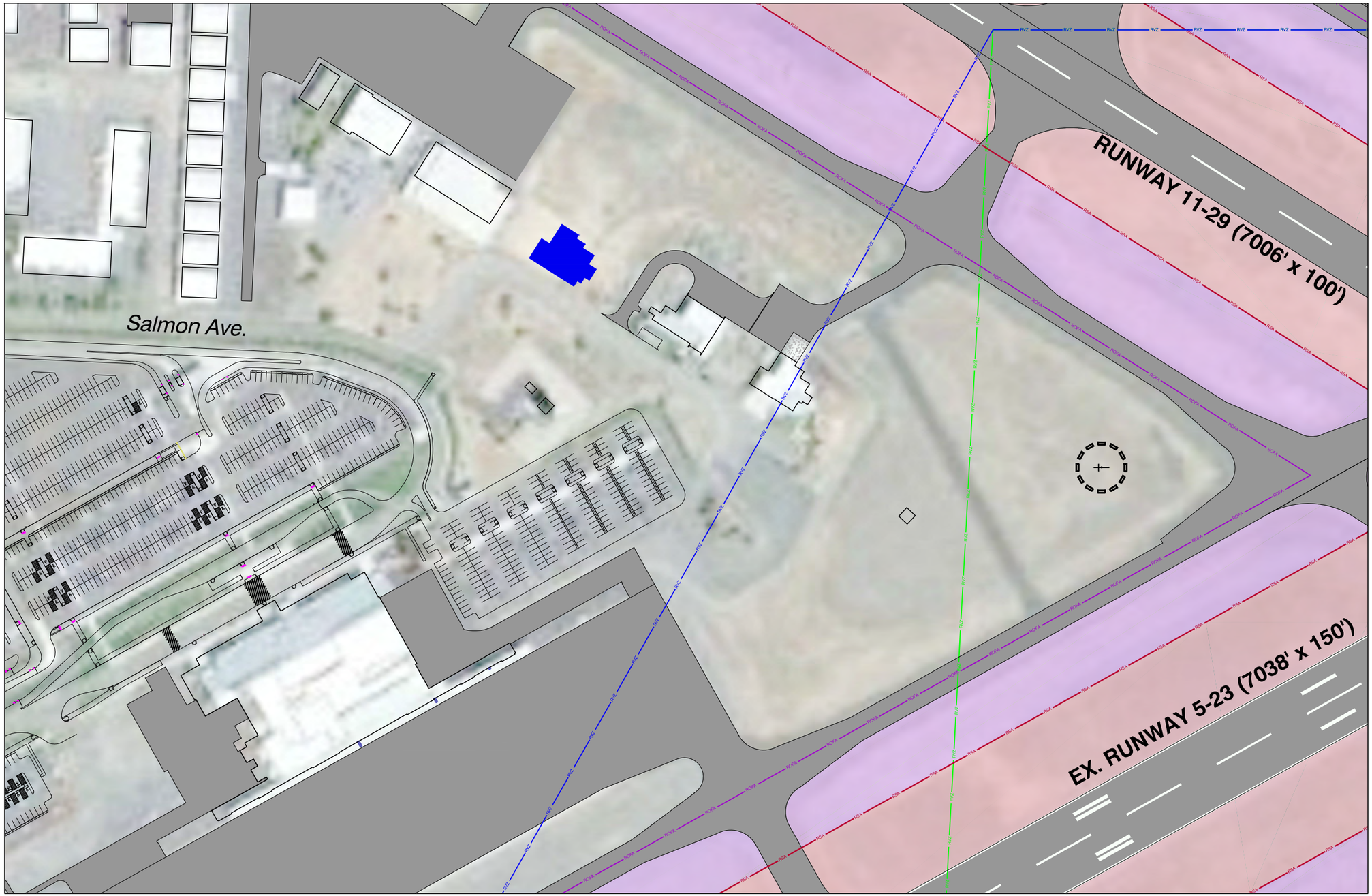


Figure 4-30
Alternative 1B - ARFF Relocation Site 2

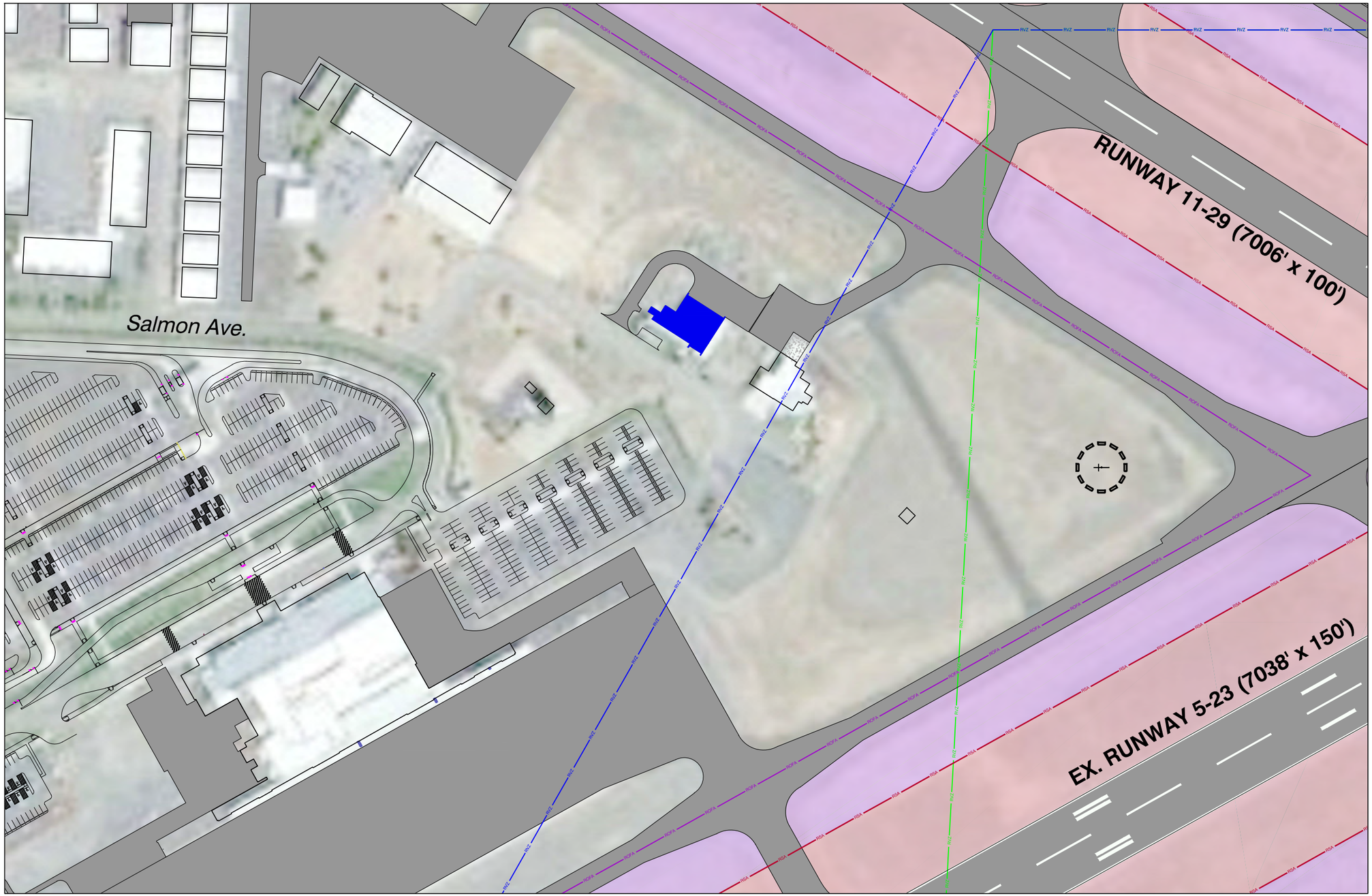


Figure 4-31
Alternative 1C - ARFF Relocation Site 3

SUMMARY EVALUATION OF ARFF BUILDING ALTERNATIVES

Table 4-9 presents a summary and an evaluation of the various alternatives for the relocation of the ARFF building. Alternative 1 is the preferred alternative because the ARFF building will continue to be in range to meet required response times for emergencies and the alternative uses a portion of the existing ARFF building footprint for the relocation.

Table 4-9. ARFF Relocation Alternatives Summary Evaluation Matrix

Impact Category	Alternative 1	Alternative 2	Alternative 3
Description of Improvement	Relocate ARFF to portion of existing ARFF footprint.	Relocate ARFF next to SRE building.	Relocate ARFF to existing SRE building.
Operational Capabilities			
Operability & Access	ARFF will remain in response time distance for emergencies	ARFF will remain in response time distance for emergencies	ARFF will remain in response time distance for emergencies
Airfield Impacts	Low	Low	Low
Performance Requirements			
Expansion Capabilities	Yes	Yes	Yes
Land Use Compatibility			
Impacts to Airport Property Use	ARFF wll be out of RVZ	ARFF wll be out of RVZ	ARFF wll be out of RVZ
Impact to Other Facilities	None	None	SRE building converted into ARFF
Environmental Impact Potential			
Property Acquisitions / Easements	None	None	None
Historic, Architectural, and Archaeological and Cultural Resources	None	None	None
Section 4(F) of the Department of Transportation Act	None	None	None
Tenant Relocation Required	Yes	Yes	Yes
Threatened and Endangered Species	Requires Contact of USFWS - East Wolf Mgmt. Zone.	Requires Contact of USFWS - East Wolf Mgmt. Zone.	Requires Contact of USFWS - East Wolf Mgmt. Zone.
Constructability			
Impact to Airport Operations	Low	Low	Low
Grading/Soil Conditions	Complex	Complex	Complex
Facilities Demolition	Yes	Yes	Yes
Phasing Complexity	Low	Low	Low
Financial Costs/Impacts			
Project Cost	$3,250,000	$2,877,280	$2,877,280
OVERALL EVALUATION			
DETERMINATION	**Favorable**	**Favorable**	**Favorable**

4.5.9 NORTHEAST PASSENGER TERMINAL APRON RECONSTRUCTION ALTERNATIVE

As part of the terminal expansion project, the northeast passenger terminal apron needs to be reconstructed with concrete to accommodate a parked regional jet Embraer ERJ-175 to have adequate support for the weight of the aircraft and tail height clearance of the FAR Part 77 transitional surface, and to remain clear of the future RVZ. The section of apron that would be reconstructed is located on the northeast side of the existing apron. The concrete area would be 135' in width and 30' in length for a total area of 4,126sf of Portland Cement Concrete Pavement (PCCP). The apron reconstruction would potentially require the relocation of two light poles, relocation of the vehicle service road, and relocation of ground support equipment storage on the apron.

ALTERNATIVE 1 – NORTHEAST APRON RECONSTRUCTION

This alternative, as shown in **Figure 4-32,** involves the reconstruction of 4,126sf of pavement to PCCP to accommodate the weight of an ERJ-175. This alternative is estimated at a total project cost of $1,998,900 and does not include any relocation of light poles, service roads, demolition of existing facilities, engineering, environmental compliance, or construction management services.

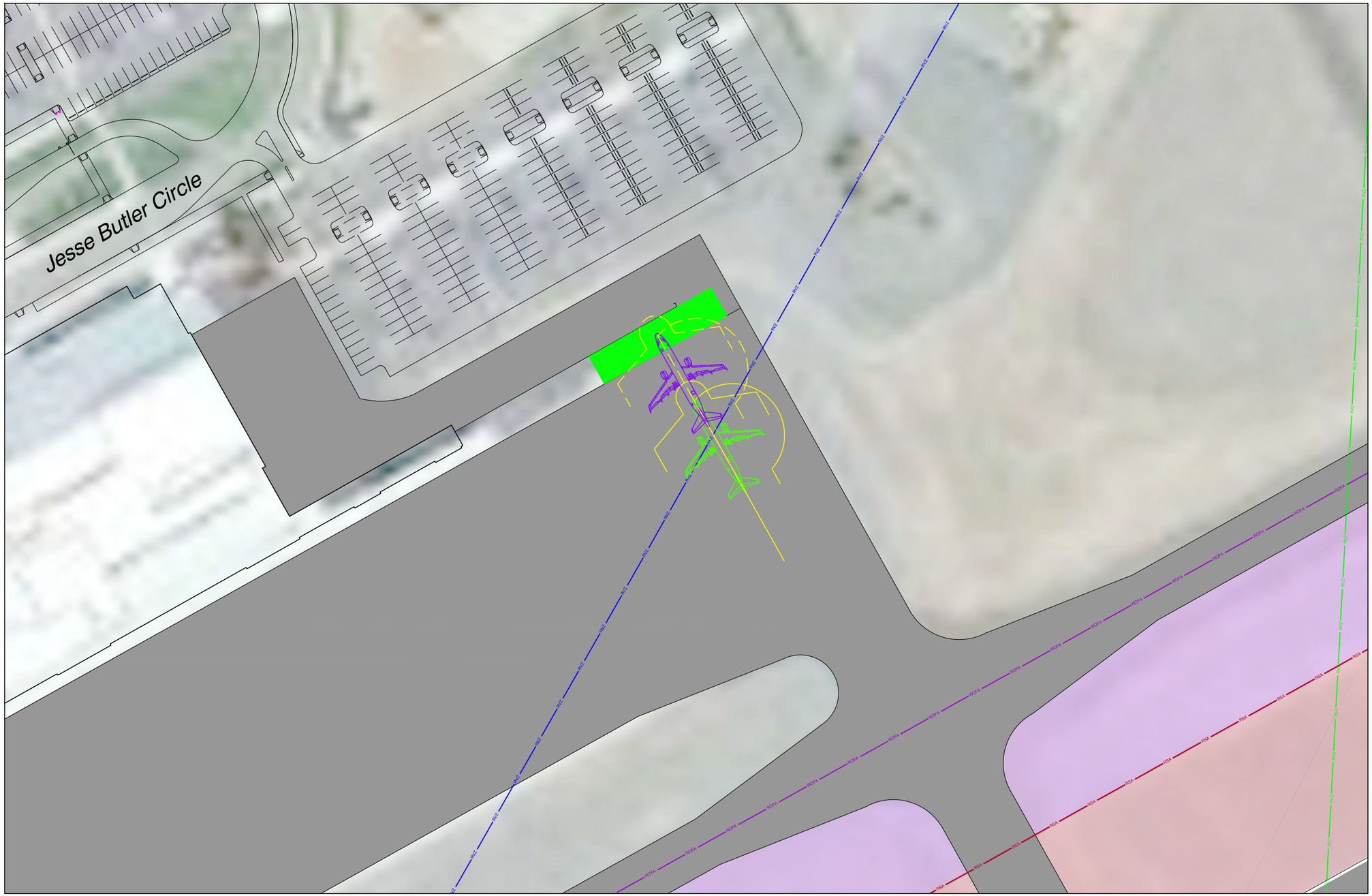


Figure 4-32
Alternative 1 - Northeast Apron Reconstruction

4.6 ALTERNATIVES SUMMARY

The preferred Airport development alternative outlines the necessary development and facility improvements that will not only meet the forecasted demand presented in **Chapter 2 – Forecast**, but also ultimately supports competitiveness and financial viability for the Airport. It is recommended that the Airport acquire available property north of Highway 126 for future aeronautical and non-aeronautical uses, in addition to ensuring compatible uses. The following improvement alternatives are recommended.

AIRSIDE FACILITIES

- ✓ Extend Runway End 5 to the southwest by 2,962 feet for a total length of 10,000 feet for Runway 5-23
- ✓ Upgrade the approach to Runway 5to support LPV approach capabilities
- ✓ Demolish existing taxiway connectors E and H that provide direct access to Runway 5-23 from the passenger terminal apron and reconstruct taxiway connectors E and H in a position that conforms to current FAA AC 150/5300-13A, Change 1, *Airport Design* standards
- ✓ Construct a new taxiway connector from Taxiway F to the passenger terminal apron on the northeast side
- ✓ Construct the first phase of a new parallel taxiway on the east side of Runway 5-23, and eliminate two segments of Taxiways F and C, to address FAA identified Hot Spots 1 and 2
- ✓ Construct the second phase of a new parallel taxiway on the east side of Runway 5-23 to facilitate aircraft movements and support a future central GA development area
- ✓ Construct the third phase of a new parallel taxiway on the east side of Runway 5-23 to facilitate aircraft movements
- ✓ Construct improvements to the north and south ends of taxiway connector A to conform to current FAA AC 150/5300-13A, Change 1, *Airport Design* standards
- ✓ Reconstruct the passenger terminal apron to allow the tail of a parked ERJ-175 to remain under the FAR Part 77 surfaces and have the weight of the aircraft properly supported
- ✓ Coordinate with the FAA, Oregon Department of Transportation – Highway Division, County of Deschutes, and the local Irrigation District for the relocation of a segment of Highway 126 outside of Runway 23's RPZ to comply with requirements in FAA AC 150/5300-13A, Change 1, *Airport Design* and the *2012 RPZ Memo*

GENERAL AVIATION DEVELOPMENT

- ✓ Expand existing GA facilities on the north side
- ✓ Develop new GA facilities east of the Runway 5 End that would support future aviation uses upon buildout of the north side GA facilities

VEHICLE PARKING

- ✓ Develop property near the Deschutes County Fair Grounds Expo Center for the expansion of rental car facilities, new long-term parking, and remote parking
- ✓ Expand employee parking to include the vacant parcel within the central terminal area
- ✓ Expand existing vendor parking to consume a portion of the existing employee parking lot

SUPPORT FACILITIES

- ✓ Relocate the SRE building to the northside GA development area
- ✓ Construct a new fuel farm south of the existing passenger terminal
- ✓ Relocate the ARFF building outside of the future RVZ

PASSENGER TERMINAL BUILDING

- ✓ Expand the passenger terminal building to the west to accommodate future passenger demand and larger ADG-III aircraft

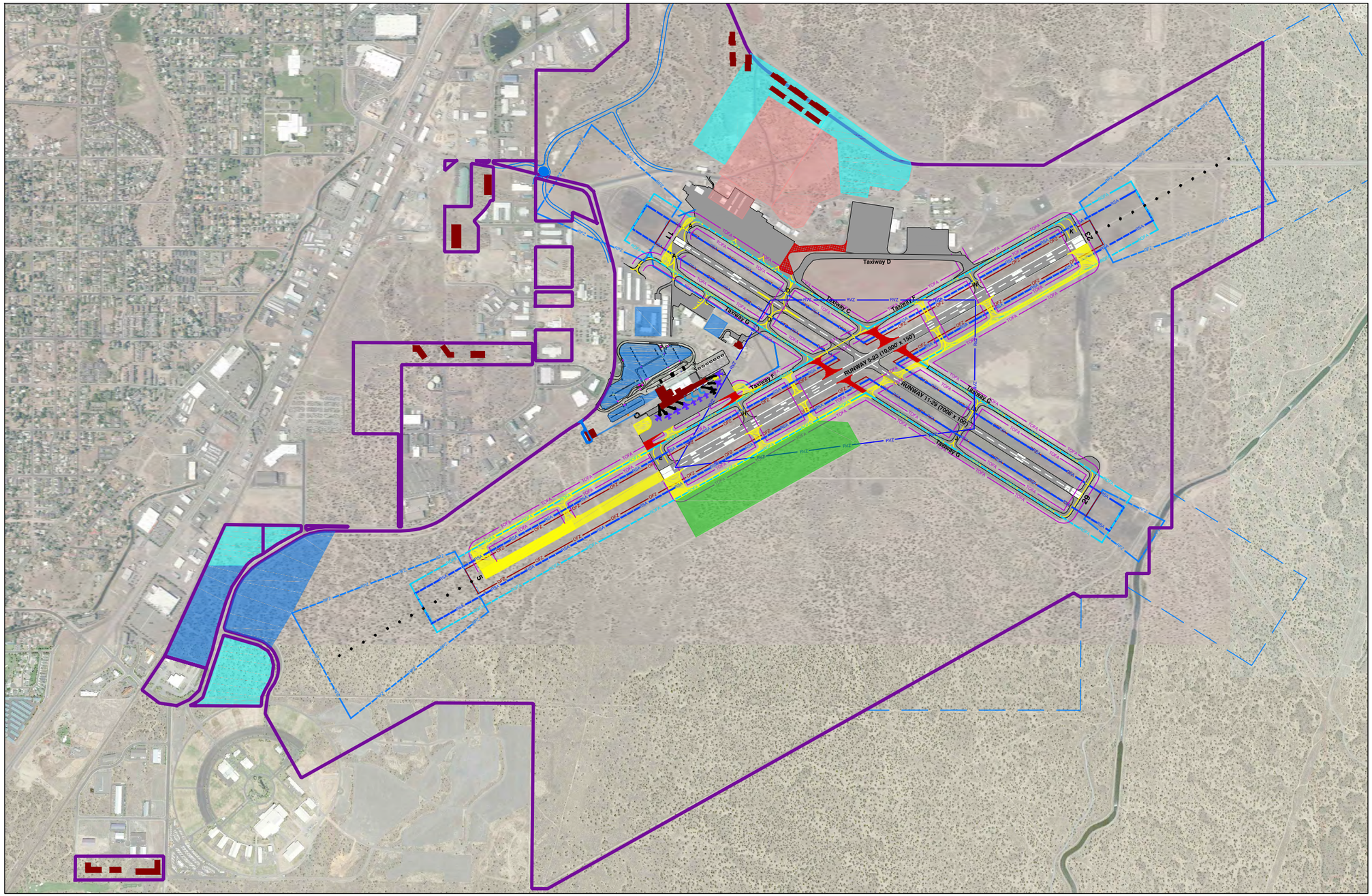
NON-AERONAUTICAL PROPERTY DEVELOPMENT

- ✓ Develop non-aeronautical property in the Fairgrounds Industrial, Airport Way, West Business Park, and North Business Park Subareas
- ✓ Explore amending the zoning near the Airport to accommodate a wider range of airport-compatible uses, including commercial, industrial, and institutional uses

4.6.1 PREFERRED DEVELOPMENT CONCEPT

Capital costs will be calculated and added to the improvement projects identified in the implementation plan. The preparation of an updated ALP will begin to show how the Airport will look at the end of the implementation plan.

The preferred airport layout is shown **in Figure 4-33**.



LEGEND

- Airport Property
- Easement
- Runway Object Free Area (OFA)
- Runway Obstacle Free Zone (OFZ)
- Runway Protection Zone (RPZ)
- Runway Safety Area (RSA)
- Runway Visibility Zone (RVZ)
- Taxiway/Taxilane Object Free Area (TOFA)
- Existing Pavement
- Removed Airfield Pavement
- Airfield Pavement to be Removed
- Future Commercial Area
- Future Pavement
- Future Auto Parking/Road
- Future General Aviation
- Future Building/Building Expansion
- Aviation Reserve

N

0' 750' 1500'

Figure 4-33
Preferred Alternatives

5.0 FINANCIAL FEASIBILITY

This chapter describes the 20-year Capital Improvement Plan (CIP) for Redmond Municipal Airport (RDM or the Airport). The CIP is a strategic year-by-year project development schedule for the continued development, upgrade, and expansion of facilities and equipment. The CIP is developed in accordance with federal and state aviation grant programs and is structured to fit the Airport's financial capabilities. The Federal Aviation Administration (FAA) and the Oregon Department of Aviation (ODA) reviewed and accepted the Airport's current five-year CIP, which RDM updates annually. Annual updates include improvement projects identified in this Master Plan through the 20-year planning horizon.

The CIP is not intended to be rigid or inflexible. It does not require the Airport to build anything and does not require the FAA or ODA to fund identified projects. Projects that receive FAA funding will need to show that they meet FAA design standards, are justified based on FAA criteria described in this chapter, and undergo an environmental review pursuant to the requirements of the National Environmental Policy Act (NEPA), as amended.

5.1 APPROACH TO CAPITAL PLANNING

5.1.1 Project Phasing

The CIP identifies individual projects, costs, and funding participation phased within the short term (1-5 years), mid-term (6-10 years), and long-term (11-20 years) planning periods. The CIP projects are prioritized based on need identified in **Chapter 2, Aviation Activity Forecasts**, and **Chapter 3, Facility Requirements**. These considerations influenced project priority:

- ✓ Ability to enhance efficiency and meet FAA design standards.
- ✓ Ability to repair and upgrade facilities reaching the end of useful life.
- ✓ Ability to meet user demand and desired level of service.
- ✓ Ability to support long-term airport strategic goals related to scheduled commercial air service, general aviation, the U.S. Forest Service, and emergency response.

Several projects identified in this CIP can be phased over years. This approach helps distribute capital costs more evenly and allows the Airport to implement improvements as demand materializes. Project phasing supports accelerating or delaying project implementation in response to economic conditions and changing airport user needs.

5.1.2 Project Costs

Professional engineers and architects have developed cost estimates for each project contained in the CIP. All project costs use 2018 dollars. For projects not occurring in 2018, the estimators adjusted for inflation at a rate of three percent. Except where explicitly noted, project costs have fifteen percent contingency added to the construction cost to account for unknowns. Costs for environmental assessment, design, and construction management are included as appropriate.

5.1.3 Funding Participation and Commitment

The CIP identifies funding classified into one of three categories for each project:

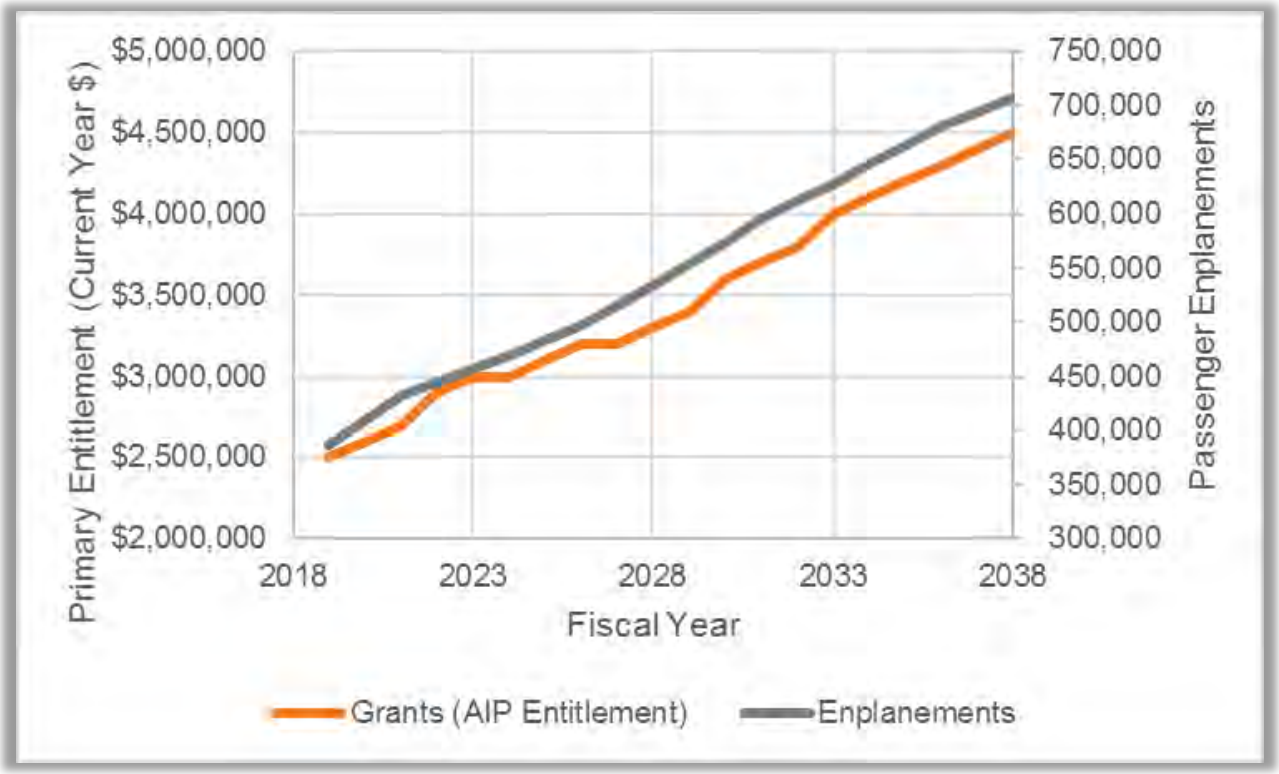
- ✓ FAA Airport Improvement Program (AIP)
- ✓ Passenger Facility Charges (PFCs)
- ✓ Local funds (Airport revenues, bonds, customer facility charge [CFC], and ODA grants)

FAA AIP funds are classified as entitlement and discretionary. The FAA grants funding to airport improvements through the Aviation Trust Fund (ATF), which is financed by aviation system user fees and taxes (e.g., airline passenger tax, aircraft parts taxes, fuel taxes, and aircraft registration fees). The AIP provides the mechanism to reinvest the ATF at FAA-eligible airports. FAA Order 5100.38D *Airport Improvement Program Handbook* (AIP Handbook) describes AIP funding eligibility. The AIP program requires the Airport to contribute a local match of 6.67 percent for AIP grants received, which is lower than the typical 10 percent requirement. This is due to the fact that the Airport receives a high federal share based the large amount of federal lands located in Deschutes County. More information can be found in FAA Order 5100.38D Appendix AA. The FAA distributes AIP entitlement funding annually, and the Airport can save the entitlement funds for up to three years, which helps pay for more expensive projects.

The FAA National Plan of Integrated Airport Systems (NPIAS) defines RDM as a primary airport, meaning it is a commercial service airport with more than 10,000 annual passenger enplanements. The NPIAS identifies airports eligible for AIP funding and estimates the amount of AIP funds needed to fund projects that will update airports to current FAA standards and increase capacity as needed. Primary airports are eligible for annual primary entitlement funding under the AIP. The total amount of primary entitlement funding depends on the number of enplaning passengers (passenger entitlements), and the volume of landed cargo (cargo entitlement). The AIP Handbook defines how the FAA calculates primary entitlement.

In fiscal year (FY) 2018, the primary entitlements (PE) for RDM totaled $2,240,000. The FAA calculates entitlement based on the last calendar year of data prior to the FAA fiscal year that starts in October. FY2018 started in October 2017, and FY2018 entitlement is based on enplanement levels in calendar year 2016. The FAA projects future entitlement funds using the passenger enplanement forecast for two years prior and rounded to the nearest hundred thousand. RDM sees less than 1/10 of a percent of national cargo volume, so cargo entitlements are not included in future entitlement projections. **Figure 5-1** shows the entitlement and passenger enplanement projections.

Figure 5-1: AIP Entitlement Funding Projection



Entitlement funds equal to current year dollars, not adjusted for inflation to 2018 values. Entitlement calculated using formula in AIP Handbook, Table 4-1, for when more than $3.2 billion is available in national AIP funding.
*Enplanement forecast described in **Chapter 3***

Projects eligible for AIP funding may receive discretionary funding if the total cost exceeds what can be covered by entitlement funds. Discretionary funds are not guaranteed and the project in question competes with others from across the NPIAS for funding.

The demand for FAA AIP funds exceeds the availability. The FAA uses a national priority rating system to allocate AIP grant funds for specific airport projects. This formula system, which is occasionally adjusted to reflect national priorities, considers the airport type and project role. The following are the FAA AIP funding categories and point system:

- ✓ Safety/Security = 10 points
- ✓ Statutory Emphasis Programs = 9 points
- ✓ Planning / Reconstruction / Environment = 8 points
- ✓ Capacity = 7 points
- ✓ Standards = 6 points
- ✓ Other = 4 points

PFCs are a fee attached to airline tickets to pay for facilities that passengers on commercial airlines use. This fee can be used for airport improvement projects; however, the Airport is required to consult with the airlines on which projects the fee will be used for. As of February 2018, the Airport collects $4.50 per enplaning passenger, and the proceeds are used for the debt service on the bonds that paid for the existing passenger terminal building. PFCs are allocated to the existing terminal debt service through the City of Redmond (the City) Fiscal Year 2038/2039.

Local funds include, but are not limited to, Airport revenues from leases, fuel surcharges, landing fees, and automobile parking. Local funds may include bonds issued on the full faith and credit of the City, grants from ODA, and CFCs from rental cars. The Airport does not receive funding from the City general fund for capital or operating expenses. The Airport uses local funds to provide the 6.67 percent match on AIP-eligible projects, and to pay for projects that are not eligible for AIP funding. FAA policy states that CFC funds can only be used for projects related to the rental cars.

The CIP identifies expected funding sources for each project based on cost and eligibility. The Airport updates it's five-year CIP with the State and the Airport annually and will update funding sources appropriately as the time nears to implement projects. Before projects included on the CIP can be implemented, they may require environmental assessment and property acquisition. The CIP allocates time and money for the Airport to complete these actions. The cost estimates include contingency for unknown expenses such as legal fees, design challenges, and changing regulation.

5.1.4 Airport Funds

The City reviewed the Airport's financial data to ascertain the availability of local funds to support the CIP. The City performed a financial analysis during the development of the CIP to identify if the expected local capital requirements could be met. The City's model considered revenue growth based on additional landings and passengers and the ability of the Airport to take on debt to finance more expensive capital projects.

Airport revenue consists of grants and fees collected from users of the air carrier terminal. Such fees include: PFCs, landing fees, rental car commissions, and parking fees. Federal and state grants for approved capital improvement projects make up a sizable portion of airport funding. The airport also receives revenue from non-aviation related land leases.

The source of funds for operational and capital improvement projects at the Airport is the Airport Fund. The Airport Fund is divided into two sub-funds: Capital Projects and Operational Projects. The Capital Projects sub-fund is used to construct major capital projects. Operational projects are further divided into three programs: the Terminal program, the Airfield program, and the General Operations program:

- The Terminal program funds Airport Terminal operations and is collected through Airline tenants paying rent, maintenance, and overhead fees.
- The Airfield program funds Airport Airfield operations and maintenance. Costs for the Airfield program are recovered through landing and fuel flowage fees.
- The General Operations program funds maintenance, improvement, and leasing of industrial properties, private hangars, and vehicle parking lots for passengers and rental car agencies.

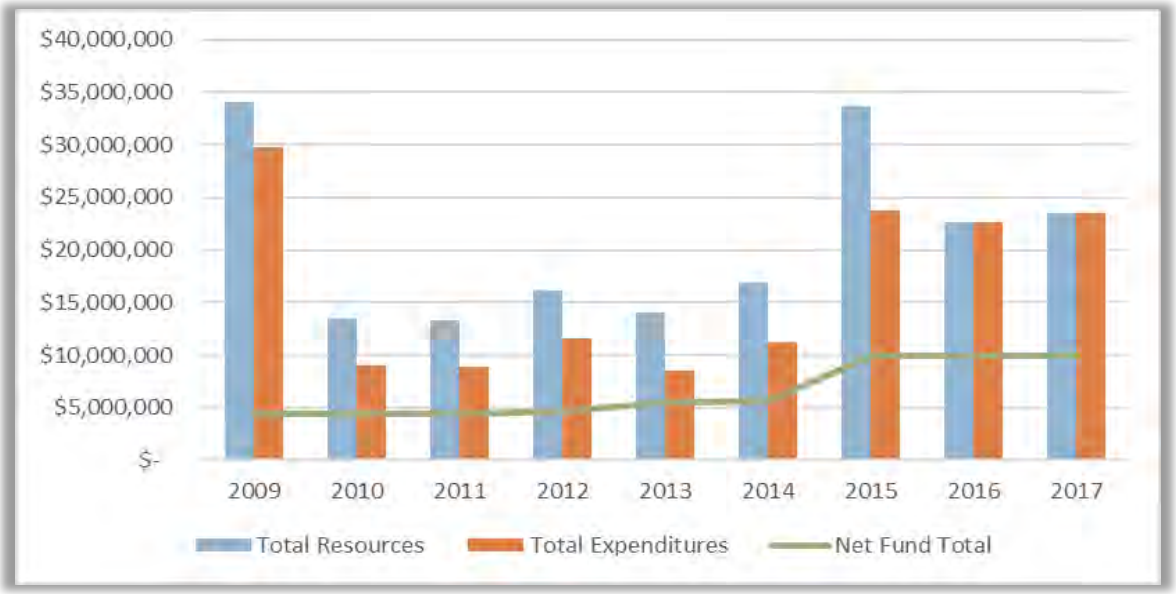
Airport funds vary from year to year depending on how busy the Airport is. Large capital projects, typically paid for by AIP grants, are the primary cause of large variations of the past five years. For example, the Airport received $3 million in grants during FY2014, and more than $12 million in grants for FY2015. **Table 5-1** shows the resource and expenditure by sub-fund.

Table 5-1. Total Resources and Expenditures by Sub-Fund					
	2013	2014	2015	2016	2017
Total Resources	$14,106,302	$16,846,264	$33,649,483	$22,616,499	$23,477,443
Total Beginning Fund Balances	$4,620,801	$ 5,562,536	$ 5,617,592	$ 8,039,651	$ 6,755,917
Total Current Resources	$9,485,501	$11,283,728	$28,031,891	$14,576,848	$16,721,526
Total Expenditures	$8,543,766	$11,228,672	$23,739,026	$22,616,499	$23,477,443
Operations	$7,307,316	$ 7,375,838	$ 9,929,537	$11,157,582	$13,308,184
Debt Service Reserve	$0	$0	$0	$ 2,515,917	$2,715,259
Customer Facility Charge	$0	$0	$0	$0	$739,000
Capital Projects	$1,236,450	$ 3,852,834	$13,809,489	$ 8,943,000	$6,715,000
Net Fund Total	$5,562,536	$5,617,592	$9,910,457	$9,910,456	$9,910,456

Total Resources is the sum of Total Beginning Fund Balances and Total Current Resources.
Total Expenditure is the sum of Operations, Debt Service Reserve, Customer Facility Charge, and Capital Projects.
Net Fund Total is the difference between Total Resources and Total Expenditure.
Source: City of Redmond: The Airport Fund

Figure 5-2 provides information on expenditures by sub-funds and total resources from FY2009 to 2017. FY2009 to FY2015 are income statements, and FY2016 and FY2017 are budgets. The budgets are balanced: expenses equal projected revenues. The Total Resources category is the sum of current resources and the fund balance from the beginning of the previous year. The Airport has had surplus net funds with enough resources to cover expenditures. Additional details of the annual revenue and expenditure can be found in the City's annual budget.

Figure 5-2: Airport Fund Resources and Expenditures



5.2 CAPITAL IMPROVEMENT PLAN

The Airport completed its latest CIP in January 2018, which covers projects for FY2019 to FY2023, and reviewed it with the FAA Seattle Airports District Office (ADO). The FAA prefers that the next three years of capital projects remain consistent to assist in the allocation of funds across the NPIAS. Thus, near-term projects have a relatively firm timeline compared to mid- and long-term projects which have more flexible timelines. The Master Plan CIP focuses on projects that occur beyond FY2023; however, there are some recommendations for reordering projects in FY2022 and FY2023 based on conversations that occurred during Master Plan CIP development. **Table 5-2** includes a summary of the costs and funding sources.

Table 5-2. Summary of Capital Improvement Plan

Period (Years)	Years	Project Costs	Entitlement	Discretionary	Local
Near-term (1-5)	2019-2023	$39,558,000	$13,633,403	$8,653,020	$17,271,577
Mid-term (6-10)	2024-2028	$28,148,001	$11,861,480	$2,143,327	$14,143,194
Long-term (11-20)	2029-2038	$203,001,667	$42,705,187	$64,244,174	$96,052,306
CIP	2019-2038	$270,707,668	$68,200,070	$75,040,521	$127,467,077

PFC funds are not shown as a source of up-front capital improvement funds. PFCs are expected to be used for terminal building debt service throughout the 20-year CIP.
This list includes only projects that are considered candidates for AIP funding.

The CIP summary shown above does not include projects not eligible for AIP funding and does not include PFCs or CFCs as funding sources. Funding from the Airport and the State are part of the local funding category, and availability of State funding should be assessed closer to the time to implement the project. AIP discretionary funding can be variable, and the project may need to be advanced or delayed depending on funding availability. The components of each period of the CIP are described in the following sections.

5.2.1 Near-term CIP (FY2019-FY2023)

The near-term CIP includes construction of a new snow removal equipment (SRE) storage facility, acquisition of SRE and aircraft rescue and firefighting (ARFF) equipment, pavement rehabilitation, airfield lighting, and the first phase of the passenger terminal building expansion. **Table 5-3** shows the near-term CIP, and the projects are described in the following sections. **Figure 5-3** shows project locations.

Table 5-3. Near-term CIP

Year	Project	Entitlement	Discretionary	Local	Total
2019	SRE Building	$2,500,000	$0	$8,613,000	$11,113,000
2020	SRE Vehicles	$1,493,333	$0	$106,667	$1,600,000
	SRE Building (Reimbursement)	$490,000	$0	$0	$490,000
2021	Rehabilitate Taxiways F, E, H, N, K	$2,316,737	$1,873,930	$299,333	$4,490,000
	Widen Taxiway F	$0	$4,648,000	$332,000	$4,980,000
	Rehabilitate Electrical Vault	$933,330	$0	$66,667	$1,000,000
2022	Pavement Management Plan	$56,000	$0	$4,000	$60,000
	Terminal Phase 1, Part 1	$1,574,720	$0	$645,280	$2,220,000
2023	Terminal Phase 1, Part 2	$4,269,280	$2,131,090	$7,204,630	$13,605,000
Near-Term CIP Total		$13,633,403	$8,653,020	$17,271,577	$39,558,000

2019 Projects

The Airport plans to build an SRE building on the north side of the Airport. This building will provide crews with a centralized storage location for their supplies and vehicles that are presently dispersed around the airfield. The project is expected to cost $11 million dollars and will be funded by $3 million in AIP entitlement funding, and $8 million in local funds. The Airport will be reimbursing itself $490,000 via entitlement funding in FY2020.

2020 Projects

The 2020 projects include the second phase of the SRE building and the purchase of two SRE vehicles. The Airport will carry the remaining $250,000 of AIP entitlement funding over to the next year, which will help cover the costs of the planned pavement and electrical projects. No environmental, design, or construction projects are planned for 2020.

2021 Projects

The 2021 projects include rehabilitation of Taxiways F, E, H, N, and K, widening of Taxiway F, and rehabilitation of the lighting electrical vault. Taxiway F is the parallel taxiway to Runway 5-23, and Taxiways E, H, N, and K and the connector taxiways. Taxiway F is going to be widened near the passenger terminal apron to accommodate the wheelbase of the Bombardier Q400 aircraft used by Alaska Airlines.

The equipment in the electrical vault, located on the north side of the Airport in the general aviation area, is aging and in need of replacement.

These projects include a mix of AIP entitlement, discretionary, and local funds. The Airport has coordinated with the Seattle ADO on the needs for discretionary funds in 2021.

2022 Projects

The 2022 projects include an update of the pavement management plan and the start of the passenger terminal program. The pavement management plan will assess the condition of the airfield pavements and be used to plan future capital investment. The passenger terminal program is a multi-year project that includes terminal rehabilitation and expansion needed to meet the expected level of passenger demand.

The terminal program begins with environmental permitting and design for Phase 1A, reconfiguration of the existing holdroom and Phase 1B, expansion of the holdroom and additional terminal apron to accommodate parked aircraft. Phase 1A, 1B, and the terminal apron will occur over three years, starting with environmental permitting and design. It is expected that both phases of the project will be Categorically Excluded under FAA Order 5050.4B *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions* as it involves the rehabilitation of an existing building and expanding the building into a paved area.

The completion of the terminal program's design and environmental review is expected to be completed within one year. The project could experience a delay into early 2023; however, it is not expected the delay will impact the 2023 terminal construction project.

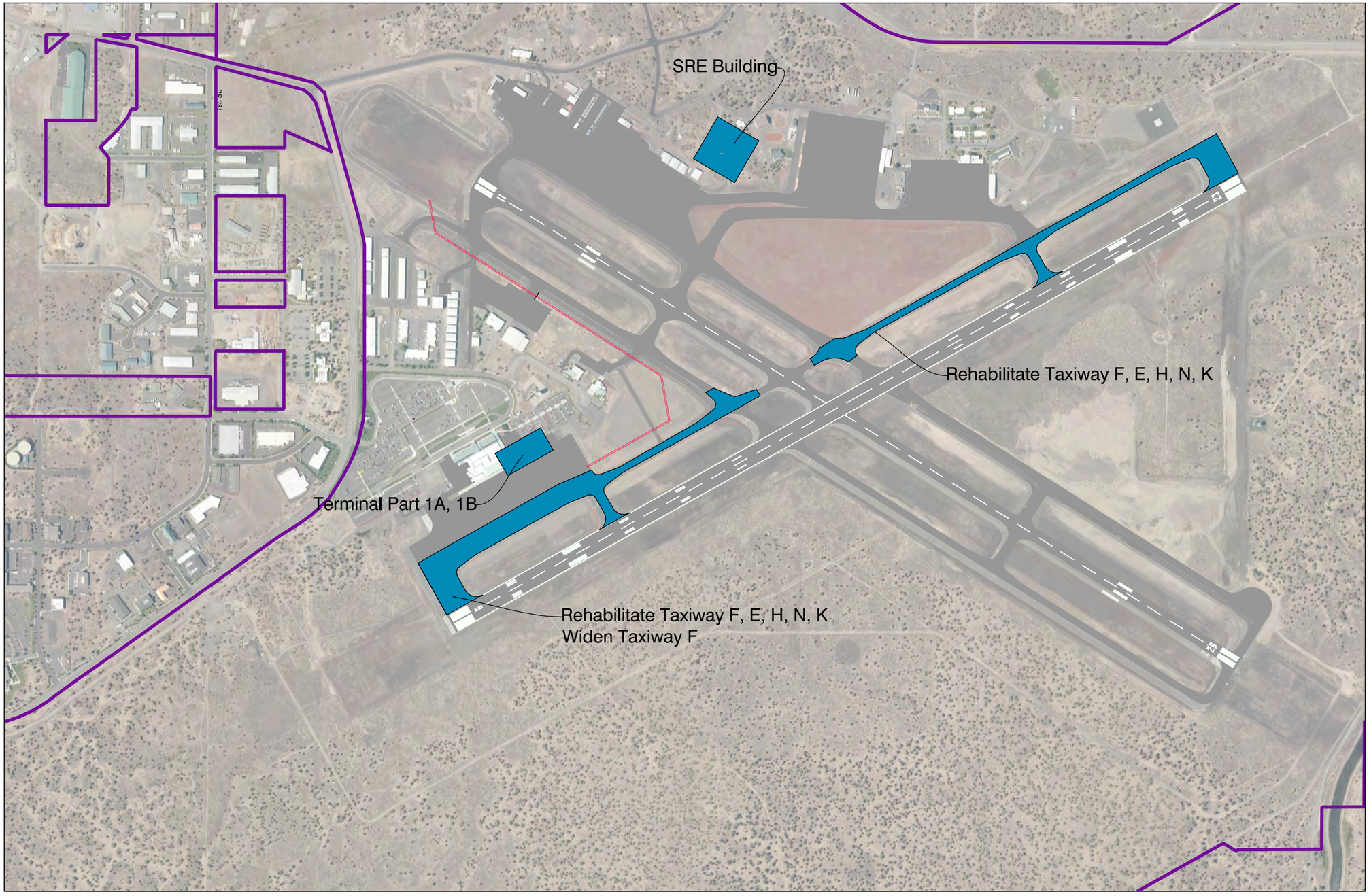
The availability of funds necessary to design and build the terminal improvements is a key consideration in implementing the project. Phase 1A and Phase 1B are expected to require more than $2.6 million in discretionary funds and $11 million in local funds. These shares were calculated assuming 93 percent of terminal square footage for Phase 1A and 91 percent for Phase 1B would be eligible for any type of AIP funding (entitlement or discretionary), and of that square footage, only 20 percent would be competitive for discretionary funds due to the nature of the project to enhance capacity. If discretionary funding is not available, or the terminal project does not compete as well for the funding as expected, then the local share will be higher. Airport operating revenues cannot cover the level of investment required and PFCs are needed for debt service on the existing terminal.

The Airport can issue a bond to cover construction costs and expects passenger growth will increase the operating revenues required for the debt service. The risk with this approach is that if passenger volumes decline, then the Airport may face a budget shortfall and need to reallocate funds to cover the debt. Demand projections and growth demonstrated by the Airport, the airlines that serve the airport, and the travelers coming to and from Deschutes County suggest that a severe decline is unlikely; however, it is recommended that the City perform a sensitivity analysis on this project prior to implementation.

2023 Project

The 2023 project is the construction of Phase 1A, 1B, and the apron. Phase 1A and the apron will be built in one year. The 2023 project will be finished in 2024 when Phase 1B is completed. The project should be designed to minimize disruption for the traveling public; however, there is a risk that construction-related disruptions may negatively impact passenger numbers during construction. The Airport dealt with construction impacts on passenger volumes and landing fees during May 2016 when the intersection of the runways was re-constructed. The loss of PFCs, concessions and parking revenues, landing fees and fuel flowage fees should be accounted for when reviewing project financials.

The terminal project is expected to be completed in 2024. Completing the entire project in 2023 may be possible. This would increase capital expenditure, but reduce operational impacts associated with construction. Construction phasing will be explored in more detail when the project is designed, and an implementation plan is developed.



LEGEND

- RDM Property Boundary
- Fuel Truck Road
- CIP Projects

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5.2.2 Mid-term CIP (FY2024-FY2028)

The mid-term CIP includes the completion of Terminal Phase 1B, acquisition of an ARFF truck, rehabilitation of the Taxiway G pavement and lighting, the environmental assessment for the general aviation expansion, a new Master Plan, a fuel truck haul road, and pavement maintenance. The mid-term CIP includes 500 additional stalls of automobile parking. **Table 5-4** shows the mid-term CIP, and the projects are described in the following sections. **Figure 5-4** shows the planned locations for these projects.

Table 5-4. Mid-term CIP

Year	Project	Entitlement	Discretionary	Local	Total
2024	Terminal Phase 1, Part 3	$2,066,667	$1,024,660	$2,538,673	$5,630,000
	ARFF Truck	$933,333	$0	$66,667	$1,000,000
	Mid-term Auto Parking (300 stalls)	Ineligible	Ineligible	$6,420,000	$6,420,000
2025	Rehabilitate Taxiway G Pavement	$2,596,000	$1,118,667	$265,333	$3,980,000
	Rehabilitate Taxiway G Lighting	$504,000	$0	$36,000	$540,000
	Mid-term Auto Parking (200 stalls)	Ineligible	Ineligible	$4,410,000	$4,410,000
2026	Northside GA Expansion (Enviro)	$289,333	$0	$20,667	$310,000
2027	Northside GA Expansion	$2,594,667	$0	$185,333	$2,780,000
	Master Plan Update	$592,667	$0	$42,333	$635,000
2028	Master Plan Update, continued	$606,667	$0	$43,333	$650,000
	Fuel Truck Road	$625,333	$0	$44,667	$670,000
	Pavement Rehabilitation	$1,052,813	$0	$70,188	$1,123,001
Mid-Term CIP Total		$12,798,980	$11,861,480	$2,143,327	$14,143,194

2024 Project

Among the 2024 projects is the completion of construction for Phase 1B. This project will increase the height of the passenger holdroom floor to allow passenger boarding bridges to reach larger aircraft on the apron. Additional projects in 2024 include ARFF truck acquisition and construction of mid-term auto parking. Acquisition of an ARFF truck to replace the existing, older vehicle will require local funds. Construction of auto parking will create 300 additional parking stalls. This new lot requires removal of the United States Department of Agriculture building and is not eligible for AIP funding. The project will help the Airport meet parking demand. Transportation network companies Uber and Lyft began operating at the Airport in 2017. It is recommended that the Airport monitor the effect of these companies on parking demand and adjust capital programming as demand warrants.

2025 Projects

Taxiway G pavement and lighting rehabilitation projects will both occur in 2025. Both project timelines are flexible; however, while maintenance of existing pavement and lighting can keep them in working order, costs will increase over time as pavement and equipment deteriorate. The lighting equipment can be upgraded to use LEDs for long term cost savings through lower power consumption, as the types of LEDs planned for use are functional in the winter months when snow piles around the base of the lights. Traditional incandescent lights melt snow with the heat they release where LEDs may not without being equipped with thermostatically-controlled heating units.

The third project to occur in 2025 is the construction of 200 parking stalls. As with the parking project in 2024, the additional parking stalls will help the Airport meet parking demands.

2026 Projects

The 2026 projects include the environmental permitting phase of the Northside GA Expansion project and the reimbursement of ARFF truck costs. Design and construction of the Northside GA Expansion will take place in 2027. The project expands the available GA area with additional hangars and facilities and will also involve rerouting an existing road. This project will require an environmental assessment. The reimbursement of the ARFF truck costs is a financial transaction with which the airport is reimbursed through the entitlement funds for the ARFF truck acquisition in 2024.

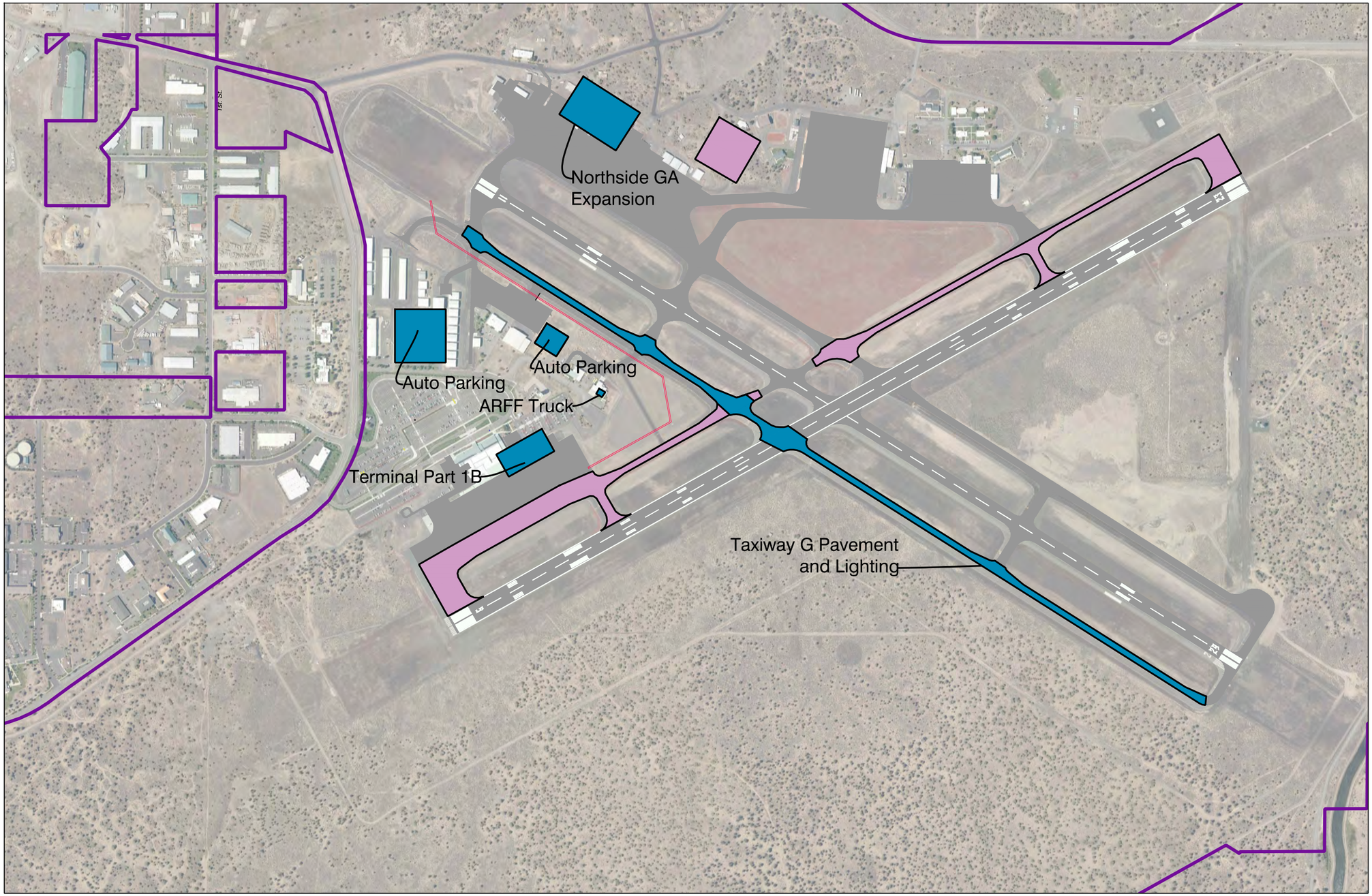
2027 Projects

The design and construction phase of the Northside GA Expansion will take place in 2027. Due to the geology, there will be significant work required to bring the terrain to airport grade before construction of the facilities can occur. The Airport will prepare sites for private investment and construct automobile and aircraft access. Tenants will develop these sites and the speed at which this occurs can impact the Airport's return on investment. The project is a low priority compared to other CIP projects and not very competitive for discretionary funding due to it not being a necessity for Airport operations.

The second 2027 project is the beginning of an Airport Master Plan. The Master Plan will likely revisit the need for the runway extension, assess long-term passenger terminal needs, and determine if additional automobile parking is needed. The implementation details of the Long-term Projects will be planned during the master plan project.

2028 Projects

Projects in 2028 include completing the Master Plan, the fuel truck road, and a placeholder for pavement rehabilitation if needed. The road is intended to minimize the amount of time trucks spend on aircraft movement areas when transferring fuel from the northside to the southside. The Airport is considering building Jet A fuel tanks near the terminal building, which may negate the need for a fuel truck road.



LEGEND

- RDM Property Boundary
- Fuel Truck Road
- Completed CIP Projects
- CIP Projects

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REDMOND MUNICIPAL
AIRPORT MASTER PLAN

Mid-Term (2024-2028) CIP Projects

5.2.3 Long-term CIP (FY2029-FY2038)

The long-term CIP encompasses the runway and taxiway extension projects as well as the ARFF building relocation needed to accommodate the extensions. Phase 2 of the terminal project is scheduled to take place between 2035 and 2037. Three pavement rehabilitation projects are planned within that period but are considered "as-needed." **Table 5-5** shows the long-term CIP, and the projects are described in the following sections. **Figure 5-5** shows the planned locations for these projects.

Table 5-5. Long-term CIP

Year	Project	Entitlement	Discretionary	Local	Total
2029	Runway Extension Environmental	$1,754,667	$0	$125,333	$1,880,000
	Taxiway Extension Environmental	$373,333	$0	$26,667	$400,000
2030	Runway Extension Design	$2,846,667	$0	$203,333	$3,050,000
	Taxiway Extension Design	$513,333	$0	$36,667	$550,000
	ARFF Building Design	$392,000	$0	$28,000	$420,000
2031	Runway Extension 1 of 2	$372,520	$22,382,147	$1,625,333	$24,380,000
	Taxiway Extension 1 of 2	$4,456,667	$0	$318,333	$4,775,000
	ARFF Building Relocation	$3,929,333	$0	$280,667	$4,210,000
2032	Runway Extension 2 of 2	$3,800,000	$19,636,000	$1,674,000	$25,110,000
	Taxiway Extension 2 of 2	$0	$4,592,000	$328,000	$4,920,000
2033	Pavement Rehab	$2,818,667	$0	$201,333	$3,020,000
2034	Terminal Phase 2 Environmental	$1,332,533	$0	$420,800	$1,753,333
2035	Terminal Phase 2 Design	$6,855,200	$0	$2,164,800	$9,020,000
2036	Terminal Phase 2 (1 of 2)	$5,593,600	$8,686,800	$42,869,600	$57,150,000
2037	Terminal Phase 2 (2 of 2)	$4,400,000	$8,947,227	$45,516,107	$58,863,334
2038	Pavement Rehab	$3,266,667	$0	$233,333	$3,500,000
Long-Term CIP Total		$39,351,587	$42,705,187	$64,244,174	$96,052,306

2029 Projects

The two 2029 projects are the environmental phases of the southwest runway extension and the associated parallel taxiway extension. The runway extension NEPA process may take 18 months or more. Justification for the runway extension is expected to occur as part of the 2027 Master Plan, and much of the environmental baseline work will occur at this time. The 2017 Master Planning process included the concept of runway extension in stakeholder meetings and the response was generally positive. The underlying goal of the extension is to open the Airport to additional markets in the Midwest that are out of range or payload-limited with the existing runway configuration. The runway length assessment is included in **Chapter 3**.

2030 Projects

Both design phases of the southwest runway extension and the associated full-length parallel taxiway will occur in 2030. The design phase of the ARFF building will also occur in 2030. The existing ARFF building lies within the runway visibility zone of extended Runway 5-23 and will need to be relocated. This project is considered part of the runway extension project as the building would not need to be moved if the runway was not extended.

2031 Projects

Construction of the runway and taxiway extensions will begin in 2031 and is expected to take two years. The ARFF building relocation will also take place in 2031 and is expected to be completed within a year. The first year of work is expected to include earthwork and grading. There is an elevation change between the existing location of Runway End 5 and where future Runway End 5 will be located. Cost estimates include approximately 950,000 cubic yards of fill for the embankment required to meet runway and taxiway grading and safety area requirements.

2032 Projects

Construction on the runway and taxiway extensions is scheduled for completion in 2032. Work completed in 2032 will include paving of the runway and taxiways and relocation of navigational aids. Runway 5-23 will need to be temporarily shortened during construction to keep aircraft clear of the construction equipment. Project phasing and implementation will be structured to minimize runway closure and downtime.

2033 Project

There are no definitive capital projects for 2033; however, the Airport can use that year to catch up on pavement rehabilitation, if needed. It is recommended that the Airport begin to save its primary entitlement funds this year to help offset the cost of Phase 2 of the passenger terminal building. The need for Phase 2 is expected to be validated by the 2037 Master Plan. The Master Plan will include new enplanement forecasts and an assessment of the performance of the passenger terminal building since Phase 1 was constructed.

2034 Project

The 2034 project is the environmental permitting of Passenger Terminal Phase 2. This improvement extends the overall building footprint to the southwest, over what is now the vendor parking lot. Passenger Terminal Phase 2 is expected to be eligible for a categorical exclusion under NEPA because impacts are limited to previously disturbed parcels. Should an environmental assessment be required, it is expected that one can be completed within a year and not delay the start of construction.

2035 Project

The 2035 project is the design of Passenger Terminal Phase 2. Phase 2 will expand the terminal and add a new concourse adjacent to the second floor holdroom. The new building will have the ticket hall and larger baggage handling area on the ground floor and a new concourse on the second floor adjacent to the existing second floor holdroom. The existing ticket hall and offices will be repurposed as the new security checkpoint after the new ticket hall is completed.

2036-2037 Projects

Passenger Terminal Phase 2 will be built over two years and construction will be structured to minimize impact on existing terminal operations. It is possible that closure and relocation of terminal facilities during construction may temporarily decrease airline activities; however, this impact is not expected to extend past construction.

Passenger Terminal Phase 2 is expected to cost more than $126 million when it is constructed (assuming 3 percent inflation), or roughly $72 million in 2018 dollars. Passenger Terminal Phase 2 will be funded by a combination of entitlement, discretionary, and local funds. PFCs are expected to be obligated for debt service on previously completed capital projects like Passenger Terminal Phase 1. Preliminary estimates suggest that 76 percent of square footage will be eligible for AIP funding, and of that, 20 percent will compete well for discretionary funding. The high-level funding split is 14 percent for entitlement ($18 million), 14 percent for discretionary ($18 million), and 72 percent for local funds ($91 million). This funding split is expected to be revised as part of the 2027-2028 Master Plan.

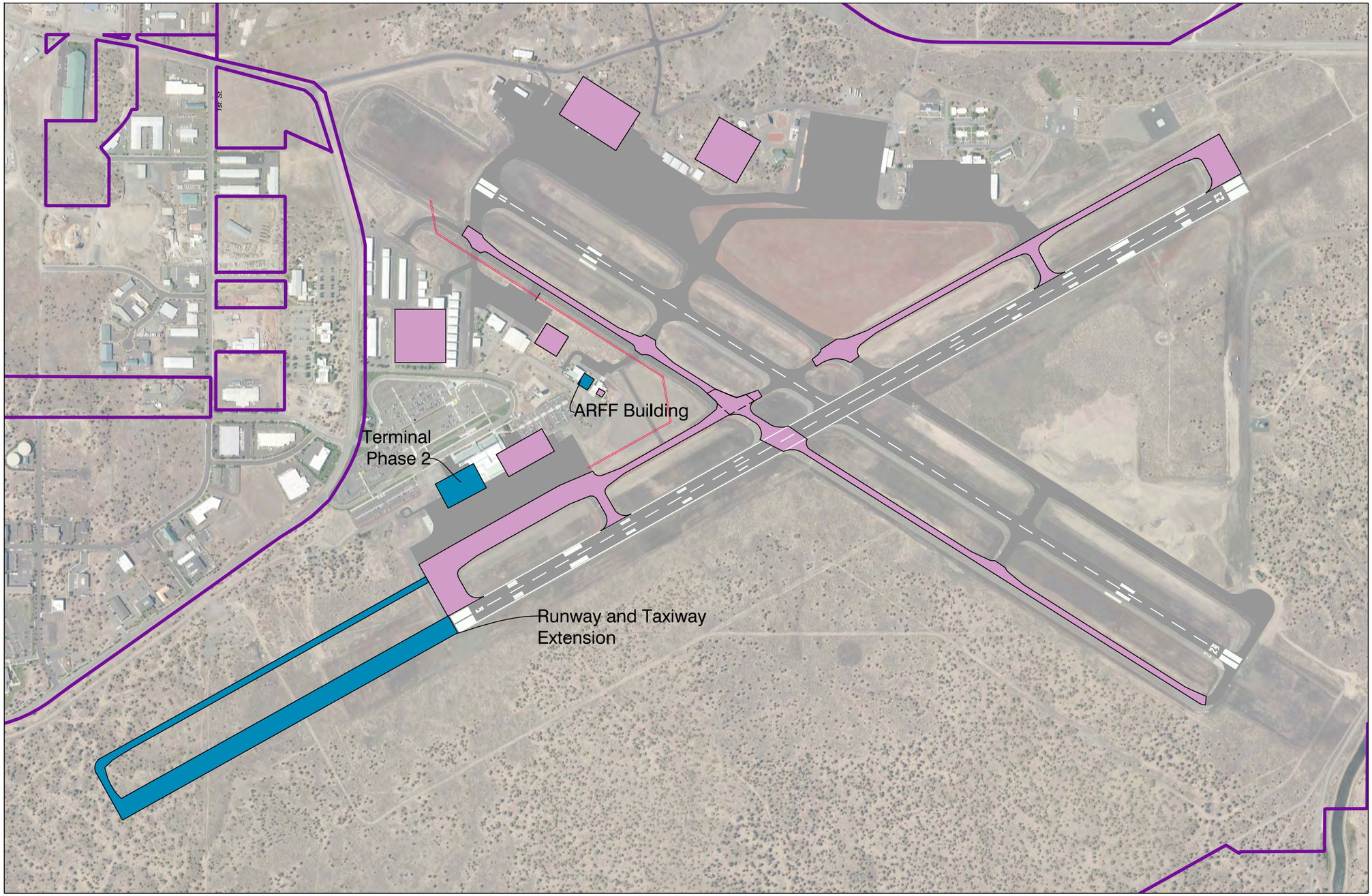


Figure 5-5
Long-Term (2029-2038) CIP Projects

5.3 CHAPTER SUMMARY

The 20-year CIP provides a flexible guideline for the Airport to plan for near-, mid-, and long-term project goals. Project phasing allows the Airport to account for economic changes and adjust project priorities to meet the Airport's financial capabilities. The projects have been distributed across 20 years to reflect the airport needs and to distribute capital costs evenly.

The near-term, five-year (FY2019-2023) CIP will help the Airport grow and meet demand by organizing resources to rehabilitate taxiways and runways as well as begin the large-scale terminal remodeling and expansion project. Including taxiway and runway rehabilitation in the near-term will help lower overall costs by mitigating the need for ongoing maintenance, which will increase in cost over time.

The mid-term (FY2024-2028) CIP projects include the continuation of the terminal phase and Taxiway G pavement and lighting rehabilitation. Additionally, the planned Northside general aviation expansion and additional parking is aimed at meeting the forecasted increase in activity at the Airport. The long-term (FY2029-2032) CIP projects consist of large-scale projects including runway extension, taxiway extension, and the second phase of terminal expansion. Many of these projects are multi-year and will require a large amount of funding. The long-term projects will increase the Airport's capabilities and contribute to helping the Airport meet increased demand.

APPENDIX A:

ALP CHECKLIST (in development)

APPENDIX B:

SUPPLEMENTAL FORECAST INFORMATION

APO TERMINAL AREA FORECAST DETAIL REPORT
For**ecast Issued January 2017**

RDM

	AIRCRAFT OPERATIONS													
	Enplanements			Itinerant Operations					Local Operations					
Fiscal Year	Air Carrier	Commuter	Total	Air Carrier	Air Taxi & Commuter	GA	Military	Total	Civil	Military	Total	Total Ops	Total Tracon Ops	Based Aircraft
REGION: ANM STATE: OR LOCID: RDM CITY: REDMOND AIRPOR T: ROBERTS FIELD														
2006	1,427	195,796	197,223	1,433	16,803	22,170	366	40,772	27,376	240	27,616	68,388	0	129
2007	9,262	220,771	230,033	2,781	16,349	26,174	306	45,610	48,990	336	49,326	94,936	0	129
2008	13,886	229,311	243,197	4,413	13,795	20,221	312	38,741	42,519	303	42,822	81,563	0	146
2009	26,618	191,208	217,826	4,444	9,680	16,014	173	30,311	25,261	134	25,395	55,706	0	125
2010	28,031	197,530	225,561	4,858	9,396	14,767	221	29,242	22,416	300	22,716	51,958	0	118
2011	26,259	205,719	231,978	4,140	8,886	13,610	224	26,860	19,554	96	19,650	46,510	0	75
2012	16,660	214,173	230,833	3,931	8,649	14,709	212	27,501	18,565	371	18,936	46,437	0	75
2013	430	226,980	227,410	4,201	8,232	13,414	323	26,170	16,124	812	16,936	43,106	0	91
2014	305	255,560	255,865	4,738	8,573	12,372	383	26,066	17,213	406	17,619	43,685	0	83
2015	303	268,829	269,132	4,335	6,578	11,551	241	22,705	22,854	214	23,068	45,773	0	83
2016*	536	297,786	298,322	5,127	6,340	10,985	341	22,793	16,829	540	17,369	40,162	0	85
2017*	536	359,803	360,339	6,897	6,245	10,711	341	24,194	15,877	540	16,417	40,611	0	87
2018*	536	369,043	369,579	7,682	5,659	10,735	341	24,417	15,909	540	16,449	40,866	0	89
2019*	536	377,594	378,130	8,528	4,981	10,759	341	24,609	15,941	540	16,481	41,090	0	91
2020*	536	385,844	386,380	9,356	4,315	10,783	341	24,795	15,973	540	16,513	41,308	0	93
2021*	536	394,034	394,570	10,139	3,699	10,807	341	24,986	16,005	540	16,545	41,531	0	95
2022*	536	402,010	402,546	10,733	3,297	10,832	341	25,203	16,037	540	16,577	41,780	0	97
2023*	536	409,726	410,262	11,038	3,222	10,857	341	25,458	16,069	540	16,609	42,067	0	100
2024*	536	417,274	417,810	11,246	3,254	10,882	341	25,723	16,101	540	16,641	42,364	0	102
2025*	536	425,305	425,841	11,462	3,293	10,907	341	26,003	16,134	540	16,674	42,677	0	105
2026*	536	433,799	434,335	11,691	3,333	10,932	341	26,297	16,167	540	16,707	43,004	0	108
2027*	536	442,039	442,575	11,913	3,373	10,957	341	26,584	16,200	540	16,740	43,324	0	111

2028*	536	450,341	450,877	12,136	3,414	10,982	341	26,873	16,233	540	16,773	43,646	0	114
2029*	536	458,968	459,504	12,368	3,455	11,007	341	27,171	16,266	540	16,806	43,977	0	117
2030*	536	467,560	468,096	12,599	3,497	11,032	341	27,469	16,299	540	16,839	44,308	0	120
2031*	536	476,332	476,868	12,835	3,539	11,057	341	27,772	16,332	540	16,872	44,644	0	123
2032*	536	485,049	485,585	13,070	3,582	11,082	341	28,075	16,365	540	16,905	44,980	0	126
2033*	536	493,906	494,442	13,308	3,625	11,107	341	28,381	16,398	540	16,938	45,319	0	129
2034*	536	503,097	503,633	13,555	3,669	11,132	341	28,697	16,431	540	16,971	45,668	0	132
2035*	536	512,709	513,245	13,814	3,713	11,157	341	29,025	16,464	540	17,004	46,029	0	135

APO TERMINAL AREA FORECAST DETAIL REPORT
For**ecast Issued January 2017**

RDM

	AIRCRAFT OPERATIONS													
	Enplanements			Itinerant Operations					Local Operations					
Fiscal Year	Air Carrier	Commuter	Total	Air Carrier	Air Taxi & Commuter	GA	Military	Total	Civil	Military	Total	Total Ops	Total Tracon Ops	Based Aircraft
2036*	536	522,589	523,125	14,080	3,758	11,182	341	29,361	16,497	540	17,037	46,398	0	138

Source: https://www.census.gov/content/dam/Census/newsroom/releases/2015/cb15-56_table3.pdf

The 20 Fastest-Growing Metro Areas from July 1, 2013, to July 1, 2014

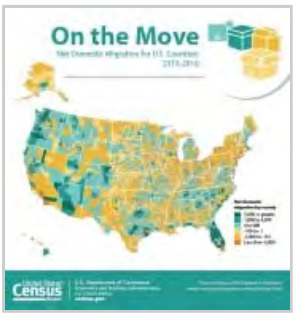
Rank	Metro Area	Percent Change
1.	The Villages, Fla.	5.4
2.	Myrtle Beach-Conway-North Myrtle Beach, S.C.-N.C.	3.2
3.	Austin-Round Rock, Texas	3.0
4.	Odessa, Texas	2.9
5.	St. George, Utah	2.9
6.	Cape Coral-Fort Myers, Fla.	2.7
7.	Bend-Redmond, Ore.	2.7
8.	Greeley, Colo.	2.6
9.	Midland, Texas	2.6
10.	Naples-Immokalee-Marco Island, Fla.	2.5
11.	Houston-The Woodlands-Sugar Land, Texas	2.5
12.	Fort Collins, Colo.	2.4
13.	Hilton Head Island-Bluffton-Beaufort, S.C.	2.4
14.	Daphne-Fairhope-Foley, Ala.	2.4
15.	Raleigh, N.C.	2.3
16.	Orlando-Kissimmee-Sanford, Fla.	2.2
17.	Charleston-North Charleston, S.C.	2.2
18.	North Port-Sarasota-Bradenton, Fla.	2.2
19.	Panama City, Fla.	2.2
20.	Boise City, Idaho	2.1

Newsroom

FOR IMMEDIATE RELEASE: THURSDAY, MARCH 23, 2017

Maricopa County Added Over 222 People Per Day in 2016, More Than Any Other County

March 23, 2017
Release Number: CB17-44



MARCH 23, 2017 — Maricopa County, Ariz., replaced Harris County, Texas, as the county with the nation's highest annual population growth, according to U.S. Census Bureau population estimates released today. Harris County was the largest numeric gainer for eight years in a row. Maricopa County gained 81,360 people between July 1, 2015 and July 1, 2016, or about 222 people per day, while the nation's second-largest population gainer, Harris County, gained 56,587 people, or about 155 people per day on average.

Maricopa County, home to Phoenix, primarily grew through the addition of 43,189 residents from net domestic migration, a measure of how many people move to or from an area versus other parts of the United States. The county also added 25,428 people from natural increase (more births than deaths) and 10,188 people from net international migration.

Harris County, Texas, home to Houston, saw changes in net domestic migration, going from a net gain of more than 17,000 to a net loss of more than 16,000. Despite this, Harris County had the second largest gain in population due to high natural increase (46,412) and net international migration (27,922).

"In the early 2000s, Maricopa County was in the top one or two counties by numeric growth. From 2009-2011, Maricopa County saw much lower net migration than in the years before or after, which caused the county to drop out of the top population-gaining counties," explained

Peter Borsella, a demographer in the Census Bureau's population division. "While net international migration has not reached prior levels, net domestic migration and natural increase have continued to rise, making Maricopa County this year's largest numeric gainer."

In addition, Maricopa grew the fastest among the top 10 largest counties at 1.95 percent, an increase from 1.90 percent from the previous year. Harris County remained the third-largest county with 4.6 million people, and Maricopa County remained the fourth-largest county with 4.2 million people. Los Angeles County and Cook County, Ill., remained the largest and second-largest counties, respectively.

The statistics released today provide population estimates and components of change for our nation's 382 metropolitan statistical areas, 551 micropolitan statistical areas, and 3,142 counties, as well as Puerto Rico's metropolitan statistical areas, micropolitan statistical areas and municipios.

Find more highlights from this year's release below and local-level statistics on census.gov.

In the coming months, the Census Bureau will release 2016 population estimates for cities and towns, as well as national, state and county population estimates by age, sex, race and Hispanic origin.

Some High-Population Counties or County-Equivalents Continued to Experience Population Loss

These notable high-population counties continued to see population loss:

- Cook County, Ill. (Chicago): -21,324.
- Wayne County, Mich. (Detroit): -7,696.
- Baltimore city, Md.: -6,738.

Baltimore city saw an increase in population loss this year primarily due to a doubling of its net domestic out-migration.

Fastest-Growing Areas in Utah

Three of the 20 fastest-growing metro areas between 2015 and 2016 were located either partially or completely in Utah (St. George, Utah; Provo-Orem, Utah; and Logan, Utah-Idaho).

- Provo-Orem, Utah, and Logan, Utah-Idaho, saw natural increase as a larger component of growth than either net international migration or net domestic migration, while St. George, Utah, saw net domestic migration as a larger component of growth than either net international migration or natural increase.
- Also, San Juan County, Utah, was the fastest-growing county in the United States among counties with populations of 10,000 or more in 2015. It grew by 7.6 percent.

Second-Fastest-Growing U.S. County in 2015 Fell to 2,858th in 2016

North Dakota counties no longer top the list of fastest-growing counties by percentage change.

- McKenzie County fell from second-fastest growing by percentage change to 2,858th.
- Williams County fell from third to 3,105th.
- Mountrail County fell from sixth to 2,375th.
- Stark County fell from eighth to 3,103rd.

All of these counties lost population due to people moving away to other parts of the United States (negative net domestic migration). Formerly fast-growing North Dakota counties have been replaced in the top 10 by counties in Iowa, Oregon and Washington. Other top 10 counties once again are in Utah, Texas and Florida.

County Highlights

- Eight of the 10 counties with the most natural decrease (more deaths than births) were in Florida. Four of the top 10 counties with the most natural increase were in California, and 3 of the 10 were in Texas.
- St. Louis County, Mo., dropped below 1 million for the first time since 2011, largely due to a rise in net domestic out-migration.
- Three counties reached a population milestone of 100,000 or higher: Fairbanks North Star Borough, Alaska; Highlands County, Fla., and Carver County, Minn.
- Pasco County, Fla., reached a population of 500,000, and Tarrant County, Texas, reached 2 million.

Metropolitan Statistical Area Highlights

- The nation's 382 metro areas contained approximately 277.1 million people in 2016, representing approximately 86 percent of the nation's population. This was an increase of approximately 2.3 million people from 2015.
- For the fourth year in a row, The Villages, Fla., a metro area west of the Orlando-Kissimmee-Sanford, Fla., metro area, was the nation's fastest-growing metro area, with a 4.3 percent population increase between 2015 and 2016.
- The Dallas-Fort Worth-Arlington, Texas, and Houston-The Woodlands-Sugar Land, Texas, metro areas were the two largest numeric-gaining metro areas between 2015 and 2016, increasing by more than 100,000 each.
- Four metro areas were among both the 25 fastest growing and the 25 largest numeric gaining between 2015 and 2016: Austin-Round Rock, Texas; Raleigh, N.C.; Orlando-Kissimmee-Sanford, Fla.; and Las Vegas-Henderson-Paradise, Nev. For all four areas, net domestic migration was a larger component of change than either net international migration or natural increase
- Among the 10 largest metro areas, the Chicago-Naperville-Elgin, Ill.-Ind.-Wis., metro area was the only metro area that did not grow in population between 2015 and 2016.

Micropolitan Statistical Area Highlights

- The nation’s 551 micro areas contained approximately 27.7 million people in 2016, representing approximately nine percent of the nation’s population. This is an increase of approximately 16,000 people from 2015.
- Micro areas in the West grew the most.
  - Heber, Utah, was the fastest-growing micro area, with an increase of 4.7 percent between 2015 and 2016. The five fastest-growing micro areas were in the West: Heber, Utah; Prineville, Ore.; Ellensburg, Wash.; Bozeman, Mont.; and Cedar City, Utah. Among these five areas, net domestic migration was a larger component of change than either net international migration or natural increase.
  - Bozeman, Mont., had the largest numeric gain among micro areas between 2015 and 2016, increasing by approximately 3,800 people. Four of the five largest numeric-gaining micro areas between 2015 and 2016 were in the West: Bozeman, Mont.; Hilo, Hawaii; Kalispell, Mont.; and Oak Harbor, Wash.

Puerto Rico

- Overall, Puerto Rico's population has been decreasing since 2010. The Commonwealth total resident population decreased by 314,850 (or 8.4 percent) since 2010 to 3,411,307 on July 1, 2016.
- San Juan experienced the largest numeric decrease in population of any municipio, losing 8,497 residents between July 1, 2015 and July 1, 2016, followed by Bayamón (-4,448 residents) and Ponce (-3,748 residents).
- Of Puerto Rico's 78 municipios, only Gurabo experienced growth between July 1, 2015, and July 1, 2016, gaining 56 residents (an increase of 0.1 percent).
- All other municipios experienced a decline in population. The fastest-declining municipios were Peñuelas, Lares and Guánica, featuring a decline of 2.7 percent each.

To find where people are leaving from and moving to, visit Census Flows Mapper.

-X-

The Census Bureau develops county, metro area and micro area population estimates by measuring population change since the most recent census. The Census Bureau uses births, deaths, administrative records and survey data to develop estimates of population. For more detail regarding the methodology, see <www.census.gov/programs-surveys/popest/technical-documentation/methodology.html>.

The Office of Management and Budget's statistical area delineations (for metro and micro areas) are those issued by that agency in July 2015. Metro areas contain at least one urbanized area of 50,000 or more population, and micro areas contain at least one urban cluster of at least 10,000 (but less than 50,000) population. Both metro and micro areas consist of one or more whole counties or county equivalents. Some metro and micro area titles may be abbreviated in the text of the news release. Full titles are shown in the tables.

Top 10 Largest-Gaining Counties (Numeric Change): July 1, 2015 to July 1, 2016

County	Population	Numeric Change	Percent Change	Births	Deaths	Domestic Migration	International Migration
Maricopa County, Arizona	4,242,997	81,360	1.95	56,073	30,645	43,189	10,188
Harris County, Texas	4,589,928	56,587	1.25	73,072	26,660	-16,225	27,922
Clark County, Nevada	2,155,664	46,375	2.20	27,352	16,501	27,735	6,566
King County, Washington	2,149,970	35,714	1.69	25,905	13,580	8,511	15,500
Tarrant County, Texas	2,016,872	35,462	1.79	28,682	12,903	13,411	6,348
Riverside County, California	2,387,741	34,849	1.48	30,845	17,092	16,961	3,099
Bexar County, Texas	1,928,680	33,198	1.75	28,283	13,458	13,077	5,361
Orange County, Florida	1,314,367	29,503	2.30	16,721	8,198	10,083	11,078
Dallas County, Texas	2,574,984	29,209	1.15	40,063	16,407	-6,193	12,133
Hillsborough County, Florida	1,376,238	29,161	2.16	17,345	11,179	14,806	7,774

Top 10 Fastest-Growing Counties (Percent Change, Counties With a Population of 10,000 or More): July 1, 2015 to July 1, 2016

County	Population	Numeric Change	Percent Change	Births	Deaths	Domestic Migration	International Migration
San Juan County, Utah	16,895	1,188	7.56	240	112	1,038	13
Kendall County, Texas	42,540	2,088	5.16	391	389	1,844	77
Hays County, Texas	204,470	9,896	5.09	2,553	1,011	7,932	171
Wasatch County, Utah	30,528	1,363	4.67	475	126	891	77
Dallas County, Iowa	84,516	3,739	4.63	1,268	433	2,500	296
Comal County, Texas	134,788	5,675	4.40	1,597	1,085	4,760	109
Sumter County, Florida	123,996	5,114	4.30	501	1,742	4,873	55
Crook County, Oregon	22,570	923	4.26	240	236	886	7
Juab County, Utah	11,010	444	4.20	185	74	319	-1
Kittitas County, Washington	44,866	1,809	4.20	391	286	1,563	72

Top 10 Largest-Declining Counties or County Equivalents (Numeric Change): July 1, 2015 to July 1, 2016

County	Population	Numeric Change	Percent Change	Births	Deaths	Domestic Migration	International Migration

Cook County, Illinois	5,203,499	-21,324	-0.41	68,049	42,297	-66,244	18,434
Wayne County, Michigan	1,749,366	-7,696	-0.44	23,209	18,231	-17,346	4,279
Baltimore city, Maryland	614,664	-6,738	-1.08	8,654	6,871	-11,008	2,195
Cuyahoga County, Ohio	1,249,352	-5,673	-0.45	14,941	13,563	-10,122	3,402
Suffolk County, New York	1,492,583	-5,320	-0.36	15,446	12,793	-11,278	4,327
Milwaukee County, Wisconsin	951,448	-4,866	-0.51	13,675	8,176	-13,186	2,505
Allegheny County, Pennsylvania	1,225,365	-3,933	-0.32	13,193	13,995	-5,821	3,479
San Juan County, New Mexico	115,079	-3,622	-3.05	1,703	1,026	-4,341	42
St. Louis City, Missouri	311,404	-3,471	-1.10	4,547	3,070	-6,189	981
Jefferson County, New York	114,006	-3,254	-2.78	2,000	945	-4,674	345

Top 25 Fastest-Growing Metro Areas (Percent Change): July 1, 2015 to July 1, 2016

Rank by Percent Change	Metro Area	2015 Population	2016 Population	Numeric Change	Percent Change	Natural Increase	Births	Deaths	Net Migration	Domestic Migration	International Migration
1	The Villages, FL	118,882	123,996	5,114	4.3	-1,241	501	1,742	4,928	4,873	55
2	Myrtle Beach-Conway-North Myrtle Beach, SC-NC	432,493	449,295	16,802	3.9	-488	4,214	4,702	15,308	14,881	427
3	Bend-Redmond, OR	174,942	181,307	6,365	3.6	398	1,853	1,455	5,698	5,695	3
4	Greeley, CO	285,053	294,932	9,879	3.5	2,381	4,106	1,725	7,300	6,991	309
5	Cape Coral-Fort Myers, FL	700,285	722,336	22,051	3.1	-658	6,666	7,324	20,780	17,769	3,011
6	St. George, UT	155,450	160,245	4,795	3.1	1,026	2,232	1,206	3,285	3,267	18
7	Provo-Orem, UT	585,362	603,309	17,947	3.1	10,004	12,347	2,343	7,765	6,893	872
8	Punta Gorda, FL	173,194	178,465	5,271	3.0	-1,614	1,044	2,658	6,154	5,800	354
9	Austin-Round Rock, TX	1,998,104	2,056,405	58,301	2.9	17,071	27,375	10,304	40,273	33,395	6,878
10	North Port-Sarasota-Bradenton, FL	768,013	788,457	20,444	2.7	-3,227	6,545	9,772	21,138	18,913	2,225
11	Coeur d'Alene, ID	150,364	154,311	3,947	2.6	480	1,834	1,354	3,169	3,123	46
12	Lakeland-Winter Haven, FL	649,425	666,149	16,724	2.6	892	7,678	6,786	15,061	12,152	2,909
13	Sebastian-Vero Beach, FL	147,792	151,563	3,771	2.6	-766	1,284	2,050	3,828	3,530	298
14	Raleigh, NC	1,271,381	1,302,946	31,565	2.5	8,414	15,893	7,479	22,607	18,510	4,097
15	Orlando-Kissimmee-Sanford, FL	2,382,132	2,441,257	59,125	2.5	10,798	28,849	18,051	46,922	29,441	17,481
16	Port St. Lucie, FL	454,111	465,208	11,097	2.4	-890	4,357	5,247	10,724	9,759	965

Rank by Percent Change	Metro Area	2015 Population	2016 Population	Numeric Change	Percent Change	Natural Increase	Births	Deaths	Net Migration	Domestic Migration	International Migration
17	Naples-Immokalee-Marco Island, FL	356,570	365,136	8,566	2.4	-220	3,270	3,490	7,434	5,292	2,142
18	Daphne-Fairhope-Foley, AL	203,690	208,563	4,873	2.4	161	2,274	2,113	4,289	4,046	243
19	Boise City, ID	675,777	691,423	15,646	2.3	4,157	8,753	4,596	10,757	9,950	807
20	Logan, UT-ID	133,093	136,159	3,066	2.3	1,991	2,578	587	1,052	728	324
21	Deltona-Daytona Beach-Ormond Beach, FL	623,378	637,674	14,296	2.3	-2,437	5,714	8,151	15,419	13,981	1,438
22	Fayetteville-Springdale-Rogers, AR-MO	513,449	525,032	11,583	2.3	3,660	7,266	3,606	7,845	6,564	1,281
23	Olympia-Tumwater, WA	269,183	275,222	6,039	2.2	1,000	3,172	2,172	4,725	4,060	665
24	Charleston-North Charleston, SC	744,603	761,155	16,552	2.2	3,710	9,662	5,952	12,377	11,471	906
25	Las Vegas-Henderson-Paradise, NV	2,109,289	2,155,664	46,375	2.2	10,851	27,352	16,501	34,301	27,735	6,566

Contact

Public Information Office

301-763-3030

pio@census.gov

Related Information

- Press kit
- Detailed tables
- Graphic: Embed, Download or Print
- Spanish Version

Central Oregon Association of REALTORS®
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Presentation - November 4th, 2016

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VISION: Redmond - A great place to live and prosper

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Retention

Expansion

Policy

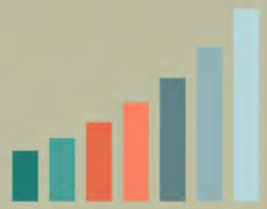
Advocate, collaborate, & track

Workforce

Space

Organizational Development

Pursue funding, quantify impact, & expand reach



Financial Sustainability

Marketing

For more information visit www.REDIINFO.com

23 Member Board of Directors

Representing a Cross Section of the Community:

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- Real Estate/Escrow
- Utilities
- Traded Sector Businesses
- Communications
- Banking
- City Leadership
- Healthcare
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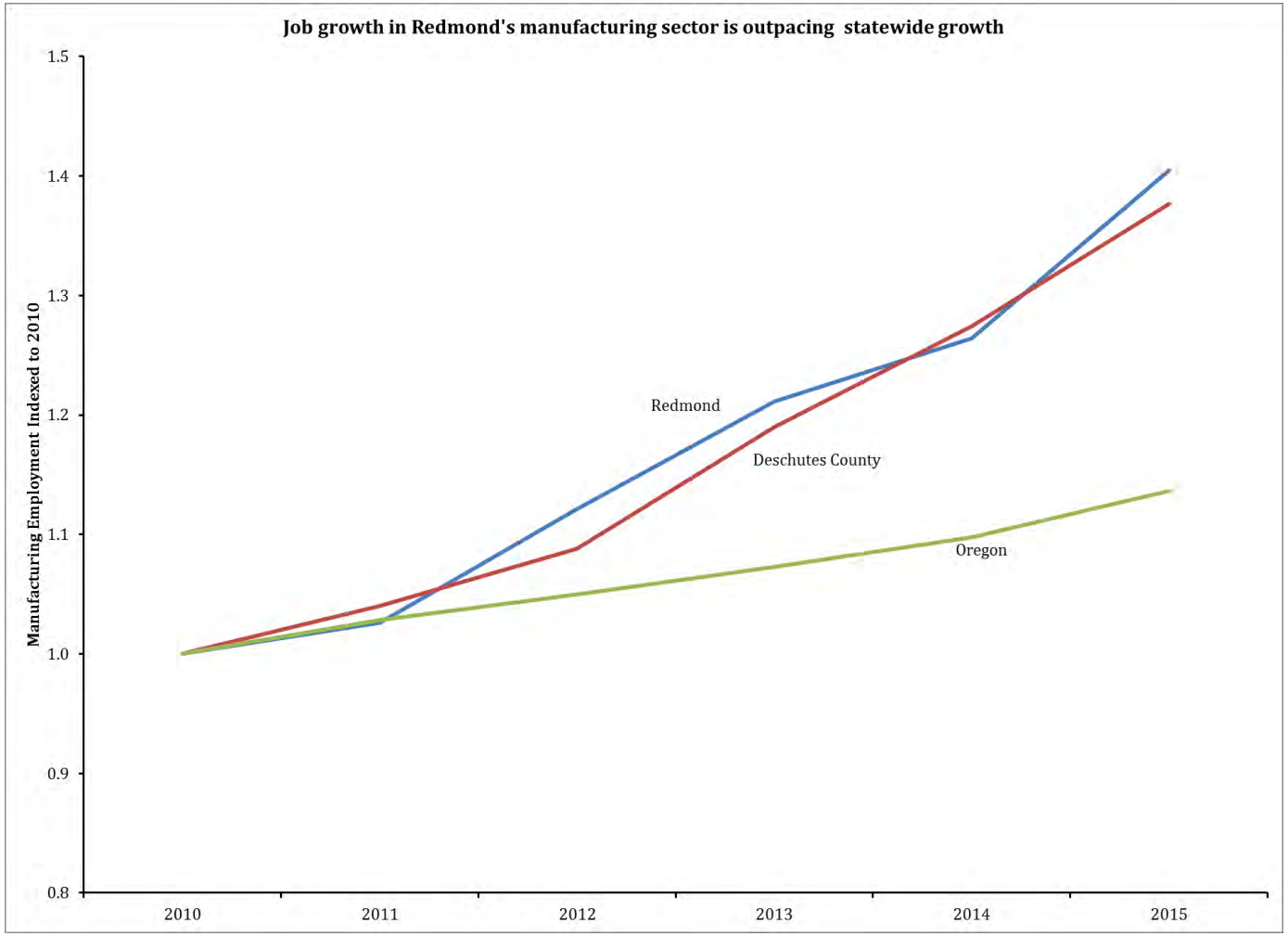

Manufacturing Growth in Redmond

-6.9% Increase '14-'15

-8th of all 382 Metro's

-41% 2010-2015

-Bend/Redmond MSA: 6th Fastest Year/Year Job Growth in US – all occupations

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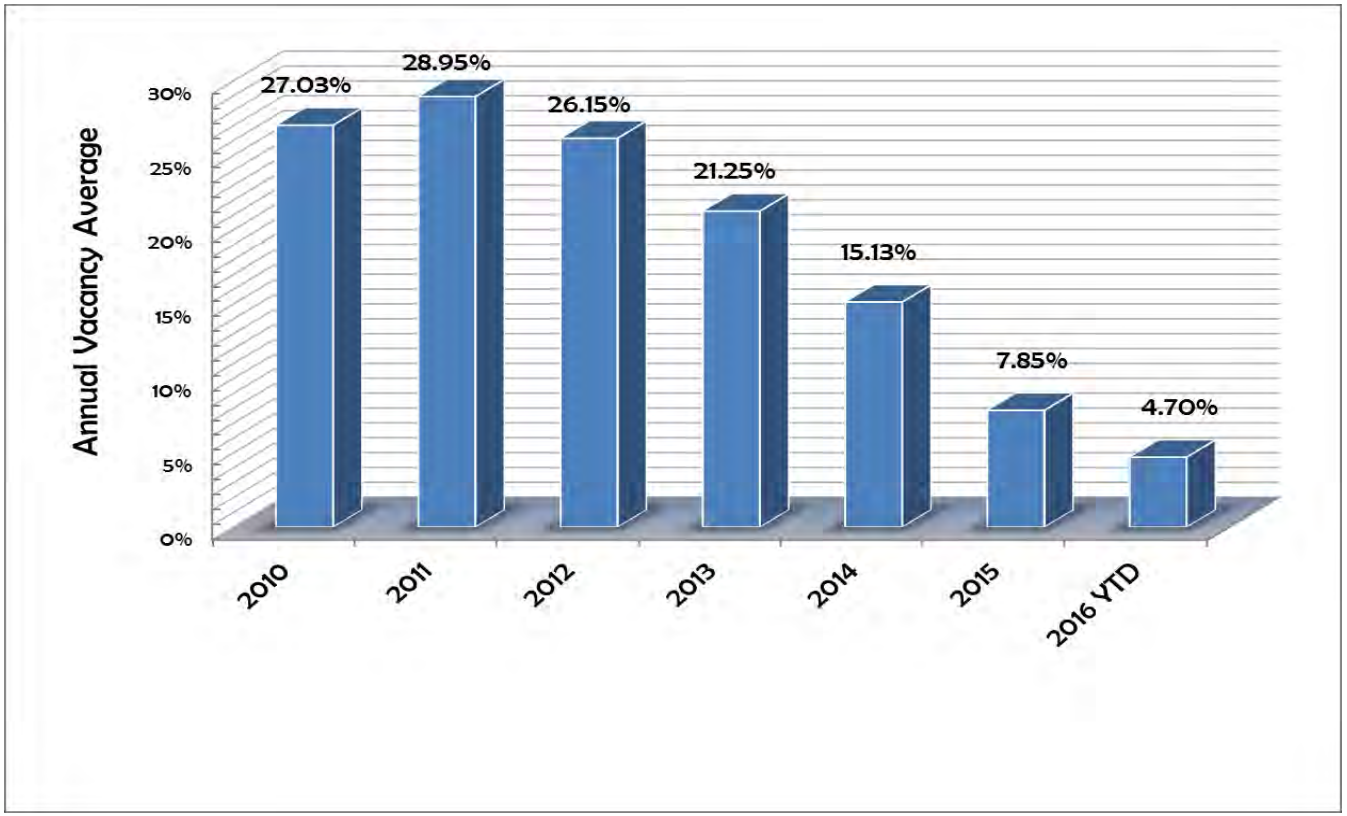
Redmond Industrial Vacancy Rate Trend



*Compass Points Publication

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Available Space

Flex Space 1,500-3,000 sf – **4** options exist

Flex Space 3,000-8,000 sf – **6** options available

Stand Alone buildings over 15,000 sf – **2** options exist

2 heavy industrial flex spaces at 13,000 and 28,000

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Industrial Land and Lease Rates

Industrial Land (M1 and M2)	$2.50-$4.50 sf
Industrial Warehouse Lease Rate (avg)	$.50/sf+ NNN
Upper Edge of Lease Market	$.70/sf + NNN

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Industrial Space - Market Demand

(REDI Pending Projects)

PROJECT NEED	DEMAND
1,500-3000 sf	3 Projects
3,000-8,000 sf	7 Projects
10,000-25,000 sf	8 Projects
25,000 sf and up	4 Projects

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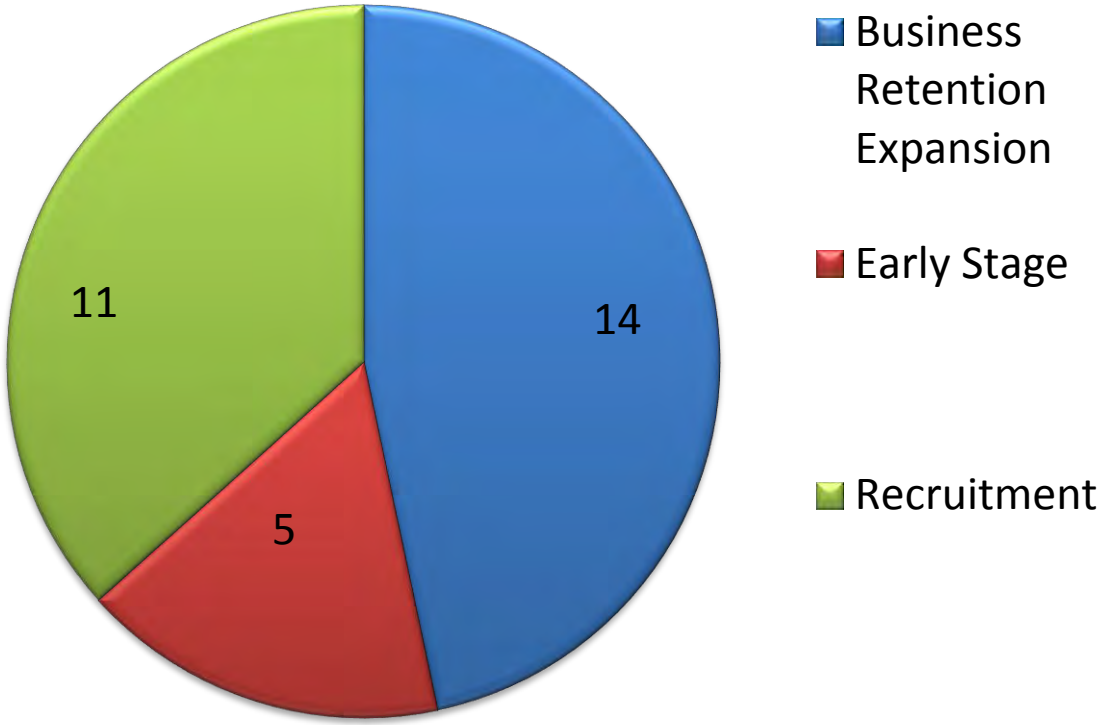
Project Type



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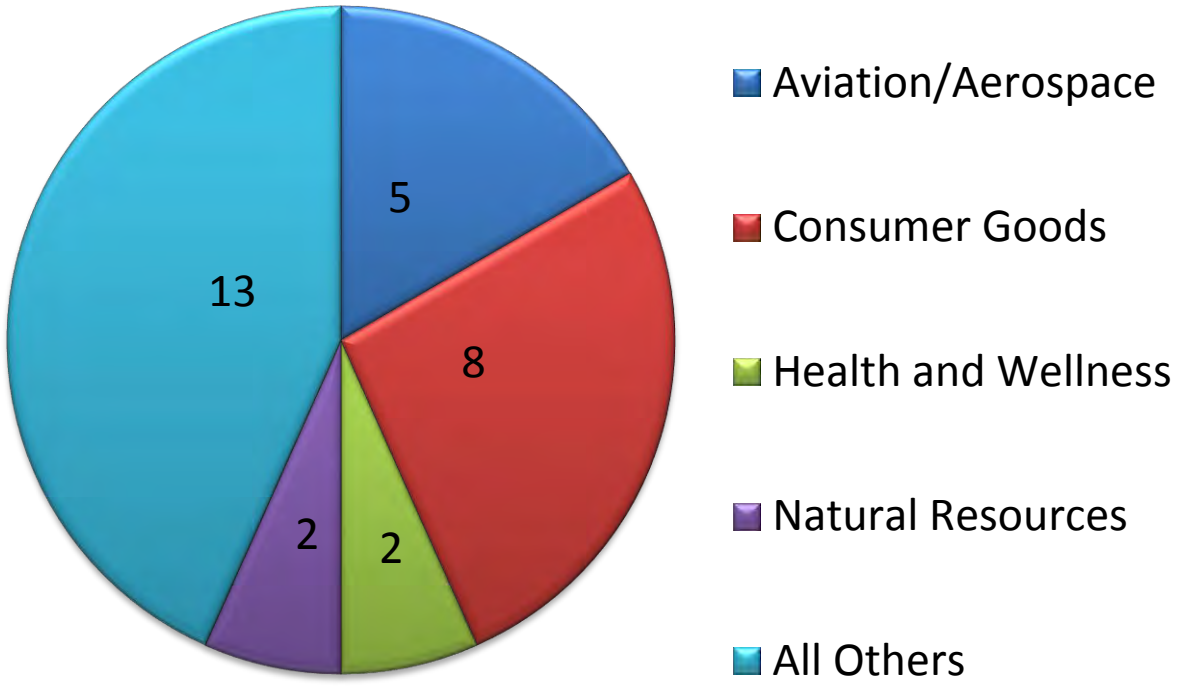
Industry Type



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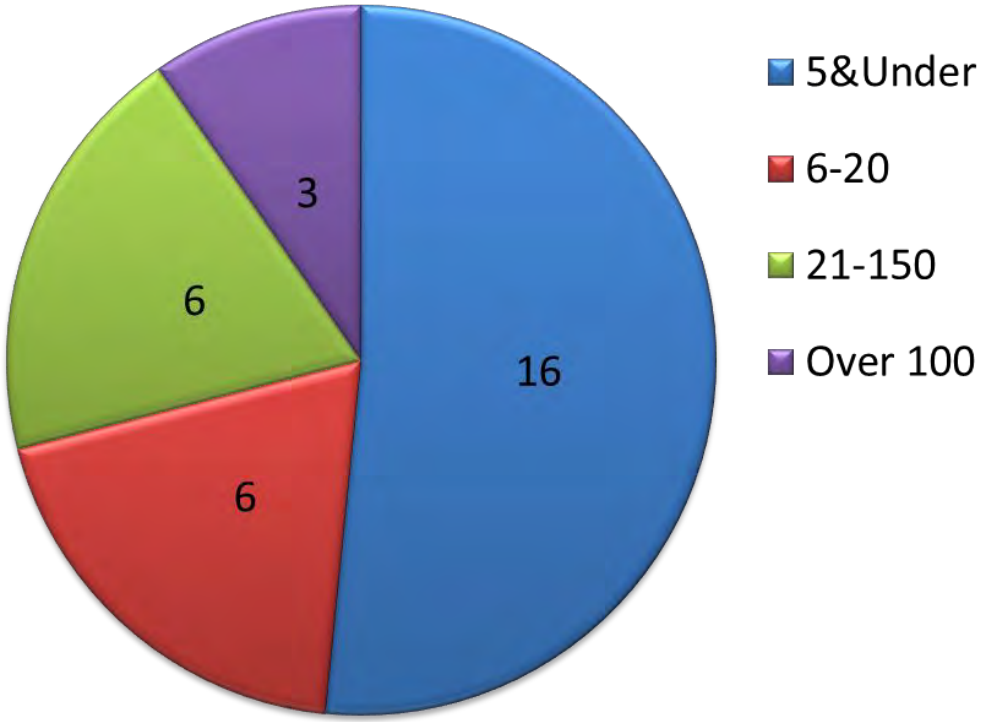
Project Pipeline: Jobs



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Strategic Initiatives: Strengthening Redmond's Business Environment

Certified Work Ready Communities

ACT Work Ready Communities
DESCHUTES COUNTY
OREGON
CERTIFIED 2015-17

Airlines Meetings (COAST)

DELTA AIR LINES

Alaska AIRLINES

Education @ Work

Central Oregon Education@Work
powered by Better Together

Advanced Mfg. Industry Consortium

In Collaboration with: EDCO MOVE START GROW

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Sustainable Operations:

Social Media Presence

3rd Annual Investor Social

Membership Development

Annual Luncheon

Made in Redmond Tour

Made In Redmond Tour

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Questions?

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Figure A4-1: TAF and Airport Records Comparison

Fiscal Year	Enplanements				Air Carrier (AC) Operations				Air Taxi (AT) Operations				Commercial Operations (AC + AT)			
	TAF	Airport	Δ#	Δ%	TAF	Airport	Δ#	Δ%	TAF	Airport	Δ#	Δ%	TAF	Airport	Δ#	Δ%
2006	197,223	205,061	7,838	4%	1,433	887	-546	-38%	16,803	17,768	965	6%	18,236	18,655	419	2%
2007	230,033	239,096	9,063	4%	2,781	3,043	262	9%	16,349	17,508	1,159	7%	19,130	20,551	1,421	7%
2008	243,197	252,665	9,468	4%	4,413	5,211	798	18%	13,795	14,498	703	5%	18,208	19,709	1,501	8%
2009	217,826	229,987	12,161	6%	4,444	5,615	1,171	26%	9,680	10,119	439	5%	14,124	15,734	1,610	11%
2010	225,561	235,921	10,360	5%	4,858	6,151	1,293	27%	9,396	9,997	601	6%	14,254	16,148	1,894	13%
2011	231,978	242,888	10,910	5%	4,140	5,064	924	22%	8,886	9,616	730	8%	13,026	14,680	1,654	13%
2012	230,833	241,488	10,655	5%	3,931	4,898	967	25%	8,649	9,218	569	7%	12,580	14,116	1,536	12%
2013	227,410	236,586	9,176	4%	4,201	4,785	584	14%	8,232	9,185	953	12%	12,433	13,970	1,537	12%
2014	255,865	265,213	9,348	4%	4,738	5,812	1,074	23%	8,573	8,526	-47	-1%	13,311	14,338	1,027	8%
2015	269,132	277,157	8,025	3%	4,335	5,860	1,525	35%	6,578	6,586	8	0%	10,913	12,446	1,533	14%
2016	298,322	304,588	6,266	2%	5,127	6,697	1,570	31%	6,340	6,451	111	2%	11,467	13,148	1,681	15%
CAGR	2.1%	2.0%			6.6%	10.6%			-4.8%	-4.9%			-2.3%	-1.7%		

TAF records (enplanements and operations) come from TAF issued January 2017.
Airport records come from airlines (enplanements) and payment of landing fees (operations).
CAGR = Compound Annual Growth Rate

Figure A4-2: Airport Commercial Operations Records

		FAA Fiscal Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	RATE	CHART
Subtotal	Air Carrier	Scheduled Commercial Passenger	209	2,184	4,636	5,142	5,742	4,542	4,413	4,207	4,995	5,240	6,254	40.5%	
Subtotal	Air Carrier	Charter	52	136	51	34	41	8	-	22	44	39	21	-8.7%	
Subtotal	Air Carrier	Air Tanker	626	723	524	439	368	514	485	556	773	581	422	-3.9%	
Subtotal	Air Carrier	Sched. Com. Pax + Charter + Tanker	**887**	**3,043**	**5,211**	**5,615**	**6,151**	**5,064**	**4,898**	**4,785**	**5,812**	**5,860**	**6,697**	22.4%	
Subtotal	Air Taxi	Scheduled Commercial Passenger	14,455	14,006	10,961	6,764	6,186	6,283	6,340	5,916	6,602	4,560	4,522	-11.0%	
Subtotal	Air Taxi	Scheduled Commercial Freight	3,313	3,502	3,537	3,355	3,811	3,333	2,878	3,269	1,924	2,026	1,929	-5.3%	
Subtotal	Air Taxi	Sched. Com. Pax + Freight	**17,768**	**17,508**	**14,498**	**10,119**	**9,997**	**9,616**	**9,218**	**9,185**	**8,526**	**6,586**	**6,451**	-9.6%	
Total		Air Carrier + Air Taxi	**18,655**	**20,551**	**19,709**	**15,734**	**16,148**	**14,680**	**14,116**	**13,970**	**14,338**	**12,446**	**13,148**	-3.4%	

Source: Airport records depicting landing fees.

Figure A4-3: Airport Enplanement Records by Month

Enplanement/Deplanement by Airlines

Summary

FY	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16
July Enplane	10,019	9,924	11,849	13,948	15,054	16,137	13,410	13,559	14,017	18,349	18,763	23,618	23,354	22,583	22,879	23,819	24,812	24,320	26,448	28,710
July Deplane	10,176	10,177	12,415	14,554	15,235	16,508	13,868	13,788	13,849	18,552	19,059	23,704	23,807	23,405	23,713	24,022	25,560	24,529	27,272	29,650
August Enplane	10,440	10,638	12,796	14,765	15,746	17,598	14,511	13,886	15,646	18,536	22,290	24,251	23,321	23,205	23,728	23,986	24,210	23,877	27,374	29,276
August Deplane	10,750	10,420	12,321	13,783	15,495	17,634	14,175	13,676	14,603	17,789	21,844	24,018	22,954	22,341	22,849	23,452	23,821	23,660	27,414	28,118
September Enplane	9,183	9,879	11,149	12,954	13,792	9,694	12,205	12,255	13,263	16,221	19,002	20,542	18,743	19,374	19,475	20,702	19,686	21,797	23,466	24,896
September Deplane	8,409	9,132	10,789	12,650	13,236	9,126	11,456	11,538	12,924	15,787	18,304	19,601	17,808	18,958	19,125	20,322	19,119	20,544	21,192	24,250
October Enplane	8,896	9,053	10,795	12,336	14,000	11,181	11,567	12,635	13,381	16,115	19,282	21,106	18,728	18,785	19,310	19,456	18,943	21,207	21,796	24,496
October Deplane	8,652	8,856	10,618	12,184	13,578	10,781	11,074	12,178	13,166	15,962	18,617	20,419	18,220	18,446	18,880	19,317	18,328	20,968	21,311	23,962
November Enplane	7,548	7,871	10,311	11,897	13,231	10,903	11,039	11,852	13,239	14,164	18,347	20,292	17,835	18,790	19,016	18,945	18,192	20,075	20,405	23,974
November Deplane	7,614	8,215	10,006	12,052	13,020	10,847	11,372	12,009	13,107	13,513	18,204	20,139	18,117	18,885	19,144	18,855	18,178	20,707	19,985	23,272
December Enplane	8,835	9,840	12,368	12,519	13,708	11,513	12,751	12,718	14,101	17,176	19,081	22,085	19,649	21,159	21,057	20,051	18,885	22,806	19,988	25,286
December Deplane	9,250	10,419	13,029	13,297	14,722	12,171	13,442	13,293	14,930	17,959	20,027	23,514	20,481	22,615	22,421	22,003	19,960	24,281	20,651	26,871
January Enplane	9,151	9,455	10,443	12,218	12,726	11,243	11,485	11,678	14,216	16,126	18,166	21,328	17,633	18,621	19,826	18,578	18,194	20,550	21,225	24,863
January Deplane	8,079	8,337	9,288	10,823	11,276	10,089	9,995	10,088	12,715	14,372	16,646	19,010	15,466	16,413	17,465	16,547	16,644	18,108	18,651	22,364
February Enplane	8,493	8,555	10,579	11,293	12,506	10,422	10,757	11,859	12,275	14,930	16,523	20,509	16,620	16,427	17,158	17,039	16,469	17,502	19,357	22,912
February Deplane	8,182	8,348	10,555	11,207	12,063	10,410	10,707	11,872	12,246	14,753	16,285	20,610	16,575	16,286	16,914	16,812	16,456	18,209	19,118	22,633
March Enplane	8,983	9,449	11,525	13,347	14,627	11,633	11,866	12,601	15,229	17,271	18,969	19,852	19,179	18,887	20,231	19,860	18,926	21,067	22,469	25,313
March Deplane	9,202	9,625	11,620	13,400	14,360	11,876	11,742	12,758	15,320	16,393	18,291	19,706	18,936	19,363	20,512	19,427	18,901	20,692	22,361	25,514
April Enplane	8,577	8,802	11,027	11,853	12,753	10,597	10,276	11,353	14,089	15,243	18,224	19,362	16,970	17,870	17,570	17,533	17,561	19,479	20,986	23,656
April Deplane	8,474	8,833	10,550	11,450	13,230	10,549	10,365	11,149	13,830	15,619	18,769	19,688	17,195	17,241	17,243	17,871	17,477	19,706	20,973	24,180
May Enplane	9,069	9,387	10,975	12,851	13,672	11,064	11,427	11,799	15,535	16,066	20,003	20,391	17,578	18,350	18,916	18,944	18,398	21,165	21,901	7,379
May Deplane	8,732	9,501	11,085	13,921	13,927	11,335	11,526	12,308	15,728	16,797	20,288	20,812	18,256	18,886	19,390	19,840	19,138	22,021	22,305	7,086
June Enplane	9,794	11,277	12,541	14,190	14,755	12,664	12,933	13,686	16,476	17,915	22,090	22,322	20,633	20,950	21,297	22,374	21,024	24,074	26,148	30,397
June Deplane	9,793	11,224	12,310	14,293	15,104	12,788	13,093	13,477	16,697	17,828	22,672	22,603	21,190	21,003	22,131	22,732	21,379	24,623	25,978	30,578
TOTAL Enplane	108,988	114,130	136,358	154,171	166,570	144,649	144,227	149,881	171,467	198,112	230,740	255,658	230,243	235,001	240,463	241,287	235,300	257,919	271,563	291,158
TOTAL Deplane	107,313	113,087	134,586	153,614	165,246	144,114	142,815	148,134	169,115	195,324	229,006	253,824	229,005	233,842	239,787	241,200	234,961	258,048	267,211	288,478
TOTALS	216,301	227,217	270,944	307,785	331,816	288,763	287,042	298,015	340,582	393,436	459,746	509,482	459,248	468,843	480,250	482,487	470,261	515,967	538,774	579,636

FAA FY (Oct-Sep)	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Enplanements	109,787	119,483	142,231	157,096	165,407	141,346	143,801	153,107	181,647	205,061	239,096	252,665	229,987	235,921	242,888	241,488	236,586	265,213	277,157	304,588
Deplanements	107,707	118,883	140,048	156,593	164,548	140,345	142,318	150,508	179,867	202,403	237,122	251,070	229,140	234,825	241,896	241,904	235,194	265,193	273,351	301,464
Total	217,494	238,366	282,279	313,689	329,955	281,691	286,119	303,615	361,514	407,464	476,218	503,735	459,127	470,746	484,784	483,392	471,780	530,406	550,508	606,052

Source: Airport records, reported by the airlines.

APPENDIX C:

RECYCLING PLAN

Fly REDMOND

REDMOND MUNICIPAL AIRPORT RECYCLING, REUSE & WASTE REDUCTION PLAN

2018

Mead&Hunt

REDMOND MUNICIPAL AIRPORT
RECYCLING, REUSE & WASTE REDUCTION PLAN
2018

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EXECUTIVE SUMMARY

The City of Redmond, Oregon, operator of Redmond Municipal Airport (RDM or the Airport) is committed to environmentally responsible operations. The Airport is updating their master plan and is including planning for solid waste in keeping with the *FAA Modernization and Reform Act of 2012* (FMRA) requirements. The purpose of this task was to evaluate RDM's existing waste and recycling program and provide recommendations to increase landfill diversion through waste reduction, reuse, and recycling.

The consultant conducted a facility walk-through and informal interviews with RDM staff to develop a baseline and identify areas of opportunity to divert waste from the landfill. The consultant developed recommendations appropriate for the Airport's waste stream based on the baseline information and identified opportunities.

Highlights of these recommendations include:

- ✓ Establish goals and objectives
- ✓ Track progress and report regularly
- ✓ Continue to promote emptying of water bottles pre-security and refilling post-security
- ✓ Collect and donate food, beverages, and toiletries
- ✓ Continue paper, plastic, plastic bottle, aluminum can, cardboard, and glass recycling and expand to other areas, including deplaned waste
- ✓ Improve education and outreach for passengers, employees, tenants, and contractors
- ✓ Supplement, right size, collocate, and standardize recycling stations and garbage cans
- ✓ Expand and improve signage, specifically at the security checkpoint
- ✓ Update contracts/leases and establish purchasing policy
- ✓ Maintain and improve recycling program according to Plan Do Check Act cycle

This range of recommendations will allow RDM the flexibility to implement those that are compatible with changing conditions and available resources, while providing the opportunity increase landfill diversion over time through a phased, comprehensive program.

1. INTRODUCTION

A. REGULATORY BACKGROUND AND PROJECT PURPOSE

Section 132(b) of the FMRA expanded the definition of airport planning to include "developing a plan for recycling and minimizing the generation of airport solid waste." FMRA Section 133 added a requirement that airports that prepare or update a master plan and receive Federal Aviation Administration (FAA) Airport Improvement Program (AIP) funding ensure that new or updated master plans address issues related to solid waste recycling. These issues include:

1) the feasibility of solid waste recycling
2) minimizing the generation of solid waste
3) operation and maintenance requirements
4) review of waste management contracts
5) the potential for cost savings or revenue generation.

In September 2014, the FAA released a memorandum titled "Guidance on Airport Recycling, Reuse, and Waste Reduction Plans." This memo details the FAA's expectations and suggestions for an airport's recycling plan. To comply with FMRA and according to the FAA's guidance memo, RDM is preparing this recycling, reuse, and waste reduction plan. The purpose of this plan is to document and assess RDM's existing waste and recycling program based on the factors listed above and to recommend improvements.

An airport's waste and recycling program and documented plan depend on several factors including:

- ✓ the size, location, and layout of the airport
- ✓ the amount and type of waste generated
- ✓ markets for recyclable commodities
- ✓ costs for recycling
- ✓ available local infrastructure
- ✓ the willingness of an airport and its tenants to implement recycling and other strategies

The extent and accuracy of available information governed the content of this plan.

B. AIRPORT DESCRIPTION

RDM is in the high desert region of central Oregon in the City of Redmond within Deschutes County. The City of Redmond owns RDM. The Airport Manager reports to the City Manager, and City employees are responsible for day to day airport operations. An Airport Committee advises elected City Council members on Airport matters. The Committee includes representation from Redmond, the City of Bend, Deschutes County, Jefferson County, and Crook County.

RDM, a non-hub primary airport, serves as the high desert region's only commercial service airport. The Airport is a public-use facility and is included in the FAA *National Plan of Integrated Airport Systems (NPIAS).* The Airport is an FAA Class I Part 139 facility, with facilities and services to accommodate scheduled passenger aircraft with 30 or more passenger seats. The Oregon Department of Aviation classifies RDM as a Category I – Commercial Service Airport.

The Airport serves commercial, general aviation (GA), military, and US Forest Service (USFS) activity. In fiscal year 2016, RDM saw approximately 546,700 total passengers (273,351 enplanements), saw 39,211 total operations, and had 40 based aircraft. Four airlines serve the Airport (American Airlines, Alaska Air, Delta Air, and United/United Express) and reach seven domestic destinations. Additional background and activity information is available in the Airport Master Plan.

C. WASTE DEFINITIONS AND PLAN FOCUS

Municipal Solid Waste (MSW) consists of everyday items that are used and then discarded. There are six primary types of MSW generated at airports:

a. General MSW consists of common inorganic waste, such as product packaging, disposable utensils, plates and cups, bottles, and newspaper. Less common items, such as furniture and clothing, are also considered general MSW.
b. Food waste is either food that is not consumed or the waste generated and discarded during food preparation. Food waste and green waste make up a waste stream known as "compostable" waste.
c. Green waste consists of tree, shrub and grass clippings, leaves, weeds, small branches, seeds, pods and similar debris generated by landscape maintenance activities. Green waste and food waste together may be referred to as "compostables."
d. Deplaned waste is a specific type of MSW that is removed from passenger aircraft. These materials include bottles and cans, newspaper and mixed paper, plastic cups, service ware, food waste, food soiled paper, and paper towels.
e. Construction and Demolition Waste (C&D) is generally categorized as MSW and is any non-hazardous solid waste from land clearing, excavation, and/or the construction, demolition, renovation or repair of structures, roads, and utilities. C&D waste commonly includes concrete, wood, metals, drywall, carpet, plastic, pipes, land clearing debris, cardboard, and salvaged building components.

This plan focuses on the management of MSW and other materials that can be recycled or disposed of in a landfill. This plan does not address the management of other types of waste, specifically:

- ✓ hazardous waste
- ✓ universal waste
- ✓ industrial waste
- ✓ waste from international flights
- ✓ C&D waste that is subject to special requirements or requires special handling (asbestos, lead, etc.).

The handling, recycling, and disposal of these materials are regulated by federal, state, and local laws.

D. KEY AIRPORT BUILDINGS AND PLAN SCOPE

The Airport's buildings include an airline passenger terminal, airport support facilities, GA facilities and tenant facilities.

AIRLINE PASSENGER TERMINAL

The passenger terminal serves airline passengers and provides space for airline-related services.

Airport administration offices, airline ticketing counters and offices, restrooms, food and retail store, security queuing area, meeter/greeter area, baggage claim, and rental car counters and offices comprise the pre-security or non-sterile portion of the terminal.

The administration offices include a reception area, offices, one conference room, and a breakroom. The firm providing airport security services has an office adjacent to the security checkpoint, and the City of Redmond Police Department also has an office in the terminal.

The ticketing counters, associated queuing lines and kiosks, and adjacent offices are allocated to each airline. A shop offering packaged food and drinks and retail items, including souvenirs, is in the non-sterile area. There are restrooms in the non-sterile area.

The meeter/greeter area connects the secure area exit with baggage claim and the car rental counters. This space also has a children's play area. There are two luggage belts in the baggage claim area, as well as a space for oversized baggage claim. Each rental car company has a counter and adjacent office for their use.

Passengers access the security checkpoint via a queuing area at its entrance. The Transportation Security Administration (TSA) operates the security checkpoint, which offers two lanes for screening of passengers and carry-on items. TSA personnel also have access to training areas, locker room space, and offices.

The post-security or secure portion of the terminal offers services for passengers already screened at the security checkpoint. The secure area includes a second food and retail shop, a bar/restaurant, restrooms, airline gates, and passenger holdrooms.

Secure area food and retail space is occupied by a small convenience store that also offers packaged foods and drinks as well as souvenirs (Figure 1).

Figure 1 : Terminal convenience store

The convenience store has a small coffee condiments area with a built-in trash can (Figure 2).

Figure 2 : Coffee condiments area in convenience store

A bar/restaurant is located on the second floor of the secure area and features bar seating as well as tables and chairs with wait staff service (Figure 3). The restaurant also sells packaged beverages (Figure 4).

Figure 3 : Bar and restaurant in secure area

Figure 4 : Bar area and cooler with packaged beverages

The secure area also has restrooms.

Six gates serve deplaning and enplaning passengers with each gate is dedicated to one airline. Holdrooms, where passengers wait to board departing flights within the departure lobby, are loosely defined at RDM by their proximity to each gate; the first-floor departure lobby is one space with seating available throughout. Additional general departure seating is available on the second-floor atrium.

Additional areas of the terminal are accessible only to credentialed staff and contractors. These areas include baggage screening, a maintenance shop, storage, and a breakroom.

AIRPORT SUPPORT FACILITIES

Airport staff maintain the property and perform snow removal and deicing activities. The Airport's plows, other winter equipment, and grounds maintenance vehicles are stored in the Snow Removal Equipment (SRE) Building.

The City of Redmond provides personnel to meet RDM's aircraft rescue and firefighting (ARFF) requirements. On-duty firefighters, ARFF vehicles, and associated activities are housed in a dedicated facility at RDM.

GENERAL AVIATION FACILITIES

One fixed-base operator (FBO) offers services such as ground handling, aircraft maintenance, hangar rental, fueling, and pilot/passenger facilities to support GA activity at RDM. The Airport has box hangars and T-hangars to store GA aircraft.

CARGO

Cargo facilities are made up of hangars that RDM leases and adjacent areas of the aircraft ramp/apron.

USFS

The USFS leases space to operate the Redmond Air Center, a firefighting facility protecting areas in Oregon, Washington, and Alaska. The Air Center is a hub of USFS firefighting operations, such as training and dispatching, as well as an incident support base for Federal Emergency Management Agency (FEMA) efforts in the event of a natural disaster in the Pacific Northwest.

PLAN SCOPE

The facilities described above include buildings and areas in which RDM has direct control of waste management and others in which RDM has influence but not direct control. According to FAA guidance, areas over which RDM has "direct control" or "influence" should be included in the Recycling, Reuse, and Waste Reduction Plan; areas outside Airport control or influence may be excluded. The Airport has direct control over operations and activities related to waste management in these areas:

- ✓ Passenger Terminal Building
  - public use spaces
  - airport administration offices
  - other staff work areas
- ✓ Airport SRE Building
- ✓ Airport maintenance activities

In addition, RDM can influence the management of waste and recyclables in tenant spaces through lease agreements and contracts, including:

- ✓ Passenger Terminal Building
  - TSA spaces
  - Airline leased areas
    (including ticketing counters, offices, breakrooms, and deplaned waste)
  - Rental car tenant areas
  - Retail areas and bar/restaurant
- ✓ FBO Building (leased by RDM)
- ✓ Aircraft hangars (leased by RDM)
- ✓ USFS facilities (leased by RDM)
- ✓ ARFF building (coordination with City of Redmond)

The Airport does not have control or influence over waste management in the FAA Air Traffic Control Tower (ATCT) nor areas adjacent to Airport property controlled by neighboring businesses and property owners; therefore, they are excluded from this plan.

2. EXISTING PROGRAM

A. DRIVERS

The Airport established its recycling program to reduce the quantity of material disposed of in the landfill and to conserve resources, including financial resources. The Airport staff's commitment and practices drive the program; it is supported by local recycling infrastructure.

B. ALIGNMENT WITH LOCAL PROGRAMS

The City, who owns and operates RDM, contracts with a waste hauling contractor to provide waste and recycling collection services for residents, multifamily units, and commercial businesses. RDM's program aligns with the City's efforts; RDM recycles all the material types collected by the City's contractor.

C. INFRASTRUCTURE

Employees, tenants, and passengers have access to a network of trash cans and recycling stations in the terminal. In general, there are many trash cans throughout the building and a few recycling stations in specific locations. The recycling stations and the garbage cans are lined/fitted with bags.

In the ticketing lobby and airline counter area, there are tall round, metal garbage cans with round openings in the lids (Figure 5). These garbage cans are also available at the entrance to the security screening checkpoint (Figure 6), in the baggage claim and meeter / greeter space (Figures 7 and 8), and throughout the sterile area, including in the holdroom (Figure 9) and atrium (Figures 10 and 11).

Figure 5 : Garbage cans in ticketing lobby

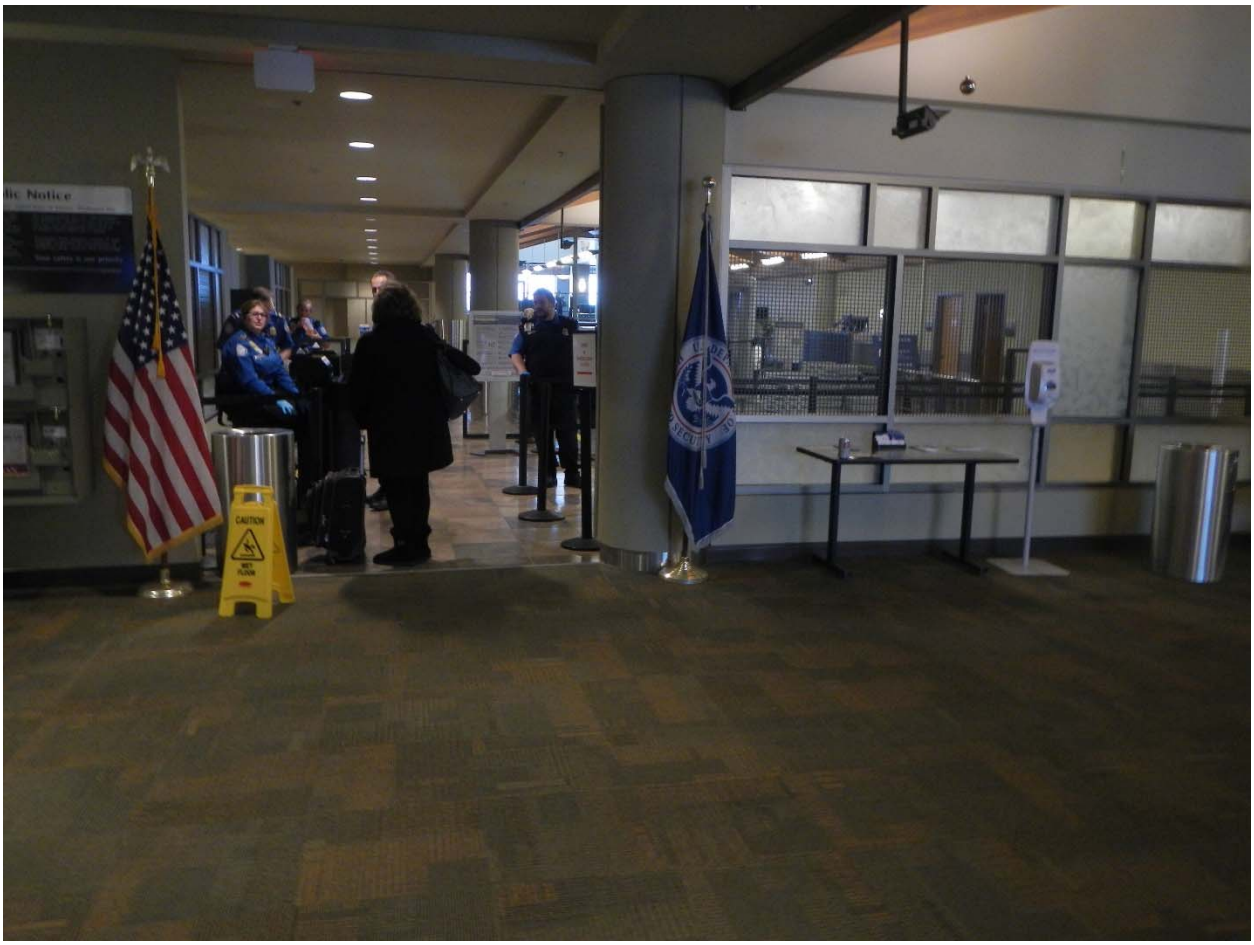


Figure 6 : Garbage cans at entrance to security screening checkpoint

Figure 7 : Garbage cans in baggage claim

Figure 8 : Garbage cans in meeter / greeter area

Figure 9 : Garbage cans in holdroom

Figure 10 : Garbage can in atrium near restaurant

Figure 11 : Garbage can in atrium

Recycling stations, conjoined units with four labeled compartments, are positioned in four locations within the non-sterile and sterile areas: in the security queuing area, at the base of the stairs leading to the atrium (Figure 12), within the atrium seating area near the restaurant (Figure 13), and in the meeter/greeter area near baggage claim (Figure 14).

Figure 12 : Recycling station in holdroom area, near stairs to atrium

Figure 13 : Recycling station in atrium, near restaurant

Figure 14: Recycling station in meeter/greeter area near baggage claim

At the curbside entrances to and exits from the terminal, there are large garbage cans featuring hoods with large openings (Figure 15).

Figure 15 : Curbside garbage can

The terminal restrooms feature paper towel dispensers and air hand dryers (Figure 16), with garbage cans positioned below the paper towel dispensers and small bins located in each toilet stall.

Figure 16 : Terminal restrooms offer both hand dryers and paper towel dispensers

Drinking fountains are available near the restrooms throughout the terminal; RDM has installed one water bottle refill station in the sterile area (Figure 17).

Figure 17 : Water bottle filling station and drinking fountain in holdroom

The restaurant kitchen and back of house area include space for food preparation, dishwashing, storage, and other activities. Space in this area is limited. Garbage is collected in a large container (Figure 18).

Figure 18 : Restaurant back of house area, including garbage can

Glass, plastic bottles, and cans are taken to the recycling station located in the atrium. Restaurant staff break down cardboard boxes and stack them throughout the day (Figure 19); they carry these to the terminal cardboard dumpster as needed to clear the space and at the end of the day.

Figure 19 : Restaurant collection of cardboard for recycling

The restaurant offers paper carryout containers, and restaurant employees use refillable water bottles. The retail areas have small trash cans near the register, and retail employees use the terminal recycling stations for paper, plastic bottles, cans, and glass.

In Alaska Air's ticketing area, each station has space for a small trash can. The cargo desk also has a small trash can (Figure 20). The airline's office/breakroom space has two large trash cans (Figure 21); a low, squat recycling bin for paper (Figure 22); and a container for cans and plastic bottles (Figure 23).

Figure 20 : Garbage can in airline cargo area

Figure 21 : Garbage can in airline breakroom area

Figure 22 : Recycling bin in airline office area

Figure 23 : Garbage and recycling collection in airline office area

The Delta ticket counter also has a space for a “trash box” (Figure 24). In the Delta offices, there are small garbage cans by the desks (Figure 25), and the area also has a low, squat recycling bin for paper (Figure 26).

Figure 24 : Airline ticketing counter with "trash box"

Figure 25 : Garbage can in airline office

Figure 26 : Recycling bin in airline office

In the airline baggage handling area, a space shared by all the airlines, there are small trash cans located by the vending machine (Figure 27).

Figure 27 : Vending machine and garbage cans in baggage handling area

The car rental offices have containers for trash, and some use the terminal recycling stations for paper, plastic bottles, cans, and glass.

In the administration offices, there are in-cabinet waste and recycling bins in the breakroom/kitchenette (Figure 28) and in the conference room (Figure 29).

Figure 28 : In-cabinet garbage and recycling bins in Airport administration breakroom

Figure 29 : In-cabinet garbage and recycling bins in Airport conference room

In the copy room, there is one bin each for garbage and recycling (Figures 30 and 31), as well as a small paper shredder.

Figure 30 : Airport administration copy room

Figure 31 : Garbage can and recycling bin in Airport administration copy room

Each office/desk has a garbage can and some employees use copy paper box lids to collect paper for recycling (Figures 32 and 33).

Figure 32 : Garbage can in Airport administration office

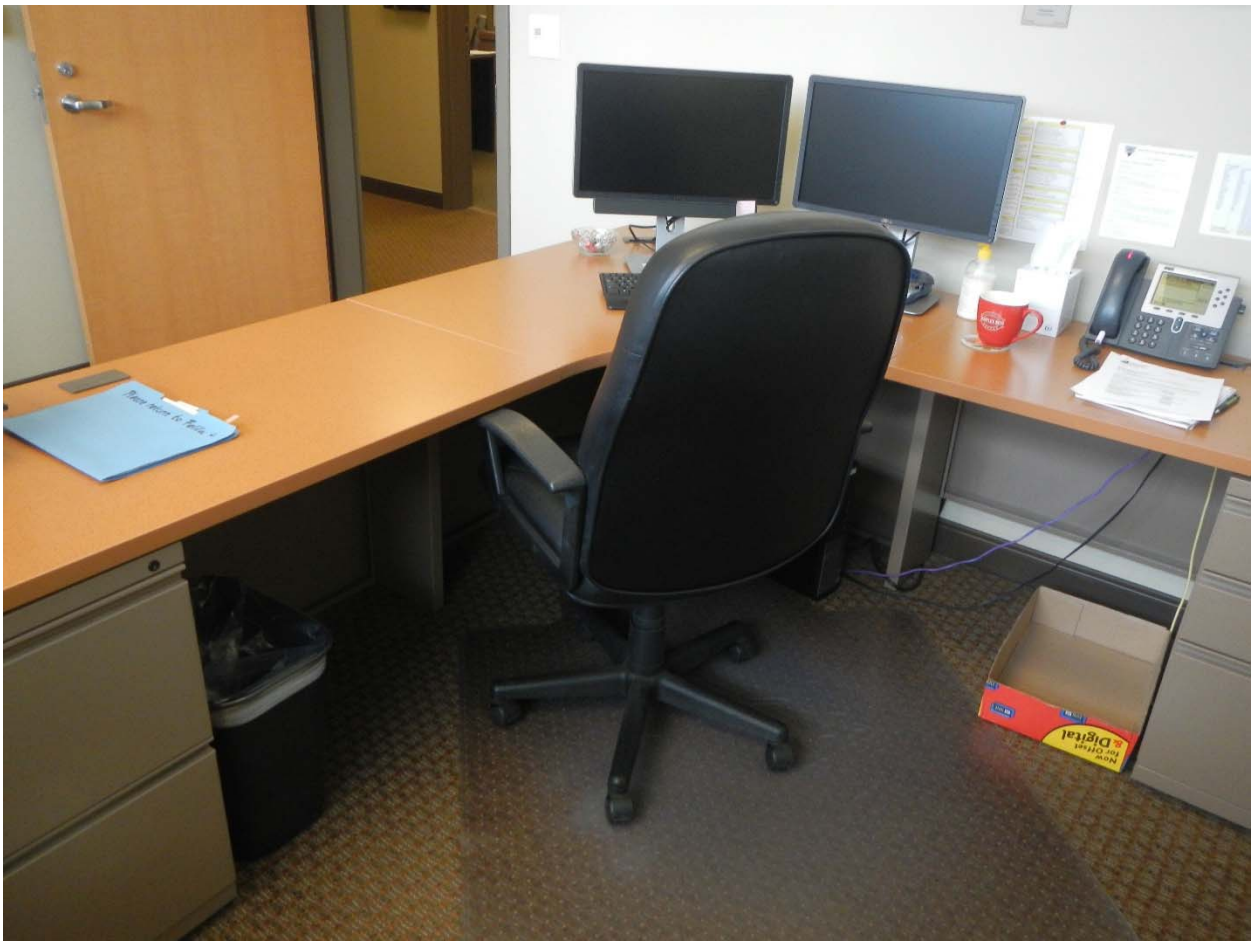


Figure 33 : Garbage can and box lid for recycling in Airport administration office

The labels on recycling stations in the terminal and on the bins in the administration offices are the primary method to convey messaging about and instructions related to recycling. The recycling stations in the terminal are labeled for plastic, glass, paper, and cans with graphics depicting a plastic bottle, glass bottle, stack of paper and envelope, and aluminum can, respectively (Figure 34). Additional signage posted on the recycling bins alerts passengers that there is a “Water bottle refill station in the boarding area” (Figure 35).

Figure 34: Recycling station labeling

Figure 35 : Recycling station sign alerting passengers about water bottle refill station located in the boarding area (holdroom)

RDM has also installed signage in the restrooms in the non-sterile area encouraging passengers to “Reuse your water bottle” (Figures 36 and 37). These signs instruct passengers to empty their bottles pre-security and refill them post-security at the drinking fountain in the boarding area.

Figure 36 : Restroom signage encouraging passengers to reuse water bottles

Figure 37 : Restroom signage encouraging passengers to reuse water bottles (closeup)

At the Maintenance building, there are several garbage cans, including in the supervisor's office and in the breakroom. The ARFF facility has carts for waste and recyclable materials (Figure 38), and there are also several recycling bins and trash cans (Figures 39 and 40).

Figure 38: Carts for garbage and recyclables at ARFF facility

Figure 39 : Garbage cans or recycling bins in ARFF building kitchen

Figure 40 : Container for recycling beverage containers in ARFF building

A trash dumpster, cardboard dumpster, and cart for recyclables are in the GA area (Figure 41).

Figure 41 : Dumpsters and carts located in GA area

The FBO terminal has several garbage cans but no recycling bins.

The carts, dumpster, and compactor used to consolidate waste and recyclables materials generated in the terminal are positioned within a landside fenced enclosure adjacent to the terminal building (Figure 42). The four, 95-gallon carts are used for comingled recyclables, the six-yard dumpster for cardboard, and the 20-yard compactor for waste. Containers for glass recycling are also located in the enclosure. A second 2-yard waste dumpster is in a landside enclosure near the terminal smoking area. The waste and recycling hauler provides these containers. Access to the enclosure is restricted to specific airport staff and the contractors' collection crews. The contractor uses its own vehicles to collect the waste and recyclable materials from RDM and transfer them for processing or disposal.

Figure 42 : Carts and compactor in fenced enclosure

Waste materials (food waste and other MSW) are collected from the dumpster weekly and the compactor biweekly. These materials are transported for disposal at Deschutes County's Knott Landfill. Recyclable materials (comingled paper, plastic, and aluminum, as well as segregated glass and cardboard) are collected weekly and transported to a recycling facility at the landfill where they are sorted, compressed into bales, marketed, and sold.

D. OPERATION AND MAINTENANCE REQUIREMENTS / ROLES AND RESPONSIBILITIES

RDM's recycling program is maintained by facilities staff, with support from Airport management personnel.

The facilities manager is primarily responsible for the recycling program, including directing housekeeping activities, adjusting the program, purchasing custodial supplies, and communicating with RDM's business coordinator about collection services.

Airport facilities staff includes six full time personnel. Facilities staff are responsible for custodial activities in specific buildings and areas, including collecting waste and recyclables from cans and bins and transferring these materials to the appropriate dumpsters. Airport facilities staff are responsible for custodial activities:

- ✓ in public spaces of the terminal
- ✓ in TSA areas
- ✓ in RDM offices
- ✓ in the SRE building
- ✓ in other Airport spaces
- ✓ on the airfield
- ✓ in GA hangars leased through Airport Administration

The Airport's terminal tenants (restaurant and shop, rental car companies, and airlines) and tenants in some of the outlying buildings (FBO and one GA hangar) are responsible for custodial activities in their areas including transferring waste to the appropriate dumpsters. The operators of the FBO, ATCT, and ARFF building are each responsible for securing their own waste and recycling services.

The Airport's business coordinator is responsible for communicating with the collection service providers and tracking program invoices. The aviation program manager is responsible for supporting the program through allocation of resources (financial and other) and for coordinating tenant leases.

High County Disposal (formerly High Desert Disposal) is the primary waste and recycling hauling contractor for RDM. High County Disposal collects garbage from RDM's dumpsters and transports this material to a transfer station for disposal at the Deschutes County's Knott Landfill. The transfer station is located approximately five miles south of the Airport, and the landfill is approximately 20 miles south of the Airport in Bend, Oregon.

High County Disposal also collects recyclable materials from RDM and transports them to one of the county's recycling facilities (located at the transfer station and the landfill) for processing. The Airport is also serviced by the parent company of High County Disposal, Bend Garbage & Recycling, for the collection of shredded paper and waste syringes. Deschutes Recycling, a sister company to High County Disposal, accepts yard waste for composting and sells compost to the public. The area does not appear to have a commercial food waste compost facility.

E. CURRENT WASTE REDUCTION, REUSE, AND RECYCLING EFFORTS

WASTE REDUCTION

Also called "waste minimization," waste reduction refers to reducing the volume of waste produced at its source. This can be accomplished through changing habits and practices, such as printing and purchasing. RDM currently employs the following practices to reduce the total amount of waste generated:

- ✓ Double sided printing in administration offices
- ✓ Email and internal websites for inter-office communication
- ✓ Shared drives for storage of documents
- ✓ Computer software to receive fax messages
- ✓ On-screen print preview and PDF printer or other electronic printing
- ✓ Outsourcing large print jobs

REUSE

In a waste management context, reuse refers to using materials and items more than once and as many times as possible before disposal. Reuse can include using items and materials for the original purpose or repurposing something for a different use. Reuse can require purchasing durable materials and items instead of disposable or single use options.

The Airport currently reuses:

- ✓ Ceramic coffee mugs and durable silverware, plates, bowls, and cups (instead of plastic, paper, or Styrofoam) in Administration breakroom
- ✓ Office supplies, including inter-office envelopes
- ✓ Towels/rags in maintenance areas
- ✓ Office furniture

RECYCLING

Using the infrastructure and resources described above, RDM currently recycles three streams: cardboard; glass; and comingled paper, plastic bottles, and aluminum cans.

Terminal tenants generate most of the cardboard in the form of shipping boxes. The paper stream includes printer paper, mail, envelopes, and other paper from the Airport Administration offices as well as paper items, such as newspapers and magazines, collected in the public areas of the passenger terminal. The plastic, aluminum, and glass streams are primarily made up of beverage containers, collected from the public areas of the passenger terminal as well as the administration offices and restaurant. Some plastic bottles and aluminum cans may be collected by employees and tenants for refund under the State's bottle bill.

CONSTRUCTION AND DEMOLITION DEBRIS, GREEN WASTE, AND OTHER WASTE

The Airport reuses and recycles the waste generated during construction projects where possible. For example, asphalt millings from a runway project were used to improve the perimeter road. Removed lighting fixtures were donated for reuse. The Airport works with the City Department of Public Works and follows the City's surplus goods policy/practices. Green waste generated from the maintenance of the property is managed on-site where possible. The Airport collects hazardous waste; used oil and filters; batteries; paint; used tires; and scrap metal for beneficial reuse, recycling, or return to supplier programs.

TENANT EFFORTS

In addition to the recycling program operated by RDM, tenants at the Airport may be recycling on their own. In some instances, these tenants may be using the Airport's bins, carts, dumpsters, and compactor.

F. TRACKING AND PERFORMANCE

The Airport does not currently track overall waste generation, recycled material volume, or other metrics. At present, RDM does not have specific waste or recycling objectives, targets, or goals.

3. WASTE AUDIT

RDM staff provided information about:

- ✓ airport buildings and facilities
- ✓ areas that generate waste
- ✓ the types of waste generated in each area
- ✓ the materials that can be recycled under the current program.

Facilities staff have informally observed passenger and employee waste and recycling related behaviors and, for this document, described generally how waste flows through the facility. The staff also described waste and recycling collection and hauling practices.

The consultant evaluated Airport information and records as well as aviation industry waste and recycling trends to identify the source, composition, and quantity of waste generated at RDM, including areas under RDM's direct control or influence. The consultant then used this information to identify opportunities to improve and monitor program effectiveness.

A. QUANTITY AND SOURCES

According to invoices provided by Airport staff, Bend Garbage & Recycling collects a 35-gallon roll cart of shredded paper approximately annually. Using conversion factors from the United States Environmental Protection Agency (EPA), this equates to approximately 8.5 pounds of paper.

According to invoices provided by Airport staff, the waste compactor serviced by High County Disposal has a capacity of 20 yards and is collected every other week. Assuming a load factor of 75 percent and based on conversion factors from the EPA, each load is estimated to contain 15 cubic yards or 4 tons of compacted municipal solid waste each collection. This totals approximately 105 tons a year. The Airport also uses a two-yard dumpster for waste; this container is serviced weekly. Based on the same load and conversion factors, this smaller container is estimated to contain 400 pounds of waste each collection for a total of 10 tons a year. Together, these dumpsters represent an annual generation of 115 tons of waste each year.

The invoices do not detail the size or collection frequency for the recycling carts and dumpsters. A representative from High County Disposal provided the following information about RDM's other waste and recycling containers' capacities and service schedules:

- ✓ Cardboard: one 6-yard dumpster; collected weekly
- ✓ Comingled recyclables: four, 95-gallon carts; collected weekly
- ✓ Glass: collected weekly

Based on a 75 percent load factor and conversion factors from the EPA, the consultant estimated that RDM recycles approximately 10 tons of cardboard and 10 tons of commingled recyclables. To estimate the annual quantity of glass recycled, information about the capacity of the glass recycling containers and their collection schedule is needed.

According to the invoices, the Airport also rented two 30-yard dumpsters for airfield waste collection and scrap metal collection in 2017. The quantity of waste generated from these occasional collection events is not included in the Airport's baseline annual generation.

Based on industry averages, the overall contribution of waste and recyclables from various areas and activities at RDM is likely similar to the distribution shown in Table 1.

Table 1: Estimated Generation at RDM by Area/Activity

RDM Area/Activity	Estimated Percent	Estimated Weight
Deplaned	20%	27 tons
Other Airline	24%	32 tons
Administration	3%	4 tons
Public Areas	35%	48 tons
Concessions	18%	24 tons
Total	100%	135 tons

Based on this distribution, programs that focus on the airlines and public areas may represent the best opportunities to reduce waste generation and increase landfill diversion. A physical waste sort could provide more detailed information about the amount and proportion of waste generated in total and by each area, activity, tenant, etc.

Based on the waste and recycling data presented above, the Airport's current recycling rate is about 15 percent.

B. COMPOSITION

Based on the activities taking place at RDM, a varied waste stream can be expected. According to industry case studies and previous waste planning projects, an airport's waste stream is approximately 40 percent recyclable, 35 percent compostable, and 25 percent waste that cannot be recycled or composted due to current technologies and, as a result, must be placed in a landfill.

Table 2 lists each area included in the scope of this plan and the type(s) of waste likely generated there.

Table 2: Redmond Municipal Airport Waste by Area and Material																		
Area | Material	Office Paper	Newspapers	Magazines	Plastic	Aluminum	Cardboard	Glass	Food Waste	Paper Products	Liquids	Toiletries	Packaging	Styrofoam	Metals	Depleted Waste	Green / Yard Waste	Construction and Demolition Waste	Other Waste
Airline Terminal Building																		
Public passenger areas Curbs, ticketing lobby, restrooms, security screening queuing area, sterile gate areas, public "meet and greet" spaces, baggage claim area		x	x	x	x			x	x	x	x	x						x
Tenant areas Shops, bar/restaurant, and associated activities	x	x	x	x	x	x	x	x	x	x		x						x
Airline areas Offices, ticketing counters, gate stations, breakrooms, underwing services, and deplaned waste	x	x	x	x	x	x		x	x	x		x			x			x
Rental Car areas Offices, counters, return areas, service areas, breakrooms	x			x	x			x	x	x								x
TSA Spaces	x	x	x	X	X			x	x	x	x	x						x
Airport Administration Offices	x	x	x	x	x	x		x	x			x						x
ARFF Building	x	x	x	x	x	x	x	x	x			x						
SRE Building	x	x	x	x	x	x		x	x						x	x	x	x
Airport Maintenance Activities															x	x	x	x

A physical waste sort could provide more detailed information about the specific composition of waste at RDM. This information may include:

- ✓ the types of items included in each general category
- ✓ the contamination rate of the recycling stream (items that are not recyclable in the recycling bins)
- ✓ the recovery rate for recycling (the proportion of recyclable items that are segregated properly).

The data from a waste audit can also be used to identify opportunities to improve the composition of the waste stream (by item substitution, by improving recycling to reduce the volume of waste, etc.).

The following sections describe in more detail some of the waste and recyclable materials generated at an airport like RDM: toiletries, food and beverages at security screening, and liquids throughout the facility.

TOILETRIES, FOOD, AND BEVERAGES - TSA RESTRICTIONS

The TSA restricts the volume of liquids, gels and aerosols that can be carried onto an aircraft. Passengers are allowed three-ounce containers of toiletries in one one-quart baggie (3-1-1) in their carry-on luggage. Even though these restrictions have been in place for longer than 10 years, toiletries, beverages, and food items that do not meet the requirements are regularly found in passenger luggage during security screening.

When these items are found, the TSA gives passengers three options: pack the item in a checked bag, give the item to a non-traveling family member or friend, or forfeit the item. By law, the TSA cannot retain any items removed from passenger luggage, so items that are not repacked or handed off end up in the trash. In addition, when a restricted item is discovered in a passenger's carry-on or bag, the passenger may be subject to additional screening, which requires extra time and can interrupt the flow at a security screening checkpoint.

Some problematic items that end up in the trash at security checkpoints include: bottled water, other bottled or canned beverages, toothpaste (larger than travel size), shampoo and/or conditioner (larger than three ounces), sunscreen, and aloe gel. Some other, less obvious unallowable items are peanut butter, yogurt, applesauce, and maple syrup.

It is expected that the garbage cans and recycling station located in the security queuing area receive a fair amount of liquids and beverage containers due to TSA restrictions. These items end up in the waste stream where the liquids are difficult to manage and the containers cannot be recycled. Liquids add significant weight to the waste stream, contaminate other materials like paper, and may be rejected by a recycler, which can result in them being landfilled.

LIQUIDS

Liquids contaminate and degrade other materials within the recycling stream and add weight to recycling or waste streams where they are found. In some cases, liquids are thrown away in their containers, which means the recyclable material found in water bottles, aluminum soda cans, and plastic beverage containers is not captured for recycling.

C. PURCHASES

The Airport does not currently track the quantity and type of disposable items and supplies purchased for the facility. This information could provide insight on some of the materials coming into the Airport which will go back out as waste (other materials are brought on-site by passengers, employees, and vendors). The purchase list may include:

- ✓ items that have reusable or recyclable alternatives (foam cups)
- ✓ some items which could be eliminated (by converting paper forms to digital to reduce paper waste generated)
- ✓ some which indicate scale of the activity at the Airport (paper towel and garbage bags).

4. REVIEW OF WASTE MANAGEMENT CONTRACTS

As noted in Section 1, the FMRA lists the review of waste management contracts as an element of addressing solid waste recycling at an airport. The FAA memorandum titled "Guidance on Airport Recycling, Reuse, and Waste Reduction Plans" explains that the purpose of reviewing these contracts is to "identify opportunities for improving (waste) program scope and efficiency, as well as identify constraints."

In general, the Airport's contracts and leases address housekeeping requirements and related expectations for managing trash and provide limited information about recycling. These contracts and leases do not necessarily impede recycling or other waste management strategies; however, they do not explicitly require conformance with or support of the Airport's recycling and related efforts. The following sections describe the content of various Airport contracts related to waste and recycling.

A. CUSTODIAL AND WASTE HAULING CONTRACTS

RDM does not contract for custodial services for the areas under airport control; these areas are maintained by City employees.

The City has an exclusive franchise agreement established by ordinance with High County Disposal for the collection of waste and recyclable materials. The City's solid waste franchise ordinance outlines the responsibilities of the collection contractor, including:

- ✓ Dispose of waste at site owned and/or operated by Deschutes County
- ✓ Provide opportunity to recycle in accordance with State law and the Department of Environmental Quality (DEQ) rules
- ✓ Provide necessary collection vehicles, containers, facilities, and personnel

The Airport is also serviced by Bend Garbage & Recycling, the parent company of High County Disposal. The Airport does not have contractual agreements with High County Disposal or Bend Garbage & Recycling. The Airport is serviced by these companies under the City's franchise agreement and ordinance.

B. TENANT LEASES AND SERVICE CONTRACTS

Two of the Airport's agreements with tenant and service providers reference recycling or recycled products; however, the rest have basic requirements pertaining to trash removal and janitorial activities in leased areas. The Airport's template T-hangar lease agreement (dated 2016) specifies that the hangar tenant will perform or pay for housekeeping services including trash collection and removal in the leased space. The Airport uses a template titled, "Lease for Aeronautical Use Improvements." The lease template requires the tenant to perform maintenance including cleaning and trash collection and removal to keep the property clean and orderly.

An example agreement titled, “On-airport Rental Car Concession,” dated October 2016 stipulates that the rental car company will provide janitorial and cleaning services and supplies for the leased spaces. It also requires that the rental car company provide for “handling and disposal of all trash, garbage, recyclable material, and other refuse” generated in the tenant’s areas. This agreement explains that the City (Airport) will provide receptacles for these materials for the tenant’s use. Through the lease agreement, the rental car tenant agrees to bear any reasonable costs “associated with the implementation of any existing or future recycling program.” The tenant can also propose an alternative recycling plan for the City’s approval. The agreement also commits the tenant to undertaking “reasonable steps to minimize the impact of their operation on the environment.” Because this agreement is more recent than the other described in this section, it’s provisions about recycling may serve as an example for future contracts.

The Airport’s lease with one of the FBOs (dated July 2015) requires the operator to “make suitable arrangements for the storage, collection, and removal of all trash, garbage and other refuse resulting from (their) activities…in accordance with any applicable laws, ordinances, and rules and regulations of the Airport.” This lease does not specifically mention recycling. The 2003 agreement between these parties required the tenant to provide “proper containers for trash and garbage” and to “keep the lease premises free and clear of rubbish, debris, and litter at all times.”

An example agreement for commercial passenger air service dated July 2014 requires the airline to provide “arrangement for the adequate, sanitary handling and disposal of all trash, garbage, aircraft sewage, and other refuse.” This agreement explains that the City (Airport) will provide “covered metal receptacles” for these materials. No reference is made to recycling.

A 2014 addendum to the FBO’s 2010 agreement with a tenant stipulates that the tenant will provide containers for trash and garbage. Recycling is not mentioned.

The City has an intergovernmental agreement with one of the County’s fire protection organizations for ARFF services. This agreement does not specifically address waste (or recycling); however, it does detail that the organization is responsible for the maintenance of the Airport Fire Station.

The Airport has two agreements with a food and beverage service provider. The first, for food and beverage concession, specifies that the City (Airport) “will provide a common-use trash compactor or dumpsters with scheduled trash collection for the Airport tenants and concessionaries.” The concessionaire agrees to provide arrangement for the handling and disposal of trash, garbage, and other refuse and to maintain temporary collection areas in a sanitary and presentable condition. The concessionaire is required to handle waste materials to “prevent the presence of rodents” and to keep all garbage materials in durable, pest-proof, covered or lidded containers that are easily cleaned. When waste materials are transported within the Terminal, the concessionaire is required to package them in containers that prevent leaks and use only the routes established by the City (Airport). This agreement also details the concessionaire’s responsibilities as related to cooking oil/liquid grease.

The Airport's second agreement with the food and beverage service provider covers retail, coffee, and snack food concession. This second agreement includes the same language regarding use of the compactors and dumpsters, maintaining leased areas in a sanitary condition, and movement of materials. Neither agreement describes the recycling program.

The Airport's 2001 agreement with the USFS (amended in 2004 and 2011) stipulates that the tenant pays rent based on costs for janitorial services and garbage collection and removal.

The Airport's agreement with a GA tenant/aviation business requires the tenant to maintain the premises "in a neat, clean, safe, and sanitary condition" and to pay charges for utilities such as garbage collection and removal and janitorial work.

The Airport's contract with a parking management company, dated June 2011, prohibits this company from accumulating trash or waste material and requires the company to promptly dispose of materials daily. This agreement does include a clause in conformance to State law that requires the company to use recycled material where applicable, if the recycled product:

- ✓ is available
- ✓ meets standards
- ✓ can substitute for a non-recycled product
- ✓ cost does not exceed the cost of the non-recycled by more than five percent.

This agreement was the only one reviewed under this project that discussed recycled products; it may serve as an example for future contracts.

The parking agreement also includes a mechanism for the City (Airport) to reimburse the company for cost and expenses according to an operating budget; however, the line item for cleaning and janitorial supplies was listed for zero dollars in the copy provided for review under this project.

Two GA hangar leases dated 2008 and 2005, respectively, contain the same language: "Tenant shall provide proper containers for trash and garbage and shall keep the leased premises free and clear of rubbish, debris, and litter at all times." This is likely standard GA hangar tenant lease language, which does not include information about recycling.

A 2002 U.S. Government Lease for Real Property leased space at the Airport for use by the TSA. This agreement describes the services provided by the Airport, including trash removal and janitorial service and supplies. It also outlines other requirements including:

- ✓ cleaning to be completed during Airport hours
- ✓ rent to be adjusted annually based on actual janitorial costs
- ✓ the Airport to maintain the area in a clean condition and provide supplies and equipment

- ✓ daily emptying of trash receptacles, disposal of trash and garbage, and cleaning of cans used for collection of waste

C. EXPIRING LEASES AND CONTRACTS

Specific information regarding the expiration, extension and/or renewal dates of the Airport's numerous leases was not reviewed under this project. As outlined in the FAA guidance memo, "this information can signal the Airport's next opportunity to add recycling, reuse, and waste reduction objectives to existing leases and contracts."

D. FUNDING

Waste and recycling collection are funded in RDM's operating budget. RDM does not currently receive payment or rebates for recycled materials.

5. RECYCLING FEASIBILITY

Many factors impact the feasibility of recycling at RDM; some are universal, and others, specific to the facility. The following sections describe the more influential of these factors.

A. COMMITMENT AND SUPPORT

The willingness of RDM and its contractors and tenants to commit to and support the facility's recycling program are critical to the success of such a program. Without the commitment of resources such as funding, labor and time, space, and access to secure areas, a waste management program could struggle.

AIRPORT POLICY AND CONTRACTOR DEDICATION

RDM's administration has supported the recycling program in the past, and it is expected that this will continue in the foreseeable future. The administration has implemented other sustainability projects, for example, as a solar energy installation. Based on the resources allocated to these programs, the Airport Committee and City of Redmond appear to generally support recycling, practical waste management, and sustainable operations.

The City's waste management contractor is "committed to providing outstanding customer service, being recognized as leaders in our industry, and maintaining a connection (the) community of Central Oregon by supporting charitable endeavors." High Country Disposal's goal is to "continue to be on the forefront offering new programs and ways for our customers to recycle more." These commitments and goals align with continued support of the City and the Airport's recycling programs.

AIRLINE POLICIES

All four airlines that operate at RDM have established sustainability programs that include elements of waste and recycling. At least one of the airlines serving RDM separates and recycles materials deplaned from commercial service flights.

American Airlines has implemented recycling programs on the ground and in the skies. American recycles in back offices and breakrooms at their major hub at Dallas/Fort Worth International Airport, at maintenance centers, and in other offices/employee work areas. According to their website, the airline introduced the industry's first onboard recycling program and recycles aluminum cans, paper, and plastic in-flight.

During information interviews, Alaska Air staff and contractors described the process for separating recyclables in flight and during cabin cleaning activities. Alaska Airlines' environmental strategy includes working to reduce waste from flights and other facilities, including recycling and composting of coffee grounds. Alaska's 2015 goal was to increase recycling capture rate on flights from 79 percent to 85 percent. The airline specifically mentions that their recycling goals are "limited by local infrastructure as many airports and municipalities have different protocols and capabilities for co-mingled recycling." Alaska has

worked with a reuse company to salvage leather from old plane seats and reuse the material in consumer goods. The airline is also working with inflight crews to keep unused disposable items such as cups and napkins on aircraft instead of returning them to the catering carts, where they are thrown away in the unstocking process. Alaska's goal is to ensure all inflight service ware items are recyclable, reusable, and/or sustainably sourced. Alaska has also taken steps to reduce dependence on printed paper using iPads, iPhones, and tailored applications ("apps") in their operations.

Per corporate policy, Delta is "committed to minimizing waste streams through diversion and re-use, waste, recycling programs, and (waste reduction)." Delta has been working to increase the number of cities where they recycle and the volume of material collected. In addition, they track employee recycling at the headquarters campus in Atlanta and upcycle life vests, carpet, and leather seat covers. Aboard Delta flights, single stream materials, including plastic, aluminum, and paper, are collected by flight attendants in designated bags. These materials are collected by cabin service and transported to designated recycling containers. Empty cans and bottles left in the beverage carts are recycled by Delta's catering partners.

United Airlines is "committed to operating sustainably and responsibly" and has recycled over 28 million pounds of aluminum cans, paper, and plastic from flights and facilities. In 2014, United began to replace its hot beverage cups with fully recyclable alternatives made from recycled plastic water bottles.

Offering recycling for deplaned waste at RDM aligns the Airport with its airline partners.

B. TECHNICAL AND ECONOMIC FACTORS

LOCAL MARKETS AND INFRASTRUCTURE

Markets for recycled materials fluctuate widely based on many factors and interactions. Local waste haulers typically accept materials that can be recycled cost-effectively in the area. Manufacturers purchasing recycled material want it to be predictable and ready for use; therefore, recycling facilities are particular about what materials they accept and prefer materials that are of high value and clean and easy to separate.

The materials listed in Table 3 are accepted under the City's commercial recycling program. As noted above, inclusion in such programs typically indicates that the market and/or infrastructure for these materials is strong. RDM currently recycles all the materials the City's commercial recycling program accepts.

Table 3: Materials Accepted for Residential Curbside Recycling in the City of Tulsa
Recyclable Materials – City of Redmond Commercial Program
Cardboard
Tin and aluminum
Plastic bottles, tubs, and jugs
Mixed paper, newspaper, magazines
Glass
Source: High Country Disposal Commercial Recycling website https://highcountrydisposal.com/services-2/commercial-services/recycling-collection/

Deschutes County operates one landfill and four transfer stations/recycling centers in the Redmond area.

LOGISTICAL CONSIDERATIONS AND CONSTRAINTS

To maintain a recycling program at RDM, certain elements must be in place. These include:

- ✓ a proactive and engaged custodial staff
- ✓ a willing and affordable hauling contractor
- ✓ space for bins, dumpsters, and compactors
- ✓ access to secure areas of the facility (including airside ramps and sterile terminal areas).

At this time, these elements appear unconstrained; additional resources including custodial labor, waste hauling services, space, and airport access are anticipated to be available to support the continuation and/or expansion of the recycling program at RDM.

CONTRACTUAL ISSUES

A detailed evaluation of the Airport's contracts is included in Section 4. Any major contractual issues with maintaining and improving the recycling program at RDM are not anticipated. RDM and the waste and recycling collection contractor will need to continue to collaborate to support the facility's recycling program.

C. RECYCLING, LANDFILL, AND ENERGY-FROM-WASTE FACILITY REQUIREMENTS

The recycling facility and landfill that accept waste from RDM have specific acceptance criteria and requirements. Adherence to these specifications protects the safety of employees handling these materials; the integrity and operation of the equipment and infrastructure used to transfer, sort, and convert these materials; and the value of the recyclable stream. Information provided by High County Disposal indicates that the glass stream collected from the Airport has included contamination (non-glass materials); this presents challenges to recycling this material.

Components that seem recyclable (plastic, glass, or metal parts) comprise some items generated at RDM; however, the recycling facility has specific material standards, so it is important that non-recyclable items are not included in the facility's recycling stream.

Waste items that may be generated at the Airport, but are prohibited at the recycling facility include:

- ✓ Styrofoam
- ✓ Plastic bags
- ✓ Saran wrap
- ✓ Frozen food packaging
- ✓ Plastic clamshells
- ✓ Bakery containers
- ✓ Paper/plastic plates
- ✓ Paper napkins
- ✓ Paper/plastic cups
- ✓ Waxed cardboard
- ✓ Plastic lids and caps
- ✓ Liquid in container
- ✓ Lightbulbs
- ✓ Batteries
- ✓ Other garbage

Waste material that may be generated at RDM but is prohibited by the Deschutes County's Knott Landfill includes hazardous waste, radioactive waste, large batteries, paint, and C&D waste.

Some waste items cannot be recycled or landfilled, for example hazardous waste and chemicals, paint, batteries, and C&D waste. These items must be managed through hazardous waste or universal waste programs or disposed of at a specialized landfill.

COSTS

RDM strives to be as self-sustaining as feasible; therefore, it is imperative that programs implemented and maintained at the facility, including recycling, are as cost-effective as possible.

D. GUIDELINES AND POLICIES

To evaluate RDM's existing recycling plan in the context of local, state, and national requirements, the consultant reviewed federal, State of Oregon, and local waste and recycling regulations and policies/factors.

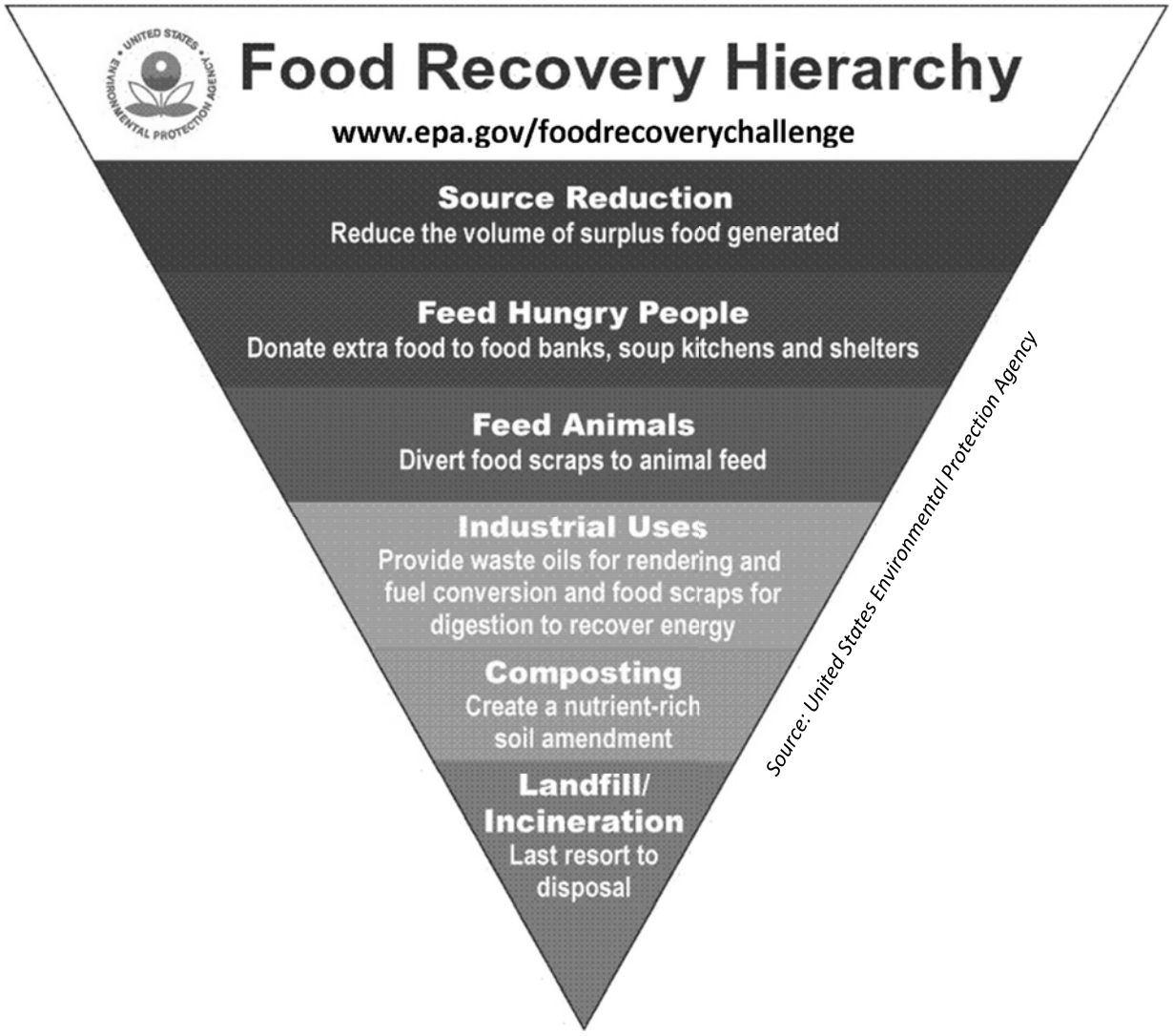
FEDERAL

At the federal level, the United States Environmental Protection Agency (EPA) is responsible for developing a solid waste management program under the Resource Conservation and Recovery Act (RCRA) and related policies and guidance. RCRA provides the framework for management of hazardous and non-hazardous waste. All generators of hazardous waste, including airports, are required to comply with RCRA and all other federal waste laws and regulations.

As described in Section 1, the FAA's definition of "airport planning" was updated in 2012 through FMRA to include planning for recycling and waste minimization. The Airport is required to address solid waste as part of airport master planning. The FAA provides guidance on airport waste and recycling in the September 2014 memo on the topic as well as in a synthesis document prepared in 2013 (both available on the FAA's website).

The EPA has developed a hierarchy of waste management strategies. This hierarchy, shown below, ranks these strategies from most- to least-environmentally preferred and places emphasis on reducing, reusing, and recycling.

In addition to the general waste management hierarchy, the EPA has also developed a preference ranking of management strategies for food waste, as shown below.



STATE

The State of Oregon's bottle bill was the first of its kind in the country and was introduced in 1971 to reduce litter. Under the current form of this law, customers pay a ten-cent deposit when they purchase soft drinks, water, and beer in metal, glass, and plastic bottles and cans. Then, customers return the empty containers to stores and centers to receive a ten-cent refund per container. This bill is administered by the Oregon Liquor Control Commission.

Outside of the bottle bill, the base recycling law is the Opportunity to Recycle Act, first passed in 1983 and last amended in 2015. The DEQ establishes Recycling and Waste Reduction administrative rules to elaborate on the Act and is responsible for regulating cities, counties, and other local governments regarding waste. The DEQ has developed a policy and integrated plan for managing waste materials, *Materials Management in Oregon: 2050 Vision and Framework for Action.*

The Opportunity to Recycle Act prioritizes certain waste management strategies over others in alignment with the hierarchy promoted by the EPA:

- ✓ Reduce
- ✓ Reuse
- ✓ Recycle
- ✓ Compost
- ✓ Energy Recovery
- ✓ Disposal

The state's material recovery rate goal is 52 percent for 2020 and 55 percent for 2025. In addition, the state's recovery rate goals for food waste, plastic waste, and carpet waste are all 25 percent by 2020. Each county (and some metropolitan areas) set their own voluntary recovery goals by statute.

To make progress under the 2050 Vision, cities of a certain size or within a certain region must implement three to five listed reduction and reuse elements. All other cities must implement a minimum number of recycling program elements, based on their size and location, chosen from the thirteen options listed in Senate Bill 263. The state's laws and plans allow the local units to implement programs to meet the statewide mandatory and individual voluntary goals.

LOCAL

Deschutes County operates one landfill, Knott Landfill, Recycling, and Transfer Facility, which is expected to reach capacity in 2029. The County has set a goal to recover 45 percent of waste generated by 2025 to reduce the amount disposed of in the landfill. As of 2018, the County has formed an advisory committee, hired a consultant, and is preparing a comprehensive solid waste management plan. The final plan may provide additional guidance and support for recycling in Redmond and at RDM.

According to the *Code of the City of Redmond*, the City's goal is to make RDM the "best airport of its size in the country." Sections 2.550 through 2.570 of the City's code describe the requirements for FBOs, airlines, charter and taxi flight operators, aircraft and parts dealer, and provider of agricultural services (crop dusting). The code also defines regulations for petroleum products sold and used at the facility, for leasing space, and for prohibiting unauthorized business as well as other aspects of the Airport's operation. The sole mention of waste or recycling appears in the section on commercial vehicle operations: drivers of commercial vehicles (car services, taxis, and courtesy vehicles) are to dispose of trash in the receptacles located on the sidewalk in the taxi parking area. Sections 2.590 through 2.588 outline the roles and responsibilities of the Airport Committee.

The *Code of the City of Redmond* includes information about garbage service in Sections 4.400 through 4.420. As outlined in the code, the City has contracted for the "exclusive right to collect, remove, and dispose of all refuse except recognized industrial by-products." The final section under the garbage heading details the City's conformance with the State's Opportunity to Recycle legislation. The City requires the collection contractor to provide recycling collection service for recyclable materials at the minimum level as required by the State or higher level as permitted by the City Council. The code specifies that the contractor's recycling program must include:

- ✓ One durable recycling container for each residential customer
- ✓ Expanded education and promotion
- ✓ Multifamily recycling
- ✓ Commercial recycling
- ✓ Recycling depots (drop-off locations)

The Code specifies that the promotion of the program is the responsibility of the contractor. However, the Code also recognizes that education on the need for recycling is a joint responsibility of the City, schools, community organizations, the contractor, the County, and other parties.

Based on the availability of residential and commercial recycling, the project team assumes the residents of the communities surrounding the airport, and therefore the employees and passengers, have been exposed to recycling, receive on-going messaging about its importance, and are generally supportive of recycling efforts.

E. OTHER INCENTIVES

As noted earlier in Section 5, most of the airlines serving RDM have recycling programs and targets. Aligning the RDM program with the airlines' practices provides the opportunity for a win-win scenario whereby the facility can reduce its environmental impact and, by helping the airlines reduce their impacts, generate goodwill with the airlines.

6. COST SAVINGS OR REVENUE GENERATION

The costs associated with a recycling program depend on available infrastructure, material markets, and the type of waste generated at a facility. These costs sometimes include capital costs for containers, landfill tipping fees, hauling costs, material rebates, and labor. An evaluation of the potential cost savings and revenue generation opportunities is required for an Airport Recycling, Reuse, and Waste Reduction Plan according to FMRA.

Airport staff provided a garbage collection expenses tracking spreadsheet for review under this project. This spreadsheet included costs for terminal waste collection, airfield waste collection, and general waste collection (specific single collection events), with the fees for collection of recyclable materials included in the waste costs. Based on data from 2015 through 2017, on average, the Airport spends approximately $8,800 each fiscal year (July 1 to June 30) for collection of waste from the terminal. One scrap metal collection from a GA hangar conducted in August 2017 cost two thousand dollars. Calendar year 2017, the Airport spent approximately fifty dollars a month for collection of waste from the airfield. The Airport pays to have waste syringes collected from the restrooms and shredded paper collected from the offices about once a year.

To estimate approximate annual costs for recycling, information about the charges associated with the collection of the recycling dumpster and carts and other services is needed. After supplementing the information compiled and analyzed in this document, RDM can make informed solid waste management decisions over time. Using the information provided in this plan and cost information available to RDM, RDM can begin to analyze the program's financials, evaluate costs, and determine if enhancements should be implemented. If expansion of the program is not technically or economically feasible at this time, this information will help RDM determine when improvements might be feasible.

7. RECOMMENDATIONS

This section documents recommendations for the Airport, including waste reduction, reuse, and recycling strategies, based on the information presented earlier, specifically the waste audit and feasibility discussion.

A. OBJECTIVES AND TARGETS

It is recommended that the Airport set specific, measurable, achievable, realistic, and time-bound (SMART) goals for its waste and recycling program. Having an established set of objectives and targets provides a basis and foundation for subsequent activities and actions. Progress toward such goals does require tracking, but can also provide information on progress and improvements, which can be a valuable marketing and education tool.

The waste source, quantity, and composition information in Section 3 provides baseline data for establishing objectives and targets, and Section 5 describes the goal and target established by the State of Oregon. The objectives and targets derived from this information can be used to calculate target levels for RDM. A physical material sort would further inform goal-setting efforts.

These are potential objectives and targets RDM might adopt or use as inspiration for other goals:

- ✓ Recover 45 percent of waste generated by 2025
  (based on Deschutes County goal, current rate is estimated at 15 percent)
- ✓ Recover 55 percent of waste generated by 2025
  (based on State of Oregon goal, current rate is unknown)
- ✓ 100 percent of tenant leases include recycling provisions
- ✓ 100 percent of RDM employees completed simple training on recycling program
  (more details later in this section)

In the absence of established specific objectives and targets, the following sections present general, universal recommendations for increasing recycling and reducing waste generation at an airport like RDM.

B. TRACKING AND REPORTING

As noted in Section 2, RDM does not currently track metrics associated with the waste management program. It is recommended that RDM begin to regularly estimate and track the volume of waste sent to the landfill and the volume of material collected for recycling as well as the costs associated with these services. Trends associated with waste generation, landfill, recycling, and cost can be assessed for issues or opportunities for improvement.

RDM's waste and recycling performance is not currently reported to stakeholders. It is recommended that RDM proactively provide this information to management, employees, tenants, and interested external stakeholders on a regular basis. The purposes of this reporting are:

- ✓ to remind management employees, tenants, and contractors about the recycling program
- ✓ to communicate the Airport's commitment to its recycling program and its broader commitment to sustainability
- ✓ to solicit feedback and suggestions for improving the recycling program.

The frequency of reporting is up to the Airport, but it is recommended that reporting be completed at least annually. The reporting schedule should also be updated as needed to accommodate changes to the program. The schedule is expected to initially increase in frequency as the program evolves and new strategies are implemented, and then potentially return to a lesser frequency as the program is maintained.

C. REDUCE AND REUSE

To reduce the facility's environmental impacts, RDM should focus on moving materials up the waste management hierarchy. Waste reduction is the most environmentally preferred waste management strategy as determined by the EPA. Waste reduction can be accomplished in many ways, including reusing items.

It is recommended that the Airport evaluate the following reduction and reuse strategies to determine which, if any, are feasible and prudent for implantation at RDM.

- ✓ Substituting disposable items with durable alternatives in the administration office and other staff work areas
- ✓ Reusing items and materials where possible
- ✓ Working with the restaurant tenant to donate edible food to a community food security organization
- ✓ Collecting and donating unopened food, beverage, and toiletry items subject to TSA restrictions
- ✓ Encouraging reuse by passengers, tenants, and contractors

LIQUIDS

It is expected that the garbage can located in the security queuing area receives a fair amount of liquids and beverage containers due to TSA restrictions. Unfortunately, when these materials end up in the waste stream, the liquids are difficult to manage, and the containers cannot be recycled. Liquids add significant weight to the waste stream, contaminate other materials like paper, and may be rejected by a recycler, which will result in them being landfilled.

To minimize the amount of liquid discarded in the security checkpoint area, it is recommended that RDM continue to promote emptying of water bottles in the restroom sinks and refilling post security. Existing colorful, graphic signs in the terminal restrooms encourage passengers to empty water bottles prior security and to refill them after screening. These signs are positioned above eye-level. The message might reach more passengers if the signs were lowered and supplemented, for example, with vinyl cling decals on the mirrors over the sinks and posters or other visuals in the checkpoint queuing area.

In the future, these signs could be revised to also encourage passengers to recycle disposable water bottles if they do not wish to refill them. It is further recommended that RDM make a recycling station available in the immediate proximity of the pre-security restrooms so that passengers who do empty their disposable containers in the sinks have a convenient place to recycle the items they do not wish to refill.

D. DONATION OF FOOD, BEVERAGES, AND TOILETRIES

It is recommended that RDM work with the food and beverage concessionaire to assess the possibility of donating edible food to a local food bank, soup kitchen, or shelter for distribution to the populations they serve. Feeding people is the second preferred strategy for addressing food waste according to the EPA. Federal and state laws protect organizations that donate food in good faith from liability. Some organizations will pick up food at the source which reduces the demand on the Airport and concessionaire.

It is recommended that RDM investigate the feasibility of collecting unopened bottles of water, other beverages, food and toiletries that are restricted from carry-on luggage and donating them to a local charity or other organization. These items can be very heavy and add weight to the waste stream.

In compliance with TSA requirements, these items may need to be collected prior to the security checkpoint queuing area. RDM would collect these items by locating a container at the security checkpoint and managing storage of the items until the receiving organization could collect them. To implement this recommendation, coordination between RDM, the designated receiving organization, and the TSA would be needed. An example of an Airport with such a program is McCarran International Airport in Las Vegas, Nevada.

Example Donation Collection at McCarran International Airport (LAS)

E. RECYCLE AND COMPOST

Recycling is the second preferred waste management strategy, according to the EPA, after waste reduction/reuse. Recycling allows waste items to be processed into raw materials to make new products. The FAA guidance expects an airport's recycling, reuse, and waste reduction plan to document, at a minimum, the facility's existing program to recycle paper, plastic bottles, aluminum cans, and plastic cups. The Airport recycles most of these materials as well as cardboard and glass.

PAPER

The Airport is currently recycling paper (printer paper, mail, envelopes, and other items) collected from the administration offices as well as from the terminal (newspapers and magazines). Paper is also recycled from the other Airport buildings (Maintenance and ARFF.) These paper streams are comingled with other recyclables. Bend Waste & Recycling collects shredded paper from the offices under a separate service.

Managing recyclable paper separately from plastic bottles and aluminum cans protects the value of the paper stream and increases its recycling potential by minimizing contamination from liquids and creating a stream that may not need to be sorted. It is recommended that the Airport ask Bend Waste & Recycling about adding non-shredded office paper, newspapers, or magazines to the shredded paper collection.

It is also recommended that the Airport expand the program to additional areas, including the airline and rental car company offices, and encourage increased recycling of paper by employees, tenants, and passengers. Doing so reduces the environmental impacts associated with landfilling this material and manufacturing virgin paper.

Waste magazines and newspapers are generated aboard commercial flights and when they expire on the newsstand; it is recommended that the Airport collaborate and coordinate with the airlines and concession tenant serving RDM to evaluate adding paper items from deplaned waste and newsstands to this program.

Collaborate concession tenant to evaluate adding paper items from newsstands to this program

PLASTIC BOTTLES AND ALUMINUM CANS

The Airport is currently recycling plastic bottles and aluminum cans collected in the terminal, Maintenance, and ARFF buildings. Some plastic bottles and aluminum cans may be collected by employees and tenants for refund under the State's bottle bill. Recycled plastic bottles and aluminum cans are comingled with paper.

It is recommended that the Airport continue the current program and expand to additional areas. It is also recommended that the Airport support return of containers included in the bottle bill refund program as these programs typically have a higher recovery rate than a comingled stream. Whether through recycling or return for refund, increased recovery of plastic bottles by employees, tenants, and passengers reduces the environmental impacts associated with landfilling this material and manufacturing virgin plastic.

Plastic bottles are also generated aboard commercial flights; it is recommended that the Airport collaborate and coordinate with the airlines serving RDM to evaluate adding plastic bottles from deplaned waste to this program.

PLASTIC CUPS

Plastic cups are typically generated aboard commercial flights. It is recommended that the Airport collaborate and coordinate with the airlines serving RDM to evaluate adding plastic cups from deplaned waste to the recycling program.

CARDBOARD

The Airport currently recycles cardboard collected from the terminal food and beverage tenants and the administration offices. This material is collected and managed separately from the comingled recyclable and glass streams; this protects the value of the cardboard material by creating a single material stream (more desirable because it reduced contamination from liquids and requires less processing after collection). It is recommended that the Airport continue to recycle cardboard. It is also recommended that RDM provide feedback to the tenants on the progress and performance of this program and solicit their feedback regarding improvements that could be made to increase or support their participation. Marketing this program to all the terminal tenants could result in additional participation and remind existing participants of the program's specific requirements.

GLASS

The Airport currently recycles glass collected from the terminal restaurant tenant and passengers. This material is collected and managed separately from the comingled recyclable and cardboard streams; this protects the value of the other material by reducing contamination glass. It is recommended that the Airport continue to recycle glass and work to reduce contamination in this material stream. It is also recommended that RDM provide feedback to the tenants on the progress and performance of this program and solicit their feedback regarding improvements that could be made to increase or support their participation.

OTHER RECYCLABLES

As other recyclable materials are identified in RDM's waste stream, it is recommended that the Airport work with the waste hauling contractor to design and implement strategies to separate, collect, and process these materials.

GREEN WASTE

It is recommended that the Airport evaluate how green waste is managed and explore opportunities to align the facility's practices with the waste hierarchy; for example, by reducing the generation of this material at the source (mulching lawnmowers), reusing material where possible (chipped branches as mulch), composting (via the local facility), and disposing of the material on or off site as a last resort.

FOOD WASTE COMPOSTING

According to industry case studies, food waste is typically a major component of the waste stream at an Airport (on average, 35 percent). As described in Section 5, the EPA's food recovery hierarchy assigns priority to composting of food waste over landfill of this material (after using it to feed people as discussed under **Reduce and Reuse**). Composting is the process of decomposing food and other waste into a nutritious soil additive.

Composting of food waste at RDM is largely dependent on the availability of a local composting facility interested in accepting this material. As noted in Section 2, there does not appear to be a commercial composting facility in the area.

If a composting facility is found or established in the area, RDM should evaluate implementing composting at the Airport. In a terminal, pre-consumer food waste (waste generated by food preparation activities) is generally easier to compost because restaurant employees are at a facility more frequently and on a more regular basis than passengers, so they are easier to train and educate on composting practices and requirements. The specific items accepted by a composting facility are dependent on that facility's design and the process used to break down the waste; some facilities accept all food waste (including meat and bones and breads) while others accept only vegetables and fruit.

One option for easing into composting gradually is to first implement a composting program for coffee grounds generated by restaurants in the terminal. Coffee grounds have a pleasant odor, are easily identifiable (therefore easy to separate), are typically uncontaminated by other materials, and are generated in a predicable manner and quantity. Once tenants are comfortable composting coffee grounds, other materials can be added by name (banana peels, apple cores, etc.) and/or by type (fruits, vegetables, etc.) until all food waste appropriate for composting is included.

PAPER PRODUCTS

Once a commercial composting facility is available in the area, the Airport may wish to collect paper towels and other paper products (napkins and tissues) for composting. Composting is environmentally preferred over landfilling this material.

Because the Airport's restrooms are equipped with paper towel dispensers and nearby garbage cans, the waste stream collected in these cans will primarily consist of paper towel. This stream can be expected to contain low contamination and a steady volume of material, making it an attractive material for composting.

No modifications to the paper towel dispensers or garbage bins would be needed to implement paper towel composting. Alternative bins would need to be conveniently located and clearly labeled to accept other waste generated in the restrooms that is not paper towel, and the bins reserved for paper towel should be labeled "Paper Towel Only – Collected for Composting" (or similar) to instruct use and explain how this material is managed. The Airport would also need a dedicated cart for this material and a procedure to collect and store it separately until it was collected by the waste hauling contractor for delivery to the composting facility.

F. EDUCATION AND OUTREACH

Under the existing program, education of and outreach to Airport employees, tenants, contractors and passengers is primarily accomplished through container signage in the terminal.

To supplement these efforts, it is recommended that RDM improve the in-terminal messaging for passengers and provide brief, clear instructions for recycling. Providing clear, instructional signage at the recycling stations or recycling bins can improve passenger participation and reduce contamination. See Section G below for information about signage.

It is recommended that RDM provide simple, on-going training for employees, tenants, and contractors that explains the recycling program, including its purpose and requirements. Such a training program will promote program participation and compliance, resulting in increased recycling and reduced contamination. In addition, training can designate a contact and a mechanism to receive feedback and ideas for improvement.

The format of employee training could take any number of forms, including emails, meetings, posters, etc. The content of such training should include:

- ✓ reminders about the materials that are accepted for recycling at the Airport and the location of the containers to be used for the program,
- ✓ information about purchasing requirements, and
- ✓ information about the positive effect the program is having on RDM's environmental impact.

Information and participation from the waste collection contractor should also be incorporated into the training program. In addition, different stakeholders and organizations involved in collection, housekeeping, recycling, composting, and other waste activities could also be asked to provide content or to be present during training.

It is recommended that the Airport include a brief overview of the recycling program during employee on-boarding training and recurrent refresher training at regular intervals. To use employee time as effectively as possible, waste training could be combined with other trainings or meetings.

RDM should consider providing introductory level information to new tenants and provide training materials such as postings, postcards, etc. to existing tenants for use with their employees. As some airport tenants may experience significant employee turnover, providing this information on a regular basis (for example, annually) will help keep everyone up to date on the program.

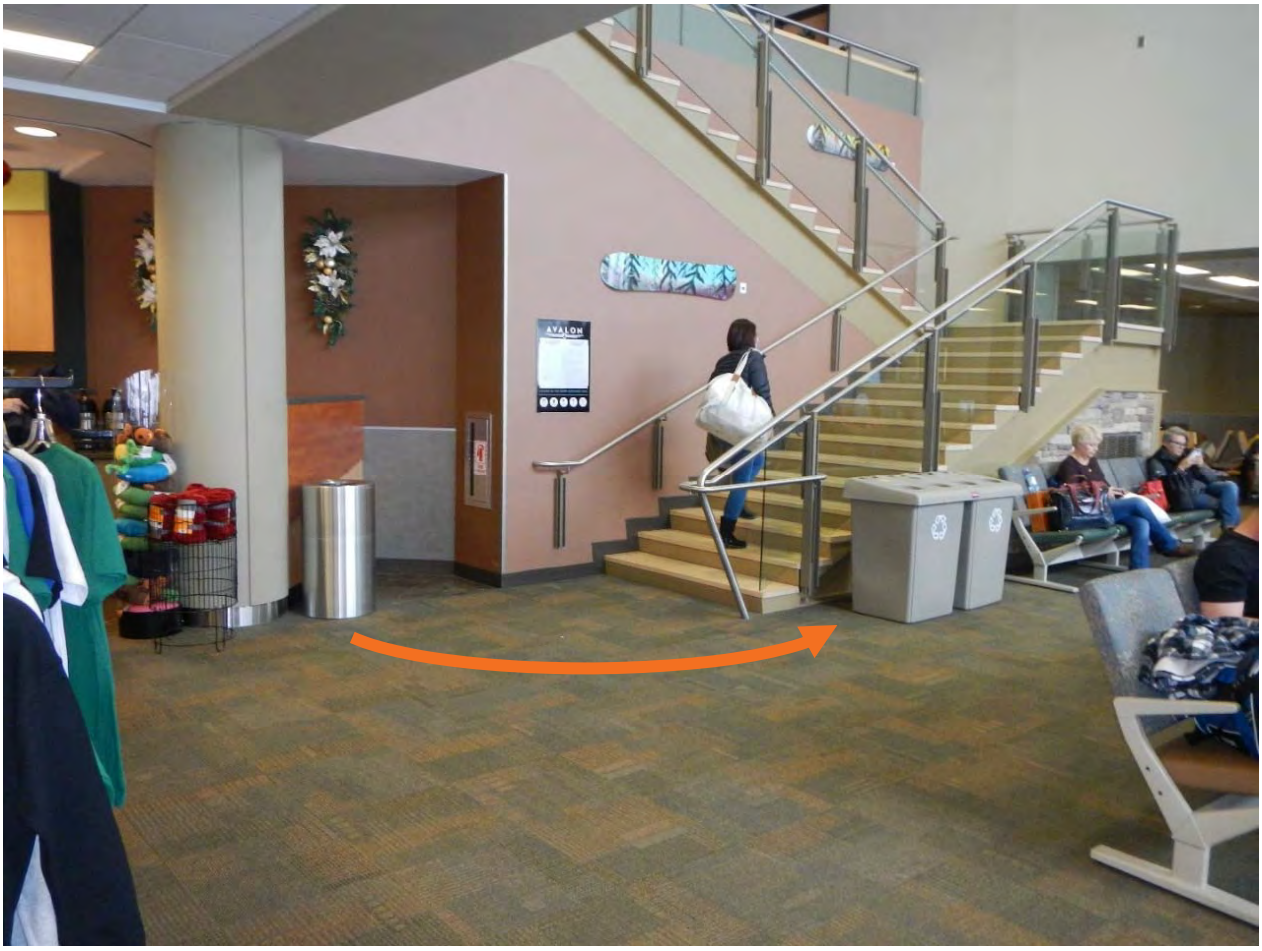
Once a training and education program is implemented, it is recommended that RDM actively maintain such a program to facilitate its continued success. The content of trainings should be updated as the program changes and grows.

G. CONTAINERS AND BINS

The existing recycling stations in the terminal are conjoined units with four compartments, top facing signage, and restrictive lids; no changes to the design of the containers are recommended at this time. Conjoined containers ensure a consistent format at every recycling station location; top facing signage and restrictive lids have also been shown to educate and instruct passengers to separate materials appropriately. It is recommended that RDM install additional recycling stations in high traffic areas of the terminal as resources allow.

The recycling containers in other areas at the Airport are typically blue and have varying sizes and designs. No major changes are recommended to the design of these bins other than to ensure they and their service schedule are rightsized for the existing and future volume of material collected under the program and future improvements.

Collocation of recycling containers with garbage cans has been shown to decrease contamination and increase recycling participation. It is highly recommended that RDM move a garbage can next to any recycling station or container that does not currently have one paired with it (as space allows).



Move garbage cans next to recycling stations and containers

In addition, RDM should consider removing some of the stand-alone garbage cans inside the public areas of the terminal. There are many garbage cans in the terminal, and they are typically closer/more available than a recycling station; therefore, in many cases, it is more convenient for passengers, employees, and tenants to locate and use a garbage can for all materials than to find and use a recycling station. These containers could be repurposed as recycling containers in other spaces for comingled or single stream recyclables (in offices for paper, in breakrooms for bottles and cans, etc.)

The design of the garbage cans varies by location. As these containers are retired or replaced, the Airport may want to consider standardizing the shape and color of the containers to aid in recognition. It is recommended that RDM install additional recycling bins in other areas as the other areas are added to the program and resources allow.

Airport maintenance staff conduct the day to day waste activities, their insight is valuable in improving and maintaining the recycling program at RDM. Their insight on which containers are underused or undersized can help inform changes to the location and size of existing and future recycling stations, recycling containers, and garbage cans.

H. SIGNAGE AND LABELING

The Airport's recycling signage could be expanded and improved. The recycling stations in the terminal are labeled for each accepted material but RDM should consider providing additional signage adjacent to recycling stations that elaborates on the Airport's program and provides direction for passengers.

A key location for additional signage is in the security checkpoint queuing area in the terminal. As described in Section 3, the TSA restrictions compel the generation of waste, and items discovered in passenger luggage must be disposed in accordance with the agency's policies. In addition, restricted items discovered in passenger luggage by TSA can prompt additional security screening that increases congestion and wait times in the security line. Clear signage in this area would help educate passengers on the restrictions as well as their options to comply with the restrictions to reduce wait times and without throwing these items away. Signage pertaining to the emptying of liquids and refill of containers post-security is discussed above.

Signage and labeling for recycling bins in other areas of the Airport is inconsistent or absent and could be improved with color, images, and short, clear, instructive text to improve understanding of which items are recyclable and which should be thrown away.

I. OTHER RECOMMENDATIONS

In addition to the strategies recommended above, the following strategies are recommended for RDM's waste and recycling program.

CONTRACTS AND LEASES

As described in Section 4, contracts are a vehicle through which the Airport can influence tenant behavior, including recycling. As contracts and leases expire, extend, or renew, it is recommended that the Airport consider revising the new contract language to include waste management requirements or preferences, for example, support of the recycling program. This could be a general clause stating a preference that tenants reduce, reuse, and recycle where practicable or specific information about recycling, reuse, or waste reduction objectives and requirements. Two agreements reviewed for this project include language regarding conformance with the State's Opportunity to Recycle law and recycled content purchasing, respectively (see Section 4). Another approach is to update the City's Airport Ordinance to include recycling requirements and preferences and ensure each contract or lease requires adherence to these policies.

PURCHASING POLICIES AND REQUIREMENTS

The Airport's existing purchases may create waste; specific purchase information was not available for this project. It is recommended that the Airport (or City) consider adopting a purchasing policy that prioritizes items that are durable (versus disposable), reusable, recyclable, compostable, and/or made from recycled content. Once established, this policy could be shared with the Airport's tenants to encourage their own adoption of sustainability-minded purchasing practices.

ADDITIONAL FACILITIES AND NEW DEVELOPMENT

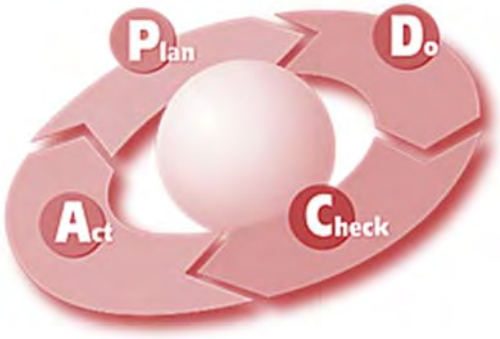
The Airport may wish to consider expanding the recycling program to additional areas, for example, in the buildings and activities that were excluded from this plan. Expanding recycling and waste reduction to areas outside the Airport's control or influence will require cooperation and collaboration with the operators of those areas as well as with their housekeeping and waste hauling contractors. Expansion could be as simple as encouraging these areas to recycle and acting as a resource for their questions or as complex as assisting these areas with an evaluation of their facility and/or container selection and signage design.

As the Airport grows and changes, it is recommended that recycling and waste management be considered as a part of designing and constructing new development projects. This could be accomplished by establishing construction specifications that outline waste management requirements or preferences for Airport projects (for example, any landfill diversion rate requirements or recycled-content material preferences) and involving the waste collection contractor in the design and planning of new facilities. The operation and maintenance of new facilities under the control or influence of RDM, once constructed, should be included in the Airport's recycling program (for example a new general aviation hangar development).

Any expansions of the existing program should be designed with care to maintain consistency and compatibility with the program in the terminal, administration offices, and other established areas.

J. CONTINUOUS IMPROVEMENT

It is recommended that RDM maintains and implements improvements to the recycling program by following the Plan Do Check Act cycle.



PLAN

The recommended strategies and supporting references make up the "plan" portion of the process. Defining success (for example, something like 45 percent recycling by 2020), establishing materials and areas of focus, collecting baseline information (waste audit, surveys, etc.), identifying sub-goals, and identifying strategies are all part of planning. In the future, additional areas of focus, baseline measurements, and goals will likely be needed.

DO

Implementation of strategies included in this plan represents the "do" portion of the process. This involves implementing the recommendations in this plan and making progress toward achieving the goals. In "doing," the Airport will continue developing a culture of awareness for waste management and will begin to shape the practices and processes for improving and optimizing its activities associated with reduction, reuse, recycling, composting, and other waste management elements at the facility.

CHECK

As strategies are implemented, the "check" portion of the process involves reporting that requires regularly tracking and checking the progress toward meeting the goals. The Airport has finite resources (financial, staffing, capital, etc.), therefore, the management and tracking of the plan must not be unnecessarily arduous. If tracking and checking become too difficult or time consuming, the entire plan may suffer. Checking may require the Airport to develop and use tools for measuring success and identifying areas for improvement, including a mechanism for feedback and process for reviewing suggestions.

The following scenarios may trigger re-evaluation of the program and/or the constraints described in this document:

- ✓ New state recycling laws, requirements, or goals
- ✓ New RDM programs or goals
- ✓ New City of Redmond programs or goals
- ✓ New Deschutes County programs or goals
- ✓ New local infrastructure, for example, composting facility
- ✓ Changes within or expiration of franchise agreement with waste hauling contractor(s)

ACT

The "act" portion of the process encompasses taking what has been learned in the previous stages and actively responding. It can be helpful to ask, "What did we learn?" and "How can we do better next time?" By re-evaluating the strategies, activities, goals, and metrics, adjustments can be identified and put into action.

It is recommended that meetings on waste and recycling be held on a regular basis to drive the continuous improvement cycle (review the recycling program and plan and implement improvements/adjustments). It is further recommended that these meetings include a representative from each of the following areas: the waste hauling company, the airlines serving RDM, the restaurant tenant, other terminal tenants, a hangar tenant, the Redmond community, and the traveling public.

K. RECOMMENDATIONS SUMMARY

The recommendations outlined in this document do not require major capital improvements and were designed to be compatible with RDM's in-progress master plan, the existing recycling program, and other airport requirements.

Table 4 summarizes recommendations for the RDM waste and recycling program.

Table 4: Recommendations Summary

RDM Waste and Recycling Program Recommendations

Objectives and Targets
- Set SMART goals (see Section 7).

Tracking and Reporting
- Regularly estimate and track volume of waste to landfill, volume of material collected for recycling, recycling rate, and costs for waste and recycling services.
- Assess waste generation, landfill, recycling, and cost trends for issues or opportunities for improvement.
- Establish a regular reporting schedule; proactively provide information about the program.

Reduce and Reuse
- Substitute disposable items with durable alternatives.
- Reuse items and materials.
- Continue to promote emptying of water bottles in restroom sinks and refilling post security.
  - Lower and supplement water bottle emptying/refilling signs.
  - Revise water bottle emptying/refilling signs to encourage recycling of disposable water bottles.
  - Place a recycling station in immediate proximity of the pre-security restrooms.
- Work with the restaurant tenant to donate edible food.
- Collect and donate unopened food, beverage, and toiletry items.
- Encourage reuse by passengers, tenants, and contractors.

Paper
- Continue the paper recycling program.
- Ask about adding non-shredded office paper, newspapers, and magazines to the shredded paper collection.
- Expand paper recycling program to additional areas, specifically airline deplaned newspapers and magazines and expired items from the newsstand.

Plastic Bottles and Aluminum Cans, Plastic Cups
- Continue the plastic bottle and aluminum can recycling program.
- Expand the program to additional areas, specifically airline deplaned beverage containers.
- Support the return of containers included in the bottle bill refund program.
- Coordinate plastic cup recycling with the airlines serving RDM.

Cardboard
- Continue the cardboard recycling program.
- Provide feedback to tenants on the progress and performance of this program, solicit their feedback, and market the program to all tenants.

Glass
- Continue the glass recycling program.
- Work to address contamination in this material stream.
- Provide feedback to tenants on the progress and performance of this program and solicit their feedback.

Other Recyclables
- Work with the waste hauling contractor to design and implement strategies for other materials as they are identified in the waste stream.

Green Waste
- Evaluate how this material is managed and explore opportunities to align with the EPA hierarchy.

Food Waste
- If a composting facility is established in the area, evaluate composting at RDM.
  - Start with coffee grounds, then expand to other pre-consumer food waste.

Paper Products
- If a composting facility is established in the area, evaluate composting at RDM.

Education and Outreach
- Improve in-terminal messaging for passengers.
  - Provide clear, instructional signage at recycling stations.
- Provide simple, on-going training for employees, tenants, and contractors.

Containers and Bins
- Install additional recycling stations in high traffic areas of the terminal.
- Right-size recycling bins and the service schedule in other areas.
- Collocate recycling bins and garbage cans.
- Remove stand-alone garbage cans in public areas of terminal.
- Standardize recycling bins and garbage cans as they are retired/replaced.
- Install additional recycling bins and garbage cans in other areas, as they are added to program.

Signage and Labeling
- Expand and improve signage to elaborate on the program and provide direction, specifically, in the checkpoint queuing area.

Contracts and Leases
- Revise new contract language or update the City Airport Ordinance to include waste management requirements/preferences.

Purchasing Policies and Requirements
- Adopt a purchasing policy that prioritizes materials that are durable, reusable, recyclable, compostable, and/or made from recycled content.
  - Share with tenants to encourage them to adopt their own similar practices.

Additional Facilities and New Development
- Collaborate with operators of areas excluded from this plan to expand the program.
- Consider recycling and waste management as part of designing and constructing new development.

Continuous Improvement
- Maintain and improve the recycling and waste program according to Plan Do Check Act cycle.

8. CONCLUSION

RDM currently has a simple recycling program in place that includes basic elements and has the potential to be expanded in phases to further reduce the facility's environmental impact. This document has described the existing program and outlined recommended improvements that will allow RDM to potentially increase both landfill diversion and recycling volumes. In addition, this plan documents and supports RDM's compliance with the FMRA of 2012 and FAA guidance for recycling, reuse, and waste reduction.

9. REFERENCES

Atkin, P., et al., “Trash Landings: How Airlines and Airports Can Clean Up Their Recycling Programs,” National Resources Defense Council, New York, N.Y., December 2006.

Berry, F., F. Gillhespy, and J. Rogers, *ACRP Synthesis 10: Airport Sustainability Practices*, Transportation Research Board of the National Academies, Washington, D.C., 2008.

Black, E., “Airport Sustainable Master Plan Pilot Program,” FAA, Washington, D.C., May 27, 2010 [Online]. Available: http://www.faa.gov/airports/environmental/sustainability/media/interim_ guidance_ sustainable_master_plan_pilot.pdf [accessed December 3, 2014].

Buckner, K., F.Pitters., and A. Wedding, *ACRP Synthesis 81: Food and Beverage and Retail Operators: The Costs of Doing Business at Airport*, Transportation Research Board of the National Academies, Washington, D.C., 2017.

Cascadia Consulting Group and HF&H Consultant, California Department of Resources Recycling and Recovery *Cost Study on Commercial Recycling*. January 2011.

Cascadia Consulting Group, LeighFisher Management Consultants, and Mary Loquvam Consulting, *ACRP Report 100 Recycling Best Practices – A Guidebook for Advancing Recycling from Aircraft Cabins*, Transportation Research Board of the National Academies, Washington, D.C., 2014.

Chicago Department of Aviation, *Sustainable Airport Manual.* Version 3.0. 2012.

EPA, “Sustainable Management of Food.” n.d. https://www.epa.gov/sustainable-management-food

EPA, *Developing and Implementing an Airport Recycling Program*. April 2009.

FAA, Office of Airports, *Recycling, Reuse, and Waste Reduction at Airports – A Synthesis Document*, April 24, 2013

FAA, “Report on the Sustainable Master Plan Pilot Program and Lessons Learned,” 2012.

Haseman, Z., *ACRP Synthesis 42: Integrating Environmental Sustainability into Airport Contracts*, Transportation Research Board of the National Academies, Washington, D.C., 2013.

Katzev, R. and Mishima, H.R., *The Use of Posted Feedback to Promote Recycling*. Psychological Reports, 71(1), 259-264. 1992.

Malick, A., *ACRP Synthesis 77: Airport Sustainability Practices*, Transportation Research Board of the National Academies, Washington, D.C., 2016

Martin-Nagle, R. and A. Klauber, *ACRP Synthesis 66: Lessons Learned from Airport Sustainability Plans,* Transportation Research Board of the National Academies, Washington, D.C., 2015.

Ralston, Phil, "PDX Waste Management" (Presentation, Airports Going Green Conference, Chicago, IL, August 6, 2009).

SanMartin F. and D. Rinsler, “Guidance on Airport Recycling, Reuse, and Waste Reductions Plans,” FAA, September 30, 2014.

Szczepanski, M., “Wheels Up: A Look at How U.S. Airports Manage Waste and Recycling.” Waste360. December 15, 2016. http://www.waste360.com/business-operations/wheels-look-how-us-airports-manage-waste-and-recycling

Werner, C.M., R. Stoll, P. Birch, and P.H. White, “Clinical Validation and Cognitive Elaboration: Signs That Encourage Sustained Recycling.” *Basic and Applied Social Psychology*, 24, 185-203. 2002.

Mead&Hunt

APPENDIX D:

IMPLEMENTATION PLAN

Project Title:	Terminal Phase 1A	**Project Number:**	
Project Description:	Environmental, design, and construction of terminal holdroom remodel and reconfiguration.		
Total Cost (2017 Dollars):	$6,160,000	**Funding Sources:**	PE, Discretionary, Local
Year:	2022-2023	**Phased Project**	☒ Yes ☐ No
Project Components	☐	Planning	
	☒	Design	$274,000
	☒	Environmental	$456,000
	☒	Construction	$5,430,000
Enabling Projects:			
Equipment Acquisition	None		
Comments:	Environment and Design phases occur in Year 1 of 2 for Terminal Phase 1B.		
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	Stakeholders generally support the project.
Process description and duration	Phase 1 will renovate existing ground floor holdroom and includes reconfiguring the boarding corridor into extra holdroom space to increase seating capacity.

Environmental

Level of state and federal environmental review required?	The project is AIP funded and will require NEPA process. Expected to be a categorical exclusion (CatEx).
Potential complications?	FAA may potentially ask for an environmental assessment instead of a CatEx.
Cost of mitigation	Mitigation not expected.
Description of mitigation process and uncertainty	Mitigation not expected.
Process description and duration	

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	No
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	
Process description and duration	

Funding

Can the Airport fund the project in its current state?	☐ Yes ☒ No
Fiscal impact of project on immediate and ongoing Airport finances.	Project costs exceed available funds. The Airport will need to issue a bond to cover costs.
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	Project will increase terminal footprint which will impact operating and maintenance costs.
Are additional staff needed?	Project will increase terminal footprint which may require additional maintenance and/or janitorial staff.

Project Title:	Terminal Phase 1B	**Project Number:**	
Project Description:	Environmental, design, and construction phases of the elevated holdroom expansion.		
Total Cost (2017 Dollars):	$11,020,000	**Funding Sources:**	Discretionary, Local
Year:	2022	**Phased Project**	☒ Yes ☐ No
Project Components	☐	Planning	
	☒	Design	$816,000
	☒	Environmental	$490,000
	☒	Construction	$9,714,000
Enabling Projects:			
Equipment Acquisition	None		
Comments:			
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	Stakeholders generally support the project.
Process description and duration	Phase 1B will elevate the ground floor of the holdroom by 5 feet to facilitate Passenger Boarding Bridge (PBBs). This will allow PBBs to reach larger aircraft on the apron.

Environmental

Level of state and federal environmental review required?	The project is AIP funded and will require NEPA process. Expected to be a categorical exclusion (CatEx).
Potential complications?	FAA may potentially ask for an environmental assessment instead of a CatEx.
Cost of mitigation	Mitigation not expected.
Description of mitigation process and uncertainty	Mitigation not expected.
Process description and duration	

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	No
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	
Process description and duration	

Funding

Can the Airport fund the project in its current state?	☐ Yes ☒ No
Fiscal impact of project on immediate and ongoing Airport finances.	A Bond will need to be considered for the greater terminal program. The City can issue a bond that contribute to local funds to cover construction costs.
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	Project will increase terminal footprint which will impact operating and maintenance costs.
Are additional staff needed?	Project will increase terminal footprint which may require additional maintenance and/or janitorial staff.

Project Title:	Terminal Apron Expansion	**Project Number:**	
Project Description:	Environmental, design, and construction phases of Terminal Apron Expansion project		
Total Cost (2017 Dollars):	$1,998,900	**Funding Sources:**	PE, Local
Year:	2022-2023	**Phased Project**	☐ Yes ☒ No
Project Components	☐	Planning	
	☒	Design	$118,000
	☒	Environmental	$73,000
	☒	Construction	$1,808,000
Enabling Projects:			
Equipment Acquisition	None		
Comments:			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	Stakeholders generally support the project.
Process description and duration	As the Terminal Phase 1B project will allow PBBs to reach larger aircraft on the apron, the apron expansion will increase the overall capacity of the apron.

Environmental

Level of state and federal environmental review required?	The project is AIP funded and will require NEPA process. Expected to be a categorical exclusion (CatEx).
Potential complications?	FAA may potentially ask for an environmental assessment instead of a CatEx.
Cost of mitigation	Mitigation not expected.
Description of mitigation process and uncertainty	Mitigation not expected.
Process description and duration	

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	No
Are there financial and operational risks based on project scale?	A Bond will need to be considered for the greater terminal program. The City can issue a bond that contribute to local funds to cover construction costs.
Improvement suggestions of design process	
Process description and duration	

Funding

Can the Airport fund the project in its current state?	☐ Yes ☒ No
Fiscal impact of project on immediate and ongoing Airport finances.	A Bond will need to be considered for the greater terminal program. The City can issue a bond that contribute to local funds to cover construction costs.
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Project Title:	Mid-term Auto Parking Phase 1	**Project Number:**	
Project Description:	Design and construction of 300 additional parking stalls.		
Total Cost (2017 Dollars):	$5,205,250	**Funding Sources:**	Local
Year:	2024	**Phased Project**	☒ Yes ☐ No
Project Components	☐	Planning	
	☒	Design	
	☐	Environmental	
	☒	Construction	
Enabling Projects:			
Equipment Acquisition	None		
Comments:	This is a Non-AIP project		
Is project timeline flexible? Are there any other projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	
Process description and duration	Project will require removal of the USDA building.

Environmental

Level of state and federal environmental review required?	
Potential complications?	
Cost of mitigation	
Description of mitigation process and uncertainty	
Process description and duration	

Design

Any pre-implementation support facility construction or site prep required?	☒ Yes ☐ No
Potential challenges of site location?	Project requires removal of USDA building and tenants, potential reconfiguration of traffic circulation, and stormwater considerations.
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	
Process description and duration	

Scheduled start date	2024
Expected cost	$339,000

Funding

Can the Airport fund the project in its current state?	☐ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	
Are additional staff needed?	

Project Title:	Rehab Taxiway G Pavement	**Project Number:**	
Project Description:			
Total Cost (2017 Dollars):	$3,331,333	**Funding Sources:**	PE, Discretionary, Local
Year:	2025	**Phased Project**	☐ Yes ☒ No
Project Components	☐	Planning	
	☒	Design	$203,000
	☐	Environmental	
	☒	Construction	$3,128,000
Enabling Projects:			
Equipment Acquisition	None		
Comments:			
Is project timeline flexible? Are there any other projects dependent on this project?	Project timeline is flexible but needs to happen sooner than later. Ongoing maintenance of existing pavement can keep it in working order, but costs will grow over time as the pavement deteriorates.		

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	Project is not controversial.
Process description and duration	

Environmental

Level of state and federal environmental review required?	The project is AIP funded and will require NEPA process. Expected to be a categorical exclusion (CatEx).
Potential complications?	FAA may potentially ask for an environmental assessment instead of a CatEx.
Cost of mitigation	Mitigation not expected.
Description of mitigation process and uncertainty	Mitigation not expected.
Process description and duration	

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	Pavement rehab is a simple project and not considered a risk.
Improvement suggestions of design process	
Process description and duration	
Scheduled start date	2025
Expected cost	$203,000

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	No major financial impact.
How competitive is the improvement for discretionary funding?	The project's competitiveness depends on what the scale of the project is anticipated to be.
How competitive is the project for FAA priority compared to other Airport CIP projects?	Competitiveness depends on the condition of the pavement and the scale of rehabilitation.

Operation and Maintenance

Potential impact on airport operating costs?	Rehabilitation should reduce maintenance costs in the short term.
Are additional staff needed?	No additional staff needed.

Project Title:	Rehab Taxiway G Lighting	**Project Number:**	
Project Description:			
Total Cost (2017 Dollars):	$453,300	**Funding Sources:**	PE, Local
Year:	2025	**Phased Project**	☐ Yes ☒ No
Project Components	☐	Planning	
	☒	Design	$28,000
	☐	Environmental	
	☒	Construction	$425,000
Enabling Projects:			
Equipment Acquisition			
Comments:			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	Project is not controversial.
Process description and duration	

Environmental

Level of state and federal environmental review required?	The project is AIP funded and will require NEPA process. Expected to be a categorical exclusion (CatEx).
Potential complications?	FAA may potentially ask for an environmental assessment instead of a CatEx.
Cost of mitigation	Mitigation not expected.
Description of mitigation process and uncertainty	Mitigation not expected.
Process description and duration	

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	Light rehabilitation is not considered a risk.
Improvement suggestions of design process	
Process description and duration	
Scheduled start date	2025
Expected cost	$28,000

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	No major financial impact.
How competitive is the improvement for discretionary funding?	The project's competitiveness depends on what the scale of the project is anticipated to be.
How competitive is the project for FAA priority compared to other Airport CIP projects?	Competitiveness depends on the condition of the lights and the scale of rehabilitation.

Operation and Maintenance

Potential impact on airport operating costs?	Rehabilitation should reduce maintenance costs in the short term.
Are additional staff needed?	No additional staff needed.

Project Title:	Mid-term Auto Parking Phase 2	**Project Number:**	
Project Description:	Design and construction of 200 additional parking stalls.		
Total Cost (2017 Dollars):	$3,695,382	**Funding Sources:**	Local
Year:	2025	**Phased Project**	☐ Yes ☒ No
Project Components	☐	Planning	
	☒	Design	$226,000
	☐	Environmental	
	☒	Construction	$3,469,000
Enabling Projects:	Mid-term Auto Parking Phase 1		
Equipment Acquisition			
Comments:	Non-AIP project		

Planning and Zoning

Project Conformity	☐ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☐ Yes ☐ No
Any potential controversy based on stakeholder feedback?	
Process description and duration	
Scheduled start date	
Expected cost	
Is project timeline flexible? Are there any other projects dependent on this project?	

Environmental

Level of state and federal environmental review required?	
Potential complications?	
Cost of mitigation	
Description of mitigation process and uncertainty	
Process description and duration	
Scheduled start date	
Expected cost	
Is project timeline flexible? Are there any other projects dependent on this project?	

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☐ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	
Process description and duration	
Scheduled start date	2025
Expected cost	$226,000
Is project timeline flexible? Are there any other projects dependent on this project?	

Funding

Can the Airport fund the project in its current state?	☐ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	
Are additional staff needed?	

Project Title:	Northside GA Expansion	**Project Number:**	
Project Description:			
Total Cost (2017 Dollars):	$2,444,692	**Funding Sources:**	PE, Local
Year:	2026-2027	**Phased Project**	☒ Yes ☐ No
Project Components	☐	Planning	
	☒	Design	$100,000
	☒	Environmental	$251,000
	☒	Construction	$2,093,000
Enabling Projects:			
Equipment Acquisition	None		
Comments:			
Is project timeline flexible? Are there any other projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	Have not received controversial feedback.
Process description and duration	

Environmental

Level of state and federal environmental review required?	Environmental Assessment required.
Potential complications?	
Cost of mitigation	
Description of mitigation process and uncertainty	
Process description and duration	Less than 1 year

Design

Any pre-implementation support facility construction or site prep required?	☒ Yes ☐ No
Potential challenges of site location?	Site will need to be brought to Airport grade, requiring significant earthwork and rock excavation.
Are there financial and operational risks based on project scale?	Return on investment – high costs and potentially low rate of return. Individual tenants are needed to fill spots.
Process description and duration	Less than 1 year

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	There is risk in finding tenants for new facilities.
How competitive is the improvement for discretionary funding?	Very low
How competitive is the project for FAA priority compared to other Airport CIP projects?	Very low

Operation and Maintenance

Potential impact on airport operating costs?	Increase airport surfaces therefore increased workload for administrative staff.
Are additional staff needed?	No additional staff needed.

APPENDIX E:

COORDINATION AND OUTREACH SUMMARY

APPENDIX E: COORDINATION AND PUBLIC OUTREACH SUMMARY

This appendix documents the coordination and outreach efforts utilized throughout the Master Plan process. Organizations involved, dates of meetings and general feedback are noted below.

PLANNING ADVISORY COMMITTEE (PAC)

A Planning Advisory Committee (PAC) was setup to engage the input and review on working papers, materials and alternatives early in the planning process. The PAC consisted of members from the following organizations:

- ✓ Mayor of the City of Redmond
- ✓ United States Forest Service – Redmond Air Center
- ✓ Redmond Municipal Airport - Fixed Base Operators
- ✓ City of Redmond – Engineering Department
- ✓ City of Redmond – Community Development Director
- ✓ City of Bend – Business Advocate
- ✓ City of Bend – Assistant City Manager
- ✓ Prineville Airport
- ✓ Redmond Economic Development, Inc.
- ✓ Deschutes County – Emergency Services
- ✓ Deschutes County – Planning Department
- ✓ Central Oregon Visitors Association

PAC MEETINGS AND DATES

The following PAC meetings were held:

- ✓ **PAC Meeting #1:** Airport Administration Offices – November 9th, 2016
- ✓ **PAC Meeting #2:** Airport Administration Offices – February 8th, 2017
- ✓ **PAC Meeting #3:** Airport Administration Offices – June 22nd, 2017
- ✓ **PAC Meeting #4:** Airport Administration Offices – October 18th, 2017
- ✓ **PAC Meeting #5:** Airport Administration Offices – March 14th, 2018

PUBLIC OPEN HOUSES

Members of the public were invited to contribute to the planning process at two open house opportunities:

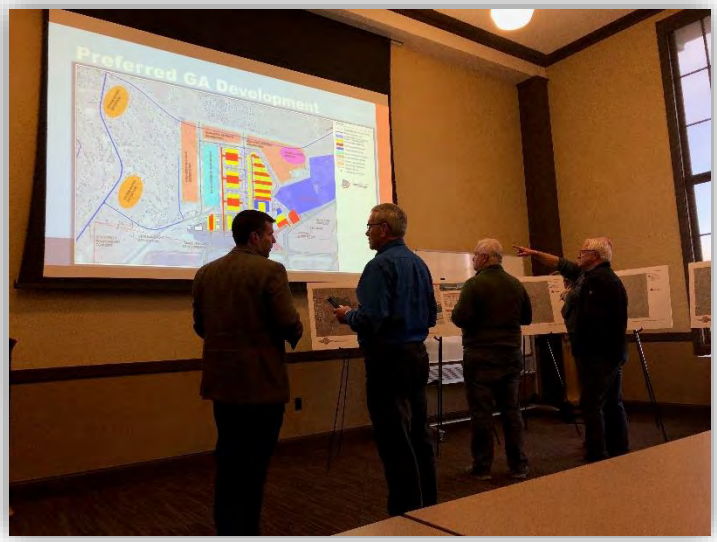
PAC MEETINGS AND DATES

The following public open houses were held:

- ✓ **Public Meeting #1:** Redmond City Hall – October 18th, 2017
- ✓ **Public Meeting #2:** Redmond City Hall – March 14th, 2018

Public Meeting #2 - March 14th, 2018

Public Meeting #2 - March 14th, 2018



ADVERTISEMENTS FOR PUBLIC OPEN HOUSES

The following public postings are examples of the advertisements used to publicize the open houses.

THE REDMOND MUNICIPAL AIRPORT CORDIALLY INVITES YOU TO
AIRPORT MASTER PLAN OPEN HOUSE
OCTOBER 18, 2017
4:30 P.M. TO 6:30 P.M.
REDMOND CITY HALL
The Airport Master Plan guides airport development over the next 20 years. Airport staff and planning consultants will be available to discuss aviation forecasts, needed airport facilities, and ideas for improvements that will help the Airport serve Central Oregon for years to come. We look forward to sharing our ideas with you, and learning what YOUR thoughts are for the future of the Redmond Municipal Airport.
REDMOND OREGON
fly REDMOND
QUESTIONS ABOUT THE MASTER PLAN PROCESS? VISIT WWW.FLYRDM.COM FOR MORE INFORMATION

THE REDMOND MUNICIPAL AIRPORT CORDIALLY INVITES YOU TO
AIRPORT MASTER PLAN OPEN HOUSE
MARCH 14, 2018
5:00 P.M. TO 7:00 P.M.
REDMOND CITY HALL
The Airport Master Plan guides airport development over the next 20 years. Airport staff and planning consultants will be available to discuss aviation forecasts, needed airport facilities, and ideas for improvements that will help the Airport serve Central Oregon for years to come. We look forward to sharing our ideas with you, and learning what YOUR thoughts are for the future of the Redmond Municipal Airport.
REDMOND OREGON
fly REDMOND
QUESTIONS ABOUT THE MASTER PLAN PROCESS? VISIT WWW.FLYRDM.COM FOR MORE INFORMATION

APPENDIX F:

LANDSIDE DEVELOPMENT

APPENDIX F: LANDSIDE DEVELOPMENT AND OTHER SUPPORT FACILITIES

The research and analysis in this appendix identifies the facility requirements for non-aviation businesses that complement the airport operations or are appropriate for the Redmond market, given local economic conditions. Subareas described in this appendix can be viewed on Figure 3-19, contained in Chapter 3 of this Master Plan.

TARGET INDUSTRY SECTORS

Based on an analysis of the Redmond economy, several market sectors were identified as target industries for the area near the airport.

FACTORS INFLUENCING SELECTION OF TARGET INDUSTRIES

The following considerations were used in identifying target industries:

- ✓ **Existing Business Clusters.** Businesses have already agglomerated in Redmond and in the vicinity of the airport based on the collective competitive advantages of the community and sites near the airport. Existing business concentrations were inventoried and evaluated in the socioeconomic analysis in **Chapter 2**.
- ✓ **Growth Outlook.** The socioeconomic analysis further identified industries and subsectors likely to experience strong growth over the next ten years. This information was derived from Oregon Employment Department data, as well as the third-party data service *Moody's Analytics*.
- ✓ **Suitability of Site/Land Inventory.** This assessment considered the suitability of available land among airport area properties to accommodate potential uses.
- ✓ **Anecdotal Input/Stakeholder Feedback.** The proposed land use determination considered the economic development goals and objectives of the City of Redmond and the airport, input from stakeholders, and professional insights from the consultant team.

TARGET INDUSTRY SECTORS

Based on the factors identified above, the following target industries have been identified for the airport area:

- ✓ **Accommodation and Food Services.** Both anecdotal and empirical inputs suggest the "airport district" (loosely defined here as land south of OR 126 and east of US 97) would benefit from expanded support services, specifically full-service restaurants serving daytime employment and potentially an airport-oriented hotel. The district has a daytime population of almost 3,000 people (not including airport passenger throughput) and is served by only a handful of full-service restaurants.
- ✓ **Speculative Light Industrial Buildings.** The City of Redmond is almost devoid of speculative industrial space suitable to accommodate small- to medium-sized emerging businesses. Speculative industrial development would face a positive real estate climate and serve a growing need in the market. However, the extent to which this use type could be achievable with a ground lease option is less certain (many businesses would prefer to own their land).
- ✓ **Construction.** Construction is a predominant industry in Central Oregon and is expected to exhibit considerable growth over the next decade. The airport district has had success attracting construction firms. There are at least 20 construction firms in the airport district. Construction firms are also a potentially compatible use for ground lease options, as their permanent capital needs are less intensive than other industrial uses.
- ✓ **Manufacturing.** The airport district has a competitive advantage in attracting manufacturing uses interested in co-locating near Central Oregon Community College and capitalizing on the steady supply of workers coming out of its Redmond campus programs. Specifically, metals, equipment, and transportation equipment manufacturers may find opportunities. These are also uses with an established presence in the district. Food and beverage manufacturing is also a high-growth sector that has a measurable presence east of US 97.
- ✓ **Wholesalers and Warehousing.** Wholesaling is an attractive use for the airport district, given the transportation advantages in Redmond and the airport district—nearly 40 wholesaling firms are already in the airport district. Wholesalers commonly require limited investment in real property, often a simple steel or concrete tilt structure. Wholesalers also typically operate on low margins. Combined, these are factors that may make a ground lease option more attractive for this sector.
- ✓ **Public Administration.** The airport district has a clear agglomeration of institutional and public administrative uses (e.g., U.S. Forest Service). Public entities are solid targets for ground leases due to their creditworthiness, long-term functions/holding periods, and (sometimes) least-cost location selection.
- ✓ **Gas Station and Convenience Store.** Per the City of Redmond request, a gas station and convenience store is desirable to serve customers utilizing the airport, including rental car returns.

LAND USE CHARACTERISTICS OF TARGET INDUSTRY SECTORS

This section describes the range of typical building and site sizes and outlines the parking requirements for the target industry sectors.

Typical Building and Site Sizes for Target Industry Sectors

Table 1 below shows an approximate range of building and site sizes for the target industry sectors listed above. This information was derived based on the sizes of similar existing uses in the Redmond and Bend areas. Hotels generally require large buildings on lots of 2 or 3 acres to accommodate parking. The size needs of food services vary widely depending on the restaurant and building type; restaurants in strip malls, for instance, generally require less space than what is shown below for stand-alone restaurants. Large lots are typically not required for food services. Speculative light industrial buildings for emerging small- or medium-sized businesses would generally require smaller spaces than the other industrial uses, though some light industrial uses in the area require large buildings and lots of over an acre. Warehouse, wholesale, and manufacturing uses require large buildings, ranging from just over 10,000 square feet to upwards of 100,000 square feet or more in some cases, though the average size for available properties in the Redmond/Bend area falls between 10,000 and 20,000 square feet. These industrial uses require site sizes ranging from several acres to over 100 acres for large regional warehouses, distribution centers, and heavy industrial manufacturing. Public administration size requirements also vary widely depending on the use. Some public administrative uses do not require large buildings or lots, but institutional campuses may require large buildings on multi-acre properties.

Table J-1. Target Industry Typical Building and Site Sizes

Target Industry	Typical Building Size (square feet)	Typical Lot Size (acres)
Accommodation (hotels)	30,000-50,000	2-3
Food Services (stand-alone)	2,000-8,000	0.1-0.25
Speculative Light Industrial Buildings	8,000-16,000	0.5 - 1.5
Construction	4,000-15,000	1-2
Manufacturing	10,000-30,000	3-100+
Wholesalers and Warehousing	10,000-170,000	2-100+
Public Administration	4,000-50,000	0.3-2
Gas Station & Convenience Store	800-2,400	0.5-1.5

Automobile Parking for Target Industry Sectors

Parking requirements are established in the City of Redmond Development Code section 8.0500. The City requires developments to provide minimum parking spaces based on land use. **Table J-2** summarizes parking requirements for land uses that fall within the target industry sectors. Note that some land uses demand more parking than the code minimum to meet operational needs.

Table J-2. City of Redmond Parking Requirements	
Land Use	**Minimum Parking Ratio**
Commercial Service and Repair	1 space per 600 square feet (sf) retail floor area
Contractor's Yard	1 space per employee or 1 space per 200 sf of office area
Eating and Drinking Establishment	1 space per 100 sf of net floor area
Equipment Rental, Sales, and Service	1 space per 600 sf of retail floor area
Espresso Stand or Booth	1 space per employee
Industrial, General, or Service Related	1 space per 800 sf
Manufacturing and Assembly	1 space per 600 sf
Motel, Hotel	1 space per room, plus 1 space for manager
Office	1 space per 300 sf net office floor area
Retail, General	1 space per 200 sf of retail floor area
Utility Facility	1 space (regardless of facility size)
Warehouse	1 space per 1,000 sf

TRANSPORTATION NEEDS FOR TARGET INDUSTRY SECTORS

All of the target industries need to provide adequate transportation access for passenger vehicles and to varying intensities of truck traffic. Efficient routes to the highway system are necessary to support freight movement associated with the target industries. The existing street network within the study area includes several minor arterial and major collector streets that provide access to the highway system. Turn lanes are generally present at major intersections, but additional turn lanes on major streets may be necessary to serve future development, and local streets may need to be widened to accommodate trucks (see Recommended Upgrades section).

UTILITY DEMANDS FOR TARGET INDUSTRY SECTORS

The target industries listed above comprise a wide range of demands on the utility systems. **Tables J-3** through **J-7** summarize minimum recommended available utility service to support industrial development.

Table J-3. Water Service Requirements for Target Industries				
Target Industry	Main Line Size[1]	Fire Line Size	High Pressure Dependency	Flow Rate[2]
Accommodation and Food Services	6”	6”	Not Required	1200 GPD / acre
Speculative Light Industrial Buildings	6”	8”	Not Required	1500 GPD / acre
Construction	6”	6”	Not Required	500 GPD / acre
Manufacturing[3]	6”	10”	Not Required	1850 GPD / acre
Wholesalers and Warehousing	6”	8”	Not Required	500 GPD / acre
Public Administration	6”	6”	Not Required	1200 GPD / acre
Gas Station & Convenience Store	6”	8” [4]	Not Required	500 GPD / acre

[1] Minimum recommended main size for domestic or process use. Utility providers typically do not install water mains smaller than 6” diameter.
[2] GPD / acre: Gallons per day per acre, based on gross property area
[3] Excludes high water users such as food processors, etc.
[4] Small-footprint buildings often do not include fire sprinklers. The fire line size listed applies to on-site hydrant service.

Table J-4. Sewer Service Requirements for Target Industries		
Target Industry	Main Line Size[1]	Flow Rate[2]
Accommodation and Food Services	8”	1200 GPD / acre
Speculative Light Industrial Buildings	8”	1500 GPD / acre
Construction	8”	500 GPD / acre
Manufacturing[3]	8”	1850 GPD / acre
Wholesalers and Warehousing	8”	500 GPD / acre
Public Administration	8”	1200 GPD / acre
Gas Station & Convenience Store	8”	500 GPD / acre

[1] Minimum recommended main size for sanitary sewer. Utility providers typically do not install sewer mains smaller than 8” diameter, so this is the smallest recommended line size.
[2] GPD / acre: Gallons per day per acre, based on gross property area
[3] Excludes high water users such as food processors, etc.

Table J-5.Telecommunications Service Requirements for Target Industries		
Target Industry	Major Communications Dependency	Fiber Optic Dependency
Accommodation and Food Services	Preferred	Preferred
Speculative Light Industrial Buildings	Preferred	Required
Construction	Preferred	Not Required
Manufacturing	Required	Preferred
Wholesalers and Warehousing	Preferred	Preferred
Public Administration	Preferred	Preferred
Gas Station & Convenience Store	Preferred	Preferred

Table J-6. Natural Gas Service Requirements for Target Industries	
Target Industry	Main Line Size
Accommodation and Food Services	2”
Speculative Light Industrial Buildings	4”
Construction	2”
Manufacturing	4”
Wholesalers and Warehousing	2”
Public Administration	2”
Gas Station & Convenience Store	2”

Table J-7. Electrical Service Requirements for Target Industries			
Target Industry	Minimum Service Demand[1]	Close Proximity to Substation	Redundancy Dependency
Accommodation and Food Services	0.5 MW	Preferred	Not Required
Speculative Light Industrial Buildings	0.5 MW	Preferred	Not Required
Construction	0.5 MW	Not Required	Not Required
Manufacturing	0.5 MW	Preferred	Not Required
Wholesalers and Warehousing	1 MW	Not Required	Not Required
Public Administration	0.5 MW	Preferred	Not Required
Gas Station & Convenience Store	0.2 MW	Not Required	Not Required
[1] ***MW: Megawatts***			

Stormwater at the Redmond Airport is generally managed and contained on site. Swales and ditches are generally used to direct runoff to localized low spots or subsurface infiltration galleries to be discharged via infiltration to the soil. Based on nearby existing facilities and development, we do not expect any issues for the proposed developments. All development will need to meet City of Redmond stormwater treatment regulations and Oregon Department of Environmental Quality requirements for underground injection control discharge, as applicable.

EVALUATION OF LAND SUPPLY FOR TARGET INDUSTRIES

This section assesses each landside development subarea to determine whether the existing zoning permits some or all of the target industries; characterizes parcel sizes for developable land; and identifies FAA leasehold restrictions. All subareas are depicted on **Figure 1-15** in **Chapter 1** of this Master Plan.

In all affected subareas, sites with leasehold restrictions may be less attractive to developers who prefer to own their own sites or who require a long-term lease for financing.[1] Those subareas closest to the runway are also subject to FAA Part 77 height and use restrictions that could affect future development.

[1] According to Redmond Planning Division staff, parcels denoted as having leasehold restrictions are those acquired by the City and/or County from the FAA that may not be sold. Therefore, any third-party users would need to lease the property.

North Development Parcel Subarea

The North Development Parcel Subarea consists of 134 developable acres of City-owned land, including 17 acres zoned Light Industrial (M1) land, 60 acres zoned Tourist Commercial (C5) accessible from OR 126, and 57 acres zoned Open Space Park Reserve (OSPR) at the southern end. The entire subarea is subject to leasehold restrictions. As noted above, ground leases may be viable options for wholesalers and warehouse uses, as well as construction firms. The M1 zone allows both of these uses, but light industrial users may be disinclined to develop a property that can only be leased, not purchased. The C5 and M1 areas, especially off OR 126, could be developed as restaurants (sit-down or drive-through), cafes, or diners. Brew pubs are allowed outright in C5 areas, but other bars and taverns would be a conditional use. Hotels and motels are allowed outright in the C5 zone and would be well-suited to these areas due to proximity to the highway and airport. Options are limited for the large area of OSPR land, but public facilities are permitted outright in this zone when approved in the comprehensive plan or other public facilities plans for this zone. The City has had preliminary conversations with emergency response agencies regarding use of this area for a future emergency training facility.

North Business Park Subarea

This subarea consists of 94 developable acres, with 44 acres zoned Light Industrial (M1), 17.2 acres zoned Tourist Commercial (C5), and 57 acres zoned Open Space Park Reserve (OSPR). The same potential uses would apply for the North Business Park Subarea as the North Development Parcel Subarea above. The entire subarea is subject to leasehold restrictions, so some industrial uses such as wholesale and warehouse might be viable options, while light industrial users may be less inclined to develop these properties through a ground lease. Construction firms could be a viable use for the M1 zones. Food services could be developed on M1 and C5 lots, though bars and taverns would be a conditional use in the C5 zone. As with the North Development Parcel Subarea, accommodation would be well-suited for the C5 areas because of convenient access to the highway and airport. Development options are limited in the OSPR zone, but there may be potential for public facilities in these areas. The southern portion of this subarea is being contemplated for future airport-compatible development (possible corporate, executive, and general aviation facilities) with the northern portion by OR 126 targeted for future commercial development due to its Tourist Commercial (C5) zoning designation.

South Apron Subarea

The South Apron Subarea contains 19 acres zoned Airport, and 5.8 acres zoned Light Industrial (M1), with approximately 25 acres of developed land excluding right-of-way. Twenty-three acres of this subarea, including both Airport and M1 zoned land, is part of a much larger lot owned by the City and subject to leasehold restrictions. A two-acre lot at the southwest corner of the subarea, privately owned and zoned M1, could be used for speculative Light Industrial, Warehouse, or Manufacturing that do not require large lot sizes, or food services uses, though the site is currently developed. In the Airport zone, development options are limited to uses that support and complement the airport.

West Business Park Subarea

The West Business Park contains 225 acres of land, including 193 acres zoned Light Industrial (M1), 24 acres zoned Public Facility, and 8 acres zoned Park. There are approximately 93 acres of developable land, including several vacant M1 parcels, and several acres of vacant area in the Park and Public Facility zoned lots. Most of the City-owned property is subject to leasehold restrictions (33 acres), while the remaining 8 acres is the Park-zoned property home to two City water storage tanks. There are several large vacant privately-owned Light Industrial (M1) zoned lots that could be potential sites for speculative light industrial, wholesale, warehouse, or manufacturing. Portions of these sites could also be used for accommodation, food services, or construction-related business. The PF-zoned lot along the eastern edge of the subarea could be suitable for public administration uses.

Airport Way Subarea

The Airport Way Subarea area contains 55 acres zoned Light Industrial (M1), including approximately 9 acres of developed land (City-owned but leased to Peterson Caterpillar) and 46 acres of developable land owned by the City. The City-owned property is subject to leasehold restrictions. Four of the vacant city-owned lots are over 8 acres and could be ideal spaces for wholesale warehouse uses or large construction firms that could operate under a ground lease. With several relatively large vacant lots adjacent or in close proximity to each other, this subarea could also be an opportunity for a regional warehouse distribution facility. Proximity to the railroad and surrounding industrial uses makes this area unappealing for accommodations such as hotels. Food services could be a viable option to serve employment in the area, as the area currently lacks food options, if it could be demonstrated that sufficient demand exists.

Fairgrounds Industrial Subarea

The Fairgrounds Industrial Subarea consists of 56 acres zoned Light Industrial (M1), including 41 developable acres. There are several privately-owned vacant lots of approximately 1-2 acres in size that could be used for small light industrial uses, construction firms, or food services uses to support the surrounding area. At the north end of the site is a larger vacant privately-owned site (8.8 acres) which, due to its size and zoning could be appealing for use as light industrial, wholesale warehouse, or manufacturing. The southernmost lot in this subarea is an 8-acre City-owned lot subject to leasehold restrictions. Wholesale and warehousing could be viable options for this relatively large site with a ground lease option.

DESCRIPTION OF EXISTING UTILITIES AND ROADWAYS SERVING LANDSIDE SUBAREAS

This section evaluates the existing public utilities and transportation network serving each subarea. Illustrations of existing utilities are found in ___.

North Development Parcel Subarea

- Water: This subarea is currently served by a 10-inch main along the northern boundary in Lake Road, and by a 12-inch main along the southern boundary in Veterans Way. Public mains do not traverse the interior of the subarea.
- Sewer: This subarea is currently served by an 8-inch main which transitions to a 10-inch main within Lake Road to the north, and an 8-inch main within Veterans Way to the south. Public mains do not traverse the interior of the subarea.
- Transportation: This subarea currently has no existing transportation infrastructure within its boundaries. Although OR 126 runs along a portion of the subarea, no existing connections are present. No connections to Veterans Way south of the subarea exist. To accommodate the Airport Runway Extension, plans to relocate the Airport Way/Veterans Way intersection and realign several network streets are under development by the City. These plans currently show a realignment of Veterans Way into the subarea and an extension of 9th Street southward from OR 126 through the subarea to connect with Airport Way. The 9th Street extension will be a minor arterial street that should include a three-lane cross section. Veterans Way will remain a major collector and should have a two-lane cross section with possible turn lanes at major intersections.

North Business Park Subarea

- Water: This subarea is currently served by an 18-inch main within OR 126 to the east, and within Veterans Way to the south. Public mains do not traverse the interior of the subarea.
- Sewer: This subarea is currently served by an 8-inch main within Veterans Way to the south, and a 12-inch main within OR 126 to the north.
- Transportation: This subarea is bisected by Veterans Way, which connects to OR 126 on the northern border of the subarea and US 97 to the west. Veterans Way is a major collector between Airport Way and OR 126. It has two travel lanes with a shoulder bike lane west of the intersection with Sisters Avenue, but no paved shoulders northeast of that intersection. No turn lanes are present on any portion of Veterans Way between Airport Way and OR 126. The subarea also includes local street connections to OR 126 with 10th Avenue connecting on the west side, and Sisters Avenue to Ochoco Way connecting on the east side. None of these local streets has been improved beyond a narrow two-lane paved section.

South Apron Subarea

- ✓ Water: This subarea is currently served by a 12-inch main within Airport Way, and a 10-inch main connecting to the terminal loop.
- ✓ Sewer: This subarea is served by 8-inch mains within Airport Way and the on-site access roads.
- ✓ Transportation: This subarea is served by Salmon Avenue, which connects to Airport Way. Salmon Avenue is a two-lane local street with no sidewalks, with the exception of one short segment. This site has direct access to the airport taxiways.

West Business Park Subarea

- ✓ Water: This subarea houses the existing water reservoirs at the north end of 6th Street. These reservoirs supply mains ranging from 10 to 18 inches within the subarea.
- ✓ Sewer: This subarea is served by 8-inch mains within the streets throughout the subarea.
- ✓ Transportation: This subarea has minor arterial streets along its northern boundary (Veterans Way) and eastern boundary (Airport Way). Veterans Way connects to both US 97 and OR 126 and has been constructed with a two-lane cross section that includes bike lanes but almost no sidewalks. It has no left-turn lanes at any of the local street intersections into the subarea. Airport Way connects to US 97 and has been constructed primarily with a two-lane cross section augmented with left-turn and right-turn lanes at intersecting streets. Bike lanes are part of the roadway, but pedestrian facilities only exist along some developed parcels. This subarea also includes Salmon Street, a major collector, and a local street network that serves existing development. To accommodate the Airport Runway Extension, plans to relocate the Airport Way/Veterans Way intersection and realign several network streets are under development by the City. A railroad spur from the BNSF tracks extends to the western boundary of this subarea.

Airport Way Subarea

- ✓ Water: This subarea is currently served by an 18-inch main within Airport Way.
- ✓ Sewer: This subarea is currently served by a 12-inch main within Airport Way to the east and south. Sewer flows from this subarea appear to be split between two separate main lines running north and west from the site.
- ✓ Transportation: This subarea is served by Airport Way, a minor arterial that connects southward to US 97 and northward to Veterans Way and OR 126. Airport Way has been constructed with a three-lane cross section (including bike lanes) with right-turn lanes at some intersections, but sidewalks are present on only some segments. Mt. Hood Drive was constructed as a four-lane local street eastward from Airport Way to the Fairgrounds but does not currently extend to the west, although a street stub has been constructed. The intersection of Wickiup Avenue (a local street) at Airport Way has been constructed, but no existing roadway connects to the intersection. The BNSF railroad tracks run along the western boundary, but has no existing rail spurs in this subarea.

Fairgrounds Industrial Subarea

- ✓ Water: This subarea is currently served by a 12-inch main within 19th Street, and 8-inch mains elsewhere throughout the subarea.
- ✓ Sewer: This subarea is currently served by a 12-inch main within 19th Street, and 8-inch mains elsewhere within the subarea.
- ✓ Transportation: This subarea is currently served by 19th Street, a minor arterial that connects to Airport Way approximately one-quarter mile from US 97. 19th Street has been fully constructed with a three-lane cross section, with sidewalks and bike lanes on both sides from Airport Way to Elkhorn Avenue. A network of new local streets west of 19th Street serve existing development. The BNSF railroad tracks run along the western boundary, but BNSF has no existing rail spurs in this subarea.

RECOMMENDED UPGRADES

The following recommendations are offered based on a comparison of the existing utility and transportation facilities and the corresponding demands of the target industries. In all subareas, sewer lines would need to be extended from nearby mains and stormwater management facilities would need to be constructed in conjunction with site development. Local streets should be constructed to the local industrial street standard (40-foot paved width with sidewalks) to accommodate necessary truck access for most of the target industry sectors. Improved access to OR 126 will eventually be required to accommodate future growth with any of the target industry sectors and will likely include added turn lanes and traffic signals. Turn lanes at major intersections may also be needed to serve future development.

Necessary improvements would be identified with the preparation of traffic impact studies for specific development proposals.

Specific upgrade requirements for each subarea are noted below.

- North Development Parcel Subarea: The existing water lines between Lake Road and Veterans Way are not well-connected. We recommend installing a loop system throughout the subarea to maintain necessary flows for high-demand industrial users. This subarea currently has no existing transportation infrastructure and will need to rely on the construction of new streets. Transportation improvements associated with the Airport Runway Extension will eventually provide access through the subarea. Local streets that provide direct site access will need to be constructed to the local industrial standard (40-foot paved width with sidewalks).
- North Business Park Subarea: The existing water lines between Veterans Way and OR 126 are not well-connected. We recommend installing a loop system to supply necessary flows for high-demand users. The local streets (10th Street, Sisters Avenue, Ochoco Way) need to be upgraded to the current local industrial standard (40-foot paved width with sidewalks). Veterans Way needs to be upgraded to meet the major collector standard (36-foot paved width with sidewalks). At the Veterans Way intersection with OR 126, an eastbound right-turn deceleration lane on OR 126 may be necessary as volumes increase, and separate left- and right-turn lanes may be necessary on the Veterans Way approach. Left-turn lanes on Veterans Way at other intersecting roadways may also be needed.
- South Apron Subarea: Salmon Avenue needs sidewalks on the north side of the street.
- West Business Park Subarea: Airport Way and Veterans Way need sidewalk infill, primarily along undeveloped property.
- Airport Way Subarea: Airport Way needs sidewalk infill on both sides of the street. Mt. Hood Drive needs sidewalks along both sides of the street. Wickiup Avenue needs to be constructed/upgraded to the current local industrial standard (40-foot paved width with sidewalks).
- Fairgrounds Industrial Subarea: Airport Way needs sidewalks on the south side of the street.

APPENDIX G:

NOISE INPUTS

NOISE INPUT APPENDIX

Existing (2016) and Future (2036) noise contours were generated with the FAA's Aviation Environmental Design Tool (AEDT) version 2d. Inputs were obtained from a variety of sources including, Chapter 2 *Aviation Activity Forecasts* of this Master Plan, Airport personnel, Air Traffic Control Tower personnel, published instrument procedures and traffic patterns and institutional knowledge.

The following information formed the basis of the noise contour development.

Table G-1 Activity Table 2016 Itinerant Operations Category	Modeled Aircraft	Modeled Operations
Air Carrier	Q400	5,688
	CRJ-700	506
Commuter / Air Taxi	CRJ-200	4,556
Air Cargo and Forest Service	Beech 99	965
	Cessna Caravan 208	965
	BAE 146	250
	Ayres T34 Thrush	250
General Aviation	Citation II	330
	Citation V	330
	GLF6	330
	Pilatus PC-12	330
	Cessna Conquest	330
	CJ1	330
	Piaggio Avanti	330
	TBM850	330
	Lancair	2,087
	Lancair Turbine	2,087
	GASEPV	2,087
	GASEPF	2,087
Helicopter	SH-60	500
	R22	0
Military	P-3	114
	King Air 90	114
	C-130	114
TOTAL ITINERANT OPERATIONS		**25,010**

Local (touch-and-go) Operations Category	Modeled Aircraft	Modeled Operations
General Aviation		
	C-172	5,267
	Piper Seminole	5,267
	King Air 90	5,267
	Lancair	2,104
	Lancair Turbine	2,104
	GASEPV	2,104
	GASEPF	2,104
Helicopter		
	R22	4,200
Military		
	P-3	90
	King Air 90	83
	C-230	83
TOTAL TOUCH-AND-GO OPS		28,673
TOTAL AIRPORT OPERATIONS*		**82,356**
*Airport operations include a 2x multiplier for touch-and-go operations as one touch-and-go represents two operations for counting purposes		

Table G-2 Activity Table 2036 Itinerant Operations Category	Modeled Aircraft	Modeled Operations
Air Carrier	Q400	1,000
	E175	1,000
	CRJ-900	1,000
	MRJ-90	2,400
	737-700A319	4,350
	737-700	1,800
	737-800	750
	737-900	300
	CRJ-700	0
Commuter / Air Taxi	CRJ-200	0
Air Cargo and Forest Service	Beech 99	1,050
	Cessna Caravan 208	1,050
	BAE 146	250
	Ayres T34 Thrush	250
General Aviation	Citation II	420
	Citation V	420
	GLF6	420
	Pilatus PC-12	420
	Cessna Conquest	420
	CJ1	420
	Piaggio Avanti	420
	TBM850	420
	Lancair	2,660
	Lancair Turbine	2,660
	GASEPV	2,660
	GASEPF	2,660
Helicopter	SH-60	1,000
	R22	0
Military	P-3	100
	King Air 90	100
	C-130	100
TOTAL ITINERANT OPERATIONS		30,500

Local (touch-and-go) Operations		
Category	**Modeled Aircraft**	**Modeled Operations**
General Aviation	C-172	5,330
	Piper Seminole	5,330
	King Air 90	5,330
	Lancair	2,363
	Lancair Turbine	2,363
	GASEPV	2,363
	GASEPF	2,363
Helicopter	R22	4,250
Military	P-3	83
	King Air 90	83
	C-230	83
TOTAL TOUCH-AND-GO OPS		29,939
TOTAL AIRPORT OPERATIONS*		**90,377**

*Airport operations include a 2x multiplier for touch-and-go operations as one touch-and-go represents two operations for counting purposes

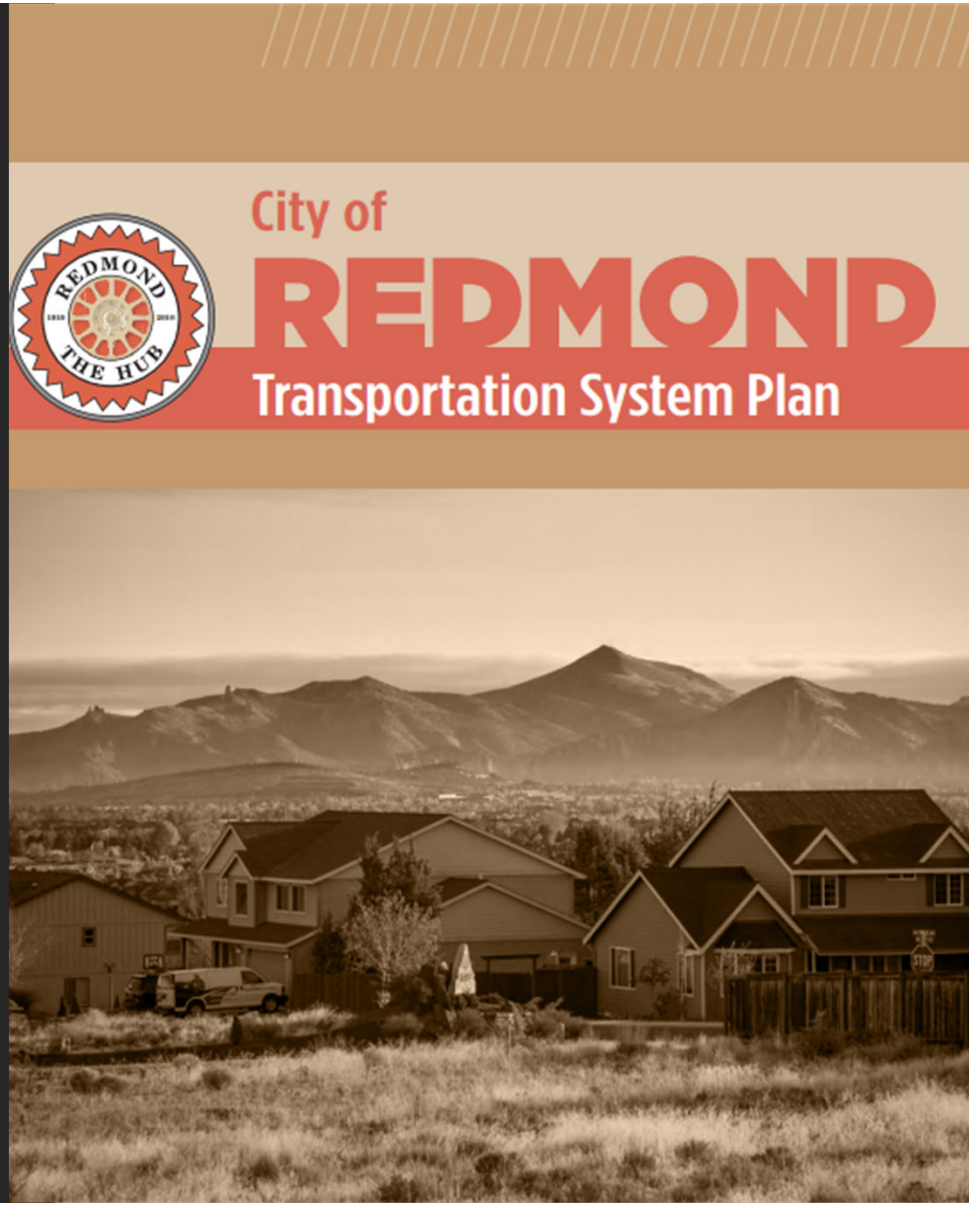
Table G-3 Time of Day	
Air Carrier	
Day	**Night**
82%	18%
Commuter / Air Taxi	
Day	**Night**
82%	18%
Air Cargo	
Day	**Night**
50%	50%
Forest Service	
Day	**Night**
100%	0%
General Aviation - Itinerant	
Day	**Night**
93%	7%
General Aviation - Local	
Day	**Night**
95%	5%
Helicopter	
Day	**Night**
100%	0%
Military	
Day	**Night**
95%	5%

Table G-4 Runway Use Distribution			
Commercial Arrivals			
Runway			
11	29	5	23
5%	5%	30%	60%
Commercial Departures			
Runway			
11	29	5	23
5%	5%	60%	30%
General Aviation Arrivals			
Runway			
11	29	5	23
60%	30%	5%	5%
General Aviation Departures			
Runway			
11	29	5	23
60%	30%	5%	5%

City Council Public Hearing

Transportation System Plan (TSP) Update

December 8, 2020



Topics

- TSP Purpose
- Key Aspects
- Plan Development
- Key Projects Identified, Implementation & Funding

REDMOND
Transportation System Plan

How will the TSP Guide Redmond?

IDENTIFIES PROJECTS, PROGRAMS AND POLICIES FOR: DRIVING, WALKING, CYCLING

SUPPORTS ANTICIPATED GROWTH IN JOBS AND HOUSING OVER THE NEXT TWENTY-YEARS

GUIDES DECISIONS RELATED TO LAND USE AND TRANSPORTATION FUNDING PRIORITIES

GUIDES WORK WITH OTHER AGENCY PARTNERS TO SEEK FUNDING

REDMOND
Transportation System Plan

Key Aspects of the TSP

Updates the 2008 TSP

- Realign transportation vision with recently completed South Corridor Plan and expected growth over the next 20-years

- Comprehensive strategy for future changes to the transportation system:
  - Street and Intersection projects that address congestion and plan for new development areas
  - Improvement and expansion of paths, sidewalks and bike facilities for those walking and biking
  - Framework for future expansion of transit system

REDMOND
Transportation System Plan

How was the TSP Developed?

REDMOND
Transportation System Plan

Community Input & Feedback at All Steps:

- "Stakeholder Interviews"
- Worked with Project Advisory Committee (PAC)
- Held 2 public meetings; one co-hosted with the South Corridor Plan
- Maintained project website
- Coordinated with Comprehensive Plan 2040 Process, Neighborhood Revitalization Plan, South Corridor Plan and CET Master Plan
- Regular outreach and coordination by City Staff

How was the TSP Developed?

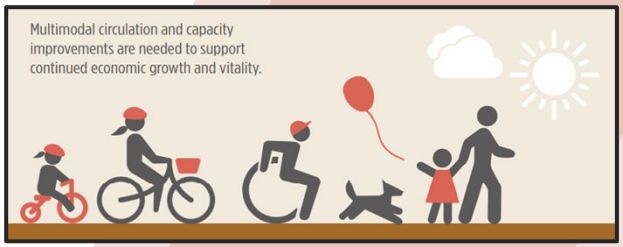
- Project Management Team (PMT); 20 meetings:
  - City Staff
  - ODOT
  - Deschutes County
- Coordinated with Transportation Providers:
  - Cascades East Transit
  - Redmond Airport

REDMOND
Transportation System Plan

Key Aspects of the TSP

- Streets and Intersections:
  - Functional Classification Designations
  - Design Standards
  - Widening Projects
  - New Planned Streets
  - Intersection Capacity Changes
  - Highway Projects
- Multi-Use Pathways
- Bicycle Corridors
- Sidewalk Needs
- Transit Corridors
- Freight Routes
- Redmond Municipal Airport
- Coordination with:
  - Rail System
  - Waterways/Pipelines

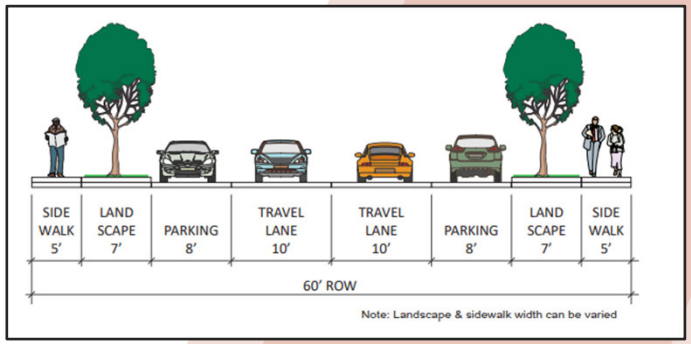
Identifies expectations for how streets and intersections will perform



REDMOND
Transportation System Plan

Key Street Needs

- Functional Classification System
  - Identifies how streets will look and feel
  - Designates space for:
    - Walking
    - Cycling
    - Driving
    - Landscaping
- Identifies Cross-Sections for local, collector and arterial streets



REDMOND
Transportation System Plan

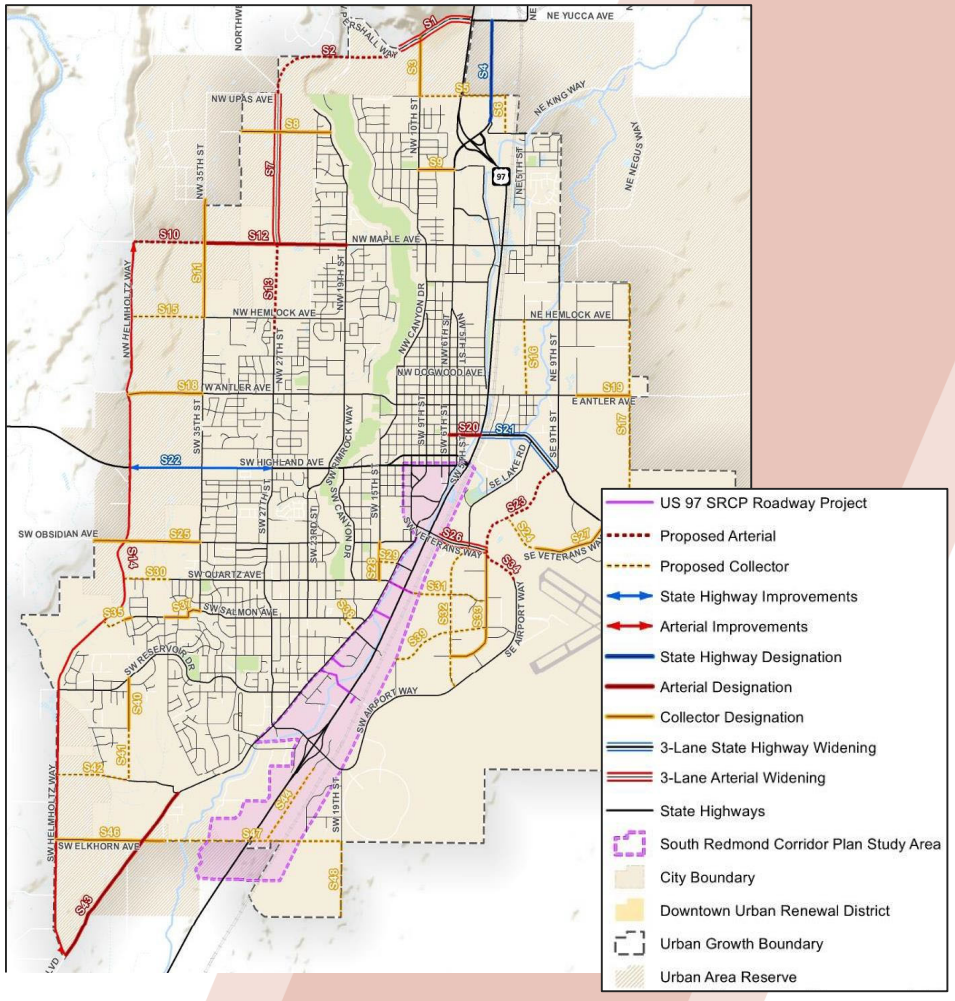
Key Street Needs

Strategic Street Capacity Investment Corridors

- 6 projects
- $54.1M

New Planned Streets

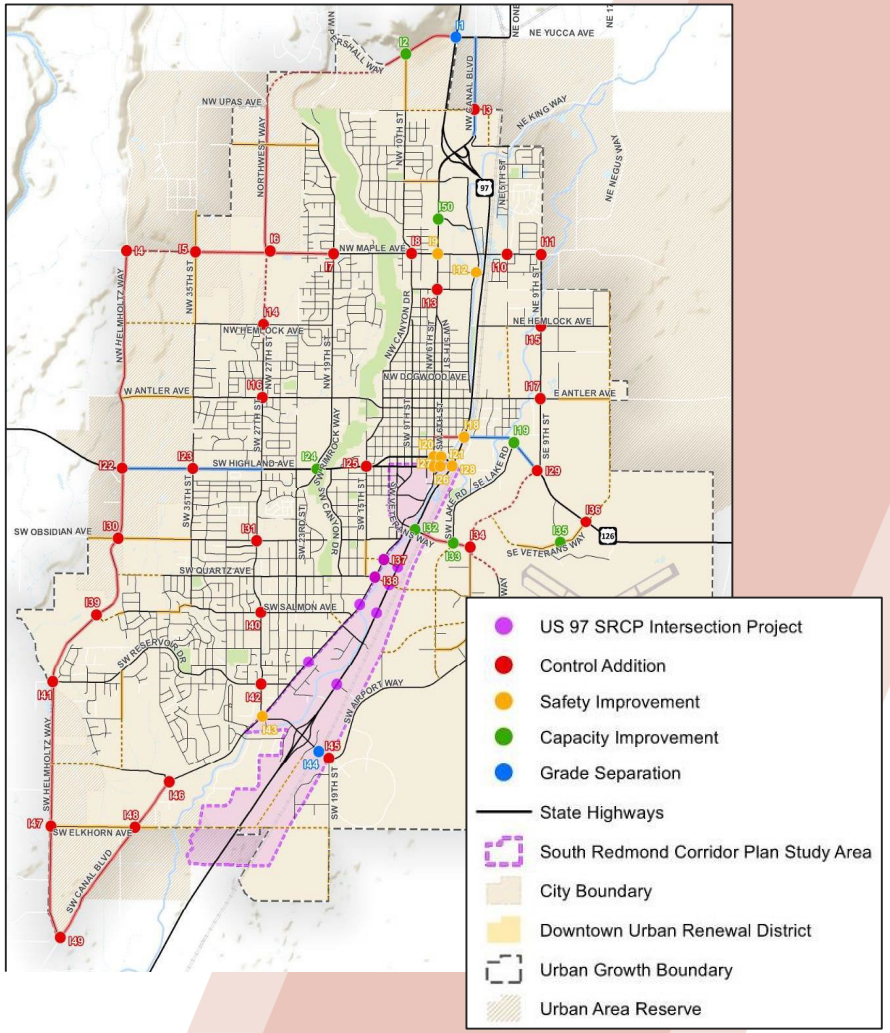
- 23 projects
- $114.1M



REDMOND
Transportation System Plan

Intersection Needs

- Intersection Capacity
  - 38 projects
  - $37.1M to$74.9M
- Grade-Separated Interchanges
  - 3 projects
  - $42.9M



JR1

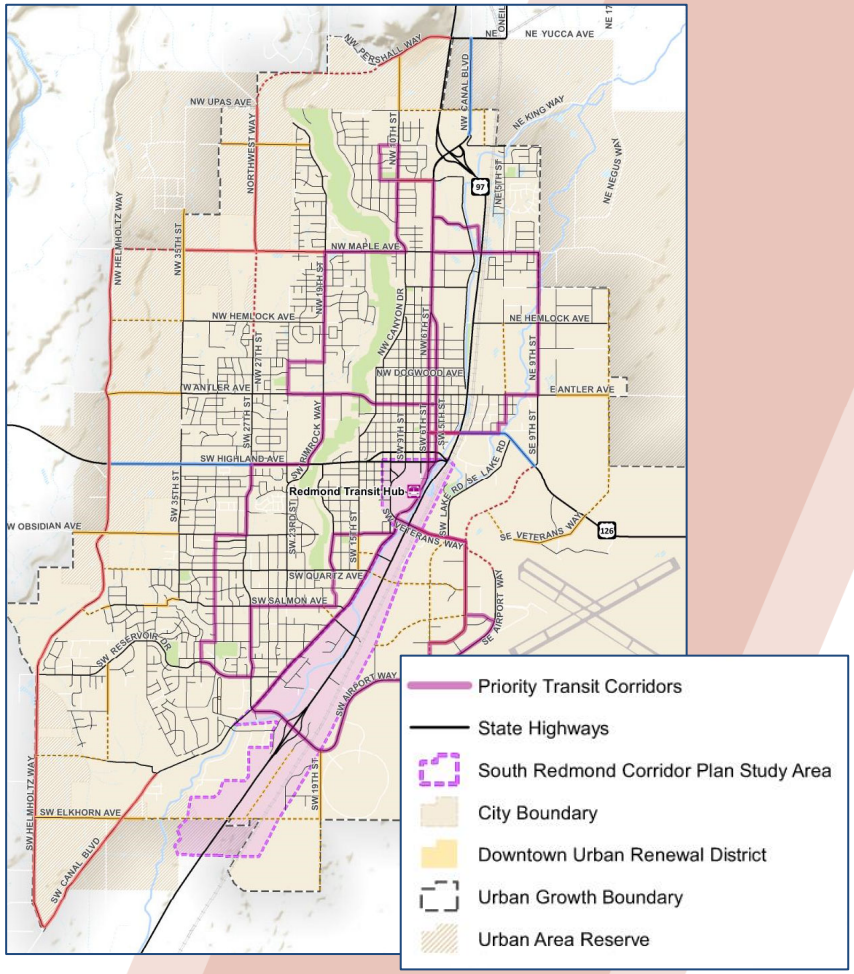
REDMOND
Transportation System Plan

Slide 10

JR1 John Roberts, 12/3/2020

Key Transit Corridors

- TSP dentifies key corridors for future transit service
- CET working on new transit service for Redmond



REDMOND
Transportation System Plan

How will Priorities be Funded?

Revenue Source	Average Annual Revenue	20-Year Revenue Forecast
SDC Improvement Sub-Fund	$1.02M	$20.35M
SDC Reimbursement Sub-Fund	$0.12M	$2.35M
Capital Projects Sub-Fund	$0.85M	$17.07M
Total Revenue	$1.99M	$39.77M

REDMOND
Transportation System Plan

Transportation Funding & Implementation

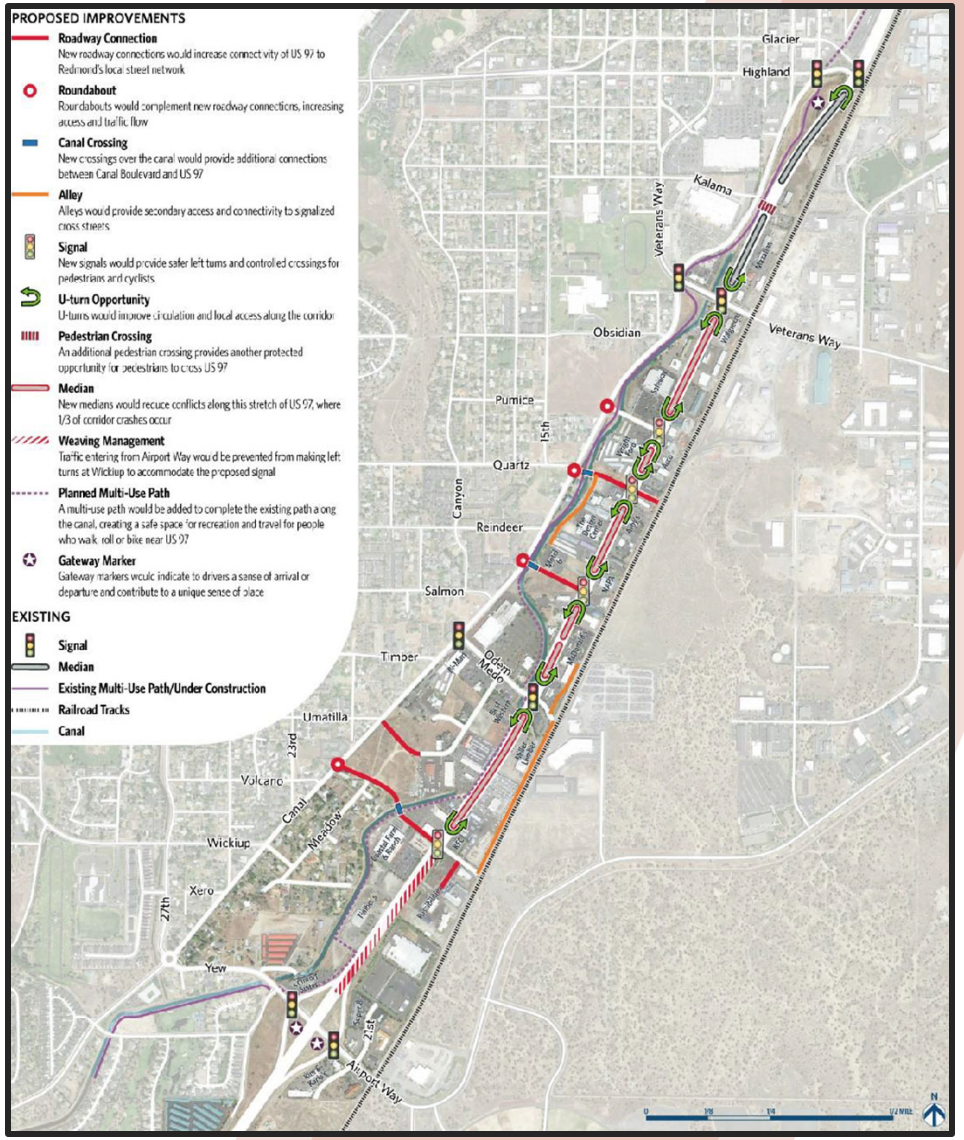
Summary of Transportation System Costs

Project Category	Total Cost ($2020)
Strategic Street Capacity Investment Corridors	$54.1M
New Planned Streets	$114.1M
Intersection Capacity Improvements	$35.4M to $70.5M depending on intersection control type selected
Other Priority Intersection Capacity Improvements	$1.7M to $4.4M depending on intersection control type selected
Grade-Separated Intersection Improvements	$42.9M
Key Multi-Use Pathways	$104.7M
Key Bicycle Corridors	$17.4M
New Sidewalk Facilities along ADA Routes	$5.5M
Sidewalk and ADA Ramp Upgrades	$11.3M
US 97 South Redmond Concept Facility Plan	$55 - $60M
Total Cost	$442.1M to $484.9M depending on intersection control type selected

REDMOND
Transportation System Plan

How Does TSP Incorporate Changes to US 97?

- City Council has adopted plan and incorporated into current TSP by reference
- Proposed TSP is closely aligned with corridor plan
- Future project delivery is not funded
- Concept will be further refined through future design efforts



REDMOND
Transportation System Plan

Questions?

REDMOND
Transportation System Plan

Airport Master plan

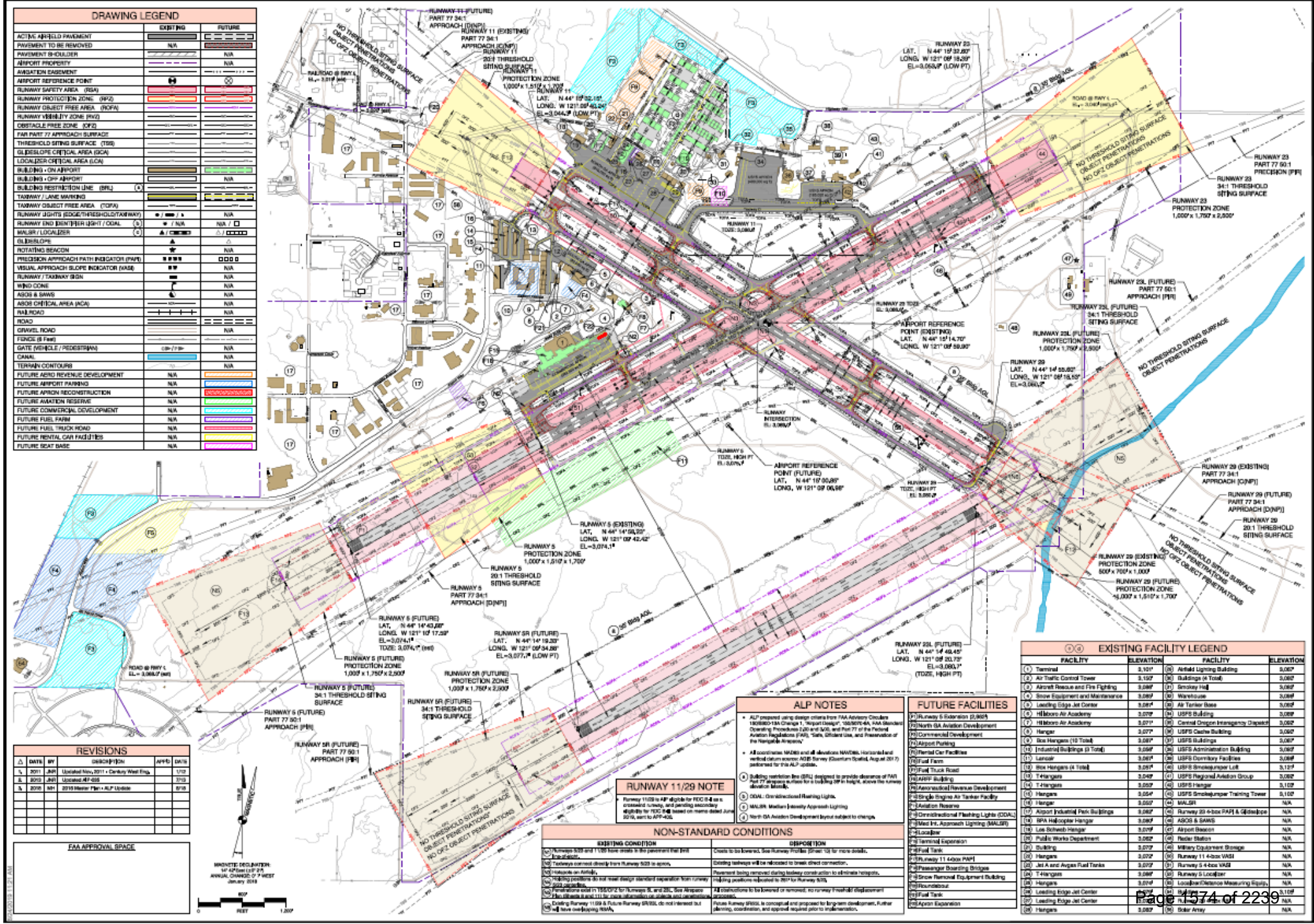
Master plan

- Required every 10 years
- Last one completed in 2005
- Began in 2016 (3-year process)
  - FAA approved in 2018
  - Airport Layout plan in 2019

The master plan: the essentials

1. Forecasting
2. Airport layout plan
3. Land use planning
4. Airspace review
5. CIP planning
6. Protecting for the future

Airport Layout plan



The master plan:
public engagement

1. 12-member planning advisory committee
2. 3 public open houses
3. 2 internal stakeholder meetings
4. Continual Airport committee involvement/approval
5. Multiple city council updates

Questions?

CITY OF REDMOND

CITY HALL
411 SW 9th STREET
REDMOND, OR 97756
541.923.7710
FAX: 541.548.0706
info@redmondoregon.gov
redmondoregon.gov

STAFF REPORT

DATE: December 8, 2020
TO: Redmond City Council
THROUGH: Keith Witcosky, City Manager
FROM: John Roberts, Deputy City Manager
Deborah McMahon, Planning Manager
SUBJECT: Ordinance #2020-20 - An ordinance adopting a new Redmond Comprehensive Plan 2040, including a Zone Map and Economic Opportunities Analysis.

Addresses Council Goal:

7. COMPREHENSIVE PLANNING: Enhance the quality of life through adoption of programs, policies, and standards that balance growth while maintaining our unique character.

A: Promote quality development.
A.i: Using the City Code and other tools, incorporate Great Neighborhood Principles for both new and infill development.
A.ii: Review and drive livability goals for design requirements in residential and commercial development in Redmond.

Report in Brief:

This City Council action would provide formal adoption of the Redmond Comprehensive Plan 2040 Update. The update also includes the Zone Map and Economic Opportunities Analysis (EOA).

Attached documents:

- Ordinance 2020-20
  - Exhibit A: Comprehensive Plan, Zone Map, Economic Opportunity Analysis
  - Exhibit B: Findings and Conclusions Redmond Comprehensive Plan 2040
- Redmond Comprehensive Plan Zone Map
- Economic Opportunities Analysis

Background:

Redmond's Comprehensive Plan 2040 is the blueprint for the City's future development over the next 20-years. The Comprehensive Plan serves as the primary land use planning document, establishing a series of goals and policies that guide future growth and development. City leaders use the Comprehensive Plan to manage expected population and employment growth, coordinate public investments and make decisions about new and existing businesses, housing and neighborhoods, transportation, parks and trails, infrastructure, and more. The update involved extensive outreach and public engagement.

The EOA is the statutorily required economic element of the Comprehensive Plan. It provides the basis for economic development, as well as an action plan to implement the economic development policies. The EOA determined whether the City had enough land to accommodate twenty years of commercial and industrial job growth.

Redmond last made a significant updated to its Comprehensive Plan in 2001. Since then, the city has grown to more than 32,000 in population and is expected to grow to more than 48,000 by 2040.

New information, supportive studies, and population growth necessitated public outreach, a review of Comprehensive Plan policies, and required updating to meet the Statewide Land Use Goals. The planning process created goals, policies and strategies that preserve and improve assets like Redmond's small-town character, thriving industrial businesses,

downtown core, distinct neighborhood identities, and access to outdoor recreation amenities like the Dry Canyon. The City contracted with 3J Consulting to guide the update process and public engagement.

Since May 2019, over 800 community members participated in events, community conversations, and online surveys to provide input into the Comprehensive Pan and share their vision for how Redmond should grow and change over the next twenty years. As part of public outreach, community members participated in interactive, map-based workshops to identify key land use opportunities and future development scenarios.

The studies needed to support the Comprehensive Plan have been completed and are part of the Plan update as denoted in the bibliography. The Planning Commission held work sessions and public hearings, as required by law, recommending approval of the Comprehensive Plan update.

The City contracted with ECONorthwest to develop the EOA and an Economic Development Strategy for Redmond. A Project Advisory Committee was formed to guide the EOA update process and public engagement.

Discussion:

The Redmond Comprehensive Plan 2040 establishes a policy framework rooted in a factual basis that helps inform other critical planning documents and implementing tools that together serve as a coordinated, overarching strategy for the City. This approach establishes the structure for how the City works and provides services. Ultimately, the Comprehensive Plan outlines the direction that the City will take when planning for land use and making public investments.

The Comprehensive Plan is presented in a series of chapters that identify the City's current assets and trends related to the twelve Oregon Statewide Planning Goals that are applicable to Redmond. Each chapter is informed by a review of relevant documents and a compilation of demographic, socio-economic and GIS data, where applicable. The purpose of this extensive review was to create a shared understanding of the City's current assets and identify potential policy questions or updates to consider. The City has also included a chapter on livability standards and policies designed to help Redmond retain its small town attributes.

Developing the Redmond Comprehensive Plan 2040

To update the Comprehensive Plan, the City launched Redmond 2040, a community-wide visioning effort. Occurring over a one-year period, Redmond 2040 identified the elements that make Redmond unique, what is important to protect for the future, and what Redmond should look like in 2040.

Redmond 2040 was built by going to places where people were, rather than directing participation to only occur at City Hall. Through Community Conversations, booths and intercept surveys at community-wide fairs and events, Comprehensive Plan Vision Summits and online engagements, the process had connection with over 800 people in the community.

A Steering Committee made up of key stakeholders, representing a cross-section of community interests and interagency partners, guided the process. The Steering Committee worked closely with a Technical Advisory Committee, which provided subject matter expertise to guide the overall direction of the Comprehensive Plan update. Together, these committees reviewed materials, acted as liaisons to various constituencies and interest groups and hosted outreach events and activities. The Steering Committee was instrumental in advancing community priorities to craft the vision and develop policies.

Vision 2040

The six guiding principles of the updated Redmond 2040 Vision include:

- Effective and collaborative governance
- Great neighborhoods for strong communities
- Business-friendly culture
- Connected transportation system
- Network of trails and parks
- Commitment to the natural environment.

Mapping

The Comprehensive Plan Map shows the type, location and density of land development and redevelopment permitted in the future. The City employs a "one map system" where the Comprehensive Plan Map and Zoning Map are identical.

Scenario planning was used to explore the alternatives to how Redmond might accommodate growth over the next 20-years. Scenarios were used to illustrate how planning choices impact important community issues, such as access to

parks, water conservation, and economic development. The planning team created three scenarios (A, B and C) for Redmond based on input from the public workshop, community conversations, and research. Each scenario met job and housing growth targets and experimented with a variety of issues including the types of housing built in new neighborhoods, where to locate new businesses, where to focus redevelopment, and where to preserve open space. Each scenario was evaluated using metrics including housing, natural resources, transportation, sustainability, and economic development.

The Comprehensive Plan Map and policies are a reflection of the three land use scenarios explored. Successful elements of each scenario were used to inform the map and policies. *Key Comprehensive Plan Map and policies include:*

- Connect existing area plans and their surrounding areas – Urban Holding land reflects area plans.
- Identify areas of change, areas of growth, and areas of stability.
- Open up gateways to the west and the north - Downtown expands to the north and big box commercial is replaced with C4 to reflect parcel sizes not suited to large commercial development.
- Allow neighborhood hubs to emerge.
- Make areas around the airport compatible with the Airport Master Plan.
- Allow for a more diverse, denser housing mix.
- Keep the spirit of downtown.
- Change large-scale commercial to walkable commercial development on smaller parcels.

The adopted Comprehensive Plan and Zoning Map will emulate the Redmond 2040 Vision, goal and policy direction, and what the community identified to preserve.

Chapter 15 - Livability

Another aspect of the Comprehensive Plan 2040 is Chapter 15 - Livability. Livability is a not an Oregon Land Use Goal, but a Redmond-specific goal that stems from the community's vision. The Goal of Livability is overarching as it applies to all facets of growth and development, as well as all chapters of the Comprehensive Plan. "Livability" in and of itself fosters thoughtful development and a thriving community. It helps convey an image of a future that offers a desirable small-town quality of life.

The Goal also complements the City's Great Neighborhood Principles (GNPs). Both Chapter 15 and the GNPs contained in Chapter 14 (Urbanization) are important to advance and connect planning goals and policies within the Comprehensive Plan and to enhance the community's broader vision for the future. Thus, the goal and policies contained in Chapter 15 identify important "Livability" attributes to examine and apply as the community continues to grow and develop. They create awareness to position Redmond to better respond to ever changing social, economic, or environmental conditions.

Bibliography of Planning Resources and Specific Studies

In developing the foundational basis for the Comprehensive Plan update, many planning resources and supportive studies were reviewed and considered. Thirty-three mandated and pertinent reports, plans and documents were identified or used to support the Comprehensive Plan's development or implementation strategies.

Economic Opportunities Analysis (EOA)

The EOA complies with the requirements of statewide planning Goal 9 and the Goal 9 administrative rules (OAR 660 Division 9). Goal 9 requires cities to identify the characteristics of sites needed to accommodate industrial and other employment uses (OAR 660-009-0025(1)) over the twenty year planning period. This approach could be characterized as a site-based approach that projects land need based on the forecast for employment growth, the City's economic development objectives, and the specific needs of target industries.

The EOA includes technical analysis to address a range of questions that Redmond faces in managing its commercial and industrial land. The primary goals of the EOA were to (1) project the amount of land needed to accommodate the future employment growth within the Redmond Urban Growth Boundary (UGB) between 2020 and 2040, (2) evaluate the existing employment land supply within the city to determine if it is adequate to meet that need, and (3) to fulfill state planning requirements for a twenty year supply of employment land.

Redmond currently has 2,925 total acres in its commercial or industrial plan designations. Of these 2,925 acres, about 1,555 acres (53%) are unconstrained and buildable within its UGB. Of Redmond's buildable acres, 257 (17%) are designated. Accordingly, Redmond's employment base was 20,557 employees in 2020. Redmond is forecast to have 32,408 employees by 2040. This is an increase of 11,851 jobs over the planning period. Redmond will also accommodate new government employees (i.e., 1,308 employees) in institutional plan designations.

The EOA drew on information from numerous data sources, such as the Oregon Employment Department, U.S. Bureau of Economic Analysis, U.S. Bureau of Labor Statistics, and the U.S. Census. The EOA also used information from the

following reports: Redmond Municipal Airport Master Plan (2018), South Redmond Tract Large Lot Industrial Site: Findings Report and Master Development Plan (2018); South Highway 97 Corridor Plan Study (2010) and US 97 South Redmond Corridor Project; and Central Oregon 2017–2021 Comprehensive Economic Development Strategy (2017).

Reviewing and Updating the Redmond Comprehensive Plan 2040
The Comprehensive Plan is a living document. As demographics, economics and technology change, so do the attitudes and aspirations of the community. The Plan will periodically undergo a major review as required by state law to assure it remains a relevant and workable framework for development. If rapidly changing conditions warrant reconsideration of the Plan's Goals and Policies between the required Periodic Review periods (generally every 10 years), modifications may be initiated by the City Council or Planning Commission.

Fiscal Impact:
There is no direct financial impact by adopting the Comprehensive Plan.

Alternative Courses of Action:
Conduct the public hearing and consider additional public testimony. Courses of action include:

1. Approve Ordinance 2020-20.
2. Direct staff to make additional changes and approve Ordinance 2020-20.
3. Do not approve Ordinance 2020-20.
4. Take no action and request more information for review at a continued hearing.

As required by City Charter, notices regarding this public hearing were posted in three places (the Library, the Police Department, and the Redmond Chamber of Commerce) in addition to City Hall on December 1, 2020, and three copies of the ordinance were available for review at City Hall.

Recommendation / Suggested Motion:
"I move to have a first and second reading of Ordinance #2020-20, by title only." (Voice vote)

(City Attorney will read ordinance by title only, twice.)

"I move to approve Ordinance #2020-20." (Roll call vote)

CITY OF REDMOND
ORDINANCE NO. 2020-20

AN ORDINANCE ADOPTING A NEW REDMOND COMPREHENSIVE PLAN 2040, INCLUDING A ZONE MAP AND ECONOMIC OPPORTUNITIES ANALYSIS.

WHEREAS, the formulation and adoption of such a Comprehensive Land Use Plan and Zone Map is mandated by the provisions of Oregon Revised Statues Chapters 197 and 227 and the Statewide Planning Goals adopted pursuant thereto by the State Land Conservation and Development Commission that regulate and control the development of land within the City; and

WHEREAS, the adoption of such a Plan and Zone Map is deemed necessary to achieve orderly and efficient growth of the City within the Urban Growth Boundary area, to promote public health, safety and general welfare of the City; and

WHEREAS, the adoption of such a Plan and Zone Map guides the development of growth within the City and adjoining areas within the Urban Growth Boundary so that uses maintain their identities through exclusion of incompatible uses; and

WHEREAS, the adoption of such a Plan and Zone Map maintains a suitable balance between the built environment and open space, ensures preservation of adequate lands for future needs relative to balanced economic development, and promotes the safe and efficient movement of people and goods; and

WHEREAS, the adoption of such a Plan and Zone Map facilitates adequate provision of community services, protects the City from excessive urban sprawl, inefficient land uses and development patterns, and furthers the coordination of land use and development between all affected parties; and

WHEREAS, the City Council has an adopted set of goals that include: “Enhance the quality of life through the adoption of programs, policies, and standards that balance growth while maintaining our unique character” and “Promote quality Development”; and

WHEREAS, in 2019, the City of Redmond selected 3J Consulting as the Project Consultant and then initiated a public planning process to develop the Redmond Comprehensive Plan 2040; and

WHEREAS, following an extensive public process which involved the Redmond City Council, Redmond Urban Area Planning Commission, Steering Committee, Technical Advisory Committee, City staff, state and local agencies, developers, property owners and interested citizens, the Redmond Comprehensive Plan 2040, Economic Opportunity Analysis, and Zone Map are ready to be adopted; and

WHEREAS, the City of Redmond Urban Area Planning Commission after reviewing the entire record and gathering public testimony have formulated and recommended the subject Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis for adoption; and

WHEREAS, the Redmond Urban Area Planning Commission conducted a public hearing on November 16, 2020, continued to November 23, 2020; and

WHEREAS, the City Council held a public hearing on December 8, 2020 to consider the recommendations of the Redmond Urban Area Planning Commission, review the existing record and gather additional evidence and public testimony; and

WHEREAS, the City Council determines that the findings and conclusion for the adoption of Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis set forth in Exhibit B fully addressed the City's Comprehensive Plan and Development Code, the applicable state law, and the Statewide Planning Goals; and,

WHEREAS, the City Council finds the Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis are necessary to further these interests.

NOW, THEREFORE, THE CITY OF REDMOND ORDAINS AS FOLLOWS:

SECTION ONE: The City of Redmond hereby adopts the Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis attached hereto as "Exhibit A."

SECTION TWO: In support of the adopted plans and Zone Map, the City for Redmond hereby adopts the findings and conclusion, attached hereto as "Exhibit B" which were prepared by City staff and demonstrate compliance with the City's Comprehensive Plan, Development Code, the applicable state law, and Statewide Planning Goals.

SECTION THREE: The provisions of this Ordinance are severable. The invalidity of any section, clause, sentence, or provision of this Ordinance shall not affect the validity of any other part of this Ordinance, which can be given without such invalid part, or parts.

SECTION FOUR: This Ordinance may be corrected by order of the Redmond City Council to cure editorial and clerical errors, insert appropriate amendment and legislative history, update the planning references and specific studies in the bibliography, and modify the Zone Map to make it more clear or readable.

PASSED by the City Council and **APPROVED** by the Mayor this 8th day of December 2020.

_____
George Endicott, Mayor

ATTEST:

_____
Kelly Morse, City Recorder

Exhibit A (attached hereto):

- Redmond Comprehensive Plan 2040
- Zone Map
- Economic Opportunities Analysis

Exhibit B: Findings and Conclusion

Findings to support adoption of new Redmond Comprehensive Plan 2040, Economic Opportunities Analysis, and Zone Map.

FILE NO. 711-19-000073-TA

REQUEST: A Legislative Amendment to the Redmond Comprehensive Plan, inclusive of the Zone Map and Economic Opportunities Analysis.

APPLICANT: City of Redmond, 411 SW 9th Street Redmond, OR 97756

STAFF: Deborah McMahon, Planning Manager
John Roberts, Deputy City Manager
3J Consulting

HEARINGS BODY: City Council & Redmond Urban Area Planning Commission

DATE& TIME: November 16 and 23, 2020 at 4:30 pm; Redmond Urban Area Planning Commission
December 8, 2020 at 6:00 pm; Redmond City Council

LOCATION: Virtual Meeting through 'GoTo' as noticed and published - City Council Chambers, 411 SW 9th Street, Redmond, OR 97756

I. APPLICABLE CODE SECTIONS AND CRITERIA:

- Oregon Revised Statutes (ORS) – ORS 197.250, 197.610, 197.763.
- Oregon Administrative Rule (OAR), LCDC, Division 15, Statewide Planning Goals and Guidelines – OAR 660-015-0000 (as applicable).
- Development Code Section 8.0760 (Criteria for Amendments).

II. BACKGROUND SUMMARY:

The Redmond Comprehensive Plan 2040 Update has been completed and is before the City Council for adoption. The update also includes the Zone Map and Economic Opportunities Analysis (EOA). The update concludes the Redmond 2040 public outreach process and policy review.

Redmond's Comprehensive Plan 2040 is the blueprint for the City's future development over the next twenty years. The Comprehensive Plan is the City's primary land use planning document, establishing a series of goals and policies that guide future growth and development. City leaders will use the Comprehensive Plan to manage expected population and employment growth, coordinate public investments and make decisions about new and existing businesses, housing and neighborhoods, transportation, parks and trails,

infrastructure, and more. The update involved robust and extensive outreach and public engagement.

The EOA is the statutorily required economic element of the Comprehensive Plan (Goal 9). It provides the basis for economic development, as well as an action plan to implement the economic development policies. The EOA determined whether the City had enough land to accommodate twenty years of commercial and industrial job growth.

The update to adopt a new Comprehensive Plan were initiated legislatively by the City. The findings and supporting materials, demonstrate the proposed updates are consistent with the City's Comprehensive Plan, Statewide Planning Goals, Council Goals, and Development Code Section 8.0760. The four criteria set forth in the Development Code Section 8.0760 are addressed herein, as well as applicable state laws and requirements.

III. PROPOSAL:

The Redmond Comprehensive Plan 2040 will guide community growth for the next ten to twenty years. Redmond last made a significant updated and review to its Comprehensive Plan in 2001. Since then, the City has grown to over 32,000 residents and is expected to grow to more than 48,000 by 2040. New information, supportive studies, and population growth necessitated public outreach, a review of Comprehensive Plan policies, and required updating to meet the Statewide Land Use Goals.

The planning process created goals, policies and strategies that preserve and improve assets like Redmond's small-town character, thriving industrial businesses, downtown core, distinct neighborhood identities, and access to outdoor recreation amenities like the Dry Canyon. The City contracted with 3J Consulting to guide the update process and public engagement.

The new Redmond Comprehensive Plan 2040, once acknowledged by the State of Oregon Land Conservation and Development Commission, will fulfill Redmond's land use planning requirements of State Law. Not only does the Comprehensive Plan implement the required Statewide Planning Goals, it will serve as the guiding land use planning document for the community; particularly the development and redevelopment of the Redmond Urban Area within a framework of goals and policies consistent with the physical characteristics.

The Comprehensive Plan also articulate ideas and resources for the community to consider as local conditions and needs change, and the community continues grows. The vision, goals and policies respond to the needs and conditions which currently exist and provide the guidance for future City programs, major capital projects, investment and other funding decisions for the period for which the Comprehensive Plan was developed.

The Comprehensive Plan guides how Redmond will plan for and manage future growth and development over the next twenty years. It guides all activities related to land use and the future of natural and man-made systems and services in Redmond. It also serves as the primary means for realizing the community's vision for the future.

The Redmond Comprehensive Plan 2040, Zone Map, and all supporting plans and studies, must remain relevant and responsive and will be revisited over time.

IV. EXHIBITS & RECORD:

The following exhibits make up the record in this matter:

1. The new Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis (Exhibit A).
2. Proposed Findings and Conclusion included herein (Exhibit B).
3. Notices to the Department of Land Conservation and Development (DLCD), Notice of Planning Commission Public Hearing in the "Bulletin", Notice of City Council Public Hearing in the "Bulletin."
4. All materials and minutes amassed from the extensive and robust public engagement and participation process, including but not limited to: community conversations, open houses, steering committee and technical advisory committee meetings, land use scenario planning workshops, visioning summits, community events and surveys.
5. All relevant Planning Commission Work Session/Public Hearing staff reports and hearing minutes.
6. All public testimony received.

V. FINDINGS AND CONCLUSION:

A. REDMOND DEVELOPMENT CODE (RDC), Chapter 8, Sections 8.0750 through 8.0775 (Amendments) sets forth the procedure and standards for an amendment to the text of the Code or to the adopted Comprehensive Plan or Zoning map. Specifically, Section 8.0760 - Criteria for Amendments, sets forth the four (4) criteria that must be met:

1. Conformity with all applicable State statutes;

Finding: The State statutes that directly apply to this application include:

1. ORS 197.610, *Local Government Notice of Amendment or New Regulation*
2. ORS 197.250, *Compliance with Goals Required.*
3. ORS 197.763, *Conduct of Local Quasi-Judicial Land Use Hearings*; *Notice Requirements*.

The applicable RDC standards (sections 8.0750 to 8.0775, *Amendment Procedures and Notice Requirements)*, and (sections 8.1100 through 8.1125, *Legislative Procedures*), were developed in compliance with the applicable State Statutes listed above regarding noticing and public hearings. Applicability of the Statewide Planning Goals is addressed below. The relevant findings, incorporated by reference herein, show compliance with the aforementioned Statutes.

Regarding Statutory noticing requirements, notice of the proposed amendment has been provided to DLCD and advertised in the local newspaper (public notice) as required by City Code, Development Code and State Statute; including a Measure 56 type notice to 250 individual property owners. Moreover, notice was sent in the November issue of the City newsletter to all property owners.

Regarding Statutory public hearing requirements, this proposal is legislative and not quasi-judicial. Sections 8.1100 through 8.1125 of the RDC implement the quasi-judicial Statutory requirements in similar fashion and have been met. The Redmond Urban Area Planning Commission and City Council's public hearing and review processes meet the Statutory requirements for the purpose of the review; inclusive of a Measure 56 type notice sent to 250 individual property owners.

Notwithstanding the Statutory requirements addressed herein, the Oregon Administrative Rules (OAR) also implement the Statutes. The applicable Rules are addressed in the ensuing review.

Conclusion: Based on the findings addressing amendment criterion 1, the new Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis conforms to applicable State statutes.

2. Conformity with the State-wide planning goals whenever they are determined to be applicable;

Twelve of the nineteen Statewide Planning Goals apply to Redmond. An additional goal Livability (Goal 15) has been added by the City.

Goal 1 - Oregon's Statewide Planning Goal: Citizen Involvement.
To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

Finding: The Redmond Urban Area Planning Commission serves as the City's formal citizen advisory committee to fulfill Goal 1 and is made up of Redmond area residents. The City conducted multiple public meetings

(Planning Commission work sessions) and one public hearing over eighteen months regarding the new Comprehensive Plan, Zone Map and Economic Opportunities Analysis.

Public notices and agendas for Planning Commission meetings were provided in accordance with law. All documents were available for public review. Further, public notice advertising the public hearing was published in the Bend Bulletin and a Measure 56 type notice sent to 250 property owners.

The City continually provided public review and involvement opportunities during public work sessions and public hearings conducted by both the Planning Commission and City Council.

A robust and extensive public engagement and participation program was development to create the new Comprehensive Plan. As part of the public participation a variety of outreach was conducted. To update the Comprehensive Plan, the City launched Redmond 2040, a city-wide visioning effort designed to reach all corners of the community.

The intent of Redmond 2040 was twofold: to describe what Redmond residents and business owners want the community to be like in the year 2040, and to help inform policy in the Comprehensive Plan update that will guide investments in the years to come. The outcome was a community-vetted Vision Statement that was the foundation of the Comprehensive Plan update.

Occurring over a one-year period, Redmond 2040 uncovered the elements that make Redmond unique, what is important to protect for the future, and what Redmond should look like in 2040. The basis of Redmond 2040 was to use Community Conversations to engage people where they are versus asking them to come to City Hall. Outreach efforts were designed to engage as many people as possible, including those who are not usually involved in planning efforts, as well as connect with diverse communities across the city, empower youth, and build community connections through existing and new networks and information channels. Through Community Conversations, booths and intercept surveys at community-wide fairs and events, Comprehensive Plan Vision Summits and online engagements, the process had connection with over 800 people in the community.

Through these public involvement activities, the City provided community members with a variety of forums to identify their priorities for future growth, development, programs and policies.

Economic Opportunities Analysis (EOA)

The EOA was developed by ECONorthwest and was a completely separate process from developing the Comprehensive Plan.

The timing of Covid-19 pandemic within the EOA process did not allow for typical public engagement. In place of an in-person open house, ECONorthwest developed a virtual open house for the City of Redmond to distribute to residents and business owners. The open house included background information on Redmond's economic trends and summarized Redmond's employment land supply and employment forecast for the 20-year period. The open house also included a series of survey questions about living, working, and running a business in Redmond.

The virtual open house was available through an online presentation website with survey questions available in an online form. The website was available for the community to participate for about 3 weeks, starting in late June through mid-July 2020. Over 100 community members participated in the open house, with responses to survey questions ranging between about 60 and 100 responses.

The EOA Advisory Committee was comprised of:

- Planning Commission
- Eric Sande, Redmond Chamber of Commerce
- Jon Stark, Redmond Economic Development, Inc.
- Redmond City staff

Conclusion: Based on these actions, Oregon Planning Goal 1 for Citizen Involvement has been met.

Goal 2 - Oregon's Statewide Planning Goal: Land Use Planning.
To establish a land use planning process and policy framework as a basis for all decisions and actions related to use of land and to assure an adequate factual base for such decisions and actions.

Finding: Through the course of developing the new Redmond Comprehensive Plan 2040 and Zone Map input was received input from: Redmond City Council, Redmond Urban Area Planning Commission, Steering Committee, Technical Advisory Committee, City staff, state and local agencies, property owners, developers, and interested citizens.

The City Council has determined adequate factual and policy basis exists to support the new Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis. The new Comprehensive Plan will better implement policies of the Comprehensive Plan and provide more relevant regulations and programs for the City staff to administer or implement.

Conclusion: Based on these findings, the new Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis meet Goal 2.

Goal 5 - Oregon's Statewide Planning Goal: Open Space, Scenic and Historic Areas, and Natural Resources.
To protect natural resources and converse scenic and historic area and open space.

Finding: The State of Oregon requires all cities and counties to address State Land Use Planning Goal 5, Open Spaces, Scenic and Historic Areas, and Natural Resources. The Comprehensive Plan identifies and ensure programs shall be provided that will ensure open space, protect scenic and historic areas, and natural resources for future generations and promote healthy and visually attractive environments in harmony with the natural landscape character of Redmond.

The identification, protection and preservation of open spaces, scenic and natural resources, and historic and cultural resources is crucial to maintaining the character and quality of life in Redmond. Without the preservation of these resources, citizens could forever lose their accessibility to the environments, events and landmarks that fashion the appearance, character and sense of place offered by Redmond today.

Redmond will continue to foster and adopt programs that will protect natural resources and conserve scenic, historic and open space resources for present and future generations. These resources promote a healthy environment and natural landscape that contributes to Redmond's livability

Plans have been and will continue to provide for open space, scenic and historic areas and natural resources and will consider as a major determinant the carrying capacity of the air, land and water resources of the Redmond Urban Area. The land conservation and development actions provided for by the Comprehensive Plan and supporting studies or plans should not exceed the carrying capacity of such resources.

Redmond will also continue to use the National Register of Historic Places and the recommendations of the State Advisory Committee on Historic Preservation to designated historic sites.

The Comprehensive Plan Goal 5 goals and policies support development to be planned and directed so as to conserve the needed amount of open space, scenic and historic areas, and natural resources.

Conclusion: Based on these findings, the new Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis meet Goal 5.

Goal 6 - Oregon's Statewide Planning Goal: Air, Water and Land Resources Quality.
To maintain and improve the quality of the air, water and land resources of the state.

Finding: Statewide Planning Goal 6 requires cities and counties to maintain and improve the quality of air, water and land resources in the Redmond urban area.

The new Comprehensive Plan Goal 6 goals and policies identify and support existing or applicable plans to:

- Designate alternative areas suitable for use in controlling pollution including but not limited to waste water treatment plants, solid waste disposal sites and sludge disposal sites.
- Designate areas for urban and rural residential use only where approvable sewage disposal alternatives have been clearly identified in such plans.
- Buffer and separate those land uses which create or lead to conflicting requirements and impact upon the air, water and land resources.
- Provide for the maintenance and improvement of air, land and water resources of the planning area should consider as a major determinant the carrying capacity of the air, land and water resources of the planning area.

The Comprehensive Plan Goal 6 goals and policies support development to be planned and directed so as maintain and improve Redmond's resource quality.

Conclusion: Based on these findings, the new Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis meet Goal 6.

Goal 7 - Oregon's Statewide Planning Goal: Natural Hazards.
To protect people and property from natural hazards.

Finding: Statewide Planning Goal 7 states that developments subject to damage or that could result in loss of life shall not be planned nor located in known areas of natural disasters and hazards without appropriate safeguards. Plans shall be based on an inventory of known areas of natural disasters and hazards.

Areas of natural disasters and hazards are areas that are subject to natural events that are known to result in death or endanger life and property. While overall risk from natural hazards remains low in Redmond relative to other areas around the state, the top four threats are winter storms, a Cascadia Subduction Zone earthquake, windstorms and

volcanoes. Other hazards include wildfire, drought, earthquakes, flood, landslides and pandemics.

The new Comprehensive Plan Goal 7 goals and policies identify and support Redmond to:

- Be responsive to new hazard information.
- Adopt plans to reduce risk to people and property from natural hazards.
- Evaluate the risk to Redmond residents and property based on new information and assessments.
- Coordinate natural hazard plans and programs with emergency preparedness, response, recovery and mitigation.
- Give special attention to emergency access when considering development in hazard areas.

The Comprehensive Plan Goal 7 goals and policies support protecting people and property from natural hazards.

Conclusion: Based on these findings, the new Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis meet Goal 7.

Goal 8 - Oregon's Statewide Planning Goal: Recreational Needs.
To satisfy the recreational needs of the citizens of the state and visitors and, where appropriate, to provide for the siting of necessary recreational facilities including destination resorts.

Finding: Statewide Planning Goal 8 requires that Redmond show that its Comprehensive Plan is consistent with these goals. The 2018 Citywide Park Master Plan describes goals and policies that will guide the City in providing services related to the provision of parks, open spaces and recreational services. The Parks Plan's policies reflect the importance of parks and recreational facilities in the urban area and offer measures to ensure that citizens are provided appropriate recreational opportunities and facilities close to where they live. The plan also provides measures to protect natural resources, to the extent practicable, as population growth and new development occurs.

The Comprehensive Plan Goal 8 goals and policies support development to be planned and directed so as to satisfy recreational needs of Redmond residents and visitors, where appropriate. The 2018 Citywide Park Master Plan serves as an important supporting plan and element to the Comprehensive Plan.

Conclusion: Based on these findings, the new Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis meet Goal 8.

Goal 9 - Oregon's Statewide Planning Goal: Citizen Involvement.
To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.

Finding: Statewide Planning Goal 9 ensures that adequate land is planned and zoned to provide opportunities for employment growth on sites with a variety of characteristics (e.g., site sizes, locations, visibility, and other characteristics).

Commercial and industrial development takes a variety of shapes and leads to economic activities that are vital to the health, welfare and prosperity of communities. To be ready for these opportunities, Goal 9 requires local governments to perform an Economic Opportunity Analysis (EOA) based on a 20-year forecast of population and job growth.

Under Goal 9, all local governments should have a working inventory of areas suitable for economic growth that can be provided with public services. These inventories primarily focus on planning for major industrial and commercial developments, and having a ready supply of land appropriately zoned and located for those opportunities and local investments. As with all areas of the comprehensive plan, the amount of land planned for economic development should be adequate for a 20-year supply.

The economic development plans formed by a city often use one or more market incentives to encourage the type of development a community or county would like to see. These might include tax incentives or disincentives, land use controls, or preferential assessments.

The 2020 Economic Opportunities Analysis meets all Goal 9 requirements. The Comprehensive Plan Goal 9 goals, policies and strategies support opportunities for continued economic growth and development.

Conclusion: Based on these findings, the new Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis meet Goal 9.

Goal 10 - Oregon's Statewide Planning Goal: Citizen Involvement.
To provide for the housing needs of citizens of the state.

Finding: Statewide Planning Goal 10 addresses housing in Oregon and provides guidelines for local governments to follow in developing their local comprehensive land use plans and implementing policies. Goal 10 requires incorporated cities to complete an inventory of buildable

residential lands and encourage the numbers of housing units in price and rent ranges commensurate with the financial capabilities of its households.

"Needed housing types" are defined as "all housing on land zoned for residential use or mixed residential and commercial use that is determined to meet the need shown for housing within an urban growth boundary at price ranges and rent levels that are affordable to households within the county with a variety of incomes, including but not limited to households with low incomes, very low-incomes and extremely low-incomes."

The Comprehensive Plan Goal 10 goals and policies support the needed development of all types of housing in Redmond. The 2019 Redmond Housing Needs Analysis, inclusive of the 2019 Residential Buildable Lands Inventory serves as required supporting elements to the Comprehensive Plan.

Conclusion: Based on these findings, the new Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis meet Goal 10.

Goal 11 - Oregon's Statewide Planning Goal: Citizen Involvement.
To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.

Finding: Public facilities are those improvements which provide various government services to the residents. These include domestic water, sanitary sewer, storm drains, transportation services, parks, schools, fire and police. Additional recognized public facilities in the Redmond area include the fairgrounds and the airport. Transportation and Parks are individual chapters in the Comprehensive Plan.

Chapter 11 describes existing public and private facilities and services and known present and future needs based on projected growth. It does not present specific public improvements which may be needed. That information is contained in the City's adopted Public Facility Plan(s). The facility plan is a support document and element to the Comprehensive Plan, which describes in detail the water, sewer, transportation, and park facilities needed to accommodate anticipated development and includes cost estimates of facility improvements.

The new Comprehensive Plan Goal1 goals and policies identify and support Redmond to:

- Develop plan providing for public facilities and services in a coordinated manner with plans for designation of urban boundaries,

urbanizable land, rural uses and for the transition of rural land to urban areas.

- Provide public facilities and services at levels appropriate for urban use. 3.
- Conduct and utilize capital improvement programming and budgeting to achieve desired types and levels of public facilities and services in urban, urbanizable and rural areas.
- Develop appropriate public facilities and services to support sufficient amounts of land to maintain an adequate housing market in areas undergoing development or redevelopment.

The Comprehensive Plan Goal 11 goals and policies support the needed development of public facilities and services. The 2018 Redmond Public Facilities Plan, and periodic updates, serves as required supporting documents to the Comprehensive Plan.

Conclusion: Based on these findings, the new Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis meet Goal 11.

Goal 12 - Oregon's Statewide Planning Goal: Transportation.
To provide and encourage a safe, convenient and economic transportation system.

Finding: The 2020 Transportation System Plan (TSP) provides the City with a coordinated guide for changes to its transportation infrastructure and operations over the next twenty years. A basic assumption in the development of this policy document is that the transportation system not only meets daily travel needs but also affects the physical, social, and economic health of the City. As such, planning for the future system must be conducted within regional and community goals and values, support local and regional economic development activities, and enhance the quality of life that residents and visitors enjoy and expect.

The Comprehensive Plan Goal 12 goals and policies support the needed development of safe, convenient and economic transportation system. The 2020 TSP serves as the required supporting transportation element to the Comprehensive Plan.

Conclusion: Based on these findings, the new Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis meet Goal 12.

Goal 13 - Oregon's Statewide Planning Goal: Energy Conversation.
To conserve energy.

Finding: Statewide Planning Goal 13 requires development and land use to be managed so as to maximize the conservation of all forms of energy, based upon sound economic principles. The Comprehensive Plan goals and policies support energy efficiency, planning, and coordination and collaboration. Specifically:

- Advancing the efficient use of resources in the built environment.
- Evaluating and planning for emerging technologies to respond to changing conditions.
- Building capacity to address climate and energy trends through innovative and collaborative partnerships.
- Land and uses developed to be managed and controlled so as to maximize the conservation of all forms of energy, based upon sound economic principles.

The Comprehensive Plan Goal 13 goals and policies support energy conservation.

Conclusion: Based on these findings, the new Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis meet Goal 13.

Goal 14 - Oregon's Statewide Planning Goal: Citizen Involvement.
To provide for an orderly and efficient transition from rural to urban land use, to accommodate urban population and urban employment inside urban growth boundaries, to ensure efficient use of land, and to provide for livable communities.

Finding: Comprehensive Plan Chapter 14 (Urbanization) identifies goals and policies that the City, in cooperation with Deschutes County, has adopted to comply with Statewide Planning Goal 14, Urbanization – to provide for an orderly and efficient transition from rural to urban land use.

To comply with Statewide Goal 14, the City and Deschutes County have adopted:

- An Urban Growth Boundary (UGB) and an Urban Reserve Area (URA);
- Policies concerning the regulation and management of land within the UGB; and
- An intergovernmental agreement that describes criteria and procedures for amending the UGB and City's Development Code.

The Comprehensive Plan Goal 14 goals and policies for managing growth and urbanization, which lead to strong communities and great neighborhoods, are informed by the Great Neighborhood Principles (GNPs) contained in Chapter 14 and City's Development Code.

Conclusion: Based on these findings, the new Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis meet Goal 14.

Goal 15 – Not a Statewide Planning Goal: Livability.
To promote livability for Redmond residents.

Finding: While Livability is not a Statewide Planning Goal, Redmond City Council has included the addition of this chapter to the Comprehensive Plan.

Livability is a Redmond-specific goal that stems from the community's vision. The Goal of Livability is overarching as it applies to all facets of growth and development, as well as all chapters of the Comprehensive Plan. "Livability" in and of itself fosters thoughtful development and a thriving community. It helps convey an image of a future that is enduring, vibrant, and offers a desirable small-town quality of life.

The Goal also complements the City's Great Neighborhood Principles (GNPs); Chapter 14. Both this chapter and the GNPs are important to advance and connect planning goals and policies within the Comprehensive Plan and to enhance the community's broader vision for the future. Thus, the goal and policies contained in Chapter 15 identify important "Livability" attributes to examine and apply as the community continues to grow and develop. They create awareness to position Redmond to better respond to ever changing social, economic, or environmental conditions.

Chapter 15 stresses Redmond shall guide development by implementing forward-looking policies to improve livability, retain community identity, create a high quality of life, and support a safe environment.

Conclusion: The State Department of Land Conservation and Development should make Livability a required Statewide Planning Goal. All cities should emulate Redmond's Comprehensive Plan's attention and acknowledgement to its efforts to guide development by implementing forward-looking policies to improve livability, retain community identity, create a high quality of life, and support a safe environment.

3. Conformity with the Redmond Comprehensive Plan, land use requirements and policies;

Finding: The purpose of the Redmond Comprehensive Plan 2040 was to repeal and replace in entirety the existing 2020 Comprehensive Plan. Demonstrating conformity of the 2040 Plan to the 2020 Plan would be redundant and unnecessary. The 2040 Plan is more relevant and workable than the 2020 Plan and is representative of extensive and robust public participation and input.

The foundation for development of the Redmond Comprehensive Plan 2040 was the existing 2020 Plan; an analysis of all existing goals and policies contained in the 2020 Plan was performed as part of developing the 2040 Plan. Conformity with all the relevant Statewide Planning Goals have been satisfied as demonstrated in Criterion 2 above.

Conclusion: The Redmond Comprehensive Plan 2040 meets all statutory requirements. The 2040 Plan repeals and replaces in entirety the existing 2020 Plan. The 2040 Plan is predicted on and includes all updated supporting elements, plans and studies.

4. That there is a change of circumstances or further studies justifying the amendment or mistake in the original zoning.

Finding: A City's Comprehensive Plan is its primary land use and planning document. It establishes a series of goals and policies that guide and manage our community's growth and development for the next twenty years.

The last major update to the Comprehensive Plan was 2001. Since then Redmond has continued to play the role of the hub of Central Oregon and has attracted newcomers from all over. During the last twenty years, Redmond has steadily grown to more than 32,000 residents today. This has brought about rapid change and remarkable success.

Current data tells us the City could be home to 50,000 residents by 2040. This presents unique challenges and opportunities, such as how to enhance what our community values the most while preserving our culture and character. The community has changed on all fronts during the last twenty years. The circumstances surrounding the growth justified new supporting plans, studies and most importantly the Redmond Comprehensive Plan 2040.

The Comprehensive Plan responds to a change of circumstances to continue to be mindful in manage growth and development. The last twenty years has brought a lot of new and significant data regarding

housing, economic development, transportation, and parks. The Comprehensive Plan process and changes in the community required evaluation to all aspects of Redmond. The new Comprehensive Plan is necessary to reflect and incorporate new information to guide Redmond the next ten to twenty years through implementation.

The Comprehensive Plan also articulate ideas and resources for the community to consider as local conditions and needs change, and the community continues grows. The vision, goals and policies respond to the needs and conditions which currently exist and provide the guidance for future City programs, major capital projects, investment and other funding decisions for the period for which the Plan was developed.

Conclusion: Based on the finding, the Redmond Comprehensive Plan 2040, Zone Map, and Economic Opportunities Analysis meet Criterion 4.

VI. FINAL CONCLUSIONARY STATEMENT:

The Comprehensive Plan is the City's way of planting the seeds of successful future growth. The Plan serves as the framework that will ensure the goals, polices, supporting plans and required elements maintain the vitality and resilience of our community. The guiding principles of the Comprehensive Plan's Vision clearly embody the community's values, desires and aspirations:

- An Effective and Collaborative Governance
- Great Neighborhoods for Strong Communities
- A Business-Friendly Culture
- A Connected Transportation System
- A Network of Trails and Parks
- A Commitment to the Natural Environment.

The Comprehensive Plan guides how Redmond will plan for and manage future growth and development over the next ten to twenty years. It will guide all activities related to land use and the future of natural and man-made systems and services in Redmond. It also serves as the primary means for realizing the community's vision for the future.

The Comprehensive Plan is a policy framework rooted in a factual basis that helps inform other critical planning documents and implementing tools that together serve as a coordinated, overarching strategy for the City. This approach establishes the structure for how the City functions and the types of services that it provides. Ultimately, the Comprehensive Plan outlines the direction that the City will take when planning for land use and making public investments.

To be successful, the Comprehensive Plan has to balance the interests of the community as it continues to change. As such, the Redmond Comprehensive

Plan 2040 is a community-inspired and community-driven project. It's also a very tangible result of effective collaboration in Redmond.

Comprehensive Plan Map:
The Comprehensive Plan Map shows the type, location and density of land development and redevelopment permitted in the future. The City employs a unique "one map system" where the Comprehensive Plan Map and Zoning Map are identical.

Scenario planning was used to explore the different ways Redmond might accommodate projected growth over the next twenty years. Scenarios were used to illustrate how planning choices impact important community issues, such as access to parks, water conservation, and economic development. The planning team created three scenarios (A, B and C) for Redmond based on input from the public workshop, community conversations, and research. Each scenario met job and housing growth targets and experimented with a variety of issues including the types of housing built in new neighborhoods, where to locate new businesses, where to focus redevelopment, and where to preserve open space. Each scenario was evaluated using a set of metrics including housing, natural resources, transportation, sustainability, and economic development.

The Comprehensive Plan Map and policies are a reflection of the three land use scenarios explored. Successful elements of each scenario were used to inform the map and policies. Key Comprehensive Plan Map and policies include:

- Connect existing area plans and their surrounding areas – Urban Holding land reflects area plans.
- Identify areas of change, areas of growth, and areas of stability.
- Open up gateways to the west and the north - Downtown expands to the north and big box commercial is replaced with C4 to reflect parcel sizes not suited to large commercial development.
- Allow neighborhood hubs to emerge.
- Make areas around the airport compatible with the Airport Master Plan.
- Allow for a more diverse, denser housing mix.
- Keep the spirit of downtown.
- Change large-scale commercial to walkable commercial development on smaller parcels.

The new Comprehensive Plan and Zoning Map will emulate the Redmond 2040 Vision, goals and policy direction, and what the community identified to preserve.

Reviewing and Updating the Comprehensive Plan
The Redmond Comprehensive Plan 2040 is a living document. As demographics, economics and technology change, so do the attitudes and aspirations of the community. The Plan will periodically undergo a major review

as required by state law to assure it remains a relevant and workable framework for development.

If rapidly changing conditions warrant reconsideration of the Plan's Goals and Policies between the required Periodic Review periods, modifications may be initiated by the City Council or Planning Commission. Any citizen or group may request the Council or Commission initiate a Plan amendment, but formal direction for study may only come from these official bodies.

REDMOND

COMPREHENSIVE PLAN

2040 REDMOND VISION

DRAFT

DECEMBER 2020

REDMOND
1910
2010
THE HUB

Letter from the Mayor

Greetings!

As a Redmond native and in serving as its mayor over this past decade, I've had the privilege of both watching our community become what it is today and helping lead the process of planning for its future.

It's my pleasure to introduce the Comprehensive Plan 2040—a foundational document that will guide growth and development for the next 20 years.

Playing the role of the hub of Central Oregon, Redmond has attracted newcomers from all over. During the last 20 years, our city has steadily grown to more than 30,000 residents today. This has brought about rapid change and remarkable success.

Current data tells us the city will be home to 50,000 by 2040. This presents unique challenges and opportunities, such as how to enhance what our community values the most while preserving our culture and character.

The Comprehensive Plan is the City of Redmond's way of planting the seeds of successful future growth. The Plan serves as the framework that will ensure these elements maintain our vitality and resilience of our community:

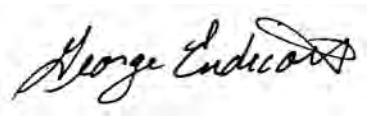
- An Effective and Collaborative Governance
- Great Neighborhoods for Strong Communities
- A Business-Friendly Culture
- A Connected Transportation System
- A Network of Trails and Parks
- A Commitment to the Natural Environment

Implementing and realizing this vision will require hard work and commitment to good planning. Our work will include sustaining our expanding business community, providing enough housing for all residents, and building livable neighborhoods where people can walk to parks and shops. Within our neighborhoods, we will need to focus on creating places where neighbors can gather; protecting environmental resources; finding alternative ways to get around town; ensuring the safety of our community; and adding amenities to increase quality of life.

Although no longer a small town, I am confident Redmond can continue to retain its most valued and defining characteristic that stitches our vision and aspirations together: our small-town character and charm.

Together, we'll do great things.

Sincerely,



Mayor George Endicott

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REDMOND
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NEW
HOTEL
REDMOND

ULD REDMOND
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N IT!!
E SHOULD WE BUILD
ARKS AND/OR TRAILS?
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UBLIC TRANSIT TO
AS AVAILABLE?
IN REDMOND THAT
USE IMPROVEMENT?
REDMOND OREGON
CITY LIMITS & GROWTH BOUNDARIES

Open House
Century 21

STOP
SPORTING GOODS

What is a Comprehensive Plan?

The Comprehensive Plan guides how Redmond will plan for and manage future growth and development over the next 20 years. It guides all activities related to land use and the future of natural and man-made systems and services in Redmond. It also serves as the primary means for realizing the community's vision for the future.

The Comprehensive Plan is a policy framework rooted in a factual basis that helps inform other critical planning documents and implementing tools that together serve as a coordinated, overarching strategy for the City. This approach establishes the structure for how the City functions and the types of services that it provides. Ultimately, the Comprehensive Plan outlines the direction that the City will take when planning for land use and making public investments.

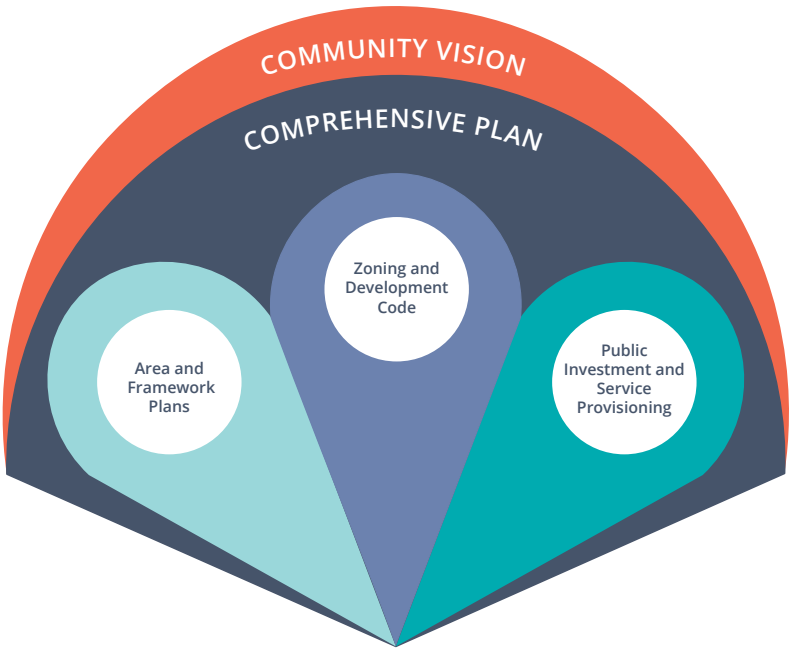
OREGON LAND USE PLANNING REQUIREMENTS

Comprehensive planning in Oregon was mandated by the 1973 Legislature with the adoption of Senate Bill 100 (ORS Chapter 197). Under this Act, the Land Conservation and Development Commission (LCDC) was created and directed to adopt Statewide Planning Goals and Guidelines. These Goals and Guidelines were adopted by LCDC in December 1974 and became effective January 1, 1975.

WHY IS IT NEEDED?

As the heart and hub of Central Oregon, Redmond's urban form and function is a deep reflection of its farmland and manufacturing industries. While known for its rural character, Redmond has experienced pronounced growth and development since the last update to its Comprehensive Plan nearly 20 years ago. Today, Redmond has become a mid-sized community of 30,000 with an annual growth rate of approximately 2.4%. By the year 2040, Redmond's population is expected to grow to over 40,000 residents. The challenge – and opportunity – is to create strategies that respond to this rapid regional growth while preserving and improving assets like Redmond's thriving trade sector and manufacturing businesses, distinct neighborhood identities, small-town feel, unparalleled access to nature and outdoor recreation, and important public spaces like the Dry Canyon.

To date, Oregon has adopted nineteen Statewide Planning Goals, and all Oregon cities and counties are required to have a Comprehensive Plan that is consistent with these Goals. Statewide Planning Goals include topics such as land use planning, citizen involvement, housing supply, economic development, transportation systems, natural resources management, recreation, and more. Each Statewide Planning Goal includes a set of guidelines that, in conjunction with community priorities, help direct the content within comprehensive plans. Once adopted, all area and community plans, zoning codes, permits, and public improvements are required be consistent with the Comprehensive Plan. This structure ensures that cities implement the State's policy goals first through the comprehensive plan, and then by more detailed supporting and implementing documents.



Twelve of the nineteen Statewide Planning Goals apply to Redmond. These include:

GOAL 1 CITIZEN INVOLVEMENT

To develop a citizen involvement program that ensures the opportunity for citizens to be involved in all phases of the planning process.

GOAL 2 LAND USE PLANNING

To establish a land use planning process and policy framework as a basis for all decisions and actions related to use of land and to assure an adequate factual base for such decisions and actions.

GOAL 5 NATURAL RESOURCES, SCENIC AND HISTORIC AREAS, AND OPEN SPACES

To conserve open space and protect natural and scenic resources.

GOAL 6 AIR, WATER, AND LAND RESOURCE QUALITY

To maintain and improve the quality of the air, water and land resources of the state.

GOAL 7 AREAS SUBJECT TO NATURAL HAZARDS

To protect life and property from natural disasters and hazards.

GOAL 8 RECREATIONAL NEEDS

To satisfy the recreational needs of the citizens of the state and visitors and, where appropriate, to provide for the siting of necessary recreational facilities including destination resorts.

GOAL 9 ECONOMIC DEVELOPMENT

To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.

GOAL 10 HOUSING

To provide for the housing needs of citizens of the state.

GOAL 11 PUBLIC FACILITIES

To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.

GOAL 12 TRANSPORTATION

To provide and encourage a safe, convenient and economic transportation system.

GOAL 13 ENERGY CONSERVATION

To conserve energy.

GOAL 14 URBANIZATION

To provide for an orderly and efficient transition from rural to urban land use.

GOAL 15 LIVABILITY

To promote livability for Redmond residents.

**While this is not a statewide planning goal, Redmond City Council has included the addition of this chapter to the Comprehensive Plan. This chapter compiles and synthesizes the major policy themes of the Comprehensive Plan and connects them to the community's vision for the future.*

COMPREHENSIVE PLAN MAP

The Comprehensive Plan Map shows the type, location and density of land development and redevelopment permitted in the future. The City employs a “one map system” where the Comprehensive Plan Map and Zoning Map are identical.

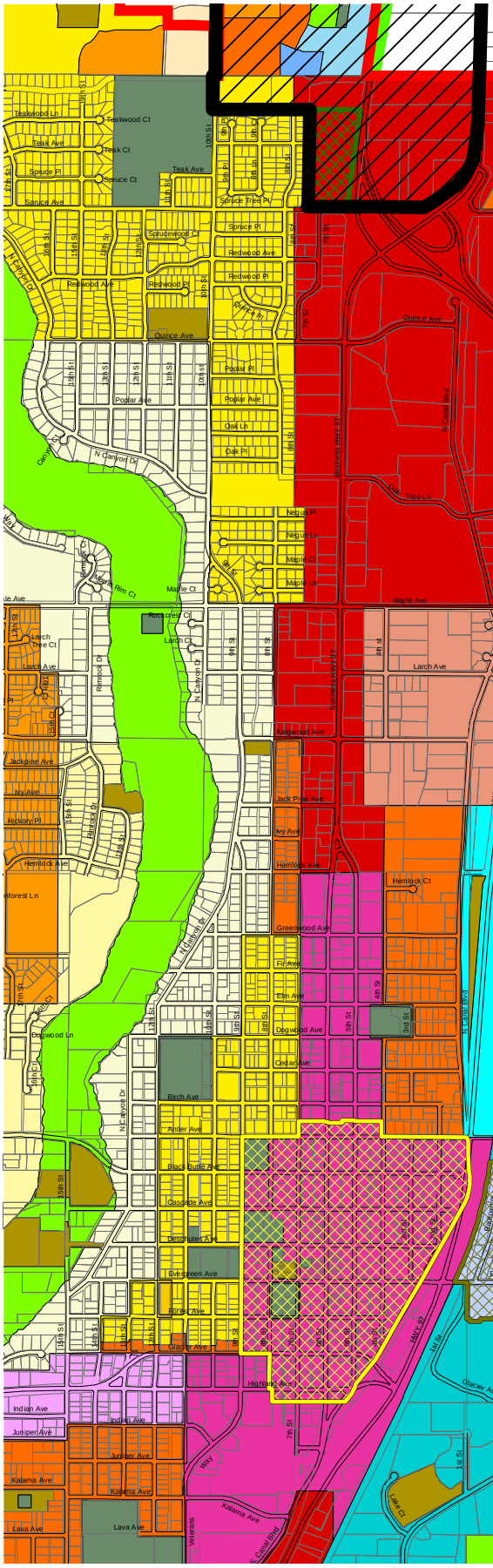
THE DEVELOPMENT CODE

Zoning and development code serves as the major implementation mechanism of the Comprehensive Plan. LCDC Goals and Guidelines require “ordinances controlling the use and construction on the land, such as building codes, sign ordinances, subdivision and zoning ordinances” be adopted to carry out the Plan.

REVIEWING AND UPDATING THE PLAN

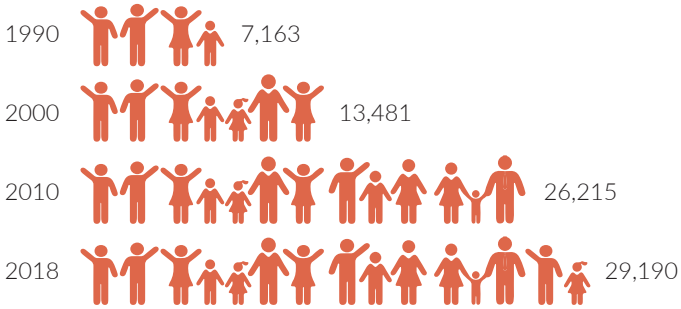
The Comprehensive Plan is a living document. As demographics, economics and technology change, so do the attitudes and aspirations of the community. The Plan will periodically undergo a major review as required by state law to assure it remains a relevant and workable framework for development.

If rapidly changing conditions warrant reconsideration of the Plan’s Goals and Policies between the required Periodic Review periods (generally every 10 years), modifications may be initiated by the City Council or Planning Commission. Any citizen or group may request the Council or Commission initiate a Plan amendment, but formal direction for study may only come from these official bodies.



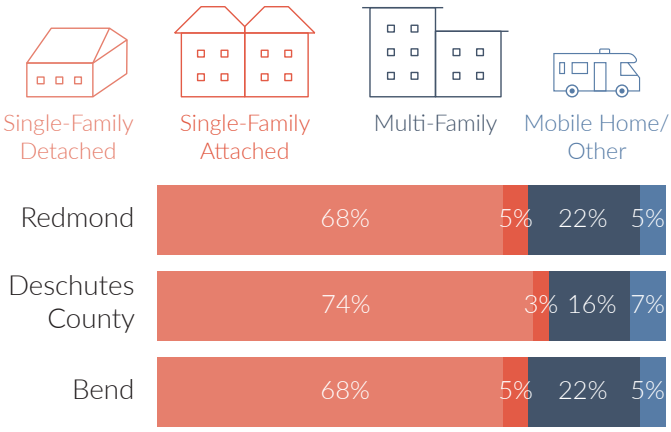
Redmond by the Numbers

Who We Are

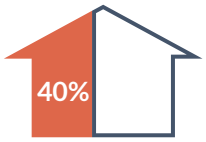


Redmond is growing! 52% of residents moved here in the last 10 years. 8,000 new households are projected in the next 20 years. The percentage of households with children (68%) is also growing.

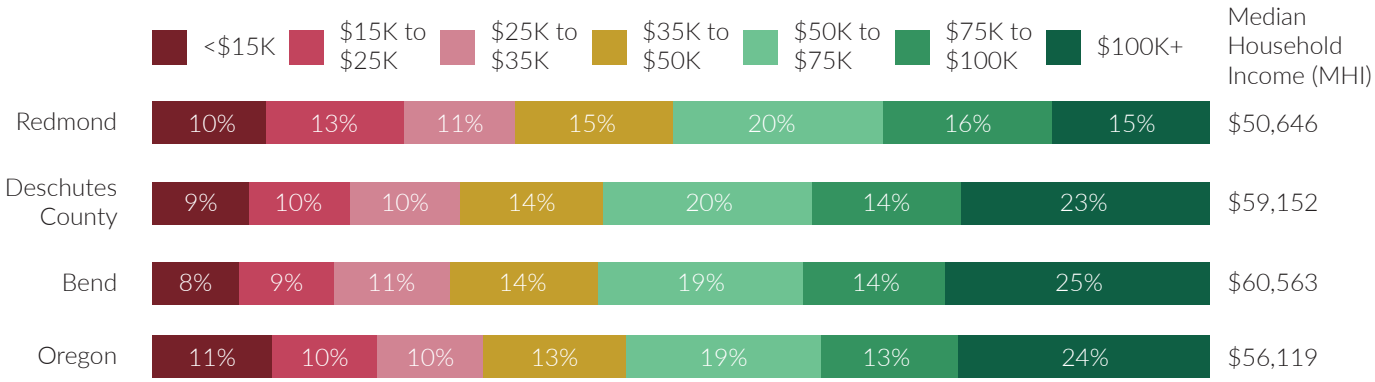
Where We Live



40% of Redmond households pay more than 30% of their income on housing.



What We Earn



Where We Work

11,766 Employed in Redmond
11,384 Living in Redmond

Just as many people travel to Redmond for work as those who leave Redmond for work. Only 3,846 employed people both live and work in Redmond.

How We Get to Work

- **73% -** Drive Alone
- **17% -** Carpool
- **6% -** Work from Home
- **2% -** Walk
- **1% -** Other Means
- **1% -** Public Transportation
- **Mean Commute Time: 21 minutes**

Our Jobs

16% - Food & Accommodation

14% - Healthcare & Social Assistance

13% - Retail Trade

10% - Manufacturing

8% - Construction

Redmond is home to a major airport connecting Central Oregon to the nation. The airport serves about 73,000 passengers per month. This is almost triple the population of Redmond.

About Our Schools

7,329 Student Enrollment

3	2	7
High Schools	Middle Schools	Elementary Schools

Redmond has two higher education campuses: Central Oregon Community College (COCC) and Oregon State University (OSU) Extension - Cascades.

About Our Parks

Community Parks
100 Acres

Neighborhood and Mini Parks
34 Acres

Special Use Facilities
192 Acres

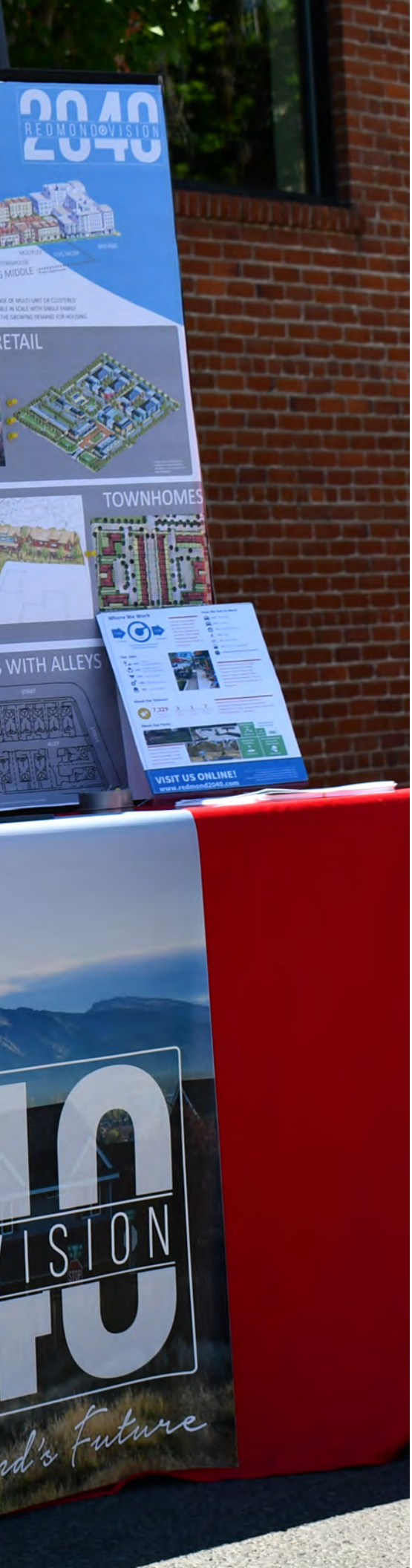
Natural Resource Areas and Open Space
207 Acres

Redmond has 59 miles of canals. Some are piped others are open. Canals can be used to extend a bike/trail system.

Sources

American Community Survey, 2013-2017 five-year estimate.
U.S. Census Bureau, Census on the Map, 2015.
City of Redmond, Citywide Park Master Plan, 2018.
Population Research Center, Portland State University. 2019.
Redmond School District Report Card, 2017-2018.

LOOK LIKE IN 20 YEARS?
We want to hear form YOU on what makes Redmond unique, whats important to protect for the future, and what needs improvement
PIN IT!!
WHERE SHOULD WE BUILD NEW PARKS AND/OR TRAILS?
WHERE WOULD YOU RIDE PUBLIC TRANSIT TO IF IT WAS AVAILABLE?
AREAS IN REDMOND THAT
REDMOND OREGON
WHAT WILL GROWTH LOOK LIKE IN REDMOND?
NEIGHBORHOODS WITH
REDMOND 2040
ME, MOM, and the OPEN SEA
Planning Redmon



Developing the Comprehensive Plan

To update the Comprehensive Plan, the City of Redmond launched Redmond 2040, a city-wide visioning effort designed to reach all corners of the community.

The intent of Redmond 2040 was twofold: to describe what Redmond residents and business owners want the community to be like in the year 2040, and to help inform policy in the Comprehensive Plan update that will guide investments in the years to come. The outcome was a community-vetted Vision Statement that was the foundation of the Comprehensive Plan update.

Occurring over a one-year period, Redmond 2040 uncovered the elements that make Redmond unique, what is important to protect for the future, and what Redmond should look like in 2040. The basis of Redmond 2040 was to use Community Conversations to engage people where they are versus asking them to come to City Hall. Outreach efforts were designed to engage as many people as possible, including those who are not usually involved in planning efforts, as well as connect with diverse communities across the city, empower youth, and build community connections through existing and new networks and information channels.

Through Community Conversations, booths and intercept surveys at community-wide fairs and events, Comprehensive Plan Vision Summits and online engagements, the process had connection with over 800 people in the community.

KEY QUESTIONS

Where are we now?

Where are we going?

Where do we want to be?

How do we get there?

REDMOND OPEN STREETS

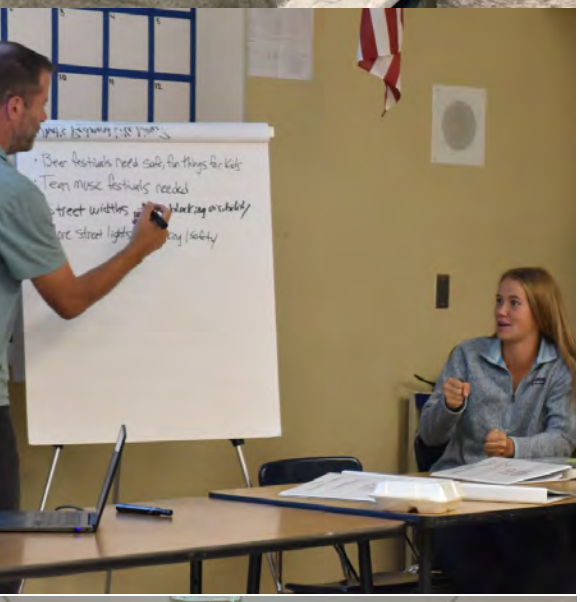
MUSIC ON THE GREEN

NATIONAL NIGHT OUT

COMMUNITY EVENTS

SATURDAY MARKET

CITY OPEN HOUSE EVENT



COMMUNITY CONVERSATIONS

Community conversation included, but were not limited to:

- Redmond Economic Development Inc. (REDI)
- Redmond Chamber of Commerce
- Central Oregon Association of Realtors (COAR) Government Affairs Committee
- Redmond Commercial Group (RCG)
- Central Oregon Veterans' Outreach (COVO)
- Redmond Ministerial Association
- OSU Extension Services - REACH
- Industry Business Leaders
- Historic Landmarks Commission (HLC)
- Bicycle and Pedestrian Advisory Committee (BPAC)
- Downtown Urban Renewal Agency Committee (DURAC)
- Urban Area Planning Commission
- Redmond Committee for Art in Public Places (RCAPP)
- Friends of Redmond
- Housing and Community Development Committee (HCDC)
- Redmond High School
- Ridgeview High School
- Redmond Patriots

A Steering Committee made up of key stakeholders, representing a broad cross-section of community interests and interagency partners, guided the process. The Steering Committee worked closely with a Technical Advisory Committee, which provided subject matter expertise to guide the overall direction of the Comprehensive Plan update. Together, these committees reviewed materials, acted as liaisons to various constituencies and interest groups and hosted outreach events and activities. The Steering Committee was instrumental in advancing community priorities to craft the vision and develop policies. *Redmond 2040* was an iterative process that leveraged input from community members, City departments, interagency partners, and community representatives, to develop a vision statement that guides the Comprehensive Plan update.

REDMOND 2040 VISION

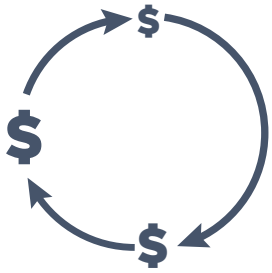
In 2040, Redmond has an...

AN EFFECTIVE AND COLLABORATIVE GOVERNANCE

Redmond is committed to inclusive and responsive leadership. A collaborative spirit lends to thoughtful planning and strategic development; culture of regional collaboration; and effective and transparent governance that makes investments in services and infrastructure, which provide residents with a high quality of life. Combined with a "get-it-done within our means" attitude, Redmond leads by example as a forward-thinking community.

GREAT NEIGHBORHOODS FOR STRONG COMMUNITIES

Redmond's well designed, connected neighborhoods contribute to retaining its small-town identity. Residents have access to a variety of housing choices which appeal to broad range of ages and income levels. Neighborhood-scale retail and amenities ensure neighbors can live, work, play and recreate together in one place. Educational, cultural and recreational opportunities strengthen the social fabric of the community. Public art is a feature. Culture and diversity are celebrated through community events and activities, lending to a spirit of inclusivity and tolerance. Redmond's agricultural and industrial heritage is reflected through access to the local food system.

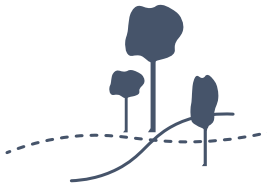


A BUSINESS-FRIENDLY CULTURE

As a regional economic hub, Redmond is open for business. The City enjoys a resilient and diversified economy that retains and expands local businesses; attracts family-wage jobs; and is connected to the regional, national and global markets. Landmarks such as the Redmond Municipal Airport, Deschutes County Fair and Expo Center and Central Oregon Community College (COCC) help put Redmond on the map. The City strengthens businesses and tourism through community-driven partnerships and programs, preserving Redmond's small-town feel.

A CONNECTED TRANSPORTATION SYSTEM

Redmond is a transportation hub with a system that leverages technology to preserve mobility and increase accessibility. A connected network of sidewalks and bike facilities provide safe routes both within and between neighborhoods. Residents enjoy convenient, frequent and reliable public transit options that connect to employment and shopping centers, schools, parks, the downtown core and airport.



A NETWORK OF TRAILS AND PARKS

Redmond residents have access to an interconnected system of parks and trails that promote health, recreation, and local and regional access. Neighborhoods have well-maintained parks that are accessible to users of all ages and levels of physical ability. The Dry Canyon is the heart of Redmond, expanded and maintained with appealing park facilities. Safe walking and biking paths like the Homestead Canal Trail system connect residents to other parts of the city and region, including skate and bike parks, athletic fields, water features and other amenities.

A COMMITMENT TO THE NATURAL ENVIRONMENT

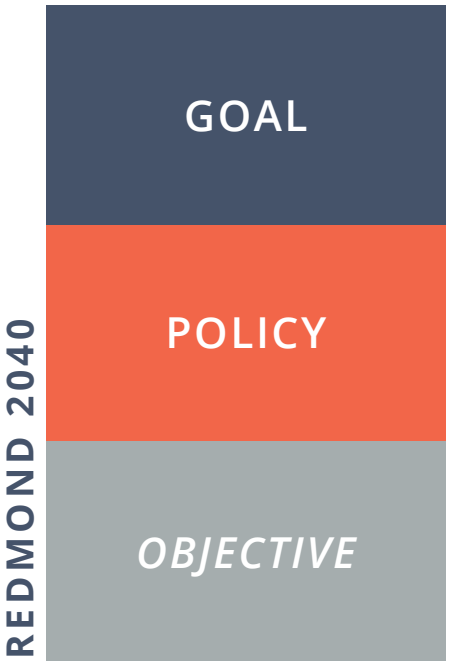
The City works to protect its unique scenic attributes, natural environment and ease of access to outdoor recreation. Residents can enjoy the region's mountains and high-desert climate for generations to come. The City pursues water conservation, renewable energy and infrastructure management options, effectively balancing community needs with the commitment to preserve clean air, water and land resources for future generations. The built environment is designed to protect, enhance and be integrated with natural systems.

GOALS AND POLICIES

USER GUIDE

The following goals and policies will guide land use decisions in Redmond. Each Statewide Planning Goal chapter opens with a short summary of the topic, then lists a series of goal statements. Each goal includes a suite of policies. Some policies include objectives (a-b-c). Whereas the goals and policies have legal status, the objectives are action-oriented guidelines.

CHAPTER STRUCTURE



AT SHOULD REDMOND
OK LIKE IN 20 YEARS?
PIN IT!!
WHERE SHOULD WE BUILD
NEW PARKS AND/OR TRAILS?
WHERE WOULD YOU
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IF IT WAS AVAILABLE?
AREAS IN REDMON
COULD USE IMPRO
2040
REDMOND2040
REDMOND OREGON
WHAT WILL
GROWTH LOOK
LIKE IN REDMOND?
MISSING M
NEIGHBORHOODS WITH RET
REDMOND 2040
A Community Snapshot
2040
VISIT US ONLINE

STATEWIDE PLANNING GOAL 1

CITIZEN INVOLVEMENT

OVERVIEW

Statewide Planning Goal 1 requires the City to adopt and publicize a program for citizen involvement that clearly defines the procedures by which the general public will be involved in the on-going land use planning process. The citizen involvement program will be appropriate to the scale of the planning effort. The program should provide for continuity of citizen participation and of information that enables citizens to identify and comprehend the issues. When federal, state and regional agencies coordinate their planning efforts with governing bodies, they make use of the existing local citizen involvement programs established by counties and cities.

GOALS AND POLICIES

GOAL 1 **ENGAGEMENT**

Develop and maintain a comprehensive community engagement and public information program that ensures the opportunity for the community to be informed and involved in all phases of the planning process.

POLICY 1-1-1 Establish and maintain a citizen involvement program to provide for widespread citizen involvement that involves a representative cross-section of community members.

a) *The City shall assign the Redmond Urban Area Planning Commission as its officially recognized Committee for Citizen Involvement (CCI) and ensures this group meets as the CCI at least once a year.*

POLICY 1-1-2 Allocate adequate staffing, financial and informational resources to implement and maintain the citizen involvement program.

GOAL 2 **INCLUSION**

Practice inclusive community engagement that reaches diverse communities, advances race equity and respect, and addresses participatory barriers through innovative partnerships and tools.

POLICY 1-2-1 Prioritize place-based, community conversation activities as engagement methods to create better outcomes and build more equitable communities.

POLICY 1-2-2 Ensure a City-wide demographic profile and 'community snapshot' is regularly maintained and widely understood.

POLICY 1-2-3 Gain and develop tools to address barriers to public participation, such as: racial, ethnic and cultural disparities, language differences, socio-economic challenges, meeting place/time, childcare needs, ADA accessibility, etc.

POLICY 1-2-4 Conduct outreach that supports differences across all spectrums, including but not limited to ethnicity, gender, age, disability, and sexuality.

POLICY 1-2-5 Provide communication materials in linguistically and culturally appropriate manners.

GOAL 3 **ACCOUNTABILITY**

Ensure transparency and accountability in communications, planning processes and City decision-making.

POLICY 1-3-1 Establish mechanisms to assure effective and transparent communications between community members, elected and appointed officials, and commission/committee members.

POLICY 1-3-2 Ensure City-wide plans, programs and processes are available, including the CCI's community involvement plan.

a) Develop annual performance report using key metrics to measure achievements, such as: permit processing times, housing unit final occupancy permits, total types of land use permits issued or applied for, staffing capacity, community engagement, operational efficiencies, process improvements, interagency cooperation, committee involvement and accomplishments, and special projects.

POLICY 1-3-3 Develop project websites for significant planning initiatives that are updated frequently and provide information about engagement opportunities.

POLICY 1-3-4 Ensure technical information is available to citizens in an understandable form.

STATEWIDE PLANNING GOAL 2

LAND USE PLANNING AND PROCEDURES

OVERVIEW

Statewide Planning Goal 2, Land Use Planning requires that city, county, state and federal agency and special district plans and actions related to land use are consistent with the comprehensive plans of cities and counties and regional plans adopted under the Oregon Revised Statutes.

The Redmond Comprehensive Plan is the official policy statement of the Redmond City Council. The City will interpret the standards and requirements of the text and maps of the Comprehensive Plan pursuant to the adopted process. The City will review and update the Development Code (Chapter 8 of the City Code) to ensure it is aligned with the Comprehensive Plan. The City expects to review the Comprehensive Plan periodically to ensure the Plan remains a workable framework for development.

Land use categories ensure an adequate supply of land for residential, commercial and industrial development purposes and other uses that provide for a complete community. The following land use categories have been developed for use in the Comprehensive Plan Map, which also serves as the City's zoning map:

Urban Holding Area (UHA)
This plan designation is applied to all areas added to the UGB that have not yet completed planning for urban uses. Agricultural, rural residential uses and other uses allowed in the UH-10 zone are allowed on an interim basis so long as their location and operation does not impair the future conversion of these lands from rural to urban use. New parcels less than 10 acres in size may not be created within areas designated UHA.

Residential Low Density (RL)
Areas designated RL are intended primarily for development as single-family home sites, and duplexes per HB 2001. Planned urban densities are expected to average 3 dwelling units per acre with densities ranging from 2 units per net acre to 5 units per net acre. The Development Code may establish more than one zoning district for the RL designation to address local conditions and the need for different development review criteria.

Residential Medium Density (RM)
Areas designated RM are intended primarily for development as single-family home sites intermixed with “Middle Housing” housing (i.e., duplexes, triplexes, quadplexes, townhouses and cottage clusters). Planned urban densities are expected to average more than four dwelling units per acre with densities ranging from four units per net acre to twelve units per net acre. The Development Code may establish more than one zoning district for the RM designation to address local conditions and the need for different development review criteria.

Residential High Density (RH)
Areas designated RH are intended primarily for development as multi-family development complexes, condominiums, congregate living facilities, and other attached dwelling products. Planned urban densities are expected to average more than 8 dwelling units per acre. The Development Code may establish more than one zoning district for the RH designation to address local conditions and the need for different development review criteria.

Neighborhood Center (NC)
Areas designated NC are intended for development as commercial service areas supporting surrounding residential neighborhoods. Neighborhood Centers may also be focused around a cultural activity or a school. Commercial uses and development form may not be of a type found in highway commercial and strip commercial development areas. NC areas also may include residential uses, either in the form of residences on upper stories above retail uses or, where compatible with surrounding uses, as standalone high-density residential development. Standalone residential projects in NC areas may not take direct access from arterial or collector streets.

Mixed Use Downtown (MUD)
The MUD designation is for the area defined as the Redmond Downtown. Uses in the MUD area are subject to regulations contained in the Redmond Downtown Plan and related zoning districts.

Mixed Use Employment (MUE)

Areas designated MUE are intended for development as employment centers developed as campus-type or light industrial with some limited commercial and residential development contained within the MUE area. Standalone residential projects are not permitted within the MUE area. The City may provide for mixed use projects located within the MUE through planned developments. Commercial uses must be of a type and scale that is designed to support surrounding industrial and employment uses and may not be used for commercial development that serves a regional retail function, such as large merchandise retailers, home improvement centers, and mini-mall developments.

Commercial (C)

Areas designated Commercial on the plan map are intended primarily for commercial retail and service uses for local or regional scale development. Highway commercial uses are allowed where transportation impacts can be managed in conformance with state and local requirements. Residential development may be permitted in the C designation, either in the form of residences on upper stories above retail uses or, where compatible with surrounding uses, as standalone high-density residential development. Standalone residential projects in "C" areas may not take direct access from arterial or collector streets.

Industrial (I)
Areas designated "I" on the plan map are intended primarily for industrial and employment uses. Commercial uses may be permitted when they are of a type and scale that is designed to support surrounding industrial and employment uses. Industrial areas may not be used for commercial development that serves a regional retail function, such as large merchandise retailers, home improvement centers, and mini-mall developments. The Development Code may establish more than one zoning district for the "I" designation to address local conditions and the need for different development review criteria to serve different types of industrial uses, such as heavy industrial, light industrial, and campus industrial uses.

Public Facilities (PF)
Areas designated PF on the Comp Plan Map are intended for development as public and quasi-public facilities serving local and regional needs. Uses may include municipal utility installations, electrical installations, schools, public recreational uses, government buildings and other uses. The Development Code may establish more than one zoning district for the PF designation to address different development review criteria for different types of public facilities.

Open Space (OS)
Areas designated OS include areas not intended for urban development that are planned to remain in an undeveloped state for use as active or passive recreation or to avoid placing development in areas that may have development hazards. The Development Code may establish more than one zoning district for the OS designation to address different types of OS objectives, including areas where development is restricted altogether or permitted on limited bases subject to special review criteria.

Mixed Use Live Work (MULW)
The purpose of the MULW zone is to: 1) provide a mixed use area that is appropriate for development which may include both living units and work space; 2) Provide flexibility for the development of live/work units; and 3) Provide locations, where appropriate, for new businesses to start up and existing businesses to continue and potentially expand.

Mixed Use Live Work
Special District (MULW-SD) – The purpose of this Special District Overlay is to allow uses within a portion of the MULW Zone that exist at the time of the effective date of the adoption of this ordinance to be permitted as outright permitted uses. The Special District Overlay will allow existing uses and businesses to continue and potentially expand their operations in perpetuity, subject to the requirements of this Section.

GOALS AND POLICIES

GOAL 1 **COORDINATION**

Ensure that Redmond's Comprehensive Plan, implementation tools, and administration procedures build on the community's vision for the future and align with regional, state, and federal plans and regulations.

POLICY 2-1-1 Ensure that key elements of the Plan Vision are incorporated into Plan policies.

POLICY 2-1-2 Maintain a Plan and associated implementation tools consistent with the Oregon Statewide Planning Goals and all other applicable state and federal regulations.

POLICY 2-1-3 Ensure that land use and plan administration procedures are compatible with the goals and policies in the Plan, consider relevant agreements with and plans by other local jurisdictions, and comply with regional, state, and federal plans and regulations.

POLICY 2-1-4 Ensure that the Plan empowers community members to act as informed participants in the land use planning process.

POLICY 2-1-5 All land use plans shall include identification of issues and problems, inventories and other factual information for each applicable statewide planning goal, evaluation of alternative courses of action and ultimate policy choices, taking into consideration social, economic, energy and environmental needs. The required information shall be contained in the Plan document or in supporting documents.

POLICY 2-1-6 Maintain a Plan that designates a range of land uses based on findings with respect to:

- Natural resource capacity and environmental quality;
- Projected population and economic growth;
- Location, capacity and level of services;
- Existing land use patterns;
- Projected land use and community needs; and
- Energy conservation and resources.

POLICY 2-1-7 Identify and assign land uses in a way that encourages the best relationship between places where people live, work, shop and recreate.

GOAL 2 **ADMINISTRATION**

Maintain and periodically review a Comprehensive Plan and Map as a basis for all decisions and actions related to land use to ensure a relevant foundation of information for such decisions and actions.

POLICY 2-2-1 Provide a technical foundation that documents and evaluates existing conditions related to social, economic, energy, and environmental needs in order to inform and refine policy recommendations and act as a foundation for future updates to the Plan.

a) Ensure technical information and visuals are updated regularly, relevant and can be understood by the public.

POLICY 2-2-2 Endeavor to review the Plan and update the Plan every ten years, including data inventories and projections used.

POLICY 2-2-3 Retain the Plan and supporting documents on file and available to the public through the City Recorder at Redmond City Hall.

POLICY 2-2-4 Adopt a Comprehensive Plan Map that identifies planned uses for all land within the Redmond Urban Growth Boundary (UGB). The land use designations in the above table will be used on the Comprehensive Plan Map to designate areas intended for the land uses described. The table also includes a list of City and County zoning designations that are compatible with the associated Comprehensive Plan Map designation. All property added to the UGB from the Urban Reserve Area (URA) is considered to have an Urban Holding Area Comprehensive Plan designation and an Urban Holding-10 (UH-10) zone. Urban development consistent with the Plan designation may not be approved until the land is annexed to the City of Redmond and rezoned consistent with the zoning categories listed.

GOAL 3 **IMPLEMENTATION**

Use a variety of implementation tools to carry out the Comprehensive Plan in a coordinated and collaborative manner.

POLICY 2-3-1 The Plan shall be the basis for specific implementation measures, which will be standardized and remain consistent for effective and efficient administration.

POLICY 2-3-2 Coordinate Plan policies and related implementation measures within the City, and other agencies, governments and special districts service providers.

POLICY 2-3-3 Adopt updates to system plans, as required by state law or necessary to address changing community needs and incorporate these plans by reference in the Comprehensive Plan.

POLICY 2-3-4 Ensure the community has the opportunity to provide input during the preparation and review of implementing ordinances.

STATEWIDE PLANNING GOAL 5

OPEN SPACES, SCENIC AND HISTORIC AREAS, AND NATURAL RESOURCES

OVERVIEW

The State of Oregon requires all cities and counties to address State Land Use Planning Goal 5, Open Spaces, Scenic and Historic Areas, and Natural Resources. Programs shall be provided that will ensure open space, protect scenic and historic areas, and natural resources for future generations and promote healthy and visually attractive environments in harmony with the natural landscape character.

The identification, protection and preservation of open spaces, scenic and natural resources, and historic and cultural resources is crucial to maintaining the character and quality of life in Redmond. Without the preservation of these resources, citizens could forever lose their accessibility to the environments, events and landmarks that fashion the appearance, character and sense of place offered by Redmond today.

5 GOALS AND POLICIES

GOAL 1 **OPEN SPACE RESOURCES**

Conserve open space and protect natural and scenic resources.

POLICY 5-1-1 Require subdivision development along major natural and scenic resources to provide public access as deemed appropriate or necessary.

POLICY 5-1-2 Utilize canals, rights-of-way and easements as recreation linkages for bike paths, hiking and jogging trails throughout the urban area.

POLICY 5-1-3 Develop a bicycle and pedestrian network that, including both on-street and off-street trails, bicycle lanes and Quiet Streets. Emphasize facilities physically separated from the street, to interconnect schools, concentrations of populations, service nodes, employment, parks and open spaces.

POLICY 5-1-4 Expand the City's trail system beyond City boundaries to link recreational and natural areas surrounding Redmond, including, but not limited to the Deschutes River, Smith Rock State Park and wetlands that may have developed at the City's existing irrigation site.

a) The City's Bicycle and Pedestrian Advisory Committee shall continue to work with the Deschutes County Bicycle and Pedestrian Advisory Committee to plan for, design and implement trails that would benefit Redmond residents, but primarily exist in the County.

POLICY 5-1-5 Periodically review the Redmond Dry Canyon Master Plan as incorporated in the Redmond Parks Master Plan.

POLICY 5-1-6 Pursue opportunities to acquire properties to expand the Dry Canyon.

POLICY 5-1-7 Preserve and enhance the natural condition of the Dry Canyon to the greatest extent possible.

a) Develop standards for the grading of property within the canyon or the required canyon rim setback and water drainage over the canyon walls. An analysis should consider the impacts of water on natural canyon vegetation, creation of insect growth, and erosion and pondage.

b) Except for development within a public facilities zone, prohibit the storage or discard of solid wastes, including but not limited to excavation, tailings, rubbish, auto bodies, junk and other similar materials.

c) *Prohibit the extension of the water pollution control facility further south into the Dry Canyon than is shown on the Dry Canyon Master Plan map and explore opportunities to move treatment processes to the existing irrigation site.*

d) *Pursue opportunities to relocate public utilities out of the Dry Canyon Preservation Area.*

POLICY 5-1-8 Preserve and manage the 40-acre Redmond Caves area as natural open space and/or for recreational purposes.

GOAL 2 **NATURAL SYSTEMS**

Invest, protect and enhance the function, health and diversity of the City's natural systems.

POLICY 5-2-1 Support water conservation efforts within the Deschutes Basin to meet the water needs for rivers and communities today and into the future.

POLICY 5-2-2 Preserve mature trees and natural tree coverage to retain the natural character of Central Oregon within the urban area as the community grows.

POLICY 5-2-3 Encourage preservation of all natural drainageways by implementing the stormwater management principles provide in the Central Oregon Stormwater Manual.

POLICY 5-2-4 Protect and maintain the groundwater supply and quality essential to clean water and natural vegetation.

POLICY 5-2-5 Encourage habitat-friendly development practices for developments with Regionally Significant Fish and Wildlife Habitats.

GOAL 3 **CULTURAL AND HISTORIC RESOURCES**

Preserve and retain historic structures, areas, sites and cultural resources.

POLICY 5-3-1 Foster and encourage the preservation, management and enhancement of buildings, structures, objects, sites or districts that are of historic or cultural significance.

a) *Continue to provide staffing support for the Redmond Historic Landmarks Commission.*

POLICY 5-3-2 Continue to implement and update the City's Historic Preservation Plan.

POLICY 5-3-3 Acknowledge, promote and support the Downtown Redmond National Historic District designation.

POLICY 5-3-4 Examine areas of high archeological site potential prior to disturbing ground or designating land for other uses.

POLICY 5-3-5 Encourage public knowledge, understanding and appreciation of the City's past, including pre-settlement history.

POLICY 5-3-6 Foster community pride and a sense of identity based on the recognition and use of City-owned historic and cultural resources.

STATEWIDE PLANNING GOAL 6

AIR, WATER AND LAND RESOURCES QUALITY

OVERVIEW

Statewide Planning Goal 6 requires cities and counties to maintain and improve the quality of air, water and land resources in the Redmond urban area.

GOALS AND POLICIES

GOAL 1 **REDUCE IMPACTS**

Uphold the carrying capacity of air, water and land resources by reducing impacts from pollutants consistent with federal and state standards.

POLICY 6-1-1 Require development to construct the infrastructure necessary to provide public or community water service, unless plans are approved for individual service with the applicable state agency. The applicable state and federal water quality standards shall be used to implement this policy and reference may also be made to the State Water Quality Management Plan.

POLICY 6-1-2 Ensure all waste and process discharges from future development, when combined with such discharges from existing developments, shall not threaten to violate or violate applicable state or federal environmental quality statutes, rules and standards.

POLICY 6-1-3 Comply with applicable State and Federal water quality standards in all water related issues.

GOAL 2 **IMPROVE QUALITY**

Improve the quality of air, water and land resources.

POLICY 6-2-1 Coordinate with the Oregon Department of Environmental Quality (DEQ) and Deschutes County Department of Health and Human Services on existing programs and in developing future strategies for improving air quality, including initiatives such as managing wood burning emissions.

POLICY 6-2-2 Encourage lighting design and practices that reduce the negative impacts of light pollution.

POLICY 6-2-3 Ensure compatibility between land uses by separating and buffering pollutant emitting land uses and sensitive populations through land use designation, zoning and site design.

GOAL 3 **REGIONAL COLLABORATION**

Promote a collaborative and coordinated regional approach to reducing pollutant emissions and the City's carbon footprint.

POLICY 6-3-1 Participate in appropriate environmental quality planning efforts on a regional level.

POLICY 6-3-2 Work with the DEQ and Deschutes County to perform more thorough monitoring of the air quality of the Redmond urban area and work with DEQ to ensure that State and Federal ambient air quality standards are not exceeded.

POLICY 6-3-3 Coordinate with Redmond Municipal Airport operations to analyze and reduce noise impacts.

POLICY 6-3-4 Partner with regional and state agencies on strategies to reduce greenhouse gas emissions that adversely affect public health and contribute to climate change.

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STATEWIDE PLANNING GOAL 7

NATURAL HAZARDS

OVERVIEW

Statewide Planning Goal 7 states that developments subject to damage or that could result in loss of life shall not be planned nor located in known areas of natural disasters and hazards without appropriate safeguards. Plans shall be based on an inventory of known areas of natural disasters and hazards.

Areas of natural disasters and hazards are areas that are subject to natural events that are known to result in death or endanger life and property. While overall risk from natural hazards remains low in Redmond relative to other areas around the state, the top four threats are winter storms, a Cascadia Subduction Zone earthquake, windstorms and volcanoes. Other hazards include wildfire, drought, earthquakes, flood, landslides and pandemics.

7

GOALS AND POLICIES

GOAL 1 **MINIMIZE IMPACT**

Minimize the risk of natural hazards and the impacts to life and property through hazard mitigation planning.

POLICY 7-1-1 Coordinate with Deschutes County on developing and maintaining the Natural Hazard Mitigation Plan.

POLICY 7-1-2 Avoid development in unsafe areas and where development increases hazard impacts, such as runoff from paving projects and soil slippage due to weak foundation soils

POLICY 7-1-3 When locating developments in areas of known natural hazards, the density or intensity of the development shall be limited by the degree of the natural hazard.

POLICY 7-1-4 Collaborate with jurisdictions within the Redmond wildland urban interface boundary to periodically review the Greater Redmond Community Wildfire Protection Plan and ensure Redmond remains a Fire Adapted Community.

a) *Apply the International Wildland-Urban Interface Code with modifications to allow buffers of aggregated defensible space or similar tools, as appropriate, to the land included in the UGB and annexed to the City of Redmond.*

POLICY 7-1-5 Develop plans, strategies, and acquire resources to improve Redmond's utilities resilience and reduce its risk to natural hazards.

GOAL 2 **CAPACITY**

Build capacity for community resilience and adaptation.

POLICY 7-2-1 Manage and maintain spatial, demographic, and economic data to support hazard mitigation planning.

POLICY 7-2-2 Build broad public awareness about natural hazards and mitigation measures in a variety of formats and languages to reach people of all ages, abilities, cultures and incomes.

POLICY 7-2-3 Support and invest in seismic retrofits and infrastructure redundancies.

GOAL 3 **RESPONSE AND RECOVERY**

Support plans, programs and investments that aid in rapid response and recovery.

POLICY 7-3-1 Plan and prepare for the Cascadia earthquake to reduce the City's vulnerability to loss of life and property and build capacity for local, regional and state relief.

a) Support legislative efforts to establish offshore seismic networks and develop a public alert system for seismic hazards.

POLICY 7-3-2 Support plans and programs to expedite the restoration of critical services following a natural hazard event, including lifeline transportation routes.

POLICY 7-3-3 Review the Natural Disaster Recovery Plan in partnership with private and public service providers that identifies near-term and long-term strategies for response and recovery

STATEWIDE PLANNING GOAL 8

RECREATIONAL NEEDS

OVERVIEW

Statewide Planning Goal 8 requires that Redmond show that its Comprehensive Plan is consistent with these goals. The City's Parks Master Plan describes goals and policies that will guide the City in providing services related to the provision of parks, open spaces and recreational services. The Parks Plan's policies reflect the importance of parks and recreational facilities in the urban area and offer measures to ensure that citizens are provided appropriate recreational opportunities and facilities close to where they live. The plan also provides measures to protect natural resources, to the extent practicable, as population growth and new development occurs.

8

GOALS AND POLICIES

GOAL 1 **ENGAGE AND INFORM THE COMMUNITY**

Redmond's Parks Division fosters and expands the social connections linking the City together and bridging its neighborhoods.

POLICY 8-1-1 Encourage and support active and ongoing participation by diverse community members in the planning and decision-making for parks and recreational opportunities

a) Involve residents and stakeholders in system-wide planning and park site facility design. Use a diverse set of communication and informational materials to solicit community input, facilitate project understanding and build public support.

b) Employ innovative strategies to improve community involvement in park and recreation planning efforts.

c) Identify under-represented segments of the community and work to improve their capacity to participate in park planning and decision- making.

d) Continue to promote and distribute information about parks, recreational amenities, events and volunteer activities sponsored by the City and partner agencies and organizations.

e) Provide clear maps of City parks, trails and recreation facilities online, in the City newsletter, at trailheads and public counters, and in newspaper articles or notices.

f) Support the Parks Committee as the forum for public discussion of parks and recreation issues.

g) Conduct periodic joint sessions between the Parks Committee and other standing City boards, such as the Planning Commission, and with the City Council to improve coordination and discuss policy matters of mutual interest pertaining to recreational resources, opportunities and funding.

h) Survey, review and publish local park and recreation preferences, needs and trends at least once every five years.

i) Pursue opportunities to partner with residents and neighborhood groups to improve, maintain and monitor local parks, natural areas and trails.

j) Encourage and promote volunteer park improvement and maintenance projects from a variety of individuals, service clubs, churches and businesses.

k) Support and promote efforts to document and publicize Redmond's local heritage and identity, to include interpretive displays/markers.

l) Add a webpage with planned and current park improvements.

GOAL 2 **SECURE LANDS FOR THE FUTURE**

Redmond provides a comprehensive system of parks, natural resource areas and recreation amenities that serves current and future needs.

POLICY 8-2-1 Plan for and acquire additional parklands necessary to adequately serve the City's current and future population based on adopted service levels and community needs.

a) *Provide urban parks (community, neighborhood and mini parks) to a service standard of 4 acres per 1,000 persons.*

b) *Proactively seek parklands identified within the Parks Master Plan, in both developed and undeveloped areas, to secure suitable locations for new parks to serve future residents.*

c) *Identify and protect land for parks and recreation within the Urban Growth Boundary or co-located with other City-owned property.*

d) *Identify and prioritize lands for inclusion in the parks system based on factors such as contribution to level of service, connectivity or recreational opportunities for residents.*

e) *Establish acquisition for future parks to ensure the future site has the necessary characteristics to provide recreational value and prepare development standards to ensure good park design.*

f) *Pursue acquisition of park-adjacent parcels to provide for needed parking expansion or valuable natural area/open space conservation.*

g) *Seek and implement opportunities for the acquisition and use of contiguous school and park sites for recreational purposes beneficial to both the City and the Redmond School District.*

h) *Evaluate opportunities to acquire lands declared surplus by other public agencies for park and recreation use.*

i) *Explore opportunities for agreements with local utilities, public agencies and private landowners for easements for parkland, trail corridors and recreation facilities.*

POLICY 8-2-2 Plan for the location of parks in the proximity of under- served neighborhoods and/or high-density developments.

a) *Coordinate with the Community Development Department for Parks Division staff review and comment on development proposals to improve park siting and community planning; Update the development code as necessary to accommodate development review for park infrastructure.*

b) *Explore and implement area planning in areas of the UGB and URA that are not already planned to identify future park and trail sites.*

c) *Prioritize park acquisition in areas of the city facing population growth, and residential and commercial development.*

d) *Provide equitable access to parks such that all city residents live within a ½-mile of a developed park.*

GOAL 3 **CREATE GREAT PARKS AND PUBLIC SPACES**

Redmond's parks meet local needs for active and passive recreation, enhance the environmental and visual quality of the community, and healthy living.

POLICY 8-3-1 Design and develop park sites and facilities to maximize recreational value and experience, while minimizing maintenance and operational costs and negative environmental or community impacts.

a) *Examine existing parks for opportunities to add, change or redesign existing recreational amenities to ensure the most effective use of park space and provide diverse outdoor recreation opportunities.*

b) *Maintain an inventory of assets and their condition; update the inventory as assets are added, updated or removed from the system and periodically assess the condition of park facilities and infrastructure.*

c) *Incorporate low impact design practices into the design, planning and rehabilitation of new and existing facilities; consider the use of native vegetation for landscaping to reduce maintenance requirements.*

POLICY 8-3-2 Strive to reduce barriers to participation and improve safety by providing universal access to parks and amenities.

a) *Design new parks and provide improvements to existing parks which promote public safety and security and provide accessibility to all in accordance with Americans with Disabilities Act standards.*

b) *Continually evaluate facilities for ADA compliance; implement and update as needed the ADA Transition Plan to address and prioritize accessibility in parks and facilities.*

POLICY 8-3-3 Establish and operate specialized recreational facilities (e.g. sport facilities, off leash dog areas, skateparks, community gardens) to respond to identified public needs, as appropriate.

a) *Develop and maintain minimum design and development standards for park and recreation amenities within private developments to address community facility needs, equipment types, accessibility and installation procedures.*

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b) *Assess overall sport fields needs on a regular basis, based on existing inventories and local participation trends.*

c) *Provide additional picnic shelters for events, such as family gatherings and community events.*

POLICY 8-3-4 Conserve significant natural areas to meet habitat and canyon protection needs and to provide opportunities for residents to recreate appropriately.

a) *Implement the goals and policies of the Dry Canyon Master Plan.*

b) *Consider the preparation of an Urban Forestry Management Plan to articulate a long-term strategy for tree protection, urban forestry management and public education and outreach.*

c) *Establish and fund a tree canopy replacement program for parks.*

GOAL 4 **CONNECT TRAILS AND NEIGHBORHOODS**

Redmond's parks, and open spaces are connected with safe and accessible trails, bikeways and pedestrian linkages.

POLICY 8-4-1 Develop a network of shared-use recreational, pedestrian and bicycle trails to enable connections within parks and between parks, neighborhoods and public amenities.

a) *Integrate the siting of proposed trail segments into the development review process; require development projects along designated trail routes to be designed to incorporate trail segments as part of the project.*

b) *Provide trailhead accommodations, as appropriate, to include parking, signage, restrooms and other amenities.*

POLICY 8-4-2 Design and construct trails to serve a variety of users at varying skill levels.

a) *Implement trail signage standards, route and wayfinding signage for trails and associated facilities and informational maps and materials identifying existing and planned trail facilities, as described in the Dry Canyon Master Plan.*

b) *Incorporate an environmental interpretation sign system for conveying values of natural areas in parks and along trails.*

POLICY 8-4-3 Support other City departments in the implementation of the Bicycle & Pedestrian Network Plan.

a) *Implement the goals and projects noted in the Bicycle & Pedestrian Trails Plan to strengthen the connections between the on-street infrastructure to existing and planned recreational trails.*

b) *Coordinate with and guide the participation of local trail users to build, maintain or modify trails, as appropriate, in alignment with the Dry Canyon Master Plan and Bicycle & Pedestrian Trails Plan.*

c) *Coordinate with neighboring jurisdictions, Deschutes County, RAPRD and COID to provide a connected trail network that provide continuous walking and biking access between parks, natural areas and other key destinations, especially along the Pilot Butte Canal and the BPA corridor.*

GOAL 5 **FOSTER A HEALTHY, ACTIVE COMMUNITY**

Redmond's parks and facilities bring residents together, encourage and amplify healthy lifestyles, and foster community pride and identity.

POLICY 8-5-1 Identify opportunities to create public gathering spaces that enable residents of all ages to connect with each other.

a) *Monitor local and regional recreation trends to ensure community needs and interests are addressed by available amenities.*

b) *Continue to support community events that provide opportunities for social engagement and bring families and neighbors together.*

c) *Partner for and promote special events to enhance community identity, community activity and environmental education.*

d) *Continue to partner and coordinate with RAPRD in their planning for recreation programs and to maximize the use of recreation facilities.*

e) *Explore partnership opportunities with regional healthcare providers and services, such as St. Charles Health System and the Deschutes County Health Services Department, to promote wellness activities, healthy lifestyles and communications about local recreation amenities and the benefits of parks and recreation.*

POLICY 8-5-2 Seek opportunities to support and expand heritage facilities.

a) *Continue to support the Homestead Park and enhance with historical monuments and interpretive displays.*

POLICY 8-5-3 Reflect the City's identity by incorporating art, history and culture into the park and recreation system.

a) *Identify appropriate locations within parks and natural areas for the installation of public art, interpretive signs or cultural displays.*

GOAL 6 **MAINTAIN AND MANAGE FOR THE PUBLIC GOOD**

The Parks Division stewards the community's human, social and physical resources to care for and expand recreational opportunities for residents.

POLICY 8-6-1 Provide leadership and sufficient staff resources to maintain the overall parks and recreation system to the City's requirements.

POLICY 8-6-2 Actively manage Redmond's park and recreational assets through a regular schedule of maintenance and capital renewal efforts to optimize use, reduce unplanned reactive maintenance and protect public investment.

POLICY 8-6-3 Pursue and maintain effective partnerships with governmental agencies and private and non-profit organizations to plan and provide recreation activities and facilities in an effort to maximize opportunities for public recreation.

POLICY 8-6-4 Use traditional and new funding sources to adequately and cost-effectively maintain and enhance the quality of Redmond's park system.

a) Promote professional development opportunities that strengthen the core skills and commitment from staff, Committee members and key volunteers, to include trainings, materials and/or affiliation with the National Recreation & Park Association (NRPA) and the Oregon Recreation & Park Association (ORPA).

b) Assess the Department's staffing needs and hire adequate staff to manage the City's park and recreation system.

c) Use part-time, seasonal and contract employees for select functions to meet peak demands and respond to specialized or urgent needs.

d) Annually update the Capital Facilities Plan to reflect the recreational needs of the community.

e) Periodically update the Parks System Development Charges and methodology to reflect revised park capital and population forecasts.

f) Assess park maintenance standards and prepare a routine preventative maintenance program to ensure parks, facilities and equipment are maintained in a manner that keeps them in safe and attractive condition.

g) Plan for and finance deferred maintenance projects and upgrades for ADA compliance to ensure safe and accessible park infrastructure.

h) Coordinate with public, private and non-profit providers, such as organized sport leagues and the Redmond School District, to plan for projects to expand specialized recreational facilities.

i) Utilize strategic capital investments in parks, trails, natural areas and art to encourage and support economic development and revitalization.

j) Pursue supplemental funding options and dedicated revenues for the acquisition and development of parks and facilities, such as through private donation, sponsorships, partnerships and state and federal grant sources, among others.

k) Consider the establishment of a Parks Utility Fee to facilitate funding for ongoing park operations and maintenance.

REDMOND

STATEWIDE PLANNING GOAL 9

ECONOMIC DEVELOPMENT

OVERVIEW

Statewide Planning Goal 9 ensures that adequate land is planned and zoned to provide opportunities for employment growth on sites with a variety of characteristics (e.g., site sizes, locations, visibility, and other characteristics).

Commercial and industrial development takes a variety of shapes and leads to economic activities that are vital to the health, welfare and prosperity of communities. To be ready for these opportunities, Goal 9 requires local governments to perform an Economic Opportunity Analysis (EOA) based on a 20-year forecast of population and job growth.

Under Goal 9, all local governments should have a working inventory of areas suitable for economic growth that can be provided with public services. These inventories primarily focus on planning for major industrial and commercial developments, and having a ready supply of land appropriately zoned and located for those opportunities and local investments. As with all areas of the comprehensive plan, the amount of land planned for economic development should be adequate for a 20-year supply. The economic development plans formed by a city often use one or more market incentives to encourage the type of development a community or county would like to see. These might include tax incentives or disincentives, land use controls, or preferential assessments.

GOALS AND POLICIES

GOAL 1 **LAND SUPPLY**

The City will plan for a 20-year supply of suitable commercial and industrial land on sites with a variety of characteristics (e.g., site sizes, locations, visibility, and other characteristics).

POLICY 9-1-1 Provide for an adequate supply of commercial and industrial land to accommodate the types and amount of economic development and growth anticipated in the future, as described in the City's most recent Economic Opportunities Analysis. The supply of commercial and industrial land should provide a range of site sizes and locations to accommodate the market needs of a variety of commercial and industrial employment uses. Some commercial development should occur in newly master planned residential neighborhoods.

a) *Identify land to rezone (and re-designate) to provide for an adequate supply of commercial and industrial land and make efficient use of land. Some of land to rezone will likely be in the UH-10 zone on the west side of Redmond (consistent with Objective 9-1-1b).*

b) *As part of the City's master planning process, identify commercial and employment land in or near to newly developing neighborhoods to provide opportunities for commercial employment centers, retail, and services to develop near new residential development. Areas in the UH-10 zone where the City may want to zone for Mixed-Use development include along the Highway 126 Corridor between 35th Street and Helmholtz.*

POLICY 9-1-2 Provide for an adequate short-term supply of suitable commercial and industrial land to respond to economic development opportunities as they arise.

"Short-term supply" means suitable land that is ready for construction usually within one year of an application for a building permit or request for service extension.

a) *As commercial and industrial sites develop, especially sites larger than five acres, the City should plan for replenishment of land in the short-term supply through the capital improvement planning process (consistent with Goal 3).*

b) *The City's Planning and Public Works departments should coordinate planning to ensure an on-going short-term supply of land. This planning could be based on development of scenarios of likely near-term future development, with feedback from partners such as REDI and other utility providers to understand both opportunities and infrastructure constraints.*

POLICY 9-1-3 Monitor and replenish the total and short-term supply of commercial and industrial land on a regular, periodic basis.

a) *Develop and implement a system to monitor the supply of commercial and industrial lands. This includes monitoring commercial and industrial development (through permits) as well as land consumption (e.g. development on vacant, or redevelopable lands). Continue to assess permitted uses on commercial and industrial lands with the goal to attract businesses with higher-than-average wages.*

b) *Update the Economic Opportunities Analysis every two to five years, in coordination with other infrastructure master plans, to evaluate development of Redmond's target industries and buildable lands inventory to track employment growth and changes in Redmond, improvements to infrastructure, and changes in the regional economy occur.*

GOAL 2 **LARGE-LOT INDUSTRIAL LAND SUPPLY**

Continue to coordinate with the Central Oregon Intergovernmental Council (COIC) on the large lot industrial site program. The City supports a multi-jurisdictional cooperative effort to pursue a regional approach to establish a short-term supply of sites particularly designed to address out-of-region industries that may locate in Central Oregon. The City recognizes the importance of maintaining a large-lot industrial land supply that is readily developable in Central Oregon.

The City entered into an Intergovernmental Agreement (IGA) with COIC. In addition, Redmond adopted the Central Oregon Regional Large Lot Industrial Land Need Analysis ("Analysis", dated November 20, 2012) by Ordinance 2013-15 is incorporated by reference herein.

POLICY 9-2-1 The City supports REDI and EDCO, non-profit organizations facilitating new job creation and capital investments, that monitor and advocate for the region's efforts of maintaining an inventory of appropriate sized and located industrial lots available to the market.

POLICY 9-2-2 The City will continue to collaborate with regional public and private representatives to engage the Oregon Legislature and state agencies and their commissions to address public facility, transportation and urbanization issues that hinder economic development opportunities in Central Oregon.

POLICY 9-2-3 The City will limit allowed uses on the Large Lot Industrial site to traded sector uses but may allow non-industrial uses primarily serving the needed of the employees of industrial uses developed on the site, as required by OAR 660-024-0045(10).

POLICY 9-2-4 The City will preserve the Large Lot Industrial land for large-lot industrial uses for at least 10 years from the time the site is added to the city, prohibit division of lots within the site to new lots less than the minimum size of the site until the site is developed with a primary traded sector use requiring a large lot, and , as required by OAR 660-024-0045(9).

POLICY 9-2-5 The City will work with partners to support development of the Large Lot Industrial site.

a) Identify opportunities to work with land owners and other project partners to support development through efforts to market the land to potential developers and businesses.

b) Encourage land owners to get the sites certified shovel ready through the Business Oregon Certified Shovel Ready program.

GOAL 3 **INFRASTRUCTURE PLANNING**

Provide adequate infrastructure efficiently and fairly to support business and employment growth.

POLICY 9-3-1 The City will coordinate capital improvement planning to ensure infrastructure availability on employment land and continue to pursue funding for needed infrastructure to support economic development activities.

a) Consider development of employment land as a criteria for evaluating priority of capital improvements.

b) Coordinate capital improvement planning annually to incorporate the priorities in the City's Economic Development Strategy (See Objective 9-5-1a).

c) Work with landowners to develop master plans to prepare for and guide development of key industrial sites.

POLICY 9-3-2 The City will ensure that infrastructure planning is cost-effective, supports economic development, is consistent with the City's master plans for new area development, and supports cohesive development patterns across the City.

POLICY 9-3-3 The City will identify opportunities for forward-thinking planning that reduces infrastructure costs without negative impacts on the health, safety, or service obligations of the City.

POLICY 9-3-4 The City will work to ensure sufficient water service is available in commercial and industrial areas to support the necessary water for fire suppression, as part of making sure the City has a sufficient short-term supply of land (consistent with Policy 9-1-2). The City will provide information to landowners and potential developers about where sufficient water service is available.

POLICY 9-3-5 The City will work with partners such as Business Oregon to advocate for state funding to support infrastructure development.

POLICY 9-3-6 The City and REDI will coordinate with developers and private utility providers (such as power companies or natural gas companies) to ensure that need for private utilities is understood and can be accommodated.

GOAL 4 **DEVELOPMENT, INFILL DEVELOPMENT, AND REDEVELOPMENT**

The City will support and encourage development, infill development and redevelopment, especially in areas with existing infrastructure, as a way to use land and existing infrastructure more efficiently.

"Infill" is additional development on the vacant portion of a tax lot with existing development (i.e., putting a new building on a 2-acre tax lot where the existing building occupies one-half of an acre).

"Redevelopment" is when an existing building is demolished and a new building is built, adding additional capacity for more employees. Redevelopment could also include substantial renovations of an existing building that increases the employment capacity of the building.

POLICY 9-4-1 Work with regional partners, such as the Department of State Land (the landowner), REDI, EDCO, and Business Oregon, to plan for development of the Large Lot Industrial land within Redmond.

POLICY 9-4-2 Ensure that there are sufficient available small industrial sites, such as sites in industrial parks. Redmond has a limited amount of industrial parcels smaller than five acres and relatively few vacant industrial buildings. Businesses that want a small site or industrial site in an existing building, have difficulty finding appropriate sites.

a) *Develop standards and processes to allow more flexibility for subdivision of smaller parcels in existing industrial parks and on other industrial parcels (except for land zoned Large-Lot Industrial).*

b) *The City could develop a land use process template for subdividing M1 and M2 parcels into smaller sites, to make it easier, faster, and less costly for landowners or developers to subdivide existing sites. This template could include pre-approved subdivision plans.*

c) *Identify at least one site for a new industrial park, likely on land zoned (or rezoned to) M2.*

POLICY 9-4-3 Provide opportunities for development of commercial centers that allow for a mixture of retail, commercial, and residential uses, both in master planned areas near new residential development and in redevelopment areas that are appropriate for new commercial development. For development of larger commercial centers, Redmond should focus on development of Community or Neighborhood Centers.[1]

a) *Identify one or two potential sites for development of a Community Center. The Community Center should be located in an area with high visibility from an arterial or collector street and have a site size of about 10 to 15 acres.*

b) *Identify potential sites for development of Neighborhood Centers, as part of Redmond's master planning process. The Neighborhood Centers should be 3 to 5 acres in size and located in areas with existing and/or new residential development along areas with high visibility from an arterial or collector street. Redmond may have greater need for new Neighborhood Centers on the west side of town, where residential development is occurring and planned.*

c) *Identify potential sites for development of Village Centers, as part of Redmond's master planning process. The Village Centers should be larger than 3 acres in size and located in areas with existing and/or new residential development. Redmond may have greater need for new Village Centers on the west side of town, where residential development is occurring and planned.*

d) *Evaluate consolidating some commercial zones, when the uses and development standards overlap. For example, the C-5 (Tourist Commercial), C-3 (Special Service Commercial), and C-4 (Limited Service Commercial) zones could be merged together or in some cases removed entirely. Creation of a mixed-use commercial center zone or overlay is a flexible zone to enable more cohesive master planning.*

[1] *Based on definitions of commercial centers from the International Council of Shopping Centers. These definitions are included in the EOA, in the section titled "Site Needs for Potential Growth Industries."*

e) *Update Redmond's zoning standards to allow Community or Neighborhood Centers to include a mixture of commercial and residential uses. Currently, Redmond's zoning code allows mixed-use development in C-2 and MULW zones; entertainment, eating, and drinking uses in C-1, C-2, C-3, M-1, and M-2; retail uses in C-1, C-2, C-3, and MULW; high-density residential in C-1 and C-2; and office commercial uses in C-1, C-2, and some limited uses in M-1 and M-2.*[2]

Uses Allowed	C-1	C-2	C-3	MULW	M-1	M-2
Mixed Use Development	✓	✓	✗	✓ (live/work)	✗	✗
Entertainment/ Eating and Drinking	✓	✓	✓	✗	✓	✓
Retail Uses (Primary)	✓	✓	✓	✓	✗	✗
High-density Residential	✓	✓	✗	✗	✗	✗
Office Services	✓	✓	✗	✗	✓ (limited)	✓ (limited)

f) *Update Redmond's zoning code to ensure that critical zoning standards match those necessary to support development of Community or Neighborhood Centers. Currently, Redmond's zoning code meets building height standards typical of Community or Neighborhood Centers. However, Redmond's code does not align with other typical development standards, such as minimum lot area, setbacks, lot coverage, and residential density.*

Zoning Standards	C-1	C-2	C-3	MULW	M-1	M-2
Maximum building height: 70 feet	✓ (60)	✓ (50/60)	✓ (60)	✓ (45)	✓ (60)	✓ (60)
No minimum lot area	✗*	✗*	✗*	✗ 5,000 sq ft (only applies to non-reuse)	✗*	✗*
No minimum building setback	✗	✗	✗	✗	✗	✗
Minimum density: 25-50 du/acre	✓	✓	✓	✓	✗	✗
Parking Standards	ECO will evaluate parking standards in the next version of this memorandum.					
Flexible Design Standards	Redmond's commercial design standards appear sufficiently flexible.					

**Redmond development code notes: "The minimum lot size shall be determined based on demonstration of the ability to develop the site in accordance with the zone standards, off-street parking standards, Site & Design Review Standards, landscaping requirements and other applicable Development Code provisions without adverse impact to water and land resource quality and adjoining properties."*

[2] ✓ *= Allowed outright in current Redmond Development Code;* ✗ *= Not allowed in current Redmond Development Code*

POLICY 9-4-4 Plan for and facilitate commercial redevelopment in Downtown and along Highway 97 and other major transportation corridors. The Redmond Urban Renewal Plan provides tools to support redevelopment in Downtown. The Urban Renewal Plan proposes tools such as: a property assistance grant or loan program, business support programs that provide funding for business development and marketing, the restaurant program that provides public financing of costly kitchen equipment, an industrial opportunity fund for financial incentives and development incentives for industrial businesses, and the redevelopment opportunity fund that would fund development of amenities in downtown. The City of Redmond developed the Redmond South US 97 Corridor Plan and is in the process of implementing the plan.

a) *Redmond South US 97 Corridor Plan should be amended to include development of residential uses, as part of the mixture of uses within the redevelopment area.*

POLICY 9-4-5 Support and encourage business location at the Redmond Airport, focusing on businesses that benefit from locating at the Airport. The types of businesses that may locate at the Airport are aviation-related businesses, such as general aviation facilities, passenger terminal complexes, air cargo or airline maintenance facilities, support facilities including Aircraft Rescue and Firefighting (ARFF) facilities, and any compatible uses which compliments aviation uses. Non-aviation businesses may locate on the Airport property, as identified in the subareas of the Redmond Airport Master Plan. These businesses include those identified as "target industry sectors," such as accommodation and food services, speculative light industrial buildings, construction, manufacturing, wholesale and warehousing, public administration, and gas station/convenience store.

a) *The City should work with the regional economic development partners (such as those listed in Policy 9-5-3) to attract and grow businesses that want to locate at the Redmond Airport and understand the opportunities and constraints of locating at an airport.*

GOAL 5 **EXISTING BUSINESS RETENTION, NEW BUSINESS DEVELOPMENT, AND ATTRACTION OF NEW BUSINESSES**

The City will support retention and expansion of existing businesses, growth and creation of entrepreneurial business, and attraction of new businesses.

POLICY 9-5-1 Ensure that the City's planning for economic development increases economic resiliency, mitigating long-run economic risks such as future disruptions such as: infrastructure issues, technological disruptions, natural disasters, or national economic recessions.

a) *Develop a 3-year Economic Development Strategy and Economic Resiliency Plan, collaborating with REDI from their 3-year Economic Development Strategy. The Strategy could use data on local and regional economic trends gathered through the Economic Opportunity Analysis, from goals established in the Comprehensive Plan and from interviews with local citizens, business owners, schools, and professionals. The Plan should emphasize economic resiliency and should have a broader focus than land use, considering issues such as workforce development and collaborating with business to support business growth. The Plan should help the City prioritize goals around long-term economic resiliency.*

b) *As part of the developing the Economic Development Strategy and Economic Resiliency Plan, establish a framework for decision making about future economic development investments, with the goal of making investments with will make the best use of Redmond's economic assets and provide additional economic development benefits.*

c) *Ensure that Redmond's development code and other policies accommodate development of childcare centers.*

POLICY 9-5-2 Promote and support diversification of Redmond's economic base, focusing on growth of family wage jobs. The types of industries Redmond should focus on include advanced and specialty manufacturing, aviation and aerospace manufacturing, healthcare technology and manufacturing, food and beverage manufacturing, and service and hospitality.

Redmond defines a family wage job as a job with a wage sufficient to allow a household to purchase a home in Redmond. In the first quarter 2020, the mean sales price of a house in Redmond was $323,000.[3] A household would need to have an income of $85,000 to afford a unit at this price.[4]

[3] Source: Central Oregon Association of REALTORS, 2020 Quarter 1 Report.
[4] This assumes that the household puts 20% down on the unit, with a 30-year mortgage at an interest rate of 4.0%.

On average, there are 1.7 jobs per household in Redmond. This suggests that a family wage in Redmond is $50,000. This is considerably above Redmond's average wage of $41,700.

a) The City should work with economic development stakeholders (such as those in 5.3) and regional partners to market commercial and industrial sites in Redmond to encourage economic growth.

b) The City should focus efforts to attract jobs with an average wage of $50,000 or more to Redmond. This is an approximate family wage in Redmond and is considerably above Redmond's average wage of $41,700.

c) The City should focus efforts to attract jobs that are above the Redmond average wage of $41,700, above the industry's average wage in Deschutes County, or both.

d) Identify opportunities to use the City's existing Enterprise Zone to support business development, combining benefits of the Enterprise Zone with other approaches to supporting business development, such as reductions in land use and permit fees or expedited permit review, where appropriate.

POLICY 9-5-3 Coordinate economic development efforts with cities in the region and local and regional economic development organizations, including but not limited to REDI, COIC, EDCO, Deschutes County, the Redmond Chamber of Commerce, Business Oregon, the Regional Solutions team, and the Central Oregon Small Business Development Center. In addition, coordinate economic development with regional private utilities, such as Pacific Power, Central Oregon Electric, Bonneville Power Administration, Cascade Natural Gas Corporation, telecommunication providers, and other private utilities.

a) Continue to actively participate on the Boards of REDI and EDCO and actively work with the Redmond Chamber of Commerce.

b) Continue to actively participate with regional planning efforts through participation in COIC.

c) Coordinate economic development efforts with other cities and counties in the Central Oregon Region, through participation in COIC.

POLICY 9-5-4 Retain and encourage growth of existing businesses in Redmond, including retention of small businesses and entrepreneurs.

a) City staff should work with businesses, the City Council, the Redmond Chamber of Commerce, REDI, and other stakeholders on economic development issues, as part of development of the Economic Development Strategy and Economic Resiliency Plan in Objective 9-5-1a.

b) *City staff should work with Redmond Chamber of Commerce reach out to businesses in Redmond and identify problems and barriers to economic development.*

c) *Act as a convener to bring partners (such as those in Policy 9-5-3) together with landowners and developers to lower or remove barriers to development.*

d) *Work with REDI on recruitment efforts to identify barriers to business growth and propose solutions to lower or remove the barriers. This will require the City's policies to be as flexible as possible and the City to act quickly and nimbly in response to requests and issues.*

e) *Work with EDCO to support entrepreneurship through programs such as their Venture Catalyst program.*

POLICY 9-5-5 Ensure that Redmond has the services and amenities necessary to attract workers and provide the services they need, such as medical services, child care services, educational and training opportunities, public transportation, retail and restaurants, and other necessary services and amenities.

POLICY 9-5-6 Ensure that Redmond has the services and amenities necessary to for residents of Redmond. These services and amenities include those in Policy 9-5-6 but also include parks and open space, public library, and public safety services. Redmond should also ensure that there are opportunities for development of housing and services for seniors, such as assisted living and other senior housing opportunities.

GOAL 6 **WORKFORCE DEVELOPMENT**

The City will support workforce development through collaboration with regional partners and businesses.

POLICY 9-6-1 Act as a convener to support discussions about workforce training needs between businesses and regional partners involved in workforce development, such as the Redmond School District, the Central Oregon Community College, OSU Cascades, East Cascades Works, Worksource Oregon Employment Department, Deschutes County human services, and other partners.

a) *Evaluate gaps in the training and educational services to ensure that Redmond's workforce can meet changing needs of businesses. If gaps are identified, Redmond should assist regional partners involved in workforce development in developing and implementing a plan to fill the gaps to make sure that necessary training and educational services are available.*

STATEWIDE PLANNING GOAL 10

HOUSING

OVERVIEW

Goal 10 addresses housing in Oregon and provides guidelines for local governments to follow in developing their local comprehensive land use plans and implementing policies. Goal 10 requires incorporated cities to complete an inventory of buildable residential lands and encourage the numbers of housing units in price and rent ranges commensurate with the financial capabilities of its households.

"Needed housing types" are defined as "all housing on land zoned for residential use or mixed residential and commercial use that is determined to meet the need shown for housing within an urban growth boundary at price ranges and rent levels that are affordable to households within the county with a variety of incomes, including but not limited to households with low-incomes, very low-incomes and extremely low-incomes."

GOAL 1 **LAND AVAILABILITY**

Plan for a 20-year supply of suitable land for Redmond to meet housing needs within the existing urban growth boundary.

POLICY 10-1-1 Ensure that there is sufficient land in each residential plan designation to meet the land needs identified in the Housing Needs Analysis.

a) *Re-zone land to address the deficits of land identified in the Housing Needs Analysis in Limited Residential, General Residential, and High-Density Residential zones, as well as the Mixed Use Live/Work zone.*

POLICY 10-1-2 Meet the housing needs of Redmond's current and future residents by planning for opportunity for development of the needed housing mix of 60% single-family housing types and 40% multiple family and single-family attached housing types as a long-range target, and an average residential density of 8.0 dwelling units per net acre, or about 6.2 dwelling units per gross acre over the 20-year planning period between 2019 and 2039.

POLICY 10-1-3 The following density target ranges for housing will be required for each Plan Designation:

DESIGNATION	ZONE	REQUIRED DENSITY
Limited Residential	Single-Family Residential: R-1, R-2	Between 2.0 and 5.0 dwelling units per net acre
General Residential	Residential Medium: R-3, R-4	Minimum of 4.0 dwelling units per net acre
High Density Residential	High Density Residential: R-5	Minimum 8.0 dwelling units per net acre

POLICY 10-1-4 Identify opportunities to increase allowable densities in Redmond's residential zones.

a) *Evaluate increasing the minimum density from 2.0 to 4.0 dwelling units per net acre in the Limited Residential Designation (R-1 and R-2 zones). Allow development of between 4.0 and 6.0 dwelling units per net acre in the R-1 and R-2 zones. Decrease the minimum lot size from 9,000 square feet to 7,300 square feet in the R-1 and R-2 zones.*

b) *Evaluate increasing the minimum density for both zones from 4.0 to 5.0 dwelling units per net acre in General Residential Designation (R-3 and R-4 zones).*

c) *Evaluate allowing development of between 5.0 to 7.25 dwelling units per net acre, with a minimum lot size of 6,000 square feet (down from the current 7,500 square feet) in the R-3 zone.*

d) *Evaluate allowing development of between 5.0 to 8.7 dwelling units per net acre, with a minimum lot size of 5,000 square feet (down from the current 6,000 square feet) in the R-4 zone.*

e) *Evaluate allowing development of 8.7 dwelling units per net acre, with a minimum lot size of 5,000 square feet (down from the current 6,000 square feet) for single-family detached housing in the High-Density Designation (R-5 zone).*

f) *Evaluate increasing the minimum density to 12 dwelling units per net acre in High Density overlay zone. Remove the minimum lot size for single-family detached and duplex housing and allow the minimum density to set minimum lot sizes.*

g) *Evaluate removing the maximum density standard and allowing the building height limitation, lot coverage standard, and parking requirement to limit density in the R-5 zone and the Higher Density overlay.*

h) *Evaluate using average lot size requirements, rather than minimum lot size requirements, in the zoning code. This standard is more applicable to developments with multiple units (such as Master Planned Areas), rather than infill development of one or two units.*

POLICY 10-1-5 Encourage development of small vacant and partially vacant parcels, with policies that support development of infill housing types, especially in areas with existing urban services.

a) *Identify barriers to infill development, such as parking, setbacks, design review, and to the extent possible, lower or eliminate these barriers, as part of the code audit in 10-2-1a.*

b) *Develop incentive(s) to support redevelopment or infill development of underutilized land to support development of residential infill, such as providing a density bonus or lower-cost infrastructure requirements (i.e., not requiring curbs or sidewalk extensions or not charging for connecting to sewers).*

POLICY 10-1-6 Monitor residential land development to ensure that there is enough residential land to accommodate the long-term forecast for population growth.

a) *Develop and implement a system to monitor the supply of residential land every two years. This includes monitoring residential development (through permits) as well as land consumption (e.g. development on vacant, or redevelopable lands).*

b) *Evaluate residential development to determine whether development has occurred at densities consistent with the City's planned density standards.*

c) *If development has not occurred at densities consistent with the City's standards (10-1-3), revise standards or regulations that allow densities that are lower than the City's planned densities.*

GOAL 2 **HOUSING OPPORTUNITY**

Provide opportunities for development of a range of housing types that are affordable to households at all income levels as described in the Redmond Housing Needs Analysis. These housing types include (but are not limited to): single-family detached housing, accessory dwellings, cottage housing, manufactured housing, townhouses, duplexes, multifamily products (including apartments).

POLICY 10-2-1 Develop clear and objective standards for development of all types of needed housing and identify opportunities to increase residential development in Redmond through removing or lowering barriers to residential development.

a) *Conduct an audit of the City's zoning code to identify barriers to residential development and identify alternatives for lowering or eliminating the barriers.*

b) *Modify the zoning code to develop clear and objective standards for all type of needed housing and address the issues identified in the code audit (10-2-1a).*

c) *Apply for grants to support further revisions to the zoning code, such as a Code Assistance grant from Oregon's Transportation and Growth Management Program (TGM).*

POLICY 10-2-2 Allow for and encourage a wider range of types of housing development within Redmond to meet the housing needs of all income levels in both existing neighborhoods and new residential areas.

a) *Evaluate allowing townhouses, tri-plexes, and quad-plexes in the R-3 zone as a permitted use in selected areas, such as on corner lots or on lots that are not located on canyon rims.*

b) *Evaluate allowing cottage housing in clusters with shared central amenities (such as open space) to allow for development of small single-family detached housing clustered on a lot, possibly with flexible parking requirements.*

c) *Evaluate allowing of a tiny house in clusters with shared central amenities (such as open space) to allow for development of small single-family detached housing clustered on a lot.*

d) Evaluate requirement of parking garages for tri-plex and quad-plex units. Consider requiring off-street parking but not parking garages.

e) Evaluate setback requirements as a barrier to allowing development of a wider range of housing types.

f) Evaluate development standards to allow for conversions from single-family detached housing to multifamily housing.

POLICY 10-2-3 Allow and encourage development of higher density multifamily housing in High Density overlay zone.

a) Evaluate increasing the maximum building height in the overlay zone from 40 feet (3 stories tall) to 60 feet (5 stories tall).

POLICY 10-2-4 Design neighborhoods with features that promote development of a full range of housing types and neighborhoods that incorporate the following planning principles:

- Implement Redmond's Great Neighborhood Principles
- Require Master Development Plans that incorporate these characteristics for new development in the Urban Holding-10 zone.
- Include connections within and between neighborhoods and with open space and other amenities via sidewalks, trails and roads.
- Incorporate alley access when lots are smaller than 6,000 square feet and have a lot frontage of 60 feet or less, with garages accessed from alleyways.
- Provide multi-modal (multiple transportation options) access for residential developments internally and to adjacent development.
- Allow transit stops within neighborhoods as required by an adopted Transportation System Plan (TSP).
- Protect, to the greatest extent possible, the physical characteristics of the site relating to soils, slope, erosion, drainage, natural features and vegetation.

a) Evaluate Redmond's Great Neighborhood Principles to ensure that they are achieving their goals of creating neighborhoods with a vibrant mixed-use core that is diverse, legible, sustainable, and well connected.

b) *Evaluate Redmond's Master Planning requirements to ensure that it is resulting in development that meets the City's broader goals for growth, such as development of Great Neighborhoods.*

c) *Evaluate requirements for connections and open space in neighborhoods to determine how it is affecting density of housing development (i.e., are the requirements making it more difficult to develop a range of housing types or are increases in density increasing open space requirements) and housing affordability (i.e., are the requirements for devoting land for these uses making housing less affordable)?*

d) *Evaluate requirements for incorporating alley access to understand how the requirements are affecting development density and the costs of housing development.*

POLICY 10-2-5 Consider requiring new developments include alley access, especially in areas with denser development, such as the R-3, R-4, and R-5 areas.

a) *Evaluate adding alley standards master planning requirements for areas newly zoned R-3, R-4, and R-5.*

POLICY 10-2-6 Require that redevelopment of parcels larger than one acre have a redevelopment plan that shows how the property will be redeveloped consistent with planned residential densities in the surrounding area once primary urban services are available.

a) *Develop criteria for what is included in a redevelopment plan.*

POLICY 10-2-7 Encourage development of mixed-use multifamily housing in commercial zones.

a) *Identify and lower barriers to mixed-use development that includes residential development in commercial zones (as part of 10-2-1a).*

b) *Evaluate developing a density bonus program or a transfer of development rights program to allow higher density development of multifamily in Redmond's downtown.*

POLICY 10-2-8 Resolve the issue of tax lots that have split Plan Designations and zones.

a) *Develop and implement a process to resolve the split zone issue.*

GOAL 3 **AFFORDABLE HOUSING**

Provide the opportunity to develop broad range of accessible and affordable housing (affordable housing is defined as housing for which persons or families pay 30 percent or less of their gross income for housing, including necessary and essential utilities), focusing on housing development for low-income affordable housing and/or middle-income affordable housing. Development of affordable housing should be encouraged in a variety of locations across the city.

POLICY 10-3-1 Support development of government-subsidized low-income housing through partnering with non-profit, for-profit, and governmental developers of low-income affordable housing.

a) Work with developers of government-subsidized low-income housing to identify barriers to development of this type of housing and identify opportunities to lower or remove these barriers (as part of 10-2-1a).

b) Identify surplus publicly owned properties that could be used for affordable housing and partner with the developers of low-income government-subsidized housing to develop affordable housing.

POLICY 10-3-2 Support development of government-subsidized low-income housing and affordable market-rate housing by providing density bonuses and other incentives that support development of affordable housing, including entry-level ownership units.

a) Develop policy guidance for the criteria for granting density bonuses, such as the level of affordability required for the bonus, the number of units (or percentage of the development) required to be affordable for the bonus, and other criteria.

b) Identify policies that support development of entry-level housing, possibly in conjunction with infill development or redevelopment.

POLICY 10-3-3 Support development of all types of multifamily affordable housing, market rate or government-subsidized affordable housing, through use of tools to lower development or operational costs or make the development process simpler or faster.

a) *Partner with organizations to support programs that preserve market-rate housing, such as provision of grants or low-interest loans to support rehabilitation of existing, older single-family detached homes in poor condition.*

b) *Partner with organizations to establish a land bank or land trust, to support affordable housing by reducing or eliminating land cost from the development process.*

c) *Evaluate opportunities for a tax abatement program, such as the multiple-unit limited tax exemption program or the vertical housing tax credit, to promote development of affordable multifamily housing.*

d) *Develop an expedited review process for development of affordable housing projects that target housing affordability at 120% of Median Family Income or less.*

e) *Partner with Oregon Housing and Community Services (OHCS), working with other members of the Regional Solutions Team, to identify resources for developing additional housing affordable for both very low-income households and middle-income households. As part of the Statewide Housing Plan, OHCS' goal is increasing their housing development in rural areas by 75%.*

POLICY 10-3-4 Develop the "Redmond Housing Program in coordination with existing CDBG Consolidated Plan efforts," which would be a comprehensive housing strategy that supports development of both government-subsidized affordable housing and naturally occurring affordable housing. The Redmond Housing Program will be a program that uses a variety of tools, such as those described in this memorandum, to lower barriers to and encourage affordable housing development.

a) *Apply for a state grant to develop a comprehensive housing strategy to support development of affordable housing.*

b) *Work with willing landowners to use the tools in support of new affordable multifamily (or other higher density affordable housing). For example, the city might work with a land owner that wants to develop market-rate affordable housing (i.e., housing affordable at below 80% of the Median Family Income) on a high priority site, providing assistance with rezoning land (such as unzoning from low- to high-density), using tools like a multiple unit tax exemption and paying for SDCs for low-income housing development, building key off-site infrastructure necessary for the development, and paying for the costs of these actions through CET funding.*

c) *Develop Skyline Village, per HB 2336, as an opportunity for an urban growth boundary expansion for development of affordable housing.*

GOAL 4 **INFRASTRUCTURE PLANNING**

Plan for infrastructure development to support residential development.

POLICY 10-4-1 Coordinate land use planning with the Capital Improvement Plan to ensure that infrastructure is available to support residential development, especially in newly urbanizing areas and areas identified as high priority for development.

a) Develop and deliver a report about implementation of the Capital Improvement Plan as it relates to development in Redmond for the Planning Commission and City Council.

b) Identify areas of high priority for improving infrastructure to support new residential development, such as master planned areas.

c) Identify opportunities to improve infrastructure in older neighborhoods, especially when infrastructure improvements will support infill development or housing rehabilitation and improvements.

d) Ensure that the City's Capital Improvement Plan includes funding for improvements and maintenance necessary to support 10-4-1a and 10-4-1b.

e) Continue to develop programs to pay SDCs for low to moderate income affordable housing.

f) Identify opportunities to reduce development costs through changes to infrastructure development standards, when appropriate. For example, development of a cottage housing cluster would require multiple water meters under existing standards but there may be an opportunity to change the standard to allow one water meter for multiple cottage units.

GOAL 5 **FUNDING**

Develop funding sources to pay for the costs of implementing the affordable housing programs described in Goal 3 and infrastructure improvements in Goal 4.

POLICY 10-5-1 Identify funding sources to pay for the affordable housing programs and infrastructure development actions in this strategy.

a) *Use Urban Renewal funding to support development of infrastructure necessary to support housing development in downtown. If there is a further revision to Redmond's Urban Renewal Plan, evaluate funding more projects related to affordable housing (such as those in Goal 3).*

b) *Evaluate a Construction Excise Tax (CET) on new development to pay for developer incentives, such as fee and SDC waivers, tax abatements, or finance-based incentives.*

c) *Evaluate other sources of revenues for funding affordable housing development, such as Transient Lodging Taxes, General Obligation Bonds, Bancroft Bonds (for infrastructure projects), or marijuana taxes (if Federal laws change and the City allows sale of marijuana).*

STATEWIDE PLANNING GOAL 11

PUBLIC FACILITIES AND SERVICES

OVERVIEW

Public facilities are those improvements which provide various government services to the residents. These include domestic water, sanitary sewer, storm drains, transportation services, parks, schools, fire and police. Additional recognized public facilities in the Redmond area include the fairgrounds and the airport. Transportation and Parks are individual chapters in the Comprehensive Plan.

This chapter describes existing public and private facilities and services and known present and future needs based on projected growth. It does not present specific public improvements which may be needed. That information is contained in the City's adopted Public Facility Plan. The facility plan is a support document to the Comprehensive Plan, which describes in detail the water, sewer, transportation, and park facilities needed to accommodate anticipated development and includes cost estimates of facility improvements.

11 GOALS AND POLICIES

GOAL 1 **LEVEL OF SERVICE**

Provide public facilities, services and private utility systems at levels necessary and suitable for existing and proposed uses.

POLICY 11-1-1 Ensure development within the Redmond UGB is subsequent to or concurrent with the provision of an adequate level of public facilities and services and complies with utility and facility plans intended to serve the area.

POLICY 11-1-2 Balance the extension of public facilities, utilities, and services in a manner that accommodates expected population and employment growth while maintaining the City's ability to continue providing existing services citywide at levels necessary and suitable for urban uses.

POLICY 11-1-3 Weigh the following factors when determining public facility location:

- Availability and cost of usable land;
- Degree of disruption of residential areas;
- Operational efficiency of alternate locations;
- Social justice (i.e., disproportionate environmental and health effects on neighborhoods);
- Geographic restrictions and requirements; and
- Comprehensive Plan Vision, goals and policies

POLICY 11-1-4 Maintain and enhance the provision of police, fire and emergency medical services for residents.

POLICY 11-1-5 Work with Deschutes County to ensure adequate provision for and control of solid waste disposal sites.

POLICY 11-1-6 Work with Federal, State and local agencies to expand wastewater treatment services at the City's existing irrigation site and facility north of town. Pursue sustainable and environmental options to relocate treatment processes from the Dry Canyon operations, which could also provide opportunities for protection of the natural environment, recreation and development of natural habitat.

GOAL 2 **PLANNING**

Maintain and regularly update public systems plans to ensure concurrency, cost-effectiveness and equitable access to services.

POLICY 11-2-1 Coordinate public facility planning for the Redmond UGB with participation and assistance from Deschutes County and the following service providers:

- Transportation – Deschutes County, Oregon Department of Transportation,
- Burlington Northern Santa Fe Railroad, Central Oregon Intergovernmental Council – Cascade East Transit.
- Water – Brentwood Water Association, Avion Water, Central Oregon Irrigation District
- Sewer
- Storm Drainage – Deschutes County, Central Oregon Irrigation District
- Parks – Deschutes County, RAPRD, Redmond School District.

POLICY 11-2-2 Collaborate with private utility companies to ensure equitable access to services throughout the City.

POLICY 11-2-3 Maintain and enhance access to library resources by expanding services and promoting co-location with other community amenities.

POLICY 11-2-4 Coordinate with the Redmond public school district in developing and updating their facility plans designed to meet enrollment increases and population growth, including land supply analysis for future school siting.

GOAL 3 **FUNDING**

Maintain capital improvements programming and budgeting to leverage, coordinate and manage investments.

POLICY 11-3-1 Prepare, adopt, and periodically update a long-term Capital Improvements Plan (CIP) for public facilities for the entire planning period.

POLICY 11-3-2 Adopt additional funding methodologies, as needed, and coordinate investments to pay for and leverage planned capital improvements.

POLICY 11-3-3 Explore different funding alternatives to ensure equitable and adequate provisioning of public facilities and services.

STATEWIDE PLANNING GOAL 12

TRANSPORTATION

OVERVIEW

The 2020 Transportation System Plan (TSP) provides the City of Redmond with a coordinated guide for changes to its transportation infrastructure and operations over the next twenty years. A basic assumption in the development of this policy document is that the transportation system not only meets daily travel needs but also affects the physical, social, and economic health of the City. As such, planning for the future system must be conducted within regional and community goals and values, support local and regional economic development activities, and enhance the quality of life that residents and visitors enjoy and expect.

12 GOALS AND POLICIES

GOAL 1 **ECONOMIC DEVELOPMENT**

Provide a safe and efficient transportation network to complement key economic development priority areas, the comprehensive plan, recreational needs, and adopted state, regional and local plans and policies.

POLICY 12-1-1 Manage the City's street, bike, pedestrian, and transit system to facilitate economic growth of existing and future businesses in Redmond.

POLICY 12-1-2 Consider environmental impacts of the overall transportation system and strive to mitigate negative effects and enhance positive features of the natural landscape and topography.

POLICY 12-1-3 Provide a multi-modal transportation system to help reduce reliance on single-occupancy vehicle travel and support mixed-use areas, employment centers, recreation, commercial, residential, and public developments.

POLICY 12-1-4 Manage the on-street parking system to preserve adequate capacity and turnover for access to businesses in the downtown area.

POLICY 12-1-5 Facilitate prompt emergency responses by ensuring that fire and emergence response routes remain passable by design.

POLICY 12-1-6 Coordinate underground capital improvement projects to coincide with needed transportation project expenditures.

GOAL 2 **OREGON RESILIENCY PLAN**

Advance community and statewide emergency preparedness efforts through support of the Oregon Resiliency Plan.

POLICY 12-2-1 Prioritize transit and roadway improvements that help ensure access to local schools and other public buildings that could be used during emergencies.

POLICY 12-2-2 Prioritize roadway improvements that can be used as alternative routes to US 97 and other state facilities in the case of emergencies.

POLICY 12-2-3 Prioritize roadway improvements that provide land-side access to the Redmond Municipal Airport and the BNSF line.

GOAL 3 **MULTIMODAL**

Provide transportation choices and address the needs and safety of all travelers, including people of all ages, abilities, ethnicities, and incomes.

POLICY 12-3-1 Address the mobility and safety needs of motorists, transit users, bicyclists, pedestrians, freight, and the needs of emergency vehicles when planning and constructing roadway system improvements.

POLICY 12-3-2 Consider safety first when making transportation decisions. Strive for zero transportation-related fatalities and severe injuries through design, operations, maintenance, education and enforcement.

POLICY 12-3-3 Foster neighborhoods where all residents can meet many of their basic daily needs without an automobile by providing streets, sidewalks, bike facilities and access to transit in an environment where people feel safe and secure.

POLICY 12-3-4 Expand existing Transportation Demand Management (TDM) programs related to carpooling, alternate work schedules, walking, bicycling, and transit use in order to reduce peak hour congestion and reliance on SOVs.

GOAL 4 **BICYCLE AND PEDESTRIAN**

Provide comfortable, convenient and safe pedestrian and bicycle facilities for all users.

POLICY 12-4-1 Maintain and preserve a safe and efficient bike and pedestrian system in Redmond.

POLICY 12-4-2 Strive to increase the percentage of bicycle and pedestrian system users by planning, designing, and managing systems to support the needs of diverse populations and types of users, including meeting Americans with Disabilities Act (ADA) needs.

POLICY 12-4-3 Ensure that there are safe, accessible, comfortable, and direct sidewalk connections between residential areas, schools, major destinations, and transit stops.

POLICY 12-4-4 Improve community health by designing streets and paths to encourage increased physical activity by the public.

POLICY 12-4-5 Prioritize improvements that complement and improve access to the Dry Canyon trail system and Homestead Canal Trail.

POLICY 12-4-6 Coordinate with Deschutes County to provide additional trail extensions throughout the community including connections beyond the city limits.

GOAL 5 **TRANSIT**

Provide reliable and convenient transit service to Redmond residents and businesses as well as special transit options for the City's elderly and disabled residents.

POLICY 12-5-1 Coordinate with Cascades East Transit to increase the transit system's accessibility and convenience for all users, including the transportation-disadvantaged population.

POLICY 12-5-2 Prioritize improved transit service in areas with access to key employment, retail/commercial, multi-use development and recreational areas.

GOAL 6 **FREIGHT**

Ensure efficient and effective freight transportation infrastructure is developed and maintained to support local and regional economic expansion and diversification consistent with City and Regional economic plans and policies.

POLICY 12-6-1 Promote and manage mobility for efficient freight and goods movement along designated freight and rail routes on the east side of Redmond on the industrial lands.

POLICY 12-6-2 Facilitate efficient access for freight, employees, and customers to and from employment, commercial, and industrial lands, including freight access to the Redmond Municipal Airport.

POLICY 12-6-3 Continue to explore opportunities to enhance rail services in Redmond, while also being cognizant to reduce transportation conflicts.

GOAL 7 **REGIONAL COORDINATION**

Implement the plan in a timely fashion and keep it up to date with respect to local and regional priorities.

POLICY 12-7-1 Coordinate the design of Redmond's transportation system with ODOT, Deschutes County, Cascades East Transit and other relevant local, regional, and state agencies.

POLICY 12-7-2 Support development of a stable and flexible transportation finance system that provides adequate resources for transportation needs identified in the TSP.

POLICY 12-7-3 Build and maintain public support for the TSP through open information, public participation, public discussion of the plan's effects on the community, and periodic reassessment of the plan's goals and policies.

REDMOND
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CENT-
WISE
DRUG

STATEWIDE PLANNING GOAL 13

ENERGY CONSERVATION

OVERVIEW

Statewide Planning Goal 13 requires development and land use to be managed so as to maximize the conservation of all forms of energy, based upon sound economic principles.

GOALS AND POLICIES

GOAL 1 **EFFICIENCY**

Advance the efficient use of resources in the built environment

POLICY 13-1-1 Work with Deschutes County and the Department of Transportation to provide an efficient and adequate transportation network that provides for a variety of travel options.

POLICY 13-1-2 Locate land use activities with adequate density and intensity so as to reduce energy-consuming travel and development patterns.

POLICY 13-1-3 Support and implement weatherization and other energy saving programs for all new public buildings.

POLICY 13-1-4 Encourage new development, redevelopment and retrofits to utilize the best available energy conservation techniques and construction material efficiency.

GOAL 2 **PLANNING**

Evaluate and plan for emerging technologies to respond to changing conditions.

POLICY 13-2-1 Support the use of emerging user and systemwide technologies and periodically update relevant codes and standards to remain responsive to changing conditions.

POLICY 13-2-2 Explore harnessing emerging technologies that would increase the use, production, storage and delivery of alternative energy sources to meet power demand.

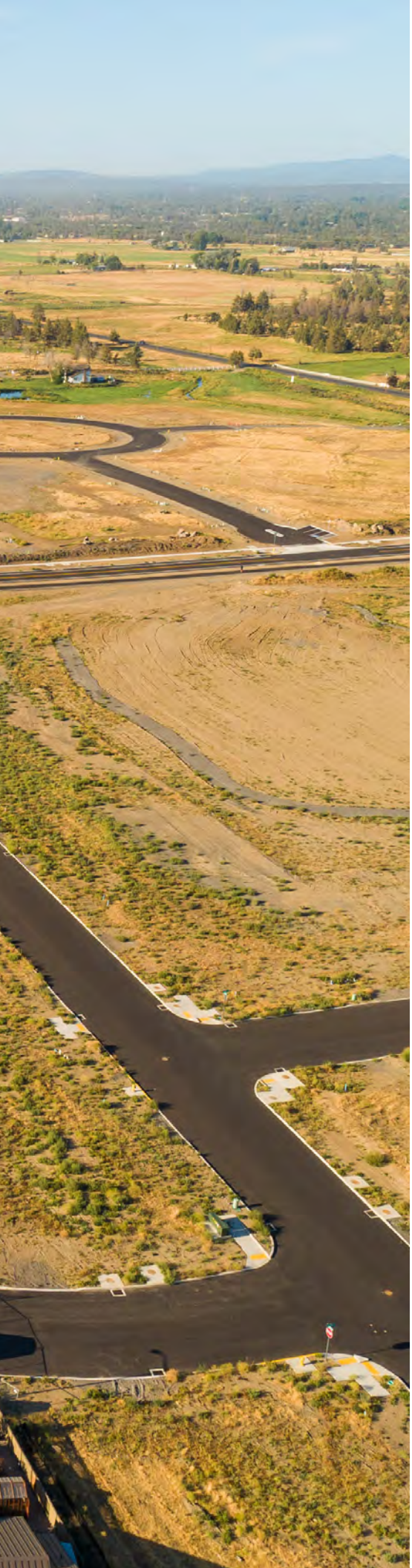
GOAL 3 **COORDINATION AND COLLABORATION**

Build capacity to address climate and energy trends through innovative and collaborative partnerships.

POLICY 13-3-1 Inform climate change mitigation and adaptation efforts by promoting projects and development that quantifies energy use, resource impacts, and carbon emissions.

POLICY 13-3-2 Participate in a regional conversation about innovative strategies and partnerships for climate change mitigation and adaptation.

POLICY 13-3-3 Facilitate energy and climate change education that is inclusive and accessible to both the development community and public.



STATEWIDE PLANNING GOAL 14

URBANIZATION

OVERVIEW

The purpose of this chapter is to identify the goals and policies that the City, in cooperation with Deschutes County, has adopted to comply with Statewide Planning Goal 14, Urbanization – to provide for an orderly and efficient transition from rural to urban land use.

To comply with Statewide Goal 14, the City of Redmond and Deschutes County have adopted:

a) An Urban Growth Boundary (UGB) and an Urban Reserve Area (URA);

b) Policies concerning the regulation and management of land within the UGB; and

c) An intergovernmental agreement that describes criteria and procedures for amending the UGB.

The goals and policies for managing growth and urbanization, which lead to strong communities and great neighborhoods, are informed by the following principles:

Great Neighborhood Principles

- **Transportation.** Connect people and places through a complete grid street network and trail system that invites walking and bicycling and provides convenient access to parks, schools, neighborhood service centers, and future transit stops.
- **Housing.** A mix of housing types and densities should be integrated into the design of new neighborhoods.

- **Open spaces, greenways, recreation.** All new neighborhoods should provide useable open spaces with recreation amenities that are integrated to the larger community. Central parks and plazas shall be used to create public gathering places. Incorporate significant geological features such as rock outcroppings, stands of clustered native trees, etc. into the design of new neighborhoods. Neighborhood and community parks shall be shown in appropriate locations consistent with polices in Redmond's Parks Master Plan.
- **Integrated design elements.** Streets, civic spaces, signage, and architecture shall be coordinated to establish a coherent and distinct character for the MDP. Plans may integrate design themes with adjacent developed or planned areas.
- **Diverse mix of activities.** A variety of uses is encouraged in order to create vitality and bring many activities of daily living within walking and biking distance or a short drive of homes.
- **Public art.** Public art is encouraged at the gateways to neighborhoods and/or in and around the center of neighborhoods to provide focal points.
- **Scenic views.** Identify and preserve scenic views and corridors of the Cascade Range, Ochoco Mountains, and Smith Rock. Streets and common or public open spaces should be located and oriented to capture and preserve scenic views for the public. Minimize visual clutter within scenic corridors.

- **Urban-rural interface.** Urban development shall interface with rural areas through open space buffers at least 100 feet wide and the length of the urban development, excluding public streets, or shall transition higher density development to lower density development at the urban-rural interface, or utilize other appropriate and equivalent transitional elements.
- **'Mini' parks in neighborhoods.** "Pocket Parks" or "tot lots" shall be incorporated into medium and high density zoned residential subdivisions and site plans. These areas shall be developed for every twenty-five lots/units, a minimum of 1,500 square feet in size, and privately maintained unless the City maintains the park site.
- **Canal trails.** If canals or laterals are present, multi-use trails, at least 10 feet wide shall be provided, subject to the Central Oregon Irrigation District's review and approval. Pedestrian amenities such as benches and trash receptacles shall be provided at appropriate locations.
- **Green Design.** Environmentally friendly and energy efficient design is encouraged for public and private architecture and building orientation, open spaces and natural areas, and transportation facilities. In addition, the planting of native, drought- resistant trees is encouraged to provide shade and to minimize water usage.

14

GOALS AND POLICIES

GOAL 1 **GROWTH MANAGEMENT**

Guide growth and development in a manner that implements the Redmond 2040 Vision.

POLICY 14-1-1 Promote the efficient use of land, including appropriate in-fill, redevelopment and new development. Encourage the city to grow its existing neighborhoods, amenities, town center and industrial areas into one connected well planned city.

POLICY 14-1-2 Urban development on the edge of the UGB that is adjacent to land planned for long-term rural use should buffer urban uses with open spaces, when feasible, or lower density residential development, or other appropriate transitional uses.

POLICY 14-1-3 Continue to adopt and modify an Urban Framework Plan for future urban areas in the UGB and Urban Reserve Area. The Redmond Urban Framework Plan will be used as a conceptual guide for future urban land uses in urban reserve areas and areas within the UGB. The Framework Plan is not parcel-specific and is intended to provide general guidance as to community form and design, and to be used as the basis for preparation of Area Plans.

POLICY 14-1-4 All types of Master Development Plans (MDP) as well as major land division and site development plans, phased development plans, subdivisions, and site plans, shall address the applicable Great Neighborhood Principles to ensure livability.

POLICY 14-1-5 When land is brought into the UGB, it shall be designated Urban Holding (UH-10) on the comprehensive plan map.

POLICY 14-1-6 The UH-10 plan designation may be changed when the land is annexed and approved for urban zoning through a Master Plan approval process.

POLICY 14-1-7 Land that is designated UH-10 on the Comprehensive Plan Map shall be planned for urban development using a Master Development Plan or Partial Master Development Plan. Such plans may be approved through a quasi-judicial land use process and should be prepared so that contiguous UH-10 zoned parcels are covered by the plan. Minority property holdings that abut or are surrounded by a proposed Master Development Plan or Partial Master Development Plan may be included in the plan without landowner consent, but City annexation and rezoning may be delayed until requested by the landowner.

POLICY 14-1-8 Master Development Plans (MDP(s)) or Partial Master Development Plans (PMDP(s)) will be used to support rezoning land zoned Urban Holding-10 (UH-10), whether or not the land is inside City limits. City approval of an MDP or PMDP will require an amendment to the comprehensive plan map and zone change to reflect the new land use designations. Properties may be annexed concurrently with the City's approval of an MDP or PMDP unless otherwise approved by the City. However, properties previously annexed without master plan approval shall be zoned UH-10 until the City approves MDP or PMDP for a specific area, unless exempt.

- MDPs/PMDPs may be approved through a City initiated or property owner initiated quasi-judicial approval process. MDPs/PMDPs must be consistent with the Redmond Urban Framework Plan or the Comprehensive Plan (Plan) map in order to be approved through a quasi-judicial process.
- City approval of an MDP or PMDP will result in an amendment to the Plan Map and/or the zoning map.
- Properties designated UH-10 may be annexed when they are subject to an approved MDP or PMDP; annexation may occur concurrently with approval of an MDP or PMDP.
- The City intends that MDPs/PMDPs cover as large an area and as many contiguous UH-10 zoned properties as possible. Minority property interests may be subject to a MDP or PMDP without consent of the property owner. However, they may not be rezoned and annexed to the City without consent of the property owner.
- The City will only approve Plan designations and zoning for a MDP or PMDP that is consistent with identified urban lands shown in the Redmond Framework Plan or adopted Area Plans.
- Once approved, compliance with an MDP or PMDP is mandatory for all property subject to that Framework or Area Plan.
- MDPs or PMDPs that are not substantially consistent with the City Framework Plan or adopted Area Plans may only be approved through a comprehensive plan amendment planning process.

POLICY 14-1-9 Approval of a zone change from UH-10 to an urban zone may be granted without preparation of an MDP or PMDP pursuant to all of the following conditions.

- The zone change request is for a land parcel that is less than 12 acres and does not include more than 3 acres of proposed residential development.

- For land outside the City, the request is made in conjunction with a petition for annexation.
- The proposed urban zoning is consistent with the Redmond Framework Plan or an adopted Area Plan when the property is within the boundary of such plans and addresses applicable Great Neighborhood Principles.

POLICY 15-1-10 Upon annexation, roads and rights-of-way will be accepted by the City under the City's annexation regulations.

- Annexation of roads and rights-of-way will include the full width of existing and new rights-of-way along the frontage of annexing properties.
- In addition to annexing right-of-way along the frontage of annexing properties, annexation of right-of-way will include the full length and width of the existing road and right-of-way within the UGB, including road and right-of-way segments that do not adjoin annexing properties, so as to avoid creating segments of alternating jurisdictional authority over the road within the UGB. In locations where annexation of road and right-of-way segments that do not adjoin annexing properties conflicts with adopted City legislation, jurisdictional transfer, in accordance with the procedures given in ORS 373.270 and by intergovernmental agreement under the authority given in ORS 190.010 and ORS 223.930, shall be required.
- All annexed rights-of-way shall require a transfer of jurisdictional authority from the County to the City per ORS 373.270.

GOAL 2 **LAND SUPPLY**

Maintain a UGB that provides appropriate land to accommodate projected population and employment growth during the 20-year planning period.

POLICY 14-2-1 The establishment and change of the UGB shall be a cooperative process between the City of Redmond and Deschutes County.

POLICY 14-2-2 The City will update its buildable lands inventory and evaluate the UGB every three (3) to seven (7) years to ensure that that boundary contains sufficient buildable land to meet projected urban growth needs for the succeeding 20-year period.

POLICY 14-2-3 The City may consider expanding the UGB using the Simplified UGB Method pursuant to OAR 660-038-000 to meet its projected housing need over the 14-year period.

POLICY 14-2-4 The City will consider other UGB amendment opportunities to implement Redmond Vision 2040, such as the Affordable Housing Pilot Project adopted by HB 2336 in 2019.

GOAL 3 **REGIONAL COORDINATION**

Engage in cooperative regional planning to monitor and designate Urban Reserve Areas and priority lands within the Redmond UGB to meet documented needs for additional urban land.

POLICY 14-3-1 In anticipation of the need to expand the UGB to accommodate population and employment forecasts for the year 2040 and beyond, the City of Redmond and Deschutes County have jointly agreed establish an Urban Reserve Area (URA) consistent with state law.

POLICY 14-3-2 Include a 30-year supply of land within the urban reserve beyond the 20-year time frame used to establish the UGB.

POLICY 14-3-3 Urban Reserve Area lands will be included within the UGB on a phased basis as the need for urbanizable land warrants an expansion. The City and County may establish a strategy and priority for expanding the UGB based on factors such as proximity to existing urban development and ability to extend public facilities and services in an orderly and efficient manner.

POLICY 14-3-4 The City of Redmond will adopt and implement IGAs with Deschutes County and other agencies to facilitate long-range transportation planning and master planning of the Redmond Urban Reserve Area.

POLICY 14-3-5 The City will encourage the preparation of Framework Plans for urban reserve area(s) prior to *approving* an UGB amendment consistent with the City/County Urban Area Management Agreement.

POLICY 14-3-6 The City of Redmond and Deschutes County will work cooperatively to ensure that interim development in Urban Reserve Areas does not interfere with the future extension of urban services. This is accomplished by identifying future urban transportation and utility corridors and regulating uses adjacent to those corridors to prevent encroachment by interim development.

POLICY 14-3-7 Urban development that occurs adjacent to designated Urban Reserve Areas shall be planned with the adjacent land's future urban use in mind. Urban development should be sensitive to adjacent rural uses but the development pattern should not be altered to the point that it fails to achieve desired urban characteristics or interferes with future urban expansion.

POLICY 14-3-8 Property owners have the opportunity to request that land within a designated Urban Reserve Area be included within the UGB, based on consideration of the following factors outlined in Statewide Goal 14, as amended. The Goal generally includes:

- Demonstrated need to accommodate urban population growth requirements;
- Need for housing, employment opportunities and livability;
- Orderly and economic provision of public facilities of services;
- Maximum efficiency of land uses;
- Retention of agricultural land;
- Compatibility of urban uses with nearby agricultural activities; and
- Environmental, energy, economic and social consequences.

POLICY 14-3-9 The City and County will favor UGB additions that are of sufficient size and scale to be integrated into the urban area as great neighborhoods or other community elements rather than isolated individual parcels. Privately initiated requests for UGB amendments should include a minimum of 150 acres and shall be based on demonstrated land needs to maintain a 20-year supply of urbanizable land within the UGB, unless otherwise allowed by state- law.

GOAL 4 **STRONG COMMUNITIES**

Support the Great Neighborhood Principles as a framework for urbanization and the development of strong communities.

POLICY 14-4-1 Ensure applicable Great Neighborhood Principles are addressed in all types of MDPs as well as major land division and site development plans, phased development plans and subdivisions.

POLICY 14-4-2 Regularly review the Great Neighborhood Principles to ensure livability and a high quality of life is promoted through growth and development.

REDMOND
EST 1910
Welcome
to
Redmond!
Evergreen

SALON
Bumble and bumble spoken here.
Chocolate
FUDGE
Truffles
Sweet Oasis
SWEET SHOP
Caramel
Corn
Candy
Welcome
to
Redmond!
Sweet Oasis
SWEET SHOP & GIFTS
OPEN
OPEN

NOW
OPEN

CITY OF REDMOND PLANNING GOAL 15

LIVABILITY

OVERVIEW

Livability is a not an Oregon Land Use Goal, but a Redmond-specific goal that stems from the community's vision.

The Goal of Livability is overarching as it applies to all facets of growth and development, as well as all chapters of the Comprehensive Plan. "Livability" in and of itself fosters thoughtful development and a thriving community. It helps convey an image of a future that is enduring, vibrant, and offers a desirable small-town quality of life.

The Goal also complements the City's Great Neighborhood Principles (GNPs). Both this chapter and the GNPs are important to advance and connect planning goals and policies within the Comprehensive Plan and to enhance the community's broader vision for the future.

Thus, the goal and policies contained herein identify important "Livability" attributes to examine and apply as the community continues to grow and develop. They create awareness to position Redmond to better respond to ever changing social, economic, or environmental conditions.

GOALS AND POLICIES

GOAL 1 **LIVABILITY**

Redmond shall guide development by implementing forward-looking policies to improve livability, retain community identity, create a high quality of life, and support a safe environment.

POLICY 15-1-1 Redmond shall plan and invest in neighborhoods to provide a high quality of life for residents through incorporating the Great Neighborhood Principles in both existing and new neighborhoods.

POLICY 15-1-2 Redmond shall build safe places where people from all racial, ethnic and cultural backgrounds thrive socially, economically, academically and physically.

POLICY 15-1-3 Redmond shall improve community aesthetics.

POLICY 15-1-4 Redmond shall plan to become an interconnected community of parks and open spaces.

POLICY 15-1-5 Redmond shall adopt urban planning and building design strategies to create enduring value, including planning for and promoting attractive streetscapes.

POLICY 15-1-6 Downtown Redmond shall offer diverse districts with mutually supportive functions, including a pedestrian focused core that attracts residents and visitors for entertainment, shopping, dining, civic activities and community events.

POLICY 15-1-7 Redmond shall require the design of new neighborhoods to include a variety of housing types for all income levels.

POLICY 15-1-8 Redmond shall support energy-efficient housing choices for people of all ages, incomes, races, and ethnicities.

POLICY 15-1-9 Redmond shall strengthen its identity and sense of place by recognizing and enhancing its unique cultural and environmental resources, such as: historic structures, viewsheds, urban landscapes, authenticity, heritage, and architectural styles.

POLICY 15-1-10 Redmond shall develop a variety of safe, reliable, and economical mobility choices to decrease transportation costs, improve air quality, reduce greenhouse gas emissions, and promote healthy lifestyles.

POLICY 15-1-11 Redmond shall promote economic competitiveness through sustainable choices for employment, housing, transportation, education, cultural diversity and enrichment, and recreational opportunities. These choices also include reliable and timely access (by workers) to employment centers, educational opportunities, services and other basic needs.

POLICY 15-1-12 Redmond shall help existing businesses grow and thrive while also helping to create and foster new businesses, especially those that create family wage jobs.

POLICY 15-1-13 Redmond shall provide well-planned and flexible choices for infrastructure to support a competitive advantage for business retention and growth.

POLICY 15-1-14 Redmond shall work to retain and attract an educated, skilled and competitive workforce capable of fulfilling a variety of 21st century employer needs.

POLICY 15-1-15 Redmond shall develop strategies that improve resiliency in times of crisis and reduce the potential negative impact to the whole city should any one system falter or fail. Improving resiliency means Redmond should maximize the variety of business types.

REFERENCE DOCUMENTS

BIBLIOGRAPHY OF PLANNING RESOURCES AND SPECIFIC STUDIES

In developing the foundational basis for the Redmond Comprehensive Plan 2040, many planning resources and supportive studies were reviewed and considered.

Below is a list of the mandated and pertinent reports, plans and documents supporting the comprehensive plan's development and implementation. The sources listed here include various plans, such as: economic analysis, transportation-related plans, housing and land use studies, urban renewal plans, Deschutes County plans, and framework and public facilities plans. All the supporting plans identified, and as amended, are incorporated herein and made part of the Comprehensive Plan 2040. If new plans are developed to support the Comprehensive Plan they will be added by amendment.

DOCUMENT

1. 2020 Redmond Economic Opportunities Analysis

- *2013 Central Oregon Large Lot Industrial Land Need Analysis*
- *2012 The Redmond Development Plan: A Long-Term Economic Vision for Our Community*

2. 2020 Redmond Transportation Plan (TSP); also a component of the Public Facilities Plan. TSP includes:

- *2020 Cascades East Transit (CET)/2040 Transit Master Plan*
- *2019 US 97 Facility Plan (South Redmond Corridor Plan)*
- *2019 Redmond Municipal Airport Master Plan*
- *2014 Trails Master Plan*
- *2011 Bicycle Refinement Plan ('Reinventing the Wheel')*
- *2011 US97 Reroute Gateway Beautification Project*
- *2007 North Redmond US 97 Interchange Area Management Plan*

3. 2019 Redmond Housing Needs Analysis (HNA)

- *2019 Residential Buildable Lands Inventory (part of HNA)*
- *2019 Central Oregon Regional Housing Needs Assessment (COIC)*

4. US Department of Housing and Urban Development Community Development Block (CDBG) Program

- 2020 CDBG Annual Action Plan; updated yearly
- 2020 CDBG Citizen Participation Plan
- 2019-2023 CDBG 5-Year Consolidated Plan
- 2018 CDBG Consolidated Annual Performance Evaluation Report (CAPER); updated yearly

5. 2011 Downtown Redmond Urban Renewal Plan *(as amended)*

- *2016 City of Redmond Mid-town Plan*
- *2012 Professional Business Medical District Master Plan*
- *2006 Downtown Action Plan*

6. 2020 South Redmond US 97 Urban Renewal Area *(in progress)*

7. 2015 Historic Preservation Plan

8. Redmond Framework Plans:

- *2021 West Redmond Area Plan (in progress)*
- *2014 Southwest Area Plan (SWAP)*
- *2008 Eastside Framework Plan*
- *2007 Highway 97 Area Plan (HAP) – Land Use and Public Improvements*
- *2007 Northwest Area Plan (NAP) - Land Use and Public Improvements*

9. Deschutes County

- 2015 Natural Hazards Mitigation Plan
- 2015 Emergency Operations Plan
- 2012 Deschutes County TSP (update in progress)

10. 2018 Redmond Public Facilities Plan (PFP):

- *2021 Water System Master Plan (in progress)*
- *2021 Wastewater Facility Plan: Redmond Water Pollution Control Facility (in progress)*
- *2020 TSP (as noted above)*
- *2018 Citywide Park Master Plan*
- *2007 Wastewater Collections System Master Plan*
- *(elements for each plan include an i. Capital Improvement Plan and ii. corresponding SDC methodology)*

PFP Implemented by:

- Annual 5-Year Capital Projects Plan

AMENDMENT LOG

AMENDMENT LOG

The following table is a log of amendments made to the adopted Redmond 2040 Comprehensive Plan. For a list of amendments made to the previous Comprehensive Plan (Redmond 2020 Comprehensive Plan), see the Appendix.

ORD. NO.	DATE	DESCRIPTION

ACKNOWLEDGMENTS

CITY COUNCIL

Jon Bullock, *Councilor*
Joseph Centanni, *Councilor*
Krisanna Clark-Endicott, *Councilor*
George Endicott, *Mayor*
Camden King, *Councilor*
Ginny McPherson, *Councilor*
Jay Patrick, *Council President*

PLANNING COMMISSION

David Allen
Heather DeWolf
William Guy
Teri Jansen, *Chair*
Michael Kusinska
Nelson Rivers
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STEERING COMMITTEE

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Fred Bray, *Bicycle and Pedestrian Advisory Committee (BPAC)*
Steve Buettner, *Commercial/Residential Construction*
Neal Cross, *Downtown Urban Renewal Advisory Committee (DURAC)*
Scott Edelmann, *Department of Land Conservation and Development (DLCD)*
Krisanna Clark Endicott, *City Council*
Shannon Farnsworth, *Historical Landmarks Commission (HLC)*
Katie Hammer, *Redmond Area Parks and Recreation District (RAPRD)*
Devin Hearing, *Oregon Department of Transportation (ODOT)*
Andrew Hoeksema, *Redmond Ministerial Association*
Ken Kehmna, *Redmond Fire and Rescue*
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Dan Mooney, *Redmond Committee for Art in Public Places (RCAPP)*
Sean Neary, *Redmond Municipal Airport*
Tyler Neese, *Central Oregon Association of Realtors (COAR)*

Jenny O'Keefe, *Parks Committee*
Kelly O'Rourke, *Central Oregon Irrigation District (COID)*
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April Pust, *Hayden Homes*
Drew Roberts, *Historical Landmarks Commission (HLC)*
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Fregonese Associates
DKS Associates

City of Redmond
Community Development Department
City Thank You Letter

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A City's Comprehensive Plan is its primary land use and planning document. It establishes a series of goals and policies that guide and manage our community's growth and development for the next 20-years.

To be successful, the Comprehensive Plan has to balance the interests of the community as it continues to change. As such, the Comprehensive Plan 2040 is a community-inspired and community-driven project. It's also a very tangible result of effective collaboration in Redmond.

As we know, there is a lot of learning to be had from listening. A diverse and thoughtful citizenry identified and provided the values upon which this plan is built. During the Comprehensive Plan process, the City worked with over 800 residents, employees, business owners, community partners, and stakeholders. On behalf of all City staff, we are so grateful for everyone who participated—for the insight provided by the Citizen Advisory Committee, the expertise provided by the Technical Advisory Committee, and all the valuable feedback provided by the members of our community. Hard work and thoughtful contributions lead to purposeful and meaningful outcomes.

As Redmond continues to grow, the input will remain vital in guiding Redmond's future. No doubt, this moment in time has showcased Redmond's small-town culture of care and made us prouder than ever to serve our community! The City of Redmond thanks you for your participation and feedback throughout this unique planning process.

Together, we'll do great things.

Sincerely,

John Roberts

John Roberts
Deputy City Manager

APPENDICES

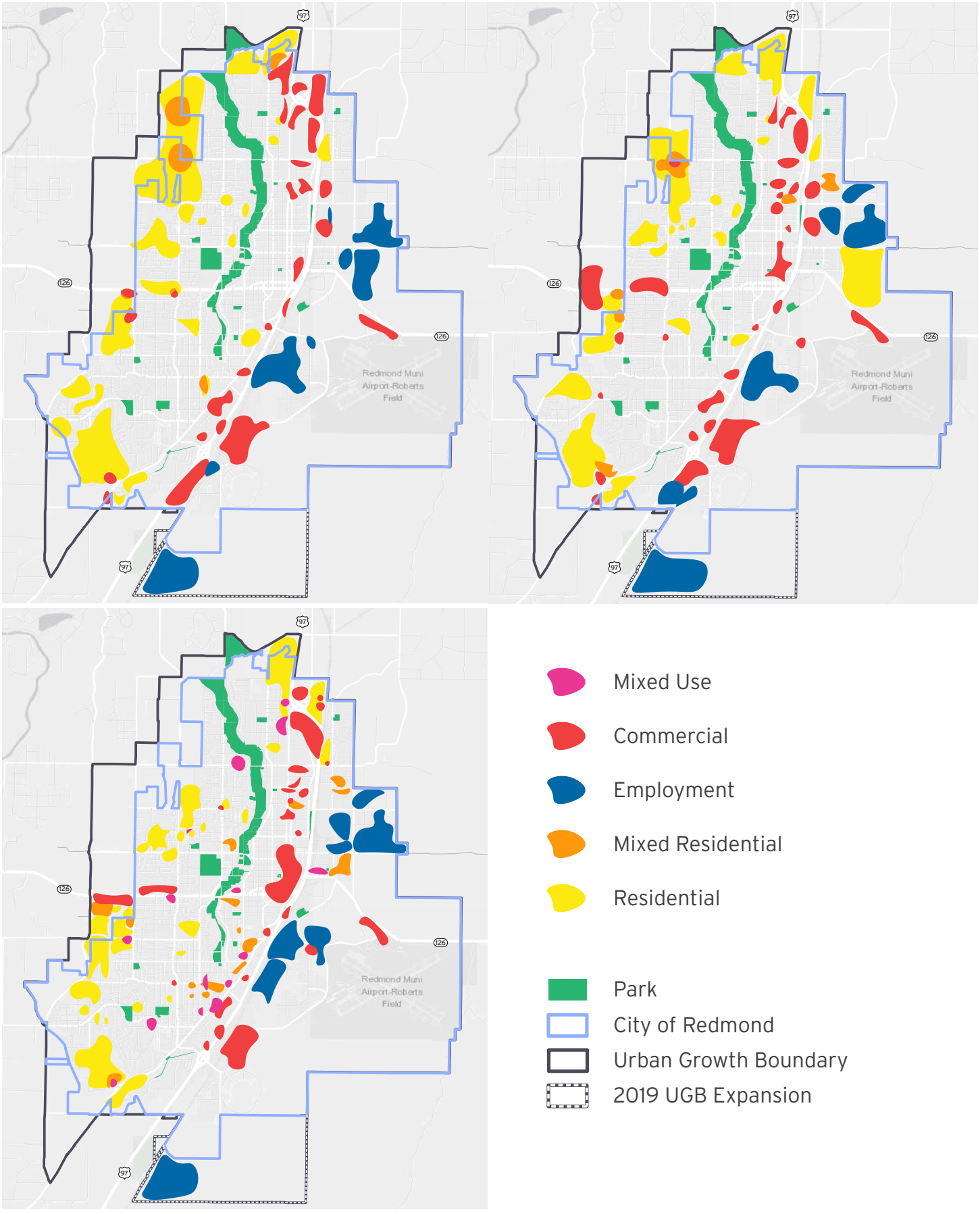
Scenario Land Use Planning Process

Scenario planning was used to explore the different ways Redmond might accommodate projected growth over the next 20 years. Scenarios illustrated how planning choices impact important community issues, such as access to parks, water conservation, and economic development.

The planning team created three scenarios for Redmond based on input from the public workshop, community conversations, and research. Each scenario met job and housing growth targets and experimented with a variety of issues including the types of housing built in new neighborhoods, where to locate new businesses, where to focus redevelopment, and where to preserve open space.

Each scenario was evaluated using a set of metrics including housing, natural resources, transportation, sustainability, and economic development. The most successful elements of each scenario were used to inform Redmond's Comprehensive Plan Map and policies.

Community Workshops
In October 2019, a scenario workshop was held to plan for Redmond's future. Small groups discussed housing, infrastructure, and employment needs while creating a scenario map. The activity allows members of the public to act as a planner, grappling with tradeoffs and solving problems.


Redmond Muni Airport-Roberts Field
Mixed Use
Commercial
Employment
Mixed Residential
Residential
Park
City of Redmond
Urban Growth Boundary
2019 UGB Expansion

SCENARIO A

- Residential housing (mostly single family) is found on the west side of Redmond.
- Employment is primarily on the east side of Redmond.
- Highway 97 continues to be a major commercial corridor.
- Development is concentrated on large undeveloped lots along the edge of town.

SCENARIO B

- A variety of housing types are found throughout Redmond.
- Employment is concentrated on the east side of Redmond.
- Commercial and shopping is primarily found along the edges of town.
- Summit attendees ranked Scenario B as the most business-friendly option.

SCENARIO C

- A variety of housing types are found throughout Redmond.
- Neighborhoods are walkable with access to nearby jobs and services.
- There is a greater variety in employment options throughout Redmond.
- Summit attendees ranked Scenario C as having:
    - the best educational, cultural, and recreational opportunities,
    - the most efficient transportation network,
    - the most high-quality housing choices,
    - the best protection for open and natural spaces,
    - and the best access to parks and open spaces.

COMPREHENSIVE PLAN AND ZONING MAP

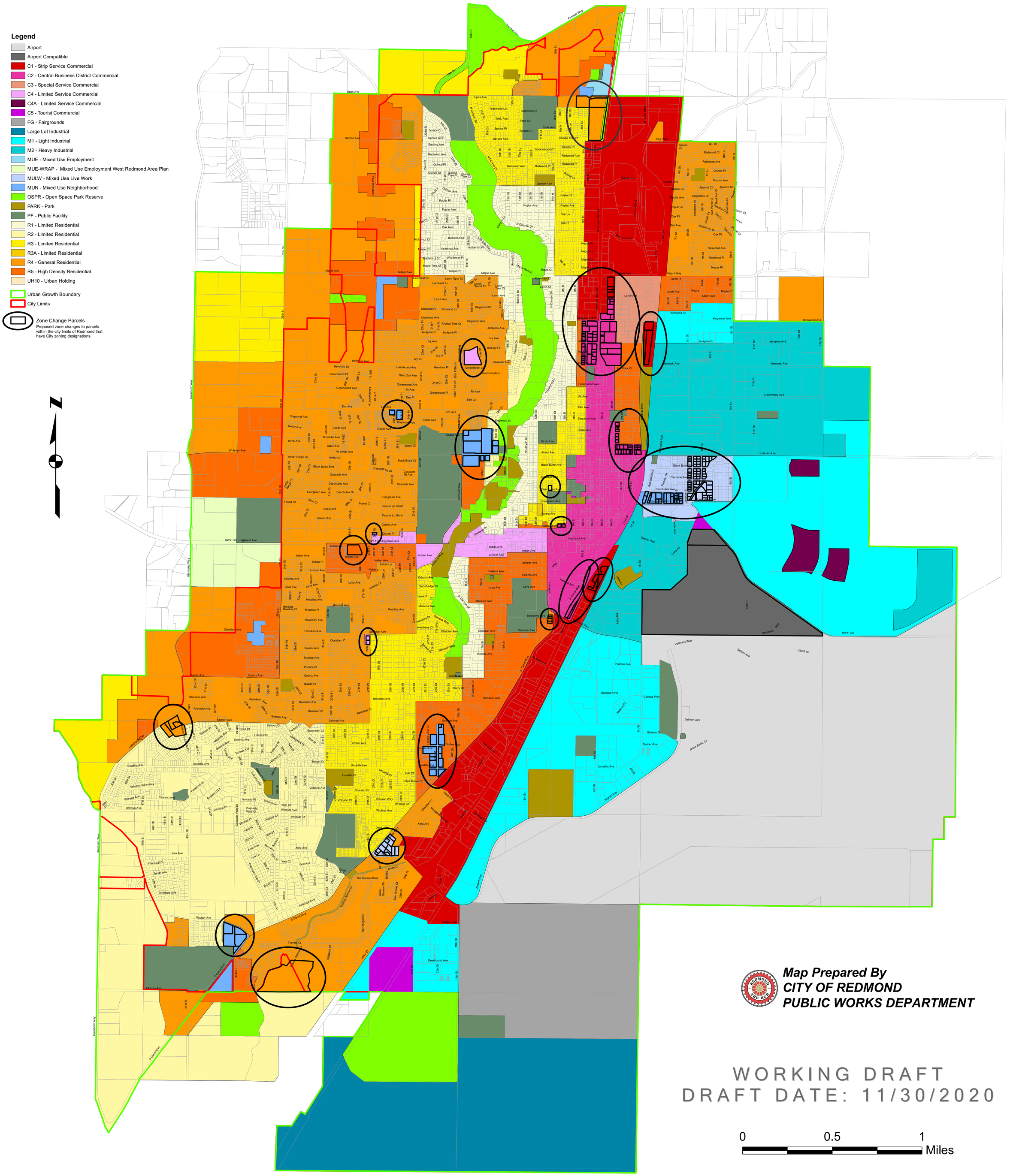
After continued engagement through a public open house and stakeholder meetings, the community voiced overwhelming support for Scenario C. Themes from Scenario C were used to update the future land use map and to inform implementation strategies in the Comprehensive Plan.

The adopted Comprehensive Plan and Zoning Map emulates the Redmond 2040 Vision, goal and policy direction contained herein, and what the community identified to preserve. Furthermore, the adopted map is a reflection of the three land use scenarios explored.

The Comprehensive Plan Map and policies:

- Connect existing area plans and their surrounding areas – Urban Holding land reflects area plans.
- Identify areas of change, areas of growth, and areas of stability.
- Open up gateways to the west and the north - Downtown expands to the north and big box commercial is replaced with C4 to reflect parcel sizes not suited to large commercial development.
- Allow neighborhood hubs to emerge, a request from the public.
- Make areas around the airport compatible with the Airport Master Plan.
- Allow for a more diverse, denser housing mix.
- Keep the spirit of downtown.
- Change large-scale commercial to walkable commercial development on smaller parcels.

2040 Greater Redmond Area Comprehensive Plan and Zone Map



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City of Redmond Economic Opportunities Analysis

August 2020

Prepared for:

City of Redmond

DRAFT REPORT

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Acknowledgments

ECONorthwest prepared this report for the City of Redmond. ECONorthwest and the City thank the many people who helped to develop the Redmond Economic Opportunities Analysis.

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Summary

This report presents an economic opportunities analysis consistent with the requirements of statewide planning Goal 9 and the Goal 9 administrative rule (OAR 660-009). Goal 9 describes the EOA as "an analysis of the community's economic patterns, potentialities, strengths, and deficiencies as they relate to state and national trends" and states that "a principal determinant in planning for major industrial and commercial developments should be the competitive advantage of the region within which the developments would be located."

The primary goals of the EOA are to (1) project the amount of land needed to accommodate the future employment growth within the Redmond Urban Growth Boundary (UGB) between 2020 and 2040, (2) evaluate the existing employment land supply within the city to determine if it is adequate to meet that need, and (3) to fulfill state planning requirements for a twenty-year supply of employment land.

How Much Buildable Employment Land Does Redmond Currently Have?

Redmond has 2,925 total acres in its commercial or industrial plan designations. Of these 2,925 acres, about 1,555 acres (53%) are unconstrained and buildable within its UGB. Of Redmond's buildable acres, 257 (17%) are designated for commercial or mixed-use and 1,298 (83%) are designated for industrial uses.

How Much Growth Is Redmond Planning For?

Goal 9 requires that cities provide for an adequate supply of commercial and industrial sites consistent with plan policies. To meet this requirement, Redmond needs an estimate of the amount of commercial and industrial land that will be needed over the 2020 to 2040 planning period.

Accordingly, Redmond's employment base will be 20,557 employees in 2020. Redmond is forecast to have 32,408 employees by 2040. This is an increase of 11,851 jobs over the planning period.

Redmond will also accommodate new government employees (i.e., 1,308 employees) in institutional plan designations. We deduct forecasted government employees from the total forecast of new jobs. The analysis also deducts new jobs anticipated to locate in residential plan designations (i.e., 1,058 employees). The analysis therefore concludes that the 9,486 new employees will require commercial and industrial lands over the 2020 and 2040 planning period.

How Much Land Will Be Required for Employment?

The forecast for land needed to accommodate employment growth in Redmond shows that the growth of 9,486 new employees will result in demand for about 826 gross acres of commercial and industrial employment lands.

Does Redmond Have Enough Land to Accommodate Employment Growth?

Redmond has enough employment land to accommodate demand for industrial growth, but not for commercial growth. The deficit of land for commercial development can be accommodated within the existing Redmond UGB.

What Types of Business Does Redmond Want to Attract?

An analysis of growth industries in Redmond should address two main questions: (1) Which industries are most likely to be attracted to Redmond? and (2) Which industries best meet Redmond's economic development goals? The selection of target industries is based on Redmond's goals for economic development; economic conditions in Redmond, Deschutes County, and larger regions; and the city's competitive advantages.

Given the current employment base, which is primarily composed of small and midsized businesses, it is reasonable to assume that much of the city's business growth will come from small and midsized businesses. This growth will either come from businesses already in Redmond or new businesses that start or relocate to Redmond from other areas. The industries identified as having potential for growth in Redmond are:

- **Manufacturing.** As automation continues to change manufacturing industries, Redmond's target manufacturing industries will also evolve. Based on existing businesses in Redmond, these industries may include:
    - Advanced and specialty manufacturing (including metals manufacturing or secondary wood products)
    - Plastics and other advanced materials
    - Food and beverage manufacturing
- **Aviation and Aerospace Manufacturing.** The location of Redmond's municipal airport may attract businesses in industries related to aviation, such as aviation and aerospace manufacturing.
- **Healthcare Technology, Manufacturing, and Support.** Redmond has an existing concentration of businesses in healthcare technology. These industries require a range of sites, including both industrial space for manufacturing, as well as office commercial space for support-related businesses.

- **Services for visitors.** Redmond's location in Central Oregon provides access to a range of outdoor recreation activities. Visitors will continue to stop in Redmond, creating future demand for services such as hotels, restaurants, retail, and experiences available in or near Redmond (e.g., recreation guiding services or equipment rental).
- **Services for residents.** As Redmond's population or the population of the outlying areas Deschutes County grows, demand for services for residents will grow. These services include retail, restaurants, personal services (like hairdressers), financial services, medical services, and other services. These types of services present opportunities for entrepreneurship and small business development in Redmond.

What Are the Conclusions of the EOA?

- **Redmond is forecast for growth in both the commercial and industrial employment sectors.** Redmond is planning for the growth of 11,852 new jobs in the city over the 2020 to 2040 period. Of these, about 3,260 of the jobs will be industrial, 5,679 of the jobs will be in office and commercial services, and 1,605 in retail. Growth of these jobs will result in the demand for about 416 gross acres of commercial land and 411 gross acres of industrial land.
- **Redmond has enough employment land to accommodate industrial growth.** Exhibit 22 shows that Redmond has enough land for industrial employment growth over the next 20 years, with a surplus of 888 acres. For its target industries, Redmond will have need for industrial sites ranging from 5 to 25 acres for small and mid-sized industrial businesses to 25 to 100-acre sites for large industrial businesses or new business parks.
- **Redmond has a deficit of land for commercial development, but this deficit can be accommodated within the existing UGB.** Redmond has a deficit of about 159 gross acres of land for commercial office, services, and retail uses. This deficit can be accommodated through development in the UH-10, as part of a master planning process, or through redevelopment of the South Highway 97 corridor. Redmond's commercial businesses may locate in existing built spaces or on sites smaller than 5 acres. In addition, Redmond should consider planning for one or more new commercial centers (e.g., neighborhood or community center) for larger-scale commercial development. In addition, Redmond should plan for smaller village centers with new residential development.
- **Redmond's wages are below the regional average. Redmond's average wage of nearly $42,000 is below the average of $45,571 for Deschutes County.** Redmond's target industries generally have above average wages, except for some types of services for visitors and residents of Redmond, such as retail and accommodations and food services.
- **Redmond will need to address key infrastructure needs in the City.** Redmond will need to address the need for water service sufficient to support fire suppression in areas across the city, especially the South Redmond area for the Large-Lot Industrial land. In

addition, land in the UH-10 lacks the necessary water and wastewater infrastructure to support development.

- **Short-term supply of land.** Redmond has enough land that is or could be made development-ready within one year. Land in the Large-Lot Industrial (LLI) zone is not in the short-term land supply. Currently, the lots on LLI land do not have adequate water fire flow required for industrial uses. Sewer is stubbed out to the property line, but development of the site would require more than a year to build out infrastructure. While not considered in the analysis of short-term land supply, land in the UH-10 zone would also require more than one year to develop required water and wastewater infrastructure.

What Are the Key Recommendations to Support Economic Development in Redmond?

ECONorthwest prepared the *Redmond Economic Development Strategy* memorandum which presents a full list of recommendations for Redmond (framed as policies, objectives, and actions).

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1. Introduction

This report presents an Economic Opportunities Analysis (EOA) for the City of Redmond. The purpose of an EOA is to develop information as a basis for policies that capitalize on Redmond's opportunities and help address the city's challenges. The EOA includes technical analysis to address a range of questions that Redmond faces in managing its commercial and industrial land. For example, the EOA includes an employment forecast that describes how much growth Redmond should plan for over the 2020 to 2040 period and identifies the amount and type of employment land necessary to accommodate growth in Redmond over that period. The EOA also includes an inventory of commercial and industrial land within Redmond's urban growth boundary (UGB) to provide information about the amount of land available to accommodate employment growth.

This EOA complies with the requirements of statewide planning Goal 9, the Goal 9 administrative rules (OAR 660 Division 9), and the court decisions that have interpreted them. Goal 9 requires cities to identify the characteristics of sites needed to accommodate industrial and other employment uses (OAR 660-009-0025(1)) over the 20-year planning period. This approach could be characterized as a *site-based* approach that projects land need based on the forecast for employment growth, the City's economic development objectives, and the specific needs of target industries.

Background

The City of Redmond last evaluated economic trends in an update to the City's Comprehensive Plan, including the Comprehensive Plan Economic Element, in 2005, based on the 2000 Census data. Substantial changes have occurred in the national and regional economies since 2005 that have implications for economic growth in Redmond, such as the recovery from the Great Recession, as well as the changes in retail and manufacturing. In 2019, as part of the Central Oregon Regional Large Lot Industrial Program, Redmond added a 949-acre site to the UGB. In addition, the City of Redmond completed the Mid-Town Plan in 2015, which identified opportunity sites for mixed-use and other land uses focused on livability.

The purpose of the EOA is to develop a factual basis for providing the city with information about current economic conditions. This factual basis provides information necessary for updating the City's economic development Comprehensive Plan policies. This report identifies opportunities to meet the City's economic development objectives and develop Comprehensive Plan policies and implementation strategies that capitalize on the city's comparative advantages and address areas of economic weakness.

The EOA provides information that the City can use to identify and capitalize on its economic opportunities. It also provides information essential to addressing the City's challenges in managing economic development, such as a lack of larger industrial sites to support growth of businesses that require large sites, underutilized commercial land, underutilized industrial land, and a lack of policy direction to address these issues.

The EOA draws on information from numerous data sources, such as the Oregon Employment Department, U.S. Bureau of Economic Analysis, U.S. Bureau of Labor Statistics, and the U.S. Census. The EOA also uses information from the following reports:

- *Redmond Municipal Airport Master Plan* (2018)
- *South Redmond Tract Large Lot Industrial Site: Findings Report and Master Development Plan (2018)*
- *South Highway 97 Corridor Plan Study (2010) and US 97 South Redmond Corridor Project*
- *Central Oregon 2017–2021 Comprehensive Economic Development Strategy* (2017)

Framework for an Economic Opportunities Analysis

The content of this report is designed to meet the requirements of Oregon Statewide Planning Goal 9 and the administrative rule that implements Goal 9 (OAR 660-009). The analysis in this report is designed to conform to the requirements for an Economic Opportunities Analysis in OAR 660-009 as amended.

1. *Economic Opportunities Analysis (OAR 660-009-0015)*. The Economic Opportunities Analysis (EOA) requires communities to identify the major categories of industrial or other employment uses that could reasonably be expected to locate or expand in the planning area based on information about national, state, regional, county, or local trends; identify the number of sites by type reasonably expected to be needed to accommodate projected employment growth based on the site characteristics typical of expected uses; include an inventory of vacant and developed lands within the planning area designated for industrial or other employment use; and estimate the types and amounts of industrial and other employment uses likely to occur in the planning area. Local governments are also encouraged to assess community economic development potential through a visioning or some other public input-based process in conjunction with state agencies.
2. *Industrial and commercial development policies (OAR 660-009-0020)*. Cities are required to develop commercial and industrial development policies based on the EOA. Local comprehensive plans must state the overall objectives for economic development in the planning area and identify categories or particular types of industrial and other employment uses desired by the community. Local comprehensive plans must also include policies that commit the City or County to designate an adequate number of employment sites of suitable sizes, types, and locations. The plan must also include

policies to provide necessary public facilities and transportation facilities for the planning area.

3. *Designation of lands for industrial and commercial uses (OAR 660-009-0025).* Cities and Counties must adopt measures to implement policies adopted pursuant to OAR 660-009-0020. Appropriate implementation measures include amendments to plan and zone map designations, land use regulations, public facility plans, and transportation system plans. More specifically, plans must identify the approximate number, acreage, and characteristics of sites needed to accommodate industrial and other employment uses to implement plan policies and must designate serviceable land suitable to meet identified site needs.

This report also considers economic resiliency, both in the analysis and in the development of recommendations and policies and actions. The U.S. Economic Development Agency (EDA) defines resiliency as the ability to recover quickly from a disruption or economic shock. Examples of economic shocks include downturns in an industry, downturns in the national economy, or a natural disaster such as an earthquake or wildfire.

While not explicitly mentioned in Goal 9, the analysis required in an EOA (described above) is a part of resiliency planning, as is all comprehensive planning work. In the case of an EOA, the analysis should consider a city's resiliency structures as they relate to a city's land use and development policies. Examples of resilient structures include: diversity (such as diversity of businesses or diversity of development sites), redundant infrastructure (such as physical infrastructure like water pipes or information infrastructure such as Internet connectivity), and clear and regular communication between regional economic development stakeholders.[1] These ideas are considered in the EOA and in the Economic Development Strategy.

[1] *Oregon Economic Resilience: Training Toolkit*, 2018, University of Oregon Community Service Center Team.

Organization of This Report

This report is organized as follows:

- **Chapter 2. Factors Affecting Future Economic Growth** summarizes historic economic trends that affect current and future economic conditions in Redmond, as well as Redmond's competitive advantages for economic development.
- **Chapter 3. Employment Growth and Site Needs** presents a forecast for employment growth in Redmond and describes target industries and site needs for potential growth in industries.
- **Chapter 4. Buildable Lands Inventory** presents a summary of the inventory of employment lands.
- **Chapter 5. Land Sufficiency and Conclusions** compares the supply of and demand for buildable lands and presents key concluding recommendations for Redmond.

This report also includes three appendices:

- Appendix A. National, State, and Regional and Local Trends
- Appendix B. Buildable Lands Inventory Methodology
- Appendix C. Open House Summary

2. Factors Affecting Future Economic Growth

Redmond exists as part of the economy of the Central Oregon region, and is the second-largest city in the region. Its proximity to Bend, the largest city in the region, provides opportunities for the city's residents and access to a larger labor pool for employers. The economic focus of Redmond consists of several types of manufacturing as well as transportation and logistics. The city's location in Central Oregon also makes Redmond a popular destination for visitors for outdoor recreation and other leisure activities. Redmond's business-friendly environment has attracted a range of businesses to locate in the city. The quality of life and available amenities also attract people to live and work in Redmond.

At the time of developing the majority of this report, residents and workers in Redmond were under stay-at-home orders associated with the COVID-19 pandemic. While it is difficult to predict the long-term implications of the pandemic at this point, it is certain that it will disrupt the factors that affect future economic growth. This chapter describes the factors affecting economic growth in Redmond within the context of national and regional economic trends, highlighting the potential outcomes of COVID-19 where possible. The analysis presents the city's competitive advantages for growing and attracting businesses, which forms the basis for identifying potential growth industries in Redmond.

Factors That Affect Economic Development[2]

The fundamental purpose of Goal 9 is to make sure that a local government plans for economic development. The planning literature provides many definitions of economic development, both broad and narrow. Broadly,

> "Economic development is the process of improving a community's well-being through job creation, business growth, and income growth (factors that are typical and reasonable focus of economic development policy), as well as through improvements to the wider social and natural environment that strengthen the economy."[3]

That definition acknowledges that a community's well-being depends in part on narrower measures of economic wellbeing (e.g., jobs and income) and on other aspects of quality of life (e.g., the social and natural environment). In practice, cities and regions trying to prepare an economic development strategy typically use a narrower definition of economic development;

2 The information in this section is based on previous Goal 9 studies conducted by ECONorthwest and the following publication: An Economic Development Toolbox: Strategies and Methods, Terry Moore, Stuart Meck, and James Ebenhoh, American Planning Association, Planning Advisory Service Report Number 541, October 2006.

3 An Economic Development Toolbox: Strategies and Methods, Terry Moore, Stuart Meck, and James Ebenhoh, American Planning Association, Planning Advisory Service Report Number 541, October 2006.

they take it to mean business development, job growth, and job opportunity. The assumptions are that:

- Business and job growth are contributors to and consistent with economic development, increased income, and increased economic welfare. From the municipal point of view, investment and resulting increases in property tax are important outcomes of economic development.
- The evaluation of tradeoffs and balancing of policies to decide whether such growth is likely to lead to overall gains in well-being (on average and across all citizens and businesses in a jurisdiction, and all aspects of well-being) is something that decision makers do after an economic strategy has been presented to them for consideration.

That logic is consistent with the tenet of the Oregon land-use planning program: all goals matter, no goal dominates, and the challenge is to find a balance of conservation and development that is acceptable to a local government and the State. Goal 9 does not dominate; it legitimizes and requires that a local government focus on the narrower view of economic development regarding economic variables.

In that context, a major part of local economic development policy is about local support for business development and job growth; that growth comes from the creation of new firms, the expansion of existing firms, and the relocation or retention of existing firms. Specifically, new, small businesses are accounting for a larger share of the job growth in the United States.[4] This shift toward a focus on entrepreneurship, innovation, and small businesses presents additional options for local support for economic development beyond firm attraction and retention. Thus, a key question for economic development policy is: *What are the factors that influence business and job growth, and what is the relative importance of each?* This document addresses that question in depth.

What Factors Matter?

Why do firms locate where they do? There is no single answer—different firms choose their locations for different reasons. Key determinants of a location decision are a firm's *factors of production*. For example, a firm that spends a large portion of total costs on unskilled labor will be drawn to locations where labor is relatively inexpensive. A firm with large energy demands will give more weight to locations where energy is relatively inexpensive. In general, firms choose locations they believe will allow them to maximize net revenues: if demand for goods and services are held roughly constant, then revenue maximization is approximated by cost minimization.

[4] According to the 2018 Small Business Profile from the US Small Business Office of Advocacy, small businesses account for over 99 percent of total businesses in the United States, and their employees account for nearly 50% of American workers. https://www.sba.gov/sites/default/files/advocacy/2018-Small-Business-Profiles-US.pdf

The typical categories that economists use to describe a firm's production function are:

- **Labor.** Labor is often the most important factor of production. Other things equal, firms look at productivity—labor output per dollar. Productivity can decrease if certain types of labor are in short supply, which increases the costs by requiring either more pay to acquire the labor that is available, the recruiting of labor from other areas, or the use of the less productive labor that is available locally.
- **Land.** Demand for land depends on the type of firm. Manufacturing firms need more space and tend to prefer locations where land is relatively less expensive and less difficult to develop. Warehousing and distribution firms need to locate close to interstate highways.
- **Local infrastructure.** An important role of government is to increase economic capacity by improving the quality and efficiency of infrastructure and facilities, such as roads, bridges, water and sewer systems, airport and cargo facilities, energy systems, and telecommunications.
- **Access to markets.** Though part of infrastructure, transportation merits special attention. Firms need to move their product, either goods or services, to the market, and they rely on access to different modes of transportation to do this.
- **Materials.** Firms producing goods, and even firms producing services, need various materials to develop products that they can sell. Some firms need natural resources (e.g., raw lumber) and others may need intermediate materials (e.g., dimensioned lumber).
- **Entrepreneurship**. This input to production may be thought of as good management or even more broadly as a spirit of innovation, optimism, and ambition that distinguishes one firm from another even though most of their other factor inputs may be quite similar. Entrepreneurial activity, even when unsuccessful, can offer information about the local market that other entrepreneurs can use in starting a new firm. Entrepreneurs are typically willing to take on more risk in uncertain markets, and a strengthened entrepreneurial environment can help to reduce that risk and uncertainty.[5] Entrepreneurs also tend to have more mobility than larger firms, and are more likely to locate in areas with a strong entrepreneurial environment.[6] To some degree, local governments can promote the high quality of life in an area to attract entrepreneurs, in addition to adopting regulations with minimal barriers—or at least, clear guidelines—for new, small businesses.

[5] Tessa Conroy and Stephan Weiler "Local and Social: Entrepreneurs, Information Network Effects, and Economic Growth" (2017). https://redi.colostate.edu/wp-content/uploads/sites/50/2017/05/gender_gia_Jun2017-2.pdf

[6] Emil E. Malizia and Edward J. Feser. *Understanding Local Economic Development. (*1999).

The supply, cost, and quality of any of these factors depend on market factors: on conditions of supply and demand locally, nationally, and even globally. But they also depend on public policy. In general, public policy can affect these factors of production through:

- **Regulation.** Regulations protect the health and safety of a community and help maintain quality of life; however, overly burdensome regulations can be disincentives for businesses to locate in a community. Simplified bureaucracies and straightforward regulations can reduce the burden on businesses and help them react quickly in a competitive marketplace.
- **Taxes**. Firms tend to seek locations where they can optimize their after-tax profits. Tax rates are not a primary location factor—they matter only after businesses have made decisions based on labor, transportation, raw materials, and capital costs. The costs of these production factors are usually similar within a region. Therefore, differences in tax levels across communities within a region are more important in the location decision than are differences in tax levels between regions.
- **Financial incentives**. Governments can offer firms incentives to encourage growth. Most types of financial incentives have had little significant effect on firm location between regions. For manufacturing industries with significant equipment costs, however, property or investment tax credit or abatement incentives can play a significant role in location decisions. Incentives are more effective at redirecting growth within a region than they are at providing a competitive advantage between regions.

This discussion may make it appear that a location decision is based entirely on a straight-forward accounting of costs, with the best location being the one with the lowest level of overall costs. Studies of economic development, however, have shown that location decisions depend on a variety of other factors that indirectly affect costs of production. These indirect factors include agglomerative economies (also known as industry clusters), quality of life, and innovative capacity.

- **Industry clusters**. Firms with similar business activities can realize operational savings when they congregate in a single location or region. Clustering can reduce costs by creating economies of scale for suppliers. For this reason, firms tend to locate in areas where there is already a presence of other firms engaged in similar or related activities.
- **Quality of life.** A community that features many quality amenities, such as access to recreational opportunities, culture, low crime, good schools, affordable housing, and a clean environment can attract people simply because it is a nice place to be. A region's quality of life can attract skilled workers, and if the amenities lure enough potential workers to the region, the excess labor supply pushes their wages down so that firms in the region can find skilled labor for a relatively low cost. The characteristics of local communities can affect the distribution of economic development within a region, with different communities appealing to different types of workers and business owners. Sometimes location decisions by business owners are based on an emotional or historical attachment to a place or set of amenities, without much regard for the cost of other factors of production.

- **Innovative capacity.** Increasing evidence suggests that a culture promoting innovation, creativity, flexibility, and adaptability is essential to keeping U.S. cities economically vital and internationally competitive. Innovation is particularly important in industries that require an educated workforce. High-tech companies need to have access to new ideas typically associated with a university or research institute. In addition to innovations in research and development within firms or research institutions, firms may also draw on the innovative capacity of entrepreneurs in an area. These entrepreneurs may be former employees of the larger firm or businesses that relocated to an area because of the proximity to an industry cluster. Strong networks and communication between firms, research institutions, and entrepreneurs are key components to leveraging innovative capacity in an area.[7] Local governments are well-equipped to help foster these networks through supporting economic development tools such as small business assistance centers or incubation centers. Government can also be a key part of a community's innovative culture, through the provision of services and regulation of development and business activities that are responsive to the changing needs of business.

How Important Are These Factors?

To understand how changes in public policies affect local job growth, economists have attempted to identify the importance for firms with different locational factors. They have used statistical models, surveys, and case studies to examine detailed data on the key factors that influence the business location decision.

Economic theory says that firms locate where they can reduce the costs of their factors of production (assuming demand for products and any other factors are held constant). Firms locate in regions where they have access to inputs that meet their quality standards at a relatively low cost. Because firms are different, the relative importance of different factors of production varies both across industries and, even more importantly, across firms.

No empirical analysis can completely quantify firm location factors because numerous methodological problems make any analysis difficult. For example, some would argue simplistically that firms would prefer locating to a region with a low tax rate to reduce tax expenses; however, the real issue is the value provided by the community for the taxes collected. Because taxes fund public infrastructure that firms need, such as roads, water, and sewer systems, regions with low tax rates may end up with poor infrastructure, making it less attractive to firms. When competing jurisdictions have roughly comparable public services (type, cost, and quality) and quality of life, then tax rates (and tax breaks) can make a difference.

[7] Nancey Green Leigh and Edward Blakely. Planning Local Economic Development: Theory and Practice. 2013.

Further complicating any analysis is the fact that many researchers have used public expenditures as a proxy for infrastructure quality. But large expenditures on roads do not necessarily equal a quality road system. It is possible that the money has been spent ineffectively and the road system is in poor condition.

An important aspect of this discussion is that the business function at a location matters more than a firm's industry. A single company may have offices spread across cities, with headquarters located in a cosmopolitan metropolitan area, with the research and development divisions located near a concentration of universities, the back office in a suburban location, and manufacturing and distribution located in areas with cheap land and good interstate access.

The location decisions of businesses are primarily based on the availability and cost of labor, transportation, raw materials, and capital. The availability and cost of these production factors are usually similar within a region. Most economic development strategies available to local governments, however, only indirectly affect the cost of these primary location factors. Local governments can most easily affect tax rates, public services, and regulatory policies. Economists generally agree that these factors do affect economic development, but the effects on economic development are modest. Thus, most of the strategies available to local governments have only a modest effect on the level and type of economic development in the community.

Local governments can provide support for new and existing small businesses through policies and programs that support entrepreneurship and innovation. The National League of Cities suggests strategies for local governments: strong leadership from elected officials; better communication with entrepreneurs, especially about the regulatory environment for businesses in the community; and partnerships with colleges, universities, small business development centers, mentorship programs, community groups, businesses groups, and financial institutions.[8]

Local governments in Oregon also play a central role in the provision of buildable land through inclusion of lands in the Urban Growth Boundary, as well as through determination of plan designations and zoning, and through provision of public services. Obviously, businesses need buildable land to locate or expand in a community. Providing buildable land alone is not sufficient to guarantee economic development in a community—market conditions must create demand for this land, and local factors of production must be favorable for business activity. In the context of expected economic growth and the perception of a constrained land supply in Redmond, the provision of buildable land has the potential to strongly influence the level and type of economic development in the city. The provision of buildable land is one of the most direct ways that Redmond can affect the level and type of economic development in the community.

[8] National League of Cities "Supporting Entrepreneurs and Small Businesses" (2012). https://www.nlc.org/supporting-entrepreneurs-and-small-business

Summary of the Effect of National, State, and Regional Trends on Economic Development in Redmond

This section presents a summary and the implications of national, state, and regional economic trends on economic growth in Redmond, which are presented in Appendix A. As of June 2020, several counties across Oregon began the process of re-opening from the stay-at-home orders associated with the COVID-19 pandemic. While it is difficult to predict the long-term implications of the pandemic at this point, it is certain that it will disrupt the factors that affect future economic growth. This section focuses on long-term trends that are likely to affect economic growth in Redmond over the 20-year planning period. It considers some near-term impacts of the COVID-19 pandemic but focused on long-term trends.

- **County and local employment growth.** Employment increased in Deschutes County since 2001, with a gain of about 30,713 employees between 2001 and 2018. The largest increases were in trade, transportation, and utilities, and education and health services. Redmond accounted for about 17% of employment in Deschutes County. Employment in Redmond increased between 2008 and 2018 by about 2,677 employees or 24%.
- **Increases in regional economic diversity.** Within Central Oregon (which includes Deschutes, Crook, and Jefferson Counties), the types of industries transitioned away from the traditional natural resource extraction-based economy to a more diverse economic base, which includes aviation/aerospace, bioscience, brewing and distilling, high-tech, outdoor gear and apparel, value-added food production, health care, building materials, headquarter operations, data and call centers, and agriculture and ranching.[9] The increases in regional economic development diversity provide opportunities for the development of new businesses in Redmond, as clusters of similar businesses continue to locate in Central Oregon.
- **Changes in manufacturing and concentration of manufacturing in Oregon.** Redmond's location in Central Oregon, as well as its access to highways, land, and a skilled workforce present for opportunities for growth in manufacturing businesses. Between 2008 and 2018, the manufacturing sector in Redmond grew from 1,019 to 1,493 employees, an increase of 474 employees. Manufacturing makes up about 11% of Redmond's total covered employment, and has an average wage of $49,206, higher than the city's average wage of $41,659.

  Most cities have a larger distribution of smaller commercial or industrial sites available for development, and few large sites available. Typically, smaller sites are more difficult to develop for industrial uses, especially in manufacturing industries. Larger sites are generally easier to subdivide. While Redmond still needs a range of site sizes, including small sites, the accessibility of larger sites, and the potential to subdivide them, presents

[9] Central Oregon 2017-2021 Comprehensive Economic Development Strategy, Central Oregon Intergovernmental Council

opportunities for industrial development in Redmond, such as development of an industrial park.

- **Increases in automation.** Businesses in both industrial and commercial industries will continue to respond to increases in automated processes, decreasing employment in some types of manufacturing processes and slightly increasing need for workers with skills in computers and other high-tech. While automation has been a factor in industrial sectors for decades (e.g., manufacturing), recent increases in automation for commercial industries, such as certain functions of retail or office jobs. Oregon's overall risk of automation is similar to the that of the nation with lower and middle-wage jobs at higher risk of being automated. Jobs that are considered to be at lower risk include those that provide personal services or experiences, such as food service or hospitality. Higher-wage jobs that are also considered to be at a lower risk of automation include jobs that require social intelligence, perception, creativity, or fine motor skills.

  Most industrial sectors will still hire employees to complete certain tasks, though the types of skills required for these jobs may change as automation increases. Redmond's access to a skilled workforce is an advantage for businesses in Redmond, as long as the educational opportunities in the region continue to align with the needs for skills in industries in Redmond.

- **Importance of small businesses in Redmond's economy.** The average business in Redmond has 9 employees, lower than the state average of 11 employees per business. The creation of new businesses is vital to Oregon's (and Redmond's) economy as their formations generate new jobs and advance innovations into markets. Younger workers are important to continued growth of small businesses, as more than one-third of Millennials in the nation are self-employed. Redmond's access to a relatively young workforce from across the Central Oregon region presents opportunities for small businesses to grow in the city.

- **Changes in the retail sector.** Although the retail sector has reacted over the past two decades to changing consumer preferences for shopping at large supercenters as well as online shopping, these preferences do not replace all types of goods and services. Consumers still prefer physical, brick-and-mortar stores for certain items, such as large furniture, specialty goods, and groceries. Furthermore, consumer preferences have shifted to spending at restaurants and experience-focused series (e.g., entertainment or recreation). Retail businesses that compete with on-line retailers may become less common in Redmond (and other cities) but businesses providing experiences or goods that cannot be purchased on-line may grow and expand in Redmond. This presents opportunities for Redmond's retail industry to build on the city's high quality of life, providing experiences for residents and visitors, especially those in the outdoor recreation industry (e.g., guided trips, gear rental, etc.).

- **Growth of tourism in Central Oregon.** Redmond's location in the Central Oregon region presents opportunities for growth of tourism opportunities in the city. Tourists may visit Redmond as a stop on their way to other destinations, such as Bend, Sisters, or the numerous locations for outdoor recreation in the region. Redmond itself can also be

a destination for visitors as a place to stay while seeking out various outdoor recreation activities available nearby. According to Redmond Economic Development Inc. (REDI), business owners who eventually locate in Redmond have stated they chose Redmond after visiting and enjoying the quality of life and outdoor recreation amenities.

In 2018, the largest visitor spending categories in Deschutes County were for accommodations and food services; arts, entertainment, and recreation; and ground transportation. Between 2008 and 2018, lodging tax receipts in Deschutes County increased from $7.1 million to $17.5 million. The effects of the COVID-19 pandemic will lead to a short-term (2 to 3 year) recovery period for the tourism industry, likely followed by continued growth over the long term.

- **Continued increase in demand for energy.** While energy prices were unusually low in early 2020, energy prices are forecasted to increase over the planning period. If energy prices increase over the long term, these higher prices will likely affect the mode of commuting before affecting workers' willingness to commute. For example, commuters may choose to purchase a more energy-efficient car or carpool. In Redmond, the options for modes of commuting are more limited than in larger urban areas with access to transit, bike, and pedestrian infrastructure. Very large increases in energy prices may affect workers' willingness to commute, especially workers living the furthest from Redmond or workers with lower paying jobs. In addition, very large increases in energy prices may make shipping freight long distances less economically feasible, resulting in a slowdown or reversal of offshore manufacturing, especially of large, bulky goods.
- **A tight labor market that changed abruptly.** Similar to both Oregon and the nation, Deschutes County's unemployment rate has declined since the Great Recession. In 2019, the unemployment rate in Deschutes County was 3.9%, about the same as Oregon's rate of 3.7%, and slightly higher than the national rate of 3.6%. However, the sudden onset of the COVID-19 pandemic resulted in an abrupt increase in unemployment across the nation and in Oregon. In April 2020, unemployment rates increased to 18.2% in Deschutes County, 14.8% in Oregon, and 14.7% nationwide.[10] In Deschutes County, approximately 13,100 jobs were lost, concentrated in the leisure and hospitality, education and health services, and professional and business services industries.[11] It is unclear how many of these jobs are lost in the long-term and how many will come back as the regional and statewide economy re-opens. The Oregon Office of Economic Analysis estimates that employment will not return to early 2020 levels until mid-2024, assuming the effects of the COVID-19 pandemic are alleviated by a vaccine or effective treatment.
- **Availability of trained and skilled labor.** Availability of labor depends, in part, on population growth and in-migration. Redmond's population increased by 15,709 people

[10] Note that these unemployment rate estimates are preliminary and may be revised as the year continues.

[11] This job loss estimate was calculated by averaging the total nonfarm employment in Deschutes County for January, February, and March 2020 (about 85,800 jobs) and subtracting the estimated County employment in April 2020 (about 72,700 jobs).

between 2000 and 2017, at an average annual growth rate of 4.4%. Most of the population increase occurred between 2000 to 2010, with an increase of 11,476 residents. In comparison, Oregon's population grew at an average annual growth rate of 2.1% between 2000 and 2017, with 66% of population coming from in-migration.

The current labor force participation rate is another important consideration in the availability of labor. The labor force in any market consists of the adult population (16 and over) who are working or actively seeking work. The labor force includes both the employed and unemployed. According to the 2014-2018 American Community Survey, Redmond had about 15,854 people in its labor force and Deschutes County had over 92,800. The labor force participation rates in Redmond (68%) and Deschutes County (63%) were higher than Oregon (62%) in the 2014-2018 period. Non-participants in the labor force (the 37% of people not participating in Deschutes County's labor force) include students 16 years and older, retirees, and unemployed people not actively seeking work. A higher concentration of older residents in an area or a mismatch of the types of jobs available in an area and the types of skills of the labor force can contribute to low labor force participation rates.

Thirty-two percent of workers at businesses in Redmond live in Redmond and 66% live in Deschutes County. Businesses in Redmond draw employees from across Deschutes County as well as Crook, Jefferson, and Lane Counties. Relative to Oregon, Redmond residents have a slightly higher level of some college or associate degree educational attainment, though Redmond residents tend to have lower levels of bachelor's or professional degree attainment relative to the State and Deschutes County.

- **Lower household income and average wages.** Redmond's average household income is lower relative to both the county and the state. In the 2014-2018 period, Redmond's median household income was $55,679, 13% lower than Deschutes County's median household income of $63,680, and 6% lower than Oregon's $59,393. The average wage at private businesses in Redmond was about $41,659 in 2018, which was lower than the Deschutes County average in 2018 of $45,571. The lower incomes and wages in Redmond may make the city more competitive as a destination for businesses that prefer to locate in Central Oregon but need a place with lower wages and lower costs of living than Bend.
- **Education as a determinant of wages.** Redmond's population has a smaller share (17%) of college graduates (bachelor's degree or higher) than in Deschutes County (36%) or Oregon (34%). About 40% of Redmond's residents have some college or an associate degree, and about 43% have a high school diploma or less. Businesses that need employees with a college degree may be less likely to move to Redmond or may need to recruit employees from outside of the city. Redmond businesses have access to students from the local campus of Central Oregon Community College, OSU-Cascades, and high school training programs.

- **Aging of the population and need for replacement workers.** Redmond has a smaller percentage of residents 60 years and older relative to Oregon and Deschutes County. Redmond's median age, which was 32.7 in 2000, increased to 37.4 by the 2014-2018 period. In comparison, Deschutes County's median age was 42.3, and Oregon's median age was 39.2 in the 2014-2018 period.

  Deschutes County's population is expected to continue aging, with people 60 years and older increasing from 25% of the population in 2018 to 29% of the population in 2043, consistent with statewide trends. As workers retire, businesses need to replace them with new workers. This need for replacement workers will continue to drive need for workers.

- **Increases in racial and ethnic diversity.** Overall, both the nation and Oregon are becoming more racially and ethnically diverse. Between 2000 and 2014-2018, the Hispanic and Latino population in Oregon increased from 8% to 12%, while it increased in Redmond from 6% to nearly 12%. The population of people of color has increased from 13% to 15% in Oregon since 2000 and from 6% to 10% in Redmond. Although Redmond's population is about as ethnically diverse as the state's, the city's racial diversity is less so.

- **Decreasing housing affordability across Deschutes County.** Redmond completed a Housing Needs Analysis (HNA) in 2019, which highlighted housing trends in Redmond, as compared to Central Oregon and Deschutes County. While Redmond's median home sales price ($294,000 at the end of 2018) is lower than in Bend, Sisters, and Sunriver, the city's overall home sales price trend increased along with other cities in the region. Between 2007 and 2018, Redmond's median home sales price increased by about 24% (or $57,000). About 40% of Redmond's households were cost burdened, meaning that they are paying more for housing than they can afford, compared to 40% of households in Deschutes County.

  The cost of living in Redmond, as other cities in Deschutes County, is increasing and making Redmond a less affordable place to live. Redmond's lower cost of housing, relative to other cities in Deschutes County, may make it an attractive place to grow a business, as more workers can afford to live and work in Redmond. However, business owners in Redmond are seeing limitations to attracting workers, citing the cost of housing in Redmond as a primary factor.

Employment Trends in Redmond and Deschutes County

The nation's economy changed substantially between 1980 and 2018. These changes affected the composition of Oregon's economy, including Redmond's economy. At the national level, the most striking change was the shift from manufacturing employment to service-sector employment. During this period, the most important shift in Oregon has been away from a timber-based economy to a more diverse economy, with the greatest employment in services. This section focuses on changes in the economy in Deschutes County since 2008 and in Redmond since 2008.

Employment Trends in Deschutes County

Exhibit 1 shows covered employment[12] in Deschutes County for 2008 and 2018. Employment increased by 6,537 jobs, or 10%, over this period. The sectors with the largest employment increases were healthcare and social assistance; accommodation and food services; retail trade; professional and technical services; and other services, such as public administration.

The average wage for employment in Deschutes County in 2018 was about $45,577. Employment in higher-wage industries, such as information, increased by 249 jobs over the 2008 to 2018 time period.

Exhibit 1. Covered Employment by Industry, Deschutes County, 2008-2018

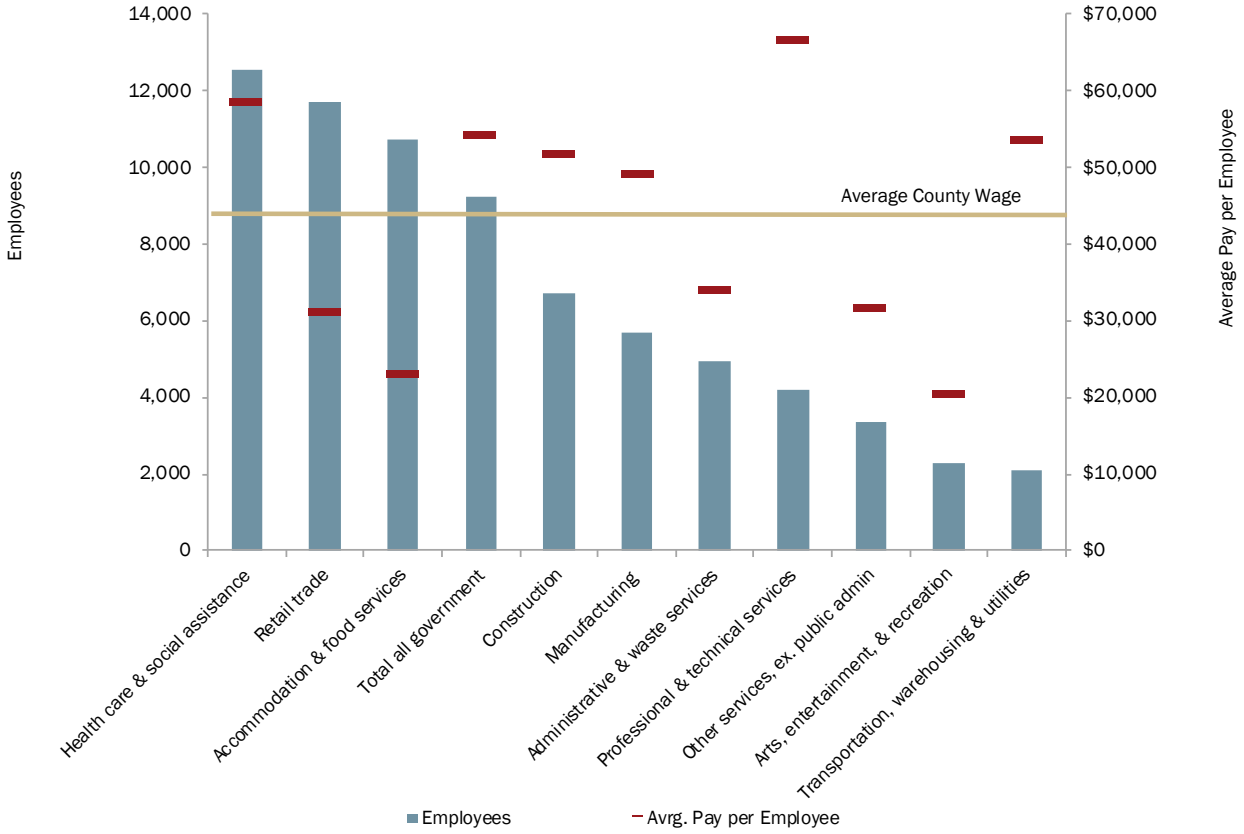
Sector	2008	2018	Change 2008 to 2018		
			Difference	Percent	AAGR
Agriculture, forestry, fishing & hunt	521	693	172	33%	2.9%
Mining	93	64	-29	-31%	-3.7%
Construction	5,646	6,708	1,062	19%	1.7%
Manufacturing	5,024	5,692	668	13%	1.3%
Wholesale trade	1,628	1,922	294	18%	1.7%
Retail trade	10,170	11,714	1,544	15%	1.4%
Transportation, warehousing & utili	1,208	2,106	898	74%	5.7%
Information	1,615	1,864	249	15%	1.4%
Finance and insurance	2,312	1,953	-359	-16%	-1.7%
Real estate and rental and leasing	1,377	1,305	-72	-5%	-0.5%
Professional and technical service:	2,690	4,207	1,517	56%	4.6%
Management of companies and en	303	896	593	196%	11.5%
Administrative and waste services	4,274	4,965	691	16%	1.5%
Educational services	675	938	263	39%	3.3%
Health care and social assistance	8,302	12,541	4,239	51%	4.2%
Arts, entertainment, and recreatior	1,968	2,272	304	15%	1.4%
Accommodation and food services	8,007	10,718	2,711	34%	3.0%
Other services, ex. public admin	2,279	3,345	1,066	47%	3.9%
Unclassified	22	56	34	155%	9.8%
Total all government	8,212	9,211	999	12%	1.2%
Total	66,326	83,170	6,537	10%	2.3%

Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2008-2018.
Note: "ND" stands for "Not Disclosed" and indicates that the data has been suppressed by the BLS due to confidentiality constraints. The total amount of not-disclosed employment is shown in the table.

[12] **Covered** employment includes employees covered by unemployment insurance. Examples of workers not included in covered employment are sole proprietors, some types of contractors (often referred to as "1099 employees"), or some railroad workers. Covered employment data is from the Oregon Employment Department.

Exhibit 2 shows covered employment and average wages for the 10 largest industries in Deschutes County. Jobs in health care and social assistance, retail trade, and accommodation and food services, each accounted for over 13% of the county's covered employment but only health care and social assistance paid more per year than the county average at $58,565. Jobs in government; construction; manufacturing; professional and technical services; and transportation, warehousing, and utilities also paid more per year than the county average but accounted for a smaller share of covered employment in the county. Retail trade, accommodation and food services, administrative and waste services, other services, and arts, entertainment and recreation paid below the 2018 county average.

Exhibit 2. Covered Employment and Average Pay by Sector, 10 Largest Sectors Deschutes County, 2018



Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2018.

The loss of statewide employment due to the COVID-19 pandemic impacted the accommodation and food services industry the most, followed by the arts, entertainment, and recreation industry.[13] Other services, which include personal care services such as barber shops and beauty salons, non-veterinary pet care, and fitness instructors, also experienced acute impacts. Jobs in these industries tend to have lower wages and the Oregon Employment Department (OED) reported that in the first nine weeks of the pandemic, about 68% of all initial

[13] Damon Runberg. "Who Are the COVID-19 Unemployed in Oregon?" Salem, OR: State of Oregon Employment Department. May 21, 2020. https://www.qualityinfo.org/-/who-are-the-covid-19-unemployed-in-oregon-

unemployment claims came from individuals working jobs that pay less than $20 per hour.[14] Furthermore, OED reported that the manufacturing, construction, and health care industries had a large quantity of initial unemployment insurance claims. For the manufacturing and construction industries, OED suggested that this is likely due to businesses' inability to put effective social distancing requirements into place.

In their June 2020 economic and revenue forecast, the Oregon Office of Economic Analysis (OEA) anticipates that over one-third of the initial job losses due to the pandemic will return by the end of 2020.[15] However, the Oregon economy will be far from full recovery by then. OEA expects that after this initial economic snapback, Oregon's economy will be in a position similar to that of the early 1980s recession or the Great Recession. OEA forecasts that the economy should recover to health by mid-2024.

Employment in Redmond

Between 2008 and 2018, employment in Redmond increased by about 2,677 employees (24%). Employment in transportation, warehousing, and utilities increased by about 454 employees (191%) and manufacturing employment increased by about 474 employees (47%) (Exhibit 3).

Exhibit 3. Change in Covered Employment, Redmond UGB, 2008-2018

Sector	2008 Employment	2018 Employment	Change (Number)	Change (Percent)	AAGR
Construction; Agriculture; Mining	843	1,222	379	45%	3.8%
Manufacturing	1,019	1,493	474	47%	3.9%
Wholesale Trade	263	387	124	47%	3.9%
Retail Trade	2,026	2,107	81	4%	0.4%
Transportation and Warehousing; Utilities	238	692	454	191%	11.3%
Information	59	32	(27)	-46%	-5.9%
Finance and Insurance	356	411	55	15%	1.4%
Real Estate and Rental and Leasing	229	158	(71)	-31%	-3.6%
Professional, Scientific, and Technical Services	226	232	6	3%	0.3%
Management of Companies and Enterprises	57	59	2	4%	0.3%
Private Education	58	125	67	116%	8.0%
Health Care and Social Assistance	1,221	1,750	529	43%	3.7%
Arts, Entertainment, and Recreation	101	93	(8)	-8%	-0.8%
Accommodation and Food Services	1,159	1,487	328	28%	2.5%
Other Services	1,405	1,486	81	6%	0.6%
Government	1,963	2,166	203	10%	1.0%
Total	**11,223**	**13,900**	**2,677**	**24%**	**2.2%**

Source: Oregon Employment Department, Quarterly Census of Employment and Wages, 2008 and 2018.

[14] Damon Runberg. "Who Are the COVID-19 Unemployed in Oregon?" Salem, OR: State of Oregon Employment Department. May 21, 2020. https://www.qualityinfo.org/-/who-are-the-covid-19-unemployed-in-oregon-

[15] Oregon Employment Department, Oregon Economic and Revenue Forecast, June 2020

Employment in Redmond accounted for about 17% of employment in Deschutes County in 2018. Exhibit 4 shows a summary of covered employment data for the Redmond UGB in 2018. The sectors with the greatest number of employees were government (16%), retail trade (15%), health care and social assistance (13%), accommodation and food services (11%), and manufacturing (11%).

Exhibit 4. Covered Employment and Average Pay by Sector, Redmond UGB, 2018[16]

Sector	Establishments	Employees	Payroll	Average Wage
Construction; Agriculture	204	1,222	$ 67,552,676	$ 55,280
Manufacturing	76	1,493	$ 73,464,627	$ 49,206
Wholesale Trade	57	387	$ 19,203,587	$ 49,622
Retail Trade	121	2,107	$ 62,196,687	$ 29,519
Transportation and Warehousing; Utilities	39	692	$ 37,296,589	$ 53,897
Information	17	32	$ 1,586,493	$ 49,578
Finance and Insurance	70	411	$ 26,960,806	$ 65,598
Real Estate and Rental and Leasing	52	158	$ 5,030,790	$ 31,840
Professional, Scientific, and Technical Services	58	232	$ 10,658,008	$ 45,940
Management of Companies and Enterprises	10	59	$ 2,979,145	$ 50,494
Admin. and Support and Waste Mgmt and Remed. Serv.	51	739	$ 24,903,021	$ 33,698
Private Education	8	125	$ 4,459,260	$ 35,674
Health Care and Social Assistance	142	1,750	$ 99,671,857	$ 56,955
Arts, Entertainment, and Recreation	11	93	$ 1,492,078	$ 16,044
Accommodation and Food Services	110	1,487	$ 29,612,769	$ 19,914
Other Services	215	747	$ 22,781,558	$ 30,497
Government	45	2,166	$ 89,203,566	$ 41,184
Total	**1,286**	**13,900**	**$579,053,517**	**$ 41,659**

Source: Oregon Employment Department, Quarterly Census of Employment and Wages, 2018.

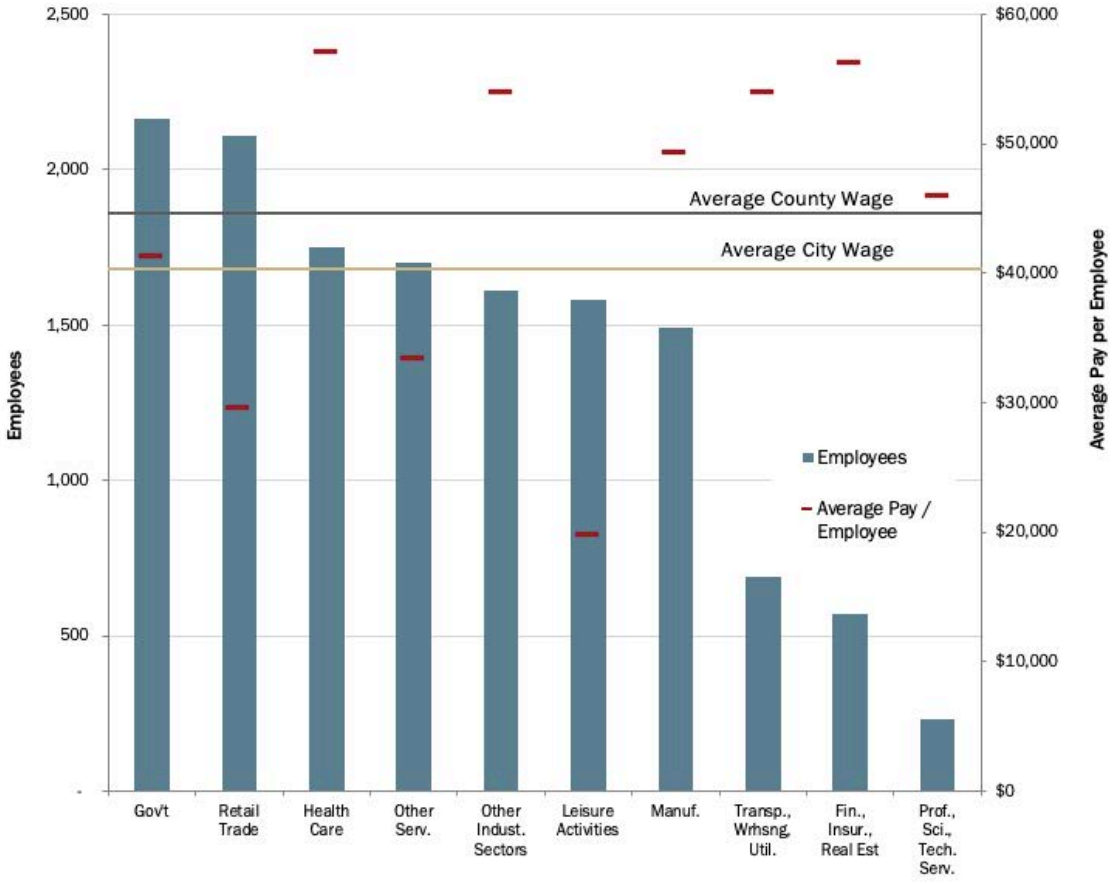
Though data are not readily available at the city level to inform the impacts of the COVID-19 pandemic, OED reports that Deschutes County has one of the highest rates of Unemployment Insurance (UI) claims as a share of labor force relative to all Oregon counties.[17] In the ten weeks following the onset of the pandemic (for data ending May 23, 2020), nearly 17,600 initial UI claims were made in Deschutes County. Of these claims, almost 4,380 were in the accommodation and food services sector (25% of the county total). Health care and social assistance had the next largest share of claims at about 15% of the county total, followed by retail trade with 13%. The depth of the impact on wages is not fully apparent in the data yet; however, the sharp job loss in these sectors and others is expected to decrease or at least stagnate them in the short run.

[16] The following sectors were combined due to confidentiality of QCEW data: construction and natural resources; utilities, transportation and warehousing.

[17] Damon Runberg. "Who Are the COVID-19 Unemployed in Oregon?" Salem, OR: State of Oregon Employment Department. May 21, 2020. https://www.qualityinfo.org/-/who-are-the-covid-19-unemployed-in-oregon-

Exhibit 5 shows the employment and average pay per employee for sectors in Redmond. Average pay for all employees ($41,659) is shown as a light brown line across the graph and average pay for individual sectors as short red lines. The figure shows that health care and social assistance; finance, insurance, and real estate; professional scientific, and technical services; government; and industrial sectors had above average wages. The lowest wages were in retail trade and leisure activities, which includes arts, entertainment, and recreation and accommodation and food services. The average size for a private business in Redmond was 9 employees per business, compared to the statewide average of 11 employees per private business. Businesses with 9 or fewer employees accounted for 21% of private employment and 50 or fewer account for 64% of private employment.

Exhibit 5. Covered Employment and Average Pay by Sector, Redmond UGB, 2018[18]



Source: Oregon Employment Department, Quarterly Census of Employment and Wages, 2018.

[18] "Other Industrial Sectors" includes natural resources, construction, and wholesale trade. "Other Services" includes information; management of companies and enterprises; administrative and support and waste management and remediation services; private education; and other services. "Leisure activities" includes accommodation and food services and arts, entertainment, and recreation.

Outlook for Growth in Deschutes County

Given the large change in the economy starting in March 2020 as a result of the COVID-19 pandemic, it is difficult to accurately understand the likely outlook for growth in Deschutes County. The best currently available data is as follows. Exhibit 6 shows the Oregon Employment Department's forecast for employment growth by industry for the Central East Cascades region (Crook, Deschutes, and Jefferson Counties) over the 2017 to 2027 period. Employment in the region is forecasted to grow at an average annual growth rate of 1.5%.

The sectors that will lead employment in the region for the 10-year period are: health care and social assistance (a projected growth of 2,540 jobs), construction (2,350 jobs), trade, transportation, and utilities (2,050 jobs), leisure and hospitality (1,850 jobs), and professional and business services (1,820 jobs). In sum, these sectors are expected to add 10,610 new jobs or about 78% of employment growth in the Central Region. Deschutes County accounts for about 80% of employment in these three counties, and Redmond accounts for about 17% of the county's employment.

Exhibit 6. Regional Employment Projections, 2017-2027, Central East Cascades Region (Crook, Deschutes, and Jefferson Counties)

Industry Sector	2017	2027	Change 2017 - 2027		
			Number	Percent	AAGR
Total private	81,780	95,010	13,230	16%	1.5%
Natural resources and mining	1,440	1,630	190	13%	1.2%
Mining and logging	250	240	-10	-4%	-0.4%
Construction	6,670	9,020	2,350	35%	3.1%
Manufacturing	7,090	8,040	950	13%	1.3%
Durable goods	4,970	5,400	430	9%	0.8%
Wood product manufacturing	1,800	1,750	-50	-3%	-0.3%
Nondurable goods	2,120	2,640	520	25%	2.2%
Trade, transportation, and utilities	17,810	19,860	2,050	12%	1.1%
Wholesale trade	2,830	3,140	310	11%	1.0%
Retail trade	12,600	14,020	1,420	11%	1.1%
Transportation, warehousing, and utilities	2,380	2,700	320	13%	1.3%
Information	1,770	2,100	330	19%	1.7%
Financial activities	4,690	5,240	550	12%	1.1%
Professional and business services	10,330	12,150	1,820	18%	1.6%
Private educational and health services	14,560	17,260	2,700	19%	1.7%
Health care and social assistance	13,630	16,170	2,540	19%	1.7%
Health care	11,430	13,640	2,210	19%	1.8%
Leisure and hospitality	13,730	15,580	1,850	13%	1.3%
Accommodation and food services	11,510	12,870	1,360	12%	1.1%
Other services and private households	3,690	4,130	440	12%	1.1%
Government	12,740	13,180	440	3%	0.3%
Federal government	1,320	1,300	-20	-2%	-0.2%
State government	1,280	1,340	60	5%	0.5%
Local government	10,140	10,540	400	4%	0.4%
Local education	4,620	4,880	260	6%	0.5%
Total payroll employment	94,520	108,190	13,670	14%	1.4%

Source: Oregon Employment Department. Employment Projections by Industry 2017-2027.

Redmond's Competitive Advantage

Local conditions, as well as national and state economic conditions, will affect economic development opportunities in Redmond. Economic conditions in Redmond relative to these conditions in other portions of the Central Oregon region form Redmond's competitive advantage for economic development. Redmond's competitive advantages have implications for the types of firms most likely to locate and expand in the area.

Redmond's primary competitive advantages and key economic assets are access to US-97 and Highway 126, access to a skilled labor force, supply of industrial land, presence of the regional airport, business-friendly environment, and high quality of life. These factors make Redmond attractive to residents and businesses that want a high quality of life where they live and work.

The discussion in Chapter 2 provided information about Redmond's existing base of businesses and access to labor, which are key to understanding Redmond's competitive advantages. This section summarizes these and other local factors that form Redmond's competitive advantage, with additional details in the sections following this summary.[19]

- **Location.** Redmond is located in Deschutes County, and is part of the Central Oregon region. It is about 17 miles north of Bend and 126 miles east of Eugene. Employers in Redmond have access to the labor force in the broader Central Oregon region, drawing employees from Bend, Madras, Prineville, and unincorporated parts of Deschutes and surrounding counties.
- **Transportation.** Redmond is located along US Highway 97, which is a major north-south connector from the northern Oregon state border at I-84 eventually connecting to I-5 in California, near the southern Oregon border. Other than interstates, this route is a preferred route for trucking and distribution between California and Washington, as it is relatively flat. The primary east-west connector in Redmond is state Highway 126, which connects with US Highway 26 in Sisters, about 20 miles west of Redmond.

  Redmond's municipal airport (RDM) serves both passenger travel and freight, providing a key connection for the Central Oregon region. The airport is a primary advantage for the city, in that it provides easy access to air travel, air freight, and the airport has a substantial amount of developable land.
- **Developable land.** One of Redmond's most important economic assets is the amount and types of vacant, unconstrained buildable land within the UGB. Redmond has large, developable areas for manufacturing and other industrial uses, as well as opportunities for commercial development where new residential development is occurring. Most of Redmond's unconstrained buildable land is in the short-term land supply, with the exception of areas in South Redmond and in the Urban-Holding (UH-10) areas on the westside of the city.

[19] The analysis in this section also incorporates information from the *Central Oregon 2017-2021 Comprehensive Economic Development Strategy*.

One of Redmond's key land assets is the South Redmond Tract, which has approximately 775 acres designated for large-lot industrial development and is designated under the City's Large Lot Industrial (LLI) zone.[20] The South Redmond Tract was approved as one of six sites to be included in the Central Oregon Large Lot Industrial Lands Program in May of 2015. The land in the LLI zone is generally unconstrained and suitable for industrial development. The intention of the LLI zone is to preserve large lot industrial land to meet the needs of businesses that need large industrial sites for development. The Redmond City Code stipulates that the any property within the zone cannot be rezoned to any other city zone within ten years of initial designation of LLI. The types of uses in the LLI zone are traded-sector, subordinate traded-sector, service commercial, and service retail uses.

Redmond has 1,596 acres of vacant land within the UGB zoned for UH-10, which is intended for future urban development. The Redmond Housing Needs Analysis assumes that about 296 acres of the vacant land in UH-10 will be used to accommodate residential growth over the 20-year planning period. Some portion of UH-10 land is expected to develop with commercial uses, providing opportunities for businesses that provide goods and services to locate near new residential development.

In addition, the Redmond Airport has 408 acres of land where development is allowed. The *Redmond Municipal Airport Master Plan* describes opportunities for businesses to locate near the airport, with target industries including accommodation and food services, speculative light industrial buildings, construction, manufacturing, wholesale and warehousing, public administration, and gas station/convenience stores. Constraints for development on land at the airport include: (1) FAA regulations that require some land at the airport stay in public ownership, resulting in opportunities to lease but not sell the land; (2) restrictions on the types of industries that locate on the airport property; and (3) limitations on the size, height, or other development standards of buildings on the airport property, to not interfere with regular operations of the airport.

- **Availability of public infrastructure.** Redmond's infrastructure, specifically water and wastewater systems, is able to accommodate existing and future needs of industrial and commercial systems. The city's infrastructure is maintained through regular updates and incremental improvements as needed to build capacity and redundancy. In areas where these systems are more limited, the City has larger projects planned for completion in the near term (within about five years). For example, the development of a new reservoir and booster pump station will allow for industrial development in vacant areas of the South Redmond area, including the LLI land. Additionally, as master planning occurs throughout Redmond, specifically in the UH-10 area on the westside of the city, the infrastructure will be built out as development occurs.
- **Labor market.** Redmond's workforce is relatively young, with a smaller share of older people approaching retirement than in Deschutes County or Oregon overall. Employers

[20] A 160-acre portion of the South Redmond Tract is planned for an expansion of the Deschutes County Fairgrounds and a relocated facility for the Oregon Military Department (OMD).

have access to workers in the early and mid-stages of their careers, as well as students attending trade programs in high school or pursuing postsecondary education at Central Oregon Community College or OSU-Cascades nearby in Bend. However, 17% of working age population in Redmond having a bachelor's degree or higher, compared to the County average of 36%. Redmond Economic Development Inc. (REDI) hosts an internship program that connects employers and students at various levels of education for internships at businesses throughout the city.

Commuting is common for workers in Redmond (and across Central Oregon), who have noted difficulty in finding housing in the city. While Redmond is more affordable than Bend, and some workers would prefer to live and work in Redmond, about two thirds of Redmond workers commute from surrounding cities, including Prineville, Crooked River, Madras, and Terrebonne.

- **Business-friendly environment.** Redmond has a long-standing reputation as a business-friendly community, with the systems in place to respond to a business' needs quickly. From permit needs to utility demands, the City can generally keep up with and accommodate requests from new and existing businesses. Employers have moved businesses to Redmond because of the City's partnerships with businesses, and general willingness to work together to set up businesses for continued success. The City continues to prioritize relationships with business owners and has developed key partnerships with organizations including REDI and the Chamber of Commerce.
- **Tourism and access to outdoor recreation.** Redmond, similar to other places in the Central Oregon region, attracts visitors for its access to various outdoor recreation opportunities. The city is located about 9 miles south of Smith Rock State Park and in close proximity to various access points to Deschutes National Forest. Visitors come to Redmond for outdoor recreation throughout the year to enjoy activities including hiking, biking, skiing, rafting, and fishing. Businesses and employees may be attracted to Redmond because of the easy access to outdoor recreation.
- **Relatively affordable housing.** Within Deschutes County, Redmond's housing is comparatively affordable. According to the Redmond Housing Needs Analysis, the median home sales price at the end of 2018 was $294,000, compared with $425,000 in Bend and $448,000 in Sisters. Sales prices in La Pine were lower than Redmond ($260,000). In addition, rents in Redmond were more than 10% lower than in Bend. The comparatively affordable housing costs in Redmond make it more attractive than Bend for workers and businesses. However, businesses in Redmond report increasing difficulty in attracting workers who prefer to live and work in Redmond, as housing prices continue to increase.
- **Quality of life.** For many of the reasons that Redmond attracts visitors, it also attracts residents. Redmond's quality of life attracts employers and their workers to the city. Central Oregon's dry climate is often favorable to living cities in the Willamette Valley, Redmond also provides residents with safe, small-town character, while providing necessary services and amenities. The access to recreation and comparatively affordable housing costs also contribute to Redmond's high quality of life.

Redmond's disadvantages for economic development include:

- **Location.** While Redmond is located along a primary north-south connector (US 97), it is relatively isolated, compared to communities along I-5. For companies looking to locate in the state, Redmond's location presents challenges as it is not along an interstate. Redmond's isolation may draw residents and visitors who seek a more remote location, but it can be a disadvantage for many types of businesses, especially those that need close proximity to a larger urban area and other cities. Development of smaller scales of these businesses, however, may find Redmond's location as an advantage to serve markets in the region and the state.
- **Rail access.** Redmond has rail access to both BNSF and Union Pacific but businesses that depend on rail service have difficulty finding rail accessible sites.
- **Need for infrastructure.** Some vacant land in Redmond lacks the infrastructure necessary to support development, most notably the land in the UH-10 zone on the westside of the city and the South Redmond area. The UH-10 areas lack the needed wastewater infrastructure, which are typically provided along with planned development and require development from north to south, generally. This presents limitations on where initial development can occur, making development in the southern portion of the UH-10 land less feasible without development in the northern area first.

  In addition, Redmond has a broad need for water service sufficient to support fire suppression in areas across the city, especially the South Redmond area. The development of a new reservoir and booster pump station in the South Redmond area will help to provide better fire flow. This is the primary limitation to development in the Large-Lot Industrial area of South Redmond. The sewer access in this area is stubbed out, and while not in the short-term supply (i.e., ready within one year), this area could accommodate light-industrial uses after completing the sewer infrastructure.
- **High development costs.** Development in Redmond, as in much of Central Oregon, is more expensive than development in the Willamette Valley because of the types of soils in Central Oregon, most notably hard igneous rock.
- **Few vacant industrial buildings.** While Downtown Redmond has some vacant store fronts, Redmond has relatively few vacant industrial buildings, including few vacant spaces in existing industrial parks. The lack of vacant industrial buildings makes it difficult to attract small and mid-sized businesses to Redmond.

Public Facilities and Services

Provision of public facilities and services can impact a firm's decision regarding location within a region, but ECONorthwest's past research has shown that businesses make locational decisions primarily based on factors that are similar within a region. These factors are the availability and cost of labor, transportation, raw materials, and capital. The availability and cost of these production factors are usually similar within a region.

Once a business has chosen to locate within a region, they consider the factors that local governments can most directly affect including tax rates, the cost and quality of public services, and regulatory policies. Economists generally agree that these factors do affect economic development, but the effects on economic development are modest. Thus, most of the strategies available to local governments have only a modest effect on the level and type of economic development in the community.

Water

Generally, Redmond has adequate water capacity and treatment facilities to meet current and future demand to serve population and employment growth. Currently, the city does not have a lot of excess supply and storage capacity at about 4 million gallons per day in excess supply. Put in context, the city has demand for about 2 to 3 million gallons per day in the winter and about 14 million gallons per day in peak summer.

The City has the capacity to pump 18 or 19 gallons per day through the main well, which can present limitations if it stops functioning. To address this issue, the City is working incrementally to keep up with future growth needs. Future projects in the near term include adding one well and a new reservoir with a booster pump station, located in South Redmond. This project is planned for completion in the fall of 2021. The location of the new pump station will help to provide better fire flow for industrial and commercial uses, increasing the flow to about 3,500 gallons per minute. This will create a sufficient rate for these types of uses, as the typical requirement for industrial and commercial fire flow is about 2,000 gallons per minute.

The City is also working incrementally to upgrade water pipe systems, but there are no challenges in making these improvements and the system is generally well maintained.

Wastewater

Redmond's wastewater treatment plant was built in the 1970s and is considered to be newer and in relatively good condition. The plant has the capacity for 3 million gallons per day, with a current peak of about 2.5 million gallons per day. The plant has options for increasing capacity, but potential growth is limited by factors such as aging solids handling equipment. The recently completed facility plan includes a project within 2 to 4 years to increase the capacity through gravity flow. This would require interceptors that flow north to south. Interceptors will be expanded as development occurs in Redmond, and the next area of potential development is along the west portion of the UGB. Generally, capacity for wastewater is built north to south in Redmond, making development in the south more difficult to serve in the near term, though pump stations can serve as interim solutions.

3. Employment Growth and Site Needs

Goal 9 requires cities to prepare an estimate of the amount of commercial and industrial land that will be needed over a 20-year planning period. The estimate of employment land need and site characteristics for Redmond is based on expected employment growth and the types of firms that are likely to locate in Redmond over the 20-year period. This chapter presents an employment forecast and analysis of target industries that build from recent economic trends.

Forecast of Employment Growth and Commercial and Industrial Land Demand

Demand for industrial and non-retail commercial land will be driven by the expansion and relocation of existing businesses and by the growth of new businesses in Redmond. This employment land demand is driven by local growth independent of broader economic opportunities, including the growth of target industries.

The employment projections in this section build off of Redmond's existing employment base, assuming future growth is similar to Deschutes County's long-term historical employment growth rates. The employment forecast does not take into account a major change in employment that could result from the location (or relocation) of one or more large employers in the community during the planning period. Such a major change in the community's employment would exceed the growth anticipated by the City's employment forecast and its implied land needs (for employment, but also for housing, parks, and other uses). Major economic events, such as the successful recruitment of a very large employer, are difficult to include in a study of this nature. The implications, however, are relatively predictable: more demand for land (of all types) and public services.

Projecting demand for industrial and non-retail commercial land has four major steps:

1. **Establish base employment for the projection.** We start with the estimate of covered employment in Redmond presented in Exhibit 4. Covered employment does not include all workers, so we adjust covered employment to reflect total employment in the city.
2. **Project total employment.** The projection of total employment considers forecasts and factors that may affect employment growth in Redmond over the 20-year planning period.
3. **Allocate employment.** This step involves allocating types of employment to different land-use types.
4. **Estimate land demand.** This step estimates general employment land demand based on employment growth and assumptions about future employment densities.

The remainder of this section follows this outline to estimate employment growth and commercial and industrial land demand for Redmond.

Employment Base for Projection

The purpose of the employment projection is to model future employment land need for general employment growth. The forecast of employment growth in Redmond starts with a base of employment growth on which to build the forecast. Exhibit 7 shows ECONorthwest's estimate of total employment in Redmond in 2018.

To develop the figures, ECONorthwest started with estimated covered employment in the Redmond UGB from confidential Quarterly Census of Employment and Wages (QCEW) data provided by the Oregon Employment Department. Based on this information, Redmond had about 13,900 covered employees in 2018.

Covered employment does not reflect all workers in an economy including sole proprietors. Analysis of data shows that *covered* employment reported by the Oregon Employment Department for Deschutes County is only about 64% of *total* employment reported by the U.S. Department of Commerce.[21] We evaluated this ratio for each industrial sector for Deschutes County and used the resulting ratios to determine the number of non-covered employees. This allowed us to determine the total employment in Redmond. Exhibit 7 shows Redmond had an estimated 19,642 *total* employees within its UGB in 2018.

Exhibit 7. Estimated Total Employment by Sector, Redmond UGB, 2018

	Covered Employment	Estimated Total Employment	Covered % of Total
Construction; Natural Resources	1,222	1,915	64%
Manufacturing	1,493	1,836	81%
Wholesale Trade	387	510	76%
Retail Trade	2,107	2,661	79%
Transportation and Warehousing; Utilities	692	1,143	61%
Information	32	41	78%
Finance and Insurance	411	976	42%
Real Estate and Rental and Leasing	158	1,007	16%
Professional, Scientific, and Technical Services	232	515	45%
Management of Companies and Enterprises	59	68	87%
Admin. and Support and Waste Mgmt and Remed. Serv.	739	1,092	68%
Private Education	125	264	47%
Health Care and Social Assistance	1,750	2,047	85%
Arts, Entertainment, and Recreation	93	174	53%
Accommodation and Food Services	1,487	1,637	91%
Other Services	747	1,590	47%
Government	2,166	2,166	100%
Total Non-Farm Employment	**13,900**	**19,642**	**71%**

Source: 2018 covered employment from confidential Quarterly Census of Employment and Wage (QCEW) data provided by the Oregon Employment Department.

[21] **Covered** employment includes employees covered by unemployment insurance. Examples of workers not included in covered employment are sole proprietors, some types of contractors (often referred to as "1099 employees"), or some railroad workers. Covered employment data is from the Oregon Employment Department.

Total employment includes all workers based on date from the U.S. Department of Commerce. Total employment includes all covered employees, plus sole proprietors and other non-covered workers.

Employment Projection

The employment forecast covers the 2020 to 2040 period, requiring an estimate of total employment for Redmond in 2020.

Redmond does not have an existing employment forecast, and there is no required method for employment forecasting. OAR 660-024-0040(9) sets out some optional "safe harbors" that allow a City to determine employment land need.

Redmond is relying on the safe harbor described in OAR 660-024-0040(9)(a)(B), which allows the City to assume that the current number of jobs in the Redmond UGB will grow during the 20-year planning period at a rate equal to the population growth rate provided in the most recent forecast published by Portland State University's Oregon Population Forecast Program. The latest forecast shows that population in Redmond will grow at an average annual growth rate of 2.3%.[22]

Exhibit 8 shows employment growth in Redmond between 2020 and 2040, based on the assumption that the City will grow at an average annual growth rate of 2.3%. Redmond will have 32,408 employees within the UGB by 2040, which is an increase of 11,851 employees (58%) between 2020 and 2040. Given the decrease in employment in Deschutes County in 2020 and the current recession, growth of employment in Redmond is likely to be slower through the first three to five years of the forecast. As Redmond continues to prepare vacant land for development (especially the LLI sites) and population continues to move to Redmond, the pace of employment growth is likely to increase in the latter half of the 2020 decade.

Exhibit 8. Employment Growth in Redmond UGB, 2020–2040

Year	Total Employment
2020	20,557
2040	32,408
Change 2020 to 2040	
Employees	11,851
Percent	58%
AAGR	2.30%

Source: ECONorthwest

[22] Final Population Forecasts prepared by Population Research Center, Portland State University, June 30th, 2018.

Allocate Employment to Different Land Use Types

The next step in forecasting employment is to allocate future employment to broad categories of land use. Firms wanting to expand or locate in Redmond will look for a variety of site characteristics, depending on the industry and specific circumstances. We grouped employment into four broad categories of land use based on North American Industrial Classification System (NAICS): industrial, retail commercial, office and commercial services, and government.

Exhibit 9 shows the expected share of employment by land-use type in 2020 and the forecast of employment growth by land-use type in 2040 in the Redmond UGB. For each land-use type, we assumed that the share of total employment will increase, except for government, which will remain at about the same number of employees and decrease in overall share of employment in Redmond.

Exhibit 9. Forecast of Employment Growth by Land-Use Type, Redmond UGB, 2020–2040

	2020		2040		Change 2020
Land Use Type	Employment	% of Total	Employment	% of Total	to 2040
Industrial	5,656	28%	8,916	28%	3,260
Retail Commercial	2,785	14%	4,390	14%	1,605
Office & Commercial Services	9,849	48%	15,528	48%	5,679
Government	2,267	11%	3,575	11%	1,308
Total	**20,557**	**100%**	**32,408**	**100%**	**11,852**

Source: ECONorthwest
Note: The shaded percentages denote an assumption about the future change in the share of employment (as a percent of total) by land use type.

Estimate of Demand for Commercial and Industrial Land

This section shows demand for vacant (including partially vacant) land in Redmond over the 20-year period. This section estimates demand for commercial and industrial land. Need for new land for government uses, such as schools, new infrastructure (e.g., wastewater facilities), and government offices can be addressed on land currently owned by the public agencies or on vacant land in areas like the UH-10, along with residential, commercial, and industrial development. For example, discussions with staff at the Redmond School District indicate that the District expects to develop new schools or facilities at land owned by the District.

The assumptions used in this analysis are:

- **Employment locating in residential plan designations.** According to QCEW data, some employment in Redmond in 2018 was located on land designated for residential uses. The following amounts of employment located in residential plan designations are (1) 10.4% of industrial employment, such as home offices for construction companies; (2) 9.9% of commercial employment; such as corner stores; other retail in neighborhoods; medical offices; or small personal service businesses such as banks or hair stylists.

  Exhibit 10 shows that the percentage of new employment locating in residential land designations will remain the same over the 20-year period: 10.4% of industrial, 9.9% of retail, and 9.9% of office and commercial service employment. Some of these

employment uses may require additional land in the UH-10 (where residential growth is expected to be concentrated) and some may locate in home offices.

Exhibit 10. Estimated Employment Growth Accommodated on Residential Plan Designations, Redmond UGB, 2020–2040

Land Use Type	New Employment Growth	Emp. In Res. Designations	New Emp. on Vacant Land
Industrial	3,260	339	2,921
Retail Commercial	1,605	158	1,447
Office & Commercial Services	5,679	561	5,118
Total	**10,544**	**1,058**	**9,486**

Source: ECONorthwest

- **Employment density.** Employees per acre is a measure of employment density based on the ratio of the number of employees per acre of employment land that is developed for employment uses. An empirical analysis of Redmond's existing employment conducted by ECONorthwest showed that industrial sites have an average of 8 employees per acre, retail commercial sites have an average of 11 employees per acre, and office and commercial services sites have an average of 18 employees per acre.[23]

  Using the existing employment densities as a baseline, while also considering Redmond's future development goals and policies, Exhibit 11 assumes the net employees per acre: industrial will have an average of 8 employees per acre, retail commercial will have an average of 15 employees per acre, and office and commercial services will have an average of 20 employees per acre. These employment densities are consistent with employment densities in Oregon cities of similar size as Redmond. Some types of employment will have higher employment densities (e.g., a multistory office building), and some will have lower employment densities (e.g., a convenience store with a large parking lot).

- **Conversion from net to gross acres.** The data about employment density is in net acres, which does not include land for public right-of-way. Future land need for employment should include land in tax lots needed for employment plus land needed for public right-of-way. One way to estimate the amount of land needed for employment, including public right-of-way, is to convert from net to gross acres based on assumptions about the amount of land needed for public right-of-way.[24] A net-to-gross conversion is expressed as a percentage of gross acres that are in public right-of-way.

[23] This analysis considered a sample of existing businesses in Redmond, accounting for 15% of existing employment in Redmond. The results were generally consistent with ECONorthwest's analysis of employment densities in other cities across Oregon.

[24] OAR 660-024-0010(6) uses the following definition of net buildable acre. "Net Buildable Acre" consists of 43,560 square feet of residentially designated buildable land after excluding future rights-of-way for streets and roads. While the administrative rule does not include a definition of a gross buildable acre, using the definition above, a gross buildable acre will include areas used for rights-of-way for streets and roads. Areas used for rights-of-way are considered unbuildable.

Based on empirical evaluation of Redmond's existing net-to-gross ratios, ECONorthwest uses a net-to-gross conversion factor of 15% for industrial and 24% for commercial.

Using these assumptions, the forecasted growth of 9,486 new employees will result in the demand for vacant (and partially vacant) employment land including 411 gross acres of industrial land, 114 acres of retail commercial land, and 302 gross acres of office and commercial land.

Exhibit 11. Demand for Vacant Land to Accommodate Employment Growth, Redmond UGB, 2020–2040

Land Use Type	New Emp. on Vacant Land	Employees per Acre (Net Acres)	Land Demand (Net Acres)	Land Demand (Gross Acres)
Industrial	2,921	8	348	411
Retail Commercial	1,447	15	96	114
Office & Commercial Services	5,118	20	256	302
Total	**9,486**		**701**	**826**

Source: ECONorthwest

Target Industries

The characteristics of Redmond will affect the types of businesses most likely to locate in the city. Redmond's attributes that may attract firms are Redmond's buildable land, transportation access, access to resources, recreational opportunities, and quality of life.

Redmond's existing businesses are concentrated in the industries defined in Exhibit 12. The industries in green highlight are industries with a high location quotient (i.e., highly specialized compared to national employment in the industry), high employment (i.e., have more than 50 employees in Redmond), and higher-than-average city wages. These industries have the highest potential for growth, given existing businesses and the higher concentration of employment.

Redmond also has opportunities for employment growth in industries without a concentration of employment or a high location quotient.

Exhibit 12. Concentration of Industries and Employment, Redmond, 2018

	High Employment (more than 50 employees)	Low Employment (at least 10 employees)
High Location Quotient (High concentration of employment relative to the nation)	▪ Construction of Buildings ▪ Specialty Trade Contractors ▪ Nonmetallic Mineral Product Manufacturing ▪ Furniture and Home Furnishings Stores ▪ Food and Beverage Stores ▪ General Merchandise Stores ▪ Social Assistance ▪ Food Services and Drinking Places ▪ Repair and Maintenance ▪ Religious, Grantmaking, Civic, Professional, and Similar Organizations	▪ Miscellaneous Manufacturing
Low Location Quotient (Low concentration of employment relative to the nation)	▪ Chemical Manufacturing ▪ Fabricated Metal Product Manufacturing ▪ Machinery Manufacturing ▪ Computer and Electronic Product Manufacturing ▪ Merchant Wholesalers, Durable Goods ▪ Electronics and Appliance Stores ▪ Health and Personal Care Stores ▪ Sporting Goods, Hobby, Musical Instrument, and Book Stores ▪ Miscellaneous Store Retailers ▪ Truck Transportation ▪ Support Activities for Transportation ▪ Couriers and Messengers ▪ Insurance Carriers and Related Activities ▪ Professional, Scientific, and Technical Services ▪ Management of Companies and Enterprises ▪ Educational Services ▪ Ambulatory Health Care Services ▪ Nursing and Residential Care Facilities ▪ Accommodation ▪ Personal and Laundry Services ▪ Private Households	▪ Heavy and Civil Engineering Construction ▪ Food Manufacturing ▪ Beverage and Tobacco Product Manufacturing ▪ Wholesale Electronic Markets and Agents and Brokers ▪ Securities, Commodity Contracts, and Other Financial Investments and Related Activities

Source: Oregon Employment Department, Quarterly Census of Employment and Wages, 2018.
Note: Green highlighting indicates higher than Redmond's average wage.

Potential Growth Industries

An analysis of growth industries in Redmond should address two main questions: (1) Which industries are most likely to be attracted to Redmond? and (2) Which industries best meet Redmond's economic development goals? The selection of target industries is based on Redmond's goals for economic development, economic conditions in Redmond and Deschutes County, and the city's competitive advantages.

Given the current employment base, which is composed of small-sized businesses, it is reasonable to assume that much of the city's business growth will come from small-sized businesses. This growth will either come from businesses already in Redmond or new businesses that start or relocate to Redmond from within the Central Eastern Cascades region or from outside of the region.

As Redmond plans for growth over the next 20 years, one of the City's economic development goals is to diversify its economic base through growth of businesses that are not present in Redmond. Some of the businesses in target industries may be part of an industrial cluster of similar or related businesses in Redmond and others will be new to Redmond. Diversifying Redmond's economic base can improve the community's economic resiliency because a downturn in one or two industries can be offset by other industries less affected by a downturn.

For example, Redmond has concentrations in metals manufacturing (Exhibit 12) but relatively modest employment in food and beverage manufacturing. They are both target industries because these types of manufacturing are common in Oregon. Redmond has sites to accommodate these types of manufacturing, as well as access to natural resources and the transportation access necessary for these industries.

The industries identified as having potential for growth in Redmond are described below. This list is a result of first reviewing existing work completed by REDI, then considering the business environment in Redmond and the city's economic development advantages and refining the potential list of industries with the Project Advisory Committee.

- **Manufacturing.** As automation continues to change manufacturing industries, Redmond's target manufacturing industries will also evolve. Based on existing businesses in Redmond, these industries may include:
  - Advanced and specialty manufacturing (including metals manufacturing or secondary wood products)
  - Plastics and other advanced materials
  - Food and beverage manufacturing
- **Aviation and Aerospace Manufacturing.** The location of Redmond's municipal airport may attract businesses in aviation-related industries, such as aviation and aerospace manufacturing.

- **Healthcare Technology, Manufacturing, and Support.** Redmond has an existing concentration of businesses in healthcare technology. These industries require a range of sites, including both industrial space for manufacturing and office commercial space for support-related businesses.
- **Services for visitors.** Redmond's location in Central Oregon provides access to a range of outdoor recreation activities. Visitors will continue to stop in Redmond, creating future demand for services such as hotels, restaurants, retail, and experiences available in or near Redmond (e.g., recreation guiding services or equipment rental).
- **Services for residents.** As Redmond's population or the population of the outlying areas Deschutes County grows, demand for services for residents will grow. These services include retail, restaurants, personal services (e.g., hairdressers), financial services, medical services, and other services. These types of services present opportunities for entrepreneurship and small business development in Redmond.

Site Needs for Potential Growth Industries

OAR 660-009-0015(2) requires the EOA to "identify the number of sites by type reasonably expected to be needed to accommodate the expected [20-year] employment growth based on the site characteristics typical of expected uses." The Goal 9 rule does not specify how jurisdictions conduct and organize this analysis.

The rule, OAR 660-009-0015(2), does state that "[i]ndustrial or other employment uses with compatible site characteristics may be grouped together into common site categories." The rule suggests, but does not require, that the City "examine existing firms in the planning area to identify the types of sites that may be needed." For example, site types can be described by (1) plan designation (e.g., heavy or light industrial), (2) general size categories that are defined locally (e.g., small, medium, or large sites), or (3) industry or use (e.g., manufacturing sites or distribution sites). For purposes of the EOA, Redmond groups its future employment uses into categories based on their need for land with a particular plan designation (i.e., industrial or commercial) and by their need for sites of a particular size.

The potential growth industries described in the prior section are a mixture of business sizes, from small to medium-sized businesses. For the most part, Redmond's potential growth industries need flat sites smaller than two acres and up to 25 acres. Industrial businesses need access to arterial and highways with no freight movement through neighborhoods. These businesses may also need greater access to water and wastewater. Exhibit 13 shows the typical site needs for manufacturing businesses in Oregon.

Exhibit 13. Industrial Development Competitiveness Matrix, Business Oregon

Industry Sector	Site size (Acres)	Site Topography (Slope)	Trip Generation (ADT/Acre)	Site Access Max distance in miles to interstate or major arterial	Railroad or Port Access	Telecommunications (major communications dependency)
Regionally to Nationally Scaled Clean-Tech Manufacturer	5-100+	0-5%	40 - 60	10	Preferred	Required
Heavy Industrial/ Manufacturing	10-100+	0-5%	40 - 60	10	Preferred	Preferred
General Manufacturing	5-15+	0-5%	40 - 50	20	Preferred	Required
Food Processing	5-25+	0-5%	50 - 60	30	Preferred	Preferred
Regional (multistate) Distribution Center	20-100+	0-5%	40 - 80	5 Only Interstate highway or equivalent	Preferred	Preferred
Warehouse/Distribution (local)	10-25	0-5%	40 - 80	5 Only Interstate highway or equivalent	Preferred	Preferred
Call Center / Business Services	5-15	0 to 12%	170 - 180	Not applicable	Preferred	Required
Advanced Manufacturing & Assembly	5-25+	0-7%	40 - 60	15	Not Required	Required
Business Park and R&D Campus	20 - 100+	0-7%	60 to 150	N/A	Preferred	Required
UVA Manufacturing / Research	10-25+	0-7%	40 - 80	N/A	Not Required	Required
Data Center	10-25+	0-7%	20 - 30	30	Avoid / Not Required	Required
Rural Industrial	5-25+	0-5%	40 - 50	N/A	N/A	Preferred

Source: Business Oregon, Infrastructure Finance Authority, "Industrial Development Competitiveness Matrix"
Note: Items identified as "preferred" are those that increase the feasibility of the subject property and its future reuse. Items identified as "required" are factors seen as mandatory in the vast majority of cases and have become industry standards.

For the most part, the size of sites needed by most potential growth industries will range from space in an existing building to flat sites of one acre or less to sites of 25 acres for manufacturing businesses. In a few instances, such as in industrial or business parks, sites larger than 25 acres (and up to 100 acres or larger) may be necessary to meet the needs of businesses or developments to support businesses. Manufacturing and other industrial businesses likely to locate in Redmond will have a range of space needs:

- **Small-scale manufacturing space.** Businesses would be located in an industrial building with many other users. These businesses will need direct access to arterial and highways.
- **Space in an existing building.** The majority of businesses that work with Business Oregon on site selection request space in existing buildings. Redmond has relatively few vacant industrial buildings.
- **Mid-sized manufacturing.** Some mid-sized manufacturers may prefer to locate in a building with a one or two other businesses. Other manufacturers may prefer to newly developed buildings on sites from five to 15 acres in size. These businesses will need direct access to arterial and highways and may need greater access to water and wastewater.

- **Large-scale manufacturing or industrial or business parks.** Some large-scale manufacturers may be looking for sites of 25 acres or larger. And some businesses may prefer to locate in industrial or business parks, which may be sized from 15 acres to 100 acres or larger, with smaller development-ready sites for businesses that prefer to locate in an industrial or business park.

Commercial businesses, including service and hospitality, require high visibility locations near other businesses and neighborhoods. Professional and commercial service businesses have a variety of space needs, ranging from:

- **Space in an existing building.** Businesses would be located as one of several or many firms within the building.
- **Space in a building dominated by one firm.** This could potentially be with manufacturing or other industrial space in the building.
- **Land for construction of a building designed for the firm.** However, in the case where the business needs to build a building, they are typically seeking existing space rather than land to build a new facility.

The current development pattern in Redmond concentrates employment development generally to the east of Highway 97 and residential development, especially new residential development, to the west of Highway 97. Given the forecast growth of 17,763 in residents between 2020 and 2040, Redmond will need to plan for new commercial centers, which can accommodate restaurants, service businesses, retail, medical and other offices, and other commercial uses. As the City master plans newly developing areas, Redmond should consider plans for new commercial centers. Because of Redmond's size, the types of commercial centers likely to be needed in Redmond over the next 20 years are:[25]

- **Community Center.** This is a mid-sized commercial center typically of 10 to 40 acres in size and with 125,000 to 400,000 square feet of built space. It has 2 or more anchor tenants with 15 to 40 stores, typically focused on general merchandise or convenience retail uses. A community center typically services 90,000 to 100,000 people, with a trade area of 3 to 6 miles. Redmond and the surrounding areas may have sufficient population within the planning period to support a community center, probably in an area that has high visibility from Highway 97.
- **Neighborhood Center.** This is a large commercial center typically 3 to 5 acres in size and 30,000 to 125,000 square feet of built space. It includes one or more anchor tenants, such as a supermarket, and has 5 to 20 stores that focus on convenience retail uses. A neighborhood center typically services 10,000 to 30,000 people, with a trade area of 3 miles. Redmond has sufficient population to support a neighborhood center, possibly located in an area with visibility from Highway 126 or Highway 97.

[25] These commercial centers are based on definitions of commercial centers from the International Council of Shopping Centers.

- **Village Center.** This is a convenience-oriented center typically less than 3 acres in size and less than 30,000 square feet of built space with about 3 stores. A village center typically services 2,000 people, with a trade area of 1.5 to 2 miles. Redmond has sufficient population to support village centers, which may be located in various commercial nodes in the City's master-planned areas.

Airport-related businesses would likely prefer to be located at the Airport, in a hangar or other airport building. Some businesses in the aviation and aerospace manufacturing growth industry may locate at the airport, while others may locate on other industrial sites in Redmond. The *Redmond Municipal Airport Master Plan* (2018) provides details on the specific non-aviation target industries and uses that are allowed to locate on the airport property. These industries include:

- Accommodation and food services for airport passengers or operations
- Speculative light industrial buildings
- Construction
- Manufacturing of aviation-related products
- Wholesales and warehousing, especially businesses that ship by airplane
- Public administration, especially related to airport operations
- Gas station and convenience stores

These businesses will need to follow development standards and requirements defined in the Master Plan. Further discussion of the airport property is provided in Chapter 4.

4. Buildable Lands Inventory

The buildable lands inventory is intended to identify commercial and industrial lands that are available for development for employment uses within the Redmond UGB. The inventory is sometimes characterized as *supply* of land to accommodate anticipated employment growth. Population and employment growth drive *demand* for land. The amount of land needed depends on the type of development and other factors.

This chapter presents results of the commercial and industrial buildable lands inventory for the Redmond UGB. The results are based on analyses of City of Redmond, Deschutes County, and State of Oregon GIS data by ECONorthwest and reviewed by City staff. The remainder of this chapter summarizes key findings of the buildable lands inventory.

The general steps in the buildable lands inventory are:

1. Generate UGB "land base"
2. Classify lands by development status
3. Identify constraints
4. Verify inventory results
5. Tabulate and map results

The next section provides a summary of the results of the commercial and industrial buildable lands inventory for the Redmond UGB in both tabular and map formats. **Appendix B presents the full buildable lands inventory, including the methodology for developing the inventory.**

Land Base

Exhibit 14 summarizes all land included in the employment land base (e.g., lands with plan designations that allow employment) in the Redmond UGB. ECONorthwest used this land base in the buildable lands analysis for Redmond. The land base includes traditional employment designations within the Redmond UGB. According to 2019 data, there are about 6,932 acres in 1,642 tax lots in total within Redmond's UGB.

Exhibit 14. Commercial and Industrial Acres, Redmond UGB, 2019

Zone/Plan Designation	Number of taxlots	Percent	Total taxlot acreage	Percent (total acreage)
Commercial	**916**	**56%**	**782**	**11%**
C1 - Strip Service Comm.	280	17%	464	7%
C2 - Central Bus. Dist.	462	28%	137	2%
C3 - Special Service Comm.	55	3%	54	1%
C4 - Limited Service Comm.	114	7%	42	1%
C4-A - Limited Service Comm.	3	0%	47	1%
C5 - Tourist Comm.	2	0%	38	1%
Mixed Use	**147**	**9%**	**71**	**1%**
MUE - Mixed Use Employment	1	0%	9	0%
MULW - Mixed Use Live/Work	142	9%	54	1%
MUN - Mixed Use Neighborhood	4	0%	8	0%
Industrial	**233**	**14%**	**2,072**	**30%**
LLI - Large Lot Industrial	1	0%	935	13%
M1 - Light Industrial	60	4%	580	8%
M2 - Heavy Industrial	172	10%	557	8%
Other	**346**	**21%**	**4,007**	**58%**
UH10	163	10%	1,751	25%
Airport Master Plan	183	11%	2,256	33%
Total	**1,642**	**100%**	**6,932**	**100%**

Source: ECONorthwest analysis of data from City of Redmond and Deschutes County.

Development Status

Exhibit 15 shows commercial, industrial, and agricultural land in Redmond by development status. Of the 2,925 commercial and industrial acres in the Redmond UGB, about 1,355 acres (46%) are in classifications with no development capacity (or "committed acres"). Of the remaining 1,570 acres, 15 acres (1%) are constrained and 1,555 acres (53%) are buildable land with development capacity.

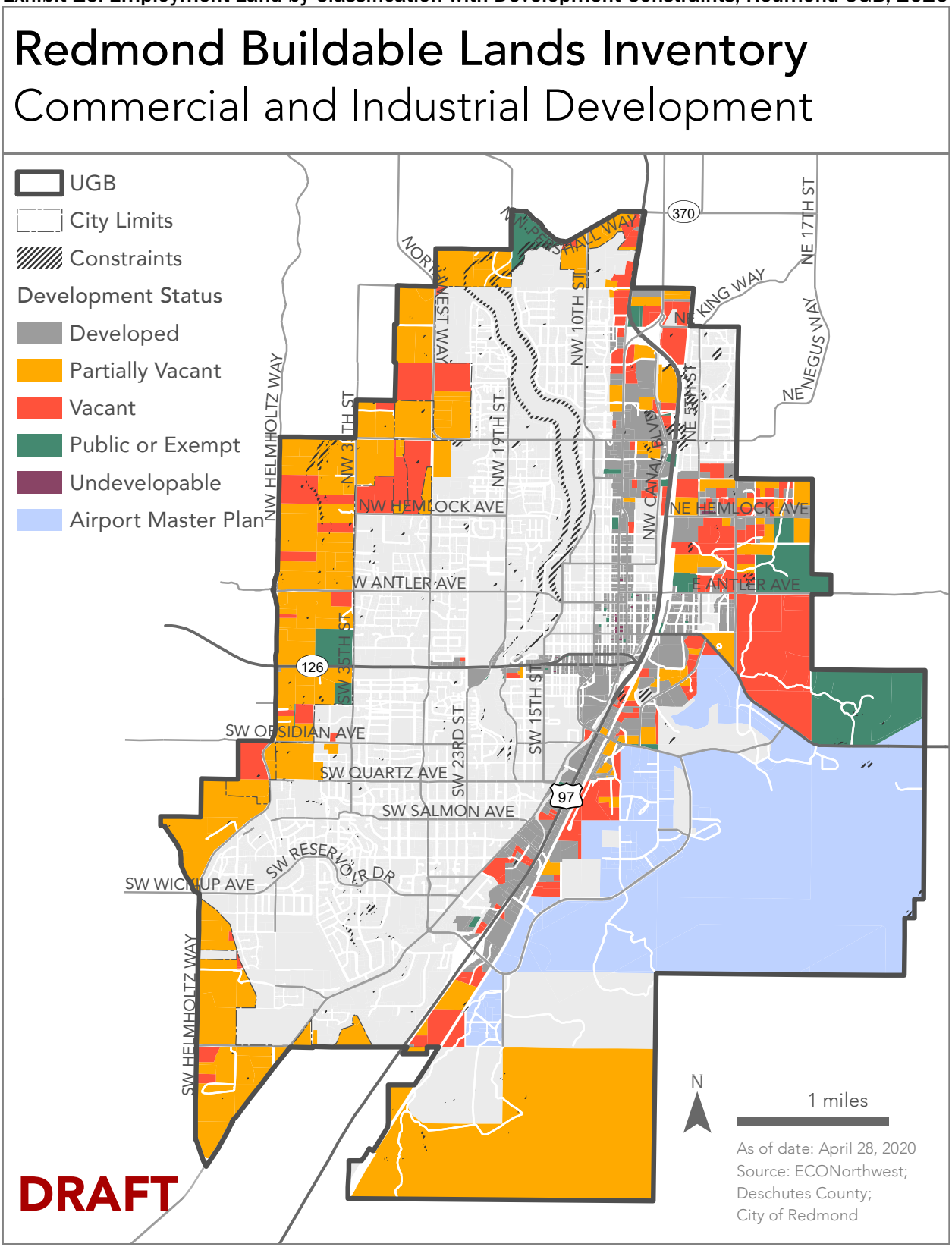
Exhibit 15. Employment Acres by Classification and Plan Designation, Redmond UGB, 2019

Zone/Plan Designation	Total Acres	Committed Acres	Constrained Acres	Buildable Acres
Commercial	**782**	**539**	**8**	**235**
C1 - Strip Service Comm.	464	315	5	143
C2 - Central Bus. Dist.	137	133	1	3
C3 - Special Service Comm.	54	38	1	15
C4 - Limited Service Comm.	42	39	0	3
C4-A - Limited Service Comm.	47	13	-	33
C5 - Tourist Comm.	38	-	0	38
Mixed Use	**71**	**50**	**-**	**22**
MUE - Mixed Use Employment	9	-	-	9
MULW - Mixed Use Live/Work	54	47	-	7
MUN - Mixed Use Neighborhood	8	3	-	5
Industrial	**2,072**	**766**	**7**	**1,298**
LLI - Large Lot Industrial	935	158	2	775
M1 - Light Industrial	580	232	2	346
M2 - Heavy Industrial	557	375	4	178
Total	**2,925**	**1,355**	**15**	**1,555**

Source: ECONorthwest analysis of data from City of Redmond and Deschutes County.

Land in the UN-10 zone and at the Airport is addressed at the end of this chapter.

Exhibit 16. Employment Land by Classification with Development Constraints, Redmond UGB, 2020



Vacant Buildable Land

The next step in the commercial and industrial buildable land inventory was to net out portions of vacant tax lots that are unsuitable for development. Areas unsuitable for development fall into three categories: (1) developed areas of partially vacant tax lots, (2) areas with service constraints, (3) areas with physical constraints (areas with wetlands, floodways, riparian setback areas and steep slopes).

Exhibit 17 shows unconstrained buildable acres for vacant and partially vacant land by plan designation. The results show that Redmond has about 235 net buildable acres in commercial, 22 acres in mixed-use designations, and 1,298 acres in industrial. Large Lot Industrial land accounts for about 775 buildable acres, or about 60% of the total industrial buildable land supply.[26]

Exhibit 17. Employment Land with Unconstrained Development Capacity (Vacant, and Partially Vacant) by Plan Designation, Redmond UGB, 2019

Zone/Plan Designation	Total Buildable Acres	Buildable Acres on Vacant Lots	Buildable Acres on Partially Vacant Lots
Commercial	**235**	**196**	**39**
C1 - Strip Service Comm.	143	108	36
C2 - Central Bus. Dist.	3	3	
C3 - Special Service Comm.	15	12	3
C4 - Limited Service Comm.	3	3	
C4-A - Limited Service Comm.	33	33	
C5 - Tourist Comm.	38	38	
Mixed Use	**22**	**18**	**4**
MUE - Mixed Use Employment	9	9	
MULW - Mixed Use Live/Work	7	7	
MUN - Mixed Use Neighborhood	5	2	4
Industrial	**1,298**	**445**	**853**
LLI - Large Lot Industrial	775		775
M1 - Light Industrial	346	317	29
M2 - Heavy Industrial	178	128	50
Total	**1,555**	**659**	**896**

Source: ECONorthwest analysis of data from City of Redmond and Deschutes County.

In July 2020, the City of Redmond determined that a 3.5-acre C1-zoned parcel will need to be rezoned to a residential zone to accommodate a future RV park approved by the City in 2017. This parcel is not yet developed and appears in the total buildable acres for commercial land in the table above. If this rezone is approved, this will reduce the total buildable acres to about 1,551 acres.

[26] The LLI parcel (Taxlot ID "1513000000130") in the data used for this analysis is about 935 acres in size. It has about 1.5 acres of constrained land. This parcel is defined as partially vacant with about 158 acres assumed to be committed for public use by the Deschutes County Fairgrounds and Oregon Military Department facilities. This division of land is described in the City of Redmond Staff Report for the Redmond Urban Area Planning Commission on December 17, 2018.

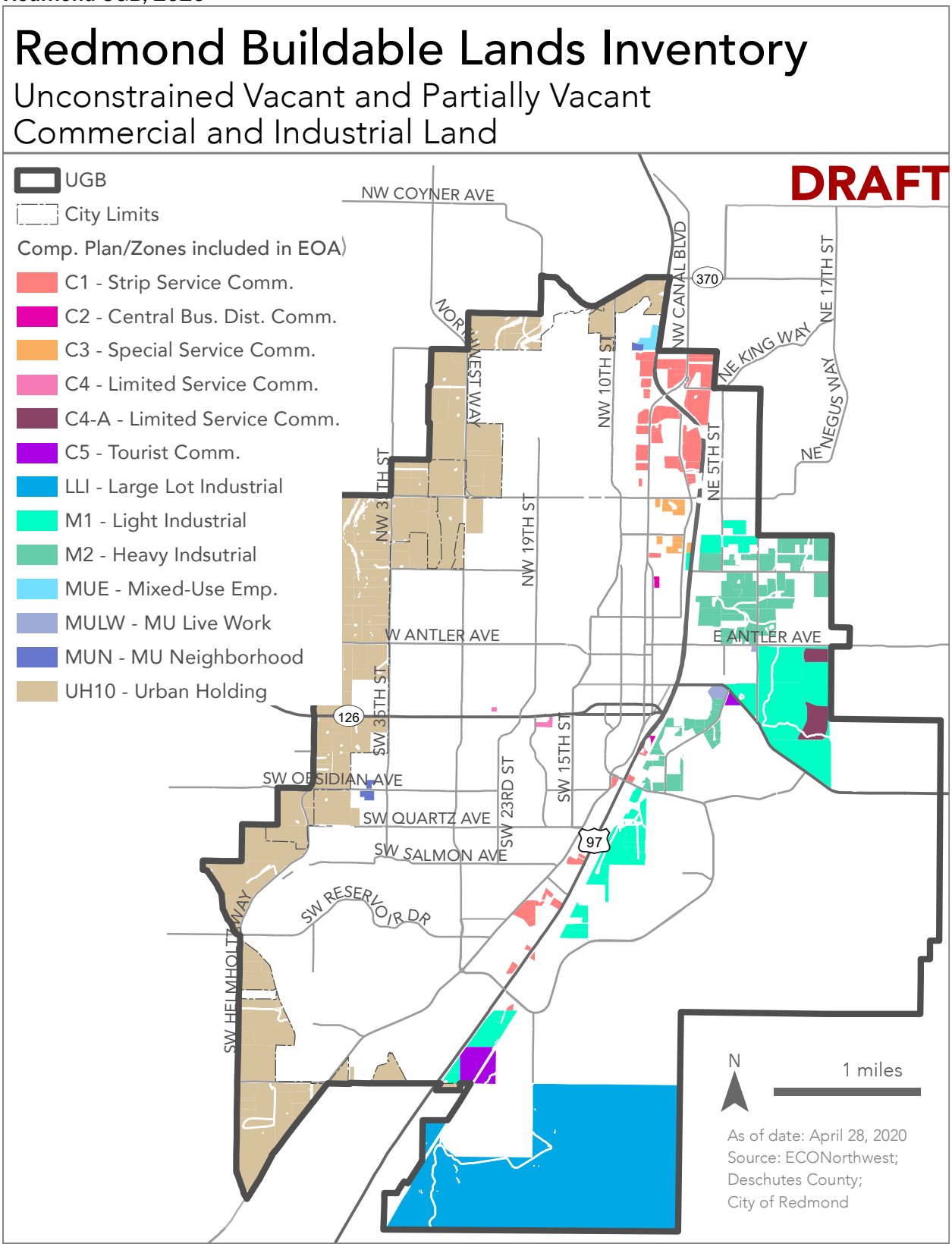
Exhibit 18 shows the size of lots by plan designations for buildable employment land. Redmond has 5 lots that are smaller than 0.5 acres (with 2 acres of land), 122 lots between 0.5 and 2 acres (137 acres of land), 38 lots between 2 and 5 acres in size (121 acres of land), 17 lots between 5 and 10 acres in size (120 acres of land), 10 lots between 10 and 20 acres in size (133 acres of land), 4 lots between 20 and 50 acres in size (154 acres of land), and 2 lots over 50 acres in size (889 acres of land).

Exhibit 18. Lot Size by Plan Designation, Buildable Acres, Redmond UGB, 2019

	Buildable acres in taxlots								
	<0.50 acre	0.50-0.99 acres	1.00-1.99 acres	2.00-4.99 acres	5.00-9.99 acres	10.00-19.99 acres	20.00-49.99 acres	50.00+ acres	Total
Commercial	**1**	**20**	**29**	**45**	**39**	**43**	**58**		**235**
C1 - Strip Service Comm.	1	16	13	41	29	43			143
C2 - Central Bus. Dist.	0	1	1						3
C3 - Special Service Comm.		2	13						15
C4 - Limited Service Comm.	0	1	2						3
C4-A - Limited Service Comm.					9		24		33
C5 - Tourist Comm.				4			34		38
Mixed Use			**6**		**15**				**22**
MUE - Mixed Use Employment					9				9
MULW - Mixed Use Live/Work			1		6				7
MUN - Mixed Use Neighborhood			5						5
Industrial	**0**	**19**	**61**	**76**	**66**	**90**	**95**	**889**	**1,298**
LLI - Large Lot Industrial								775	775
M1 - Light Industrial		4	17	13	34	68	95	114	346
M2 - Heavy Industrial	0	15	44	63	33	22			178
Acreage subtotal	**2**	**40**	**97**	**121**	**120**	**133**	**154**	**889**	**1,555**
Commercial	**4**	**29**	**21**	**14**	**5**	**3**	**2**		**78**
C1 - Strip Service Comm.	2	23	9	13	4	3			54
C2 - Central Bus. Dist.	1	2	1						4
C3 - Special Service Comm.		3	10						13
C4 - Limited Service Comm.	1	1	1						3
C4-A - Limited Service Comm.					1		1		2
C5 - Tourist Comm.				1			1		2
Mixed Use			**4**		**2**				**6**
MUE - Mixed Use Employment					1				1
MULW - Mixed Use Live/Work			1		1				2
MUN - Mixed Use Neighborhood			3						3
Industrial	**1**	**27**	**41**	**24**	**10**	**7**	**2**	**2**	**114**
LLI - Large Lot Industrial								1	1
M1 - Light Industrial		5	10	4	5	5	2	1	32
M2 - Heavy Industrial	1	22	31	20	5	2			81
Lot subtotal	**5**	**56**	**66**	**38**	**17**	**10**	**4**	**2**	**198**

Source: ECONorthwest analysis of data from City of Redmond and Deschutes County.

Exhibit 19. Buildable Employment Land by Plan Designation with Development Constraints, Redmond UGB, 2020



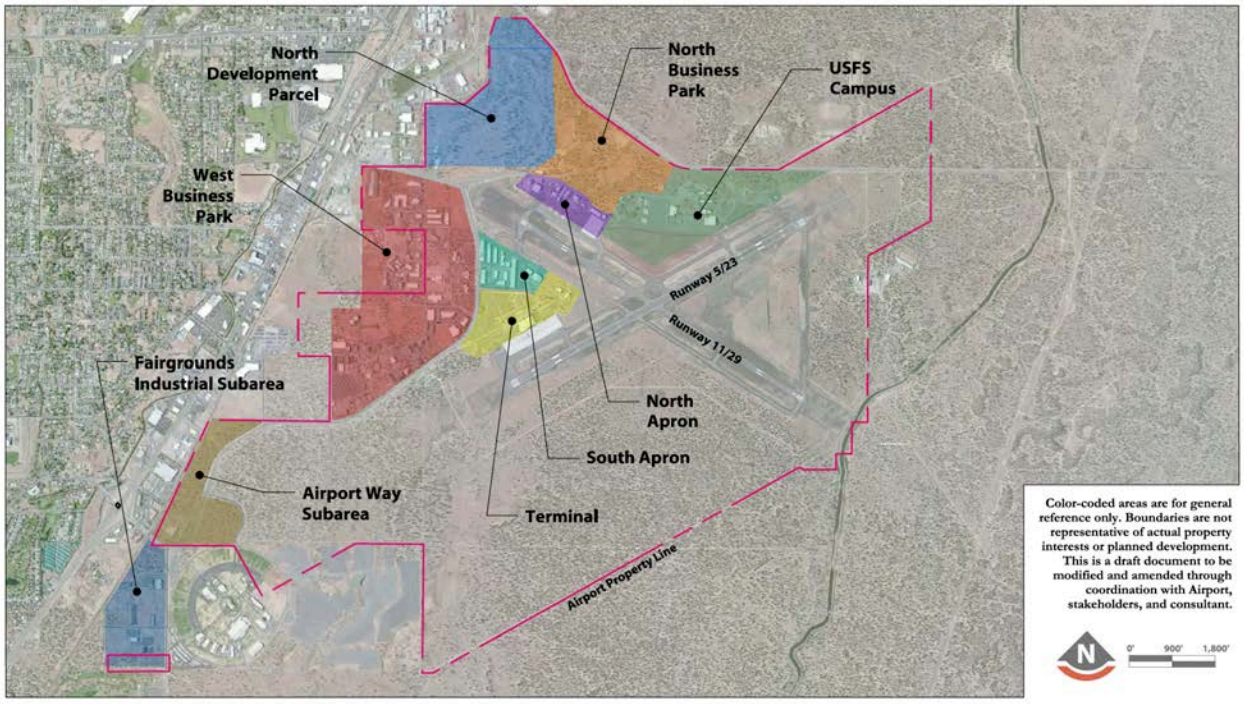
Land in Urban Holding

Redmond has about 1,751 total acres in the Urban Holding-10 (UH-10) zone. Some of these areas will develop as commercial land, while others will be residential. The HNA reported that about 137 acres of land zoned UH-10 is in master planned areas for residential use, and up to 296 acres of the vacant land will be used to accommodate residential growth over the 20-year planning period. At the time of this analysis, the Maple Meadows Master Plan allocated about 10 acres to the Mixed-Use Neighborhood plan designation. This leaves approximately 1,300 acres that could be redesignated to allow employment uses, such as commercial development.

Land at the Redmond Airport

Of the 6,932 acres in Redmond's commercial and industrial plan designations, about 2,256 acres (33%) are located in the airport property. Exhibit 20 shows the airport property boundary (magenta-colored line) and various subareas on the airport property as defined in the *Redmond Municipal Airport Master Plan.*

Exhibit 20. Redmond Municipal Airport Subareas, 2018



Source: Redmond Municipal Airport Master Plan. Mead & Hunt. 2018.

Exhibit 21 shows a summary of the developable acres, general site characteristics, and potential uses allowed in each subarea on the airport property. Since sites on these areas have more restrictions than typical commercial and industrial land in Redmond, these acres are not included in the calculation of unconstrained buildable land in the remainder of this Chapter.

The Airport has 408 developable acres, most of which are city owned and have lease restrictions but about 90 acres are privately owned and have no lease restrictions.

Exhibit 21. Developable Acres by Subarea, Redmond Municipal Airport, 2018

Subarea	Developable Acres	City owned?	Subject to leasehold resrictions?	Potential Uses *(based on Airport Master Plan, Appendix F)*
North Development Parcel Subarea	**134**			
Light Industrial (M1)	17	Yes, entire area	Yes, entire area	Wholesale, warehouse, construction, accommdation and food services, hospitality
Tourist Commercial (C5)	60			
Open Space Park Reserve (OSPR)	57			Public facilities (e.g., emergency training facility)
North Business Park Subarea	**94**			
Light Industrial (M1)	44	Mix of public and private ownership	Yes, entire area	Wholesale, warehouse, construction, accommdation and food services, hospitality
Tourist Commercial (C5)	17			
Open Space Park Reserve (OSPR)	57			Public faclities
South Apron Area	**0**			
Airport		Mix of public and private	Yes, entire area	All land currently developed, some potential for speculative redevelopment. Any use required to
Light Industrial (M1)				
West Business Park Subarea	**93**			
M1	"several vacant parcels"	Mix of public and private ownership	Yes, 33 acres of city owned property	Light industrial, wholesale, warehouse, or manufacturing
PF	"several acres"			Public administration uses
Airport Way Subarea	**46**			
Light Industrial (M1)	46	Yes, entire area	Yes, entire area	Wholesale, warehouse, construction, food services
Fairgrounds Industrial Subarea	**41**			
Light Industrial (M1)	41	Mix of public and private ownership	Yes, 8 acres of city owned property	Light industrial, wholesale, warehouse, or manufacturing

Source: Redmond Municipal Airport Master Plan. Mead & Hunt. 2018.

Short-Term Supply of Land

This section evaluates the short-term supply of employment land in Redmond. It begins with an overview of the policy context for this this analysis, and then it evaluates the short-term land supply.

Policy Context

The Goal 9 Administrative Rule (OAR 660-009) includes provisions that require certain cities to ensure an adequate short-term supply of industrial and other employment lands. Redmond is not currently subject to this requirement; however, the City's forecast population growth means that Redmond will likely be subject to this requirement in the future. OAR 660-009-005(10) defines short term supply as follows:

> "…means suitable land that is ready for construction within one year of an application for a building permit or request for service extension. Engineering feasibility is sufficient to qualify land for the short-term supply of land. Funding availability is not required. "Competitive Short-term Supply" means the short-term supply of land provides a range of site sizes and locations to accommodate the market needs of a variety of industrial and other employment uses."

The Goal 9 rule also requires cities in a Metropolitan Planning Organization (MPO, which may include Redmond in the future) to make a commitment to providing a competitive short-term supply of land and establishes targets for the short-term supply of land. Specifically, OAR 660-009-0020(1)(b) states:

> "Cities and counties within a Metropolitan Planning Organization must adopt a policy stating that a competitive short-term supply of land as a community economic development objective for the industrial and other employment uses selected through the economic opportunities analysis pursuant to OAR 660-009-0015."

The rule goes on to clarify short-term land supply targets for cities in an MPO (OAR 660-009-0025):

> (3) Short-Term Supply of Land. Plans for cities and counties within a Metropolitan Planning Organization or cities and counties that adopt policies relating to the short-term supply of land must designate suitable land to respond to economic development opportunities as they arise. Cities and counties may maintain the short-term supply of land according to the strategies adopted pursuant to OAR 660-009-0020(2).
>
> (a) Except as provided for in subsections (b) and (c), cities and counties subject to this section must provide at least 25% of the total land supply within the urban growth boundary designated for industrial and other employment uses as short-term supply.
>
> (b) Affected cities and counties that are unable to achieve the target in subsection (a) above may set an alternative target based on their economic opportunities analysis.
>
> (c) A planning area with 10 percent or more of the total land supply enrolled in Oregon's industrial site certification program pursuant to ORS 284.565 satisfies the requirements of this section.

In summary, the rule requires cities subject to the requirement to assess the short-term supply of employment land based on the criteria that land can be ready for construction within one year. The determination is based on "engineering feasibility."

Analysis of Short-Term Supply of Land

ECONorthwest worked with the City of Redmond staff to identify commercial and industrial land that meet the definition of short-term supply of land, using the results of the buildable lands inventory as a basis. Exhibit 17 shows that Redmond has 1,555 acres of unconstrained buildable land on vacant and partially vacant tax lots in commercial and industrial plan designations.[27] On these lands, we considered access to water, sanitary sewer, and stormwater.

The results show that all commercial and mixed-use land in Redmond (257 acres) is in the short-term supply of land and 524 acres of industrial land is in the short-term supply of land. In other words, all unconstrained buildable commercial and industrial land in Redmond is in the short-term supply, except for land in the Large-Lot Industrial zone (775 acres). In comparison to all unconstrained vacant and partially vacant commercial and industrial land (from Exhibit 17), 50% of Redmond's land is in the short-term supply.

[27] We did not factor in UH-10 land in this analysis, as most is not in city limits and has not been designated for commercial or industrial use at the time of the analysis.

5. Land Sufficiency and Conclusions

This chapter presents conclusions about Redmond's employment land sufficiency for the 2020-2040 period. The chapter then concludes with a discussion about Redmond's land base and its ability to accommodate growth over the next 20 years, as well as recommendations for the City to consider, ensuring it meets its economic growth needs throughout the planning period.

Land Sufficiency

Exhibit 22 shows commercial and industrial land sufficiency within the Redmond UGB. It shows:

- **Vacant unconstrained land** from Exhibit 17 within the UGB. Exhibit 22 shows that Redmond has 1,298 gross acres of industrial land and 257 gross acres of commercial land.
- **Demand for commercial and industrial land** from Exhibit 11. Exhibit 22 shows Redmond will need a total of 411 gross acres for industrial uses and 415 gross acres for commercial uses over the 2020-2040 period.

Exhibit 22 shows that Redmond has:

- An 888-acre surplus of industrial land.
- A 159-acre deficit of commercial land.

Exhibit 22. Comparison of the Capacity of Unconstrained Vacant Land with Employment Land Demand by Land Use Type, Redmond UGB, 2020-2040

Land Use Type	Land Supply (Suitable Gross Acres)	Land Demand (Gross Acres)	Land Sufficiency (Deficit)
Industrial	**1,298**	**411**	**888**
Commercial	**257**	**415**	**(159)**
Retail Commercial		*114*	
Office & Commercial Services		*302*	
Total	**1,555**	**826**	**729**

Source: ECONorthwest

The target industries identified are a combination of manufacturing businesses, commercial office businesses, and retail and commercial services for residents and visitors (see Potential Growth Industries). The site needs generally show that these businesses in Redmond will need sites of 25 acres or smaller, with some need for sites of 25 to 100 acres for large industrial uses or business parks (see Site Needs for Potential Growth Industries).

Exhibit 18 shows that Redmond has 27 sites (253 acres) of sites from 5 to 20 acres. About two-thirds of these sites are commercial. Redmond has 4 sites (154 acres) that are between 20 and 50 acres in size, three quarters of which are commercial. Redmond has two sites (889 acres) in sites larger than 50 acres, all of which is industrial. Redmond also has about 1,300 acres of land in the UH-10 where commercial services and office development could locate, as part of a master plan. In addition, the South Highway 97 Corridor Project development of a vibrant business district that accessible by car, bus, bike, or on foot. The area provides redevelopment opportunities for new commercial development.

Some businesses will need sites smaller than 5 acres for development. Redmond has 162 sites smaller than 5 acres (260 acres). In addition, development of sites larger than 5 acres is likely to result in parcelization of some sites into smaller sites. Redmond has a limited number of industrial sites, especially those that are development-ready, smaller than 5 acres.

Based on this information and the analysis in Exhibit 22, we conclude that Redmond has enough land within the UGB to accommodate development of expected growth within the UGB.

Conclusions and Recommendations

The conclusions about commercial and industrial land sufficiency are:

- **Redmond is forecast for growth in both the commercial and industrial employment sectors.** Redmond is planning for growth of 11,852 new jobs in the city over the 2020 to 2040 period. About 3,260 of the jobs will be industrial, 5,679 of the jobs will be in office and commercial services, and 1,605 in retail. Growth of these jobs will result in demand for about 416 gross acres of commercial land and 411 gross acres of industrial land.
- **Redmond has enough employment land to accommodate industrial growth.** Exhibit 22 shows that Redmond has enough land for industrial employment growth over the next 20 years, with a surplus of 888 acres. For its target industries, Redmond will have need for industrial sites ranging from 5 to 25 acres for small and mid-sized industrial businesses to 25 to 100-acre sites for large industrial businesses or new business parks.
- **Redmond has a deficit of land for commercial development, but this deficit can be accommodated within the existing UGB.** Redmond has a deficit of about 159 gross acres of land for commercial office, services, and retail uses. This deficit can be accommodated through development in the UH-10, as part of a master planning process, or through redevelopment of the South Highway 97 corridor. Redmond's commercial businesses may locate in existing built spaces or on sites smaller than 5 acres. In addition, Redmond should consider planning for one or more new commercial centers, such as a neighborhood center or community center, for larger-scale commercial development. In addition, Redmond should plan for smaller village centers with new residential development.
- **Redmond's wages are below the regional average. Redmond's average wage of nearly $42,000 is below the average of $45,571 for Deschutes County.** Redmond's target industries generally have above average wages, except for some types of services for visitors and residents of Redmond, such as retail and accommodations and food services.
- **Redmond will need to address key infrastructure needs in the city.** Redmond will need to address the need for water service sufficient to support fire suppression in areas across the city, especially the South Redmond area for the Large-Lot Industrial land. In addition, land in the UH-10 lacks the needed water and wastewater infrastructure to support development.
- **Short-term supply of land.** Redmond has enough land that is or could be made development-ready within one year. Land in the Large-Lot Industrial (LLI) zone is not in the short-term land supply. The lots on LLI land do not currently have adequate water fire flow required for industrial uses. Sewer is stubbed out to the property line, but development of the site would require more than a year to build out infrastructure. While not considered in the analysis of short-term land supply, land in the UH-10 zone would also require more than one year to develop required water and wastewater infrastructure.

The following are ECONorthwest's recommendations to Redmond based on the analysis and conclusions in this report.

- **Update the Economy Element of the Comprehensive Plan.** The Economy Element has not been updated in more than a decade. We recommend that the Planning Commission and City Council review the revised policies in the Redmond Economic Development Strategy and, after making additional necessary revisions to the policies, adopt the revised goals, objectives, and implementation strategies into the Economy Element.
- **Align the City's goals for economic development with planning for infrastructure development.** Aside from ensuring that there is sufficient land to support employment growth, one of the most important ways that the City can support economic development is through planning for and developing infrastructure (e.g., roads, water, sanitary sewer, and storm water systems). We recommend that the City align its goals for economic development with infrastructure development through updates to the City's Capital Improvements Plan.

  Providing infrastructure to the Large-Lot Industrial land is necessary to allow employment growth to occur in the area. Without infrastructure, much of this land will remain undeveloped.
- **Monitor and replenish the total and short-term supply of commercial and industrial land on a regular, periodic basis.** The buildable lands inventory identifies the existing development status of employment land in Redmond, as well as identifies the existing short-term land supply. While Redmond will not completely update the buildable lands inventory on an annual basis, City staff should still monitor the development status of these employment lands and replenish short-term supply when possible.
- **Work with partners to support development of the Large Lot Industrial land.** The City should identify opportunities to work with landowners and other project partners to support development through efforts to market the land to potential developers and businesses. One approach to this is encouraging landowners to get the land certified shovel ready through the Business Oregon Certified Shovel Ready program.
- **Identify options to provide opportunities for growth at industrial parks.** Redmond has a limited amount of industrial parcels smaller than five acres and relatively few vacant industrial buildings. Businesses that want a small site or industrial site in an existing building have difficulty finding appropriate sites. Redmond should identify opportunities to support expansion of existing business parks or establishing a new business park.
- **Identify and plan for new commercial centers.** Redmond should work with landowners on development of commercial centers that allow for a mixture of retail, commercial, and residential uses, both in master planned areas near new residential development and in redevelopment areas that are appropriate for new commercial development. These may range from smaller village centers that develop as part of a master plan for residential development or a community or neighborhood center that provides commercial service for residents across Redmond, areas beyond Redmond, and

visitors to Redmond. The City should ensure its zoning code supports development of commercial centers in areas where the City would like them built.

- **Address infrastructure gaps through master planning processes and other large-scale planning processes.** Redmond should plan for infrastructure development (and financing) consistent with the City's master planning process, as well as with other large-scale planning processes. The City's infrastructure planning process should not create barriers to development or economic development. This planning process should align with Redmond's commitment to strong infrastructure planning and identify methods and standards to make infrastructure development and improvements cost effective, avoiding excessive infrastructure requirements that may be barriers to development. This will support growth in master planned areas and in other areas with large-scale development, rather than over incremental or uncoordinated growth.
- **Support redevelopment in Downtown and along Highway 97.** The Redmond Urban Renewal Plan provides tools to support redevelopment in Downtown. The City of Redmond developed the Redmond South US 97 Corridor Plan and is in the process of implementing the plan. As the City continues to implement these plans, they should support new commercial development.
- **Identify opportunities to support the creation, growth, development, and retention of businesses in Redmond.** Retention and expansion of new and existing businesses, including those that create destinations and experiences for residents and visitors, is one of Redmond's key opportunities for economic growth. The City can support businesses by understanding businesses' opportunities for growth and expansion and lowering or eliminating the barriers in Redmond that limit growth and expansion.
- **Work with partners to develop a broad economic development strategy and resiliency plan for Redmond.** The revisions to the Comprehensive Plan presented in the Redmond Economic Development Strategy focus on land-based policies and actions. The City also needs a broader strategy for economic development that focuses on issues such as economic resiliency, communication with existing businesses to identify barriers to expansion, economic development, marketing of Redmond's businesses and business opportunities, building business and other partnerships, and coordinating economic development efforts with local and regional economic development organizations.

  This strategy could be developed through leadership from the City, collaborating with partners including REDI, the Redmond Chamber of Commerce, COIC, EDCO, Deschutes County, Business Oregon, and the Regional Solutions team.

Appendix A. National, State, and Regional and Local Trends

The economic trends discussed in this appendix are based on long-term trends that are generally expected to continue on national, state, and regional scales. During the development of this document, the effects of the global COVID-19 pandemic began to emerge. However, the availability of data and the potential change in long-term effects remain unknown. Where available, this appendix provides data and discussion about the short-term economic effects of the pandemic.

National Trends

Economic development in Redmond over the next 20 years will occur in the context of long-run national trends. The most important of these trends include:

- **Economic growth was forecasted to continue at a slow pace over the course of the next decade but the effects of the COVID-19 pandemic have ended the nation's longest period of economic expansion**. The Congressional Budget Office (CBO) previously predicted that real GDP would grow by 2.2% in 2020, followed by stagnation in later years as growth in private investment and consumer spending lessened. From 2021 to 2030, CBO forecasted that output would increase at an average annual rate of 1.7 percent.[28] However, in March 2020, business closures related to the novel coronavirus forced the nation into a recession. According to CBO's preliminary estimates, unemployment is expected to surpass 10% during the second quarter of 2020 due to sharp increases in unemployment claims. Additionally, GDP will likely decline by more than 7% during the second quarter, leading to a fall in the annualized growth rate of at least 28%.[29] The fiscal stimulus, as well as the federal government's efforts to maintain operations for essential businesses, will likely mitigate the fallout of the virus. An estimated 70% of GDP is derived from businesses exempt from stay-at-home orders and half of non-exempt businesses are able to continue their operations remotely.[30] Importantly, long-term projections are highly variable as the economic impact of the COVID-19 pandemic unfolds.
- **The aging of the Baby Boomer generation accompanied by increases in life expectancy.** As the Baby Boomer generation continues to retire, the number of Social

[28] Congressional Budget Office. *The Budget and Economic Outlook: 2020 to 2030. January 2020.* https://www.cbo.gov/publication/56020.

[29] Swagel, P. (2020, April 2). Updating CBO's Economic Forecast to Account for the Pandemic. Congressional Budget Office. https://www.cbo.gov/publication/56314.

[30] Caldwell, P., and Andersen, K. (2020). Coronavirus Update: Long-Term Economic Impact Forecast to Be Less Than 2008 Recession. Morningstar, Inc. https://www.morningstar.com/articles/976107/coronavirus-update-long-term-economic-impact-forecast-to-be-less-than-2008-recession

Security recipients is expected to increase from almost 65 million in 2020 to over 88 million in 2045, a 36.5% increase. But due to lower birth-rate replacement generations, the number of covered workers is only expected to increase 10.3% over the same time period, from over 178 million to almost 197 million in 2045. In 2020, there are 36 Social Security beneficiaries per 100 covered workers but by 2045 there will be 45 beneficiaries per 100 covered workers. This will increase the percent of the federal budget dedicated to Social Security and Medicare.[31]

Baby Boomers are expecting to work longer than previous generations. An increasing proportion of workers 55 and older expect to work after age 65.[32] This trend can be seen in Oregon, where the share of workers 65 years and older grew from 2.9% of the workforce in 2000 to 4.1% of the workforce in 2010. In 2018, this share increased to 5.6%, or a 94% increase over the 2000 to 2018 period. Over the same eighteen-year period, workers 45 to 64 years decreased by about 2%.[33]

- **Need for replacement workers.** The need for workers to replace retiring Baby Boomers will outpace job growth. Between 2018 and 2028, the Bureau of Labor Statistics (BLS) estimates that total employment in the United States will grow by about 8.4 million jobs. Over this same period, BLS forecasts an annual average of 19.7 million occupational openings indicating that the number of job openings per year exceeds expected employment growth. About 78% of annual job openings are in occupations that do not require postsecondary education.[34]
- **The importance of education as a determinant of wages and household income.** According to BLS, a majority of the fastest growing occupations will require an academic degree, and on average, they will yield higher incomes than occupations that do not require a degree. The fastest growing occupations requiring an academic degree will be occupational therapy assistants, information security analysts, physician assistants, statisticians, nurse practitioners, and speech language pathologists. Of the top 10 fastest-growing occupations, the top four do not require an academic degree. From 2018 to 2028, the fastest-growing occupations are solar photovoltaic installers, wind turbine service technicians, home health aides, and personal care aides. However, these non-degree requiring occupations yield lower incomes than the other six occupations.

  Five sectors are projected to decline from 2018 to 2028. These include manufacturing, federal government, utilities, wholesale trade, and retail trade. The BLS estimates that

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[31] The Board of Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds, 2015, The 2018 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds, June 5, 2018. https://www.ssa.gov/oact/tr/2018/tr2018.pdf.

[32] The Employee Benefit Research Institute. Retirement Confidence Survey, 2016 RCS Fact Sheet #4. https://www.ebri.org/docs/default-source/rcs/4_rcs_16-fs-4_age.pdf?sfvrsn=56e8302f_2.

[33] Analysis of 2000 Decennial Census data, 2010 U.S. Census American Community Survey, 1-Year Estimates, and 2018 U.S. Census American Community Survey, 1-Year Estimates, for the table Sex by Age by Employment Status for the Population 16 Years and Over.

[34] Bureau of Labor Statistics. (2019). Occupational Employment Projections to 2018-2028. https://www.bls.gov/news.release/pdf/ecopro.pdf.

retail trade will decrease by 153,700 positions, possibly due to the rise of e-commerce. Conversely, this shift in shopper preference is increasing occupations in transportation and warehousing.[35] Retail positions occupations typically have lower pay than occupations requiring an academic degree.

The national median income for people over the age of 25 in 2019 was about $48,464. Workers without a high school diploma earned $19,708 less than the median income, while those with a high school diploma earned $10,504 less than the median income. Workers with some college earned $6,760 less than median income, and workers with a bachelor's degree earned $13,832 more than median. Workers in Oregon experience the same patterns as the nation but pay is generally lower in Oregon than the national average.[36]

- **Increases in labor productivity.** Productivity, as measured by output per hour of labor input, increased in most sectors between 2000 and 2010, peaking in 2007. However, productivity increases were interrupted by the recession. After productivity decreases from 2007 to 2009, many industries saw large productivity increases from 2009 to 2010. Industries with the fastest productivity growth were Information Technology-related industries. These include wireless telecommunications carriers, computer and peripheral equipment manufacturing, electronics and appliance stores, and commercial equipment manufacturing wholesalers.[37]

  Since the end of the recession (or 2010), labor productivity has increased across a handful of large sectors but has also decreased in others. In wholesale trade, productivity—measured in output per hour—increased by 19% over 2009 to 2017. Retail trade gained even more productivity over this period at 25%. Food services, however, have remained stagnant since 2009, fluctuating over the nine-year period and shrinking by 0.01% over this time frame. Additionally, the Bureau of Labor Statistics reports multifactor productivity in manufacturing has been slowing down 0.3% per year over the 2004 to 2016 period. Much of this, they note, is due to slowdown in semiconductors, other electrical component manufacturing, and computer and peripheral equipment manufacturing.[38]

- **The importance of entrepreneurship and growth in small businesses.** According to the 2019 Small Business Profile from the US Small Business Office of Advocacy, small businesses account for over 99 percent of total businesses in the United States, and their

[35] Bureau of Labor Statistics. (2019). Occupational Employment Projections to 2018-2028. https://www.bls.gov/news.release/pdf/ecopro.pdf.

[36] Bureau of Labor Statistics. (2019). Occupational Employment Projections to 2018-2028. https://www.bls.gov/news.release/pdf/ecopro.pdf.

[37] Brill, M.R., & Rowe, S.T. (March 2013). Industry Labor Productivity Trends from 2000 to 2010. Bureau of Labor Statistics, *Spotlight on Statistics.*

[38] Brill, M., Chanksy, B., & Kim, J. (July 2018). Multifactor productivity slowdown in U.S. manufacturing. *Monthly Labor Review*, U.S. Bureau of Labor Statistics. https://www.bls.gov/opub/mlr/2018/article/multifactor-productivity-slowdown-in-us-manufacturing.htm.

employees account for nearly 47% of American workers.[39] The National League of Cities suggests ways that local governments can attract entrepreneurs and increase the number of small businesses including strong leadership from elected officials; better communication with entrepreneurs, especially about the regulatory environment for businesses in the community; and partnerships with colleges, universities, small business development centers, mentorship programs, community groups, businesses groups, and financial institutions.[40]

- **Increases in automation across sectors.** Automation is a long-running trend in employment, with increases in automation (and corresponding increases in productivity) over the last century and longer. The pace of automation is increasing, and the types of jobs likely to be automated over the next 20 years (or longer) are broadening. Lower-paying jobs are more likely to be automated, with the potential for automation of more than 80% of jobs paying less than $20 per hour over the next 20 years. About 30% of jobs paying $20 to $40 per hour and 4% of jobs paying $40 or more are at risk of being automated over the next 20 years.[41]

  Low to middle-skilled jobs that require interpersonal interaction, flexibility, adaptability, and problem solving will likely persist into the future as will occupations in technologically lagging sectors (e.g., production of restaurant meals, cleaning services, hair care, security/protective services, and personal fitness).[42] This includes occupations such as (1) recreational therapists, (2) first-line supervisors of mechanics, installers, and repairers, (3) emergency management directors, (4) mental health and substance abuse social workers, (5) audiologists, (6) occupational therapists, (7) orthotists and prosthetists, (8) healthcare social workers, (9) oral and maxillofacial surgeons, and (10) first-line supervisors of firefighting and prevention workers.

  Occupations in the service and agricultural or manufacturing industry are most at-risk of automation because of the manual-task nature of the work.[43,44,45] This includes occupations such as (1) telemarketers, (2) title examiners, abstractors, and searchers, (3) hand sewers, (4) mathematical technicians, (5) insurance underwriters, (6) watch

[39] US Small Business Office of Advocacy. (2019). 2019 Small Business Profile. https://cdn.advocacy.sba.gov/wp-content/uploads/2019/04/23142719/2019-Small-Business-Profiles-US.pdf

[40] National League of Cities. (2012). Supporting Entrepreneurs and Small Businesses. https://www.nlc.org/supporting-entrepreneurs-and-small-business

[41] Executive Office of the President. (2016). Artificial Intelligence, Automation, and the Economy.

[42] Autor, D.H. (2015). Why Are There Still So Many Jobs? The History and Future of Workplace Automation. *Journal of Economic Perspectives, 29*(3), 3–30.

[43] Frey, C.B, & Osborne, M.A. (2013). The Future of Employment: How Susceptible Are Jobs to Computerisation? Oxford Martin School, University of Oxford.

[44] Otekhile, C.A., & Zeleny, M. (2016). Self Service Technologies: A Cause of Unemployment. *International Journal of Entrepreneurial Knowledge, 4*(1). DOI: 10.1515/ijek-2016-0005.

[45] PwC. (n.d.). Will robots really steal our jobs? An international analysis of the potential long-term impact of automation. https://www.pwc.com/hu/hu/kiadvanyok/assets/pdf/impact_of_automation_on_jobs.pdf.

repairers, (7) cargo and freight agents, (8) tax preparers, (9) photographic process workers and processing machine operators, and (10) accounts clerks.[46]

- **Continued transformation of retail.**[47] In the last two decades, retail sales by e-commerce and warehouse clubs/supercenters (a lower-cost model to the traditional department store) have increased steadily, pulling the industry in two different directions. On one hand, the trend toward warehouse/supercenters is increasing the average scale of retail operations, increasing market concentrations, reducing business dynamism, and shifting retail activity toward more populated areas. On the other hand, the trend toward e-commerce generates "smaller [retailers], less market concentration, more geographical dispersion, and higher productivity."[48] Since 2000, e-commerce sales grew from 0.9% of total retail sales to 9.7% (2018). Over this same period, e-commerce retail sales have grown at a rate of 18% per year.[49] It is reasonable to expect this trend to continue and will be accelerated by requirements to stay at home during the COVID-19 pandemic.

  Ultimately, the growth in online shopping and the increasing dominance of large, supercenters has made it difficult for small and medium-sized retail firms (offering a narrower selection of goods) to compete. Declining net profits and increased competitive pressures have led many well-known retailers (e.g., J.C. Penney, Macy's, Sears) to declare bankruptcy or to scale back their operations.

  In the future, the importance of e-commerce will likely continue to grow, and despite the highly publicized closures of brick and mortar stores, physical retail is likely to remain an important part of the retail sector. In fact, retail sales at brick and mortar stores accounted for almost 90% of all retail sales in the Q3 of 2019.[50]

  Modern consumers are increasingly price sensitive, less brand loyal, and (since the advent of internet) able to substitute between retailers easily. To compete, retailers must be nimble, adept in recognizing the changing needs of their consumers, and quick to differentiate themselves from their competitors.

- **Opportunities for local retail and service.** The types of retail and related services that remain will likely be sales of goods that people prefer to purchase in person or that are difficult to ship and return (e.g., large furniture), specialty goods, groceries and personal goods that maybe needed immediately, restaurants, and experiences (e.g., entertainment or social experiences). According to the Urban Land Institute, in the post-disruption era of retail, new trends in this sector are beginning to emerge. These changes include the

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[46] Frey, C.B., & Osborne, M.A. (2013). The Future of Employment: How Susceptible Are Jobs to Computerisation? Oxford Martin School, University of Oxford.

[47] Ali Hortaçsu and Chad Syverson. (2015). The Ongoing Evolution of US Retail: A Format Tug-of-War. *Journal of Economic Perspectives, 29*(4), 89–112.

[48] Ali Hortaçsu and Chad Syverson. (2015). The Ongoing Evolution of US Retail: A Format Tug-of-War. *Journal of Economic Perspectives, 29*(4), 89–112, p. 109.

[49] U.S. Census Bureau, Monthly Retail Trade, Latest Quarterly E-Commerce Report. Retrieved from: https://www.census.gov/retail/index.html#ecommerce

[50] Per data from the U.S. Census Bureau, cited in Deloitte's 2020 Retail Industry Outlook.

convergence of technology and shopping, as businesses focus on brand awareness and customer engagement via digital channels in the physical retail space.[51]

- **The importance of high-quality natural resources.** The relationship between natural resources and local economies has changed as the economy has shifted away from resource extraction. High-quality natural resources continue to be important in some states, especially in the Western U.S. Increases in the population and in households' incomes, plus changes in tastes and preferences have dramatically increased demands for outdoor recreation, scenic vistas, clean water, and other resource-related amenities. Such amenities contribute to a region's quality of life and play an important role in attracting both households and firms.[52]
- **Continued increase in demand for energy.** While energy prices were unusually low in early 2020, energy prices are forecasted to increase over the planning period. While energy use per capita is expected to decrease through 2050, total energy consumption will increase with rising population (0.2%). Energy consumption is expected to grow primarily from industrial (0.7%) and, to a lesser extent, commercial users (0.2%). Residential and transportation consumption are forecasted to decrease (-0.2%). This decrease in energy consumption for transportation is primarily due to increased federal standards and increased technology for energy efficiency in vehicles. Going forward through the projection period, potential changes in federal laws (such as decreases in car emissions) leave energy demand somewhat uncertain.

  Energy consumption by type of fuel is expected to change over the planning period. By 2050, the U.S. will continue to shift from crude oil towards natural gas and renewables. For example, from 2018 to 2050, the Energy Information Administration projects that overall energy consumption in the U.S. will average a 0.2% annual growth rate, while consumption of renewable sources grows at 1.6% per year. With increases in energy efficiency, strong domestic production of energy, and relatively flat demand for energy by some industries, the U.S. will be able to be a net exporter of energy over the 2018 to 2050 period. Demand for electricity is expected to increase (0.2%), over 2018 to 2050 as population grows and economic activity increases.[53]
- **Impact of rising energy prices on commuting patterns.** As energy prices increase over the planning period, energy consumption for transportation will decrease. These increasing energy prices may decrease willingness to commute long distances, though with expected increases in fuel economy, it could be that people commute further while

[51] Diane Hoskins. "Three Trends Shaping Retail's Great Transformation." *Urban Land Institute*, September 3, 2019. https://urbanland.uli.org/economy-markets-trends/three-trends-shaping-retails-great-transformation/

[52] For a more thorough discussion of relevant research, *see,* for example, Power, T.M. and R.N. Barrett. 2001. *Post-Cowboy Economics: Pay and Prosperity in the New American West*. Island Press, and Kim, K.-K., D.W. Marcouiller, and S.C. Deller. 2005. "Natural Amenities and Rural Development: Understanding Spatial and Distributional Attributes." *Growth and Change* 36 (2): 273-297.

[53] Energy Information Administration, 2019, Annual Energy Outlook 2019 with Projections to 2050, U.S. Department of Energy, January 2019. https://www.eia.gov/outlooks/aeo/pdf/aeo2019.pdf. Note, the cited growth rates are shown in the interactive tables and can be viewed here: https://www.eia.gov/outlooks/aeo/data/browser/.

consuming less energy.[54] Over 2019 to 2035, the U.S. Energy Information Administration estimates in its forecast that the decline in transportation energy consumption as a result of increasing fuel economy more than offsets the total growth in vehicle miles traveled (VMT). VMT for passenger vehicles is forecasted to increase through 2050.

- **Potential impacts of global climate change.** The consensus among the scientific community that global climate change is occurring expounds important ecological, social, and economic consequences over the next decades and beyond.[55] Extensive research shows that Oregon and other western states have already experienced noticeable changes in climate and that more change will occur in the future.[56]

  In the Pacific Northwest, climate change is likely to (1) increase average annual temperatures, (2) increase the number and duration of heat waves, (3) increase the amount of precipitation falling as rain during the year, (4) increase the intensity of rainfall events, (5) increase sea level, (6) increase wildfire frequency, and (7) increase forest vulnerability to tree disease.[57] These changes are also likely to reduce winter snowpack and shift the timing of spring runoff earlier in the year.[58]

  The Oregon Climate Change Research Institute (OCCRI) evaluated potential scenarios for "Climate Change Influence on Natural Hazards in Oregon Counties" in 2018. OCCRI specifically focused on Counties in the Gorge and Eastern Oregon and evaluated the potential increased or decreased risk for natural hazards such as heat waves, cold waves, heavy rains, river flooding, drought, wildfire, poor air quality, windstorms, dust storms, increased invasive species, and loss of wetland ecosystems. Across the eight counties evaluated, the hazards most likely to increase with the effects of climate change are heat waves, heavy rains, river flooding, wildfires, increased invasive species, and loss of wetland ecosystems.[59]

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[54] Energy Information Administration, 2019, *Annual Energy Outlook 2019 with Projections to 2050*, U.S. Department of Energy, January 2019.

[55] U.S. Global Change Research Program. *National Climate Assessment*. 2018. https://nca2018.globalchange.gov/

[56] Oregon Global Warming Commission. *2018 Biennial Report to the Legislature.* 2018. https://www.keeporegoncool.org/reports/

[57] U.S. Global Change Research Program. *National Climate Assessment*. "Chapter 24: Northwest." 2018. https://nca2018.globalchange.gov/chapter/24/

[58] Mote, P., Salathe, E., Duliere, V., & Jump, E. (2008). *Scenarios of Future Climate for the Pacific Northwest.* Climate Impacts Group, University of Washington. March. http://cses.washington.edu/db/pdf/moteetal2008scenarios628.pdf; Littell, J.S., McGuire Elsner, M., Whitely Binder, L.C., and Snover, A.K. (eds). (2009). "The Washington Climate Change Impacts Assessment: Evaluating Washington's Future in a Changing Climate - Executive Summary." *In The Washington Climate Change Impacts Assessment: Evaluating Washington's Future in a Changing Climate*, Climate Impacts Group, University of Washington. www.cses.washington.edu/db/pdf/wacciaexecsummary638.pdf; Madsen, T., & Figdor, E. (2007). *When it Rains, it Pours: Global Warming and the Rising Frequency of Extreme Precipitation in the United States.* Environment America Research & Policy Center and Frontier Group.; Mote, P.W. (2006). Climate-driven variability and trends in mountain snowpack in western North America. *Journal of Climate, 19*(23), 6209-6220.

[59] Mote, P.W., Abatzoglou, J., Dello, K.D., Hegewisch, K., & Rupp, D.E. (2019). Fourth Oregon Climate Assessment Report. Oregon Climate Change Research Institute. occri.net/ocar4; Oregon Climate Change Research Institute. Climate Change Influence on Natural Hazards in Eight Oregon Counties. August 2018. https://www.oregon.gov/lcd/CL/Documents/OCCRI_PDM16_AllCountyOverview2018.pdf

These anticipated changes point toward some of the ways that climate change is likely to impact ecological systems and the goods and services they provide. There is considerable uncertainty about how long it would take for some of the impacts to materialize and the magnitude of the associated economic consequences. Assuming climate change proceeds as today's models predict, the Pacific Northwest will experience potential economic impacts:[60]

- *Potential impact on agriculture and forestry.* Climate change may impact Oregon's agriculture through changes in growing season, temperature ranges, and water availability.[61] Climate change may impact Oregon's forestry through an increase in wildfires, a decrease in the rate of tree growth, a change in the mix of tree species, and increases in disease and pests that damage trees.[62]
- *Potential impact on tourism and recreation.* Impacts on tourism and recreation may range from (1) decreases in snow-based recreation if snowpack in the Cascades decreases, (2) negative impacts to tourism along the Oregon Coast as a result of damage and beach erosion from rising sea levels,[63] (3) negative impacts on availability of water summer river recreation (e.g., river rafting or sports fishing) as a result of lower summer river flows, and (4) negative impacts on the availability of water for domestic and business uses.

Short-term national trends will also affect economic growth in the region, but these trends are difficult to predict. At times, these trends may run counter to the long-term trends described above. A recent example is the recession following the global COVID-19 pandemic. Despite efforts to mitigate the economic fallout from the virus by lowering interest rates and implementing federal stimulus packages, unemployment rates have risen 10.3 percentage points to 14.7% as of April 2020.[64] While job losses have occurred in all major sectors, the sharpest declines have been in the airline, leisure and hospitality, casinos and gambling, automotive parts and equipment, and oil and gas drilling industries.[65] As

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[60] The issue of global climate change is complex and there is a substantial amount of uncertainty about climate change. This discussion is not intended to describe all potential impacts of climate change but to present a few ways that climate change may impact the economy of cities in Oregon and the Pacific Northwest.

[61] Resource Innovations & Institute for a Sustainable Environment. (2005). The Economic Impacts of Climate Change in Oregon: A Preliminary Assessment. https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/2299/Consensus_report.pdf?sequence=1

[62] Climate Leadership Initiative & Institute for Sustainable Environment. (2007). Economic Impacts of Climate Change on Forest Resources in Oregon: A Preliminary Analysis.

[63] Resource Innovations & Institute for a Sustainable Environment. (2005). The Economic Impacts of Climate Change in Oregon: A Preliminary Assessment. https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/2299/Consensus_report.pdf?sequence=1

[64] This is the highest unemployment rate and largest over-the-month increase in the history of the series with seasonally adjusted data reported since 1948. Bureau of Labor Statistics. (2020, May 8). The Employment Situation – April 2020. News Release, Bureau of Labor Statistics. Retrieved from: https://www.bls.gov/news.release/pdf/empsit.pdf.

[65] Kumar, N., and Haydon, D. (2020, April 7). Industries Most and Least Impacted by COVID 19 from a Probability of Default Perspective March 2020 Update. *S&P Global*.

these industries recover, they will continue to play a significant role in the national, state, and local economy over the long run. This report takes a long-run perspective on economic conditions (as the Goal 9 requirements intend) and does not attempt to predict the impacts of short-run national business cycles on employment or economic activity.

State Trends

Short-Term Trends

According to the Oregon Office of Economic Analysis (OEA), the Oregon economy is in a recession due to the COVID-19 pandemic and the resulting statewide shutdowns.[66] Although OEA's June 2020 *Oregon Economic and Revenue Forecast* stated that the current recession would be shorter than the Great Recession, the severity would be the deepest on record since 1939. As the economy begins to reopen in phases through 2020, the agency expects the economy to return to near pre-recession levels by the middle of the 2020 decade.[67]

Preliminary unemployment estimates in March and April 2020 indicate that approximately 267,000 jobs were lost statewide due to the pandemic.[68] This resulted in an unemployment rate increase from 3.8% in both January and February 2020 to 14.8% in April 2020, a difference of 11 percentage points.[69] As of May 2020, job losses were highest among workers with lower pay and lower for highly paid workers.

The OEA forecasts that there will be strong growth in the latter half of 2020, and though the agency anticipates a sizable rebound in economic activity, it expects a full recovery will take much longer, with jobs returning to early 2020 levels by mid-2024. To illustrate the impact of this rebound, OEA reported that it may take Oregon to depression levels similar to those seen in the state's early 1980s depression or the Great Recession.[70]

In 2019, Oregon's average wage was at its highest point since the 1980s. Though the OEA forecasts an annual average wage increase of 4.5% in 2020, the agency estimates wages will contract by 0.1% in 2021 before growing by 3.0% in 2022, 4.2% in 2023, and 4.4% in 2024.[71]

By the end of 2020, the OEA forecasts 225,100 jobs in Oregon's economy will be lost. This is an approximate 11.6% annual decrease in total nonfarm employment relative to 2019 levels.[72] Every employment sector, with the exception of government, is forecasted to decrease. The

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[66] Office of Economic Analysis. (2020). Oregon Economic and Revenue Forecast, June 2020. Vol. XL, No. 2, p. 1. https://www.oregon.gov/das/OEA/Documents/forecast0620.pdf.

[67] Ibid, p. 1.

[68] Ibid, p. 3.

[69] Oregon Employment Department, Local Area Unemployment Statistics (LAUS), Unemployment Rate estimates for the State of Oregon. Data retrieved on May 28, 2020.

[70] Oregon Economic and Revenue Forecast, June 2020. Vol. XL, No. 2, p. 4.

[71] Ibid, p. 32.

[72] Ibid, p. 32.

impacts on the leisure and hospitality sector are forecasted to be the most severely with a 29.7% contraction, or approximately 81,500 jobs lost. Construction and manufacturing are forecasted to lose 16,700 (15.3% decrease) and 30,900 (15.6% decrease) jobs, respectively. Furthermore, retail trade is forecasted to lose nearly 13,600 jobs in 2020 or decrease by 13.6%.[73]

Oregon's household formation rate will be weaker over the medium term due to income loss, economic uncertainty, and in-migration reduction.[74] Housing starts in 2019 reached approximately 21,000 units. Through the end of 2020, however, the OEA forecasts a 21.7% contraction in housing starts for a total of about 16,200 units. In the years following the recession, they anticipate a partial recovery of housing starts in 2021 (3.0% increase), with growth increasing in velocity in 2022 (13.3% increase) and 2023 (13.1% increase) before settling to about 2.3% in 2024.[75]

Oregon's economic health is dependent on the export market, which are also affected by the COVID-19 pandemic. The value of Oregon exports in 2017 was $22.3 billion. In 2019, the countries that Oregon exports the most to are China (31% of total Oregon exports), Canada (14%), Japan (7%), South Korea (6%), Malaysia (6%), and Vietnam (5%).[76] Any strains on the relationship between the United States and China could impact Oregon's economy.[77] Additionally, China's public debt burden poses a threat not only to the state and region but also to the global economy.[78]

Long-Term Trends

State, regional, and local trends will also affect economic development in Redmond over the next 20 years. The most important of these trends includes continued in-migration from other states, distribution of population and employment across the state, and change in the types of industries in Oregon.

- **Continued in-migration from other states.** Oregon will continue to experience in-migration (more people moving *to* Oregon than *from* Oregon) from other states, especially California and Washington, though to a lesser degree given the recession. From 1990 to 2017, Oregon's population increased by over 1.3 million, 66% of which was from people moving into Oregon (net migration). The average annual increase in population from net migration over the same time period was about 33,128. During the early to mid-1990s, Oregon's net migration was highest, reaching over 60,000 in 1991,

[73] *Ibid*, p. 32.

[74] *Ibid*, p. 10.

[75] *Ibid*, p. 32.

[76] United States Census Bureau. State Exports from Oregon, 2015-2019. https://www.census.gov/foreign-trade/statistics/state/data/or.html.

[77] Office of Economic Analysis. Oregon Economic and Revenue Forecast, December 2019. Vol. XXXIX, No. 4, p. 3. https://www.oregon.gov/das/OEA/Documents/forecast1219.pdf.

[78] *Ibid*, p. 14.

with another smaller peak of almost 42,100 in 2006. In 2019, net migration reached just over 47,500 persons.

- **Increasing ethnic diversity.** Oregon's population has continued to get more ethnically and racially diverse, with the Latino population growing from 8% of the population in 2000 to 12% of the population in 2014-2018. The non-White population grew from 13% of the population to 15% of the population over the same period. The share of Latino and people of color populations increased in Redmond since 2000 as well.
- **Forecast of job growth.** Total nonfarm employment was forecasted to increase from about 1.94 million in 2019 to just over 2 million in 2023, but the OEA's June 2020 economic and revenue forecast revises the 2023 employment estimate down to nearly 1.90 million, or by about 7%. Of private industry, the OEA forecasts job losses across the board in 2020 with an expectation of growth in the years following as economic activity and consumer confidence increases.[79]
- **Manufacturing is an important part of Oregon's economy.** The manufacturing sector has long been a crucial component of Oregon's economy. In the last decade, growth in Oregon's manufacturing sector has outpaced that of the nation, growing by 23% compared to the nation's 12%.[80] The manufacturing sector also makes up a larger share of Oregon's economy than it does in the nation with 10.2% of Oregon's payroll employment in manufacturing compared to 8.5% for the nation in 2018.[81]

  Manufacturing remains an important piece of Oregon's economy and the sector is evolving. Only a few decades ago, Oregon's manufacturing economy was predominantly dependent on forestry and wood products. But between 1990 and 2018, annual average employment in wood product manufacturing dropped by 22,600 jobs or 46%.[82]

  Growth in Oregon's electronic component manufacturing, however, has filled the gap left by the decline in wood manufacturing. In 2018, there were a total of 37,900 jobs in Oregon's electronic component manufacturing (i.e., manufacturing of computer chips, computers and related equipment, and communications equipment), making it Oregon's largest manufacturing industry. Employment in this industry is over six times more concentrated in Oregon than it is nationally and is driving much of the growth in Oregon manufacturing.[83]

  Continued growth, spurred by electronic component manufacturing, is expected in the future for Oregon's manufacturing sector. Although Oregon's economy is shifting, the state's roots in forestry and wood product manufacturing remain important, particularly

[79] Oregon Employment Department, Oregon Economic and Revenue Forecast, June 2020. Vol. XL, No. 2, p. 32.

[80] Oregon Employment Department, Quarterly Census of Employment and Wages, 2018, qualityinfo.org.

[81] *Ibid.*

[82] *Ibid.*

[83] *Ibid.*

for rural areas. Douglas County, for example, had 8.3% of its total employment and 10.7% of its total payroll in wood product manufacturing in 2018.[84]

- **Advancements in technology and increases in automation of jobs.**[85] In decades past, automation was focused on manufacturing. In the coming decades, jobs at risk for automation will tend to be those without "computerization bottlenecks" or jobs that do not require social intelligence, perception, creativity, or fine motor skills. Jobs in industries lacking customer service component, such as those in transportation and material moving, are also at greater risk. Most researchers agree that "less educated workers in low-skill, lower-wage jobs featuring routine tasks are those most likely to be displaced by automation."[86] Oregon's overall risk of automation is similar to the nation's, with lower and middle-wage jobs at higher risk.

  In 2017, 144,200 jobs in Oregon were found to be at risk of automation and 93% of jobs in food preparation and serving were found to be at risk.[87] However, automation risk does not imply automation certainty. For example, consumer preferences for personalized and genuine experiences/interactions will likely slow job automation, particularly in the food services and hospitality sectors. In addition, there is a notable difference between task automation and full automation of jobs. One research study speculates that only 5% of jobs are fully automated, and that the "activities most susceptible to automation involve physical activities in highly structured and predictable environments, as well as the collection and processing of data."[88]

- **Income and wages continue to increase.** Despite Oregon's income and wages falling below the average among states, Oregon wages are at their highest point relative to other states since the recession in the early 1980s mainly due to the wage growth over the last two to three years. In 2018, the average annual wage in Oregon was $53,053, and the median household income was $60,212 (compared to national average wages of $57,266 in 2018, and national household income of $60,336).[89] Total personal income (all classes of income, minus Social Security contributions, adjusted for inflation) in Oregon is expected to increase by 22%, from $214.3 billion in 2019 to $312.4 billion in 2027.[90] Per capita income is expected to increase by 16% over the same time period, from $50,200 in

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[84] *Ibid.*

[85] Portland Business Alliance. (2017). Automation and the Future of Work. https://portlandalliance.com/assets/pdfs/2017-VOJ-Automation-summary.pdf

[86] Marcus Casey and Sarah Nzau. (2019). Searching for clarity: How much will automation impact the middle class? Brookings.

[87] Portland Business Alliance. (2017). Automation and the Future of Work. https://portlandalliance.com/assets/pdfs/2017-VOJ-Automation-summary.pdf

[88] McKinsey & Company. (2017). A Future that Works: Automation, Employment, and Productivity.

[89] Average annual wages are for "Total, all industries," which includes private and public employers. Oregon Quarterly Census of Employment and Wages, 2018. Retrieved from: https://www.qualityinfo.org; Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2017; Total, U.S. Census American Community Survey 1-Year Estimates, 2017, Table B19013.

[90] Office of Economic Analysis. Oregon Economic and Revenue Forecast, September 2018. Vol. XXXVIII, No. 3, page 39.

2018 to $64,400 in 2027 (in nominal dollars).[91] The economic fallout from the COVID-19 pandemic is likely to slow, or possibly eliminate, income growth at least through the resulting recession.

- **Small businesses continue to account for a large share of employment in Oregon**. While small firms played a large part in Oregon's expansion between 2003 and 2007, they also suffered disproportionately in the recession and its aftermath (64% of the net jobs lost between 2008 and 2010 was from small businesses).

  In 2017 small businesses (those with 100 or fewer employees) accounted for 95% of all businesses and 66% of all private-sector employment in Oregon. Said differently, most businesses in Oregon are small (in fact, 78% of all businesses have fewer than 10 employees), but the largest share of Oregon's employers work for large businesses (those with more than 100 employees).[92] The average annualized payroll per employee for small businesses was $39,099 in 2017, which is considerably less than that for large businesses ($56,466) and the statewide average for all businesses ($49,548).[93]

  Younger workers are important for the continued growth of small businesses across the nation. More than one-third of Millennials (those born between 1980 - 1999) are self-employed, with approximately half to two-thirds interested in becoming an entrepreneur. According to the Kauffman Indicators of Entrepreneurship, in 2018, about 79% of startups nationwide were still active after one year. On average, startups nationwide created approximately 5.2 jobs in their first year (when normalized by population).[94] It is typically the case that startups are important for job creation on a longer time horizon, well beyond their first year, as "fewer than half of all startups in America are still in business after five years."[95]

- **Entrepreneurship in Oregon.** The creation of new businesses is vital to Oregon's economy as their formations generate new jobs and advance new ideas and innovations into markets. They also can produce more efficient products and services to better serve local communities. According to the Kauffman Index, Oregon ranked 25th in the country in 2018 for its startup activity, a measurement comprised of four statistics: rate of new entrepreneurs, opportunity share of new entrepreneurs, startup density, and start up early survival rate.[96] This ranking is lower than its 2017 rank of 13. Oregon's rate of new entrepreneurs (the percent of adults that became an entrepreneur in a given month) was in steady decline post-recession, but since 2013, has gradually recovered until 2018

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[91] *Ibid*, page 39.

[92] U.S Census Bureau, 2017 Statistics of U.S. Businesses, Annual Data, Enterprise Employment Size, U.S and States. https://www.census.gov/data/tables/2017/econ/susb/2017-susb-annual.html.

[93] *Ibid.*

[94] Kauffman Foundation. *Kauffman Indicators of Entrepreneurship*. Indicators: Startup Early Job Creation and Startup Early Survival Rate. Information retrieved on December 19, 2019. https://indicators.kauffman.org/data-table

[95] Nish Acharya. "Small Business Are Having A Bigger Impact on Job Creation Than Large Corporations." Forbes, May 5, 2019. https://www.forbes.com/sites/nishacharya/2019/05/05/who-is-creating-jobs-in-america/#5c74c156597d

[96] Kauffman Foundation. The Kauffman Index, Oregon. https://indicators.kauffman.org/data-table

where it dropped to 0.27. This rate is below 2017's rate of 0.32% and well below Oregon's pre-recession peak of 0.43% in 2000.

Moreover, in 2018, the Oregon Office of Economic Analysis reports new business applications in Oregon are increasing. They do, however, simultaneously note startup businesses "are a smaller share of all firms than in the past."[97] Though this measurement of economic activity does not constitute a full understanding of how well entrepreneurship is performing, it does provide an encouraging signal.

Regional and Local Trends

Throughout this section and the report, Redmond is compared to Deschutes County and the State of Oregon. These comparisons provide context for changes in Redmond's socioeconomic characteristics.

Availability of Labor

The availability of trained workers in Redmond will impact the city's economic development over the planning period. A skilled and educated populace can attract well-paying businesses and employers and spur the benefits that follow from a growing economy. Key trends that will affect the workforce in Redmond over the next 20 years include its overall population growth, rising senior population, and commuting trends.

Population Change

Population growth in Oregon tends to follow economic cycles. Oregon's population grew from 2.8 million people in 1990 to 4.9 million people in 2018, an increase of over 2,100,000 people at an average annual rate of 2%. Between 2000 and 2018, Oregon's annual growth rate increased to 3%.

From 1990 to 2018, Redmond's population increased by 22,025 residents and grew at an average annual rate of 5.1%. Over the same time period, Deschutes County's population grew at an average annual rate greater than that of Oregon (3.3% and 2.0%, respectively).

Exhibit 23. Population Growth, Redmond, Deschutes County, and Oregon, 1990 – 2018

Geography					Change, 1990 - 2018		
	1990	2000	2010	2018	Number	Percent	AAGR
Redmond	7,165	13,481	24,957	29,190	22,025	307%	5.1%
Deschutes County	74,958	115,367	157,733	187,621	112,663	150%	3.3%
Oregon	2,842,337	3,421,399	3,844,195	4,953,000	2,110,663	74%	2.0%

Source: U.S. Census Bureau, 1990, 2000, and 2010. Portland State University Population Estimates, 2018.

[97] Lehner, Josh. (August 2018). "Start-Ups, R&D, and Productivity." Salem, OR: Oregon Office of Economic Analysis. Retrieved from: https://oregoneconomicanalysis.com/2018/08/27/start-ups-rd-and-productivity/.

Age Distribution Change

The number of people aged 65 and older in the U.S. is expected to increase by nearly three-quarters by 2050, while the number of people under age 65 will only grow by 16%. The economic effects of this demographic change include a slowing of the growth of the labor force, need for workers to replace retirees, aging of the workforce for seniors that continue working after age 65, increased demand for healthcare services, and an increased share of the federal budget dedicated to Social Security and Medicare.[98]

Exhibit 24 through Exhibit 27 show the following trends:

- Redmond's population is aging differently than the population in Deschutes County and Oregon. While the median ages in Deschutes County and Oregon have increased, the median age in Redmond has decreased from 38.3 in 2000 to 37.4 in the 2014-2018 period. In the 2014-2018 period 29% of Redmond's residents were between 20 to 39 years old, while 22% were 60 years and older (Exhibit 26). This suggests that Redmond is attracting more people in their early and mid-adult lives, providing an increased availability of mid-career workers.
- Deschutes County's population is expected to continue to age, with the share of people 60 years and older increasing from 24% of the population in 2018 to 29% in 2043. This is consistent with statewide trends. While Redmond has a larger population of early and mid-life workers, the availability of people nearing retirement (e.g., 55 to 70 years old) is likely to increase over the next 20 years in both Redmond and Deschutes County. People in this age group may provide an important source for skilled labor, as people continue to work until later in life. These skilled workers may provide opportunities to support business growth in these areas.

Redmond's median age has increased by 4.7 years since 2000, while the median ages in Deschutes County and Oregon increased by 4 years and 2.9 years, respectively.

This increase suggests Redmond is attracting more workers in their middle adult lives.

Exhibit 24. Median Age, Redmond, Deschutes County, and Oregon, 2000 to 2014-2018

Source: U.S. Census Bureau, 2000 Decennial Census, Table P013; American Community Survey 2014-2018 5-year estimates, Table B01002.

2000	32.7 Redmond	38.3 Deschutes County	36.3 Oregon
2014-18	37.4 Redmond	42.3 Deschutes County	39.2 Oregon

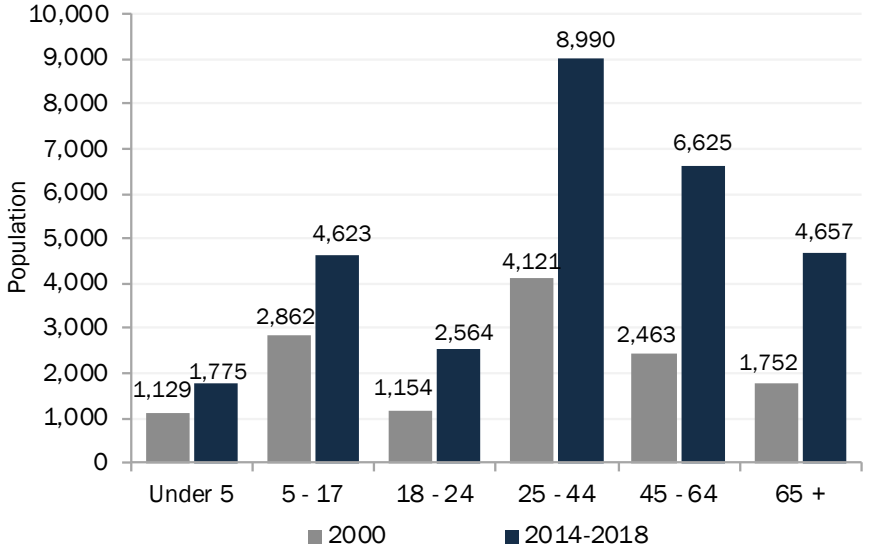
[98] The Board of Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds, 2017, The 2017 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds, July 13, 2017. The Budget and Economic Outlook: Fiscal Years 2018 to 2028, April 2018.

Over 2000 to 2014-2018, Redmond's largest population increase was for those aged 25-44 and older.

This is inconsistent with statewide trends.

Exhibit 25. Redmond Population Change by Age Group, 2000 to 2014-2018

Source: U.S. Census Bureau, 2000 Summary File; American Community Survey 2014-2018 5-year estimates, Table B01001.



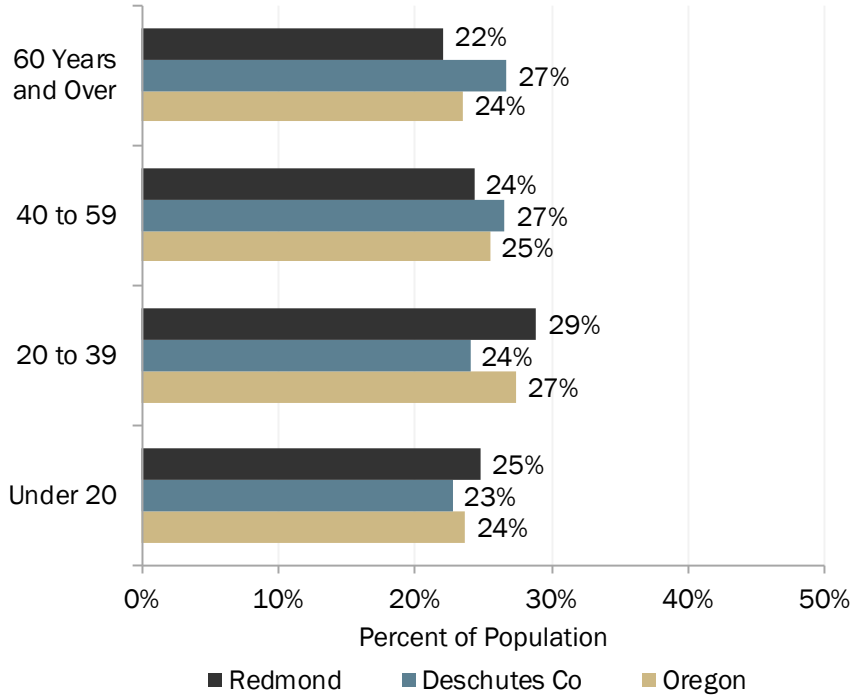
During the 2014-2018 period, 22% of Redmond residents were over 60 years of age.

This proportion of older residents was lower than that of the state.

Additionally, the proportion of Redmond residents under 39 years of age was much larger relative to Deschutes County and Oregon.

Exhibit 26. Population Distribution by Age, Redmond, Deschutes County, and Oregon, 2014-2018

Source: U.S. Census Bureau, American Community Survey, 2014-2018 5-year estimate, Table B01001.

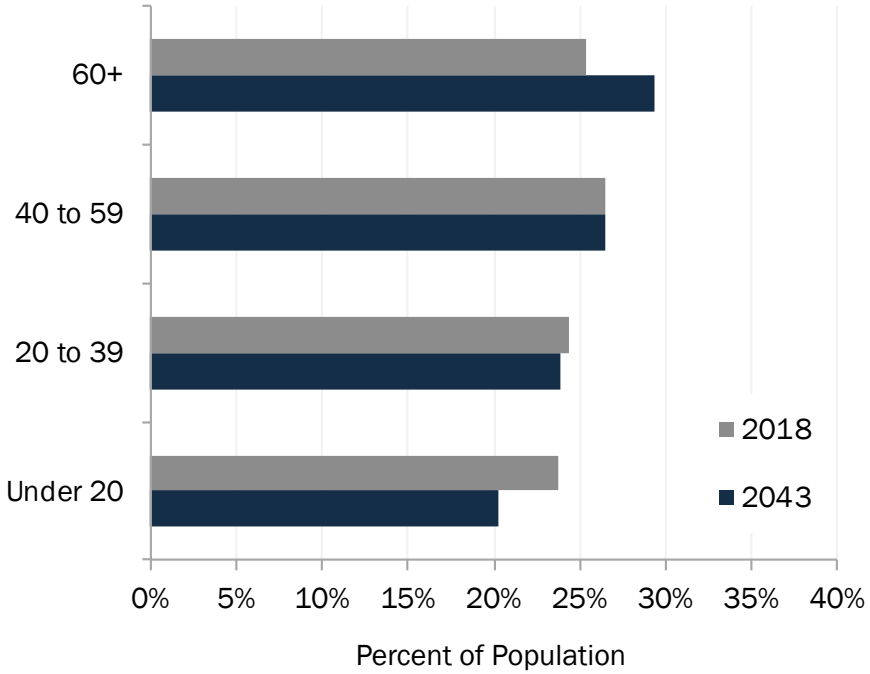


By 2043, Deschutes County will have a larger share of residents 60 years and older than it does today.

The share of residents aged 60 years and older will account for 29% of Deschutes County's population, compared to 25% in 2018.

Exhibit 27. Population Growth by Age Group, Deschutes County, 2018 – 2043

Source: Oregon Population Forecast, 2018.



Race and Ethnicity

Redmond, like Oregon overall, is becoming more racially and ethnically diverse. The Hispanic and Latino population as well as the population of people of color increased in Redmond between 2000 and 2014-2018. The Hispanic and Latino population in Redmond grew from 5% to less than 12%, while the population of people of color rose from 6% to 10%. This trend was also true for Deschutes County which experienced an increase in the populations of both people of color (5% to 7%) and the Hispanic and Latino community (4% to 8%) during the same time period. Redmond is nearly as ethnically and racially diverse than the state and providing culturally specific services to Native American and Spanish-speaking community members can help improve their participation in the workforce and economy.

The population of people of color is defined as the share of the population that identifies as a race other than "White alone" according to Census definitions. The small population in Redmond results in small sample sizes, and thus margin of error is considerable for the estimate of these populations.

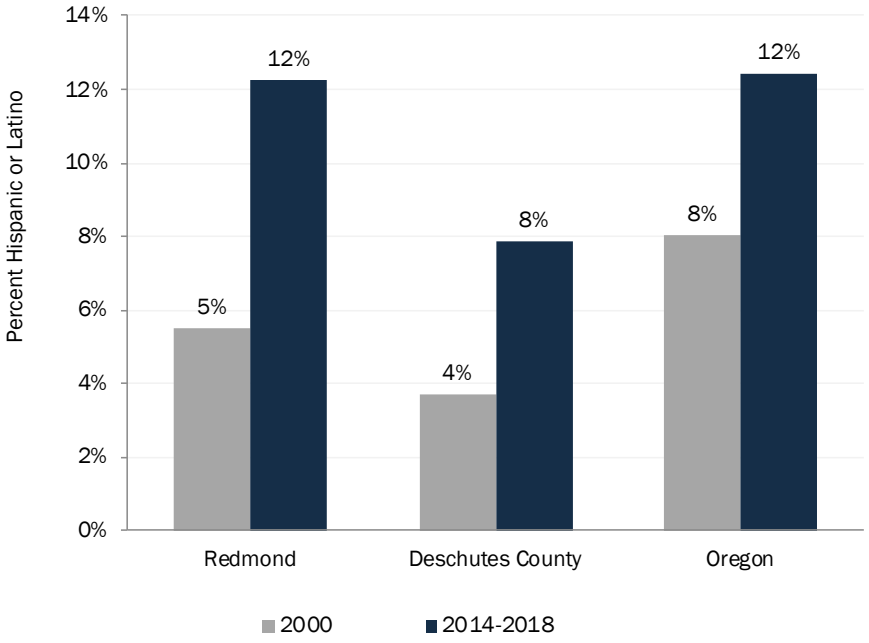
Exhibit 28 and Exhibit 29 show the change in the share of Hispanic and Latino and people of color populations in Redmond compared to Deschutes County and Oregon between 2000 and 2014-2018. The group with the largest share of the people of color population in 2014-2018 was those that identify as "two or more races," representing 2% of Redmond's population.

Redmond's Hispanic / Latino population increased between 2000 and 2014-2018 from 6% to 12%.

Redmond is nearly equally as ethnically diverse as the state and more so than Deschutes County.

Exhibit 28. Hispanic or Latino Population as a Percentage of the Total Population, 2000, 2014-2018

Source: U.S. Census Bureau, 2000 Decennial Census Table P008, 2014-2018 ACS Table B03002.



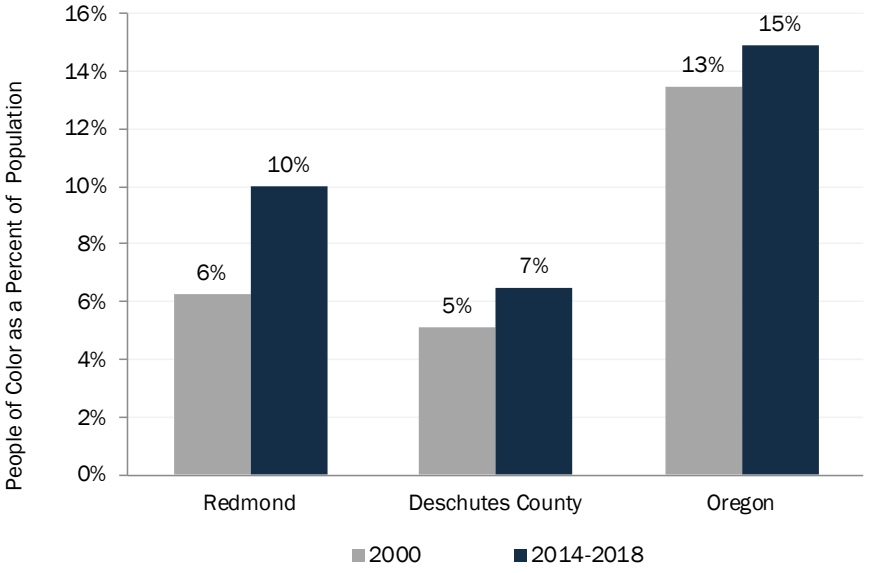
The population of people of color in Redmond increased between 2000 and 2014-2018.

Redmond is more racially diverse than Deschutes County, but less so than the state. The percentage of people of color in Redmond is 10% compared to 7% in Deschutes County and 15% in Oregon.

The group with the largest share of the people of color was "two or more races" representing 5% of Redmond's population.

Exhibit 29. People of Color Population as a Percentage of the Total Population, 2000, 2014-2018

Source: U.S. Census Bureau, 2000 Decennial Census Table P007, 2014-2018 ACS Table B02001



Income

Income and wages affect business decisions for locating in a city. Areas with higher wages may be less attractive for industries that rely on low-wage workers. Redmond's median household income ($55,679) was below the county median ($63,680). In 2018, average wages at private businesses in Redmond ($41,659) were also below the county average ($45,571).

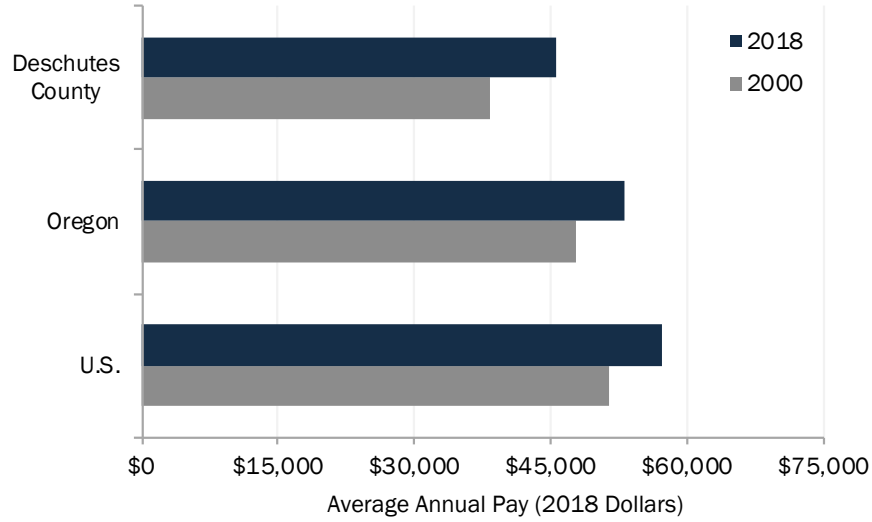
Consistent with statewide and national trends, Deschutes County's average annual wage increased between 2000 and 2018. When adjusted for inflation, the county's average annual wage grew by 19%, surpassing both Oregon and the nation (11%).

From 2000 to 2018, the average annual wage rose in Deschutes County, Oregon, and across the nation.

In 2018, Deschutes County's average annual wage was $45,571. This was below Oregon ($53,053) and the nation ($57,266).

Exhibit 30. Average Annual Wage, Covered Employment, Deschutes County, Oregon, and the U.S., 2000 to 2018, Inflation-Adjusted 2018 Dollars

Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages.



Over the 2014-2018 period, the median household income in Redmond was below Deschutes County's and Oregon's median household income by 13% and 6%, respectively.

Exhibit 31. Median Household Income (MHI),[99] 2014-2018

Source: U.S. Census Bureau, American Community Survey 2014-2018 5-year estimates, Table B19013.

$55,679	$63,680	$59,393
Redmond	Deschutes County	Oregon

[99] The Census calculated household income based on the income of all individuals 15 years old and over in the household, whether they are related or not.

Redmond's median family income during the 2014-2018 period was below the median family income of both Deschutes County and Oregon by 12% and 11%, respectively.

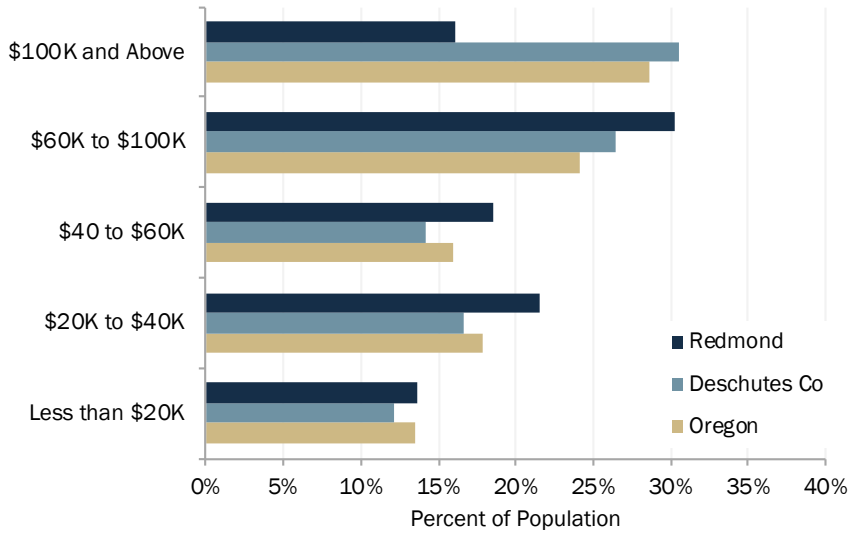
Exhibit 32. Median Family Income,[100] 2014-2018
Source: U.S. Census Bureau, American Community Survey 2014-2018 5-year estimates, Table B19113.

$65,402	$73,935	$72,823
Redmond	Deschutes County	Oregon

During the 2014-2018 period, 36% of Redmond households earned less than $40,000 annually, compared to 29% of Deschutes County households and 31% of Oregon households.

Over the same period, 19% of Redmond households earned between $40,000 and $59,999, a proportion larger than both Deschutes County residents (14%) and residents statewide (16%).

Exhibit 33. Household Income by Income Group, Redmond, Deschutes County, and Oregon, 2014-2018, Inflation-Adjusted 2018 Dollars
Source: U.S. Census Bureau, American Community Survey 2014-2018 5-year estimates, Table B19001.



[100] The Census calculated family income based on the income of the head of household, as identified in the response to the Census forms, and income of all individuals 15 years old and over in the household who are related to the head of household by birth, marriage, or adoption.

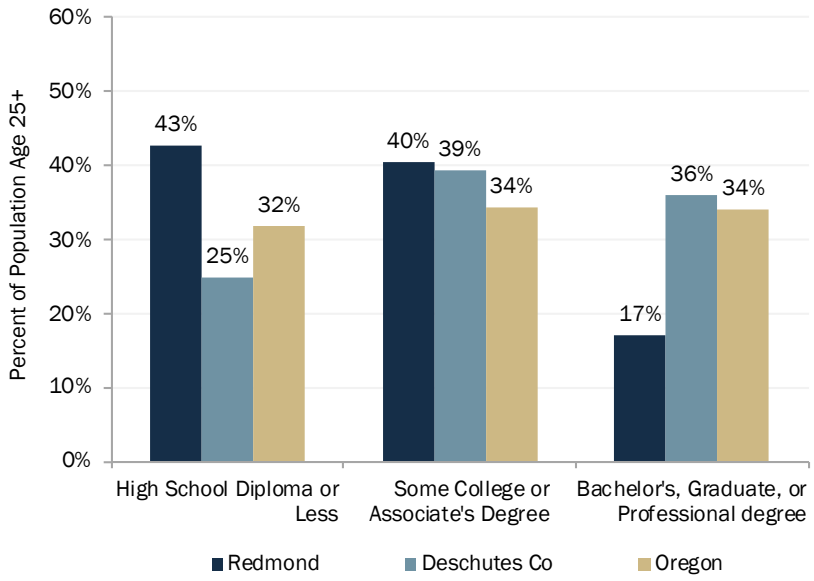
Educational Attainment

The availability of trained, educated workers affects the quality of labor in a community. For many industries, educational attainment is an important labor force factor because firms need to be able to find educated workers.

About 17% of Redmond's residents have a bachelor's degree or higher, which is lower than Deschutes County and Oregon. Redmond has a higher share of residents with some college or an associate degree when compared with the county and state.

Exhibit 34. Educational Attainment for the Population 25 Years and Over, Redmond, Deschutes County, and Oregon, 2014-2018

Source: U.S. Census Bureau, American Community Survey 2014-2018 5-year estimates, Table B15003.



Labor Force Participation and Unemployment

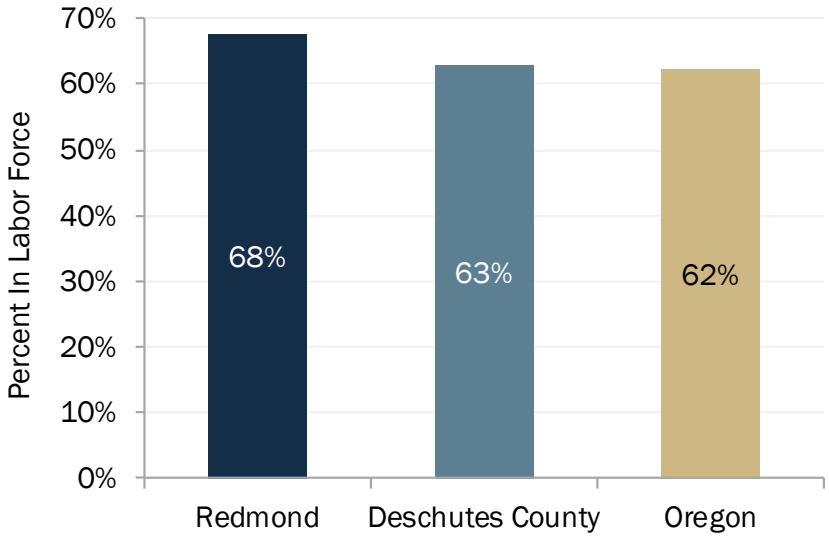
The current labor force participation rate is an important consideration in the availability of labor. The labor force in any market consists of the adult population (16 and over) who are working or actively seeking work and includes both the employed and unemployed. Children, retirees, students, and people who are not actively seeking work are not considered part of the labor force. According to the 2014-2018 American Community Survey, Deschutes County had almost 92,900 people in its labor force while Redmond's labor force had 15,854 people.

In 2017, the Oregon Office of Economic Analysis reported that 64% of job vacancies were difficult to fill. The most common reason for difficulty in filling jobs included a lack of applications (30% of employers' difficulties), lack of qualified candidates (17%), unfavorable working conditions (14%), a lack of soft skills (11%), and a lack of work experience (9%).[101] These statistics indicate a mismatch between the types of jobs that employers are demanding and the skills that potential employees can provide.

Redmond has a higher labor force participation rate relative to Deschutes County and Oregon.

Exhibit 35. Labor Force Participation Rate, Redmond, Deschutes County, and Oregon, 2014-2018

Source: U.S. Census Bureau, American Community Survey 2012-2016 5-year estimates, Table B23001.



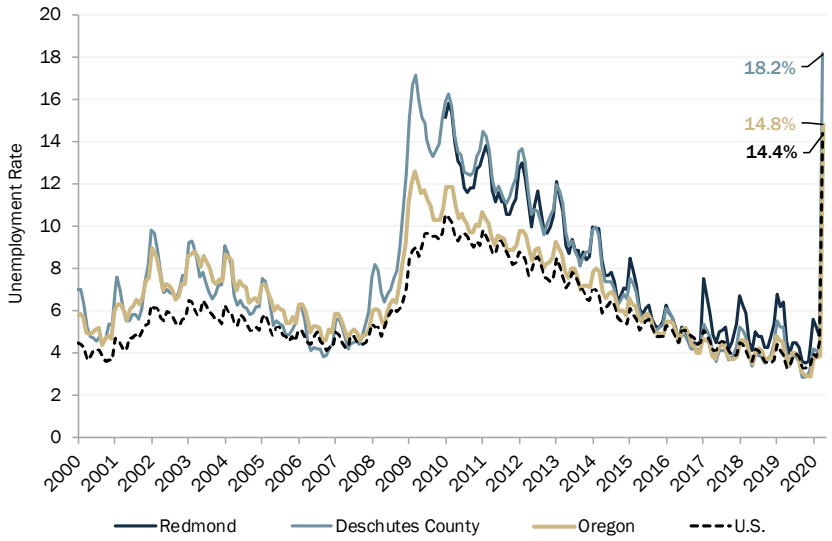
[101] Oregon's Current Workforce Gaps: Difficult-to-fill Job Openings, Oregon Job Vacancy Survey, Oregon Employment Department, June 2018.

The unemployment rates in Redmond, Deschutes County, Oregon, and the nation have declined since the Great Recession. However, since the pandemic, unemployment rates for the month of April 2020 exceeded the peak rate experienced during the Great Recession.

Unemployment rates for April 2020 in Deschutes County (18.2%) and Oregon (14.8%) were greater than the nationwide rate of 14.4%.

Exhibit 36. Unemployment Rate, Redmond, Deschutes County, Oregon, and the U.S., 2000 – April 2020

Source: Bureau of Labor Statistics, Local Area Unemployment Statistics and Labor Force Statistics.



Commuting Patterns

Commuting plays an important role in Redmond's economy because employers in the area are able to access workers from people living in cities across Deschutes County and from the broader East Cascade Region.

Exhibit 38 shows that 32% of Redmond workers also live in Redmond, while 17% live in Bend, and 4% commute from Prineville. The remaining workers commute from other cities throughout region.

Redmond is part of an interconnected regional economy.

Fewer people both live and work in Redmond than commute into or out of the city for work. This commuting pattern differs from Deschutes County in that there are more persons employed and living in the county than persons who commute into or out of the county for work.

Exhibit 37. Commuting Flows, Redmond, 2017
Source: U.S. Census Bureau, Census On the Map.

About 32% of all people who work in Redmond also live in Redmond.

Exhibit 38. Places Where Redmond Workers Lived,[102] 2017
Source: U.S. Census Bureau, Census On the Map.

32%	17%	4%	4%
Redmond	Bend	Prineville	Crooked River

[102] In 2017, 12,675 people worked at businesses in Redmond, with 32% (4,088) people both employed and working in Redmond.

About 32% of residents who live in Redmond also work in Redmond.

Thirty percent of Redmond residents commute to Bend for work.

Exhibit 39. Places Where Redmond Residents Were Employed,[103] 2017

Source: U.S. Census Bureau, Census On the Map.

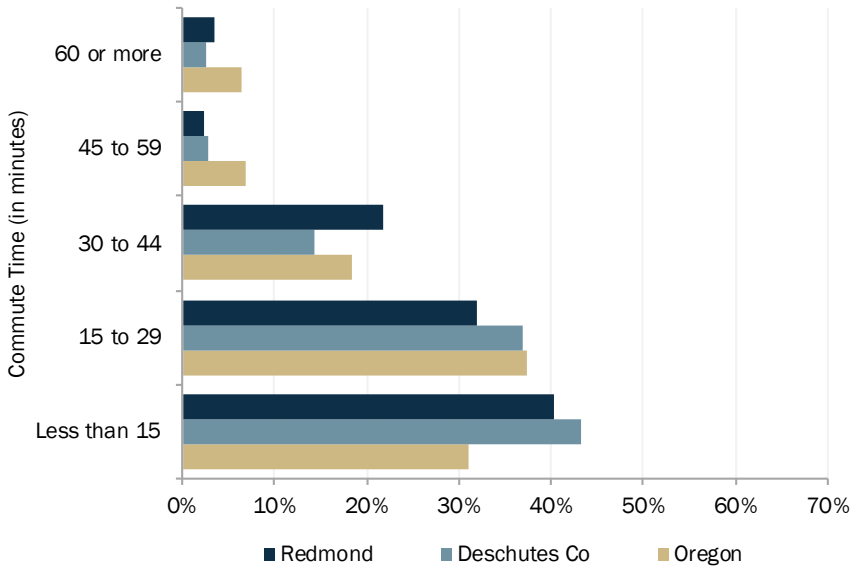
32%	30%	4%	2%
Redmond	Bend	Portland	Prineville

During the 2014-2018 period, about 40% of Redmond residents had a commute of less than 15 minutes, compared to 43% of Deschutes County's residents and 31% of Oregon residents.

The majority of Redmond residents (60%) have a commute time over 15 minutes. This is consistent with Deschutes County, where 57% of County residents have a commute time of this length.

Exhibit 40. Commute Time by Place of Residence, Redmond, Deschutes County, and Oregon, 2014-2018

Source: U.S. Census Bureau, American Community Survey 2014-2018 5-year estimates, Table B08303.



[103] In 2017, 15,854 residents of Redmond worked, with 11% of Redmond residents (4,088) both living and employed in Redmond.

Tourism in Central Oregon and Deschutes County

Longwoods International provides regional statistics on travel. The following information is from Longwoods International's 2017 Regional Visitor Report for the Central Oregon Region, which is comprised of southern Crook, Deschutes, Jefferson, and southern Wasco counties.[104] Broadly, travelers to Central Oregon accounted for:[105]

- 4.5 million overnight trips in 2017, or 13% of all Oregon overnight travel that year.
- From 2016 to 2017, the primary market areas for travelers were Oregon, Washington, and California: 51% of Central Oregon visitors came from Oregon, 13% came from Washington, and 11% came from California.
- Over this same time period, about 58% of visitors stayed 2 or fewer nights in Central Oregon, 35% stayed 3-6 nights, and 7% stayed 7 or more nights. The average nights spent in Central Oregon was 2.8.
- The average per person expenditures on overnight trips in 2017 ranged from $13 on transportation at destination to $54 per night on lodging.
- About 78% of visits to the Central Oregon Region between 2016 and 2017 were via personally owned automobiles, 13% were by rental car, and 12% were via an online taxi service (e.g., Lyft or Uber).
- Visitors tended to be younger or middle-aged adults with an average age of 45.1 years. Those between the ages of 25 and 44 comprised 39% of overnight visits while 37% were between 45 and 64, and 13% were 65 or older. About 65% of visitors graduated college or completed a post-graduate education. Additionally, 33% of visitors earned less than $50,000 in household income, 42% earned between $50,000 and $99,999, and 25% earned more than $100,000. On average, the household income for Central Oregon visitors was about $72,435.

Deschutes County's direct travel spending increased 82% from 2008 to 2018.

The Central Oregon Region's direct travel spending increased by 86% over the same period.

Exhibit 41. Direct Travel Spending ($ millions), 2008 and 2018

Source: Dean Runyan Associates, Oregon Travel Impacts, 1992-2018, and Dean Runyan Associates, Oregon Travel Impacts, 1992-2018p.

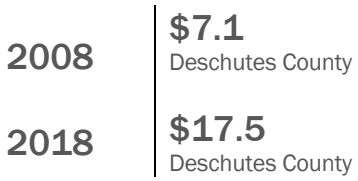
2000	$622.1 Central Oregon Region	$512.8 Deschutes County
2018	$961.2 Central Oregon Region	$812.5 Deschutes County

[104] Travel Oregon. "Central Oregon Overnight Travel Study: 2017," Longwoods International, October 2018. Retrieved from: http://industry.traveloregon.com/content/uploads/2018/10/OR-2017-Central-Region-Visitor-Report.pdf.

[105] Longwoods International issues caution in interpreting these tourism estimates in Central Oregon as the sample size for this region is low.

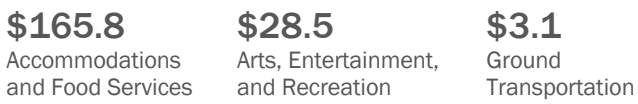
Deschutes County's lodging tax receipts increased 127% between 2008 and 2018.

Exhibit 42. Lodging Tax Receipts ($ millions), 2008 and 2018
Source: Dean Runyan Associates, Oregon Travel Impacts, 1992-2018.



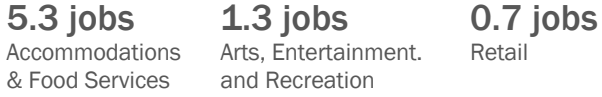
Deschutes County's largest visitor spending for purchased commodities is accommodation and food services.

Exhibit 43. Largest Visitor Spending Categories ($ millions), Deschutes County, 2017
Source: Dean Runyan Associates, Oregon Travel Impacts.



Deschutes County's largest employment generated by travel spending is in the accommodations and food services industry.

Exhibit 44. Largest Industry Employment Generated by Travel Spending (thousands), Deschutes County, 2017
Source: Dean Runyan Associates, Oregon Travel Impacts.



The number of overnight visitors to Deschutes County has increased from 6,910,000 in 2017 to 7,037,000 in 2018, an increase of 127,000 overnight stays or 1.8%.

Appendix B. Buildable Lands Inventory

The buildable lands inventory is intended to identify commercial and industrial lands that are available for development for employment uses within the Redmond UGB. The inventory is sometimes characterized as *supply* of land to accommodate anticipated employment growth. Population and employment growth drive *demand* for land. The amount of land needed depends on the type of development and other factors.

This appendix presents methods and definitions used to develop the commercial and industrial buildable lands inventory for the Redmond UGB. The results (shown in Chapter 4) are based on analyses of City of Redmond, Deschutes County, and State of Oregon GIS data by ECONorthwest and reviewed by City staff. The remainder of this appendix summarizes key findings of the buildable lands inventory.

Methods and Definitions

The BLI for Redmond includes all land that allows commercial and industrial uses within the UGB. From a practical perspective, land was included in the BLI if it met all of the following criteria: 1) it is inside the Redmond UGB, 2) it is inside a tax lot (as defined by Deschutes County), and 3) if its current zoning/comprehensive plan designation allows employment uses.[106] Note that tax lots do not generally include road or railroad rights-of-way or water. The inventory then builds from the tax lot-level database to estimates of buildable land by plan designation.

Inventory Steps

The steps in the BLI are:

1. Generate UGB "land base"
2. Classify lands by development status
3. Identify constraints
4. Verify inventory results
5. Tabulate and map results

Step 1: Generate UGB "Land Base"

The commercial and industrial inventory used all of the tax lots in the Redmond UGB with the appropriate comprehensive plan designations: Airport, C1, C2, C3, C4, C4-A, C5, LLI, M1, M2, MUE, MULW, MUN, and UH10. Exhibit 47 shows a map of the specific designations that were used in the BLI.

[106] In Redmond, the comprehensive plan map and the zone map are the same.

Step 2: Classify Lands

In this step, ECONorthwest classified each tax lot with an employment plan designation (based on definition above) into one of five mutually exclusive categories based on development status:

- Developed land
- Vacant land
- Partially vacant land
- Undevelopable land
- Public or exempt land

ECONorthwest identified buildable land and classified development status using a rule-based methodology. The rules are described below in Exhibit 45.

Exhibit 45. Rules for Development Status Classification

Development Status	Definition	Statutory Authority
Vacant Land	A tax lot: (a) Equal to or larger than one half-acre not currently containing permanent buildings or improvements; or (b) Equal to or larger than five acres where less than one half-acre is occupied by permanent buildings or improvements For the purpose of criteria (a) above, lands with improvement values of $0 will be considered vacant.	OAR 660-009-005(14)
Partially Vacant Land	Partially vacant tax lots are those between one and five acres occupied by a use that could still be further developed based on the zoning. This determination was based on a visual assessment and City staff verification.	No statutory definition
Undevelopable Land	Vacant tax lots less than 3,000 square feet in size are considered undevelopable.	No statutory definition
Public or Exempt Land	Lands in public or semi-public ownership are considered unavailable for commercial or industrial development. This includes lands in Federal, State, County, or City ownership as well as lands owned by churches and other semi-public organizations. Public lands will be identified using the Deschutes County Assessment property tax exemption codes.	No statutory definition
Developed Land	OAR 660-009-005(1) defines developed land as "Non-vacant land that is likely to be redeveloped during the planning period." Lands not classified as vacant, partially vacant, undevelopable, or public or exempt are considered developed.	OAR 660-009-005(1) We addressed redevelopment potential on the demand side—operationalizing a definition of developed land consistent with this definition is complicated

Step 3: Identify Constraints

As shown in Exhibit 46, the BLI included development constraints consistent with guidance in OAR 660-008-0005(2).

Exhibit 46. Constraints to be Included in BLI

Constraint	Statutory Authority	Threshold
Goal 5 Natural Resource Constraints		
Regulated Wetlands	OAR 660-009-0005(2)	Within National Wetlands Inventory
Natural Hazard Constraints		
Steep Slopes	OAR 660-009-0005(2)	Slopes greater than 15%

These areas were evaluated as prohibitive constraints (unbuildable). All constraints were merged into a single constraint file, which was then used to identify the area of each tax lot that is constrained. These areas were deducted from lands that are identified as vacant or partially vacant.

Step 4: Verify Inventory Results

ECONorthwest used a multi-step verification process. The first verification step involved a "visual assessment" of land classifications using GIS and recent aerial photos. The visual assessment involves reviewing classifications overlaid on recent aerial photographs to verify uses on the ground. ECONorthwest reviewed all tax lots included in the inventory using the visual assessment methodology. The second round of verification involved City staff verifying the visual assessment output. ECONorthwest amended the BLI based on City staff review and a discussion of staff's comments. The final verification is reviewed by stakeholders, most especially PAC members.

Step 5: Tabulate and Map Results

The results of the commercial BLI are presented in tabular and map format in the remainder of this appendix. This includes a zoning/comprehensive plan map, the land base by classification, vacant and partially vacant lands by plan designation, and vacant and partially vacant lands by plan designation with constraints showing.

Exhibit 47. Comprehensive Plan Designations Included in the Commercial and Industrial BLI, Redmond UGB, 2019

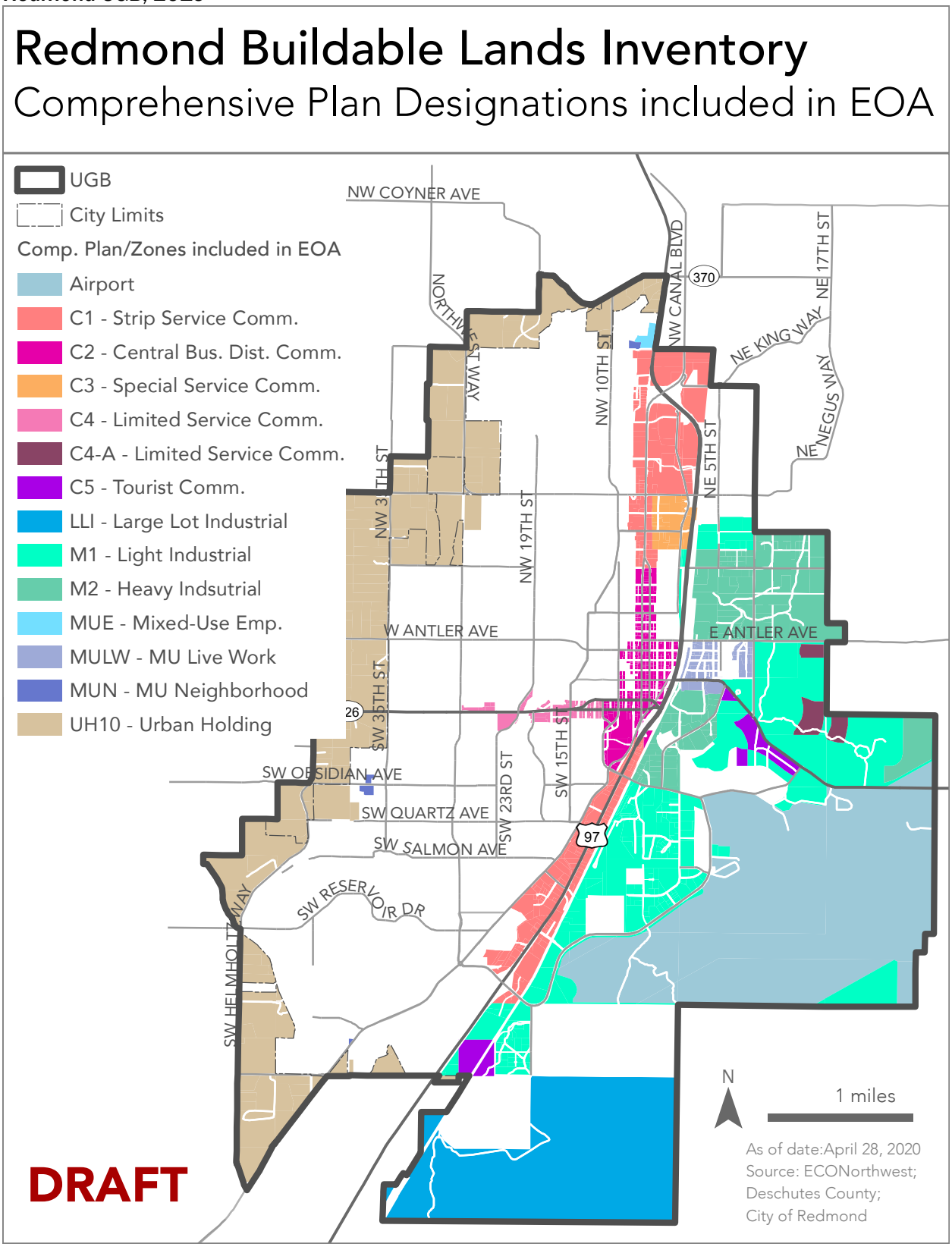
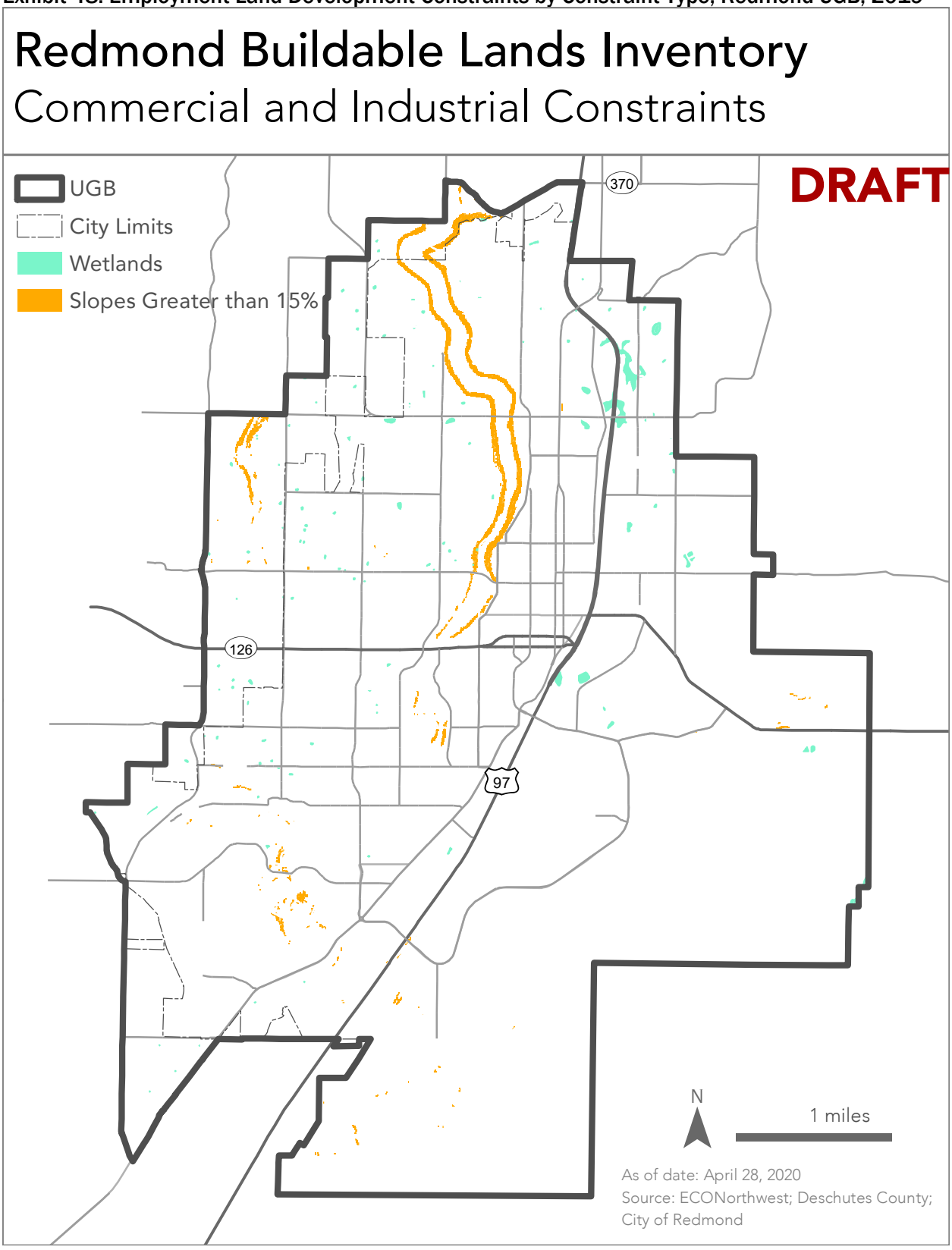


Exhibit 48. Employment Land Development Constraints by Constraint Type, Redmond UGB, 2019



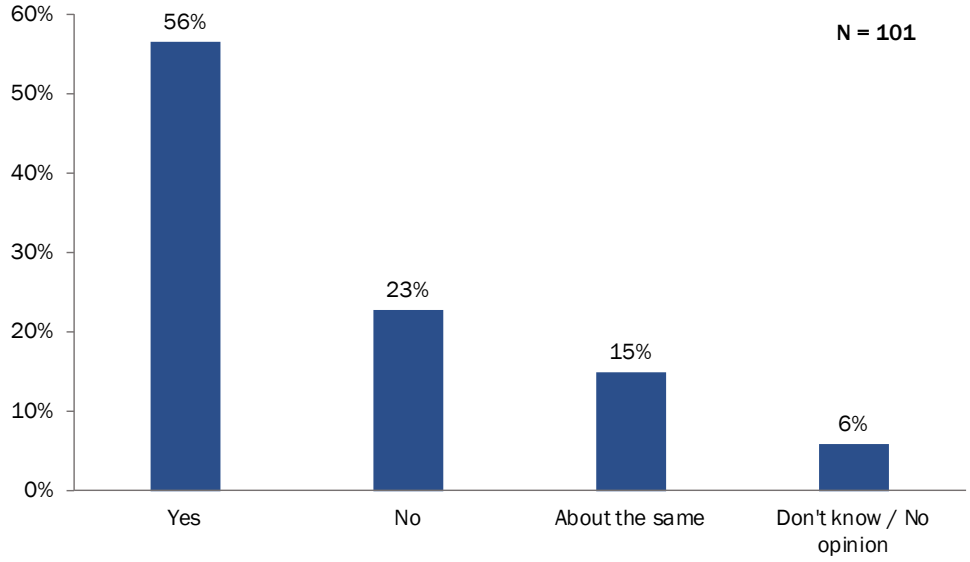
Appendix C. Open House Summary

The timing of Covid-19 pandemic within the EOA process did not allow for typical public engagement. In place of an in-person open house, ECONorthwest developed a virtual open house for the City of Redmond to distribute to residents and business owners. The open house included background information on Redmond's economic trends and summarized Redmond's employment land supply and employment forecast for the 20-year period. The open house also included a series of survey questions about living, working, and running a business in Redmond. The responses are summarized in this appendix.

The virtual open house was available through an online presentation website with survey questions available in an online form. The website was available for the community to participate for about 3 weeks, starting in late June through mid-July 2020. Over 100 community members participated in the open house, with responses to survey questions ranging between about 60 and 100 responses.

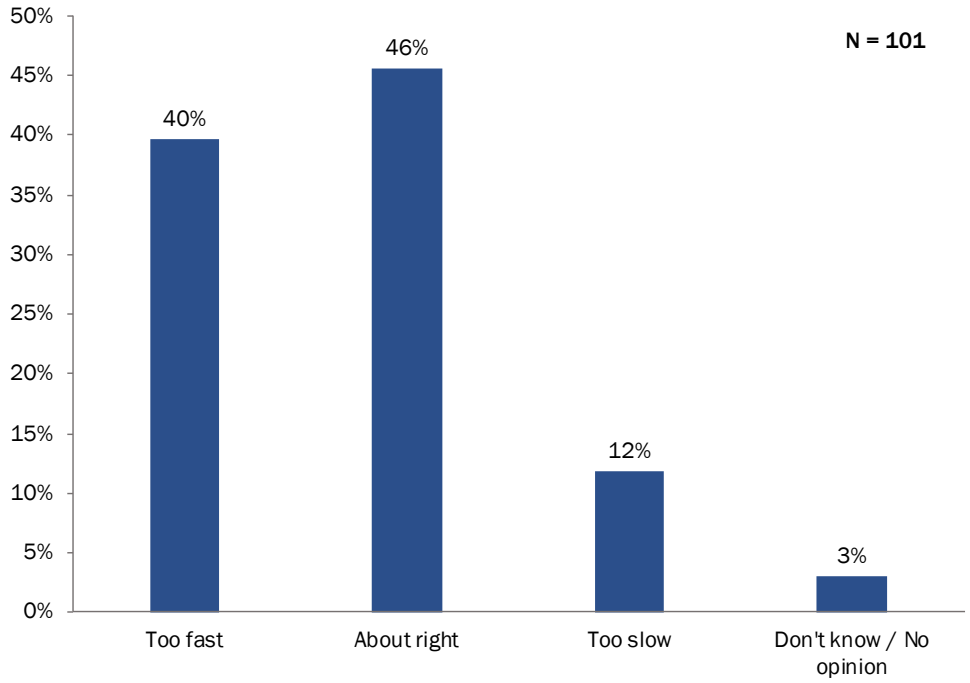
Exhibit 49 shows how respondents view Redmond's quality of life relative to 10 years ago or since they moved to or began working in the area. The majority (56%) felt that Redmond was a better place to live or work in while 23 percent disagreed, and 15 percent felt it was about the same.

Exhibit 49. Do You Think Redmond Is a Better Place to Live Than It Was 10 Years Ago (Or Since You Have Lived or Worked in Redmond)?



As shown in Exhibit 50 respondents were split in their views when asked about Redmond's rate of growth with 40 percent stating that it is growing "too fast" while slightly more (46%) said the growth rate is "about right."

Exhibit 50. How Would You Describe the Rate of Growth in the City of Redmond?



The survey asked respondents to identify Redmond's strengths as well as reasons business owners may want to locate to Redmond. Common responses include:

- Amenities
- Affordability
- Business-friendly culture
- Climate
- Cost of living
- Development opportunities (including downtown)
- Diverse retail climate
- Enterprise Zone tax incentives
- Family friendly
- Growth opportunities for businesses
- Infrastructure (including roads and airport)
- Livability
- Location

- Opportunities to become involved with local government
- Personal freedom
- Proximity to other Central Oregon cities
- Quality of life
- Quality of public services (i.e., police, EMS)
- Recreational opportunities
- Safety
- Small business presence
- Small size
- Small-town culture
- Strong sense of community
- Well-developed industrial land
- Well-maintained public spaces

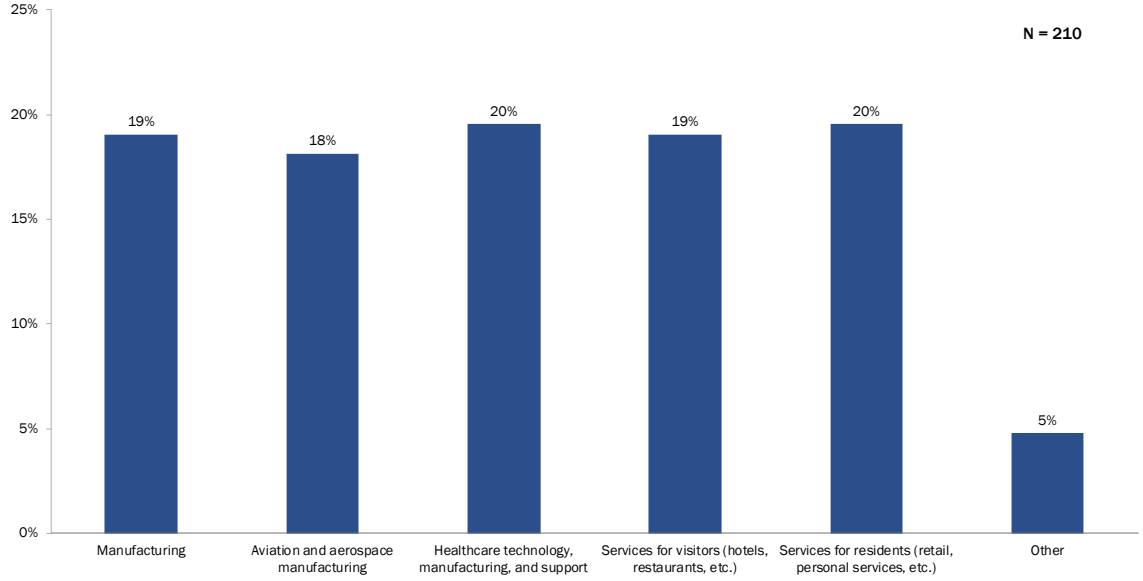
In comparison, respondents were asked about Redmond's weaknesses and what may make a business owner decide not to locate in Redmond or leave the city altogether. Individuals provided a variety of explanations including:

- Business competition
- Decreased quality of healthcare services
- Difficulty with downtown foot traffic
- Distance from large population centers
- Downtown commercial vacancies
- Few commercial services
- Few cultural resources (e.g., theaters, live music, museums)
- Few opportunities and resources for families
- High commercial real estate prices
- High cost of living
- High property taxes
- Highway 97 traffic
- Housing unaffordability
- Inaccessibility to businesses along South US 97
- Lack of business variety
- Lack of educated workforce

- Lack of low-income housing
- Lack of marijuana dispensaries
- Lack of racial, ethnic, and political diversity
- Lack of support for remote industries
- Low-quality housing
- Low wages
- Out-of-state influence
- Population growth
- Shortage of skilled workers
- Shortage of industrial space
- Small airport with limited flight options and times
- Traffic
- Water quality and scarcity
- Weak downtown retail presence
- Weak infrastructure (e.g., narrow roads, lack of alternate routes to popular spots)

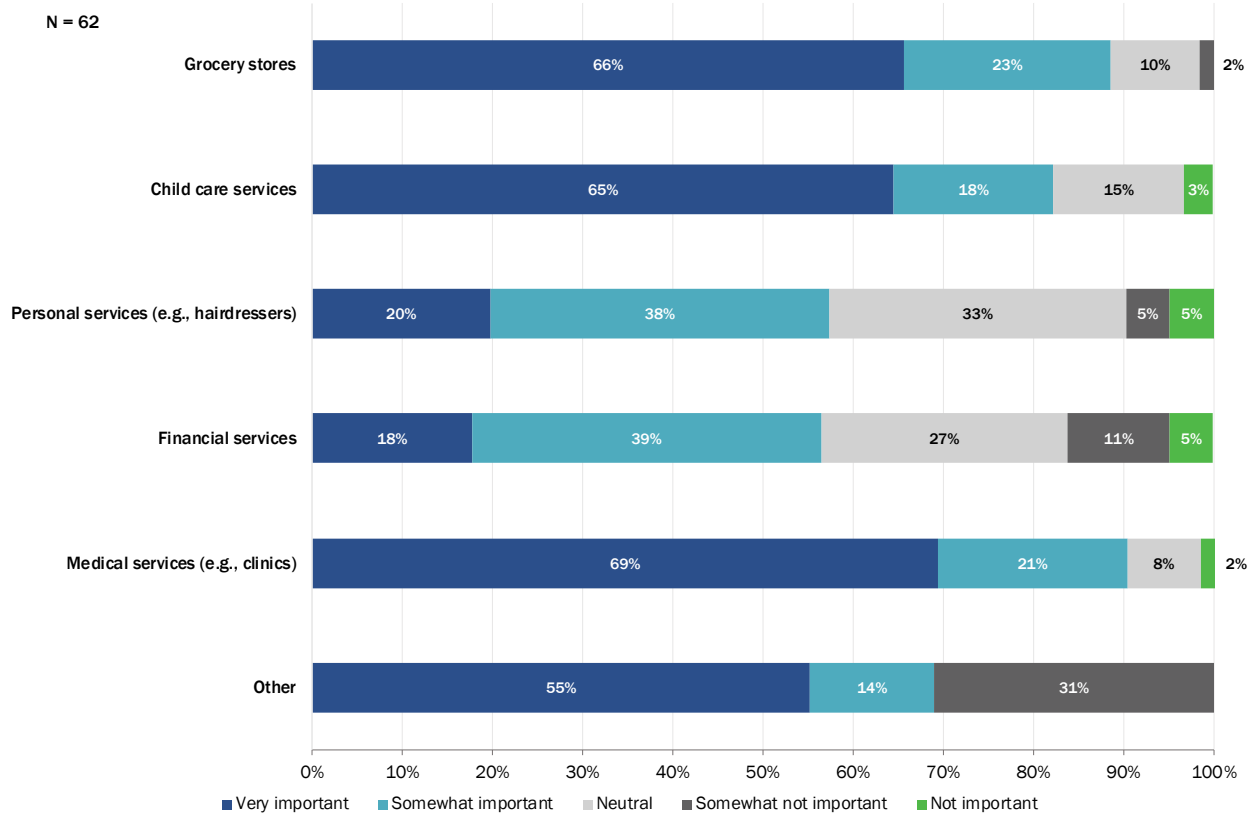
When asked about what types of businesses that would be attracted to located in Redmond, no single industry stood out, as shown in Exhibit 51.

Exhibit 51. What Types of Businesses Would Be Attracted to Locating in Redmond?



The survey asked respondents to assess the relative importance of services residents and workers need in Redmond. The majority of respondents identified grocery stores (66%), childcare services (65%), medical services (69%), and other (55%) as very important, as shown in Exhibit 52.

Exhibit 52. What Kind of Services Do Residents and Workers Need in Redmond? (Indicate the Level of Importance for Each Type of Service Needed.)



As a follow-up question for those who answered, "Other services," respondents identified the following:

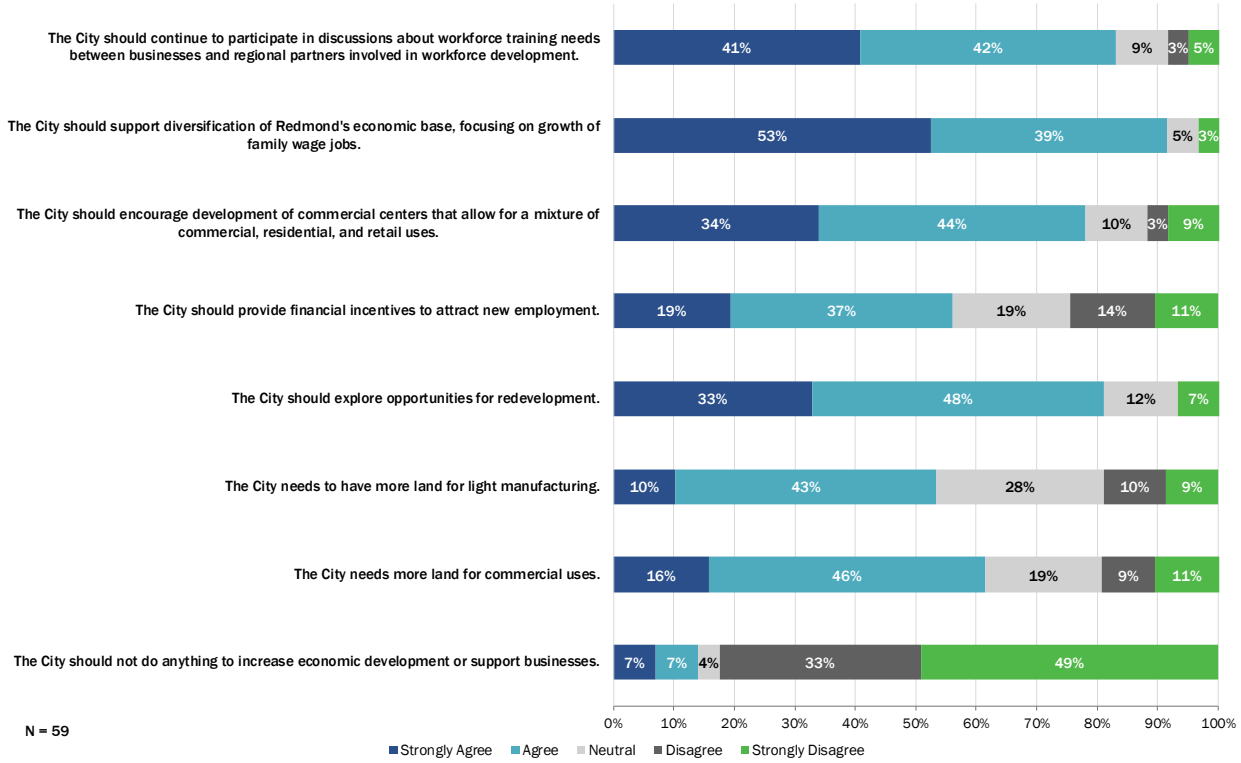
- Cultural resources
- Dental offices
- Dispensaries
- Family entertainment and activities
- Increased technical/trade school programs
- Low-income housing
- Public spaces
- Senior center
- Shopping and dining venue
- Tourism services

When asked about other potential growth opportunities for Redmond businesses, respondents stated the following:

- Charter and private schools
- Childcare
- Dispensaries
- Family-friendly activities and entertainment (e.g., indoor athletic center, movie theater, bowling)
- Homeless shelters
- Large and small animal veterinarian
- Large retailers (e.g., Costco)
- Local farmers market
- Manufacturing
- Neighborhood grocery stores
- Pediatric counselors and therapists
- Recreation equipment and activities stores
- Remote work
- Retail stores
- Social venues
- Tourism
- Upscale housing
- Warehousing and distribution point
- Winter activities

The survey asked respondents to state their level of agreement about what the City of Redmond could be doing to support business and economic development. As shown in Exhibit 53, 53 percent of respondents strongly agreed that the City should support diversification of Redmond's economic base and focus on growth of family-wage jobs.

Exhibit 53. What Can the City of Redmond Do to Support Businesses and Economic Development? (Indicate Your Level of Agreement for Each Topic Listed Below.)



The survey asked respondents about other activities the City could do to support businesses and economic development. Common responses include:

- Address water quality and scarcity
- Address traffic
- Allow dispensaries
- Avoid additional business regulations
- Encourage business owner engagement with state legislature
- Encourage diversity of businesses and business owners
- Encourage local business to hire COCC/OSU graduates
- Increase access to affordable and low-income housing
- Increase access to commercial centers
- Increased local government transparency
- Provide more downtown parking options

- Provide vocational training options
- Offer public transportation
- Support female and POC-owned businesses

ECONorthwest
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DATE: July 29, 2020
TO: Redmond Economic Development Advisory Committee
CC: Deborah McMahon
FROM: Beth Goodman
SUBJECT: Draft: Redmond Economic Development Policies and Actions

The City of Redmond contracted ECONorthwest to develop an Economic Opportunities Analysis and an Economic Development Strategy for Redmond. The Economic Opportunities Analysis (EOA) will determine whether the City of Redmond has enough land to accommodate twenty years of commercial and industrial job growth. The EOA will provide the basis for an update to the City's Comprehensive Plan Economic Element, as well as development of an action plan to implement the economic development policies (i.e., the Economic Development Strategy).

The City of Redmond's existing Comprehensive Plan Housing Element policies have not been updated since Redmond last completed its periodic review in 2001. A key objective of the EOA and accompanying Economic Development Strategy is to identify options for changes to the City's Comprehensive Plan and land use regulations needed to address commercial and industrial land needs. This memorandum presents Redmond's existing economic development policies for discussion with the Project Advisory Committee (PAC) at the May and June 2020 meetings. Our expectation is that these policies may be revised or substituted based on additional work from the City of Redmond's Planning Commission or City Council.

This Economic Development Strategy focuses on land use tools to ensure there is adequate land planned and zoned to provide opportunities for employment growth on sites with a variety of characteristics (e.g., site sizes, locations, visibility, and other characteristics).

This memorandum was drafted in the Spring of 2020. As of this draft, the COVID-19 virus has created a global pandemic that has resulted in entire sectors of the economy being put on pause. Short- to intermediate-term impacts on the economy remain uncertain, although disruptions in commercial and industrial market fundamentals are expected. Over the 20-year planning period for this project, prevailing long-term economic and demographic trajectories will have greater influence than cyclical variation or economic shocks. As such, in this analysis we assume a return to long-term economic stabilization.

Appendix A presents the full text of Redmond's existing Comprehensive Plan policies for commercial and industrial development. Appendix B presents the information about economic development tools commonly used in other cities in Oregon.

Vision for Economic Development

The *Redmond 2040 Vision* presents the following vision for economic development.

A Business-Friendly Culture

As a regional economic hub, Redmond is open for business. The City enjoys a resilient and diversified economy that retains and expands local businesses; attracts family-wage jobs; and is connected to the regional, national and global markets. Landmarks such as the Redmond Municipal Airport, Deschutes County Fair and Expo Center, Central Oregon Community College (COCC), and growing downtown, help put Redmond on the map. The City strengthens businesses and tourism through community-driven partnerships and programs, preserving Redmond's small-town feel.

Summary of Actions

Note to reviewers: Please review the rest of the memorandum before reviewing the suggested schedule in this table.

Implementation Actions	Implementation Schedule				
	On-going	Within 1 year	Within 2 years	2 to 5 years	5 + years
Policy 1. Land Supply					
Action 1.1a: Identify land to rezone (and re-designate) to provide for an adequate supply of commercial and industrial land and make efficient use of land.		✓			
Action 1.1b: As part of the City's master planning process, identify commercial and employment land in or near to newly developing neighborhoods to provide opportunities for commercial employment centers, retail, and services to develop near new residential development.	✓				
Action 1.2a: As commercial and industrial sites develop, especially sites larger than five acres, the City should plan for replenishment of land in the short-term supply through the capital improvement planning process.	✓				
Action 1.2b: The City's Planning and Public Works departments should coordinate planning to ensure an on-going short-term supply of land.	✓				
Action 1.3a: Develop and implement a system to monitor the supply of commercial and industrial lands. This includes monitoring commercial and industrial development (through permits) as well as land consumption (e.g. development on vacant, or redevelopable lands).			✓		
Action 1.3b: Update the Economic Opportunities Analysis every two to five years, in coordination with other infrastructure master plans, to evaluate development of Redmond's target industries and buildable lands inventory to track employment growth and changes in Redmond, improvements to infrastructure, and changes in the regional economy occur.				✓	

Implementation Actions	Implementation Schedule				
	On-going	Within 1 year	Within 2 years	2 to 5 years	5 + years
Policy 2. Large-Lot Industrial Land Supply					
Action 2.5a: Identify opportunities to work with land owners and other project partners to support development through efforts to market the land to potential developers and businesses.		✓			
Action 2.5b: Encourage land owners to get the sites certified shovel ready through the Business Oregon Certified Shovel Ready program.	✓				
Policy 3. Infrastructure Planning					
Action 3.1a: Consider development of employment land as a criteria for evaluating priority of capital improvements.	✓				
Action 3.1b: Coordinate capital improvement planning annually to incorporate the priorities in the City's Economic Development Strategy (See Action 5.1a).	✓				
Action 3.1e: Work with landowners to develop master plans to prepare for and guide development of key industrial sites.			✓		
Policy 4. Development, Infill Development, and Redevelopment					
Action 4.2a: Develop standards and processes to allow more flexibility for subdivision of smaller parcels in existing industrial parks and on other industrial parcels (except for land zoned Large-Lot Industrial).		✓			
Action 4.2b: The City could develop a land use process template for subdividing M1 and M2 parcels into smaller sites, to make it easier, faster, and less costly for landowners or developers to subdivide existing sites. This template could include pre-approved subdivision plans.		✓			

Implementation Actions	Implementation Schedule				
	On-going	Within 1 year	Within 2 years	2 to 5 years	5 + years
Action 4.2c: Identify at least one site for a new industrial park, likely on land zoned (or rezoned to) M2.				✓	
Action 4.3a: Identify one or two potential sites for development of a Community Center. The Community Center should be located in an area with high visibility from an arterial or collector street and have a site size of about 10 to 15 acres.		✓			
Action 4.3b: Identify potential sites for development of Neighborhood Centers, as part of Redmond's master planning process. The Neighborhood Centers should be 3 to 5 acres in size and located in areas with existing and/or new residential development along areas with high visibility from an arterial or collector street.		✓			
Action 4.3c: Identify potential sites for development of Village Centers, as part of Redmond's master planning process. The Village Centers should be larger than 3 acres in size and located in areas with existing and/or new residential development.		✓			
Action 4.3d: Evaluate consolidating some commercial zones, when the uses and development standards overlap.		✓			
Action 4.3e: Update Redmond's zoning standards to allow Community or Neighborhood Centers to include a mixture of commercial and residential uses.		✓			
Action 4.3e: Update Redmond's zoning code to ensure that critical zoning standards match those necessary to support development of Community or Neighborhood Centers.		✓			
Action 4.4a: Redmond South US 97 Corridor Plan should be amended to include development of residential uses, as part of the mixture of uses within the redevelopment area.			✓		
Action 4.5a: The City should work with the regional economic development partners to attract and grow businesses that want to locate at the Redmond Airport and understand the opportunities and constraints of locating at an airport.	✓				

Implementation Actions	Implementation Schedule				
	On-going	Within 1 year	Within 2 years	2 to 5 years	5 + years
Policy 5. Existing Business Retention, New Business Development, and Attraction of New Businesses					
Action 5.1a: Develop a 3-year Economic Development Strategy and Economic Resiliency Plan, collaborating with REDI from their 3-year Economic Development Strategy.			✓		
Action 5.1b: As part of the developing the Economic Development Strategy and Economic Resiliency Plan, establish a framework for decision making about future economic development investments, with the goal of making investments with will make the best use of Redmond's economic assets and provide additional economic development benefits.			✓		
Action 5.1c: Ensure that Redmond's development code and other policies accommodate development of childcare centers.		✓			
Action 5.2a: The City should work with economic development stakeholders and regional partners to market commercial and industrial sites in Redmond to encourage economic growth.	✓				
Action 5.2b: The City should focus efforts to attract jobs with an average wage of $50,000 or more to Redmond. This is an approximate family wage in Redmond and is considerably above Redmond's average wage of $41,700.	✓				
Action 5.2c: The City should focus efforts to attract jobs that are above the Redmond average wage of $41,700, above the industry's average wage in Deschutes County, or both.	✓				
Action 5.2d: Identify opportunities to use the City's existing Enterprise Zone to support business development, combining benefits of the Enterprise Zone with other approaches to supporting business development, such as reductions in land use and permit fees or expedited permit review, where appropriate.	✓				
Action 5.3a: Continue to actively participate on the Boards of REDI and EDCO and actively	✓				

Implementation Actions	Implementation Schedule				
	On-going	Within 1 year	Within 2 years	2 to 5 years	5 + years
work with the Redmond Chamber of Commerce.					
Action 5.3b: Continue to actively participate with regional planning efforts through participation in COIC.	✓				
Action 5.3c: Coordinate economic development efforts with other cities and counties in the Central Oregon Region, through participation in COIC.	✓				
Action 5.4a: City staff should work with businesses, the City Council, the Redmond Chamber of Commerce, REDI, and other stakeholders on economic development issues, as part of development of the Economic Development Strategy and Economic Resiliency Plan.			✓		
Action 5.4b: City staff should work with Redmond Chamber of Commerce reach out to businesses in Redmond and identify problems and barriers to economic development.	✓				
Action 5.4c: Act as a convener to bring partners together with landowners and developers to lower or remove barriers to development.	✓				
Action 5.4d: Work with REDI on recruitment efforts to identify barriers to business growth and propose solutions to lower or remove the barriers.	✓				
Action 5.4.e: Work with EDCO to support entrepreneurship through programs such as their Venture Catalyst program.	✓				
Policy 6. Workforce development					
Action 6.1a: Evaluate gaps in the training and educational services to ensure that Redmond's workforce can meet changing needs of businesses. If gaps are identified, Redmond should assist regional partners involved in workforce development in developing and implementing a plan to fill the gaps to make sure that necessary training and educational services are available.			✓		

Revised Commercial and Industrial Policies

Policies, Objectives, and Actions

Policy 1. Land Supply: The City will plan for a 20-year supply of suitable commercial and industrial land on sites with a variety of characteristics (e.g., site sizes, locations, visibility, and other characteristics).

Objective 1.1: Provide for an adequate supply of commercial and industrial land to accommodate the types and amount of economic development and growth anticipated in the future, as described in the City's most recent Economic Opportunities Analysis. The supply of commercial and industrial land should provide a range of site sizes and locations to accommodate the market needs of a variety of commercial and industrial employment uses. Some commercial development should occur in newly master planned residential neighborhoods.

Action 1.1a: Identify land to rezone (and re-designate) to provide for an adequate supply of commercial and industrial land and make efficient use of land. Some of land to rezone will likely be in the UH-10 zone on the west side of Redmond (consistent with Action 1.1b).

Action 1.1b: As part of the City's master planning process, identify commercial and employment land in or near to newly developing neighborhoods to provide opportunities for commercial employment centers, retail, and services to develop near new residential development. Areas in the UH-10 zone where the City may want to zone for Mixed-Use development include along the Highway 126 Corridor between 35th Street and Helmholtz.

Objective 1.2: Provide for an adequate short-term supply of suitable commercial and industrial land to respond to economic development opportunities as they arise.

"Short-term supply" means suitable land that is ready for construction usually within one year of an application for a building permit or request for service extension. "

Action 1.2a: As commercial and industrial sites develop, especially sites larger than five acres, the City should plan for replenishment of land in the short-term supply through the capital improvement planning process (consistent with Policy 3).

Action 1.2b: The City's Planning and Public Works departments should coordinate planning to ensure an on-going short-term supply of land. This planning could be based on development of scenarios of likely near-term future development, with feedback from partners such as REDI and other utility providers to understand both opportunities and infrastructure constraints.

Objective 1.3: Monitor and replenish the total and short-term supply of commercial and industrial land on a regular, periodic basis.

Action 1.3a: Develop and implement a system to monitor the supply of commercial and industrial lands. This includes monitoring commercial and industrial development (through permits) as well as land consumption (e.g. development on vacant, or redevelopable lands). Continue to assess permitted uses on commercial and industrial lands with the goal to attract businesses with higher-than-average wages.

Action 1.3b: Update the Economic Opportunities Analysis every two to five years, in coordination with other infrastructure master plans, to evaluate development of Redmond's target industries and buildable lands inventory to track employment growth and changes in Redmond, improvements to infrastructure, and changes in the regional economy occur.

Policy 2. Large-Lot Industrial Land Supply: Continue to coordinate with the Central Oregon Intergovernmental Council (COIC) on the large lot industrial site program. The City supports a multi-jurisdictional cooperative effort to pursue a regional approach to establish a short-term supply of sites particularly designed to address out-of-region industries that may locate in Central Oregon. The City recognizes the importance of maintaining a large-lot industrial land supply that is readily developable in Central Oregon.

The City entered into an Intergovernmental Agreement (IGA) with COIC. In addition, Redmond adopted the Central Oregon Regional Large Lot Industrial Land Need Analysis ("Analysis", dated November 20, 2012) by Ordinance 2013-15 is incorporated by reference herein.

Objective 2.1: The City supports REDI and EDCO, non-profit organizations facilitating new job creation and capital investments, that monitor and advocate for the region's efforts of maintaining an inventory of appropriate sized and located industrial lots available to the market.

Objective 2.2: The City will continue to collaborate with regional public and private representatives to engage the Oregon Legislature and state agencies and their commissions to address public facility, transportation and urbanization issues that hinder economic development opportunities in Central Oregon.

Objective 2.3: The City will limit allowed uses on the Large Lot Industrial site to traded sector uses but may allow non-industrial uses primarily serving the needed of the employees of industrial uses developed on the site, as required by OAR 660-024-0045(10).

Objective 2.4: The City will preserve the Large Lot Industrial land for large-lot industrial uses for at least 10 years from the time the site is added to the city, prohibit division of lots within the site to new lots less than the minimum size of the site until the site is developed with a primary traded sector use requiring a large lot, and , as required by OAR 660-024-0045(9).

Objective 2.5: The City will work with partners to support development of the Large Lot Industrial site.

Action 2.5a: Identify opportunities to work with land owners and other project partners to support development through efforts to market the land to potential developers and businesses.

Action 2.5b: Encourage land owners to get the sites certified shovel ready through the Business Oregon Certified Shovel Ready program.

Policy 3. Infrastructure Planning: Provide adequate infrastructure efficiently and fairly to support business and employment growth.

Objective 3.1: The City will coordinate capital improvement planning to ensure infrastructure availability on employment land and continue to pursue funding for needed infrastructure to support economic development activities.

Action 3.1a: Consider development of employment land as a criteria for evaluating priority of capital improvements.

Action 3.1b: Coordinate capital improvement planning annually to incorporate the priorities in the City's Economic Development Strategy (See Action 5.1a).

Action 3.1e: Work with landowners to develop master plans to prepare for and guide development of key industrial sites.

Objective 3.2: The City will ensure that infrastructure planning is cost-effective, supports economic development, is consistent with the City's master plans for new area development, and supports cohesive development patterns across the City.

Objective 3.3: The City will identify opportunities for forward-thinking planning that reduces infrastructure costs without negative impacts on the health, safety, or service obligations of the City.

Objective 3.4: The City will work to ensure sufficient water service is available in commercial and industrial areas to support the necessary water for fire suppression, as part of making sure the City has a sufficient short-term supply of land (consistent with Objective 1.2). The City will provide information to landowners and potential developers about where sufficient water service is available.

Objective 3.5: The City will work with partners such as Business Oregon to advocate for state funding to support infrastructure development.

Objective 3.6: The City and REDI will coordinate with developers and private utility providers (such as power companies or natural gas companies) to ensure that need for private utilities is understood and can be accommodated.

Policy 4. Development, Infill Development, and Redevelopment: The City will support and encourage development, infill development and redevelopment, especially in areas with existing infrastructure, as a way to use land and existing infrastructure more efficiently.

"Infill" is additional development on the vacant portion of a tax lot with existing development (i.e., putting a new building on a 2-acre tax lot where the existing building occupies one-half of an acre).

"Redevelopment" is when an existing building is demolished and a new building is built, adding additional capacity for more employees. Redevelopment could also include substantial renovations of an existing building that increases the employment capacity of the building.

Objective 4.1: Work with regional partners, such as the Department of State Land (the landowner), REDI, EDCO, and Business Oregon, to plan for development of the Large Lot Industrial land within Redmond.

Objective 4.2: Ensure that there are sufficient available small industrial sites, such as sites in industrial parks. Redmond has a limited amount of industrial parcels smaller than five acres and relatively few vacant industrial buildings. Businesses that want a small site or industrial site in an existing building, have difficulty finding appropriate sites.

Action 4.2a: Develop standards and processes to allow more flexibility for subdivision of smaller parcels in existing industrial parks and on other industrial parcels (except for land zoned Large-Lot Industrial).

Action 4.2b: The City could develop a land use process template for subdividing M1 and M2 parcels into smaller sites, to make it easier, faster, and less costly for landowners or developers to subdivide existing sites. This template could include pre-approved subdivision plans.

Action 4.2c: Identify at least one site for a new industrial park, likely on land zoned (or rezoned to) M2.

Objective 4.3: Provide opportunities for development of commercial centers that allow for a mixture of retail, commercial, and residential uses, both in master planned areas near new residential development and in redevelopment areas that are appropriate for new commercial development. For development of larger commercial centers, Redmond should focus on development of Community or Neighborhood Centers.[1]

Action 4.3a: Identify one or two potential sites for development of a Community Center. The Community Center should be located in an area with high visibility from an arterial or collector street and have a site size of about 10 to 15 acres.

[1] Based on definitions of commercial centers from the International Council of Shopping Centers. These definitions are included in the EOA, in the section titled "Site Needs for Potential Growth Industries."

Action 4.3b: Identify potential sites for development of Neighborhood Centers, as part of Redmond's master planning process. The Neighborhood Centers should be 3 to 5 acres in size and located in areas with existing and/or new residential development along areas with high visibility from an arterial or collector street. Redmond may have greater need for new Neighborhood Centers on the west side of town, where residential development is occurring and planned.

Action 4.3c: Identify potential sites for development of Village Centers, as part of Redmond's master planning process. The Village Centers should be larger than 3 acres in size and located in areas with existing and/or new residential development. Redmond may have greater need for new Village Centers on the west side of town, where residential development is occurring and planned.

Action 4.3d: Evaluate consolidating some commercial zones, when the uses and development standards overlap. For example, the C-5 (Tourist Commercial), C-3 (Special Service Commercial), and C-4 (Limited Service Commercial) zones could be merged together or in some cases removed entirely. Creation of a mixed-use commercial center zone or overlay is a flexible zone to enable more cohesive master planning.

Action 4.3e: Update Redmond's zoning standards to allow Community or Neighborhood Centers to include a mixture of commercial and residential uses. Currently, Redmond's zoning code allows mixed-use development in C-2 and MULW zones; entertainment, eating, and drinking uses in C-1, C-2, C-3, M-1, and M-2; retail uses in C-1, C-2, C-3, and MULW; high-density residential in C-1 and C-2; and office commercial uses in C-1, C-2, and some limited uses in M-1 and M-2.[2]

Uses allowed	C-1	C-2	C-3	MULW	M-1	M-2
Mixed use development	✓	✓	X	✓ (live/work)	X	X
Entertainment/ Eating and Drinking	✓	✓	✓	X	✓	✓
Retail uses (Primary)	✓	✓	✓	✓	X	X
High-density residential	✓	✓	X	X	X	X
Office services	✓	✓	X	X	✓ (limited)	✓ (limited)

[2] ✓ = Allowed outright in current Redmond Development Code; X = Not allowed in current Redmond Development Code

Action 4.3e: Update Redmond's zoning code to ensure that critical zoning standards match those necessary to support development of Community or Neighborhood Centers. Currently, Redmond's zoning code meets building height standards typical of Community or Neighborhood Centers. However, Redmond's code does not align with other typical development standards, such as minimum lot area, setbacks, lot coverage, and residential density.

Zoning Standards	C-1	C-2	C-3	MULW	M-1	M-2
Maximum building height: 70 feet	✓ 60	✓ 50/60	✓ 60	✓ 45	✓ 60	✓ 60
No minimum lot area	X*	X*	X*	X 5,000 sq ft (only applies to non-res use)	X*	X*
No minimum building setback	X	X	X	X	X	X
Minimum density: 25-50 du/acre	✓ No density max in code *update*	✓ No density max in code *update*	✓ No density max in code *update*	✓ No density max in code *update*	X (No res allowed)	X (No res allowed)
Parking standards	ECO will evaluate parking standards in the next version of this memorandum.					
Flexible Design Standards	Redmond's commercial design standards appear sufficiently flexible.					

*Redmond development code notes: "The minimum lot size shall be determined based on demonstration of the ability to develop the site in accordance with the zone standards, off-street parking standards, Site & Design Review Standards, landscaping requirements and other applicable Development Code provisions without adverse impact to water and land resource quality and adjoining properties."

Objective 4.4: Plan for and facilitate commercial redevelopment in Downtown and along Highway 97 and other major transportation corridors. The Redmond Urban Renewal Plan provides tools to support redevelopment in Downtown. The Urban Renewal Plan proposes tools such as: a property assistance grant or loan program, business support programs that provide funding for business development and marketing, the restaurant program that provides public financing of costly kitchen equipment, an industrial opportunity fund for financial incentives and development incentives for industrial businesses, and the redevelopment opportunity fund that would fund development of amenities in downtown. The City of Redmond developed the Redmond South US 97 Corridor Plan and is in the process of implementing the plan.

Action 4.4a: Redmond South US 97 Corridor Plan should be amended to include development of residential uses, as part of the mixture of uses within the redevelopment area.

Objective 4.5: Support and encourage business location at the Redmond Airport, focusing on businesses that benefit from locating at the Airport. The types of businesses that may locate at the Airport are aviation-related businesses, such as general aviation facilities, passenger terminal complexes, air cargo or airline maintenance facilities, support facilities including Aircraft Rescue and Firefighting (ARFF) facilities, and any compatible uses which compliments aviation uses. Non-aviation businesses may locate on the Airport property, as identified in the subareas of the Redmond Airport Master Plan. These businesses include those identified as "target industry sectors," such as accommodation and food services, speculative light industrial buildings, construction, manufacturing, wholesale and warehousing, public administration, and gas station/convenience store.

Action 4.5a: The City should work with the regional economic development partners (such as those listed in Objective 5.3) to attract and grow businesses that want to locate at the Redmond Airport and understand the opportunities and constraints of locating at an airport.

Policy 5. Existing Business Retention, New Business Development, and Attraction of New Businesses: The City will support retention and expansion of existing businesses, growth and creation of entrepreneurial business, and attraction of new businesses.

Objective 5.1: Ensure that the City's planning for economic development increases economic resiliency, mitigating long-run economic risks such as future disruptions such as: infrastructure issues, technological disruptions, natural disasters, or national economic recessions.

Action 5.1a: Develop a 3-year Economic Development Strategy and Economic Resiliency Plan, collaborating with REDI from their 3-year Economic Development Strategy. The Strategy could use data on local and regional economic trends gathered through the Economic Opportunity Analysis, from goals established in the Comprehensive Plan and from interviews with local citizens, business owners, schools, and professionals. The Plan should emphasize economic resiliency and should have a broader focus than land use, considering issues such as workforce development and collaborating with business to support business growth. The Plan should help the City prioritize goals around long-term economic resiliency.

Action 5.1b: As part of the developing the Economic Development Strategy and Economic Resiliency Plan, establish a framework for decision making about future economic development investments, with the goal of making investments with will make the best use of Redmond's economic assets and provide additional economic development benefits.

Action 5.1c: Ensure that Redmond's development code and other policies accommodate development of childcare centers.

Objective 5.2: Promote and support diversification of Redmond's economic base, focusing on growth of family wage jobs. The types of industries Redmond should focus on include

advanced and specialty manufacturing, aviation and aerospace manufacturing, healthcare technology and manufacturing, food and beverage manufacturing, and service and hospitality.

Redmond defines a family wage job as a job with a wage sufficient to allow a household to purchase a home in Redmond. In the first quarter 2020, the mean sales price of a house in Redmond was $323,000.[3] A household would need to have an income of $85,000 to afford a unit at this price.[4] On average, there are 1.7 jobs per household in Redmond. This suggests that a family wage in Redmond is $50,000. This is considerably above Redmond's average wage of $41,700.

Action 5.2a: The City should work with economic development stakeholders (such as those in 5.3) and regional partners to market commercial and industrial sites in Redmond to encourage economic growth.

Note to reviewers: Past discussions were clear that the Committee wants to focus efforts on attracting jobs with higher than average wages. We discussed a "family wage" job, which is shown below in Action 5.2b. The wages needed for a family wage job are much higher than average wages in Redmond. An alternative could be focusing less on a specific wage target and focusing on above average wages, as in Action 5.2c.

Action 5.2b: The City should focus efforts to attract jobs with an average wage of $50,000 or more to Redmond. This is an approximate family wage in Redmond and is considerably above Redmond's average wage of $41,700.

Action 5.2c: The City should focus efforts to attract jobs that are above the Redmond average wage of $41,700, above the industry's average wage in Deschutes County, or both.

Action 5.2d: Identify opportunities to use the City's existing Enterprise Zone to support business development, combining benefits of the Enterprise Zone with other approaches to supporting business development, such as reductions in land use and permit fees or expedited permit review, where appropriate.

Objective 5.3: Coordinate economic development efforts with cities in the region and local and regional economic development organizations, including but not limited to REDI, COIC, EDCO, Deschutes County, the Redmond Chamber of Commerce, Business Oregon, the Regional Solutions team, and the Central Oregon Small Business Development Center. In addition, coordinate economic development with regional private utilities, such as Pacific Power, Central Oregon Electric, Bonneville Power Administration, Cascade Natural Gas Corporation, telecommunication providers, and other private utilities.

Action 5.3a: Continue to actively participate on the Boards of REDI and EDCO and actively work with the Redmond Chamber of Commerce.

Action 5.3b: Continue to actively participate with regional planning efforts through

[3] Source: Central Oregon Association of REALTORS, 2020 Quarter 1 Report.

[4] This assumes that the household puts 20% down on the unit, with a 30-year mortgage at an interest rate of 4.0%.

participation in COIC.

Action 5.3c: Coordinate economic development efforts with other cities and counties in the Central Oregon Region, through participation in COIC.

Objective 5.4: Retain and encourage growth of existing businesses in Redmond, including retention of small businesses and entrepreneurs.

Action 5.4a: City staff should work with businesses, the City Council, the Redmond Chamber of Commerce, REDI, and other stakeholders on economic development issues, as part of development of the Economic Development Strategy and Economic Resiliency Plan in Action 5.1a .

Action 5.4b: City staff should work with Redmond Chamber of Commerce reach out to businesses in Redmond and identify problems and barriers to economic development.

Action 5.4c: Act as a convener to bring partners (such as those in Objective 5.3) together with landowners and developers to lower or remove barriers to development.

Action 5.4d: Work with REDI on recruitment efforts to identify barriers to business growth and propose solutions to lower or remove the barriers. This will require the City's policies to be as flexible as possible and the City to act quickly and nimbly in response to requests and issues.

Action 5.4.e: Work with EDCO to support entrepreneurship through programs such as their Venture Catalyst program.

Objective 5.5: Ensure that Redmond has the services and amenities necessary to attract workers and provide the services they need, such as medical services, child care services, educational and training opportunities, public transportation, retail and restaurants, and other necessary services and amenities.

Objective 5.6: Ensure that Redmond has the services and amenities necessary to for residents of Redmond. These services and amenities include those in Objective 5.6 but also include parks and open space, public library, and public safety services. Redmond should also ensure that there are opportunities for development of housing and services for seniors, such as assisted living and other senior housing opportunities.

Policy 6. Workforce development: The City will support workforce development through collaboration with regional partners and businesses.

Objective 6.1: Act as a convener to support discussions about workforce training needs between businesses and regional partners involved in workforce development, such as the Redmond School District, the Central Oregon Community College, OSU Cascades, East Cascades Works, Worksource Oregon Employment Department, Deschutes County human services, and other partners.

Action 6.1a: Evaluate gaps in the training and educational services to ensure that

Redmond's workforce can meet changing needs of businesses. If gaps are identified, Redmond should assist regional partners involved in workforce development in developing and implementing a plan to fill the gaps to make sure that necessary training and educational services are available.

Appendix A: Redmond's Existing Comprehensive Plan Policies

Chapter 9
ECONOMIC DEVELOPMENT

The City of Redmond is experiencing a period of economic growth unparalleled in its history. The light industrial and service sectors have expanded significantly, with the bulk of new jobs since 1990 coming from small businesses. Factors which contributed to the development of these new businesses and jobs include a considerable inventory of vacant and competitively priced commercial and industrial lands; the location of Central Oregon's only commercial airport, Roberts Field, in Redmond; the availability of the State sponsored Enterprise Zone; the livability of the Central Oregon area, and the marketing of the community by the Redmond Economic Development Inc. (REDI) and Economic Development for Central Oregon (EDCO).

The following goal statements describe Redmond's future economic hopes. These goals provide the foundation for the economic policies in this chapter.

GOALS

1. Expand, improve and diversify the economy of the Redmond Urban Growth Boundary area while maintaining Redmond's quality of life.
2. Provide family wage employment opportunities for area residents.
3. Retain or create industrial, office, professional services, technology, medical, tourism, retail and other jobs through expansion and retention of existing businesses and recruitment of new businesses.
4. Improve the appearance of the community's employment districts, particularly along Highways 97 and 126, the Downtown, central east side industrial areas, and the Airport/Fairgrounds area.
5. Allow mixed used employment and commercial uses in outlying areas of the community as neighborhood centers to provide opportunities for citizens to reside near employment and service destinations.
6. Provide for an attractive, interesting, and convenient downtown as a place to do business, work, shop, reside, visit, socialize, and celebrate the community
7. Preserve our historic legacy as reflected in place names, parks, art, buildings and traditions.
8. Protect industrial lands from being converted to commercial uses, while allowing limited service commercial uses that directly support industrial areas.
9. Provide, maintain, and promote the enhancement of state of the art infrastructure, including, but not limited to, transportation systems, sewer, water, natural gas, power, telecommunications and air service to support the commercial and industrial needs of the community.
10. The City and County shall continue to work cooperatively with the State and Federal government and economic development agencies to implement economic development within the Redmond Urban Growth Boundary.

11. Maintain Redmond's favorable employment to housing ratio by taking affirmative steps to ensure economic development and employment growth keeps pace with population growth, especially for industrial employment.
12. To build a strong and thriving regional economy by coordinating public investments, policies and regulations to support regional and state economic development objectives in Central Oregon as determined through the Central Oregon Large Lot Industrial Land Need Analysis.

POLICIES
INDUSTRIAL DEVELOPMENT

Lands

1. Sufficient vacant industrial lands with a diversity of sizes, types, and service levels for future industrial development shall be designated on the comprehensive plan/zoning map.
2. Publicly owned lands shall not be given a competitive advantage over private ownership through governmental land use regulations.
3. Industrial areas should be set aside primarily for industrial activities. Other supporting uses, including some retail uses, may be allowed if limited to sizes and locations intended to serve the primary uses and the needs of people working or living in the immediate industrial areas.

Appearance

4. Industrial developments along state highways shall be subject to development standards relating to setbacks, landscaping, signs, exterior lighting, parking, building height, massing and visual impacts, architectural styles and outside storage.

Campus Industrial Park

5. Mixed use employment zoning shall be provided for offices, professional services, medical uses, light industrial and supporting commercial (e.g., restaurants) and recreational uses (e.g., golf course). The City shall adopt a mixed-use employment zone at the time of the next Comp Plan update.

Airport

6. The Airport Master Plan for Roberts Field shall be adopted by reference as a part of the Comp Plan. Updates to the Airport Master Plan shall be treated as amendments to the Comp Plan, excepting changes to the Plan required by the Federal Aviation Administration (FAA), or insignificant changes such as (including but not limited to): changes to air carriers, amended passenger forecasts, changes to flight schedules, and other such changes that do not affect the overall airport operation as contemplated in the adopted Airport Master Plan. Not included among the exceptions are changes to Airport Layout Plan (ALP) that were not required by the FAA, or any physical changes that were not included or contemplated in the adopted Airport Master Plan. Notwithstanding these exceptions, all changes shall be included in the Airport Master Plan as the plan is updated on a periodic basis.
7. An Airport Zone shall be established for those lands committed for the airport and aviation uses.

The Environment

8. Uses within the industrial zones shall not significantly impair the quality of surface or ground water or air resources.

Infrastructure

9. The City should give a high priority to extending and improving the infrastructure needed for economic development.

Incentives

10. The City shall provide an incentive program encouraging the development of primary industry family wage jobs.
11. The City should provide incentives and innovative ways to encourage and promote an inventory of available industrial buildings and a pre-approved process to attract industrial uses.

COMMERCIAL DEVELOPMENT

General Objectives

12. The following shall be the general objectives of the Redmond urban area concerning overall commercial development to:

1. a) Protect and insure the permanency of the Central Business District (CBD) as a vital economic base and to maximize customer access and exposure, and convenience.
2. b) Encourage landscaping and other forms of city beautification for the purpose of enhancing the physical character of commercial areas and the city overall.
3. c) Maintain alleyways as viable pedestrian walkways in the CBD area and to promote an atmosphere therein for pedestrian traffic.

4. Solve the problems of parking within the CBD area and to prevent or minimize such problems in other and new commercial development.
5. e) Increase customer convenience and accessibility to downtown businesses, minimize congested traffic conditions and pedestrian/auto conflicts, and generally promote the downtown area.
6. f) Focus community efforts to improve the overall appearance of existing commercial areas and encouraged to all new developments.
7. g) Encourage new commercial areas in developing neighborhoods to be clustered in mixed-use neighborhood commercial centers rather than as strips along major roads.
8. h) Establish development standards for all commercial areas and particularly for those that are planned within mixed-use centers and in areas where commercial and industrial uses are adjacent to residential areas.
9. i) Rehabilitate or re-develop older commercial areas in order to retain their values to the community, including the Downtown and Highway 97 corridor after the highway is re-routed to a limited access corridor.

Lands

13. Sufficient vacant commercial lands with a diversity of sizes, types, and service levels for future commercial uses shall be designated on the comprehensive plan/zoning map consistent with the Economic Opportunities Analysis and Buildable Lands Analysis.
14. Redmond shall evaluate, and potentially expand, the boundaries of the central business district as the community grows to ensure the downtown area is adequate to meet the needs of a growing population.

Appearance

15. The exterior of designated historic buildings should be rehabilitated to their original, architectural quality with careful application of design standards relating to signage,

    architectural detail and ornamentation. Historically significant buildings shall be inventoried and documented with photographs.

16. The City shall develop standards relating to appearance and neighborhood compatibility.
17. Large retail development shall comply with design standards relating to appearance and neighborhood compatibility.

Central Business District (CBD)

18. Implement the 2006 Downtown Plan. The Plan outlines public, private and non-profit investment strategies, and establishes architectural design standards, a parking management plan, and business development plan within the downtown.
19. Within the CBD alleyways should be maintained and used as pedestrian walkways, for rear entrance delivery and/or customer access.
20. Downtown park plazas shall be developed and/or expanded.
21. Conflicts between parking and moving traffic, especially on 5th and 6th streets should be minimized.
22. Pedestrian access to, though, and within the CBD should be improved by providing safe, continuous sidewalks with well-marked street intersection crossings. Connections to the surrounding neighborhoods and the Dry Canyon should be prioritized.
23. Bicycle access to, through and within the CBD should be improved on roadways and alleyways and secure bike parking areas should be provided by businesses.
24. Secure and safe bike storage areas should be developed.
25. Sidewalk and street activity that will stimulate pedestrian traffic should be encouraged.
26. The City shall consider incentives to preserve historically significant buildings in the Downtown Core.
27. Commercial development should be based on the following goals, guidelines and principles:
    1. a) Separation of pedestrian and through motor vehicle traffic.
    2. b) Grouping of retail opportunities conducive to pedestrian shopping movement.
    3. c) Convenient, identifiable and accessible parking.
    4. d) Major highway traffic should be routed around the CBD but provide convenient

       access to commercial areas and their parking facilities.

    5. e) Incorporate inter-parcel connectivity between adjacent commercial developments
    6. f) Encourage wherever possible shared/joint access to adjacent commercial

development from adjacent public streets.

7. g) By-pass industrial and truck traffic around commercial areas, particularly the CBD.

8. h) Improve CBD shopping environment through investment in public amenities such as pedestrian furnishings, public gathering spaces, lighting and signage.

28. The permanency of the CBD commercial area shall be protected and maintained by encouraging CBD compatible businesses as defined below to locate or expand within or adjacent to that area identified as the CBD.
    1. a) Professional services
    2. b) Product-oriented businesses such as grocery, variety, drugs, clothing, home furnishings, art galleries, hardware, specialty products, etc.
    3. c) Service-oriented businesses such as laundry, beauty salons, barber shops, shoe repair, household repair and products, etc.
    4. d) Entertainment facilities such as cafes, restaurants, brew pubs, theaters, guest lodging, and travel services.
    5. e) Governmental service offices.
29. C-1 (strip commercial) commercial type businesses, big box retail/wholesale and drive-thru businesses are incompatible with the CBD.
30. 30. A concerted effort should be made to revitalize the CBD through rehabilitation or redevelopment of existing areas and buildings.

Neighborhood Commercial

31. Small neighborhood stores, which provide a limited number of products and services for adjacent and nearby residential areas, shall be recognized and provisions for such uses shall be provided in City development regulations.
32. Neighborhood commercial centers that serve the needs of people in the immediate area shall be provided for and regulated as mixed use districts. Neighborhood Commercial Centers should be appropriately spaced in the areas shown on the Redmond Urban Framework Plan and when appropriate, shown as Master Development Plans. These Centers should be planned to serve at least 5,000 residents. Higher residential densities are required in the vicinity of the Center and densities may decrease as distance increases from the Center. The intent is to have higher density close to the Center. Other Neighborhood Centers may be focused around a civic land use, such as a library, cultural activity, school, or public service facility.

Highway Commercial Development

33. Commercial development adjacent to arterial streets and State highways shall be subject to access restrictions.
34. C-1 commercial development along Highway 97 shall be encouraged to provide service access roads which feed into arterial and collector streets at designated points.
35. C-1 commercial developments shown on the plan along highways should not be extended.
36. At the time of the next Comp Plan update, the City should review and analyze the land uses occurring around the North "Y" and in the US Highway 97 corridor that are impacted by the highway re-location.
37. The City shall encourage "nodal" (compact, mixed use) commercial development and integrated shopping centers with consolidated access points and inter parcel connectivity as a means for reducing traffic impacts on the transportation system.

Tourist Commercial

38. The City shall encourage tourist-related commercial development aimed at attracting investment in businesses serving tourism, and recreation oriented businesses near the fairgrounds. Expand winter tourism activities and events.

Signs

39. Sign standards should be designed to enhance the appearance of the city and provide for the advertising needs of the business community.

Housing in Downtown and Neighborhood Commercial Areas

40. The City shall encourage and provide incentives for attracting housing in the downtown core area consistent with the requirements, goals and objectives of the Downtown Urban Renewal District and Downtown Design Plan.
41. Housing shall be permitted over ground floor commercial uses in the Downtown, Neighborhood Commercial and in Mixed Use Centers.
42. Housing of medium to high density should be encouraged and promoted close to and within the CBD and Neighborhood Commercial Centers.

Parking

43. Alternatives must be considered and deemed infeasible before any historically significant building is demolished to make way for a parking lot or garage in the CBD.
44. The public and private sector should work together to develop and implement a plan to provide an adequate supply of clearly signed and designated parking in the Central Business District for customers, patrons, employees and residents.

Central Oregon Large Lot Industrial Need Analysis
Background
During the 1990s, the Central Oregon region experienced a dramatic transformation from an economy concentrated largely on wood products into a service-based economy serving a growing and diverse tourism and household base. Accelerated in-migration and tourism growth gave way to rapid economic expansion, escalation in home prices, and a systematic shift in the local economy from goods producing activities to service oriented industries. While initially

representing a diversification of the local economy, this shift led to an over-reliance upon these types of industries.

During the recent recession, the regional economy's vulnerabilities became apparent. Suitable land for today's industrial development forms emerged as one of Oregon's most severe development challenges. In 2010, 2011, and 1012, Deschutes, Crook and Jefferson counties and their respective cities, undertook an unprecedented regional evaluation of the economic opportunities and constraints associated with users of large industrial parcels in the Central Oregon region. The purpose of this evaluation was to aid in providing a more diversified economic base for the region that would accommodate industrial uses with a need for larger lots than possibly may be currently available in any of the Central Oregon cities. As part of that evaluation, Deschutes County hired a consultant to draft an analysis of Central Oregon's opportunities, competitiveness, ability and willingness to attract more basic industries. The analysis focused specifically on industries that require large lots. The result was a document called the Central Oregon Regional Opportunity Analysis, and was the basis for adopting Deschutes County Ordinance 2011-017, dated May 31, 2011.

Ordinance 2011-017 was appealed to the Land Use Board of Appeals by 1,000 Friends of Oregon ("1,000 Friends"). The appeal was stayed in early 2012 to allow Deschutes County, the Governor's Office, and 1,000 Friends to explore a settlement, which was ultimately reached in April, 2012. The settlement consisted of policy concepts focusing entirely on Central Oregon's

short-term need for large-lot industrial sites as well as a commitment from the Department of Land Conservation and Development ("DLCD") to initiate rule-making that summer. The three counties, their respective cities, 1,000 Friends, and DLCD staff then engaged in drafting a proposed rule. In August, the final draft of the rule was then sent to the Oregon Land Conservation and Development commission ("LCDC"). As a result, in November, the LCDC adopted Oregon Administrative Rule (OAR) 660-024-0040 and 660-024-0045. That rule provides that the large lot industrial land need analysis agreed upon by all of the parties, once adopted by each of the participating governmental entities, would be sufficient to demonstrate a need for up to nine large industrial sites in Central Oregon. Six of the sites will be made available initially. Three more sites may be added under the rule as the original sites are occupied. After the adoption of the new OARs, Deschutes County (as the initiating entity for the REOA and the subsequent settle agreement and Central Oregon Large Lot Industrial Land Need Analysis), voluntarily repealed Ordinance 2011-017 and adopted a new ordinance, Ordinance 2013-002, in accordance with the OARs (which added the Central Oregon Large Lot Industrial Land Need Analysis and corresponding policies into their Comprehensive Plan). Following the lead of Deschutes County and under the direction of the settlement agreement and new Administrative Rules, the City of Redmond is adopting the Central Oregon Large Lot Industrial Land Need Analysis and corresponding policies in order to be considered for large lot industrial sites.

An additional necessary component is an intergovernmental agreement ("IGA") between the region's jurisdictions and the Central Oregon Intergovernmental Council ("COIC"). Through IGA, COIC will provide oversight of the short-term land supply of large-lot industrial sites to enable the region to become competitive in industrial recruitment.

Once each of the three counties and their respective cities adopt similar ordinances and enter into an IGA with COIC, the large lot sites will enable industrial recruitment opportunities to attract potential industrial users to consider the region that may not have otherwise without the

availability of these large lots. Participating local governments will review the program after all nine sites have been occupied or after ten years, whichever comes first.

45. The City supports a multi-jurisdictional cooperative effort to pursue a regional approach to establish a short-term supply of sites particularly designed to address out-of-region industries that may locate in Central Oregon.
46. The City recognizes the importance of maintaining a large-lot industrial land supply that is readily developable in Central Oregon.
47. The Central Oregon Regional Large Lot Industrial Land Need Analysis ("Analysis", dated November 20, 2012), adopted by Ordinance 2013-15 is incorporated by reference herein.
48. Within six months of the adoption of Ordinance 2013-15, in coordination with the participating local governments in Central Oregon, the City of Redmond will participate in an IGA with the COIC that specifies the process of allocation of large lot industrial sites among the participating local governments.
49. The City supports EDCO, a non-profit organization facilitating new job creation and capital investment to monitor and advocate for the region's efforts of maintaining an inventory of appropriate sized and located industrial lots available to the market.
50. The City will continue to collaborate with regional public and private representatives to engage the Oregon Legislature and state agencies and their commissions to address public facility, transportation and urbanization issues that hinder economic development opportunities in Central Oregon.

Appendix B: Economic Development Tools

The City of Redmond is in the process of developing an economic opportunities analysis and updating its Comprehensive Plan policies for economic development. This appendix presents potential economic development actions that cities take to increase economic activities. **The purpose of this appendix is to provide information and ideas to Redmond staff and stakeholders, as they develop economic development policies and actions to implement those policies.** This appendix is not intended to be adopted into the Redmond Comprehensive Plan.

A wide range of economic development policies and actions are available to cities for influencing the level and type of economic development. It is useful to make a distinction between economic development policies, which are typically adopted by ordinance into local comprehensive land use plans, and a local economic development strategy. While policies and economic development strategies should be aiming to achieve the same outcomes, they are not the same thing. The key differences are (1) economic development strategies are typically presented in the form of a strategic plan that covers a five-year time horizon while policies use the longer 20-year horizon in most comprehensive plans, (2) strategies are more broad reaching and may identify actions that extend outside the capacity of local government while policies focus on land use and infrastructure; and (3) strategies are more agile in the sense that they provide a framework rather than legal guidance.

While many of the actions identified in this appendix could be included either as policies or strategies, the focus is primarily on policies and actions that implement those policies.

Local economic development policy usually has a fundamental goal of supporting businesses that align with a jurisdiction's long-term vision for the community.[5] Economic development broadly focuses on three strategies: (1) business recruitment; (2) business retention and expansion (BRE); and (3) innovation and entrepreneurship. Historically, many cities focused on recruitment as their foundational strategy; however, many cities and economic development are rethinking this approach and local governments are increasingly implementing policies that focus on support for entrepreneurs, especially those starting new businesses.[6]

Recent research on the effectiveness of local economic development efforts support this focus on innovation and entrepreneurship to attract new, young businesses. Providing support for institutions and firms where innovation happens allows for businesses to grow and new businesses to form as industries evolve. Local jurisdictions can specifically provide support for

[5] Based on Leigh and Blakley's definition for sustainable economic development as follows, "Local economic development is achieved when a community's standard of living can be preserves and increased through a process of human and physical development that is based on principles of equity and sustainability. There are three essential elements in this definition, detailed below: First economic development establishes a minimum standard of living for all and increases the standard over time. Second, economic development reduces inequality. Third, economic development promotes and encourages sustainable resource use and production." Leigh, N. and Blakeley, E. *Planning Local Economic Development: Theory and Practice.* 2013.

[6] Kauffman Foundation. "Entrepreneurship's Role in Economic Development." Entrepreneurship Policy Digest. June 2014.

accelerators and incubators, especially those that provide connections between research institutions, established firms, and entrepreneurs. Entrepreneurs are also increasingly mobile with improved access to high-speed internet. Local jurisdictions can promote quality of life and access to amenities as a way to attract these new businesses.[7] Moreover, every start up is also a BRE opportunity.

Economic development is also about collaboration and identifying partnerships that can make the most of the resources available for economic development activities. Local jurisdictions should focus on their role in economic development, as there are factors that the jurisdiction can and cannot control. As identified in a 2017 University of Oregon report on the "Perceptions and Needs of Economic Development Programs in Oregon," organizations and jurisdictions involved in economic development activity supported the importance of coordination between entities, but that implementation of coordinating efforts is difficult due to lack of capacity, unbalanced effort, or trust issues.[8] To help overcome these barriers to coordinating economic development efforts, a key component to developing local economic development policies is identifying which policies and actions that the City is well-suited to be a lead partner, and those better suited for a partner organization to lead. It is important to develop policies and actions that identify other organizations as the lead partner. Successful implementation of these policies and actions will depend on an understanding of an organization's capacity and access to resources.

The focus of the actions listed in this appendix is primarily on the City's role: what resources can the City commit to economic development and what roles are most appropriate for the City. Following are foundational assumptions about the City's role:

- The City plays a support role in economic and business development
- The City is one of several organizations that provide and maintain infrastructure
- The City has limited staff and financial resources that can be invested in appropriate economic development activities
- The City has an obligation to adopt an economic development strategy, policies to manage employment lands, and maintain a 20-year supply of commercial and industrial sites under Goal 9 and OAR 660-009.
- The City is not the ideal organization to coordinate BRE and entrepreneurship activities or to house staff that are coordinating BRE and entrepreneurship activities

The policy and action examples provided in this appendix are organized by broad policy categories, with cross-references to the factors of production that influence business location and expansion. The factors of production are discussed in detail in the EOA document. While it is important to understand how the factors of production influence economic development activity, it is more useful to group policies and actions in broad categories such as, Land Use, Public Facilities, Business Assistance, etc.

[7] Leigh, N. and Blakeley, E. *Planning Local Economic Development: Theory and Practice*. 2013.

[8] University of Oregon, Department of Planning, Public Policy & Management, Community Services Center. "Perceptions and Needs of Economic Development Programs in Oregon." Final Report. December 2017.

The effectiveness of any individual actions or combination of actions depends on local circumstances and desired outcomes. Local strategies should be customized not only to meet locally defined objectives, but also to recognize economic opportunities and limitations (as defined in the Economic Opportunity Analysis). Positive outcomes are not guaranteed: even good programs can result in limited or modest results. It is important to remember that effective economic development requires a long-term view—immediate results are not guaranteed. Thus, maintaining a focus on implementation is essential.

Economic development is a team activity—no single entity can implement all the activities that are necessary for a robust economic development program. Many municipal economic development strategies include actions that rely on other entities to implement. For example, many municipal strategies we have reviewed include strategies and actions around workforce development. Workforce development is not a municipal service, so cities must coordinate with external entities for this function. The main points here are (1) be deliberate about policies / strategies /actions that rely on external partners, and (2) if these are included in the plan, be sure that resources are committed to execute them—understanding that coordination is time-consuming and challenging.

Table 1 identifies a range of potential economic development strategies that the Redmond could consider implementing. These strategies range from those closely associated with the basic functions of government (provision of buildable land and public services) to those sometimes viewed as outside the primary functions of government (such as financial incentives and business assistance). The primary action categories in Table 1 are Land Use, Public Facilities, Business Assistance, Workforce, and Other. As stated above, it is important for Redmond to identify the policies and actions they are well-suited to lead, and where collaboration with, and leadership from, partner organizations is necessary. Table 1 also includes suggestions for potential partners and whether Redmond should take on a lead or support role.

Table 1. Potential economic development actions

Category/Policy Examples	Description and Examples	Potential Partners	City Lead or Support Role	Relevant Factors of Production
Land Use	**Policies regarding the amount and location of available land and allowed uses.**			
Provide adequate supply of land	Provide an adequate supply of development sites to accommodate anticipated employment growth with the public and private services, sizes, zoning, and other characteristics needed by firms likely to locate in Sherwood.	County, adjacent cities, State, landowners, and key stakeholders	Lead	Land, infrastructure
Increase the efficiency of the permitting process and simplify city land-use policies	Take actions to reduce costs and time for development permits. Adopt development codes and land use plans that are clear and concise.	County, if they assist with the permitting or building inspection process	Lead	Regulation, taxes, financial incentives
Public Facilities	**Policies regarding the level and quality of public and private infrastructure and services.**			
Provide adequate infrastructure to support employment growth	Provide adequate public services (i.e. roads, transportation, water, and sewer) and take action to assure adequate private utilities (i.e. electricity and communications) are provided to existing businesses and development sites.	Public works department, special service districts, utilities, State and Federal partners who may provide grants, developers and landowners	Lead	Local infrastructure, Access to markets, suitable land to serve
Focused public investment	Provide public and private infrastructure to identified development or redevelopment sites.	Public works department, special service districts, utilities, State and Federal partners who may provide grants, developers and landowners	Lead	Regulation, taxes
Communications infrastructure	Actions to provide high-speed communication infrastructure, such as developing a local fiber optic network.	Communication utilities and public works department	Lead/Support	Local infrastructure, Access to markets

Category/Policy Examples	Description and Examples	Potential Partners	City Lead or Support Role	Relevant Factors of Production
Business Assistance	**Policies to assist existing businesses and attract new businesses.**			
Business retention and growth	Targeted assistance to businesses facing financial difficulty or thinking of moving out of the community. Assistance would vary depending on a given business' problems and could range from business loans to upgrades in infrastructure to assistance in finding a new location within the community.	Chamber of Commerce, Business Oregon, Regional ED Corporation	Support	Local infrastructure, Access to markets, Materials, Regulation, Taxes, Financial incentives, Industry clusters
Recruitment and marketing	Establish a program to market the community as a location for business in general, and target relocating firms to diversify and strengthen the local economy. Take steps to provide readily available development sites, an efficient permitting process, well-trained workforce, and perception of high quality of life.	Chamber of Commerce, Business Oregon, Regional ED Corporation	Support	Labor, Land, Local infrastructure, Regulation, Taxes, Industry clusters, Quality of life
Development districts (enterprise zones, renewal districts, etc.)	Establish districts with tax abatements, loans, assist with infrastructure, reduced regulation, or other incentives available to businesses in the district that meet specified criteria and help achieve community goals.	Business Oregon, taxing districts, special districts, county	Lead	Local infrastructure, Regulation, Taxes, Financial incentives, Quality of life
Business clusters	Help develop business clusters through business recruitment and business retention policies. Encourage siting of businesses to provide shared services to the business clusters, businesses that support the prison and hospital and agricultural industry, including retail and commercial services.	Business Oregon, Educational/research institutions	Support	Industry clusters, Innovative capacity
Public/private partnerships	Make public land or facilities available, public lease commitment in proposed development, provide parking, and other support services.	Developers, businesses, and landowners	Lead and/or Support	Land, Financial incentives

Category/Policy Examples	Description and Examples	Potential Partners	City Lead or Support Role	Relevant Factors of Production
Financial assistance	Tax abatement, waivers, loans, grants, and financing for firms meeting specified criteria. Can be targeted as desired to support goal such as recruitment, retention, expansion, family-wage jobs, or sustainable industry.	County, special service districts, other taxing districts	Lead	Regulation, Taxes, Financial incentives
Business incubators	Help develop low-cost space for use by new and expanding firms with shared office services, access to equipment, networking opportunities, and business development information. Designate land for live-work opportunities.	Education/research institutions, Chamber of Commerce, Small Business Administration (Federal)	Support	Entrepreneurship, Innovative capacity, Access to markets
Business/start-up accelerators	Provide similar services and opportunities as a business incubator but using a specific timeframe for businesses to meet certain benchmarks. Help connect businesses with funding at the end of the time period of the program to continue product development.	Education/research institutions, Chamber of Commerce, Small Business Administration (Federal), venture capitalists	Support	Entrepreneurship, Innovative capacity, Access to markets
Mentoring and advice	Provide low-cost mentors and advice for local small businesses in the area of management, marketing, accounting, financing, and other business skills.	Chamber of Commerce, local businesses, and other potential mentors	Support	Entrepreneurship, Innovative capacity
Export promotion	Assist businesses in identifying and expanding into new products and export markets; represent local firms at trade shows and missions.	State, Chamber of Commerce, regional economic development partners	Support	Entrepreneurship, Innovative capacity, Access to markets
Workforce	**Policies to improve the quality of the workforce available to local firms.**			
Job training	Create opportunities for training in general or implement training programs for specific jobs or specific population groups (i.e. dislocated workers).	School districts, education/research institutions, businesses	Support	Labor
Job access	Provide transit/shuttle service to bring workers to job sites.	Businesses, transit agency	Support	Labor, Local infrastructure

Category/Policy Examples	Description and Examples	Potential Partners	City Lead or Support Role	Relevant Factors of Production
Jobs/housing balance	Make land available for a variety of low-cost housing types for lower income households, ranging from single-family housing types to multifamily housing.	Developers, landowners, businesses, affordable housing developers, other housing agencies or developers	Support	Land, Labor, Quality of life
Other				
Regional collaboration	Coordinate economic development efforts with the County, the State, and local jurisdictions, utilities, and agencies so that clear and consistent policies and objectives are developed.	Regional economic development partners, county, nearby cities, Business Oregon	Lead initiation of the coordination, participatory in the coordination process	Innovative capacity
Quality of life	Maintain and enhance quality of life through good schools, cultural programs, recreational opportunities, adequate health care facilities, affordable housing, neighborhood protection, and environmental amenities.	School district, recreational districts, hospitals and medical providers, affordable housing providers, and other stakeholders	Lead on city programs, support on other programs	Local infrastructure, Labor, Land, Quality of life

Source: ECONorthwest.

Redmond EOA: City Council Presentation

December 8, 2020

ECONorthwest

ECONOMICS • FINANCE • PLANNING

EOA & Policies are the Product of Collaboration

Advisory Committee

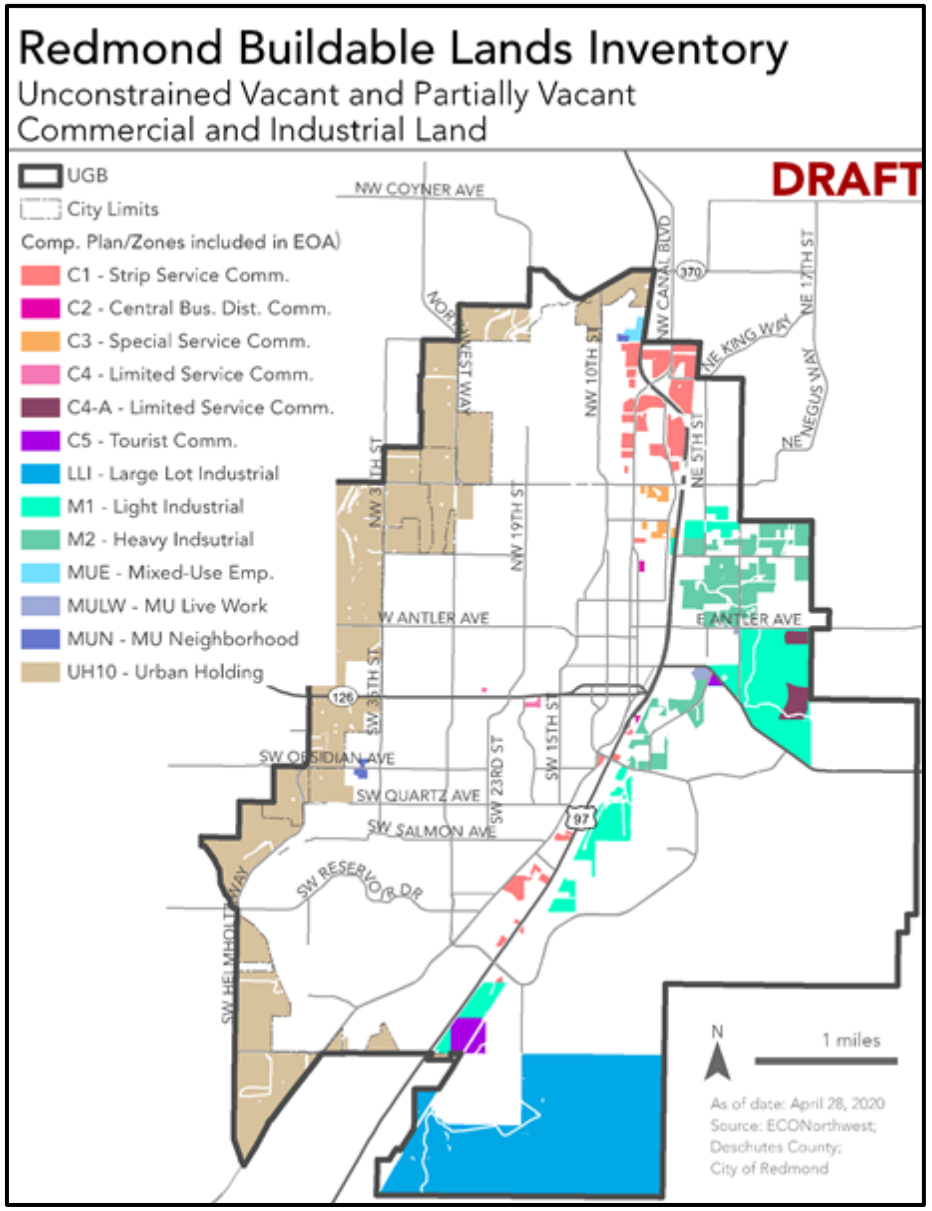
- Planning Commission
- Eric Sande, Redmond Chamber of Commerce
- Jon Stark, REDI

Redmond City Staff

Virtual Open House

- 60 community members completed the survey
- 92% Agreed with the fundamental policy that the city should support economic diversification and focus on growth of family wage jobs

Redmond is in a unique position



- Large supply of vacant, unconstrained land, especially LLI
- Location on Hwy 97 & in Central Oregon
- Business friendly and flexible City policies
- Collaborations and partnerships

Redmond has a healthy supply of land

Vacant, unconstrained buildable land

- Commercial: 235 acres
- Industrial: 1,298 acres (775 acres is in Large Lot Industrial)
- Mixed Use: 22 acres
- UH-10: ~1,300 acres (excl. land for residential future development)

Redmond has more industrial land than is likely to develop by 2040

Redmond has a deficit of land designated for commercial and will need to look to the UH-10 and re-zoning/redevelopment for commercial development opportunities

Monitoring land development will be essential

This is Redmond's first complete EOA

Key policies:

- Monitor and replenish supply of industrial and commercial land
- Update the EOA every 2 to 5 years
- Identify areas for development of commercial centers, consistent with residential master planning
- Ensure there are small industrial sites available to development, such as industrial parks
- Ensure that water, wastewater, and other necessary services are extended to serve areas for new development

Questions?

CITY OF REDMOND

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info@redmondoregon.gov
redmondoregon.gov

STAFF REPORT

DATE: December 8, 2020
TO: Redmond City Council
THROUGH: Keith Witcosky, City Manager
Chuck Arnold, Economic Development/Urban Renewal Program Manager
FROM: Meghan Gassner, Urban Renewal Program Analyst
SUBJECT: Ord #2020-19 - An ordinance of the City of Redmond approving the establishment of the South 97 Urban Renewal District and directing that Notice of Approval be published.

Addresses Council Goal:
4. ECONOMIC DEVELOPMENT: Develop and maintain an environment that promotes and supports a strong, healthy, and diverse economic base.

9. URBAN RENEWAL: Invest resources to encourage new business investment in designated blighted areas that will grow the job base and strengthen and diversify the tax base in that area. Invest in infrastructure projects that make a demonstrable, positive impact on job creation and encourage private investment.

Report in Brief:
This item requests City Council approve Ordinance No. 2020-19, which adopts the South 97 Urban Renewal Plan ("Plan") and establishes the South 97 Urban Renewal District.

Background:
The South 97 Urban Renewal District extends along the Highway 97 corridor between Veteran's Way and Yew Avenue, and also encompasses the recently annexed Large Lot Industrial Area south of the Deschutes County Fairgrounds, also known as the South Redmond Tract.

This area is characterized by blighting elements such as, large vacant sites, insufficient and undersized infrastructure, deteriorating or substandard buildings and properties, vacant buildings, inadequate and incomplete street and sidewalk systems, and inefficient and unsafe traffic conditions. These conditions pose a constraint that will inhibit the successful future development envisioned and identified in the City's 2040 Comprehensive Plan.

The primary objectives of the District would be to generate local resources to address these conditions, including: (1) make essential safety improvements, relieve congestion/improve freight mobility along the corridor; (2) create opportunities for new development; and (3) provide resources for infrastructure investments to incent development and job growth.

Adopted South 97 Facility Plan (2019):
Discussions about needed improvements to this corridor have been underway since 2010. Public engagement comprised years of community outreach, stakeholder and technical advisory committee meetings, which culminated in the development of the US 97 Facility Plan (a.k.a. the South Redmond Corridor Project). The plan was approved by City Council and the Redmond Urban Area Planning Commission on September 24, 2019 via an amendment to the City's Transportation System Plan.

The US 97 Facility Plan identified the need for $50M - $80M in improvements along the corridor and the Department of State Lands (DSL)property to the south.

The role of Tax Increment Financing (TIF):
TIF was identified as a resource to fund the improvements to the Corridor, and the necessary infrastructure in the DSL property. TIF gives the City the ability to than leverage state and federal dollars. Creating a new urban renewal district produces the ability to access TIF.

Urban renewal is enabled through Oregon Revised Statute 457. The program works to invest tax increment funds in targeted projects in a designated area of blighted conditions. The intent is to reverse the existing conditions by stimulating private investment and thus accelerating the increase in assessed valuation. The property taxes generated by the growth provide financing for projects identified in the Plan.

Urban Renewal District Feasibility Study (2020):
A feasibility study that was approved by City Council in June 2020 concluded:
- The plan area proposed is within the acreage and total value limits established by ORS 457.
- The proposed boundary contains blighting conditions as defined by ORS 457.
- The scheduled project activities meet the eligibility requirements for tax increment funding.
- The duration needed to carry out plan activities is estimated at twenty-five years and is typical of the duration used for newly adopted urban renewal plans.

Given the tax increment revenue assumptions, project cost information, and program funding included in the feasibility study, forecasted tax increment revenue is adequate to fund the proposed projects in the Plan.

There is no evidence of any technical or legal obstacles to the feasibility of establishing an urban renewal plan for the identified study area.

Also in June, the City Council/Urban Renewal Agency Board directed staff to complete the South 97 Urban Renewal Plan and Report (attached as Exhibit 1) and begin outreach efforts to community and stakeholder groups.

Urban Renewal Plan and Report (Fall 2020):
The proposed District encompasses 1,330 acres of parcels, with a maximum indebtedness of $85,036,400.

Primary investments areas include:
Transportation:
US97 improvements, per the US97 Corridor Plan (including road repair, raised center medians, pedestrian and bicycle facilities, additional traffic signals, and south gateway treatment).

New local streets to improve access, increase east-west connections, and provide a safer, more attractive environment.

Construction of sidewalks, landscaping, signage, and other streetscape improvements.

Street and sidewalk improvements to improve multimodal safety and circulation.

Acquisition and disposition of land for public improvements, rights-of-way, and utility improvements.

Infrastructure:
Public utilities (water, sewer, stormwater).
Power and gas.

Funding and incentive programs to support economic development objectives, business expansion, employment growth, and other projects as identified in the Plan.

Figure 1. Urban Renewal Projects and Program Funding

Project and Program Description	Urban Renewal Funding	Dates	Future Estimated Cost
US Highway 97 projects	$24,018,000	2024-2032	$27,892,200
Local transportation projects	$5,328,000	2025-2040	$6,782,100
Fire station	$4,500,000	2030-2035	$5,709,200
Industrial opportunity fund	$12,500,000	2023-2042	$16,325,500
Small loan program	$2,000,000	2022-2042	$2,527,800
Incentive funding	$10,000,000	2023-2042	$12,820,100
Canal improvement contribution	$4,000,000	2026-2032	$4,736,000

Program administration	$5,923,000	2022-2045	$7,405,500
Total Urban Renewal Project Funding	$68,269,000		$84,198,400

Outreach Efforts (2020):
After receiving Council direction in June 2020 to begin outreach, staff began an extensive formal outreach effort to overlapping taxing districts to obtain input on the proposed Plan.

These informational meetings are required by state statute. The intent was to provide the taxing district partners with details of the Urban Renewal Plan and Report and present the primary plan objectives and financial requirements and impacts of adopting and implementing the Plan.

The outreach was also intended to gain their support for the creation of the District.

Per state statute, an urban renewal district can be implemented after a process of "consulting and conferring" with taxing district partners. However, if a plan includes a public building (as is proposed in this Plan), taxing districts must provide their consent. Concurrence is required of three of the four taxing districts estimated to forego the most in property tax revenue (see Figure 2).

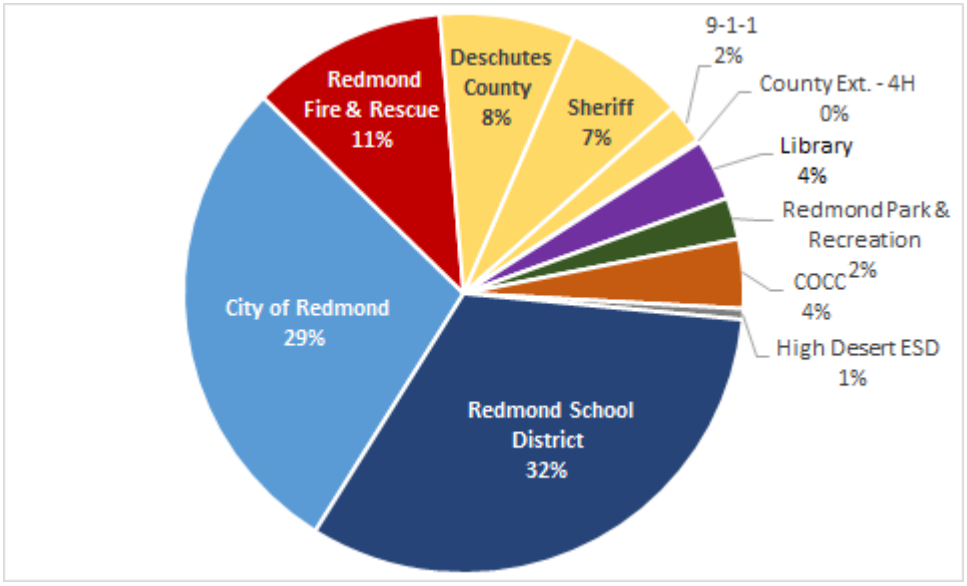

Figure 2. Overlapping Taxing District Levy Rates

During this outreach process, the Plan and Report was distributed to all overlapping taxing district partners and stakeholder groups on August 30, 2020. Per state statute, taxing district boards had 45 days after receipt of the Plan to submit recommendations to City Council for review and consideration.

To date, concurrence to implement the District has been received from the following taxing district boards, including consent from three of the top four overlapping districts (**bolded**):

- **Redmond Fire and Rescue**
- **Redmond School District**
- **Deschutes County Board of County Commissioners**
- Redmond Area Parks and Recreation
- Deschutes County Library
- High Desert Education Service District

Letters of Support and Resolutions submitted from the taxing district partners are attached as Exhibit 2.

During the outreach presentations, staff addressed many questions about the project from district partners, and also received comments and feedback, detailed in Exhibit 3.

Staff also distributed a supernotice which by statute is required to be mailed to all property taxpayers in the City limits. This notice identified that City Council will make a determination on a new urban renewal area and that there would be an opportunity for testimony at the December 1, 2020 City Council meeting.

Discussion:

Critical safety issues exist along the South Highway 97 Corridor, spurred in part by significant regional growth. Without safety improvements, traffic crashes that currently average 43 per year are expected to nearly double by 2040.

The South Redmond Tract lands lack infrastructure necessary for development. To make these annexed 1,000 acres shovel-ready, the Plan projects and activities will bring needed infrastructure to incentivize development and provide significant job growth for Redmond.

By approving Ordinance 2020-19, the District will leverage locally generated tax increment resources to be used as matching funds to unlock state and federal funding not otherwise available. The City has limited resources to fund project activities directly. Establishing the District will enable the City and ODOT to respond to safety issues along the South Highway 97 Corridor. Projects to be implemented will reduce accidents and improve mobility for freight as well as all modes of transport. Resources invested to bring infrastructure to the South Redmond Tract will bring these recently annexed 1,000 acres closer to shovel-ready for development and job growth.

The City has had success with prior urban renewal districts, proving the funding tool can bring infrastructure and jobs to the region. By utilizing tax increment resources to fill financing gaps and incentivize development, the City has been able to significantly move the needle on development in the City.

Specifically, the metric utilized to measure success of an urban renewal district is growth in assessed value. If a district has achieved its objectives, improvements made over the life of the urban renewal plan will help remove blight and raise the valuation. The Redmond Urban Renewal Agency operated the South Airport Urban Renewal District from 1989 to 2010. Upon the closure of the district, the assessed value grew from $725K to $63M-equivalent to the tax base being multiplied by a factor of 86.

Similarly, the currently active Downtown Urban Renewal District, which began in 1998, has a growth factor of 4 times, beginning with an assessed value base of $72M, and, if closed today, would have a new assessed value of $305M. Future projections show it will close with an assessed value of $743M in 2031, a growth in valuation over 100 times.

Feedback from taxing district partners demonstrated the objectives of the District, as well as the City's proven track record with urban renewal, played a large role in gaining their support for the District's adoption. Taxing district boards recognized the need to solve regional safety concerns with a regional solution, and that incentivizing development and creating job growth will benefit all. For those reasons, taxing district partners have all voted in support of the creation of the district.

This district will require its own advisory body, similar to DURAC. Given the slow early growth of increment, staff proposes the creation of a separate City Council appointed advisory committee occur later in calendar year 2021. A proposal will be brought forward to City Council by June 30, 2021 for this committee.

Fiscal Impact:

<u>All Taxing Districts</u>

Based upon defined tax levy rates, all overlapping taxing districts receive their share of approximately $2.3M in annual tax revenue (the frozen base) from properties in the defined project area. Should the District be implemented, that tax revenue growth is projected to increase to nearly $13.7M in the first year after the District sunsets (approximately Year 25 of the District). Without the District, the tax revenue for that same area is projected to increase to just $5.2M in the same time period.

<u>City of Redmond</u>

The potential financial impact to the City of Redmond is illustrated in Figure 3, below. With a tax levy rate of 29%, the City currently receives approximately $653K in annual property tax revenue (the frozen base) from the properties in the proposed urban renewal area. If the District is established, this revenue will continue to flow to the City each year for the life of the District. Upon the District's sunset in Year 25, the projected annual property tax revenue will increase from $653K to $3.9M. If the District is not implemented, the property tax revenue is projected to increase to $1.5M.

The financial projections in the Plan estimate taxing districts will realize a 14.3% return on their investment, with a seven-year payback window (when all foregone revenues will be recouped).

Figure 3. City of Redmond Financial Impact

Current Annual Property Tax Revenue	Foregone Revenue over life of District (25 years)	Projected Property Tax at Sunset – Without UR	Projected Property Tax at Sunset – With UR
$653K	**$17M**	**$1.5M**	**$3.9M**

As required by City Charter, notices regarding this public hearing were posted in three places (the Library, the Police Department, and the Redmond Chamber of Commerce) in addition to City Hall on December 4, 2020, and three copies of the ordinance were available for review at City Hall.

Alternative Courses of Action:

1. Approve Ordinance No. 2020-19, adopting the South 97 Urban Renewal Plan and Report and establishing the South 97 Urban Renewal District.
2. Request more information.
3. Do not approve Ordinance 2020-19.

Recommendation / Suggested Motion:
"I move to have a first and second reading of Ordinance #2020-19, by title only." (Voice vote)

(City Attorney will read ordinance by title only, twice.)

"I move to approve Ordinance #2020-19 adopting the South 97 Urban Renewal Plan and Report and establishing the South 97 Urban Renewal District." (Roll call vote)

December 2020

Urban Renewal Plan

South 97 Urban Renewal Area

Prepared for:

City of Redmond, Oregon
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EXECUTIVE SUMMARY

As the hub of Central Oregon, Redmond has experienced pronounced growth and development throughout the last 20 years. Attracting newcomers from all over, Redmond has become a mid-sized community of 30,000 residents, with an annual growth rate of approximately 2.4 percent. By 2040, the population is expected to grow to nearly 50,000.

Known for its progressive and innovative leadership, Redmond enjoys a state-wide reputation for its ability to successfully undertake efforts that improve the community. The most immediate challenge Redmond faces is how to strategically respond to rapid regional growth while preserving and improving assets like Redmond's small-town character, thriving traded sector and industrial businesses, distinct neighborhood identities, access to nature and outdoor recreation, and important public spaces like the Dry Canyon.

Managing the growth impacts of the South Redmond US Highway 97 (US97) corridor is critical. As the primary north-south route through Redmond, US97 is central to the community's ability to succeed in the areas of safety, mobility, connectivity, and economic development.

In 2019, following a decade of research and outreach, the Oregon Department of Transportation (ODOT), the City of Redmond (City), and local committees completed a joint study of the highway and made recommendations to accommodate its growing use. This study, referred to in this South 97 Urban Renewal Plan ("Plan") as the Redmond South US 97 Corridor Plan ("Corridor Plan"), included a recommended concept intended to enhance corridor safety, improve access to businesses, beautify the highway, create bicyclist- and pedestrian-friendly routes, develop east/west linkages, and enhance economic development and business vitality for long-term community health and sustainability.

The Corridor Plan also identifies several potential funding sources for these improvements, one of which is the creation of an urban renewal area. Urban renewal is one of the only funding mechanisms in the State of Oregon that can raise funds for projects without raising taxes for the local residents through the use of tax increment financing ("TIF").[1] The tax increment is the difference between the total assessed value of the urban renewal area in a given year and the original frozen base value. Tax revenue from the increment value is diverted from other taxing districts in the Urban Renewal Area ("Area") and invested in projects to make improvements in infrastructure that lead to jobs, advance public policy objectives, and accelerate growth in property taxes.

The City staff spent more than two years working with stakeholders to evaluate conditions in the corridor and potential investments that would benefit from tax increment financing. This work included a parcel-by-parcel assessment to understand the extent of the blighted conditions. A feasibility study found that urban renewal would be an appropriate tool to generate sufficient revenues to support the identified projects in the Plan.

[1] Similar tax increment funding was utilized by the City of Redmond for North Highway 97 and related improvements in the 2000s.

Figure 1. US 97 Corridor Plan Rendering

Source: SERA Architects (from US 97 SRC Facility Plan, "US 97 Corridor Plan")

Plan Boundary, Description, Condition

The 1330.5-acre Urban Renewal Area boundary was determined by the Corridor Plan Committee to include the US 97corridor. A subsequent Urban Renewal Feasibilty Study also included the South Redmond Tract - a state designated land area of nearly 1,000 acres with industrial development opportunities in southeast Redmond.

The South Redmond Tract accounts for approximately 71 percent of the total Area. Significant investments in infrastructure are necessary to realize its potential for substantial industrial development and employment growth.

The remaining land in the Area - approximately 300 acres along South Highway 97 - is zoned for commercial uses. Urban renewal funding is largely expected to provide local matching dollars necessary to leverage state and federal highway improvement funds.

A legal description for the project boundary is included in Attachment "A" of this Plan. The boundary of the Area is shown in Figure 2 on page 7 of this Plan.

Existing Conditions and Challenges of the District

The South Redmond US 97 corridor serves as the primary north-south arterial through Central Oregon. The corridor serves a mixture of state, regional, and local traffic traveling to, from, and within a variety of different destinations in the region. The city's location is not only the hub for transportation serving Central Oregon, but also has regional attractors, including a commercial airport, county fairgrounds, and many industrial and commercial areas.

The corridor currently has a number of challenges related to safety, mobility, and connectivity, including:

- The number of vehicle crashes (about 40 per year) is well above the statewide average.
- Congestion and unreliable travel times slow the movement of freight traffic.

- Lacking or substandard pedestrian facilities.
- Lacking or substandard bicyclist facilities.
- Limited east-west crossing opportunities for pedestrians and bicyclists.
- Limited east-west connectivity between the corridor and the neighborhoods to the west.

Anticipated employment and housing growth will exacerbate these challenges, with traffic activity expected to increase significantly by 2040. The number of vehicle crashes is projected to reach more than 70 per year if challenges are not addressed . The investments outlined in the Plan are critical to mitigating the negative impacts of growth, and significantly improve safety and operations.

Beyond these traffic-related concerns, there is untapped development potential due to a multitude of vacant or underdeveloped parcels along the corridor. The Area contains 77 vacant or mostly vacant parcels, representing 30.8 percent of the parcels, but 87.4 percent of the land area within the proposed boundary. The South Redmond Tract is largely undeveloped and underserved by infrastructure. This area is largely without streets, sidewalks, and utilities necessary for development. An opportunity exists to promote higher density industrial development on the undeveloped acreage.

Additionally, there are challenging corridor aesthetics. Approximately 42 percent of parcels in the Area have missing or deteriorated sidewalks, and 20.9 of parcels are considered to have poor or substandard site conditions.

Maximum Indebtedness/Implementing the Plan

The maximum amount of indebtedness that may be issued or incurred under the Plan is $85,458,900 (inflation-adjusted dollars). This total is based upon good faith estimates of the scope and costs of projects in the Plan and the schedule for their completionThe tax increment funding will help leverage state and other funding toward the estimated cost of $116.5 million of improvements (2020 dollars). Please see the accompanying Report for additional information.

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100. INTRODUCTION

This South 97 Urban Renewal Plan has been prepared pursuant to Oregon Revised Statute (ORS) Chapter 457, the Oregon Constitution, and all applicable laws and ordinances of the State of Oregon and City of Redmond respectively. All such applicable laws and ordinances are made a part of this Plan, whether expressly referred to in the text or not.

The proposed Urban Renewal Area is a single geographic area of approximately 1,330 acres. The Area is defined by a single contiguous boundary in which a variety of activities and projects are contemplated to eliminate blight and the cause of blight, as well as create an environment in which the private sector may develop uses compatible with the purposes of this Plan.

200. DEFINITIONS

The following definitions will govern the construction of this Plan unless the context otherwise requires:

"Area" means the area included within the boundaries of the South 97 Urban Renewal Area.

"Bonded Indebtedness" means any formally executed written agreement representing a promise by a unit of government to pay to another a specified sum of money, at a specified date or dates at least one year in the future.

"City" means the City of Redmond, Oregon.

"City Council" means the City Council of the City of Redmond, Oregon.

"Comprehensive Plan" means the City's 2020 Comprehensive Plan and its implementing Ordinances, policies, and development standards.

"Corridor Plan" means the Redmond South US 97 Corridor Plan.

"County" means the County of Deschutes, State of Oregon.

"Disposition and Development Agreement" means an agreement between the Urban Renewal Agency and a private developer which sets forth the terms and conditions which will govern the disposition of land to a private developer.

"Exhibit" means an attachment, either narrative or map, to the Urban Renewal Plan for the Urban Renewal Area.

"ORS" means Oregon Revised Statute (State Law) and specifically Chapter 457 thereof.

"Plan" means the Urban Renewal Plan for the South 97 Urban Renewal Area.

"Planning Commission" means the Urban Area Planning Commission of the City of Redmond, Oregon.

"Project, Activity or Project Activity" means any undertaking or activity within the Area, such as a public improvement, street project, or other activity which is authorized and for which implementing provisions are set forth in the Urban Renewal Plan.

"Report" refers to the report accompanying the Urban Renewal Plan, as provided in ORS 457.085(3).

"Redeveloper" means any individual or group acquiring property from the Urban Renewal Agency or receiving financial assistance for the physical improvement of privately or publicly held structures and land.

"State" means the State of Oregon.

"Urban Renewal Agency" or "Agency" means the Urban Renewal Agency of the City of Redmond, Oregon.

"Urban Renewal Area", " South 97 Urban Renewal Area", or " Area" means the geographic area for which this Urban Renewal Plan has been approved. The boundary of the Renewal Area is described in Exhibits made a part of this plan.

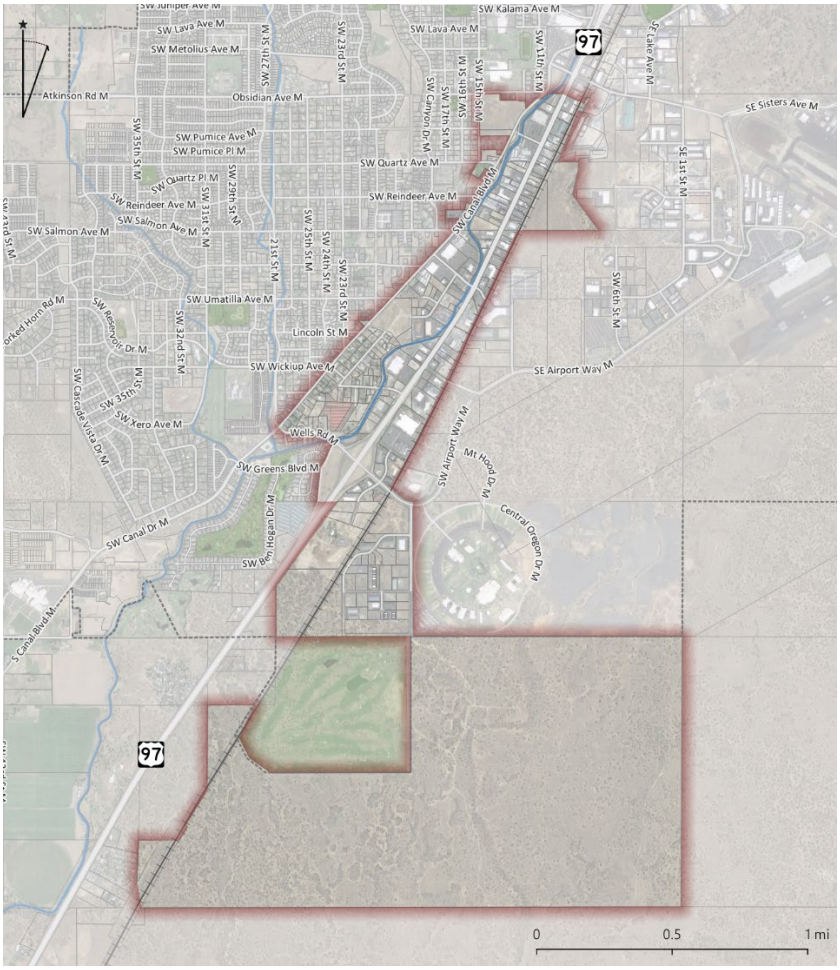
300. URBAN RENEWAL AREA BOUNDARY

The boundary of the South 97 Urban Renewal Area is shown below (Figure 2). A legal description for the Area boundary is included in Attachment "A" of this Plan.

The Urban Renewal Area boundary was determined by the Corridor Plan Committee to include the US 97 Corridor and the South Redmond Tract, a total area of 1,330.5 acres.

The City's current land area is approximately 10,449 acres. Per state statute, no more than 25 percent of the City's total land area can be designated as an urban renewal district. Added to the Redmond Downtown Urban Renewal District (701.7 acres), the total of all acreage in urban renewal areas represents 19.45 percent of the City's land area and is, therefore, within the 25 percent limitation.

Figure 2. South 97 Urban Renewal Area Boundary



Source: Leland Consulting Group

400. RELATIONSHIP TO LOCAL OBJECTIVES

The purpose of this Plan is to eliminate blighting influences found in the Urban Renewal Area, to implement goals and objectives of the City of Redmond 2020 Comprehensive Plan, and to create development strategies and objectives for the Area. The South 97 Urban Renewal Plan relates to the following guidance documents adopted by the City:

A. City of Redmond 2020 Comprehensive Plan

ORS 457.085 requires that an Urban Renewal Plan relate to local objectives. The Comprehensive Plan considers a wide range of goals and policies relating to land uses, transportation, public utilities, economic development, and housing, and serves as the guiding document to which this Plan relates. The Comprehensive Plan establishes a policy framework rooted in a factual basis that helps inform other critical planning documents and implementing tools that together serve as a coordinated, overarching strategy for the City. This approach establishes the structure for how the City works and the types of services it provides. Ultimately, the Comprehensive Plan outlines the direction the City will take when planning for land use and informs all land use decisions and actions, including how land is developed and services are provided.

If the primary goals for the Comprehensive Plan change, the goals, and policies for this Plan should be revised to appropriately reflect those changes.

Specific goals and policies found in the Comprehensive Plan concerning Area conditions and challenges are:

Chapter 9 – Economic Development

Goals

1. Expand, improve, and diversity the economy of the Redmond Urban Growth Boundary area while maintaining Redmond's quality of life.
3. Retain or create industrial, office, professional service, technology, medical, tourism, retail and other jobs through expansion and retention of existing businesses and recruitment of new businesses.
4. Improve the appearance of the community's employment districts, particularly along Highways 97 and 126, the Downtown, central east side industrial areas, and the Airport/Fairgrounds area.
9. Provide, maintain, and promote the enhancement of state of the art infrastructure, including, but not limited to, transportation systems, water, sewer, natural gas, power, telecommunications and air service to support the commercial and industrial needs of the community.
11. Maintain Redmond's favorable employment to housing ratio by taking affirmative steps to ensure economic development and employment growth keeps pace with population growth, especially for industrial employment.
12. To build a strong and thriving regional economy by coordinating public investments, policies, and regulations to support regional and state economic development objectives in Central Oregon as determined through the Central Oregon Large Lot Industrial Land Needs Analysis.

Policies

9. The City should give a high priority to extending and improving the infrastructure needed for economic development.
10. The City shall provide an incentive program encouraging the development of primary industry family wage jobs.

11. The City should provide incentives and innovative ways to encourage and promote an inventory of available industrial buildings and a pre-approved process to attract industrial uses.
12. General Objectives
    b. Encourage landscaping and other forms of city beautification for the purpose of enhancing the physical character of each area, and the overall city.
    f. Focus community efforts to improve the overall appearance of existing commercial areas and similar considerations encouraged to all new developments.
    i. Rehabilitate or re-develop older commercial areas in order to retain their values to the community, including the Downtown and Highway 97 corridor after the highway is re-routed to a limited access corridor.
33. Commercial development adjacent to arterial streets and State highways shall be subject to access restrictions.
34. C-1 commercial development along Highway 97 shall be encouraged to provide service access roads which feed into arterial and collector streets at designated points.
46. The City recognizes the importance of maintaining a large-lot industrial land supply that is readily developable in Central Oregon.

Findings: Plan's relationship to Chapter 9 – Economic Development.

- *The Plan's Industrial Opportunity Fund, Small Loan Program, and Incentive Funding project activities support Economic Development Goals 1, 3, 11, and 12 and Policies 10, 11, and 46 through programs that support the development or expansion of businesses and employment centers that retain and create job opportunities, help maintain a balance of jobs to housing, promote public-private and inter-agency coordination, and expand, diversify, and improve the local economy.*
- *The Plan's public utility, power, gas, and telecommunications project activities support Economic Development Goals 9, 11, and 12 and Policies 9 and 46 by extending and improving Redmond's infrastructure to meet the commercial and industrial needs of the community, thereby supporting job growth, supplying readily developable large-lot industrial land, and helping the City coordinate investments to support regional and state economic development objectives in Central Oregon.*
- *The Plan's transportation project activities support Economic Development Goals 4, 9, and 11 and Policies 33 and 34 by funding transportation investments that improve the appearance of transportation elements in the Area's employment districts, modify and enhance access and connectivity, and extend, develop, and improve infrastructure to serve the commercial and industrial needs of the community.*
- *The Plan's transportation project activities support Economic Development Goals 1, 4, 9, and 12 and Policies 12(b)(f)(i) and 34 by improving the Area's physical appearance, accessibility, and navigability by various modes of transportation, and strengthening the identity and vitality of both the US 97 Corridor and the broader Area.*

Chapter 10 – Housing

Goals

3. Establish residential neighborhoods that are safe, convenient, and attractive places to live, which are located close to schools, parks, shopping, and employment centers.
5. Provide a broad range of accessible and affordable housing.
6. Provide for higher densities in proximity to schools, services, parks, shopping, employment centers, and public transit.

Policies

23. Criteria for the location of multifamily housing shall include proximity to the City core, neighborhood commercial centers, major transportation corridors, schools, services, parks, shopping, employment centers, and transit corridors.

Findings: Plan's relationship to Chapter 10 – Housing.

- *The Plan's transportation and utility infrastructure project activities support Housing Goals 3, 5, and 6 and Policy 23 by reducing the cost burden on developers, thereby improving the prospects of new housing development, and potentially increasing the probability of higher density developments.*
- *The Plan's development assistance and incentive funding program activities support Goals 3, 4, 5, and 6 and Policy 23 by supporting employment growth along a major corridor, near shopping and employment centers, and near services.*

Chapter 11 – Public Facilities and Services

Goals

1. To provide for a close correlation between the provisions of urban services and urban development in order to bring about a more orderly and efficient development pattern, and thereby avoid unnecessary tax burdens and excessive utility costs normally associated with scattered, unrelated development.
2. To achieve a balance of public costs vs. benefits/revenues in the provision of public facilities and services.
3. To provide public and private utility systems - water, sanitary and storm sewer, energy, communications, garbage, and recycling - at levels necessary and suitable for existing and proposed uses.
5. Public facilities shall be available or under construction prior to the issuance of Building Permits.

Policies

2. The City should establish revenue sources to pay for its planned capital improvements.
3. The City Council should investigate funding alternatives to property taxes for funding public facilities and services.
11. The City shall continue to develop, operate, and maintain a water system, including wells, pumps, and reservoirs, capable of serving all urban development within the UGB.
15. Storm drainage facilities such as dry wells, landscaping, retention ponds or storm drains shall be used to control surface drainage.
26. The City shall encourage Natural Gas providers to provide service throughout the UGB area.
27. Property for future fire station locations should be planned for and purchased in advance in order to save costs of facility zoning construction. Attempts shall be made to combine future stations with other government entities in order to reduce infrastructure and operations costs.

Findings: Plan's relationship to Chapter 11 – Public Facilities and Services.

- *The Plan's public utility, power and gas, and communications projects support Goals 1, 2, and 3 and Policies 11, 15, and 26 by providing infrastructure deemed critical to attracting desired users to the Area and by providing the necessary infrastructure for existing businesses and industries to expand operations.*
- *The Plan's Fire Station project supports Goal 5 and Policy 27 by providing funding for a new fire station to serve south/southeast Redmond.*

- *The Plan supports Policies 2 and 3 by providing additional funding methodologies and funding alternatives to pay for and leverage planned capital improvements and programs.*
- *The Plan's Industrial Opportunity Fund, Incentive Funding, and Small Loan Program activities support Goals 1, 2, 3, and 5 and Policies 11, 15, and 26 by encouraging and accelerating the timing of the construction of critical infrastructure deemed necessary for the expansion of existing businesses and establishment of new users.*

Chapter 12 – Transportation

Goals

1. Reduce through traffic, congestion, and improve circulation along Highway 97.
2. Enhance east/west circulation.
3. Identify roadway system needs to serve undeveloped areas so that steps can be taken to preserve rights-of-ways and maintain adequate traffic circulation.
4. Increase the use of alternative travel modes through improved safety and service.

Objectives

1b. Improve intersection operations by adding left-turn phases, installing additional traffic signals, actuating and coordinating traffic signals, and/or increasing sight distance as needed.
2a. Develop a safe and efficient east-west arterial and collector system
2b. Enhance existing crossings and determine the best locations for additional crossings of Dry Canyon, Highway 97, Pilot Butte Canal, and BNSFRR line to link east and west Redmond.
3a. Integrate new arterial and collector routes into the existing city grid system.
4a. Provide additional sidewalks and improve existing sidewalk pavement for pedestrian safety and access.
4b. Provide additional bicycle routes and plan regular maintenance of existing routes for bicycle safety and access (per Redmond Bicycle Master Plan).
4c. Provide pedestrian and bicycle access, especially when direct motor vehicle access is not possible.

Policies

3. The function of existing and planned roadways as identified in the Redmond Urban Area Transportation Plan shall be protected through the application of appropriate access control measures.
10. The City shall work to acquire and develop a trail system that utilizes Redmond's irrigation canal system.
16. Sidewalks shall be included on all new streets except limited access roads or where equivalent alternative pedestrian circulation is provided in the UGB. Retrofitting existing streets with sidewalks shall proceed on a prioritized schedule.
20. Wherever practical, access to the highway will be provided via frontage roads, alternative local roads, or other means, rather than direct access to the highway.
22. A non-traversable median should be installed on the highway when operational or safety issues warrant installation. Directional breaks in the median will be provided as needed to provide safe traffic operation.
24. Medians installed in the state highways should provide bicycle and pedestrian crossings at least every 1/4 mile.
34. The City shall improve east-west and north-south traffic patterns in the central part of the community.
38. Alleys shall be an option in new residential areas, providing rear access and backyard parking.

FINDINGS: Plan's Relationship to Chapter 12 – Transportation.

- *The Plan's transportation improvement projects support Goals 1 and 3, Objective 1b, and Policies 3, 22, 24 by improving safety, efficiency, and operations through access and median treatments, supporting the development of new connections and alternatives routes to serve existing and underserved areas, and reducing through traffic by encouraging other modes of transportation.*
- *The Plan's US 97, local street, alley, and access improvement projects support Goals 1, 2, 3, and 4, Objectives 1b, 2a, 2b, and 3a, and Policies 20, 34, and 38 by enhancing crossings, improving intersection operations, addressing access through new alleys and alternative routes, and implementing circulation improvements necessary for new development.*
- *The Plan's canal improvement contribution, mixed-use path, US 97 median treatments, sidewalk improvements, and pedestrian infrastructure project activities support Goal 4, Objectives 2a, 4a, 4b, and 4c, and Policies 10, 16, and 24 by providing safer or alternative routes for pedestrians and bicyclists in the US 97 corridor and the surrounding streets, enhancing multimodal connections throughout the Area.*
- *Additionally, transportation improvements may be a key component of several projects in the Plan, such as the Industrial Opportunity Fund, which is intended to support a wide range of investments and project activities that will leverage private development.*

Chapter 15 – Livability

Goals

1. The City of Redmond shall create and maintain livability. The City of Redmond shall guide development and support community identity and pride by implementing policies that improve livability and are innovative creating a high quality of life, ample family-wage jobs, and a safe environment in which to raise and educate families.

Policies

8. Redmond shall plan for a variety of transportation choices.
9. Redmond shall plan for and promote attractive streetscapes free from clutter, confusion, and blight.
10. Redmond shall develop safe, reliable, and economical transportation choices to decrease household transportation costs, improve air quality, reduce greenhouse gas emissions, and promote public health.
11. The City of Redmond shall develop and maintain the environment that promotes and supports a strong, healthy, and diverse economic base.
12. Redmond shall promote economic competitiveness through sustainable choices for housing, transportation, education, cultural diversity and enrichment, and recreational opportunities as well as improve reliable and timely access to employment centers, educational opportunities, services, and other basic needs by workers.
13. Redmond shall help existing businesses within the City to grow and thrive.
14. Redmond shall help to create and foster new businesses of all types.
15. Redmond shall provide well planned and maintain high-quality infrastructure to provide a competitive advantage for business and community growth.

Findings: Plan's Relationship to Chapter 15 – Livability.

- *The Plan's transportation-related projects, such as US 97 improvements, local improvements, pedestrian connections, and other related projects, support Goal 1 and Policies 8, 9, 10, 11, and 12 by providing pedestrian and bicycle infrastructure to encourage walking and cycling, improving streetscapes by addressing*

blighted conditions (such as lacking sidewalks) and funding beautification efforts, and planning for improved access to current and future employment centers.

- *The Plan's Industrial Opportunity Fund, Small Loan Program, and Incentive Funding project activities support Goal 1 and Policies 11, 12, 13, 14, and 15 by providing funding to existing and future businesses to grow and create new employment opportunities.*
- *The Plan's public utility, power and gas, and communications projects support Goal 1 and Policies 12, 13, 15 by providing high-quality infrastructure as a catalyst for growth.*

B. Urban Renewal Objectives

The Plan objectives include:

1. Improve safety for drivers, bicyclists, and pedestrians.
2. Create opportunities for new development in the Area.
3. Provide adequate access to businesses along the US 97 corridor for both customers and freight/delivery.
4. Increase connectivity to surrounding neighborhoods.
5. Develop infrastructure to incent development in the Area.
6. Implement the goals and objectives of the 2020 Comprehensive Plan.

Findings: Plan's Relationship to Urban Renewal Plan Objectives.

The following project activities support Urban Renewal Objective 1 of improving safety for drivers, bicyclists, and pedestrians by funding projects along US97 and existing and planned local connections. Activities include raised medians and traffic signal systems to allow protected left-hand turning movements and U-turns at signalized intersections.These project activities provide areas for safe pedestrian refuge, pedestrian and bicyclist facilities, connections to a new shared-use path, and new access roads or alleyways to provide alternative access where new connections provide safe ingress and egress nearby.

- US Highway 97 Projects
- Local Transportation Projects

The following project activities support Urban Renewal Objective 2 of creating opportunities for new development in the area. The activities fund projects that improve the quality and increase the capacity of infrastructure necessary to support the commercial and industrial needs of the community, and provide programs to incentivize and catalyze new private investment in the Area.

- Public Utilities
- Industrial Development Opportunity Fund
- Small Loan Funding
- Incentive Funding

The following project activities support Urban Renewal Objective 3 of providing safe and adequate access to businesses along the US97 corridor for both customers and freight/delivery by funding median treatments, addressing access through new alleys, adding new connections and alternative routes to serve existing and underserved areas, enhancing pedestrian crossings and intersection operations, and reducing unnecessary through-traffic by encouraging other modes of transportation.

- US Highway 97 Projects
- Local Transportation Projects

The following project activities support Urban Renewal Objective 4 of increasing connectivity to the neighborhoods by funding transportation projects that will add new connections and alternative routes to serve existing and underserved areas, improve local streets to provide pedestrian and bicyclist infrastructure, improve intersection operations, implement circulation improvements, and enhance crossings and access.

- US Highway 97 Projects
- Local Transportation Projects
- Canal Improvement Contribution

The following project activities support Urban Renewal Objective 5 of connecting infrastructure for large lot industrial lands to incent development. The project activities will improve the quality and increase the capacity of Redmond's infrastructure to support the commercial and industrial needs of the community, and provide funding programs to assist with the development of critical infrastructure for underserved areas.

- Public Utilities
- Industrial Development Opportunity Fund
- Small Loan Funding
- Incentive Funding
- Natural Gas/Power Improvements
- Communications Improvements

The following project activities support Urban Renewal Objective 6 of implementing goals and objectives of the 2020 Comprehensive Plan, as identified in Section 400A.

- US Highway 97 Projects
- Local Transportation Projects
- Fire Station
- Public Utilities
- Industrial Development Opportunity Fund
- Small Loan Funding
- Incentive Funding
- Natural Gas/Power Improvements
- Communications Improvements
- Canal Improvement Contribution

C. Relationship to Other Plans

The Corridor Plan references several plans and describes its relevance to many goals and objectives of these plans. The plans include:

- Transportation Planning Rule (OAR 660-012) (Refreshed 2020)
- Oregon Highway Plan Amendment (2018)
- Statement Transportation Improvement Program (STIP) (2018)
- Oregon Freight Plan Amendment (2017)
- Oregon Bicycle and Pedestrian Plan (2016)
- Oregon Transportation Safety Action Plan (TSAP, 2016)
- Oregon State Rail Plan (2014)
- Oregon Resilience Plan (OSP) (2013)
- ODOT Highway Design Manual (HDM) (2012)

- Oregon Intersection Safety Implementation Plan (ISIP) (2012)
- Oregon Aviation Plan (2007)

While this section does not reiterate this Urban Renewal Plan's relationship to these plans and their objectives, it is assumed that due to the extensive processes undertaken during the Corridor Plan's development and the resulting recommended projects that now form the basis of this Urban Renewal Plan, the Corridor Plan adheres to most, if not all, of the same plans and objectives. Additionally, the Corridor Plan was also adopted into the City's Transportation System Plan.

500. PROPOSED LAND USES

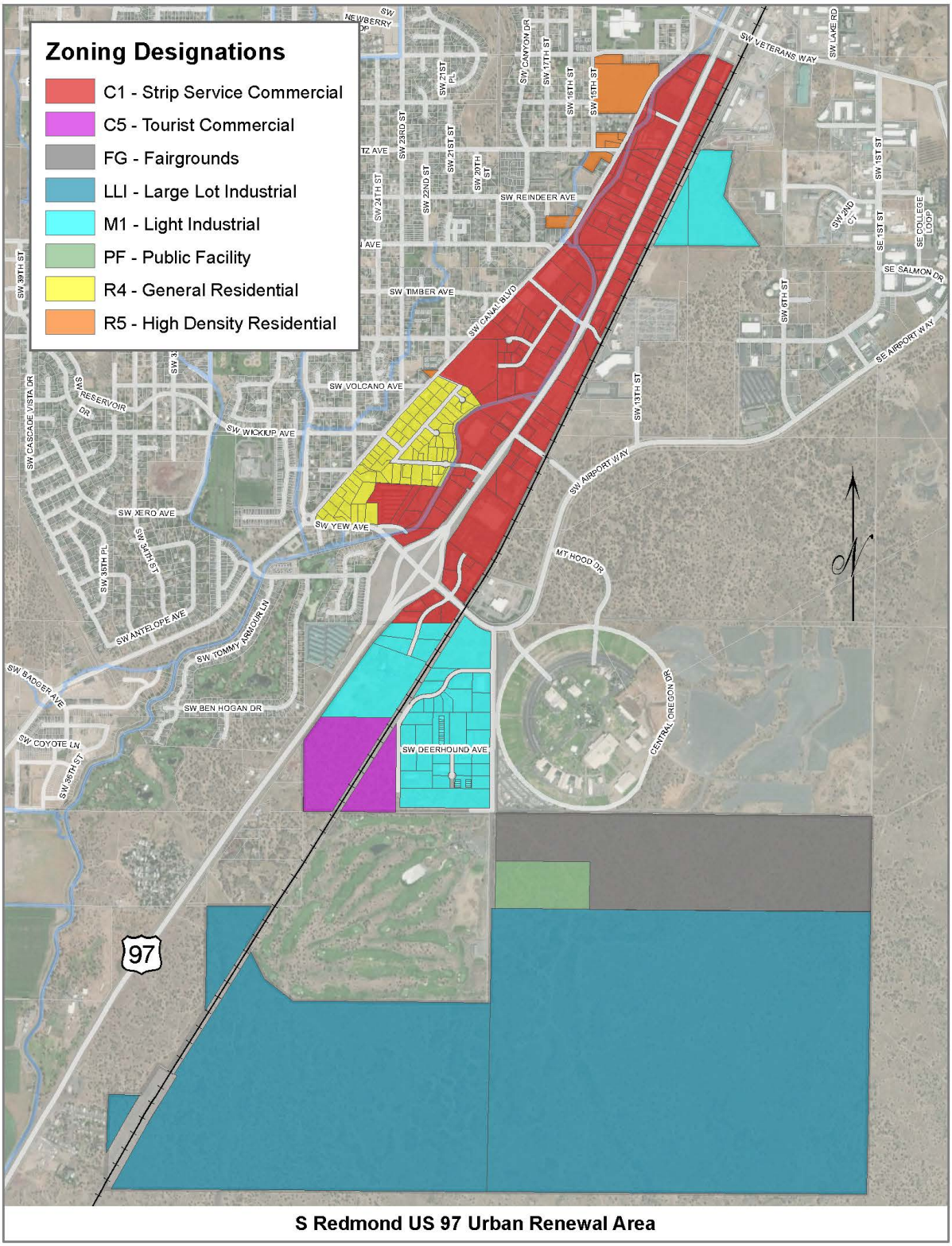
A. Land Use Plan

The map on the following page, the "Land Use Map" (figure 3) describes the locations of the principal land use classifications which apply to the Urban Renewal Area. This includes the type, location, and density of land development and redevelopment permitted in the future. The Comprehensive Plan Map is the same as the Zoning Map. The land use plan for the Urban Renewal Area is consistent with the Redmond Comprehensive Plan. The land use classifications are described below.

The Land Use Plan consists of the Comprehensive Plan and Zoning Map, the descriptive material and regulatory provisions contained in this Section (both directly stated and included by reference). This Plan shall be in accordance with the Redmond Comprehensive Plan and the Redmond Development Code, and with their implementing ordinances and policies. The zoning and development code serve as the major implementation mechanism of the Comprehensive Plan. Ordinances controlling the use and construction on the land, such as building codes, sign ordinances, subdivision and zoning ordinances, shall be adopted to carry out the Plan.

The use and development of land in the Urban Renewal Area shall be in accordance with the regulations prescribed in the Redmond Comprehensive Plan, the Redmond Development Code, Zoning Provisions, Subdivision Ordinance, City Charter, or any other applicable local, county, state or federal laws regulating the use of property in the Urban Renewal Area.

Figure 3. Land Use Map



Source: City of Redmond

C1 – Strip Service Commercial. To create and preserve areas suitable for commercial uses and services primarily oriented to automobile traffic, requiring extensive outdoor display and storage, and support of the central business district or principal downtown shopping area. In general, this zone shall be applied to those areas already existing and desirable to retain and for those areas that, because of new and/or changing traffic patterns, should be developed for such purpose. In addition, this zone allows for high-density residential development in these areas where such development will not adversely affect commercial development in the zone as a whole.

C5 –Tourist Commercial. To provide for commercial uses primarily oriented to travelers and tourists in locations complementary to existing facilities and future major transportation facilities and to provide incentives for public and private investments in traveler and tourist-related complexes.

R4 – General Residential. To provide high-density residential neighborhoods with a mix of single-family residences, duplexes, and some conditionally permitted multi-family residential development. Limited commercial uses such as offices are also conditionally permitted where compatible with surrounding development.

R5 – High-Density Residential. To provide high-density residential neighborhoods with an emphasis on multi-family development and smaller lot single-family and duplex developments. Limited commercial uses such as offices are also conditionally permitted where compatible with surrounding development.

M1 – Light Industrial. To provide for light industrial uses such as light manufacturing, research, transportation facilities, and similar uses which have a limited impact on surrounding properties and are compatible with clean non-polluting industries along with limited office and commercial activities which support these light industrial uses.

Large Lot Industrial. The South Redmond Tract, Large Lot Industrial (LLI) site, located directly south of the Deschutes County Fair & Expo Center, is designated as the only Large Lot Industrial site to be considered for light industrial development over 200 acres. The South Redmond Tract was selected to be the singular 200-plus acre site permitted by the State LLI Program. Following the purchase of the initial 200-plus acre industrial property, the remainder of the South Redmond Tract will be eligible for 50 to 200 acre light industrial sites. Staffing for these industries could be anywhere from two to 10 employees per acre. It is intended to appeal to technology and other light industrial, low impact uses that require large parcels of land. The land also abuts the airport and the highway, providing excellent transportation access.

The recent annexation of the land follows years of discussions and analysis at the local, regional, and state level. The 2012 Regional Economic Opportunity Analysis served as the basis for the Large Lot Annexation project and is supported by both the Regional Large Lot Industrial Program and the Central Oregon Large Lot Industrial Land Needs Analysis. It should be noted that the Deschutes County Fairgrounds expansion area (140 acres) and the Oregon Military Department Readiness Center area (20 acres), while included in the Urban Renewal Area, have a different zoning designation than the Large Lot Industrial lands, as indicated in Figure 3, above.

B. Plan and Design Review

The Urban Renewal Agency shall be notified of any Comprehensive Plan/Zoning amendment application, building permit, conditional use, or other development permits requested within the Area. Redevelopers, as defined in this Plan, shall comply with the Redeveloper's Obligations, Section 800 of this Plan.

C. Development Standards

Standards for future street and utility improvements are summarized below.

Streets

The 2010 Standards Specification Design Standards provide the Minimum Street design standards for the City of Redmond. Street standards are generally in conformance with the American Association of State Highway and Transportation Officials (AASHTO) Geometric Design of Highways and Streets, 2004 edition. General street right of way, roadway design, and cross-section standards are provided in Section II.A.1. Table 1, and City of Redmond Standard Drawing 2-1. Roadway functional class is determined by using the City's most current Transportation System Plan (TSP). Local transportation projects within the US97 South Redmond Corridor project include local roads, major collector roads, and commercial alley improvements. The South Redmond Tract large lot industrial parcels require streets designed to the City's industrial roadway standard.

Utilities

The 2010 Standards Specification Design Standards provide the minimum utility design standards for the City of Redmond. Stormwater systems are designed in accordance with the latest version of the Central Oregon Stormwater Manual (COSM). The City includes special provisions to the COSM in section II.B.2 of the 2010 Standard Specifications Design Standards. Underground Injection Control (UIC) systems such as dry wells are generally used throughout the City to provide quality and control for stormwater flows. Water and Sewer facilities are designed per the Oregon State Health Department, Oregon Department of Environmental Quality (DEQ), and the American Public Works Association (APWA) standards. Ductile iron pipe is currently the only approved material for water lines. Utility trenches and conduit must comply with Section E of the Design Standards and sections 101 and 212 of the City's Standards and Specifications.

600. OUTLINE OF DEVELOPMENT

The Urban Renewal Plan consists of activities and actions which treat the causes of blight and deterioration in the South 97 Urban Renewal Area. Large vacant sites and low utilization ratios of properties, deteriorated and substandard buildings/improvements, significant building vacancies, inadequate and incomplete street and sidewalk systems, and inefficient and unsafe traffic conditions have been identified as issues contributing to depressed conditions and values in the Area. The conditions also pose a constraint that will encumber successful future development envisioned and identified in the Comprehensive Plan.

Project activities to treat these conditions include:

a. Transportation projects, including:
    - US97 improvements, including new medians, signals, and beautification of US97.
    - New local streets to improve access, increase east-west connections, and provide a safer, more attractive multimodal environment.
    - Construction of sidewalks, landscaping, signage, and other streetscape improvements.
b. Street and sidewalk improvements to improve multimodal safety and circulation.
c. Acquisition and disposition of land for public improvements, rights-of-way, and utility improvements.
d. Infrastructure projects, including:
    - Public utilities, including water, sewer, and stormwater infrastructure.
    - Power and gas infrastructure.

- Communications infrastructure.

e. Funding and incentive programs to support economic development objectives, business expansion, employment growth, and other desired Plan outcomes.
f. Administration and coordination of development in the Urban Renewal Area.

Section 700, below, provides further descriptions of each urban renewal project to be undertaken within the Urban Renewal Area.

700. DESCRIPTION OF PROJECTS TO BE UNDERTAKEN

Several studies, reports, and plans that preceded the Plan development clearly articulate the need for these projects and justify the recommended project budgets in the Plan. These include the Transportation System Plan, Water System Plan, and the Corridor Plan.

Urban renewal projects authorized by the Plan are described below.[2]

Table 1. Urban Renewal Projects and Approximate Implementation

Project and Program Description	Dates
US Highway 97 Projects	2024-2032
Local Transportation Projects	2025-2040
Public Utilities	2022-2041
Fire Station	2030-2035
Industrial Opportunity Fund	2023-2042
Small Loan Program	2022-2042
Incentive Funding	2023-2042
Natural Gas/Power Improvements	2022-2041
Communications Improvements	2022-2041
Canal Improvement Contribution	2026-2032
Finance Fees and Program Administration	2022-2045

Source: LCG and GEL Oregon

A. US Highway 97 Projects

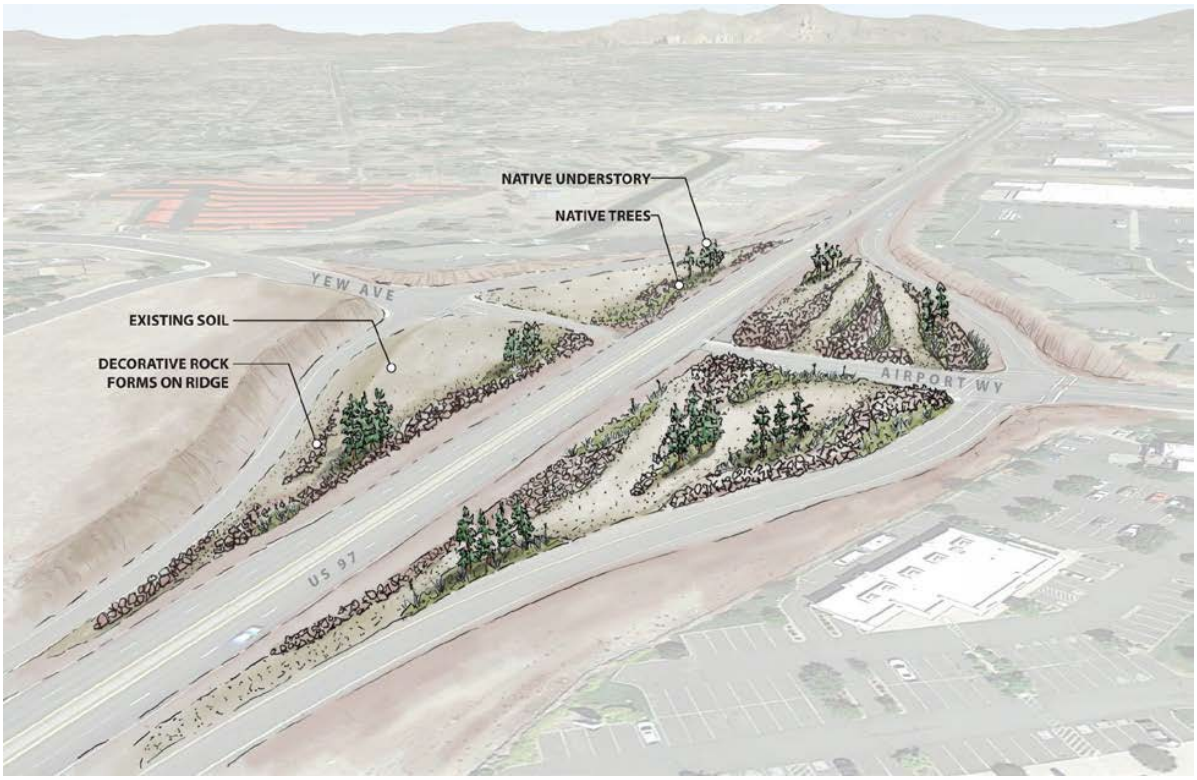
The City's Corridor Plan, in partnership with ODOT, included several recommended improvements, including:

- **US97 road construction**. Repair and replace existing pavement conditions along US97, acquire additional right-of-way as necessary.
- **Raised medians.** Traffic separators between the northbound and southbound lanes on US97 allowing protected left-hand turning movements and U-turns at signalized intersections, as well as providing areas for safe pedestrian refuge halfway across US97 to enhance pedestrian crossings (figure 5)
- **Pedestrian and bicyclist facilities.** New sidewalks and cycle track treatments throughout the length of the corridor to provide a more well-connected active transportation network.
- **Traffic signal systems.** Three new signalized intersections along US97 that allow protected U-turns.

[2] ORS 457.085 (2)(a) requires a description of each project. ORS 457.085 (3)(d) requires the cost of each project and source of funds. ORS 457.085 (3)(e) requires anticipated completion dates. See Report for details about cost and schedule.

- **Gateway Treatment.** A signature gateway design (figure 4) at the south end of the US97 Corridor will enhance the corridor as a regional destination and to improve the corridor as a welcoming route and entryway to downtown Redmond, local neighborhoods, the airport, and the fairgrounds.

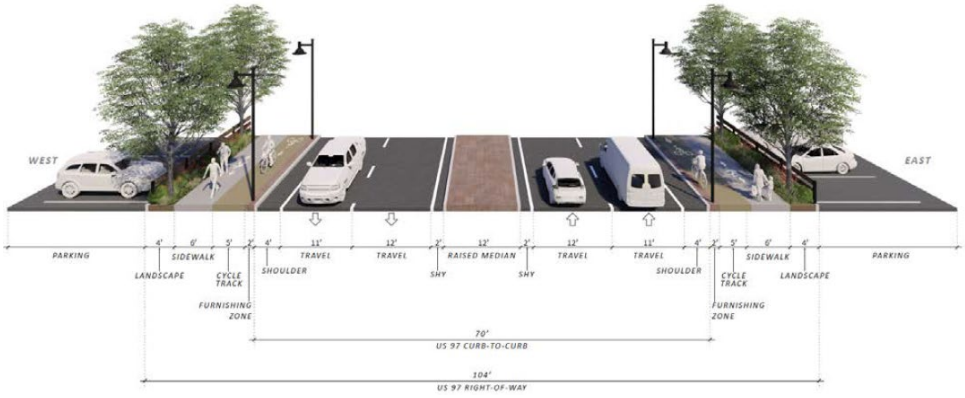
Figure 4. Concept illustration of the South Gateway



Source: SERA

These improvements aim to realize the following vision for the future of the South Redmond US97 Corridor:

*"The South US97 Corridor is a vibrant business district that is safe and accessible to shoppers traveling by car, bus, bike, or on foot. The corridor is aesthetically pleasing and provides opportunities for business and community interaction. Traffic moves efficiently and at a reasonable speed in both the north-south and east-west directions."*Figure 5. Proposed US97 Cross Section



Source: SERA

Initial ODOT funding will be used to help develop phasing and begin some of the advanced development work. Most of the remaining construction is intended to begin between 2024 to 2027. While there is currently no agreement in place between the City of Redmond and ODOT stipulating responsibilities, it is assumed that the City will be required to provide funding to complete the project in its entirety to match the Corridor Plan. As such, funds available through the Urban Renewal Area are critical to transforming the US97 Corridor to the Redmond community's vision.

B. Local Transportation Projects

Local transportation projects include collectors and distributors, and local streets (figure 6). These projects are informed by the Corridor Plan, the City's TSP, and other information provided by City staff.

Funds available through urban renewal are expected to fund a variety of projects, including:

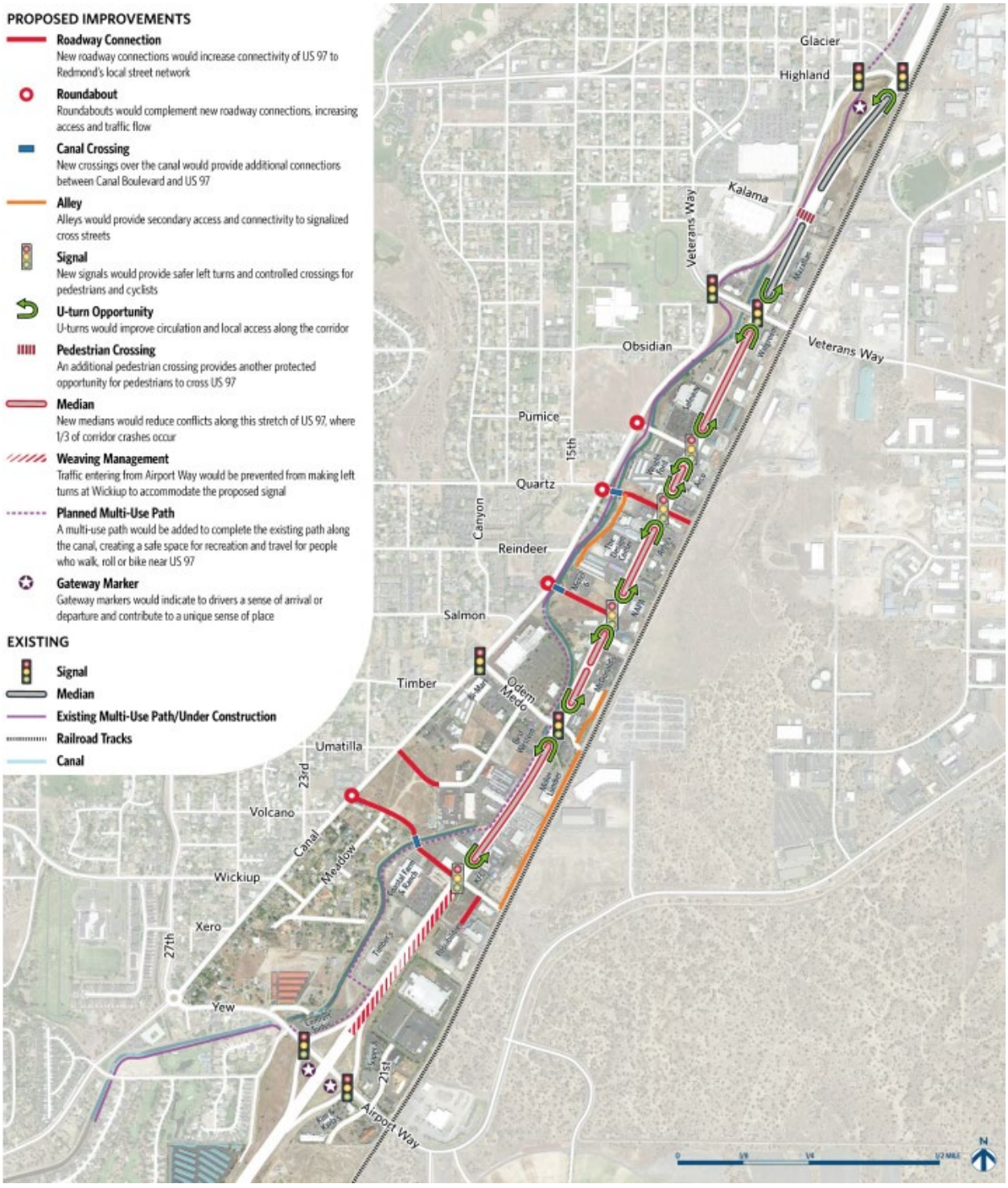
- **Connection road construction.** Three new road connections that cross the canal and connect US97 to Redmond neighborhoods on the west side of US97.
- **Connections to the new shared-use path** along Canal Boulevard and the canal itself.
- **A limited number of new access roads or alleyways** to provide alternative access where new connections provide safe ingress and egress nearby.
- **Pedestrian and bicyclist facilities.** New sidewalks and cycle track treatments along east/west connecting roads to provide a more well-connected active transportation network.
- **New streets.** Improve connectivity, circulation, and access throughout the Area with new or extended local streets. These streets include those not yet defined, such as the 19th Street extension into the South Redmond Tract.

These transportation projects are intended to provide a transportation network in the Area that supports the efficient movement of traffic, and a vibrant business district that is safe and accessible to customers traveling by car, bus, bike or on foot, with comfortable, interesting, and attractive streetscapes, especially along designated pedestrian streets.

The City is expected to include many of these projects in the Transportation System Plan (TSP) and fund them through system development charges (SDCs) and other sources. However, at present, just one new street connection at Quartz is currently planned and budgeted for in the City's TSP. Urban renewal is not expected to fund the entire cost of each project.

Urban Renewal funds are critical to accelerating the timing of these projects for economic development purposes and realizing currently untapped development and employment potential.

Figure 6. Recommended Corridor Plan Concept



Source: HDR (From Corridor Plan)

C. Public Utilities (Water, Stormwater, and Sewer Improvements)

The public utility projects are intended to address infrastructure deficiencies in the Area. This list includes the development of sewer, stormwater, and water infrastructure to support the development and expansion of

businesses in the Area. It also includes the construction of new stormwater facilities, repair of existing sewer lines, and extension or enlargement of existing water and sewer lines as needed to support desired development.

These projects will be largely funded and implemented by the City using non-TIF sources. However, including these projects in the Plan allows the City to provide gap funding assistance to developer-initiated projects and accelerate implementation as required to serve new development in the Area. As such, additional money, funded through tax increment financing, is available through the programmatic elements of the project list as needed for public utility improvements.

D. Fire Station

In order to better serve the community South Redmond and the adjacent unincorporated County area (served by Redmond Fire and Rescue), a new fire station will be constructed to reduce response times and serve new and existing commercial and residential users. As development potential is realized in the Area, lower response times are necessary, especially for users with a higher risk of fire and other hazards.

While neither the specific location nor the cost is currently known and could ultimately be outside of the proposed boundaries, the Plan includes the possibility of a partnership for the development of a new fire station..[3]

E. Industrial Development Opportunity Fund

This project activity includes a fund for public investments to support industrial development in the Area. Industrial development is a key component of realizing the City's employment growth opportunities, particularly in the South Redmond Tract. However, major new development is challenging in many places, primarily due to the lack of infrastructure in large vacant tracts of land.

While there is currently an agreement in place for the payment and construction of basic infrastructure on the lands that were recently annexed into the City, additional infrastructure investments and improvements are necessary for the area to better prepare for and attract new industrial development. To support and enhance this development, the Industrial Development Opportunity Fund is a flexible fund to help pay for the cost of public infrastructure required to support new development and business activity.

The Opportunity Fund reduces the financial burden of new development by providing gap financing to help prepare shovel-ready sites, thereby accelerating the timing of desired new employment-focused industrial development in the Area.

The Opportunity Fund will include eligibility and other important funding criteria, to be developed upon the adoption of this Plan. Assistance could take the form of gap financing (low or no interest loans), infrastructure (roads, sidewalks, utilities), and other tools.

[3] ORS 457.085 (2)(j) describes additional requirements for public buildings. HB 2174 narrowly defined public buildings as fire station, police station, public library, hospital, capitol building, school, college, university, city hall, etc.

F. Small Loan Program

The Small Loan Program provides direct low-interest and/or interest-free and/or forgivable loans as part of the City's effort to assist local businesses within the Urban Renewal Area. This program fills a niche not provided through traditional lending markets, and will include eligibility and other important funding criteria to be developed following the adoption of this Plan.

The Small Loan Program is anticipated to help retain economic vitality and increase property values within the Urban Renewal Area and Redmond through the restoration, rehabilitation, or expansion of existing properties and businesses.

G. Incentive Funding

As part of the City of Redmond's effort to enhance business vitality and support desired development within the South 97 Urban Renewal Area, Incentive Funding allows the Urban Renewal Agency to partner with property owners and developers to rehabilitate or redevelop property that will better serve the Area and the greater Redmond community. Assistance could take the form of direct developer assistance, grants, reimbursements, and or system development charge (SDC) credits for contributions to the transportation and utility system.

The Incentive Funding program is anticipated to help ensure economic growth, vitality, and property value increases within the Urban Renewal Area and citywide. The program will include eligibility and other important funding criteria, to be developed upon the adoption of this Plan.

H. Natural Gas/Power Improvements

The City may provide funding to accelerate the timing or upgrade the capacity of natural gas or power infrastructure. Investments in both gas and electricity are critical to accommodate a range of uses, including but not limited to industrial manufacturers and other significant employment-generating users.

While the construction of gas and power infrastructure is user-driven and paid for and constructed by Cascade Natural Gas and Pacific Power, respectively, to respond to user demands, this project activity allows the City to incentivize system upgrades that would not otherwise occur. As such, additional resources, funded through tax increment financing, are available through the programmatic elements of the project list as needed for gas and power improvements.

I. Communications Improvements

Communications Improvements include telephone and high-speed internet infrastructure. Broadband and other communications improvements are important for economic growth and business vitality. Broadband is the underpinning for some of today's most important transformations in business activity and government services.

While the City is not responsible for the cost of communications upgrades and improvements, this project activity provides seed funding to accelerate the timing of specific improvements to attract desired development projects. As such, additional money, funded through tax increment financing, is available through the programmatic elements of the project list as needed for communications improvements.

J. Canal Improvement Contribution

The Central Oregon Irrigation District (COID) plans to pipe 8.1 miles of the Pilot Butte Canal between Smith Rock and Bend, approximately one-quarter of which is located within the Urban Renewal Area. This project activity includes funding to help pipe at least 1.0 mile of the Canal to accommodate new roads and a multi-use path (figure 7). Once the piping is complete, the land will support road construction without additional structural reinforcements, significantly reducing the construction costs.

As the new east-west transportation connections identified in Section 700(B) do not include funding for bridge structures, the new streets in this section are directly tied to the piping of the canal. Connections to the new shared-use path along the canal are also directly tied to the piping project.

COID has yet to secure funding for piping the canal in the Area and may not do so for several years. Urban Renewal funding is therefore critical to providing gap financing to accelerate the timing of the piping project and other related transportation projects.

Figure 7. Multi-use Path Concept Illustration*

Source: 2012 Corridor Plan
** Due to new plans for the area since the development of the 2012 Corridor Plan, including the canal piping project, the illustration depicts an open canal, however the canal will eventually be rerouted via underground pipes.*

K. Finance Fees and Program Administration

The Plan provides for effective administration to complete the various activities contained within.

Project funds may be utilized to pay indebtedness associated with the preparation of the Plan, to carry out design plans, miscellaneous land use and public facility studies, engineering, market, and other technical studies as may be needed during the duration of the Plan.

This category allows for repayment of costs associated with the implementation of the Plan, including but not limited to ongoing administration and financing costs associated with issuing long and short-term debt, relocation costs, and other administrative costs.

Project funds also may be used to pay for personnel and other administrative costs incurred in the management of the Plan, such as the preparation of annual reports (ORS 457.060, HB 2174).

750. PROPERTY ACQUISITION AND DISPOSITION

The Plan authorizes the acquisition and disposition of property as described in this section. Property includes any and all interests in property, including fee simple ownership, lease, easements, licenses, or other rights to use. If a property is acquired it will be identified in the Plan through a Minor Amendment, as described in Section 1000. Identification of property to be acquired and its anticipated disposition is required by ORS 457.085(g).

A. Property Acquisition for Public Improvements

It is anticipated that the acquisition of real property will be necessary to carry out public use objectives of the Plan. These objectives include right-of-way acquisition for streets, roads, alleys, bicyclist and pedestrian ways, utility rights-of-way, and other public improvements, uses, and facilities described in Section 700 of this Plan. Before the acquisition, this Plan shall be amended to identify the specific property or interest to be acquired.

The Agency may acquire any property within the Area for the public improvement projects undertaken pursuant to the Plan by all legal means, including the use of eminent domain, as described in ORS 456.145[4]. Good faith negotiations for such acquisitions must occur before the institution of eminent domain procedures.

B. Property Disposition

The Agency will dispose of property acquired for a public improvement project by conveyance to the appropriate public agency responsible for the construction and/or maintenance of the public improvement. The Agency may retain such property during the construction of the public improvement.

The Agency may dispose of property by conveying any interest in property acquired. Property shall be conveyed at its fair reuse value. Fair reuse value is the value, whether expressed in terms of rental or capital price, at which the Agency, in its discretion, determines such property should be made available so that it may be developed, redeveloped, cleared, conserved, or rehabilitated for the purposes specified in the Plan. Because fair reuse value reflects limitations on the use of the property to those purposes specified in the Plan, the value may be lower than the property's fair market value.

Where property is sold or leased, the purchaser or lessee must agree to use the property for the purposes designated in the Plan, and to complete the building of its improvements within a period of time that the Agency determines is reasonable.

800. REDEVELOPER'S OBLIGATIONS

Redevelopers within the Urban Renewal Area will be subject to controls and obligations imposed by the provisions of this Plan. Redevelopers also will be obligated to the following requirements:

1. The Redeveloper shall develop or redevelop the property per the land use provisions and other requirements specified in this Plan.

[4] ORS 456.145 refers to the appropriate use of eminent domain in the State of Oregon

2. The Urban Renewal Agency may require the redeveloper to execute a development agreement acceptable to the Urban Renewal Agency as a condition of any form of Agency assistance. The Redeveloper shall accept all conditions and agreements as may be required by the Urban Renewal Agency.

3. The Redeveloper shall submit all plans and specifications for the construction of improvements on the land to the Urban Renewal Agency or its designated agent, for review and approval before distribution to reviewing bodies as required by the City.

4. The Redeveloper shall commence and complete the development of such property for the use provided in this Plan within a reasonable period of time as determined by the Agency.

5. The Redeveloper shall not affect any instrument whereby the sale, lease, or occupancy of the real property, or any part thereof, is restricted on the basis of age, race, color, religion, sex, marital status, or national origin.

900. RELOCATION

The Agency will provide required relocation assistance to all persons or businesses displaced by project activities. All persons or businesses which may be displaced will be contacted to determine such relocation needs. Available space information and financial assistance available will be provided based on relocation needs. Those persons or businesses displaced will be given financial assistance in finding replacement facilities and moving assistance. All persons or businesses displaced will be contacted to determine such relocation needs. They will be provided information on available space and will be assisted in moving. All relocation activities will be undertaken and payments made per the requirements of ORS 35.500 to 35.530 and any other applicable laws or regulations.

Relocation payments will be made as provided in ORS 35.510.

Payments made to persons displaced from dwellings will assure that they will have available to them decent, safe, and sanitary dwellings at costs or rents within their financial capability. Payment for moving expenses will be made to residences and businesses displaced. The Redmond Urban Renewal Agency may contract with the Oregon Department of Transportation (ODOT), or other appropriate agencies or parties for assistance in administering its relocation program.

1000. FUTURE AMENDMENTS

It is anticipated the Plan will be reviewed periodically during the execution of the Project. The Plan may be changed, modified, or amended as future conditions warrant. All amendments shall be governed by state and local laws and ordinances.

A. Minor Amendments

Minor changes to the Plan shall be made by a duly approved resolution of the Agency which describes the details of the minor change. Minor changes shall include:

1. Identification of property to be acquired or any purpose outlined in Section 750 of this Plan.

2. Changes to the Plan which are not specifically identified as requiring a Substantial Amendment or a Minor Amendment requiring Council Approval.

B. Minor Amendments Requiring Council Approval

Council-approved amendments to the Plan shall require only approval by the Agency by Resolution and approval by the City Council by Non-Emergency Ordinance. Council-approved amendments are:

1. Addition of a project, activity, or program that differs substantially from a project, program, or activity in the Plan, and is estimated to cost in excess of the equivalent of $500,000 in 2020 dollars throughout the Plan. The $500,000 threshold shall be adjusted annually at a rate equal to the Construction Cost Index (CCI), also referred to as the ENR Index for Construction published quarterly by the Engineering News Record.

2. Identification of land for acquisition which requires Council approval per Section 750 of this Plan.

3. Changes or modifications to the goals and objectives of this Plan, which in the Agency's discretion, warrant Council Approval.

C. Substantial Amendments

Substantial Amendments shall require the notice, hearing, and approval procedures required by statute. Substantial amendments consist of:

1. Adding land to the Urban Renewal Area, except for an addition of land that totals not more than one percent (1%) of the existing area of the Plan.

2. Increasing the maximum amount of indebtedness (excluding bonded indebtedness issued to refinance or fund existing bonded indebtedness) to be issued under the Plan.

3. Adding a public building(s) not identified in the Plan.

4. Any amendment defined by statute to be a substantial amendment.

1100. LATEST DATE FOR ISSUE OF BONDED INDEBTEDNESS

This Plan calls for a division of ad valorem taxes under ORS 457.440. No bonded indebtedness shall be issued with respect to the Plan, or any project undertaken with respect to the Plan later than June 30, 2042.

1200. FINANCING METHODS

A. General

The Plan will be financed using a combination of revenue sources. These include:

- Tax increment revenues;
- Advances, loans, grants, and any other form of financial assistance from federal, state, or local governments, or other public bodies;

- Loans, grants, dedications, or other contributions from private developers and property owners, including, but not limited to, assessment districts; and
- Any other public or private source.

Revenues obtained by the Urban Renewal Agency will be used to pay or repay the costs, expenses, advancements, and indebtedness incurred in (1) planning or undertaking project activities, or (2) otherwise exercising any of the powers granted by ORS Chapter 457 in connection with the implementation of this Plan.

The Urban Renewal Agency may borrow money and accept advances, loans, grants, and other forms of financial assistance from the federal government, the state, city, county or other public body, or from any sources, public or private for the purposes of undertaking and carrying out this Plan. In addition, the Agency may borrow money from, or lend money to a public agency in conjunction with a joint undertaking of a project authorized by this Plan. If such funds are loaned, the Agency may promulgate rules and procedures for the methods and conditions of payment of such loans.

The funds obtained by the Agency shall be used to pay or repay any costs, expenses, advances, and indebtedness incurred in planning or undertaking project activities or in otherwise exercising any of the powers granted by ORS Chapter 457.

B. Tax Increment Financing

It is contemplated that the Plan will be financed in whole or in part by tax increment financing, as authorized in ORS 457.420 through ORS 457.450.

The Plan may be financed, in whole or in part, by tax increment revenues allocated to the Agency, as provided in ORS Chapter 457. The ad valorem taxes, if any, levied by a taxing district in which all or a portion of the Area is located, shall be divided as provided in Section 1c, Article IX of the Oregon Constitution, and ORS 457.440. Amounts collected according to ORS 457.440 shall be deposited into the unsegregated tax collections account and distributed to the Agency based upon the distribution schedule established under ORS 311.390.

C. Prior Indebtedness

Any indebtedness permitted by law and incurred by the Urban Renewal Agency or the City in connection with preplanning for this Plan may be repaid from tax increment proceeds generated pursuant to this section.

D. Establishment of Maximum Debt

The maximum amount of indebtedness that may be issued or incurred under the Plan, based upon good faith estimates of the scope and costs of projects in the Plan and the schedule for their completion is $85,458,900. This amount is the principal of such indebtedness and does not include interest or indebtedness incurred to refund or refinance existing indebtedness or interest earned on bond proceeds. It does include initial bond financing fees and interest earned on tax increment proceeds, separate from interest on bond proceeds.

1300. CITIZEN PARTICIPATION

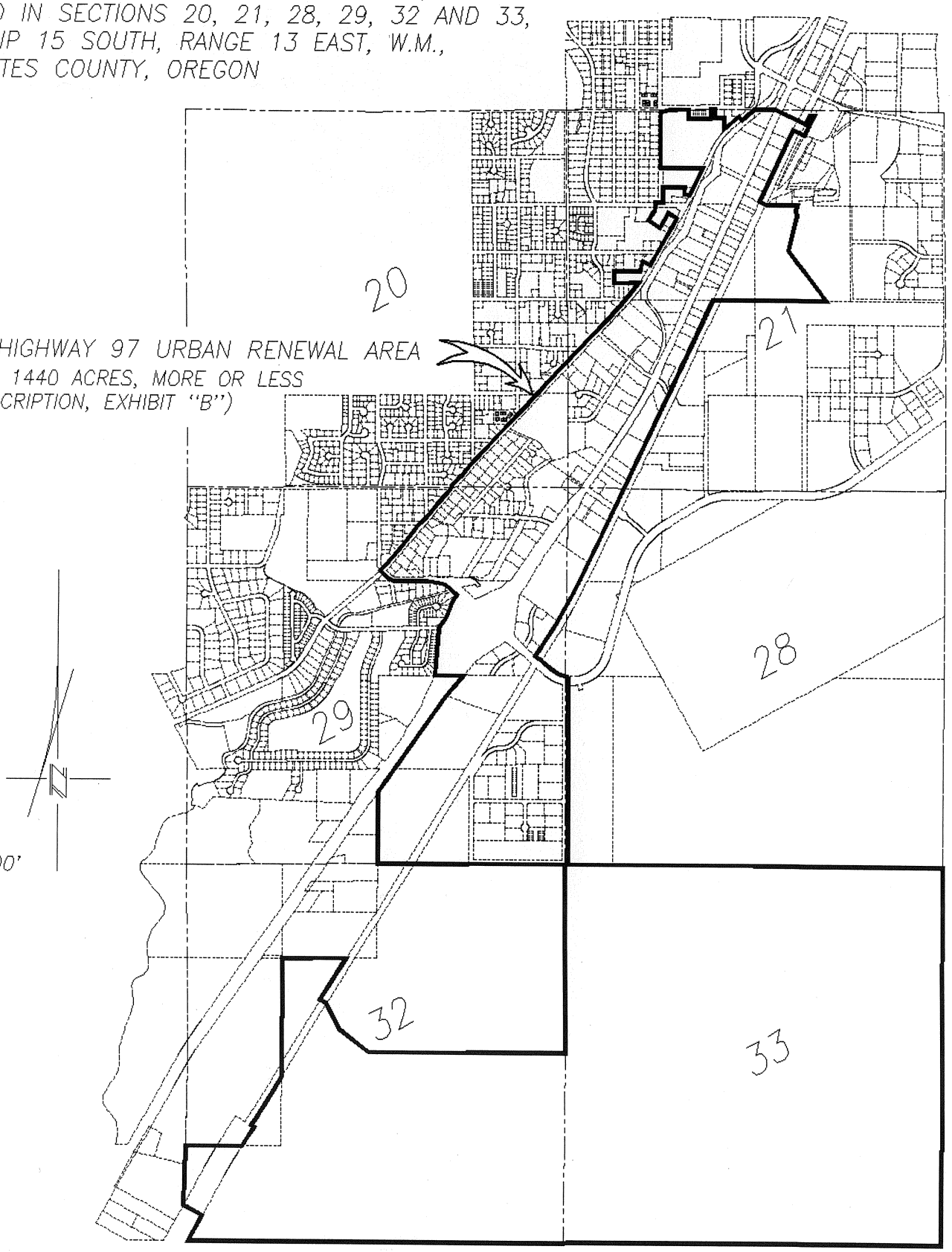
This Plan was developed under the guidance of the Redmond Urban Renewal Agency. In the course of formulating the Plan, the Agency conducted meetings on June 9, August 25, and October 6, 2020. All meetings of the Agency were open to the public for discussion and comment.

The Redmond Planning Commission met to review the Plan on July 20, 2020. The Redmond City Council held a public hearing on the adoption of this Plan on December 1, 2020. Additional notice on City Council adoption of the Plan was provided, as required by ORS 457.120.

ATTACHMENT A: LEGAL DESCRIPTION OF URBAN RENEWAL BOUNDARY

EXHIBIT "A"

SOUTH HIGHWAY 97 URBAN RENEWAL AREA,
LOCATED IN SECTIONS 20, 21, 28, 29, 32 AND 33,
TOWNSHIP 15 SOUTH, RANGE 13 EAST, W.M.,
DESCHUTES COUNTY, OREGON



SOUTH HIGHWAY 97 URBAN RENEWAL AREA
CONTAINS 1440 ACRES, MORE OR LESS
(SEE DESCRIPTION, EXHIBIT "B")

SCALE:
1" = 2000'

PREPARED JULY 3, 2020

POVEY AND ASSOC. LAND SURVEYORS
P.O. BOX 131, REDMOND, OR 97756
(541) 548-6778 20-078D.DWG

EXHIBIT "B"

DESCRIPTION –
SOUTH HIGHWAY 97 URBAN RENEWAL AREA,
LOCATED IN SECTIONS 20, 21, 28, 29, 32 AND 33,
TOWNSHIP 15 SOUTH, RANGE 13 EAST, W.M.,
DESCHUTES COUNTY, OREGON

DESCRIPTION OF A TRACT OF LAND LOCATED IN SECTIONS 20, 21, 28, 29, 32 AND 33, TOWNSHIP 15 SOUTH, RANGE 13 EAST, WILLAMETTE MERIDIAN, DESCHUTES COUNTY, OREGON, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEAST CORNER OF SAID SECTION 33; THENCE WEST ALONG THE SOUTH LINE OF SAID SECTION 33, 5296 FEET TO THE SOUTHWEST CORNER OF SAID SECTION 33; THENCE WEST ALONG THE SOUTH LINE OF SAID SECTION 32, 5232 FEET TO THE SOUTHEAST RIGHT-OF-WAY LINE OF THE BURLINGTON NORTHERN – SANTA FE (BNSF) RAILROAD, BEING 100 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N29°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 406 FEET; THENCE N61°W, PERPENDICULAR TO SAID CENTERLINE, 300 FEET THE INTERSECTION OF THE NORTHWEST RIGHT-OF-WAY LINE OF SAID RAILWAY AND THE WEST LINE OF THE SW1/4 SW1/4 OF SAID SECTION 32, SAID INTERSECTION BEING 200 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N01°E ALONG SAID WEST LINE, 817 FEET TO THE NORTH LINE OF SAID SW1/4 SW1/4; THENCE EAST ALONG SAID NORTH LINE, 793 FEET TO SAID SOUTHEAST RIGHT-OF-WAY LINE, BEING 100 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N32°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 310 FEET; THENCE N58°W ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 50 FEET; THENCE N32°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY, 802 FEET TO THE WEST LINE OF THE NE1/4 SW1/4 OF SAID SECTION 32; THENCE N01°E ALONG SAID WEST LINE, 348 FEET; THENCE NORTH ALONG THE WEST LINE OF THE SE1/4 NW1/4 OF SAID SECTION 32, 1315 FEET TO THE NORTH LINE OF SAID SE1/4 NW1/4; THENCE EAST ALONG SAID NORTH LINE, 902 FEET TO SAID NORTHWEST RIGHT-OF-WAY LINE, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE S32°W ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, 695 FEET; THENCE S58°E, PERPENDICULAR TO SAID CENTERLINE, 100 FEET TO THE INTERSECTION OF THE SOUTHEAST RIGHT-OF-WAY LINE OF SAID RAILWAY, AND THE NORTHEAST EASEMENT LINE OF BONNEVILLE POWER ADMINISTRATION'S REDMOND-BURNS NO. 1 TRANSMISSION LINE, SAID INTERSECTION BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY, AND BEING 50 FEET FROM THE CENTERLINE OF SAID POWER LINE; THENCE S27°E ALONG SAID NORTHEAST EASEMENT LINE, 417 FEET; THENCE S53°E ALONG SAID NORTHEAST EASEMENT LINE, 507 FEET TO THE SOUTH LINE OF SAID SE1/4 NW1/4; THENCE EAST ALONG SAID SOUTH LINE, AND ALONG THE SOUTH LINE OF THE NE1/4 OF SAID SECTION 32, 2750 FEET TO THE EAST LINE OF SAID NE1/4; THENCE NORTH ALONG SAID EAST LINE, 2649 FEET TO THE SOUTHEAST CORNER OF SAID SECTION 29; THENCE WEST ALONG THE SOUTH LINE OF THE SE1/4 OF SAID SECTION 29, 2634 FEET TO THE

WEST LINE OF THE SW1/4 OF SAID SE1/4; THENCE NORTH ALONG SAID WEST LINE, 992 FEET TO THE SOUTHEAST RIGHT-OF-WAY LINE OF U.S. HIGHWAY 97, BEING 90 FEET FROM THE CENTERLINE OF SAID HIGHWAY; THENCE N35°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 1659 FEET TO ENGINEER'S STATION 125+00, 90 FEET LEFT; THENCE N41°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 376 FEET TO THE NORTH LINE OF THE NW1/4 SE1/4 OF SAID SECTION 29; THENCE WEST ALONG SAID NORTH LINE, 401 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF SAID HIGHWAY (ALSO BEING THE NORTHWEST RIGHT-OF-WAY LINE OF SW 25TH PLACE), AS DESCRIBED IN VOLUME 234, PAGE 1995, DESCHUTES COUNTY DEED RECORDS; THENCE ALONG SAID NORTHWEST RIGHT-OF-WAY LINE AS FOLLOWS: N05°E, 670 FEET; THENCE N33°E, 175 FEET; THENCE N23°E, 255 FEET; THENCE N35°E, 91 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF SW YEW AVENUE, BEING A LINE OF VARIABLE WIDTH FROM THE CENTERLINE OF SAID ROADWAY; THENCE LEAVING SAID NORTHWEST RIGHT-OF-WAY LINE, AND 1190 FEET WESTERLY ALONG SAID SOUTH RIGHT-OF-WAY LINE, AND ALONG ITS NORTHWESTERLY PROLONGATION, TO A POINT WHICH BEARS N73°W, 1131 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING ON THE NORTHWEST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, AND BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE 5459 FEET NORTHEASTERLY ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, TO A POINT WHICH BEARS N42°E, 5449 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING 40 FEET FROM THE CENTERLINE OF SAID ROADWAY, AND BEING ON THE SOUTH BOUNDARY OF A TRACT OF LAND DESCRIBED IN DOCUMENT 2007-43829, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG SAID TRACT BOUNDARY AS FOLLOWS: WEST, 345 FEET; THENCE NORTH, 170 FEET; THENCE EAST, 367 FEET TO THE BOUNDARY OF PARCEL 2, AS DESCRIBED IN DOCUMENT NO. 2018-019368, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE LEAVING SAID TRACT BOUNDARY AND ALONG SAID PARCEL 2 BOUNDARY AS FOLLOWS: N13°E, 122 FEET; THENCE N37°E, 30 FEET; THENCE S61°E, 107 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE LEAVING SAID PARCEL 2 BOUNDARY, N30°E ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, 751 FEET TO THE BOUNDARY OF A TRACT OF LAND DESCRIBED IN DOCUMENT 2007-64854, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY OF SAID TRACT AS FOLLOWS: N59°W, 136 FEET; THENCE S31°W, 239 FEET; THENCE N56°W, 184 FEET; THENCE 214 FEET ALONG THE ARC OF A NON-TANGENT 658 FOOT RADIUS CURVE TO THE LEFT, THE CHORD OF WHICH BEARS N28°E, 213 FEET; THENCE LEAVING SAID TRACT BOUNDARY, NORTH, PERPENDICULAR TO THE NORTH LINE OF SAID TRACT, 60 FEET TO THE NORTH RIGHT-OF-WAY LINE OF SW QUARTZ AVENUE, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE EAST ALONG SAID NORTH RIGHT-OF-WAY LINE, 105 FEET TO THE BOUNDARY OF A TRACT OF LAND DESCRIBED IN DOCUMENT 2020-06416, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY OF SAID TRACT AS FOLLOWS: NORTH 214 FEET; THENCE S89°E, 304 FEET; THENCE S01°W, 96 FEET; THENCE S83°E, 74 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF

SW CANAL BOULEVARD, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE LEAVING SAID TRACT BOUNDARY, AND 422 FEET NORTHEASTERLY ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, TO A POINT WHICH BEARS N26°E, 422 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING AT THE SOUTHEAST CORNER OF TRACT 1, AS DESCRIBED IN DOCUMENT 2020-10963, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE WEST ALONG THE SOUTH LINE OF SAID TRACT 1, 591 FEET TO THE WEST LINE OF SAID TRACT 1; THENCE NORTH ALONG SAID WEST LINE, AND ALONG THE WEST LINE OF TRACT 2, AS DESCRIBED IN SAID DOCUMENT, 782 FEET TO THE NORTH LINE OF SAID TRACT 2; THENCE N74°E ALONG SAID NORTH LINE, 135 FEET; THENCE EAST ALONG SAID NORTH LINE, 265 FEET TO THE EAST LINE OF SAID TRACT 2; THENCE SOUTH ALONG SAID EAST LINE, 125 FEET TO THE NORTH LINE OF SAID TRACT 1; THENCE EAST ALONG SAID NORTH LINE, 312 FEET TO THE WEST RIGHT-OF-WAY LINE OF SW 13TH STREET, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE NORTH ALONG SAID WEST RIGHT-OF-WAY LINE, 125 FEET TO THE NORTH LINE OF THE NE1/4 NW1/4 OF SAID SECTION 21; THENCE EAST ALONG SAID NORTH LINE, 60 FEET TO THE EAST RIGHT-OF-WAY LINE OF SW 13TH STREET, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE SOUTH ALONG SAID EAST RIGHT-OF-WAY LINE, 120 FEET TO THE NORTH LINE OF SAID TRACT 1; THENCE EAST ALONG SAID NORTH LINE, 130 FEET TO THE EAST LINE OF SAID TRACT 1; THENCE SOUTH ALONG SAID EAST LINE, 159 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, BEING 40 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE N49°E ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, 280 FEET TO THE SOUTH LINE OF THE NORTH 96 FEET OF SAID NE1/4 NW1/4; THENCE S41°E, PERPENDICULAR TO SAID CENTERLINE, 70 FEET TO THE SOUTHEAST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE N49°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 228 FEET TO THE NORTH LINE OF THE NW1/4 NE1/4 OF SAID SECTION 21; THENCE EAST ALONG SAID NORTH LINE, 294 FEET TO THE PROLONGATION OF THE NORTHEAST LINE OF A TRACT OF LAND DESCRIBED IN VOLUME 279, PAGE 0839, DESCHUTES COUNTY DEED RECORDS; THENCE S65°E ALONG SAID PROLONGATION, AND ALONG SAID NORTHEAST LINE, 351 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE S65°E ALONG SAID PROLONGATION, 100 FEET TO THE SOUTHEAST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N26°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 126 FEET TO THE NORTH LINE OF THE FIRST EXCEPTION TO PARCEL 1, AS DESCRIBED IN DOCUMENT NO. 2018-005171, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE EAST ALONG SAID NORTH LINE, 67 FEET TO THE NORTHWEST LINE OF A TRACT OF LAND DESCRIBED IN DOCUMENT NO. 2009-52569, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE S26°W ALONG SAID NORTHWEST LINE, 306 FEET TO THE SOUTHEAST LINE OF SAID TRACT; THENCE N64°W, PERPENDICULAR TO SAID RAILWAY CENTERLINE, 160 FEET TO SAID NORTHWEST RIGHT-OF-WAY LINE; THENCE S26°W ALONG SAID

SOUTH HIGHWAY 97 URBAN RENEWAL AREA,
CONTINUED:

NORTHWEST RIGHT-OF-WAY LINE, 1110 FEET; THENCE S64°E, PERPENDICULAR TO SAID CENTERLINE, 100 FEET TO THE NORTHWEST CORNER OF PARCEL 4, AS DESCRIBED IN DOCUMENT NO. 2014-042282, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY OF SAID PARCEL 4 AS FOLLOWS: EAST, 449 FEET; THENCE S14°W, 73 FEET; THENCE S04°E, 82 FEET; THENCE S13°W, 501 FEET; THENCE S36°E, 859 FEET; THENCE WEST, 996 FEET TO THE CENTER 1/4 CORNER OF SAID SECTION 21; THENCE LEAVING SAID TRACT BOUNDARY, WEST ALONG THE SOUTH LINE OF THE SE1/4 NW1/4 OF SAID SECTION 21, 588 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE 5602 FEET SOUTHWESTERLY ALONG SAID NORTHWEST RIGHT-OF-WAY LINE TO A POINT WHICH BEARS S27°W, 5599 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING ON THE NORTHEAST RIGHT-OF-WAY LINE OF SW AIRPORT WAY, AND BEING 55 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE S52°E, 101 FEET TO THE INTERSECTION OF THE SOUTHEAST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD AND THE NORTHEAST RIGHT-OF-WAY LINE OF SW AIRPORT WAY, SAID INTERSECTION BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY, AND BEING 60 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE 444 FEET SOUTHEASTERLY ALONG SAID NORTHEAST RIGHT-OF-WAY LINE TO A POINT WHICH BEARS S60°E, 434 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING ON THE EAST LINE OF THE WEST 40 FEET OF THE SW1/4 OF SAID SECTION 28; THENCE SOUTH ALONG SAID EAST LINE (ALSO BEING THE EAST RIGHT-OF-WAY LINE OF SW 19TH STREET), 2624 FEET TO THE NORTH LINE OF SAID SECTION 33; THENCE EAST ALONG SAID NORTH LINE, 5246 FEET TO THE NORTHEAST CORNER OF SAID SECTION 33; THENCE SOUTH ALONG THE EAST LINE OF SAID SECTION 33, 5268 FEET TO THE SOUTHEAST CORNER OF SAID SECTION 33, AND TO THE POINT OF BEGINNING.

THE SAME CONTAINING 1440 ACRES, MORE OR LESS.

A SKETCH OF THE URBAN RENEWAL AREA DESCRIBED ABOVE IS SHOWN ON THE ATTACHED EXHIBIT "A", WHICH IS HEREBY INCORPORATED BY REFERENCE.

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JULY 15, 1983
WILLIAM G. BAHRKE
2039

Renewal Date: 12/31/21

PREPARED JULY 3, 2020

POVEY AND ASSOC. LAND SURVEYORS
P.O. BOX 131, REDMOND, OR 97756
(541) 548-6778 20-078D.DWG

December 2020

Report on the Urban Renewal Plan

South 97 Urban Renewal Area

Prepared for:

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INTRODUCTION

The following Report on the South 97 Urban Renewal Plan (the "Report") provides supporting information to the South 97 Urban Renewal Plan (the "Plan") according to the requirements of ORS 457.087. Gathered from a variety of resources, the Report contains background information on the South 97 Urban Renewal Area ("Area"), a blight analysis for the District, details for the projects added by the Plan, and financial feasibility analysis for the Plan. The Report accompanies the Plan to describe existing conditions in the Area, identify the estimated costs of projects and sources of funding, and perform the financial feasibility analysis. It is intended to provide public information and a basis for the findings made by the City Council as part of its approval of the Plan.

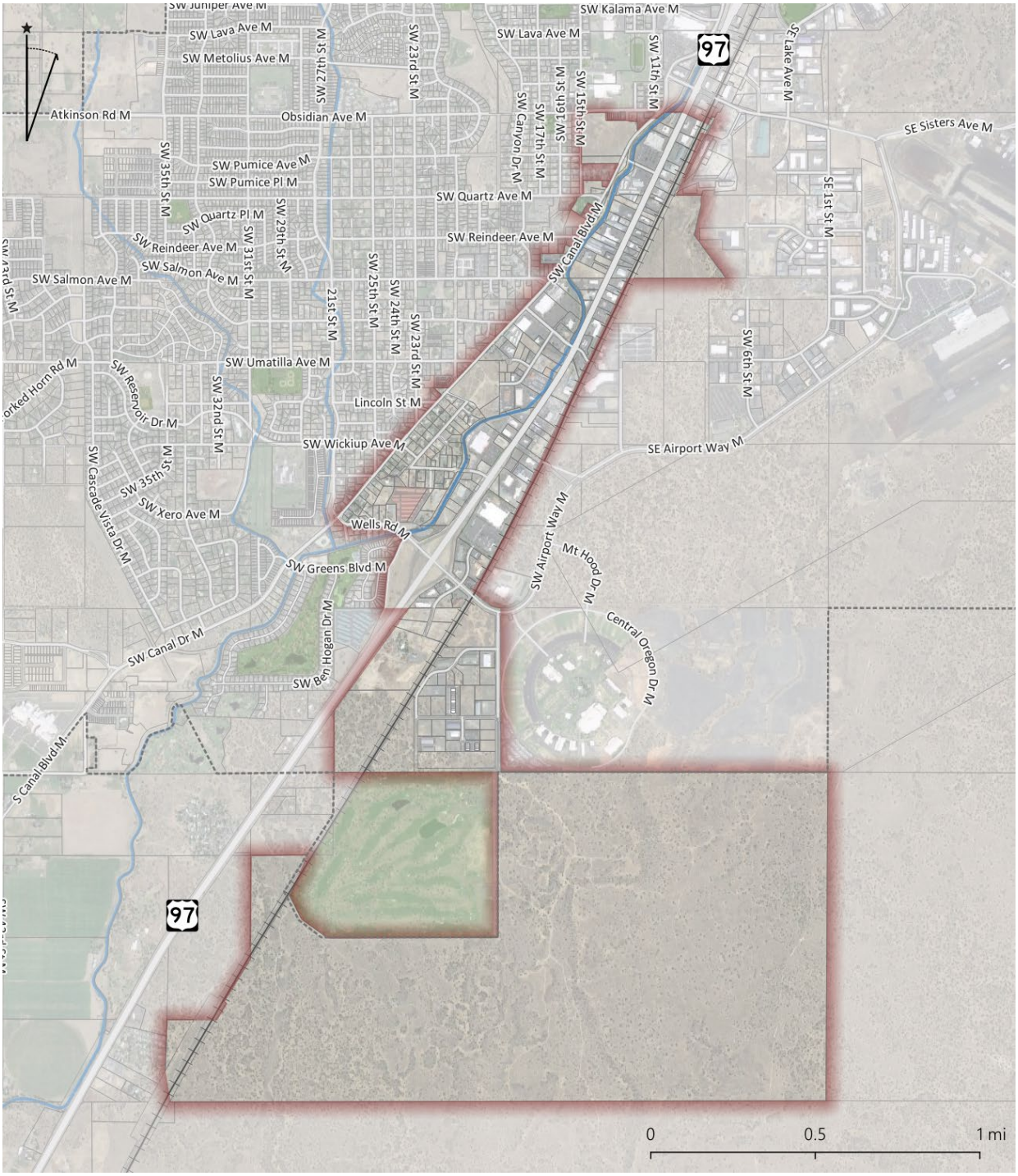
ORS 457.087 requires a report to include:

- A description of the physical, social, and economic conditions within the district and the impact of the plan, including fiscal impacts, in light of added services or increased population
- Reasons for the selection of the Urban Renewal Area (cure blight, implement recommendations from plans)
- Descriptions of land use and zoning, and references to the City's Comprehensive Plan, Capital Improvement Plan (CIP), Transportation System Plan (TSP)
- The relationship between each project and the conditions within the urban renewal area
- Project estimated costs and sources of funding (TIF and other)
- The estimated completion date for each project
- The estimated amount of money required for each urban renewal area and the anticipated year in which indebtedness will be retired or otherwise provided
- A financial analysis of the plan, with sufficient information to determine the feasibility of the plan
- The fiscal impact on overlapping taxing districts, both until and after the indebtedness is repaid
- A relocation report that includes:
    - An analysis of existing residents or business required to relocate temporarily or permanently as a result of the urban renewal agency's actions
    - A description of the methods to be used for the temporary or permanent relocation of persons living and businesses situated, in the urban renewal area
    - An enumeration, by cost range, of the existing housing units in the urban renewal areas of the plan to be destroyed or altered and the new units to be added

100. DESCRIPTION OF THE PHYSICAL, SOCIAL AND ECONOMIC CONDITIONS

The conditions described in this section pertain to the Urban Renewal Area (Area) shown in the following map (figure 1). A legal description for the Area boundary is included in this Report (Attachment F).

Figure 1. South 97 Urban Renewal Area Boundary



Source: Leland Consulting Group

A. Physical Conditions

1. Land Area

The South 97 Urban Renewal Area encompasses 1,330.5 acres of land area within the City limits.

ORS 457.420(2)(b)(B) provides that the total land area of a proposed urban renewal district, when added to the land area of existing renewal areas may not exceed 25 percent of the City's land area (for Cities with populations of less than 50,000). The City's current land area is approximately 10,449 acres. The Redmond Downtown Urban Renewal District includes 701.70 acres (6.7 percent of the total). The proposed South 97 Urban Renewal District boundary includes 1,330.52 acres (12.7 percent of the total). The total of all acreage in urban renewal areas represents 19.45 percent of the City's land area and is, therefore, within the 25 percent limitation.

Table 1. Urban Renewal Area Conditions

	Acres	% of Total
Total area within the City	10,449.0	
Redmond Downtown Urban Renewal District	701.7	6.7%
Proposed South Hwy 97 Urban Renewal District	1,330.5	12.7%
Total area within urban renewal districts	**2,032.2**	**19.5%**

Source: Deschutes County Assessor

2. Topology and Geography

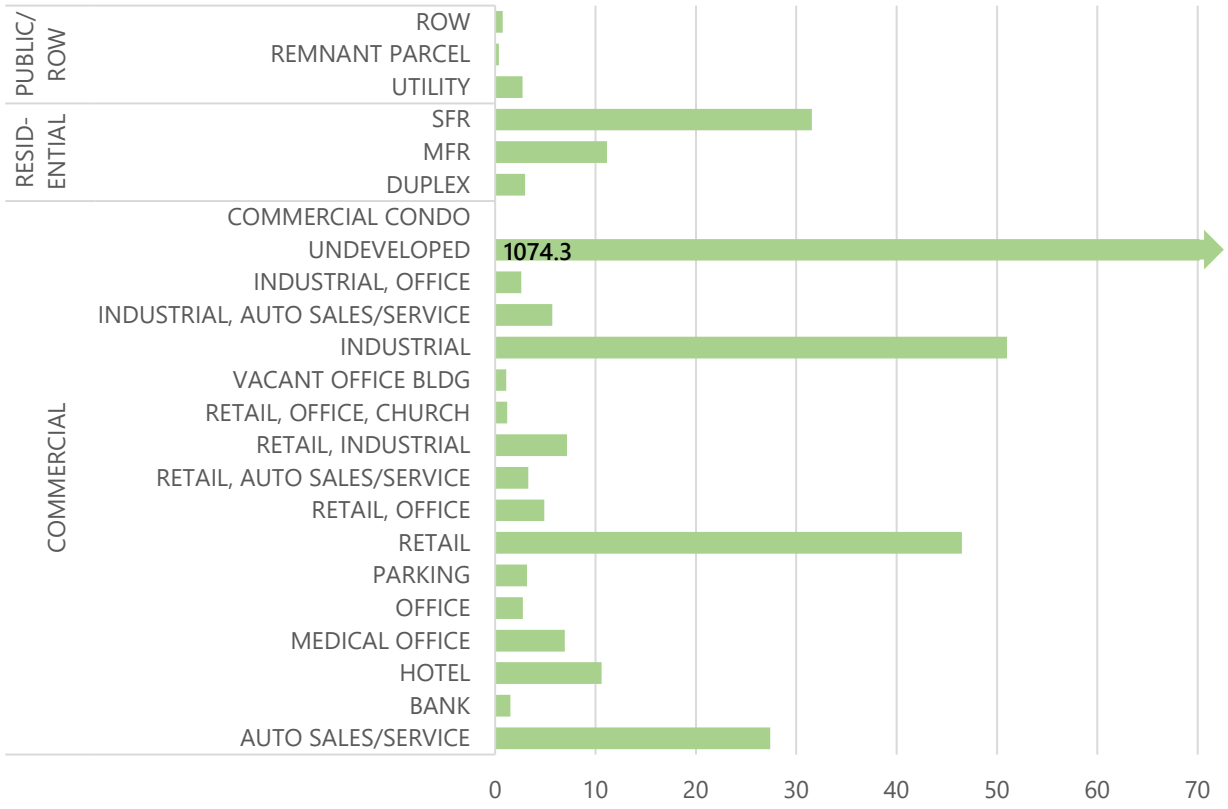
The Urban Renewal Area consists of predominately flat land, 0.0 to 8.0 percent slopes. The soil in the area is generally Deschutes-Stukel complex, which consists of shallow, well-drained soils from volcanic rock. The rocky nature of the area can add to the cost of excavation for building foundations, streets, and utilities. The Central Oregon Irrigation District (COID) Pilot Butte Canal runs adjacent to Highway 97 to the west and the Burlington Northern Santa Fe (BNSF) railway runs along the east. The irrigation canal and railway are barriers to east-west traffic circulation. US 97 South Corridor is mirrored by Canal Blvd. to the west which is the arterial roadway that collects most of the City's westbound traffic.

The South Redmond Tract is relatively level with scattered lava rock outcrops. Surrounding the rock outcrops are level areas of shallow, sandy soils. Elevation ranges from 3,050 to 3,180 feet. It is physically characterized as juniper woodland and considered rangeland. Vegetation includes western juniper and sagebrush and the soils are mostly sandy loam with basalt outcrops.

3. Existing Land Use and Development

A detailed parcel-by-parcel land use inventory of the Urban Renewal Area was undertaken in April 2020 and is summarized in the following table and charts. The inventory shows the Urban Renewal Area contains a significant amount of vacant and underdeveloped land. Of the categorized land uses, the largest percentage of the acreage is undeveloped. The Area contains 1,080.6 acres (83.2%) of land which is vacant or contains only non-structural improvements, such as parking lots, storage yards, etc. This area is mostly without streets, sidewalks, and utilities necessary for development. The four primary uses of developed acreage include industrial, retail, auto sales/service, and single-family residential. The opportunity exists to promote higher density development on the undeveloped acreage in the Urban Renewal Area.

Figure 2. Parcels by Land Use (Acres)



Source: Deschutes County Assessor, LCG

The most intense concentration of the Urban Renewal Area's commercial uses are found in the northern half. Commercial uses, which include retail, service, office, and auto-oriented uses, comprise 118 of the 283 parcels, or 41.7 percent of the total. Industrial uses, which include warehousing, manufacturing, and transportation uses, comprise 55 parcels, or 19.4 percent of the total.

Residential use comprises 81 of the 278 parcels in the Urban Renewal Area, or 29.1 percent of the total. However, reflecting the typically small parcel sizes generally associated with urban residential uses, residential parcels total only 46 acres, comprising only 3.5 percent of the total acreage within the Urban Renewal Area.

Of the 81 residential parcels, 69 are single family, three are multifamily (with one under construction), and 8 are duplexes. The bulk of the residential land uses in the Urban Renewal Area are located in the southwest section of the Area, between Canal Boulevard and US 97. A recently conducted market analysis suggests that future demand for new housing opportunities in the Urban Renewal Area exists.

4. Site Conditions

A survey of site conditions in the Urban Renewal Area was conducted in April 2020. The survey identified 77 parcels as vacant or partially vacant, representing 30.8 percent of the parcels, but 87.4 percent of the land area within the proposed boundary.

Development status was determined primarily through in-person observation and supported by aerial imagery analysis and tax roll data analysis.

The table below indicates a significant amount of potentially valuable property in the proposed renewal area appears to be under-developed, producing little property tax for the City and other taxing bodies.

The diminished property taxes resulting from a preponderance of undeveloped and/or low-value development can lead to service issues for the community. Lower property values due to lack of development and utilization of the area for tax producing purposes meet the ORS definition of blight.

Table 2. Site Development Status

Development Status	Vacant	Partially vacant	Improved
Parcels	60.0	17.0	173.0
% of Total	24.0%	6.8%	69.2%
Acres	1080.6	43.1	162.6
% of Total	84.0%	3.4%	12.6%

Source: Deschutes County Assessor, Leland Consulting Group

Additionally, site conditions of parcels for a significant majority of the proposed urban renewal area are poor or substandard (1,053.7 acres, 81.1 percent of the area). Poor and substandard site conditions include visible deterioration, drainage issues, overgrown vegetation, inefficient circulation or site configuration, etc. Less than 20 percent (18.9 percent) of the area, 200 parcels, have acceptable site conditions.

Table 3. Site Conditions

Site Condition	OK / Acceptable	Poor / Substandard
Parcels	200.0	53.0
% of Total	79.1%	20.9%
Acres	245.2	1053.7
% of Total	18.9%	81.1%

Source: Deschutes County Assessor, Leland Consulting Group

5. Building Occupancy and Conditions

A survey of building use and occupancy in the Urban Renewal Area was conducted in April 2020. The survey identified 187 parcels (66 percent of the total) in the Urban Renewal Area as containing buildings. The survey, which was of exterior building conditions only, evaluated the basic structural condition and level of maintenance of the buildings. Building conditions were categorized as "average to good", "fair (needing repair or maintenance) ", and "seriously substandard."

Building conditions in the proposed area are generally in average to good condition, 91.4 percent of parcels and 84.0 percent of developed acreage. Fair and seriously substandard buildings represent 15 parcels, 8.0 percent of the total parcels, and 15.8 percent of the developed acreage. Most of these properties in these categories are either commercial buildings suffering primarily from aesthetic obsolescence or older single-family houses that have fallen into disrepair over time.

Table 4. Building Conditions

Building Exterior Condition	Average to Good	Fair (Repair/ Maintain)	Seriously Substandard
Parcels	171.0	15.0	1.0
% of Total	91.4%	8.0%	0.5%
Acres	170.5	32.2	0.3
% of Total	84.0%	15.8%	0.2%

Source: Deschutes County Assessor, LCG

Within the study area, building occupancy is high, with 192.8 acres of 203.0 acres fully occupied (95.0 percent) representing 177 of 187 parcels with buildings (94.7 percent).

The survey results found that 10 buildings within the Renewal Area are either vacant or partially vacant. While these vacancies are scattered throughout the Area, there is a higher concentration of vacant or partially vacant commercial buildings along Highway 97.

Leland Consulting Group utilized CoStar commercial real estate data to determine existing long-term vacancies, which was supplemented with tax roll data and in-person observations.

Table 5. Building Occupancy Status

Building Occupancy	Vacant	Partially Vacant	Fully Occupied
Parcels	3.0	7.0	177.0
% of Total	1.6%	3.7%	94.7%
Acres	2.2	8.0	192.8
% of Total	1.1%	3.9%	95.0%

Source: Deschutes County Assessor, Leland Consulting Group

6. Conditions – Traffic and Circulation

The US 97 South Corridor serves as the primary north-south arterial through Redmond and is approximately three miles long from Highland Avenue to the south of the Yew Avenue/Airport Way interchange. The corridor serves a mixture of state, regional, and local traffic traveling to, from, and within a variety of different destinations in Central Oregon. The City is a destination that is not only the hub for transportation serving Central Oregon but also has regional attractors, including an airport, county fairgrounds, and many industrial and commercial areas.

Traffic signals exist at Odem Meadow Way, Veterans Way, and Highland Avenue. A 2017 traffic analysis indicated that most intersections within the corridor are within an acceptable level of service (LOS) per Highway Capacity Manual (HCM) standards. The traffic analysis also estimated 28,000 average daily trips along the corridor. A large majority of the traffic turns west on the various side streets along the corridor to reach the City's suburban areas. The commercial, industrial, fairgrounds and airport areas to the east are only accessible through Veterans Way and the off-ramps at Yew Avenue and Airport Way.

The US 97 Corridor Plan included 2040 traffic volume forecasts. Most of the land use growth in the study area forecast by the year 2040 is related to employment (i.e., commercial and industrial businesses), with a net increase of about 700 workers in the areas immediately adjacent to US 97 (a 97 percent increase over 2010). The employment growth, coupled with housing growth elsewhere in the City of Redmond and regional travel

growth on US 97, will increase traffic activity with average daily traffic volumes from approximately 28,000 vehicles in 2017 to approximately 36,000 vehicles in 2040. The improvements outlined in the Plan are expected to significantly improve operations and greatly mitigate the impacts of this growth.

Access to the South Redmond Tract is limited to a dead end on 19th Street. The 19th Street extension is critical to improving access to the area. On the north, 19th Street provides direct access to Airport Way and the Yew Avenue interchange at US 97.

7. Conditions – Sidewalks and Streetscape

Properties with missing sidewalks or sidewalks in need of repair are present throughout the Urban Renewal Area, in both residential and commercial areas. A field survey of sidewalk conditions was conducted in April 2020, which indicated that 42 percent of all parcels in the Area have missing or deteriorated sidewalks along their property frontage. The results of this survey are shown in the following table.

Given the vast majority of the area is undeveloped (due to the DSL property), a high proportion of the total acreage within the Area is without sidewalks. With regard to parcels, there is an especially high concentration of properties with missing sidewalks in the residential neighborhoods west of Canal Boulevard, in the central and southern commercial and industrial areas of the Urban Renewal Area.

Table 6. Sidewalk Conditions

Sidewalk Condition	Good Condition	No Sidewalk	Repair / Replace
Parcels	145.0	94.0	11.0
% of Total	58.0%	37.6%	4.4%
Acres	190.0	1078.3	17.9
% of Total	14.8%	83.8%	1.4%

Source: Deschutes County Assessor, LCG

8. Conditions – Sewer and Water Services

Most of the City's sewer flows within the US 97 South Corridor are collected via gravity sewer mains. The gravity sewer mains convey flows to the West Side Sewer Interceptor pipe located in the City's west and central area. The West Side Sewer Interceptor ultimately delivers all sewer flows by gravity to the City's Water Pollution Control Facility (WPCF). Sewer flows specifically from the south area, which includes the County Fairgrounds and the Fairgrounds Business Park subdivisions, are collected via gravity mains to the Yew lift station. The lift station directs flows via a sewer force main to a gravity main located along Canal Boulevard, which ultimately conveys flows to the West Side Sewer Interceptor. Capacity has not been identified as a constraint for all US 97 South Corridor improvements. The City recommends a new lift station and forced main to serve the South Redmond Tract. Alternately, the City is also open to a package treatment plant for the South Redmond Tract.

The City obtains 100 percent of its water supply from groundwater through drilled wells. The City's water distribution system is divided into various zones that operate at different capacities and pressures. Most of the US 97 South Corridor lies within Pressure Zone 2 which encompasses most of the City. The south area is within Pressure Zone 1, which is considered the high-pressure zone for the City. The City has identified several projects to align with the US 97 South Corridor improvements and also to provide water service to the South Redmond Tract. In summary, the projects identified include a new reservoir and well along with numerous new water pipeline projects which are required to meet future capacity and fire flow demands.

9. Conditions – Comprehensive Plan Goals and Objectives

The Redmond Comprehensive Plan addresses numerous conditions, deficiencies, and issues addressed in this Urban Renewal Plan. Specific goals and policies found in the Redmond Comprehensive Plan concerning area conditions and problems are:

CHAPTER 9 – ECONOMIC DEVELOPMENT

Goals

1. Expand, improve, and diversify the economy of the Redmond Urban Growth Boundary area while maintaining Redmond's quality of life.

3. Retain or create industrial, office, professional service, technology, medical, tourism, retail, and other jobs through expansion and retention of existing businesses and recruitment of new businesses.

4. Improve the appearance of the community's employment districts, particularly along Highways 97 and 126, the Downtown, central eastside industrial areas, and the Airport/Fairgrounds area.

9. Provide, maintain, and promote the enhancement of state of the art infrastructure, including, but not limited to, transportation systems, water, sewer, natural gas, power, telecommunications, and air service to support the commercial and industrial needs of the community.

11. Maintain Redmond's favorable employment to housing ratio by taking affirmative steps to ensure economic development and employment growth keeps pace with population growth, especially for industrial employment.

12. To build a strong and thriving regional economy by coordinating public investments, policies, and regulations to support regional and state economic development objectives in Central Oregon as determined through the Central Oregon Large Lot Industrial Land Needs Analysis.

Policies

9. The City should give a high priority to extending and improving the infrastructure needed for economic development.

10. The City shall provide an incentive program encouraging the development of primary industry family-wage jobs.

11. The City should provide incentives and innovative ways to encourage and promote an inventory of available industrial buildings and a pre-approved process to attract industrial uses.

12. General Objectives

    b. Encourage landscaping and other forms of city beautification for the purpose of enhancing the physical character of each area, and the overall city.
    f. Focus community efforts to improve the overall appearance of existing commercial areas and similar considerations encouraged to all new developments.
    i. Rehabilitate or re-develop older commercial areas in order to retain their values to the community, including the Downtown and Highway 97 corridor after the highway is re-routed to a limited access corridor.

33. Commercial development adjacent to arterial streets and State highways shall be subject to access restrictions.

34. C-1 commercial development along Highway 97 shall be encouraged to provide service access roads which feed into arterial and collector streets at designated points.

46. The City recognizes the importance of maintaining a large-lot industrial land supply that is readily developable in Central Oregon.

Findings: Plan's relationship to Chapter 9 – Economic Development.

- The Plan's Industrial Opportunity Fund, Small Loan Program, and Incentive Funding project activities support Economic Development Goals 1, 3, 11, and 12 and Policies 10, 11, and 46 through programs that support the development or expansion of businesses and employment centers that retain and create job opportunities, help maintain a balance of jobs to housing, promote public-private and inter-agency coordination, and expand, diversify, and improve the local economy.
- The Plan's public utility, power, gas, and telecommunications project activities support Economic Development Goals 9, 11, and 12 and Policies 9 and 46 by extending and improving Redmond's infrastructure to meet the commercial and industrial needs of the community, thereby supporting job growth, supplying readily developable large-lot industrial land, and helping the City coordinate investments to support regional and state economic development objectives in Central Oregon.
- The Plan's transportation project activities support Economic Development Goals 4, 9, and 11 and Policies 33 and 34 by funding transportation investments that improve the appearance of transportation elements in the Area's employment districts, modify and enhance access and connectivity, and extend, develop, and improve infrastructure to serve the commercial and industrial needs of the community.
- The Plan's transportation project activities support Economic Development Goals 1, 4, 9, and 12 and Policies 12(b)(f)(i) and 34 by improving the Area's physical appearance, accessibility, and navigability by various modes of transportation, and strengthening the identity and vitality of both the US 97 Corridor and the broader Area.

CHAPTER 10 – HOUSING

Goals

3. Establish residential neighborhoods that are safe, convenient, and attractive places to live, which are located close to schools, parks, shopping, and employment centers.

5. Provide a broad range of accessible and affordable housing.

6. Provide for higher densities in proximity to schools, services, parks, shopping, employment centers, and public transit.

Policies

23. Criteria for the location of multifamily housing shall include proximity to the City core, neighborhood commercial centers, major transportation corridors, schools, services, parks, shopping, employment centers, and transit corridors.

Findings: Plan's relationship to Chapter 10 – Housing.

- The Plan's transportation and utility infrastructure project activities support Housing Goals 3, 5, and 6 and Policy 23 by reducing the cost burden on developers, thereby improving the prospects of new housing development, and potentially increasing the probability of higher density developments.

- The Plan's development assistance and incentive funding program activities support Goals 3, 4, 5, and 6 and Policy 23 by supporting employment growth along a major corridor, near shopping and employment centers, and near services.

CHAPTER 11 – PUBLIC FACILITIES AND SERVICES

Goals

1. To provide for a close correlation between the provisions of urban services and urban development in order to bring about a more orderly and efficient development pattern, and thereby avoid unnecessary tax burdens and excessive utility costs normally associated with scattered, unrelated development.
2. To achieve a balance of public costs vs. benefits/revenues in the provision of public facilities and services.
3. To provide public and private utility systems - water, sanitary and storm sewer, energy, communications, garbage, and recycling - at levels necessary and suitable for existing and proposed uses.
5. Public facilities shall be available or under construction prior to the issuance of Building Permits.

Policies

2. The City should establish revenue sources to pay for its planned capital improvements.
3. The City Council should investigate funding alternatives to property taxes for funding public facilities and services.
11. The City shall continue to develop, operate, and maintain a water system, including wells, pumps, and reservoirs, capable of serving all urban development within the UGB.
15. Storm drainage facilities such as dry wells, landscaping, retention ponds or storm drains shall be used to control surface drainage.
26. The City shall encourage Natural Gas providers to provide service throughout the UGB area.
27. Property for future fire station locations should be planned for and purchased in advance in order to save costs of facility zoning construction. Attempts shall be made to combine future stations with other government entities in order to reduce infrastructure and operations costs.

FINDINGS: Plan's Relationship to Chapter 11 – Public Facilities and Services.

- The Plan's public utility, power and gas, and communications projects support Goals 1, 2, and 3 and Policies 11, 15, and 26 by providing infrastructure deemed critical to attracting desired users to the Area and by providing the necessary infrastructure for existing businesses and industries to expand operations.
- The Plan's Fire Station project supports Goal 5 and Policy 27 by providing funding for a new fire station to serve south/southeast Redmond.
- The Plan supports Policies 2 and 3 by providing additional funding methodologies and funding alternatives to pay for and leverage planned capital improvements and programs.
- The Plan's Industrial Opportunity Fund, Incentive Funding, and Small Loan Program activities support Goals 1, 2, 3, and 5 and Policies 11, 15, and 26 by encouraging and accelerating the timing of the construction of critical infrastructure deemed necessary for the expansion of existing businesses and establishment of new users.

CHAPTER 12 – TRANSPORTATION

Goals

1. Reduce through traffic, congestion, and improve circulation along Highway 97, especially along the 5th and 6th Street couplet.
2. Enhance east/west circulation.
3. Identify roadway system needs to serve undeveloped areas so that steps can be taken to preserve rights-of-ways and maintain adequate traffic circulation.
4. Increase the use of alternative travel modes through improved safety and service

Objectives:

1b. Improve intersection operations by adding left-turn phases, installing additional traffic signals, actuating and coordinating traffic signals, and/or increasing sight distance as needed.

2a. Develop a safe and efficient east-west arterial and collector system

2b. Enhance existing crossings and determine the best locations for additional crossings of Dry Canyon, Highway 97, Pilot Butte Canal, and BNSFRR line to link east and west Redmond.

3a. Integrate new arterial and collector routes into the existing city grid system.

4a. Provide additional sidewalks and improve existing sidewalk pavement for pedestrian safety and access.

4b. Provide additional bicycle routes and plan regular maintenance of existing routes for bicycle safety and access (per Redmond Bicycle Master Plan).

4c. Provide pedestrian and bicycle access, especially when direct motor vehicle access is not possible.

Policies

3. The function of existing and planned roadways as identified in the Redmond Urban Area Transportation Plan shall be protected through the application of appropriate access control measures.
10. The City shall work to acquire and develop a trail system that utilizes Redmond's irrigation canal system.
16. Sidewalks shall be included on all new streets except limited access roads or where equivalent alternative pedestrian circulation is provided in the UGB. Retrofitting existing streets with sidewalks shall proceed on a prioritized schedule.
20. Wherever practical, access to the highway will be provided via frontage roads, alternative local roads, or other means, rather than direct access to the highway.
22. A non-traversable median should be installed on the highway when operational or safety issues warrant installation. Directional breaks in the median will be provided as needed to provide safe traffic operation.
24. Medians installed in the state highways should provide bicycle and pedestrian crossings at least every 1/4 mile.
34. The City shall improve east-west and north-south traffic patterns in the central part of the community.
38. Alleys shall be an option in new residential areas, providing rear access and backyard parking.

FINDINGS: Plan's Relationship to Chapter 12 – Transportation.

- The Plan's transportation improvement projects support Goals 1 and 3, Objective 1b, and Policies 3, 22, 24 by improving safety, efficiency, and operations through access and median treatments, supporting the development of new connections and alternatives routes to serve existing and underserved areas, and reducing through traffic by encouraging other modes of transportation.
- The Plan's US 97, local street, alley, and access improvement projects support Goals 1, 2, 3, and 4, Objectives 1b, 2a, 2b, and 3a, and Policies 20, 34, and 38 by enhancing crossings, improving intersection operations, addressing access through new alleys and alternative routes, and implementing circulation improvements necessary for new development.
- The Plan's canal improvement contribution, mixed-use path, US 97 median treatments, sidewalk improvements, and pedestrian infrastructure project activities support Goal 4, Objectives 2a, 4a, 4b, and 4c, and Policies 10, 16, and 24 by providing safer or alternative routes for pedestrians and bicyclists in the US 97 corridor and the surrounding streets, enhancing multimodal connections throughout the Area.
- Additionally, transportation improvements may be a key component of several projects in the Plan, such as the Industrial Opportunity Fund, which is intended to support a wide range of investments and project activities that will leverage private development.

CHAPTER 15 – LIVABILITY

Goals

1. The City of Redmond shall create and maintain livability. The City of Redmond shall guide development and support community identity and pride by implementing policies that improve livability and are innovative, creating a high quality of life, ample family-wage jobs, and a safe environment in which to raise and educate families.

Policies

8. Redmond shall plan for a variety of transportation choices.
9. Redmond shall plan for and promote attractive streetscapes free from clutter, confusion, and blight.
10. Redmond shall develop safe, reliable, and economical transportation choices to decrease household transportation costs, improve air quality, reduce greenhouse gas emissions, and promote public health.
11. The City of Redmond shall develop and maintain the environment that promotes and supports a strong, healthy, and diverse economic base.
12. Redmond shall promote economic competitiveness through sustainable choices for housing, transportation, education, cultural diversity and enrichment, and recreational opportunities as well as improve reliable and timely access to employment centers, educational opportunities, services, and other basic needs by workers.
13. Redmond shall help existing businesses within the City to grow and thrive.
14. Redmond shall help to create and foster new businesses of all types.
15. Redmond shall provide well planned and maintain high-quality infrastructure to provide a competitive advantage for business and community growth.

FINDINGS: Plan's Relationship to Chapter 15 – Livability.

- The Plan's transportation-related projects, such as US 97 improvements, local improvements, pedestrian connections, and other related projects, support Goal 1 and Policies 8, 9, 10, 11, and 12 by providing pedestrian and bicycle infrastructure to encourage walking and cycling, improving streetscapes by addressing blighted conditions (such as lacking sidewalks) and funding beautification efforts, and planning for improved access to current and future employment centers.
- The Plan's Industrial Opportunity Fund, Small Loan Program, and Incentive Funding project activities support Goal 1 and Policies 11, 12, 13, 14, and 15 by providing funding to existing and future businesses to grow and create new employment opportunities.
- The Plan's public utility, power and gas, and communications projects support Goal 1 and Policies 12, 13, 15 by providing high-quality infrastructure as a catalyst for growth.

B. Social and Economic Conditions

1. Property Values and Utilization

The total assessed valuation for the City of Redmond for the 2019-20 tax year was $2.5 billion. The total assessed value of property within the Urban Renewal Area for the 2019-20 tax year was calculated at $142.5 million (commercial property was $104.8 million, residential property $12.8 million, industrial property $23.1 million, and municipal property $1.8 million).

The overall value of improvements to land in the Renewal Area is quite low. Improvements represent approximately $130.2 million while land represents approximately $106.0 million in value. This equates to an improvement to land value ratio of only 1.23.

Mature urban areas are expected to exhibit improvement to value ratios in the 2:1 to 3:1 range. It was noted earlier that the Urban Renewal Area contained an exceptionally high percentage of land acreage either vacant or under-developed. The low level of utilization within the Area indicates it is far from reaching its potential in terms of generating jobs and tax base for the community.

A survey of existing land use and physical conditions in the Area conducted in April of 2020 found that the Area has a significant supply of vacant and underutilized properties. These vacant properties undermine the vitality of the Area's employment districts and represent wasted opportunities to generate economic activity that would benefit the Area.

Specifically, the survey identified 117 parcels as underutilized (46.2 percent of all parcels), totaling 1,181.5 acres (91.0 percent of total acreage).

Table 7. Site Utilization Status

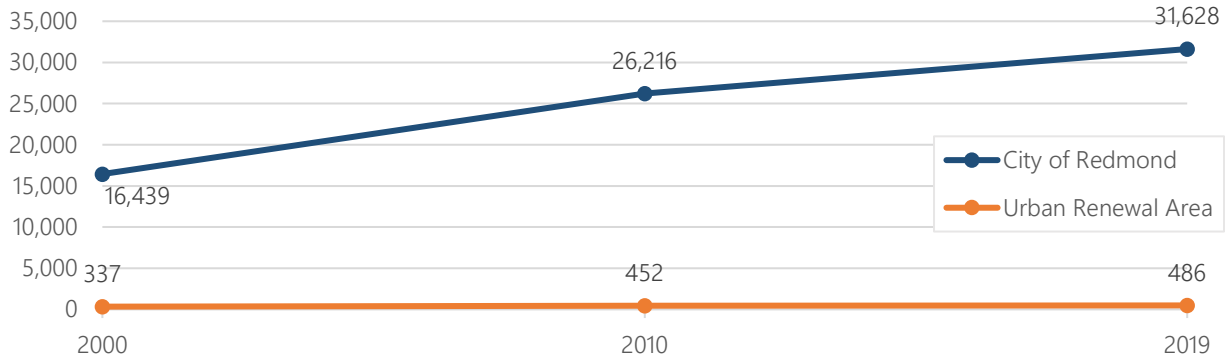
Site Utilization	Not Underutilized	Underutilized
Parcels	136.0	117.0
% of Total	53.8%	46.2%
Acres	117.3	1,181.5
% of Total	9.0%	91.0%

Source: Deschutes County Assessor, Leland Consulting Group

2. Population and Housing

In 2019, with just around 500 residents, the Area contained 1.5 percent of the City's total population of 31,628 residents.

Figure 3. Estimated Population, Urban Renewal Area & City of Redmond



Source: ESRI

As shown in the figure above, between 2000 and 2019, the Urban Renewal Area showed only a marginal population increase of nearly 150 residents. In contrast, during this same timeframe, the City's population increased significantly, adding over 15,000 residents as a result of growth and development in areas outside of the Renewal Area.

In 2019, the City of Redmond comprised an estimated 11,873 housing units. Only 178 or 1.5 percent of these housing units are located in the Renewal Area. At 37 percent, the Area's homeownership rate is significantly lower than the citywide homeownership rate of 56 percent. Further, the Area has a lower percentage of vacant housing units (6.3 percent) relative to the City (9.2 percent).

The recent Redmond Housing Needs Analysis identified the following key findings for housing needs over the 2019-2039 twenty-year planning period:

- Redmond's population is forecast to grow slower than in the past.
- Redmond needs to plan for 6,963 new dwelling units.
- Redmond needs to plan for more single-family attached and multifamily dwelling units.
- Redmond has a deficit of land for single-family and multifamily housing.
- Redmond's development occurred at relatively low densities since 2008.
- Redmond has a deficit of housing affordable to extremely low- and very low-income households.
- Redmond has a deficit of housing affordable to low- and middle- income households.

3. Income

Relative to the City, incomes in the Area are significantly lower. In 2019, the Area's median household income (MHI) was $30,973, more than $23,250 lower than the citywide MHI.

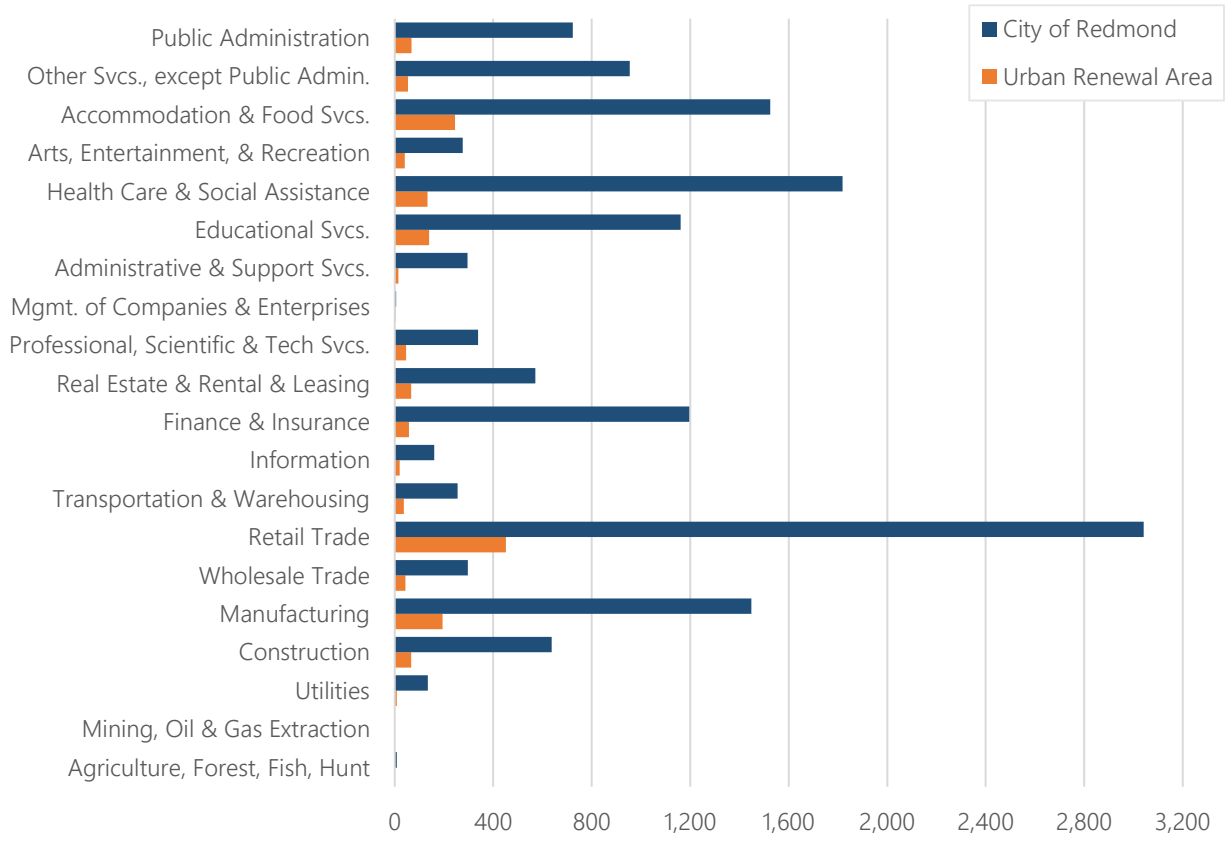
4. Employment

The following figure shows jobs by industry in the Area and the City in 2019. Key findings, based on the 2018 employment data, are summarized below.

- The Area employed 11 percent of citywide jobs in 2019.

- There are an estimated 1,692 jobs in the Area relative to 14,847 jobs in the City of Redmond.
- The majority of jobs in the Area are in the retail trade, with 451 jobs, as is the case citywide, with 3,041 jobs. Retail jobs in the Area comprise approximately 15 percent of the City's retail jobs.
- Industrial jobs, which include the industries of manufacturing, wholesale trade, construction, and transportation and warehousing, comprise 755 jobs in the Area of the 5,423 total jobs citywide (13.9 percent).
- Office jobs—which include the industries of professional, scientific and technical services, information, management of companies and enterprises, finance and insurance, and real estate and rental and leasing—comprise just 194 jobs in the Area of the 2,272 total jobs citywide (8.5 percent)
- Accommodations and Food Service jobs in the Area comprise 16 percent of citywide Accommodations and Food Service jobs.

Figure 4. Estimated 2019 Employment by Industry (NAICS)



Source: ESRI

200. EXPECTED SERVICE AND POPULATION IMPACTS OF THE PLAN

The Plan is expected to produce positive fiscal and service impacts for Redmond. Plan activities are intended to eliminate current and prevent future blighting conditions in the Area. The Plan also supports activities intended to alleviate traffic, circulation, and safety problems, and upgrade streets, sidewalks, and building conditions in the Urban Renewal Area.

The Plan will utilize tax increment revenues. The investments made with tax increment funds from the Urban Renewal Area are expected to produce a more robust tax base from redevelopment and rehabilitation. Development opportunities that may arise as a direct result of these investments are described as follow.

The US 97 Corridor Plan, which involved a significantly smaller study area within the greater Urban Renewal Area, identified a likely development program based on a range of development opportunities and likely real estate projects over the next 10 to 20 years. In 2019, it was determined that this development program would likely accommodate up to 300 units of new housing, almost 90,000 square feet of new employment space, two new hotels, and approximately 160,000 square feet of new retail services.

The addition of the South Redmond Tract provides the opportunity for significantly more development activity and employment growth. While no new analysis was conducted for this additional area within the Urban Renewal Area, the land is expected to accommodate up to three million square feet of new development. New jobs associated with this development will generate significant new state income tax revenues. The Plan supports this growth through numerous transportation and utility infrastructure project activities and programs aimed at incentivizing and catalyzing growth.

Specific impacts of the Plan to the City and other taxing jurisdictions are as follows.

City of Redmond. Demands for City policing will increase in the area as development occurs. Funding for these services will be limited to existing property taxes and additional lodging taxes (from new hotels in the Area), franchise fees; electric, natural gas, cable, water, sewer, stormwater and phone, from new development. The primary development anticipated is industrial, therefore, service demand for police services is anticipated to be limited. Revenue generated from franchise fees will offset a portion of these costs.

Water and sewer service needs, as described in the Physical Conditions in Section 100 of this Report, are generally identified in the City's Capital Improvement Plan and would be funded either by system development charges associated with the new development or with the planned project activities of the Plan.

Fire District. Demands for Fire and Rescue services will increase in the area as development occurs. Funding for these services during the duration of the urban renewal district will be limited to existing property tax revenue. The primary development anticipated is industrial, which will have considerable fire, life safety design standards and will likely be built to the most current building code and equipped with modern fire prevention and public safety features, reducing service demand for fire and rescue services. Revenue generated from existing property taxes is not anticipated to be adequate to pay for services provided during the duration of the urban renewal district.

However, currently, there are many vacant and underutilized properties in the Area which contribute disproportionately to demand for fire and police services. Since the Plan has project activities intended to encourage reinvestment in these blighted properties, it is expected that the Plan would reduce service demand associated with nuisance properties.

The Plan also supports the redevelopment and rehabilitation of older properties, which will bring them up to modern building, safety, and fire codes and is therefore expected to reduce the demand for fire services.

County and County Service Districts. Demands for County services, including but not limited to Sheriff, Library, County Clerk, District Attorney, and Assessor, are anticipated to increase marginally as development within the urban renewal area as new development is anticipated to be industrially driven with limited housing. Local public safety services are provided by the City police department. District Attorney and related court services will have limited impacts resulting from the new development. The Clerk is anticipated to generate

revenue from fees related to recoding and other development services to offset costs, and the Assessor will have impacts resulting from new development. Existing property tax revenue from the urban renewal area will offset a portion of costs during the duration of the urban renewal district, with revenue received subsequently considerably greater than the cost of delivering services within the area.

Parks District. Due to the anticipated nature of development within the urban renewal area, demands for park facilities are anticipated to be limited. Revenue from existing property taxes is anticipated to offset the cost of providing these services to residents within the service area.

Redmond School District. Due to the anticipated nature of development within the Urban Renewal Area, demands for school facilities and operations are anticipated to be limited. State school funding is provided on a per student basis, therefore, any deficiency in local property tax funding is offset by the State school funding formula. Upon the expiration of the urban renewal district, significant local funding will be forthcoming for schools, however, the amount of additional local funding received will be offset with reductions by the State to achieve equitable per student funding across the State.

Central Oregon Community College. Due to the anticipated nature of development within the urban renewal area, demands for higher education facilities and operations are anticipated to be limited. Property tax funding from the urban renewal area will be limited to existing property taxes until the urban renewal district is closed.

Education Service District. Due to the anticipated nature of development within the urban renewal area, demands for pre-kindergarten through high school education facilities and operations are anticipated to be limited. Property tax funding from the urban renewal area will be limited to existing property taxes until the urban renewal district is closed.

Note: Should residential development demand be greater than presently anticipated, impacts on local government services could be significantly different than what is described above.

300. REASONS FOR SELECTING THE URBAN RENEWAL PLAN AREA

The Urban Renewal Plan Area was selected based on Redmond Comprehensive Plan goals, objectives, and policies, and on the existence of blighting conditions within the Area. The blight is evidenced by the lack of proper utilization of land planned for commercial, industrial, residential, and public purposes, traffic and pedestrian conflicts and deficiencies, poor visual and aesthetic conditions, substandard building conditions, the prevalence of low values and lack of investment in the project area, and reduced tax receipts resulting therefrom.

Conditions within the Urban Renewal Area meet the definitions of blight in ORS 457.010. These conditions are described in the previous section, and are summarized below:

- The Area contains a high percentage of parcels of vacant and undeveloped or underdeveloped land.
- The Area lacks adequate multimodal access, circulation, and connectivity. In particular, east-west connections are highly limited.
- The Area lacks adequate sidewalks with 62 percent of parcels with incomplete or missing sidewalks.
- The Area lacks safe bicycle routes connecting key destinations.
- Much of the Area has a poor aesthetic appearance. Landscaping and streetscapes are inconsistent and, in some locations, inadequate or lacking. Overhead utilities contribute to visual clutter and help produce an environment not conducive to new investment in the area.
- The highway commercial properties lack alternative access to improve ingress and egress.

400. RELATIONSHIP BETWEEN EACH PROJECT ACTIVITY AND EXISTING CONDITIONS

The projects in Section 700 of the Plan were identified to specifically address the presence of physical, economic, and other conditions of blight present in the Area. The relationship between these projects and these conditions is described below.

A. US 97 Improvements

Description: This project activity will provide funding to carry out the highway-related improvements from the City of Redmond's US 97 Corridor Plan, including road construction, median and access treatments, pedestrian and bicycle facilities, traffic signal systems, and gateway treatments.

Relationship to Existing Conditions: An efficient and well-planned highway is a critical component of a successful employment district. Under existing conditions, US 97 is inefficient, not aesthetically pleasing, and unsafe, with crashes predicted to increase significantly by 2040. Pedestrian and bicycle connections are also missing or highly limited.

Proposed medians, signals, and access treatments will improve safety in the US 97 Corridor by reducing the frequency and severity of crashes. These projects are also critical to improving the aesthetics of the corridor, providing opportunities for business and community interaction, maintaining freight operations, and improving efficiency.

Bicycle and pedestrian improvements, and the preservation of Highway 97 access, are necessary to support commercial, industrial, and medical-related employment—particularly in the northern portion of the Area. Improvements that improve traffic circulation, such as the signalization of key intersections will also strengthen the Area's capacity to attract private investment.

B. Local Transportation Projects

Description: Local transportation projects include connection roads (including east-west collectors, distributors, and local streets), connections to and construction of a new shared-use path, new access roads or alleyways, pedestrian and bicycle facilities, and other new streets as needed to attract or support private investment.

Relationship to Existing Conditions: Under existing conditions, many parts of the Area, particularly commercial and industrial zoned areas to the north,have poor multimodal access and connectivity. There are few alternatives to US 97, unnecessarily increasing local trips on the highway.

These transportation projects are intended to provide a transportation network in the Area that supports the efficient movement of traffic, reduces traffic volumes on US 97 by providing alternative routes and promoting other transportation modes, and supports a vibrant business district.The projects are also critical to realizing currently untapped development and employment potential.

C. Public Utilities (Water, Stormwater, and Sewer Improvements)

Description: Public utility projects include the development of sewer, stormwater, and water infrastructure to accommodate future development, particularly for the South Redmond Tract. Projects also include the

construction of new stormwater facilities, repair of existing sewer lines, and extension or enlargement of existing water and sewer lines as needed to support the expansion of existing businesses or new development.

- Water, Wastewater, and Stormwater systems will need to be constructed for the area to develop. The City's master plans anticipate these improvements. Funding for these improvements is generally provided by system development charges and utility rates.
- The schedule includes $22.5 million of funding to assist developers with the cost of these facilities (Industrial Opportunity Fund, Incentive Funding)

Relationship to Existing Conditions: The projects are intended to address infrastructure deficiencies in the Area. The lack of costly utility infrastructure within the urban renewal area is a significant barrier to development. The program funding channels noted above provide financial assistance to facilitate timely and orderly completion of utility infrastructure to support development within the urban renewal area.

While most, if not all, of these projects, may currently be planned by the City, accelerating the timeline of their implementation may be required to serve new development in the Area. As such, additional money, funded through tax increment financing, is available for these projects as needed.

Note that the funding for City utilities and infrastructure and other utilities could be structured in a variety of ways. Total funding allocated to assist developers and the utilities with completion of the required improvements to serve the Area is $22.5 million.

D. Fire Station

Description: A fire station will be needed in South Redmond to reduce response times and serve new and existing commercial and residential users. As the area develops, lower response times are necessary, especially for users with a higher risk of fire and other hazards.

- Funding of $4.5 million is included for this project

Relationship to Existing Conditions: The project addresses the present lack of fire and rescue facilities and operations within proximity of the anticipated development within the urban renewal area.

Note: If public building(s) are included in the Urban Renewal Plan, a legislative change in 2017 requires the concurrence of three of four taxing districts that are estimated to forego the most property tax revenue (The City, County, School District, and Fire District). Concurrence requires a vote of the governing body of each of the four taxing districts. Failure of a governing body to take action (resolution) within 45 days of notice is considered concurrence.

E. Industrial Opportunity Fund

Description: This project activity includes a fund for public investments to prepare readily-available industrial lands and support large-scale industrial development in the Area. Assistance could take the form of gap financing (low or no interest loans), infrastructure (roads, sidewalks, utilities), and other tools.

- Funding of $12.5 million is included for this project

Relationship to Existing Conditions: The project addresses the presence of vacant and underutilized land in the area and supports Comprehensive Plan goals related to job creation, business development, and the diversification of Redmond's economy.

F. Small Loan Program

Description: This program offers financial support to assist properties and businesses within the urban renewal to help retain economic vitality and increase property values.

- $2.0 million is allocated towards this program.
- Funding for this program is consistent with tax increment financing requirements as described in ORS 457.170(2) and 457.180. A resolution adopted by the City Council may be appropriate to set forth the economic conditions and other criteria for this program.

Relationship to Existing Conditions: While the number of vacant buildings is currently low, challenging economic conditions may cause additional vacancies or a rise in dilapidated sites and building conditions. This program will support job retention and creation, and retention of property values within the urban renewal area.

G. Incentive Funding

Description: This activity creates funding to allow the Urban Renewal Agency to stimulate redevelopment in the Area by partnering with private property owners, repositioning property for redevelopment, and other activities. As part of the City of Redmond's effort to enhance business vitality and support desired development within the South 97 Urban Renewal Area, Incentive Funding is aimed at incentivizing property owners and developers to rehabilitate or redevelop property that will better serve the City's goals for the Area and the greater Redmond community. Assistance could take the form of direct developer assistance, grants, reimbursements, and or system development charge (SDC) credits for contributions to the transportation and utility system.

- Funding of $10.0 million is included for this project

Relationship to Existing Conditions: The corridor's existing site and building conditions require significant improvements. Existing property and business owners do not currently have the incentives to make the necessary improvements to their sites or building that would result in increased taxable property values, corridor aesthetics, or other economic development-related outcomes. The Incentive Funding program will support the redevelopment or rehabilitation of vacant and undeveloped or underdeveloped properties in the Area, which in turn will support job creation and the mitigation of existing transportation conditions that are a barrier to development today.

H. Natural Gas/Power Improvements

Description: The City may provide funding to accelerate the timing or upgrade the capacity of natural gas or power infrastructure, especially for underserved locations such as the South Redmond Tract.

- The schedule includes $22.5 million of funding to assist developers with the cost of these facilities (Industrial Opportunity Fund, Incentive Funding)

Relationship to Existing Conditions: The lack of costly utility infrastructure within the urban renewal area is a significant barrier to development. The program funding channels noted above provide financial assistance to facilitate timely and orderly completion of utility infrastructure to support development within the urban renewal area. Investments in both gas and electricity are critical to accommodate a range of uses, including but not limited to industrial manufacturers and other significant employment-generating users.

I. Communications Improvements

Description: Communications Improvements include telephone and high-speed internet infrastructure. While the City is not responsible for the cost of communications upgrades and improvements, this project activity provides seed funding to accelerate the timing of specific improvements to attract desired users.

- The schedule includes $22.5 million of funding to assist developers with the cost of these facilities (Industrial Opportunity Fund, Incentive Funding)

Relationship to Existing Conditions: Broadband and other communications improvements are important for economic growth and business vitality. Broadband is the underpinning for some of today's most important transformations in business activity and government services. Much of the Area is currently lacking telecommunications infrastructure, posing a significant barrier to attracting desired users to the Area.

J. Canal Improvement Contribution

Description: This project activity includes funding to help the Central Oregon Irrigation District (COID) pipe at least 1.0 mile of the canal to accommodate new road construction and a multi-use path along the canal.

- Funding of $4.0 million is included for this project

Relationship to Existing Conditions: New east-west transportation connections identified in Section 700(B) requires the piping of the canal to mitigate project costs. Bridging the canal would add significant costs to these new connections. Urban Renewal funding made available through this project activity is therefore critical to providing gap financing to accelerate the timing of the piping project and other related transportation projects.

500. FINANCIAL ANALYSIS OF PLAN

A. Estimated Project Cost and Revenue Sources

The table below shows the estimated total costs of the various projects and programs associated with the South 97 Urban Renewal Area. From the inception of the Plan in fiscal year 2020-21 until its anticipated termination in fiscal year 2044-45, total costs for additional project activities, exclusive of debt service, are estimated at $84.2 million in inflation-adjusted dollars, or $68,269,000 in 2020 dollars. An additional $1.3 million is anticipated for debt issuance related costs. Therefore, the total inflation-adjusted costs for projects, programs, administration, and debt issuance costs to complete the Plan, requires a maximum indebtedness of $85,458,900.

Table 8. Urban Renewal Projects and Program Funding

Project and Program Description	Urban Renewal Funding	Dates	Future Estimated Cost
US Highway 97 Projects	$24,018,000	2024-2032	$27,892,200
Local Transportation Projects	$5,328,000	2025-2040	$6,782,100
Fire Station	$4,500,000	2030-2035	$5,709,200
Industrial Opportunity Fund	$12,500,000	2023-2042	$16,325,500
Small Loan Program	$2,000,000	2022-2042	$2,527,800
Incentive Funding	$10,000,000	2023-2042	$12,820,100
Canal Improvement Contribution	$4,000,000	2026-2032	$4,736,000
Program Administration	$5,923,000	2022-2045	$7,405,500
Total Urban Renewal Project Funding	**$68,269,000**		**$84,198,400**

Source: LCG and GEL Oregon

The principal method of funding the project share of costs will be through the use of tax increment financing as authorized by ORS 457. In addition, the Agency will apply for, and make use of funding from other federal, state, local, or private sources as such funds become available.

Tax increment financing is based upon the premise that new taxes generated by the improvements implemented by the urban renewal district pay for the projects. The tax increment is the difference in property taxes generated by the increase in assessed value in the Area over the original frozen base value when the renewal area was first established.

Note – Urban renewal does not increase the taxes that property owners within the Urban Renewal Area pay, nor does it impact existing tax collections by overlapping taxing districts. It merely redirects any future taxes over the amount that the property owner was paying when the district was established to the Urban Renewal Agency to help pay for projects in the Renewal Area. Without urban renewal, the projects in the Plan may not be implemented due to a lack of funding.

B. Anticipated Start and Finish Dates of Project Activities

The following table shows the anticipated start and finish dates for each project and program activity. Project activities are anticipated to begin in fiscal year 2021-22, and it is estimated that all activities proposed in this plan will be completed by fiscal year 2041-42. At that time, it is estimated that there will be sufficient funds to complete all programmed project activities. Sufficient funds to retire all debt obligations is anticipated in fiscal year 2044-45. An annual schedule of anticipated start and finish dates is provided in Appendix B.

Many project activities will be partially funded with outside sources or will involve outside investment. As a result, the anticipated urban renewal spending will be significantly exceeded by additional investment tied directly to the urban renewal projects.

Table 9. Project Activities Start and Finish Dates and Funding Sources

Project Description	Amount	Dates	Funding
US 97 South Redmond Corridor Plan	**$50,266,700**		
US 97 Highway improvements	$26,248,700	2024-2032	ODOT
Pedestrian and non-street improvements	13,143,000	2025-2033	TIF
SW Volcano Avenue improvements	3,378,000	2025-2033	TIF
SW Umatilla Avenue improvements	1,030,000	2025-2033	TIF
"Reimon" Avenue improvements	2,925,000	2025-2033	TIF
SW Quartz Avenue improvements	2,901,000	2025-2033	TIF
Pumice Roundabout improvements	641,000	2025-2033	TIF
Other Local Transportation Projects	**$5,328,000**		
Commercial Alley Improvements	$1,308,000	2025-2033	TIF
COID Canal Shared-Use Path Improvements	4,020,000	2030-2040	TIF
Public Buildings			
Fire Station	6,000,000	2030-2035	TIF ($4,500,000) Fire & Rescue District
Other Public Facilities			
Canal improvement contribution	4,000,000	2026-2032	TIF/COID
Local Public Utility Projects	**$16,320,000**		
E1 - New Reservoir at Reservoir Dr	$5,000,000	2021	City/TIF
E2 - New Booster Station & Well at Reservoir Dr	7,000,000	2021	City/TIF
E3 - 43rd St Water Line Improvements	999,000	2020	City/TIF
E4 - SW Canal Water Line Improvements	380,000	2020	City/TIF
E5 - SW 19th St Water Line Improvements	265,000	2022	City/TIF
E7 - SW Deerhound Water Line Improvements	335,000	2022	City/TIF
East Hwy 97 Waterline Improvements	1,200,000	2026	City/TIF
West Hwy 97 Waterline Improvements	800,000	2028	City/TIF
Hwy 97 Sewer Improvements	341,000	2026	City/TIF
Developer Projects	**$34,545,000**		
Large Lot Industrial - North public infrastructure	$13,291,000	2030	Dev/TIF
Large Lot Industrial - South public infrastructure	13,779,000	2040	Dev/TIF
CNG - Airport Way Main Extension	475,000	2030	Dev/TIF
Natural gas/electricity improvements	4,000,000	2022-2041	Dev/TIF
Communications improvements	1,000,000	2022-2041	Dev/TIF
700 gpm Lift Station and Force main	2,000,000	2030	Dev/TIF
Total Infrastructure Projects	**$116,459,700**		

Source: LCG, HDR, and GEL Oregon

C. Estimated Expenditures and Year of Debt Retirement

It is estimated that the development activities within the Urban Renewal Area will produce approximately $110.4 million in tax increment revenue between fiscal years 2021-22 and 2044-45. These funds, along with other resources, will be utilized to finance project activities and pay all debt service costs associated with undertaking these project activities.

It is anticipated that available tax increment revenues and funds accumulated in a dedicated debt service fund for debt redemption will be sufficient to retire all outstanding bonded indebtedness in fiscal year 2045-46, and at that time terminate the tax increment financing provisions of the Agency.

The following table provides a schedule of District revenue and expenditures, exclusive of debt proceeds, and principal repayment. A detailed schedule of sources and uses is provided in Appendix C.

Table 10. Schedule of Project and Program Related Expenditures (amounts in thousands)

Fiscal Year Ending June 30	Administration	Capital Outlay	Other[1]	Total Expenditures
2022	204	-	-	204
2023	208	104	20	332
2024	212	1,167	20	1,400
2025	333	4,440	80	4,854
2026	369	4,921	80	5,371
2027	433	5,771	110	6,313
2028	441	5,886	110	6,437
2029	450	6,004	120	6,574
2030	459	6,124	120	6,703
2031	551	7,343	150	8,044
2032	562	7,490	150	8,202
2033	224	2,987	70	3,281
2034	266	3,550	60	3,876
2035	272	3,621	70	3,962
2036	236	2,482	30	2,747
2037	240	2,532	30	2,802
2038	245	2,582	20	2,847
2039	250	2,634	20	2,904
2040	255	2,687	-	2,941
2041	260	2,212	-	2,472
2042	265	2,257	-	2,522
2043	271	-	-	271
2044	276	-	-	276
2045	124	-	-	124
Totals	**7,406**	**76,793**	**1,260**	**85,459**

Source: GEL Oregon

[1] Includes bond issuance expenses

Table 11. Schedule of Tax Increment Revenue and interest earnings (amounts in thousands)

Fiscal Year Ending June 30	Property taxes	Interest Earnings	Total Current Year Resources
2022	249	-	249
2023	623	-	623
2024	942	6	948
2025	1,210	9	1,219
2026	1,489	10	1,499
2027	1,769	10	1,779
2028	2,067	10	2,077
2029	2,387	9	2,396
2030	2,729	8	2,737
2031	3,097	9	3,106
2032	3,493	8	3,501
2033	3,917	7	3,924
2034	4,373	12	4,385
2035	4,863	10	4,873
2036	5,389	14	5,403
2037	5,954	17	5,971
2038	6,560	21	6,581
2039	7,211	27	7,238
2040	7,911	33	7,944
2041	8,398	40	8,438
2042	8,626	44	8,670
2043	8,859	73	8,932
2044	9,098	119	9,217
2045	9,347	168	9,515
Total	**110,562**	**664**	**111,226**
2022	249	-	249

Source: GEL Oregon

D. Impacts of Tax Increment Financing

1. Estimated Financial Effect to Local Governments

The net fiscal impacts to local government jurisdictions shown in the table below represent the total amount of property taxes estimated to be redirected, or foregone, from within the boundaries of Redmond. The word "redirected" or "foregone" must be used in context, for those revenues will not be lost to the Redmond community, but will instead be dedicated to capital improvements or public improvements within the Area. To the extent that the Urban Renewal Area increases in assessed value over what would otherwise have occurred without urban renewal investment, the overlapping taxing districts will see an increase in tax revenue in the long-term.

The following tables show the estimated foregone real property taxes during the life of the urban renewal district with an urban renewal district and without a district. Additionally, the forecast annual property taxes in fiscal year 2045-46 (the year after the district is projected to close) are shown, the payback in years for the foregone property taxes if no urban renewal district were created and the return on investment (ROI) (year by

year foregone property taxes information is provided in the appendix for both no urban renewal district and with an urban renewal district).

Table 12. Forecast Foregone Taxes – Governments (Fiscal years 2022-2045)

Taxing Jurisdiction	City of Redmond	Deschutes County	County Library	Countywide Law Enforcement	County Extension - 4H	9-1-1	Redmond Fire & Rescue	Redmond Park & Recreation	Total General Government
No Urban Renewal	17,020,217	4,701,873	2,122,655	4,168,123	86,449	1,396,318	6,770,110	1,434,528	37,700,273
Urban Renewal	32,405,169	8,952,002	4,041,368	7,935,781	164,595	2,658,488	12,889,764	2,731,228	71,778,395
Difference	15,384,952	4,250,129	1,918,713	3,767,658	78,146	1,262,170	6,119,654	1,296,700	34,078,122

Source: GEL Oregon

Table 13. Forecast taxes – Fiscal Year 2045-46 Government; payback of foregone taxes and return on investment (ROI)

Taxing Jurisdiction	City of Redmond	Deschutes County	County Library	Countywide Law Enforcement	County Extension - 4H	9-1-1	Redmond Fire & Rescue	Redmond Park & Recreation	Total General Government
No Urban Renewal	1,479,399	408,687	184,501	362,294	7,514	121,368	588,459	124,689	3,276,911
Urban Renewal	3,906,410	1,079,154	487,183	956,650	19,842	320,477	1,553,847	329,247	8,652,810
Difference	2,427,011	670,467	302,682	594,356	12,328	199,109	965,388	204,558	5,375,899
Payback – Years	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01
ROI	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%

Source: GEL Oregon

2. Forecast Revenue Sharing by Taxing Jurisdiction

Oregon Revised Statute 457.470 (2)(b) provides that beginning with the later of the 11th year after the initial approval of the plan or the year in which the maximum division of taxes equals or exceeds 10 percent of the initial maximum indebtedness in the plan (10% of $85,458,900, or $8,545,890), the Urban Renewal Agency] shall notify the County Assessor to compute the division of taxes for the urban renewal area using the assessed value that is not greater than the sum of:

A. The amount of assessed value (AV) the Urban Renewal Agency estimates will produce division of taxes revenues equal to 10 percent of the initial maximum indebtedness ($8,545,890) in the Plan, and
B. 25 percent of the amount by which the assumed increment exceeds the AV of the increment the Urban Renewal Agency estimates will produce division of tax revenue equal to 10 percent of the initial maximum indebtedness in the plan.

Additionally, ORS 457.470(2)(c) provides that, beginning with the first year after the year in which division of taxes equals or exceeds 12.5 percent of the initial maximum indebtedness in the Plan (12.5% of $85,458,900, or $10,682,363), the Urban Renewal Agency shall notify the County Assessor pursuant to ORS 457.440 (computation of amounts to be raised from property taxes) (2)(d) to compute the division of taxes for the urban renewal area using an amount of assessed value that the agency estimates will produce division of tax revenues that do not exceed 12.5 percent of the initial maximum indebtedness in the plan ($10,682,363).

Based on the above limitations, the Agency is expected to be limited in its division of tax collections beginning in fiscal year 2041, continuing through fiscal year 2045, when the Agency is anticipated to have sufficient resources to pay all outstanding debt and close the district.

Table 14. Forecast Revenue Sharing – Government

Fiscal Year Ending June 30	City of Redmond	Deschutes County	County Library	Countywide Law Enforcement	County Extension - 4H	9-1-1	Redmond Fire & Rescue	Redmond Park & Recreation	Total General Government
2041	81,717	22,574	10,191	20,012	415	6,704	32,504	6,887	181,004
2042	258,682	71,461	32,261	63,349	1,314	21,222	102,896	21,803	572,988
2043	448,725	123,961	55,962	109,889	2,279	36,813	178,489	37,820	993,938
2044	652,823	180,344	81,416	159,871	3,316	53,557	259,672	55,022	1,446,021
2045	872,009	240,894	108,751	213,548	4,429	71,539	346,858	73,496	1,931,524
Totals	**2,313,956**	**639,234**	**288,581**	**566,669**	**11,753**	**189,835**	**920,419**	**195,028**	**5,125,475**

Source: GEL Oregon

Table 15. Forecast Revenue Sharing – Education

Fiscal Year Ending June 30	Central Oregon Community College	High Desert ESD	Redmond School District #2J	Total
2041	11,496	1,786	93,112	106,394
2042	36,391	5,655	294,756	336,802
2043	63,125	9,809	511,301	584,235
2044	91,837	14,270	743,860	849,967
2045	122,672	19,061	993,613	1,135,346
Totals	**325,521**	**50,581**	**2,636,642**	**3,012,744**

Source: GEL Oregon

3. Estimated Financial Effect on Schools

Financial impacts on Redmond School District #2J are offset by the State school funding allocation, which provides funding on a per enrolled student basis. As a result, urban renewal will not result in lost revenue to the Redmond School District.

From a more global perspective, the State receives a majority of its general fund revenue which is used for school support from personal income taxes. The anticipated development and resulting jobs created in the Urban Renewal Area will create additional personal income tax paid to the State providing an offset and likely a surplus to the amount of property taxes that are redirected.

Central Oregon Community College and the High Desert ESD are not subject to the school funding formula and will realize reduced revenue.

The following tables show the estimated foregone real property taxes during the life of the urban renewal district with an urban renewal district and without a district. Additionally, the forecast annual property taxes in fiscal year 2045-46 (the year after the district is projected to close) are shown, the payback in years for the foregone property taxes if no urban renewal district were created and the return on investment (ROI) (year by year foregone property taxes information is provided in the appendix for both no urban renewal district and with an urban renewal district).

Table 16. Foregone Taxes – Education (Fiscal years 2022-2045)

Taxing Jurisdiction	Central Oregon Community College	High Desert ESD	Redmond School District #2J	Total Education
No Urban Renewal	2,394,356	372,042	19,393,732	22,160,130
Urban Renewal	4,558,665	708,340	36,924,156	42,191,161
Difference	2,164,309	336,298	17,530,424	20,031,031

Source: GEL Oregon, Inc.

Table 17. Forecast taxes – Fiscal Year 2045-46; payback of foregone taxes and return on investment (ROI)

Taxing Jurisdiction	Central Oregon Community College	High Desert ESD	Redmond School District #2J	Total Education
No Urban Renewal	208,118	32,338	1,685,705	1,926,161
Urban Renewal	549,543	85,390	4,451,168	5,086,101
Difference	341,425	53,052	2,765,463	3,159,940
Payback – Years	7.01	7.01	7.01	7.01
ROI	14.3%	14.3%	14.3%	14.3%

Source: GEL Oregon, Inc.

4. Effect on Bond Rates Financial

The forecast amount of debt proceeds, approximately $63.0 million, issued over a period of approximately 17 years (fiscal years 2023-2039), secured by tax increment revenue, and the City's full faith and credit are forecast to have no less than a 1.13 debt coverage ratio (DCR). The DCR is projected to be greater than 1.25 in all but five fiscal years (FY 2031-2035). Debt issues are assumed to have terms of 20 years, with an interest rate of three and one-half percent (3.50%). The maximum outstanding debt balance during the life of the district is forecast at $44.6 million in fiscal year 2035.

Due to the conservative nature of the debt coverage, excess value of real market value to assessed value within the district, among other factors the debt associated with the district is not anticipated to have a material effect on interest rates of bonds issued by the City. As development occurs within the Urban Renewal Area and property values increase, the total property valuation for Redmond is anticipated to provide benefits to the City for general obligation debt and or other debt issued by the City.

5. Feasibility of Plan

A feasibility study was completed in May 2020 that found the creation of the district was feasible with respect to ORS requirements for an urban renewal district. The feasibility report is attached in Appendix F.

This report updates the financial forecasting for projects and programs, their timing, the use of debt, and repayment of debt. Additionally, comprehensive financial proformas for the Agency's implementation and execution of the plan is prepared that demonstrate the financial feasibility of the Plan.

Factors beyond the Agency's control could negatively impact the Agency's ability to complete the plan as projected. These may include but are not limited to lesser development than projected, increased borrowing costs, inflationary impacts on project costs, and delays with project implementation due to a variety of factors. If these conditions were to occur and were to be material, the Agency could adjust project and program scope and timing in order to maintain financial feasibility.

600. RELOCATION

A. Properties Requiring Relocation

At the time of this report, no specific properties associated with potential project activities have been identified as requiring relocation of businesses, households, or buildings. In addition, no housing units have been identified for destruction or alteration. As a result, no relocation surveys have been conducted at this time. The Plan contemplates the acquisition of right-of-way for various transportation improvements, however, there are no relocations anticipated to be associated with this project activity.

B. Relocation Methods

In the event of any future activity involving relocation, the Renewal Agency will explore the possibility of physically moving buildings and other improvements and will discuss with potentially impacted parties' other possible means of assisting with replacement housing if applicable. Prior to any actual relocation, the Renewal Agency will establish a Relocation Policy which will call for assistance to those residents and businesses displaced. Such assistance will include providing information regarding suitable locations, payment of moving expenses, and other payment as deemed necessary.

All relocation activities will be undertaken, and payments made in accordance with the requirements of ORS 281.045 281.105 and any other applicable laws or regulations. Relocation payments will be made as provided in ORS 281.060.

APPENDIX A: REVENUE ASSUMPTIONS FOR THE URBAN RENEWAL AREA

A. New Values Added in Area

The following specific developments are under construction at the time of writing this report:

- Two hotels, totaling 207 units,
- A commercial retail pad, and
- An apartment complex consisting of 116 units.

The following incremental real market values, as work is completed, are projected by fiscal year 2022-23.

Table 18. New Developments

Description	2022	2023	2024	2025	2026
Hotels, Retail Pad	13,432,000	20,148,000	-	2,680,000	2,000,000
Apartments	6,000,000	12,000,000	12,000,000	-	-
Total	19,432,000	32,148,000	12,000,000	2,680,000	2,000,000

Source: GEL Oregon

The taxable assessed value (TAV) to real market value ratio of 60.3% is used to estimate the TAV created by these developments.

Additionally, annual increases in TAV of existing properties are assumed to be 2.9%, slightly below the maximum property by property maximum of 3.0% annually. Lastly, growth from new development is assumed to increase TAV for the area by 1.0% annually, in addition to the project-specific development noted above, during fiscal years 2021-2023, and 4.5% annually thereafter. The increases noted above are categorized into commercial and residential.

Presently, the assessed valuation of property in the area (FY 2020-21) consists of the following types of development:

Table 19. Assessed Value by Use

Use	Commercial	Residential	Industrial	Municipal	Non-identified	Total
Assessed Value	104,849,416	12,766,770	23,109,510	1,804,290	1,620	142,529,986
Percent of Total	73.6%	9.0%	16.2%	1.3%	0.0%	

Source: GEL Oregon

The forecasts assume that future development will be similar proportionately to existing conditions.

B. Frozen Base

The "frozen base" assessed value of the district, with timely adoption of the Plan subsequent to December 2020, is estimated to be $148,072,000. This amount is the estimated total assessed value for fiscal year 2021, based on estimated values as of January 1, 2020 within the urban renewal area. This estimate reflects the current existing assessed value increased by 2.9%, plus 1.0% new assessed value due to development within the area during the calendar year 2019.

C. Tax Rates of Overlapping Taxing Jurisdictions

Table 20. Tax Rates

Taxing Districts	Operating Tax Rate	Local Option Rate	Bonded Debt Rate	Total	% of Total Levy Rate
City of Redmond	4.4101	-	-	4.4101	28.43%
Deschutes County	1.2183	-	-	1.2183	7.85%
County Library	0.5500	-	-	0.5500	3.55%
Countywide Law Enforcement	1.0800	-	-	1.0800	6.96%
County Extension - 4H	0.0224	-	-	0.0224	0.14%
9-1-1	0.3618	-	-	0.3618	2.33%
Redmond Fire & Rescue	1.7542	-	-	1.7542	11.31%
Redmond Park & Recreation	0.3717	-	-	0.3717	2.40%
Total General Government	**9.7685**	**-**	**-**	**9.7685**	**62.98%**
Central Oregon Community College	0.6204	-	-	0.6204	4.00%
High Desert ESD	0.0964	-	-	0.0964	0.62%
Redmond School District #2J	5.0251	-	-	5.0251	32.40%
Total Education	**5.7419**	**-**	**-**	**5.7419**	**37.02%**
Total	**15.5104**	**-**	**-**	**15.5104**	**100.00%**

Source: GEL Oregon

APPENDIX B: SCHEDULE OF PROJECTIONS AND PROGRAMS

Table 21. Schedule of Projections and Programs: 2022-2025

Project	Start Year	End Year	Total - Inflation Adjusted $	2022	2023	2024	2025
Program Administration	2022	2044	$7,405,500	$204,000	$208,100	$212,200	$313,100
US 97 Projects	2024	2032	27,892,200	0	0	0	3,249,700
Fire Station	2030	2035	5,709,200	0	0	0	0
Local Transportation Projects	2025	2040	6,782,100	0	0	0	0
Industrial Opportunity Fund	2023	2042	16,325,500	0	0	530,600	541,200
Incentive Funding	2023	2042	12,820,100	0	0	530,600	541,200
Small Loan Program	2022	2042	2,527,800	0	104,000	106,100	108,200
Canal Improvement Cont's.	2026	2032	4,736,000	0	0	0	0
			$84,198,400	**$204,000**	**$312,100**	**$1,379,500**	**$4,773,400**

Schedule: 2026-2030

Project	Start Year	End Year	2026	2027	2028	2029	2030
Program Administration	2022	2044	$369,100	$432,800	$441,400	$450,300	$459,300
US 97 Projects	2024	2032	3,314,700	3,381,000	3,448,600	3,517,600	3,588,000
Fire Station	2030	2035	0	0	0	0	0
Local Transportation Projects	2025	2040	392,200	400,000	408,000	416,200	424,500
Industrial Opportunity Fund	2023	2042	552,000	563,100	574,300	585,800	597,500
Incentive Funding	2023	2042	552,000	563,100	574,300	585,800	597,500
Small Loan Program	2022	2042	110,400	112,600	114,900	117,200	119,500
Canal Improvement Cont's.	2026	2032	0	750,800	765,800	781,100	796,100
			$5,290,400	**$6,203,400**	**$6,327,300**	**$6,454,000**	**$6,583,000**

Schedule: 2031-2035

Project	Start Year	End Year	2031	2032	2033	2034	2035
Program Administration	2022	2044	$550,700	$561,800	$224,000	$266,200	$271,500
US 97 Projects	2025	2033	3,659,700	3,732,900	0	0	0
Fire Station	2030	2035	1,097,100	1,119,000	1,141,400	1,164,200	1,187,500
Local Transportation Projects	2025	2040	433,000	441,600	450,500	459,500	468,700
Industrial Opportunity Fund	2022	2041	609,500	621,700	634,100	1,078,000	1,099,600
Incentive Funding	2022	2041	609,500	621,70	634,100	718,700	733,000
Small Loan Program	2022	2042	121,900	124,300	126,800	129,400	131,900
Canal Improvement Cont's.	2025	2033	812,700	828,900	0	0	0
			$7,894,100	**$8,051,900**	**$3,210,900**	**$3,816,000**	**$3,892,200**

Schedule: 2036-2040

Project	Start Year	End Year	2036	2037	2038	2039	2040
Program Administration	2022	2044	$235,500	$240,200	$245,000	$249,900	$254,900
US 97 Projects	2025	2033	0	0	0	0	0
Fire Station	2030	2035	0	0	0	0	0
Local Transportation Projects	2025	2040	478,100	487,600	497,400	507,300	517,500
Industrial Opportunity Fund	2022	2041	1,121,600	1,144,000	1,166,900	1,190,200	1,214,000
Incentive Funding	2022	2041	747,700	762,700	777,900	793,500	809,300
Small Loan Program	2022	2042	134,600	137,300	140,000	142,800	145,700
Canal Improvement Cont's.	2025	2033	0	0	0	0	0
			$2,717,500	**$2,771,800**	**$2,827,200**	**$2,883,700**	**$2,941,400**

Schedule: 2041-2044

Project	Start Year	End Year	2041	2042	2043	2044	2045
Program Administration	2022	2044	$260,000	$265,200	$270,500	$276,000	$123,800
US 97 Projects	2025	2033	0	0	0	0	0
Fire Station	2030	2035	0	0	0	0	0
Local Transportation Projects	2025	2040	0	0	0	0	0
Industrial Opportunity Fund	2022	2041	1,238,300	1,263,100	0	0	0
Incentive Funding	2022	2041	825,500	842,000	0	0	0
Small Loan Program	2022	2042	148,600	151,600	0	0	0
Canal Improvement Cont's.	2025	2033	0	0	0	0	0
			$2,472,400	**$2,521,900**	**$270,500**	**$276,000**	**$123,800**

Source: GEL Oregon

APPENDIX C: DETAILED SOURCES AND USES SCHEDULE

The following sources and uses schedule show the various sources totaling $196.7 million, including $110.6 million in tax increment property tax income, to fund the various projects, programs, administration, and debt repayment to execute the Plan.

Following the sources and uses schedule are the year-by-year forecast fund activity for the District's general fund (capital projects fund) and debt service fund.

Table 22. Sources and Uses Schedule (amounts in thousands)

Sources	
Property taxes	$ 110,562
Interest earnings	802
Debt proceeds - long-term	63,000
Debt proceeds - overnight	22,325
Total sources	**$ 196,689**
Uses	
Projects and programs	$ 76,793
Debt principal - long-term	63,000
Debt principal - overnight	22,325
Debt interest	22,520
Administration	7,406
Debt issuance costs	1,260
Ending balance	3,385
Total uses	**$ 196,689**

Source: GEL Oregon

General Fund:

The general fund accounts for debt proceeds, including overnight borrowing (du jour), interest, and other resources to fund the urban renewal projects, programs, administration, and debt issuance costs.

Table 23. General Fund (amounts in thousands)

	Resources					Expenditures						
Fiscal Year Ending June 30	Interest earnings	Debt proceeds - long-term	Debt proceeds - du jour	Total current year resources	Total Resources	Administration	Capital outlay	Other	Total expenditures	Resources over (under) expenditures	Beginning fund balance	Ending fund balance
2021	-	-	-	-	-	-	-	-	-	0	-	-
2022	-	-	225	225	225	204	-	-	204	21	-	21
2023	0	1,000	-	1,000	1,021	208	104	20	332	668	21	689
2024	7	1,000	600	1,607	2,296	212	1,167	20	1,400	207	689	897
2025	9	4,000	800	4,809	5,706	333	4,440	80	4,854	(45)	897	852
2026	9	4,000	900	4,909	5,761	369	4,921	80	5,371	(462)	852	390
2027	4	5,500	900	6,404	6,794	433	5,771	110	6,313	90	390	480
2028	5	5,500	900	6,405	6,885	441	5,886	110	6,437	(33)	480	448
2029	5	6,000	800	6,805	7,252	450	6,004	120	6,574	231	448	678
2030	7	6,000	600	6,607	7,285	459	6,124	120	6,703	(96)	678	582
2031	6	7,500	600	8,106	8,688	551	7,343	150	8,044	62	582	644
2032	6	7,500	500	8,006	8,650	562	7,490	150	8,202	(196)	644	448
2033	5	3,500	-	3,505	3,953	224	2,987	70	3,281	224	448	672
2034	7	3,000	800	3,807	4,478	266	3,550	60	3,876	(69)	672	602
2035	6	3,500	600	4,106	4,708	272	3,621	70	3,962	144	602	746
2036	8	1,500	1,000	2,508	3,254	236	2,482	30	2,747	(240)	746	506
2037	5	1,500	1,300	2,805	3,311	240	2,532	30	2,802	3	506	510
2038	5	1,000	1,700	2,705	3,215	245	2,582	20	2,847	(142)	510	368
2039	4	1,000	2,300	3,304	3,671	250	2,634	20	2,904	400	368	767
2040	8	-	2,800	2,808	3,575	255	2,687	-	2,941	(134)	767	634
2041	6	-	3,600	3,606	4,240	260	2,212	-	2,472	1,134	634	1,768
2042	18	-	1,400	1,418	3,185	265	2,257	-	2,522	(1,104)	1,768	663
2043	7	-	-	7	670	271	-	-	271	(264)	663	400
2044	4	-	-	4	404	276	-	-	276	(272)	400	128
2045	1	-	-	1	129	124	-	-	124	(123)	128	5
Totals	**139**	**63,000**	**22,325**	**85,464**		**7,406**	**76,793**	**1,260**	**85,459**	**5**	**-**	**5**

.Source: GEL Oregon

Debt Service Fund

The urban renewal debt service fund accounts for the receipt of tax increment property taxes, interest income, and the repayment of debt issued, both long-term and overnight borrowing. The urban renewal district is anticipated to have sufficient fund balance at the end of fiscal year 2045 to call and defease all outstanding debt of the district.

Table 24. Debt Serve Fund (amounts in thousands)

	Resources				Expenditures								
Fiscal Year Ending June 30	Property taxes	Interest earnings	Total current year resources	Total Resources	Principal	Interest	Du juor debt payments	Total expenditures	Resources over (under) expenditures	Beginning fund balance	Ending fund balance	DCR	Outstanding debt balance
2021	-		-	-				-	0	-	-	-	
2022	249	-	249	249	-	-	225	225	24	-	24	-	-
2023	623	-	623	648	17	18	-	35	588	24	613	-	983
2024	942	6	948	1,561	53	52	600	705	243	613	856	8.98	1,929
2025	1,210	9	1,219	2,075	143	137	800	1,080	139	856	995	4.32	5,786
2026	1,489	10	1,499	2,494	289	271	900	1,460	40	995	1,035	2.66	9,497
2027	1,769	10	1,779	2,814	466	425	900	1,792	(13)	1,035	1,022	1.98	14,531
2028	2,067	10	2,077	3,099	677	600	900	2,176	(99)	1,022	923	1.62	19,354
2029	2,387	9	2,396	3,318	903	775	800	2,479	(83)	923	840	1.42	24,451
2030	2,729	8	2,737	3,577	1,147	952	600	2,698	39	840	879	1.30	29,304
2031	3,097	9	3,106	3,985	1,425	1,146	600	3,170	(64)	879	815	1.21	35,380
2032	3,493	8	3,501	4,315	1,739	1,356	500	3,595	(94)	815	720	1.13	41,140
2033	3,917	7	3,924	4,645	1,995	1,484	-	3,480	445	720	1,165	1.13	42,645
2034	4,373	12	4,385	5,550	2,180	1,527	800	4,507	(122)	1,165	1,043	1.18	43,464
2035	4,863	10	4,873	5,916	2,372	1,563	600	4,534	339	1,043	1,382	1.24	44,593
2036	5,389	14	5,403	6,785	2,544	1,565	1,000	5,109	294	1,382	1,676	1.31	43,549
2037	5,954	17	5,971	7,646	2,687	1,527	1,300	5,514	456	1,676	2,132	1.41	42,362
2038	6,560	21	6,581	8,713	2,826	1,476	1,700	6,002	579	2,132	2,711	1.53	40,536
2039	7,211	27	7,238	9,950	2,961	1,411	2,300	6,672	567	2,711	3,278	1.65	38,576
2040	7,911	33	7,944	11,222	3,083	1,323	2,800	7,206	737	3,278	4,016	1.80	35,493
2041	8,398	40	8,438	12,453	3,192	1,215	3,600	8,006	431	4,016	4,447	1.91	32,301
2042	8,626	44	8,670	13,117	3,305	1,102	1,400	5,806	2,863	4,447	7,310	1.96	28,996
2043	8,859	73	8,932	16,242	3,386	985	-	4,372	4,561	7,310	11,871	2.03	25,610
2044	9,098	119	9,217	21,087	3,435	866	-	4,302	4,915	11,871	16,786	2.11	22,175
2045	9,347	168	9,515	26,301	3,381	746	-	4,127	5,389	16,786	22,174	2.27	18,793
Totals	**110,562**	**664**	**111,226**	**177,764**	**44,207**	**22,520**	**22,325**	**89,052**	**22,174**	**-**	**22,174**		

Source: GEL Oregon

APPENDIX D: PROJECTED INCREMENTAL TAXABLE VALUE OF DISTRICT

Table 25. Projected Incremental Taxable Value

Fiscal Year Ending June 30	Frozen Base (000's)	TAV - 4.5% (000s)
2021	-	148,072
2022	148,072	165,552
2023	148,072	191,384
2024	148,072	212,767
2025	148,072	230,109
2026	148,072	248,323
2027	148,072	266,678
2028	148,072	286,389
2029	148,072	307,557
2030	148,072	330,291
2031	148,072	354,705
2032	148,072	380,925
2033	148,072	409,083
2034	148,072	439,323
2035	148,072	471,799
2036	148,072	506,675
2037	148,072	544,129
2038	148,072	584,351
2039	148,072	627,547
2040	148,072	673,937
2041	148,072	723,756
2042	148,072	777,259
2043	148,072	834,716
2044	148,072	896,422
2045	148,072	962,690

.Source: GEL Oregon

APPENDIX E: ESTIMATED IMPACT ON TAX RATES AND REVENUE — OVERLAPPING TAXING JURISDICTIONS

Under Oregon's present property tax-based system, total tax rates will not change as a result of adopting an urban renewal program. Thus, there will be no effect on taxpayers from the establishment of an urban renewal district. Instead, the potential revenues raised by taxing bodies will be affected. The new value created within the urban renewal area after the formation of the renewal district (these values are called "incremental" or "excess" values) will not be available to other taxing bodies for raising property tax revenues. The revenues from those incremental values will instead be directed to the renewal agency for the purpose of paying off indebtedness to carry out project activities. The effects of this foregone revenue will vary with the size of the tax bodies' tax rates and the cumulative level of incremental values in the renewal area.

K-12 Schools: It should be noted that under the current system of funding K-12 schools, establishing an urban renewal area does not impact the per-student revenue for schools. The funding per student is derived from a complex formula that establishes a uniform-per-student funding level throughout the State. The amount of funds received by Redmond schools is determined by this formula, not by the amount of property taxes raised locally.

The following schedule shows the estimated foregone property tax revenue for the overlapping taxing jurisdictions based on the value growth assumptions outlined in this report. **It is important to keep the following in mind when looking at the schedule:**

- The potential impact on the school district is shown simply to demonstrate the tax rate calculation. As noted above, however, urban renewal will have no impact on K-12 per student funding (i.e., there will be no reduction in school funding resulting from the creation of an urban renewal district).
- The estimated amounts of foregone revenue assume all the development and increased property values would occur, even without the renewal programs' outlays for area improvements. In reality, the value created by new development would be less or slower without the tax increment funding.

Table 26. Estimated Foregone Property Tax Revenue – Government, Fiscal Years 2022-2045 (assuming urban renewal district created)

Fiscal Year Ending June 30	City of Redmond	Deschutes County	County Library	Countywide Law Enforcement	County Extension - 4H	9-1-1	Redmond Fire & Rescue	Redmond Park & Recreation	Total General Government
2022	77,089	21,296	9,614	18,878	392	6,324	30,663	6,497	170,753
2023	191,010	52,767	23,822	46,777	970	15,670	75,978	16,099	423,093
2024	285,311	78,818	35,582	69,871	1,449	23,407	113,488	24,047	631,973
2025	361,791	99,946	45,120	88,600	1,838	29,681	143,909	30,493	801,378
2026	442,117	122,136	55,138	108,271	2,246	36,271	175,860	37,263	979,302
2027	523,064	144,498	65,233	128,095	2,657	42,912	208,059	44,086	1,158,604
2028	609,992	168,512	76,074	149,382	3,098	50,043	242,636	51,412	1,351,149
2029	703,345	194,301	87,717	172,244	3,572	57,702	279,769	59,281	1,557,931
2030	803,604	221,997	100,220	196,797	4,082	65,927	319,649	67,731	1,780,007
2031	911,272	251,741	113,648	223,164	4,629	74,760	362,476	76,805	2,018,495
2032	1,026,905	283,685	128,069	251,481	5,216	84,246	408,471	86,551	2,274,624
2033	1,151,085	317,990	143,556	281,892	5,847	94,434	457,865	97,018	2,549,687
2034	1,284,446	354,831	160,188	314,551	6,524	105,375	510,913	108,258	2,845,086
2035	1,427,668	394,397	178,050	349,625	7,251	117,124	567,882	120,329	3,162,326
2036	1,581,475	436,886	197,232	387,291	8,033	129,743	629,061	133,293	3,503,014
2037	1,746,651	482,516	217,831	427,742	8,872	143,293	694,763	147,214	3,868,882
2038	1,924,034	531,519	239,953	471,181	9,773	157,846	765,321	162,165	4,261,792
2039	2,114,533	584,144	263,711	517,833	10,740	173,474	841,095	178,221	4,683,751
2040	2,319,117	640,661	289,226	567,934	11,779	190,258	922,472	195,464	5,136,911
2041	2,457,107	678,781	306,435	601,727	12,480	201,579	977,360	207,094	5,442,563
2042	2,516,096	695,077	313,792	616,173	12,780	206,418	1,000,824	212,066	5,573,226
2043	2,579,443	712,577	321,692	631,686	13,102	211,615	1,026,022	217,405	5,713,542
2044	2,647,476	731,371	330,177	648,347	13,447	217,196	1,053,083	223,139	5,864,236
2045	2,720,538	751,555	339,288	666,239	13,818	223,190	1,082,145	229,297	6,026,070
Totals	**32,405,169**	**8,952,002**	**4,041,368**	**7,935,781**	**164,595**	**2,658,488**	**12,889,764**	**2,731,228**	**71,778,395**

Source: GEL Oregon, Inc.

Table 27. Estimated Foregone Property Tax Revenue – Government, Fiscal Years 2022-2045 (assuming no urban renewal district created, i.e., 1.0% projected growth in TAV annually)

Fiscal Year Ending June 30	City of Redmond	Deschutes County	County Library	Countywide Law Enforcement	County Extension - 4H	9-1-1	Redmond Fire & Rescue	Redmond Park & Recreation	Total General Government
2022	77,089	21,296	9,614	18,878	392	6,324	30,663	6,497	170,753
2023	191,010	52,767	23,822	46,777	970	15,670	75,978	16,099	423,093
2024	255,773	70,658	31,898	62,637	1,299	20,983	101,738	21,557	566,543
2025	298,264	82,396	37,198	73,043	1,515	24,469	118,640	25,139	660,664
2026	340,605	94,093	42,478	83,412	1,730	27,943	135,482	28,708	754,451
2027	379,273	104,775	47,301	92,881	1,926	31,115	150,863	31,967	840,101
2028	419,440	115,871	52,310	102,718	2,130	34,410	166,840	35,352	929,071
2029	461,177	127,401	57,515	112,939	2,342	37,835	183,442	38,870	1,021,521
2030	504,537	139,380	62,923	123,557	2,563	41,392	200,689	42,524	1,117,565
2031	549,591	151,826	68,542	134,591	2,792	45,088	218,610	46,322	1,217,362
2032	596,391	164,754	74,378	146,052	3,029	48,927	237,226	50,266	1,321,023
2033	645,017	178,187	80,442	157,960	3,276	52,917	256,568	54,364	1,428,731
2034	695,530	192,142	86,742	170,330	3,533	57,061	276,660	58,622	1,540,620
2035	748,015	206,641	93,288	183,183	3,799	61,366	297,537	63,046	1,656,875
2036	802,546	221,705	100,088	196,537	4,076	65,840	319,228	67,642	1,777,662
2037	859,202	237,357	107,154	210,412	4,364	70,488	341,764	72,417	1,903,158
2038	918,068	253,618	114,496	224,828	4,663	75,317	365,179	77,378	2,033,547
2039	979,214	270,510	122,121	239,802	4,974	80,334	389,501	82,532	2,168,988
2040	1,042,742	288,060	130,044	255,360	5,296	85,545	414,770	87,886	2,309,703
2041	1,108,748	306,294	138,276	271,524	5,632	90,960	441,025	93,449	2,455,908
2042	1,177,325	325,239	146,829	288,318	5,980	96,586	468,303	99,229	2,607,809
2043	1,248,570	344,920	155,714	305,765	6,342	102,431	496,642	105,234	2,765,618
2044	1,322,593	365,369	164,946	323,893	6,718	108,504	526,086	111,473	2,929,582
2045	1,399,497	386,614	174,536	342,726	7,108	114,813	556,676	117,955	3,099,925
Totals	**17,020,217**	**4,701,873**	**2,122,655**	**4,168,123**	**86,449**	**1,396,318**	**6,770,110**	**1,434,528**	**37,700,273**

Source: GEL Oregon

Table 28. Estimated Foregone Property Tax Revenue – Education, Fiscal Years 2022-2045 (assuming urban renewal district created)

Fiscal Year Ending June 30	Central Oregon Community College	High Desert ESD	Redmond School District #2J	Total Education
2022	10,845	1,685	87,839	100,369
2023	26,871	4,175	217,647	248,693
2024	40,137	6,237	325,099	371,473
2025	50,896	7,908	412,244	471,048
2026	62,196	9,664	503,771	575,631
2027	73,583	11,434	596,007	681,024
2028	85,812	13,334	695,057	794,203
2029	98,944	15,374	801,428	915,746
2030	113,049	17,566	915,669	1,046,284
2031	128,195	19,919	1,038,351	1,186,465
2032	144,462	22,447	1,170,110	1,337,019
2033	161,931	25,161	1,311,606	1,498,698
2034	180,692	28,077	1,463,566	1,672,335
2035	200,840	31,207	1,626,760	1,858,807
2036	222,477	34,569	1,802,016	2,059,062
2037	245,714	38,180	1,990,226	2,274,120
2038	270,667	42,057	2,192,346	2,505,070
2039	297,466	46,221	2,409,410	2,753,097
2040	326,247	50,693	2,642,524	3,019,464
2041	345,659	53,710	2,799,757	3,199,126
2042	353,957	54,999	2,866,972	3,275,928
2043	362,869	56,384	2,939,154	3,358,407
2044	372,439	57,871	3,016,673	3,446,983
2045	382,717	59,468	3,099,924	3,542,109
Totals	**4,558,665**	**708,340**	**36,924,156**	**42,191,161**

Source: GEL Oregon

Note: The difference between the forecast tax collections ($110.6 million) and the foregone tax revenue (levies) of $114.0 million, or $3.4 million is due to discounts taken by taxpayers paying taxes in November of the levy year, approximately 2.5%, with the exception of fiscal years 2043-44 through fiscal year 2044-45, when delinquent tax collections are not fully collected or recognized until after those years.

Table 29. Estimated Foregone Property Tax Revenue – Education, Fiscal Years 2022-2045 (assuming no urban renewal district created, i.e., 1.0% projected growth in TAV annually)

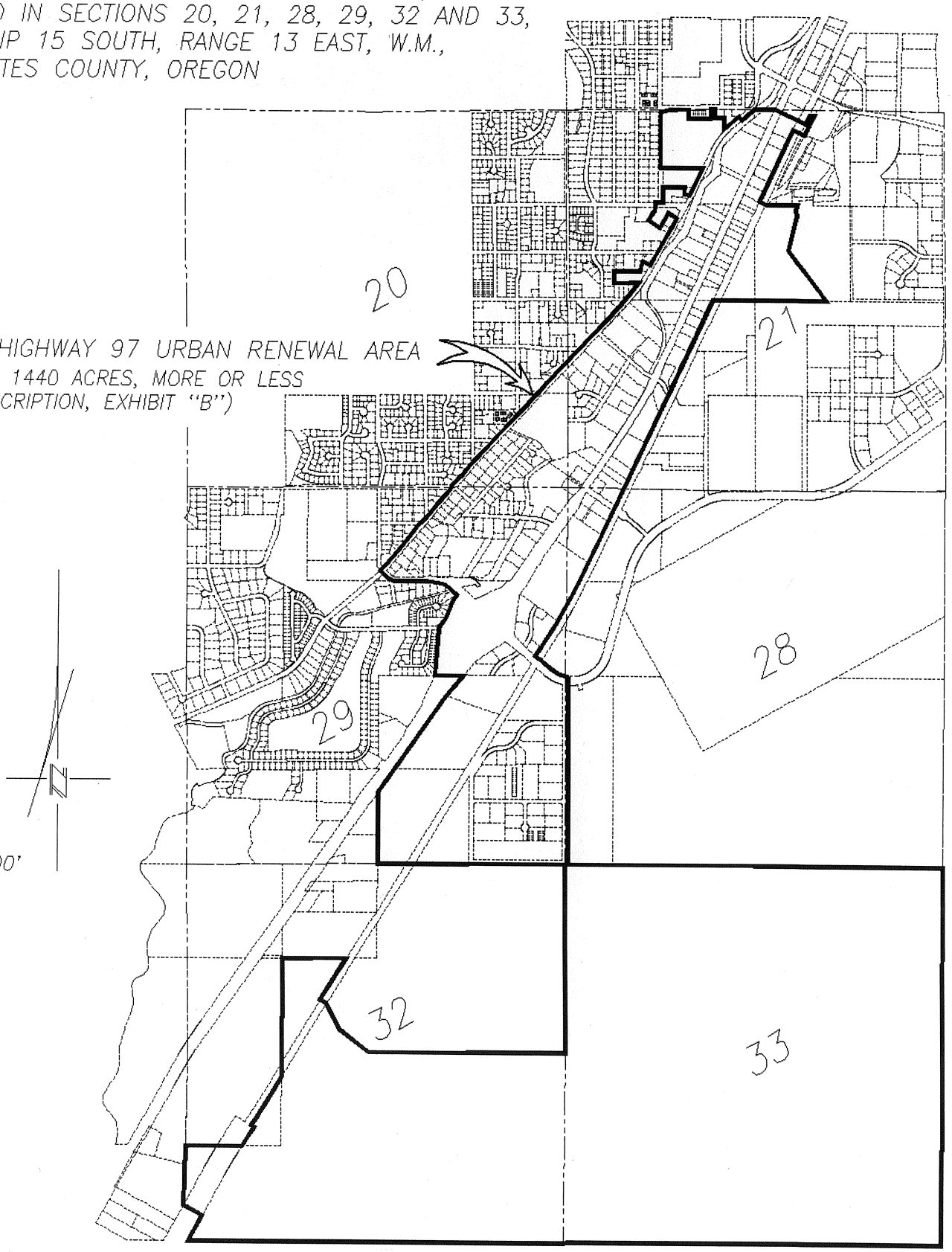
Fiscal Year Ending June 30	Central Oregon Community College	High Desert ESD	Redmond School District #2J	Total Education
2022	10,845	1,685	87,839	100,369
2023	26,871	4,175	217,647	248,693
2024	35,981	5,591	291,441	333,013
2025	41,959	6,520	339,858	388,337
2026	47,915	7,445	388,104	443,464
2027	53,355	8,290	432,164	493,809
2028	59,006	9,169	477,932	546,107
2029	64,877	10,081	525,490	600,448
2030	70,977	11,029	574,897	656,903
2031	77,315	12,013	626,233	715,561
2032	83,899	13,036	679,559	776,494
2033	90,739	14,099	734,966	839,804
2034	97,845	15,204	792,524	905,573
2035	105,229	16,351	852,327	973,907
2036	112,900	17,543	914,463	1,044,906
2037	120,870	18,781	979,020	1,118,671
2038	129,151	20,068	1,046,095	1,195,314
2039	137,753	21,405	1,115,768	1,274,926
2040	146,690	22,793	1,188,155	1,357,638
2041	155,975	24,236	1,263,365	1,443,576
2042	165,623	25,735	1,341,506	1,532,864
2043	175,645	27,292	1,422,686	1,625,623
2044	186,059	28,910	1,507,033	1,722,002
2045	196,877	30,591	1,594,660	1,822,128
Totals	**2,394,356**	**372,042**	**19,393,732**	**22,160,130**

Source: GEL Oregon

APPENDIX F: LEGAL DESCRIPTION OF URBAN RENEWAL BOUNDARY

EXHIBIT "A"

SOUTH HIGHWAY 97 URBAN RENEWAL AREA,
LOCATED IN SECTIONS 20, 21, 28, 29, 32 AND 33,
TOWNSHIP 15 SOUTH, RANGE 13 EAST, W.M.,
DESCHUTES COUNTY, OREGON



SOUTH HIGHWAY 97 URBAN RENEWAL AREA
CONTAINS 1440 ACRES, MORE OR LESS
(SEE DESCRIPTION, EXHIBIT "B")

SCALE:
1" = 2000'

PREPARED JULY 3, 2020

POVEY AND ASSOC. LAND SURVEYORS
P.O. BOX 131, REDMOND, OR 97756
(541) 548-6778 20-078D.DWG

EXHIBIT "B"

DESCRIPTION –
SOUTH HIGHWAY 97 URBAN RENEWAL AREA,
LOCATED IN SECTIONS 20, 21, 28, 29, 32 AND 33,
TOWNSHIP 15 SOUTH, RANGE 13 EAST, W.M.,
DESCHUTES COUNTY, OREGON

DESCRIPTION OF A TRACT OF LAND LOCATED IN SECTIONS 20, 21, 28, 29, 32 AND 33, TOWNSHIP 15 SOUTH, RANGE 13 EAST, WILLAMETTE MERIDIAN, DESCHUTES COUNTY, OREGON, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEAST CORNER OF SAID SECTION 33; THENCE WEST ALONG THE SOUTH LINE OF SAID SECTION 33, 5296 FEET TO THE SOUTHWEST CORNER OF SAID SECTION 33; THENCE WEST ALONG THE SOUTH LINE OF SAID SECTION 32, 5232 FEET TO THE SOUTHEAST RIGHT-OF-WAY LINE OF THE BURLINGTON NORTHERN – SANTA FE (BNSF) RAILROAD, BEING 100 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N29°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 406 FEET; THENCE N61°W, PERPENDICULAR TO SAID CENTERLINE, 300 FEET THE INTERSECTION OF THE NORTHWEST RIGHT-OF-WAY LINE OF SAID RAILWAY AND THE WEST LINE OF THE SW1/4 SW1/4 OF SAID SECTION 32, SAID INTERSECTION BEING 200 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N01°E ALONG SAID WEST LINE, 817 FEET TO THE NORTH LINE OF SAID SW1/4 SW1/4; THENCE EAST ALONG SAID NORTH LINE, 793 FEET TO SAID SOUTHEAST RIGHT-OF-WAY LINE, BEING 100 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N32°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 310 FEET; THENCE N58°W ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 50 FEET; THENCE N32°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY, 802 FEET TO THE WEST LINE OF THE NE1/4 SW1/4 OF SAID SECTION 32; THENCE N01°E ALONG SAID WEST LINE, 348 FEET; THENCE NORTH ALONG THE WEST LINE OF THE SE1/4 NW1/4 OF SAID SECTION 32, 1315 FEET TO THE NORTH LINE OF SAID SE1/4 NW1/4; THENCE EAST ALONG SAID NORTH LINE, 902 FEET TO SAID NORTHWEST RIGHT-OF-WAY LINE, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE S32°W ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, 695 FEET; THENCE S58°E, PERPENDICULAR TO SAID CENTERLINE, 100 FEET TO THE INTERSECTION OF THE SOUTHEAST RIGHT-OF-WAY LINE OF SAID RAILWAY, AND THE NORTHEAST EASEMENT LINE OF BONNEVILLE POWER ADMINISTRATION'S REDMOND-BURNS NO. 1 TRANSMISSION LINE, SAID INTERSECTION BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY, AND BEING 50 FEET FROM THE CENTERLINE OF SAID POWER LINE; THENCE S27°E ALONG SAID NORTHEAST EASEMENT LINE, 417 FEET; THENCE S53°E ALONG SAID NORTHEAST EASEMENT LINE, 507 FEET TO THE SOUTH LINE OF SAID SE1/4 NW1/4; THENCE EAST ALONG SAID SOUTH LINE, AND ALONG THE SOUTH LINE OF THE NE1/4 OF SAID SECTION 32, 2750 FEET TO THE EAST LINE OF SAID NE1/4; THENCE NORTH ALONG SAID EAST LINE, 2649 FEET TO THE SOUTHEAST CORNER OF SAID SECTION 29; THENCE WEST ALONG THE SOUTH LINE OF THE SE1/4 OF SAID SECTION 29, 2634 FEET TO THE

WEST LINE OF THE SW1/4 OF SAID SE1/4; THENCE NORTH ALONG SAID WEST LINE, 992 FEET TO THE SOUTHEAST RIGHT-OF-WAY LINE OF U.S. HIGHWAY 97, BEING 90 FEET FROM THE CENTERLINE OF SAID HIGHWAY; THENCE N35°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 1659 FEET TO ENGINEER'S STATION 125+00, 90 FEET LEFT; THENCE N41°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 376 FEET TO THE NORTH LINE OF THE NW1/4 SE1/4 OF SAID SECTION 29; THENCE WEST ALONG SAID NORTH LINE, 401 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF SAID HIGHWAY (ALSO BEING THE NORTHWEST RIGHT-OF-WAY LINE OF SW 25TH PLACE), AS DESCRIBED IN VOLUME 234, PAGE 1995, DESCHUTES COUNTY DEED RECORDS; THENCE ALONG SAID NORTHWEST RIGHT-OF-WAY LINE AS FOLLOWS: N05°E, 670 FEET; THENCE N33°E, 175 FEET; THENCE N23°E, 255 FEET; THENCE N35°E, 91 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF SW YEW AVENUE, BEING A LINE OF VARIABLE WIDTH FROM THE CENTERLINE OF SAID ROADWAY; THENCE LEAVING SAID NORTHWEST RIGHT-OF-WAY LINE, AND 1190 FEET WESTERLY ALONG SAID SOUTH RIGHT-OF-WAY LINE, AND ALONG ITS NORTHWESTERLY PROLONGATION, TO A POINT WHICH BEARS N73°W, 1131 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING ON THE NORTHWEST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, AND BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE 5459 FEET NORTHEASTERLY ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, TO A POINT WHICH BEARS N42°E, 5449 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING 40 FEET FROM THE CENTERLINE OF SAID ROADWAY, AND BEING ON THE SOUTH BOUNDARY OF A TRACT OF LAND DESCRIBED IN DOCUMENT 2007-43829, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG SAID TRACT BOUNDARY AS FOLLOWS: WEST, 345 FEET; THENCE NORTH, 170 FEET; THENCE EAST, 367 FEET TO THE BOUNDARY OF PARCEL 2, AS DESCRIBED IN DOCUMENT NO. 2018-019368, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE LEAVING SAID TRACT BOUNDARY AND ALONG SAID PARCEL 2 BOUNDARY AS FOLLOWS: N13°E, 122 FEET; THENCE N37°E, 30 FEET; THENCE S61°E, 107 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE LEAVING SAID PARCEL 2 BOUNDARY, N30°E ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, 751 FEET TO THE BOUNDARY OF A TRACT OF LAND DESCRIBED IN DOCUMENT 2007-64854, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY OF SAID TRACT AS FOLLOWS: N59°W, 136 FEET; THENCE S31°W, 239 FEET; THENCE N56°W, 184 FEET; THENCE 214 FEET ALONG THE ARC OF A NON-TANGENT 658 FOOT RADIUS CURVE TO THE LEFT, THE CHORD OF WHICH BEARS N28°E, 213 FEET; THENCE LEAVING SAID TRACT BOUNDARY, NORTH, PERPENDICULAR TO THE NORTH LINE OF SAID TRACT, 60 FEET TO THE NORTH RIGHT-OF-WAY LINE OF SW QUARTZ AVENUE, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE EAST ALONG SAID NORTH RIGHT-OF-WAY LINE, 105 FEET TO THE BOUNDARY OF A TRACT OF LAND DESCRIBED IN DOCUMENT 2020-06416, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY OF SAID TRACT AS FOLLOWS: NORTH 214 FEET; THENCE S89°E, 304 FEET; THENCE S01°W, 96 FEET; THENCE S83°E, 74 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF

SW CANAL BOULEVARD, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE LEAVING SAID TRACT BOUNDARY, AND 422 FEET NORTHEASTERLY ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, TO A POINT WHICH BEARS N26°E, 422 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING AT THE SOUTHEAST CORNER OF TRACT 1, AS DESCRIBED IN DOCUMENT 2020-10963, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE WEST ALONG THE SOUTH LINE OF SAID TRACT 1, 591 FEET TO THE WEST LINE OF SAID TRACT 1; THENCE NORTH ALONG SAID WEST LINE, AND ALONG THE WEST LINE OF TRACT 2, AS DESCRIBED IN SAID DOCUMENT, 782 FEET TO THE NORTH LINE OF SAID TRACT 2; THENCE N74°E ALONG SAID NORTH LINE, 135 FEET; THENCE EAST ALONG SAID NORTH LINE, 265 FEET TO THE EAST LINE OF SAID TRACT 2; THENCE SOUTH ALONG SAID EAST LINE, 125 FEET TO THE NORTH LINE OF SAID TRACT 1; THENCE EAST ALONG SAID NORTH LINE, 312 FEET TO THE WEST RIGHT-OF-WAY LINE OF SW 13TH STREET, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE NORTH ALONG SAID WEST RIGHT-OF-WAY LINE, 125 FEET TO THE NORTH LINE OF THE NE1/4 NW1/4 OF SAID SECTION 21; THENCE EAST ALONG SAID NORTH LINE, 60 FEET TO THE EAST RIGHT-OF-WAY LINE OF SW 13TH STREET, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE SOUTH ALONG SAID EAST RIGHT-OF-WAY LINE, 120 FEET TO THE NORTH LINE OF SAID TRACT 1; THENCE EAST ALONG SAID NORTH LINE, 130 FEET TO THE EAST LINE OF SAID TRACT 1; THENCE SOUTH ALONG SAID EAST LINE, 159 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, BEING 40 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE N49°E ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, 280 FEET TO THE SOUTH LINE OF THE NORTH 96 FEET OF SAID NE1/4 NW1/4; THENCE S41°E, PERPENDICULAR TO SAID CENTERLINE, 70 FEET TO THE SOUTHEAST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE N49°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 228 FEET TO THE NORTH LINE OF THE NW1/4 NE1/4 OF SAID SECTION 21; THENCE EAST ALONG SAID NORTH LINE, 294 FEET TO THE PROLONGATION OF THE NORTHEAST LINE OF A TRACT OF LAND DESCRIBED IN VOLUME 279, PAGE 0839, DESCHUTES COUNTY DEED RECORDS; THENCE S65°E ALONG SAID PROLONGATION, AND ALONG SAID NORTHEAST LINE, 351 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE S65°E ALONG SAID PROLONGATION, 100 FEET TO THE SOUTHEAST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N26°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 126 FEET TO THE NORTH LINE OF THE FIRST EXCEPTION TO PARCEL 1, AS DESCRIBED IN DOCUMENT NO. 2018-005171, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE EAST ALONG SAID NORTH LINE, 67 FEET TO THE NORTHWEST LINE OF A TRACT OF LAND DESCRIBED IN DOCUMENT NO. 2009-52569, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE S26°W ALONG SAID NORTHWEST LINE, 306 FEET TO THE SOUTHEAST LINE OF SAID TRACT; THENCE N64°W, PERPENDICULAR TO SAID RAILWAY CENTERLINE, 160 FEET TO SAID NORTHWEST RIGHT-OF-WAY LINE; THENCE S26°W ALONG SAID

SOUTH HIGHWAY 97 URBAN RENEWAL AREA,
CONTINUED:

NORTHWEST RIGHT-OF-WAY LINE, 1110 FEET; THENCE S64°E, PERPENDICULAR TO SAID CENTERLINE, 100 FEET TO THE NORTHWEST CORNER OF PARCEL 4, AS DESCRIBED IN DOCUMENT NO. 2014-042282, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY OF SAID PARCEL 4 AS FOLLOWS: EAST, 449 FEET; THENCE S14°W, 73 FEET; THENCE S04°E, 82 FEET; THENCE S13°W, 501 FEET; THENCE S36°E, 859 FEET; THENCE WEST, 996 FEET TO THE CENTER 1/4 CORNER OF SAID SECTION 21; THENCE LEAVING SAID TRACT BOUNDARY, WEST ALONG THE SOUTH LINE OF THE SE1/4 NW1/4 OF SAID SECTION 21, 588 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE 5602 FEET SOUTHWESTERLY ALONG SAID NORTHWEST RIGHT-OF-WAY LINE TO A POINT WHICH BEARS S27°W, 5599 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING ON THE NORTHEAST RIGHT-OF-WAY LINE OF SW AIRPORT WAY, AND BEING 55 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE S52°E, 101 FEET TO THE INTERSECTION OF THE SOUTHEAST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD AND THE NORTHEAST RIGHT-OF-WAY LINE OF SW AIRPORT WAY, SAID INTERSECTION BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY, AND BEING 60 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE 444 FEET SOUTHEASTERLY ALONG SAID NORTHEAST RIGHT-OF-WAY LINE TO A POINT WHICH BEARS S60°E, 434 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING ON THE EAST LINE OF THE WEST 40 FEET OF THE SW1/4 OF SAID SECTION 28; THENCE SOUTH ALONG SAID EAST LINE (ALSO BEING THE EAST RIGHT-OF-WAY LINE OF SW 19TH STREET), 2624 FEET TO THE NORTH LINE OF SAID SECTION 33; THENCE EAST ALONG SAID NORTH LINE, 5246 FEET TO THE NORTHEAST CORNER OF SAID SECTION 33; THENCE SOUTH ALONG THE EAST LINE OF SAID SECTION 33, 5268 FEET TO THE SOUTHEAST CORNER OF SAID SECTION 33, AND TO THE POINT OF BEGINNING.

THE SAME CONTAINING 1440 ACRES, MORE OR LESS.

A SKETCH OF THE URBAN RENEWAL AREA DESCRIBED ABOVE IS SHOWN ON THE ATTACHED EXHIBIT "A", WHICH IS HEREBY INCORPORATED BY REFERENCE.

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JULY 15, 1983
WILLIAM G. BAHRKE
2039

Renewal Date: 12/31/21

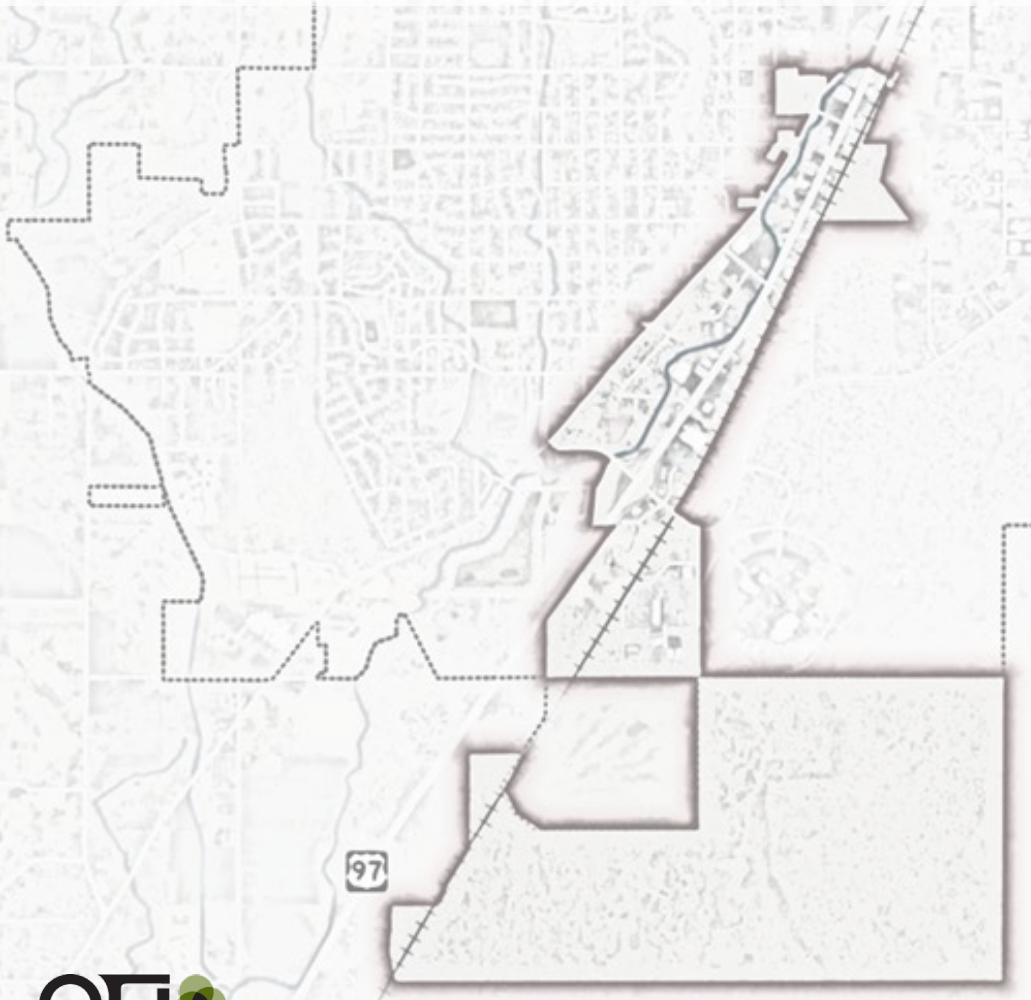
PREPARED JULY 3, 2020

POVEY AND ASSOC. LAND SURVEYORS
P.O. BOX 131, REDMOND, OR 97756
(541) 548-6778 20-078D.DWG

APPENDIX G: URBAN RENEWAL FEASIBILITY STUDY

City of Redmond
May 2020

Feasibility Study
SOUTH 97 URBAN RENEWAL PROJECT



ECONorthwest OREGON inc
LELAND CONSULTING GROUP
www.lelandconsulting.com

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INTRODUCTION

The urban renewal agency for the City of Redmond is considering an opportunity to create a new urban renewal district along US 97 to facilitate the use of tax increment financing (TIF) to primarily support infrastructure and capital investments required to implement the South U.S. 97 Framework Implementation Plan adopted by City Council in 2019.

One of the first steps in the creation of an urban renewal district is to conduct a feasibility study to determine whether physical and economic conditions are present that meet the eligibility criteria established in ORS 457.095(1), ORS 457.085(3)(a), and ORS 457.010(1):

- ✓ ORS 457.095(1) requires the municipal governing body find conditions of blight within the TIF district.
- ✓ ORS 457.085(3)(a) requires that a TIF report accompanying a TIF plan describe the physical, social, and economic conditions in the TIF areas of the plan.
- ✓ ORS 457.010(1) defines blighted areas.

To meet this requirement, the City of Redmond engaged Leland Consulting Group (LCG) to analyze existing conditions in the proposed urban renewal area (the Study Area).

Background

Why an Urban Renewal Area?

An urban renewal area facilitates the use of tax increment financing, which allows, within limits, the property tax revenues on growth in assessed value to be used to fund capital projects. These public resources are directed to a specific area to encourage and catalyze private investment that might not otherwise occur.

For the proposed urban renewal area, urban renewal provides the City with the mechanism to fund important safety, mobility, and connectivity improvements along South Highway 97 while also improving the economic viability of development for current and future developers, property owners, and business owners.

Specifically, an urban renewal area is critical to implementing the recommendations from the South Redmond US 97 Corridor Plan—a recently completed study for the Oregon Department of Transportation and the City of Redmond. The Corridor Plan includes recommended transportation and other related improvements on South Highway 97 and local connecting streets and suggests tax increment as a logical source of funding for the local improvements which can help leverage state and federal dollars for nearly $100 million required to transform the corridor. The overall objectives of the Corridor Plan are to improve the safety and mobility of U.S. 97 and enhance the economic viability of properties along the corridor.

The proposed boundary also includes nearly 1,000 acres of industrially zoned land which has multiple infrastructure needs (water, transportation, etc.) before it can be developed. The land presents a rare opportunity for significant industrial development and employment growth. An urban renewal area provides the City of Redmond with the resources to invest in infrastructure projects and incentive and grant programs that are critical in realizing these opportunities. Specific programs can encourage workforce and economic development, remove barriers that may discourage development, and facilitate and accelerate the expansion and businesses and job growth in the City of Redmond to create a more vibrant economic landscape.

Similar tax increment funding was utilized by the City of Redmond for North Highway 97 and related improvements in the 2000s.

Purpose of the Feasibility Study

This feasibility study examines key data and assumptions underlying the financial capacity and public benefit of urban renewal district investments. The study determines whether a district as proposed in this feasibility study would comply with the basic requirements of the Oregon statute governing the formation of urban renewal areas, (ORS 457) and is feasible from a financial and policy standpoint.

The study documents the City's forecasted financial capabilities to implement recommendations from the South Redmond US 97 Corridor Plan, as well as other projects and programs that have been determined as critical to the economic viability of the area.

Issues Evaluated in the Study

The following is a schedule of legal requirements the consultants addressed in determining the feasibility of the Urban Renewal District:

- ✓ A boundary for the area has been established,
- ✓ Blighting conditions as defined in ORS 457 are documented,
- ✓ The value and area within the boundary are documented to ensure each is within limitations established by ORS 457,
- ✓ Eligibility of the use of tax increment funding for proposed project activities,
- ✓ Estimated project costs and tax increment revenue, and
- ✓ Estimated completion dates for all project activities.

Note: This feasibility report has no legal status as an urban renewal plan as defined in ORS 457. It is prepared purely for information purposes. The City of Redmond will have to take numerous procedural steps, all in conformance with ORS 457, in order to create an urban renewal district and an urban renewal plan that meet all ORS 457 requirements.

Process and Approach

The analysis summarized here is explicitly intended to provide an objective assessment of conditions within the proposed urban renewal area. This documentation is intended to provide RURA and City leadership with evidence to aid those bodies in their official decision as to whether the Study Area constitutes a deteriorated area or deteriorating area eligible to be designated as an urban renewal project area.

Evidence of Study Area conditions was gathered using the following methods:

- Direct field observation,
- Geographic information systems (GIS) analysis of spatial data (including Deschutes County Assessor's parcel data, aerial imagery, and topographical data),
- Follow-up web-based research, and
- Discussions with City of Redmond staff.

Both the field observations and GIS analysis initially employed a detailed mapping of individual parcels in the proposed district to help ensure a thorough and exhaustive survey of the entire area. Findings, however, are reported and mapped here using individual points and areas without direct reference to individual parcels. This approach balances a reasonable effort to respect the privacy of owners and residents while still preserving the specificity of evidence for purposes of reaching eligibility conclusions.

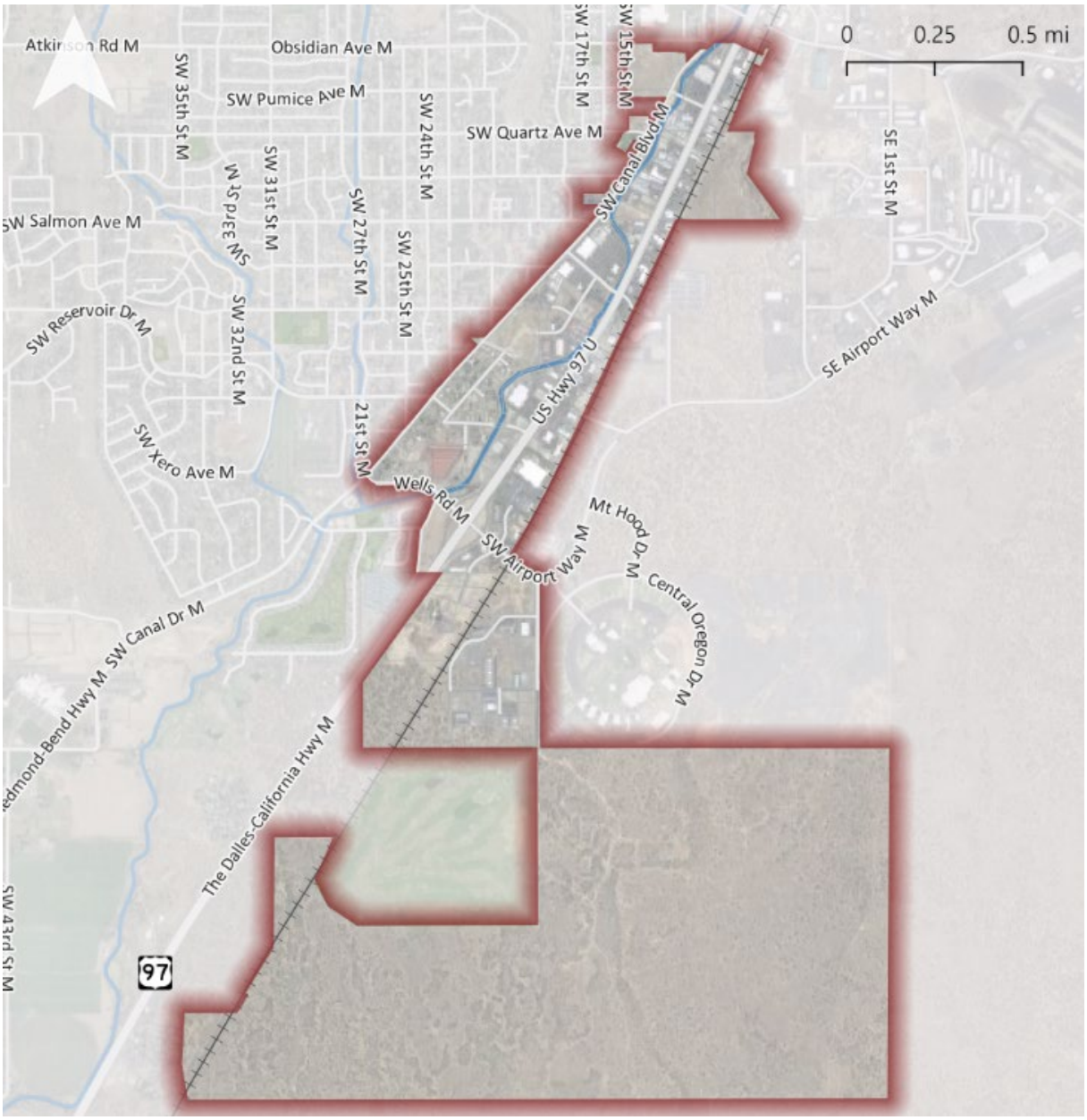
FEASIBILITY ANALYSIS AND FINDINGS

1. Boundary and Acreage Limitations

Study Area Geography

A preliminary urban renewal area boundary was determined by City staff prior to the commencement of this feasibility study. The acreage associated with that boundary is 1,330.5 acres (see proposed boundary below). The preliminary boundary was shown to representatives of overlapping taxing districts in initial meetings for their review and comment. As of the date of this report, no changes have been requested.

Figure 1. Proposed District Boundary



Source: Leland Consulting Group

ORS Requirements

ORS 457.420(2)(b)(B) essentially states that no more than 25 percent of the city's total land area can be designated as an urban renewal district (for Cities with populations of less than 50,000). As demonstrated in the following table, the City's current land area is approximately 10,449 acres. The Redmond Downtown Urban Renewal District includes 701.70 acres (6.7 percent of the total). The proposed South Highway 97 Urban Renewal District boundary includes 1,330.52 acres (12.7 percent of the total). The total of all acreage in urban renewal areas represents 19.45 percent of the City's land area and is, therefore, within the 25 percent limitation.

Table 1. Area Conditions

	Acres	% of Total
Total area within the City	10,449.0	
Redmond Downtown Urban Renewal District	701.7	6.7%
Proposed South Hwy 97 Urban Renewal District	1,330.5	12.7%
Total area within urban renewal districts	**2,032.2**	**19.5%**

Source: Deschutes County Assessor

Finding: The preliminary boundary for the proposed urban renewal area is within the ORS acreage limitation of 25% of land within the City.

2. Blighting Conditions

ORS Requirements

In order to form an urban renewal district, the City of Redmond must find that blighted areas exist within the urban renewal boundary. ORS 457.010 sets forth the definitions for "blighted areas" and blighting conditions as follows:

457.010 Definitions. As used in this chapter, unless the context requires otherwise:
(1)"Blighted areas" means areas that, by reason of deterioration, faulty planning, inadequate or improper facilities, deleterious land use or the existence of unsafe structures, or any combination of these factors, are detrimental to the safety, health or welfare of the community. A blighted area is characterized by the existence of one or more of the following conditions:

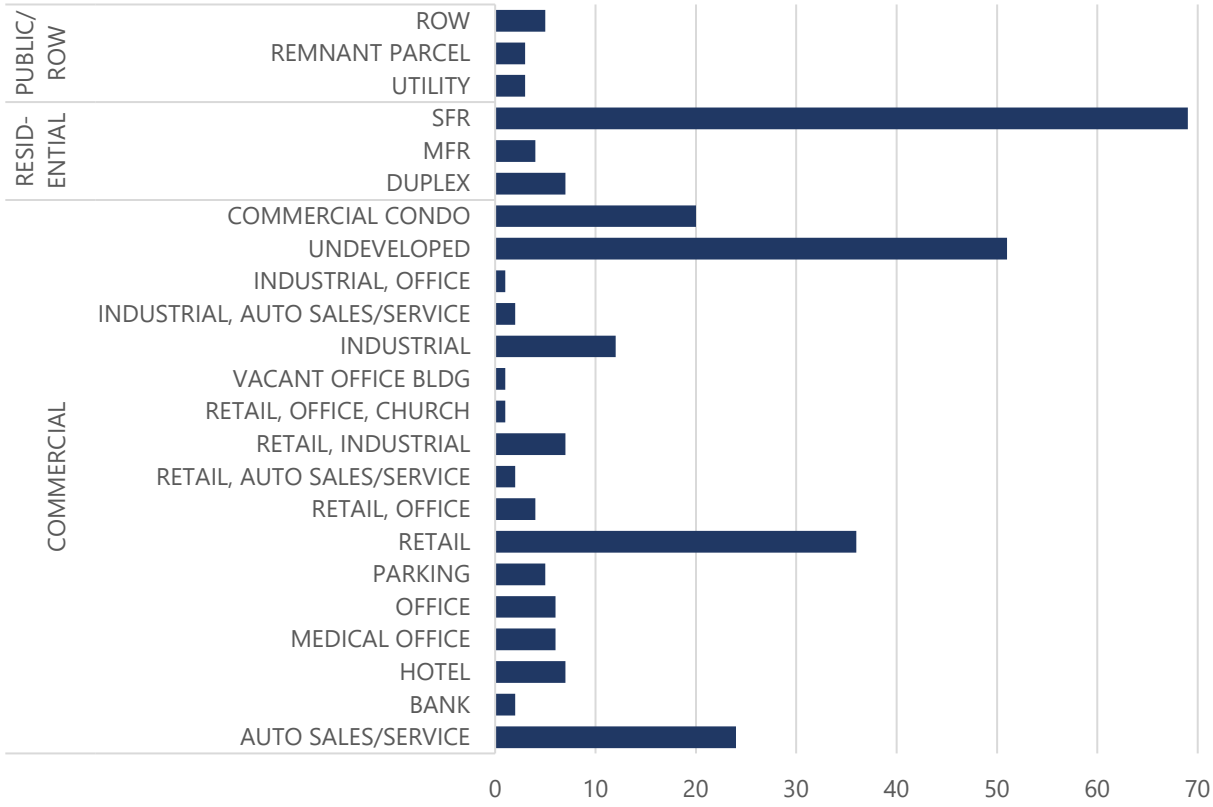
a) The existence of buildings and structures, used or intended to be used for living, commercial, industrial or other purposes, or any combination of those uses, that are unfit or unsafe to occupy for those purposes because of any one or a combination of the following conditions:
    A. Defective design and quality of physical construction;
    B. Faulty interior arrangement and exterior spacing;
    C. Overcrowding and a high density of population;
    D. Inadequate provision for ventilation, light, sanitation, open spaces and recreation facilities; or
    E. Obsolescence, deterioration, dilapidation, mixed character or shifting of uses;
b) An economic dislocation, deterioration or disuse of property resulting from faulty planning;
c) The division or subdivision and sale of property or lots of irregular form and shape and inadequate size or dimensions for property usefulness and development;
d) The laying out of property or lots in disregard of contours, drainage and other physical characteristics of the terrain and surrounding conditions;

e) The existence of inadequate streets and other rights of way, open spaces and utilities;
f) The existence of property or lots or other areas that are subject to inundation by water;
g) A prevalence of depreciated values, impaired investments and social and economic maladjustments to such an extent that the capacity to pay taxes is reduced and tax receipts are inadequate for the cost of public services rendered;
h) A growing or total lack of proper utilization of areas, resulting in a stagnant and unproductive condition of land potentially useful and valuable for contributing to the public health, safety and welfare; or
i) A loss of population and reduction of proper utilization of the area, resulting in its further deterioration and added costs to the taxpayer for the creation of new public facilities and services elsewhere.

Blighting Conditions Within Preliminary Boundary

The study area has the following land uses by parcel count.

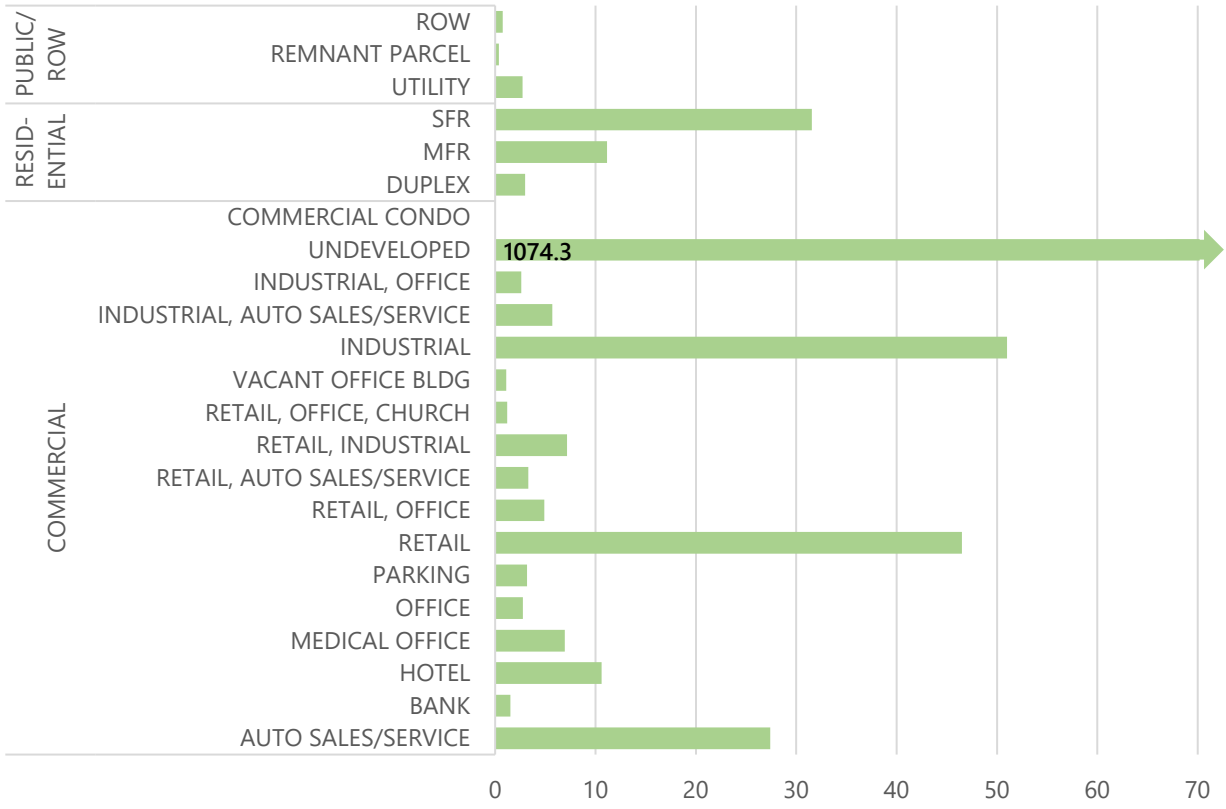
Figure 2. Parcels by Land Use (Total Lots)



Source: Deschutes County Assessor, LCG

Additionally, the study area includes the following uses by acres.

Figure 3. Parcels by Land Use (Acres)



Source: Deschutes County Assessor, LCG

The vast majority of acreage within the urban renewal study area is undeveloped, 1,074.3 acres (80.7%). This area is without streets, sidewalks, and utilities necessary for development. The four primary uses of developed acreage incudes industrial, retail, auto sales/service and single family residential.

The blight analysis reveals the following conditions that constitute blight within the preliminary boundary.

Value of Developed Properties Within the Area

Deschutes County assessor records indicate there are 283 tax accounts in the renewal study area. Of those, 14 accounts are shown in exempt property classes, and have no assessed value, including four accounts for canal purposes and a 948.97 acre parcel owned by the State of Oregon for large-lot industrial development.

The data shows, as the following table indicates, a total of 173 (61.1 percent of total) commercial or industrial property class accounts, and 88 (31.1 percent) residential class accounts.

Table 2. Parcel Summary

Property Class	Number of Parcels	% of Total	Assessed Value	% of Total
Residential	86	30.4	12,120,750	8.5
Commercial	118	41.7	104,849,416	73.6
Industrial	55	19.4	23,109,510	16.2
Multifamily	2	0.7	646,020	0.5
Municipal	12	4.2	1,804,290	1.3
Not Identified	10	3.5	0	0.0
Total	**283**	**100.0**	**142,529,986**	**100.0**

Source: Deschutes County Assessor

The data also shows 117 parcels are underutilized (46.2 percent), with the acreage underutilized at 1,181.5 acres (91.0 percent).

Utilization status was determined primarily by the improvement value to land value ratio (I:L ratio), and checked by in-person observation. An improvement value to land value ratio of less than 1.0 typically indicates underutilized property. Less than 0.5 typically indicates vacant or highly underutilized land.

Table 3. Site Utilization Status

Site Utilization (I:L Ratio by RMV*)	Not Underutilized	Underutilized
Parcels	136.0	117.0
% of Total	53.8%	46.2%
Acres	117.3	1,181.5
% of Total	9.0%	91.0%

Source: Deschutes County Assessor, Leland Consulting Group

Additionally, 77 parcels are vacant or partially vacant, representing 30.8 percent of the parcels, but 87.4 percent of the land area within the proposed boundary.

Development status was determined primarily through in-person observation and supported by aerial imagery analysis and tax roll data analysis.

Table 4. Site Development Status

Development Status	Vacant	Partially vacant	Improved
Parcels	60.0	17.0	173.0
% of Total	24.0%	6.8%	69.2%
Acres	1080.6	43.1	162.6
% of Total	84.0%	3.4%	12.6%

Source: Deschutes County Assessor, Leland Consulting Group

Within the study area, building occupancy is high, 95 percent with 192.8 acres of 203.0 acres fully occupied (95.0 percent) representing 177 of 187 parcels with buildings (94.7 percent).

Leland Consulting Group utilized Costar to determine existing long-time vacancies, as well as tax roll data and in-person observation.

Table 5. Building Occupancy Status

Building Occupancy	Vacant	Partially Vacant	Fully Occupied
Parcels	3.0	7.0	177.0
% of Total	1.6%	3.7%	94.7%
Acres	2.2	8.0	192.8
% of Total	1.1%	3.9%	95.0%

Source: Deschutes County Assessor, Leland Consulting Group

The above findings indicate a significant amount of potentially valuable property in the proposed renewal area appears to be under-developed, producing little property tax for the City, and other taxing bodies.

The diminished property taxes resulting from a preponderance of undeveloped and/or low-value development can lead to service issues for the community. Lower property values due to lack of development and utilization of the area for tax producing purposes meets the ORS definition of blight.

Building Exterior and Site Conditions

Building conditions in the proposed area are generally in average to good condition, 91.4 percent of parcels and 84.0 percent of developed acreage. Fair and seriously substandard buildings represent 15 parcels, 8.0 percent of the total parcels and 15.8 percent of the developed acreage.

Table 6. District Building Conditions

Building Exterior Condition	Average to Good	Fair (Repair/ Maintain)	Seriously Substandard
Parcels	171.0	15.0	1.0
% of Total	91.4%	8.0%	0.5%
Acres	170.5	32.2	0.3
% of Total	84.0%	15.8%	0.2%

Source: Deschutes County Assessor, LCG

Additionally, site conditions of parcels for a significant majority of the proposed urban renewal area are poor or substandard (1,053.7 acres, 81.1 percent of the area). Less than 20 percent (18.9 percent) of the area, 200 parcels, have acceptable site conditions.

Table 7. District Site Conditions

Site Condition	OK / Acceptable	Poor / Substandard
Parcels	200.0	53.0
% of Total	79.1%	20.9%
Acres	245.2	1053.7
% of Total	18.9%	81.1%

Source: Deschutes County Assessor, LCG

Substandard or Inadequate Public Facilities

As noted above, the vast majority of the area is undeveloped, therefore much of the proposed urban renewal area is without sidewalks. The developed parcels have sidewalks that are in good condition, 145, with only 11 parcels that have sidewalks the require repair and or replacement. However, only 14.8% (190.0 acres) of the area

has good condition sidewalks, with 85.2% (1,096.2 acres) having no sidewalks or have sidewalks that require repair or replacement.

Table 8. District Sidewalk Conditions

Sidewalk Condition	Good Condition	No Sidewalk	Repair / Replace
Parcels	145.0	94.0	11.0
% of Total	58.0%	37.6%	4.4%
Acres	190.0	1078.3	17.9
% of Total	14.8%	83.8%	1.4%

Source: Deschutes County Assessor, LCG

Findings: The conditions within the preliminary boundary area meet the ORS definition of blight.

3. Assessed Value Limitations

ORS Requirements

Oregon urban renewal law limits the total assessed valuation in cities under 50,000 population to 25% of the total assessed value in the city.

Assessed Value Conditions

The tax roll for the 2019-20 year shows that Redmond contains approximately $2.549 million in assessed value. This value allows area within urban renewal areas to total approximately $637.1 million in assessed value.

Table 9. Assessed Value

	Assessed Value	% of Total
Total assessed value City of Redmond	$2,548,546,802	100.0%
Assessed value Downtown Urban Renewal District	$288,796,593	11.3%
Assessed value Preliminary Urban Renewal Boundary Area	$142,529,986	5.6%
Total assessed valued within urban renewal areas	**$431,326,579**	16.9%

Source: Deschutes County Assessor

Finding: The combined assessed value of the Downtown Urban District ($288.8 million, 11.3 percent) and the preliminary urban renewal study area boundary ($142.5 million, 5.6 percent) is $431.3 million, or 16.9% of the total assessed value in the City of Redmond. The total combined assed value within the urban renewal boundaries is within the 25 percent assessed value limit.

4. Eligibility of Proposed Activities

ORS Requirements

ORS 457.170 provides for the activities that an urban renewal agency may plan or undertake consistent with an approved urban renewal plan. ORS 457.170 includes the following authorized activities:

- To carry out any work or undertaking and exercise any powers which a housing authority is authorized to perform or exercise under ORS 456.055 to 456.235, subject to the provisions of this chapter

provided, however, that ORS 456.155 and 456.160 do not limit the power of the agency in the event of a default by a purchaser or lessee of land in an urban renewal plan to acquire property and operate it free from the restrictions in those sections.

- To carry out any rehabilitation or conservation work in an urban renewal area.
- To acquire real property, by condemnation if necessary, when needed to carry out the plan.
- To clear any areas acquired, including the demolition, removal or rehabilitation of buildings and improvements.
- To install, construct or reconstruct streets, utilities, and site improvements in accordance with the urban renewal plan.
- To carry out plans for a program of the voluntary repair and rehabilitation of buildings or other improvements in an urban renewal area in accordance with the urban renewal plan.
- To assist in relocating persons living in, and property situated in, the urban renewal area in accordance with the approved urban renewal plan and to make relocation payments.
- To dispose of, including by sale or lease, any property or part thereof acquired in the urban renewal area in accordance with the approved urban renewal plan.
- To plan, undertake and carry out neighborhood development programs consisting of urban renewal project undertakings in one or more urban renewal areas which are planned and carried out on the basis of annual increments in accordance with the provisions of this chapter for planning and carrying out urban renewal plans.
- To accomplish a combination of the things listed in this section to carry out an urban renewal plan.

Additionally, activities must be consistent with the goals and policies set forth in the City's Comprehensive Plan and other adopted policy documents and must be located within the renewal area boundary. Limited exceptions may apply on a proportionality basis, e.g. a sewage treatment plant which serves the Urban Renewal area.

Identified and Potential Project Activities

At the time of preparing this feasibility report, there was no formal list of approved project activities for the preliminary urban renewal project area. However, the City's primary purpose for creating the urban renewal district is to fund local costs associated with completing the South Redmond Corridor Plan. Other eligible projects have been identified through thorough reviews of existing capital facility master plans and interviews with staff of the City, overlapping taxing districts, and utility providers in the area.

The schedule presented in the table below provides estimated project costs and likely timing for the Highway 97 South Redmond Corridor Plan. Estimated funding for other eligible projects and activities are also included.

Table 10. Proposed Project Activities

Description	Amount	Dates	Inflation Adjusted Amount
US 97 South Redmond Corridor Plan	$30,829,000	2025-2033	$36,844,000
Fire Station	4,500,000	2033-2037	6,056,400
Natural Gas/Electricity improvements	4,000,000	2022-2042	5,073,000
Industrial Opportunity Fund	5,000,000	2022-2042	6,341,000
Incentive Funding - SDCs, Capital Infrastructure	8,000,000	2022-2042	10,146,000
Small Loan Program	2,000,000	2022-2042	2,536,000
Communications improvements	1,000,000	2022-2042	1,268,000
Canal improvement contribution	4,000,000	2025-2033	4,780,000
Program administration - 9.5% of project costs	5,636,000	2021-2047	7,148,000
	$64,965,000		**$82,391,000**

Source: LCG

Transportation improvements

US 97 South Redmond Corridor Plan Project

- Joint project with Oregon Department of Transportation (ODOT)
- Improved connectivity of City street system to S. Highway 97 including but not limited to:
    A. Roadway construction
    B. Pedestrian facilities
    C. Raised medians
    D. Stormwater improvements
    E. Traffic signal improvements
    F. Design, construction engineering, right of way fee, right of way acquisition

Public Buildings

Fire Station

- A fire station will be needed to serve the area as the area develops
- Funding of $4.5 million is included for this project

Note: If public building(s) are included in the Urban Renewal Plan, a legislative change in 2017 requires the concurrence of three of four taxing districts that are estimated to forego the most property tax revenue (The City, County, School District, and Fire District). Concurrence requires a vote of the governing body of each of the four taxing districts. Failure of a governing body to take action (resolution) within 45 days of notice is considered concurrence.

Utilities to Serve the Area Within the Preliminary Boundary

City Utilities and Infrastructure

- Water, Wastewater and Stormwater systems will need to be constructed in order for the area to develop. The City's master plans anticipate these improvements. Funding for these improvements are generally provided by system development charges and utility rates.
- Local street and sidewalk improvements will need to be constructed in order for the area to develop. The City's master plans anticipate these improvements. Funding for these improvements are generally provided by developers.
- The schedule above includes $13.0 million of funding to assist developers with the cost of these facilities (Industrial Opportunity Fund, Incentive Funding)

Other Utilities

- Cascade Natural Gas - natural gas improvements
- Pacific Power - electricity infrastructure
- Irrigation District – piping canal
- Communications – telephone and high speed internet

The schedule above includes $9.0 million in funding assistance for these utilities.

Note that the funding for City utilities and infrastructure and other utilities could be structured in a variety of ways. Total funding allocated to assist developers and the utilities with completion of the required improvements to serve the area in the feasibility analysis is $22.0 million.

Small Loan Program

- Program to facilitate improvements to existing properties.
- $2.0 million is allocated towards this program.

Program Administration

- Program administration is estimated at 9.5% of project costs.
- Estimated program administration costs are $5.6 million.

Finding: The project activities in the schedule above meet the requirements of ORS 457 and will help to remove the deficient conditions found within the preliminary urban renewal area. The improvement projects listed are similar to those typically undertaken in other urban renewal districts in Oregon.

5. Financial Feasibility

ORS Requirements

ORS 457.085 (3) (g) requires that a renewal plan be accompanied by "a financial analysis of the plan with sufficient information to determine feasibility." A feasibility analysis typically estimates the tax increment resources that will be available to carry out the proposed activities, estimates when the resources will be available, and the period of time necessary to fund the cost of proposed activities. Determining financial feasibility relies on making reasonable economic and financial assumptions, including but not limited to increases in assessed value, the pace of anticipated development, property tax rates, limits or restrictions on revenue, identification of other resources, the use of debt, its timing, the scope, cost, timing and interrelations

of planned capital investment requirements to facilitate growth and increases to assessed value and other program requirements.

Estimate of Revenues to Pay for Plan Activities

The tax increment revenues to pay for project activities will be generated by the increase in assessed values within the preliminary area boundary. Under Ballot Measure 50, growth in assessed values can come in two ways:

- A maximum of three percent growth in value from the previous years' assessed value on a property by property basis.
- The assessed value from new construction or major renovation projects in the area.

Therefore, even if there is no new construction within a renewal area, overall values may increase by up to the three percent allowed by Ballot Measure 50.

For purposes of providing an estimate of revenues, we have made the following assumptions:

- The duration of tax increment collection for the renewal plan is 25 years.
- The frozen base assessed value is $142,529,986, the value within the preliminary boundary area as of January 1, 2019.
- The plan will be adopted prior to August 31, 2020.
- The first tax increment revenue will be received in November 2021.
- The combined tax rate for calculating tax increment revenue is $15.5104.
- Projected annual growth of 4.5 percent in existing incremental values in the area, together with the value of three significant projects underway at the time of writing this feasibility analysis (two hotels and an apartment complex). A growth rate of 4.5 percent is determined to be reasonable given the substantial amount of land available for new development in the area.

Table 11. Forecasted Tax Increment Revenue, Fiscal Years 2021-2046, 4.5% Growth Assumed

Year	Fiscal Year Ending June 30	Frozen Base (000's)	Forecast Assessed Value (AV) (000s)	Annual Change in AV (000s)	Cumulative Change in AV (000s)	Projected Tax Levy	Debt Capacity (millions)	Cumulative Tax Increment Revenue	Net Present Value - Discount Rate 3.5%
0	2021	0	157,060			0	0.00	0	0
1	2022	142,530	182,387	39,857	39,857	618,198	7.03	568,742	549,509
2	2023	142,530	209,256	66,726	106,583	1,034,947	11.77	1,536,348	1,452,780
3	2024	142,530	231,960	89,430	196,013	1,387,095	15.77	2,847,623	2,635,475
4	2025	142,530	250,721	108,191	304,204	1,678,086	19.08	4,450,936	4,032,669
5	2026	142,530	269,252	126,722	430,926	1,965,509	22.35	6,337,486	5,621,094
6	2027	142,530	289,153	146,623	577,549	2,274,182	25.86	8,524,848	7,400,514
7	2028	142,530	310,526	167,996	745,545	2,605,685	29.63	11,033,588	9,372,361
8	2029	142,530	333,479	190,949	936,494	2,961,696	33.67	13,887,086	11,539,341
9	2030	142,530	358,129	215,599	1,152,093	3,344,027	38.02	17,110,831	13,904,702
10	2031	142,530	384,599	242,069	1,394,162	3,754,587	42.69	20,732,162	16,471,932
11	2032	142,530	413,027	270,497	1,664,659	4,195,517	47.70	24,780,488	19,244,815
12	2033	142,530	443,556	301,026	1,965,685	4,669,034	53.09	29,287,366	22,227,392
13	2034	142,530	476,344	333,814	2,299,499	5,177,589	58.87	34,286,726	25,424,003
14	2035	142,530	511,554	369,024	2,668,523	5,723,710	65.08	39,814,948	28,839,238
15	2036	142,530	549,368	406,838	3,075,361	6,310,220	71.75	45,911,144	32,478,000
16	2037	142,530	589,977	447,447	3,522,808	6,940,082	78.91	52,617,296	36,345,478
17	2038	142,530	633,589	491,059	4,013,867	7,616,522	86.60	59,978,507	40,447,173
18	2039	142,530	680,424	537,894	4,551,761	8,342,951	94.86	68,043,189	44,788,884
19	2040	142,530	730,722	588,192	5,139,953	9,123,093	103.73	76,863,358	49,376,745
20	2041	142,530	784,738	642,208	5,782,161	9,960,903	113.25	86,494,858	54,217,208
21	2042	142,530	842,747	700,217	6,482,378	10,860,646	123.48	96,997,665	59,317,066
22	2043	142,530	905,045	762,515	7,244,893	11,826,913	134.47	108,436,201	64,683,462
23	2044	142,530	971,949	829,419	8,074,312	12,864,621	146.27	120,879,649	70,323,898
24	2045	142,530	1,043,800	901,270	8,975,582	13,979,058	150.00	134,402,313	76,246,246
25	2046	142,530	1,120,964	978,434	9,954,016	15,175,903	150.00	149,083,993	82,458,754

Source: LCG, GEL Oregon

Findings: The net present value of forecast tax increment revenue through fiscal year 2046 (25 years) is $82.5 million using a 3.5 percent discount rate on cash flows. The forecast assumes the completion of known new construction projects within the area in years one and two, with 4.5 percent annual growth due to development thereafter. Additionally, the assessed value of existing properties is assumed to increase annually by 2.9 percent for real property and 2.0 percent for personal and utility property.

The forecast debt capacity, by fiscal year, of the proposed urban renewal district projects the Agency will have the capability to finance project and program costs totaling $22.3 million by fiscal year 2026 (year 5), $42.7

million by fiscal year 2031 (year 10) and $86.6 million by fiscal year 2038 (year 17). This assumes the use of full faith and credit obligations (FFCO) with a term of 20 years and interest rate of 3.5 percent, as presented above.

Estimate of Project Costs

At the time of preparing this feasibility report, there were no estimates of project costs available, other than the primary project, i.e., the US 97 South Redmond Corridor Plan. In the absence of details on the scope of the possible activities shown in Section 4, our analysis instead uses a "revenue-side" approach to identifying costs. This approach involves estimating revenues to establish an estimate of funds available for anticipated capital development requirements within the area. The total tax increment revenues anticipated over a 20-year period are approximately $149.1 million.

To determine what the forecast revenue stream is worth in 2020 dollars, the consultant applied a 3.5 percent discount rate to the annual revenues shown above. This indicates, in 2020 dollars, the revenues may support approximately $82.5 million in project costs over the plan duration.

Estimate of Time Needed to Carry Out Plan Activities

ORS 457 imposes no time restrictions on carrying out an urban renewal plan. There is, however, a local policy issue and decision regarding how long the plan may operate before it can retire project indebtedness and return increased assessed value in the area to the tax rolls of the overlapping taxing districts.

The revenue projections shown above are limited to a 25-year period. This period appears adequate to collect sufficient tax increment to pay the anticipated eligible project and program costs. Should there be any changes to the projects, programs, costs, timing, or other assumptions regarding the amount and timing of tax increment collections, the time necessary to pay eligible project and program costs could change significantly.

Estimate of Maximum Indebtedness to Carry Out Plan Activities

With the passage of Ballot Measure 50, ORS 457 requires that a "maximum indebtedness" figure be put into the renewal plan. This figure represents the limit of the tax increment revenue that the City may take in to cover project costs, excluding interest on debt. ORS 457 imposes no restrictions on the maximum indebtedness of a renewal plan. The debt limit is based on good faith estimates of costs and inflation. No maximum indebtedness figure needs to be established at this stage. Projects and project costs should be defined through the public process in developing an urban renewal plan, and at that time the maximum indebtedness for the plan will be established.

Financial Feasibility Evaluation

The forecast of tax increment revenues shows the collection of approximately $149.1 million during the 25-year duration of the plan ("Cumulus Tax Increment Revenue" column, year 25). Adjusted to 2020 dollars, this would allow the City to undertake roughly $82.5 million in project and program activities over the duration of the plan. This amount allows the City to make meaningful and timely contributions to the project activities included in the list of recommendations in Section 4 of this report.

Findings: The estimated tax increment revenues are sufficient, discounted to 2020 dollars, to carry out or assist in carrying out the projects listed in Section 4 of this report. The revenue estimates are based on good faith assumptions about growth in the area. If those assumptions prove incorrect, project and program activities may

need to be deferred and or reduced in scope, other funding secured, or the duration of the plan extended. The assumption of a 25-year duration of tax increment collection is presented to demonstrate feasibility only.

An urban renewal district formed within the preliminary boundaries identified appears to be financially feasible.

6. Tax Impacts of an Urban Renewal Plan

Under Oregon's present property tax-based system, total tax rates will not change as a result of adopting an urban renewal program. Thus, there will be no effect on taxpayers from the establishment of an urban renewal district. Instead, the potential revenues raised by taxing bodies will be affected. The new value created within the urban renewal area after the formation of the renewal district (these values are called "incremental" or "excess" values) will not be available to other taxing bodies for raising property tax revenues. The revenues from those incremental values will instead be directed to the renewal agency for the purpose of paying off indebtedness to carry out project activities. The effects of this foregone revenue will vary with the size of the tax bodies' tax rates and the cumulative level of incremental values in the renewal area.

K-12 Schools: It should be noted that under the current system of funding K-12 schools, establishing an urban renewal area does not impact the per-student revenue for schools. The funding per student is derived from a complex formula that establishes a uniform-per-student funding level throughout the State. The amount of funds received by Redmond schools is determined by this formula, not by the amount of property taxes raised locally.

The following schedule shows the estimated foregone property tax revenue for the overlapping taxing jurisdictions based on the value growth assumptions outlined in this report. **It is important to keep the following in mind when looking at the schedule:**

- The potential impact on the school district is shown simply to demonstrate the tax rate calculation. As noted above, however, urban renewal will have no impact on K-12 per student funding, i.e., there will be no reduction in school funding resulting from the creation of an urban renewal district.
- The estimated amounts of foregone revenue assume all the development and increased property values would occur, even without the renewal programs' outlays for area improvements. In reality, the value created by new development would be less or slower without the tax increment funding.

Table 12. Estimated Foregone Property Tax Revenue – Government, Fiscal Years 2021-2046

Fiscal Year Ending June 30	City of Redmond	Deschutes County	County Library	Countywide Law Enforcement	County Extension - 4H	9/1/2001	Redmond Fire & Rescue	Redmond Park & Recreation	Total General Government
2020	-	-	-	-	-	-	-	-	-
2021	-	-	-	-	-	-	-	-	-
2022	175,773	48,558	21,921	43,046	893	14,420	69,917	14,815	**389,343**
2023	294,268	81,292	36,699	72,064	1,495	24,141	117,051	24,802	**651,812**
2024	394,395	108,953	49,187	96,584	2,003	32,356	156,878	33,241	**873,597**
2025	477,133	131,809	59,505	116,846	2,423	39,144	189,789	40,215	**1,056,864**
2026	558,857	154,385	69,697	136,860	2,839	45,848	222,296	47,103	**1,237,885**
2027	646,622	178,631	80,643	158,353	3,284	53,048	257,206	54,500	**1,432,287**
2028	740,879	204,670	92,398	181,436	3,763	60,781	294,699	62,444	**1,641,070**
2029	842,104	232,633	105,022	206,225	4,277	69,085	334,963	70,976	**1,865,285**
2030	950,813	262,664	118,579	232,847	4,829	78,004	378,204	80,138	**2,106,078**
2031	1,067,549	294,913	133,138	261,435	5,422	87,581	424,637	89,977	**2,364,652**
2032	1,192,919	329,547	148,773	292,137	6,059	97,866	474,506	100,544	**2,642,351**
2033	1,327,555	366,740	165,564	325,108	6,743	108,911	528,060	111,891	**2,940,572**
2034	1,472,153	406,686	183,598	360,519	7,477	120,774	585,577	124,079	**3,260,863**
2035	1,627,433	449,582	202,963	398,546	8,266	133,513	647,342	137,166	**3,604,811**
2036	1,794,196	495,651	223,761	439,385	9,113	147,194	713,675	151,222	**3,974,197**
2037	1,973,286	545,125	246,096	483,243	10,023	161,886	784,912	166,316	**4,370,887**
2038	2,165,619	598,257	270,082	530,344	11,000	177,665	861,416	182,527	**4,796,910**
2039	2,372,166	655,316	295,842	580,926	12,049	194,610	943,574	199,935	**5,254,418**
2040	2,593,986	716,594	323,506	635,247	13,176	212,808	1,031,806	218,631	**5,745,754**
2041	2,832,202	782,402	353,214	693,585	14,385	232,351	1,126,561	238,709	**6,273,409**
2042	3,088,027	853,074	385,119	756,234	15,685	253,339	1,228,321	260,271	**6,840,070**
2043	3,362,767	928,972	419,383	823,516	17,080	275,878	1,337,604	283,427	**7,448,627**
2044	3,657,821	1,010,481	456,180	895,773	18,579	300,084	1,454,967	308,295	**8,102,180**
2045	3,974,691	1,098,017	495,699	973,372	20,188	326,079	1,581,008	335,002	**8,804,056**
2046	4,314,992	1,192,026	538,139	1,056,709	21,917	353,997	1,716,369	363,684	**9,557,833**
Totals	**43,898,206**	**12,126,978**	**5,474,708**	**10,750,340**	**222,968**	**3,601,363**	**17,461,338**	**3,699,910**	**97,235,811**

Source: GEL Oregon

Table 13. Estimated Foregone Property Tax Revenue – Education, Fiscal Years

Fiscal Year Ending June 30	Central Oregon Community College	High Desert ESD	Redmond School District #2J	Total Education	Total
2020	-	-	-	-	-
2021	-	-	-	-	-
2022	24,727	3,842	200,285	228,854	618,197
2023	41,397	6,432	335,305	383,134	1,034,946
2024	55,482	8,621	449,395	513,498	1,387,095
2025	67,122	10,430	543,671	621,223	1,678,087
2026	78,618	12,216	636,791	727,625	1,965,510
2027	90,965	14,134	736,795	841,894	2,274,181
2028	104,225	16,195	844,197	964,617	2,605,687
2029	118,465	18,407	959,538	1,096,410	2,961,695
2030	133,758	20,784	1,083,407	1,237,949	3,344,027
2031	150,180	23,335	1,216,421	1,389,936	3,754,588
2032	167,816	26,076	1,359,275	1,553,167	4,195,518
2033	186,757	29,019	1,512,686	1,728,462	4,669,034
2034	207,098	32,180	1,677,449	1,916,727	5,177,590
2035	228,942	35,574	1,854,383	2,118,899	5,723,710
2036	252,402	39,219	2,044,402	2,336,023	6,310,220
2037	277,596	43,134	2,248,466	2,569,196	6,940,083
2038	304,653	47,338	2,467,621	2,819,612	7,616,522
2039	333,709	51,853	2,702,971	3,088,533	8,342,951
2040	364,914	56,702	2,955,724	3,377,340	9,123,094
2041	398,426	61,909	3,227,159	3,687,494	9,960,903
2042	434,415	67,501	3,518,661	4,020,577	10,860,647
2043	473,064	73,506	3,831,714	4,378,284	11,826,911
2044	514,572	79,956	4,167,913	4,762,441	12,864,621
2045	559,148	86,882	4,528,972	5,175,002	13,979,058
2046	607,020	94,321	4,916,729	5,618,070	15,175,903
Totals	**6,175,471**	**959,566**	**50,019,930**	**57,154,967**	**154,390,778**

Source: GEL Oregon

Note: The difference between the forecast tax collections ($149.1 million) and the foregone tax revenue (levies) of $154.4 million, or $5.3 million is due to discounts taken by taxpayers paying taxes in November of the levy year, approximately 2.5%, with the exception of years 23-25, when delinquent tax collections are not fully recognized until after year 25.

SUMMARY OF FEASIBILITY FINDINGS

The previous sections of this analysis have provided information on each of the key issues that should be evaluated in making the decision to proceed with an urban renewal plan. In summary, the feasibility findings are:

- The plan area proposed is within the acreage and total value limits established by ORS 457.
- The preliminary area proposed contains blighting conditions as defined by ORS 457.
- The scheduled project activities meet the eligibility requirements for tax increment funding.
- The assumptions used to estimate tax increment revenues are good faith assumptions, based on the information available, and concurred to by City staff.
- The duration needed to carry out plan activities is estimated at twenty five years and is typical of the duration used for newly adopted urban renewal plans.
- Given the tax increment revenue assumptions, project cost information, and program funding included in the feasibility study, forecasted tax increment revenue is adequate to fund the scheduled project activities to achieve the plan objectives.

On the basis of the above findings, there is no evidence of any technical or legal obstacles to the feasibility of establishing an urban renewal plan for the study area shown on the boundary map.

REDMOND FIRE & RESCUE
RESOLUTION NO. 2020-06

A RESOLUTION SUPPORTING THE CREATION OF THE REDMOND SOUTH US 97 URBAN RENEWAL DISTRICT.

WHEREAS, the BOARD recognizes that the City of Redmond has experienced pronounced growth and development throughout the last twenty years; and

WHEREAS, the City of Redmond is tasked with strategically responding to this rapid regional growth and its impacts on community safety and mobility, including along the South Redmond US Highway 97 Corridor; and

WHEREAS, the BOARD values and understands that improving the safety, mobility, and economic vitality of this Corridor, as well as the South Redmond Tract, is a vital part of the success of our regional growth and development; and

WHEREAS, the Corridor area is currently challenged by dangerous road conditions, insufficient infrastructure, and blight, and is growing economically at a significantly lower rate than surrounding areas; and

WHEREAS, a feasibility study was conducted, finding that the proposed urban renewal area encompassing the US 97 Corridor and the South Redmond Tract meets the state statutory requirements for the creation of an urban renewal district; and

WHEREAS, the proposed projects in the Urban Renewal Plan will address the safety, mobility, and economic vitality of the Plan area, and urban renewal will generate sufficient revenues through tax increment financing to support those proposed projects.

NOW, THEREFORE, BE IT RESOLVED THAT the BOARD agrees that the investments proposed for the Redmond South US 97 Urban Renewal District will prove to bring about long-term positive change and effectively leverage state, federal and private resources to build a more prosperous future for all of Central Oregon.

The BOARD supports the adoption of the South Redmond US97 Urban Renewal District.

The above resolution statements are **ADOPTED** by the District Board and **SIGNED** by Board President this 21st day of October, 2020.

Carroll Penhollow, Board President

ATTEST:

Diane Cox, District Recorder

REVIEWED

LEGAL COUNSEL

For Recording Stamp Only

BEFORE THE BOARD OF COUNTY COMMISSIONERS OF DESCHUTES COUNTY, OREGON

A Resolution in Support of the Proposed South Redmond US 97 TIF Plan (Urban Renewal)	* * *	RESOLUTION NO. 2020-065

WHEREAS, ORS Chapter 457 generally allows municipalities to establish urban renewal agencies in order to access Tax Increment Financing (TIF) to service debt associated with identified urban renewal projects; and

WHEREAS, to qualify for TIF, urban renewal projects must specifically address "blighted areas" as broadly defined in ORS 457.010; and

WHEREAS, the list of proposed urban renewal projects appears to address blighted areas and positions the City of Redmond for continued strong economic growth; and

WHEREAS, Deschutes County will benefit from investment in the large lot industrial area south of the Fair & Expo Center, including the southerly extension of 19th Street; and

WHEREAS, the ongoing and future impacts of COVID-19 to the economy of Bend, Deschutes County and Central Oregon are continuing to emerge and may not be fully identified and understood for years; and

WHEREAS, Deschutes County suggests that the City of Redmond, in consideration of the uncertainty associated with COVID-19 impacts on government budgets, consider an amendment to the proposed South Redmond US 97 TIF which provides that the subject TIF tax revenue will not be redirected from the countywide taxing district during FY 22; now therefore,

BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF DESCHUTES COUNTY, OREGON, AND ALSO AS THE GOVERNING BODY FOR THE COUNTYWIDE LAW ENFORCEMENT DISTRICT, THE DESCHUTES COUNTY EXTENSION / 4-H DISTRICT, AND THE DESCHUTES COUNTY 911 SERVICE DISTRICT as follows:

Section 1. Pursuant to applicable provisions of ORS Chapter 457, Deschutes County, the Countywide Law Enforcement District, the Deschutes County Extension / 4-H District, and the Deschutes County 911 Service District, in the interest of improving blighted areas and continued economic growth, each support the proposed South Redmond US 97 TIF.

Section 2. Deschutes County encourages that the City of Redmond, in consideration of the uncertainty associated with COVID-19 impacts on government budgets, amend the proposed South Redmond US 97 TIF to provide that the subject TIF tax revenue will not be redirected from the countywide taxing district during FY 22.

Section 3. This Resolution shall take effect immediately from and after its adoption.

Dated this 7 of October, 2020

BOARD OF COUNTY COMMISSIONERS
OF DESCHUTES COUNTY, OREGON

Patti Adair
PATTI ADAIR, Chair

opposed
ANTHONY DeBONE, Vice Chair

PHILIP G. HENDERSON, Commissioner

ATTEST:
Recording Secretary

DESCHUTES COUNTY SHERIFF'S OFFICE

L. Shane Nelson, Sheriff

Proudly Serving Our Community

Mayor and City Council Members,

Thank you for taking the time to meet with my teammates and answer our questions and address concerns with the South Hwy 97 Urban Renewal District. A lot of time and effort has been put into this proposal by the City of Redmond and many of its partners. It is important to have everyone's involvement in addressing these very important issues for this area. While I do support the plans and goals for the potential outcomes of this project, I do not support utilizing a TIF District for this urban renewal project.

I am thankful the voters (our bosses) approved law enforcement tax districts in 2006 which has provided stable funding for Sheriff's Office operations. This money was dedicated to public safety services, and I feel that it is important for the voters to weigh in on the Tax Increment Finance (TIF) District. These tax district dollars go to paying for essential public safety functions that are critical in a growing community.

This current project would be an estimated $116 million dollar project that is focused on beneficial infrastructure and. This money would be used to secure loans to private industry wanting to develop areas in the city. The portion of TIF money that would come from future Sheriff's Office Tax District revenue over the next thirty years would equate to just over $4 million dollars. That is a considerable amount of money that will not go to fund public safety.

There are currently two other TIF projects in Bend, and another one on the way: Juniper Ridge and Murphy Crossing urban renewal projects, which to date have taken a million dollars from the Sheriff's Office Tax District. Those projects have underperformed, and have not fulfilled the projections of the City of Bend.

ORS 457 allows for this process to fund urban renewal districts to address and reduce blight, taking dollars from other taxing districts. I do not believe this particular proposal fits into the category of blight, and given the dollar amount of the project, would like to see something of this magnitude go to the voters for approval.

As you know, state and local government budgets are being cut as a result of the pandemic. The State of Oregon is projecting an 18% budget cut, the City of Bend is projecting a budget cut by 10% in every department.

Sheriffs Stiles, Blanton, and I have been careful in deciding how to use these taxpayer-approved funds. We were able to reduce the rural district tax rate by 6% in 2018, now in our third year, due to my Sheriff's Office teammates being responsible in the use of taxpayer approved dollars. I want to continue to serve the citizens of the county and be a responsible steward of taxpayer dollars.

I was born and raised in Deschutes County, and have watched the growth of the county and Bend. Because Deschutes County remains a desirable place to live, work, and raise a family, this region will continue to grow. I don't have any issue with the project, only the way it will be funded…taking money from future law enforcement needs.

Respectfully,

L. Shane Nelson, Sheriff

Main Office
63333 W. Highway 20
Bend, OR 97703
541-388-6655

sheriff.deschutes.org

Adult Jail
63333 W. Highway 20
Bend, OR 97703
541-388-6661

Redmond SCHOOL DISTRICT

P: 541.923.5437

F: 541.923.5142

145 SE Salmon Dr | Redmond, OR 97756

www.redmond.k12.or.us

DATE: September 23, 2020

TO: Redmond City Council

FROM: Redmond School District 2J, Board of Directors

RE: Redmond South US 97 Urban Renewal District

On behalf of the Board of Directors of the Redmond School District, this letter confirms our support for the creation of the Redmond South US 97 Urban Renewal District.

As the hub of Central Oregon, Redmond has experienced pronounced growth and development throughout the last twenty years. This growth is noticeable and problematic along the South US 97 corridor. As the primary north-south route through Redmond, US 97 improvements need to occur which address the safety, mobility and connectivity of the corridor while also catalyzing economic development.

A strategic investment of tax increment resources will help preserve and improve Redmond's small-town character and benefit the thriving industrial traded sector businesses.

We believe the projects proposed for the Redmond South US 97 Urban Renewal District will prove to bring about positive change and effectively leverage state, federal and private resources as build to a more prosperous future for all of Central Oregon.

We support the establishment of this District.

Sincerely,

Tim Carpenter
Board Chair

High Desert
Education Service District
2804 SW Sixth Street, Redmond, OR 97756 / P 541.693.5600 / F 541.638.9646 / www.hdesd.org

September 16, 2020

Redmond City Council

RE: Redmond South US 97 Urban Renewal District

On behalf of the High Desert Education Service District Board of Directors, this letter confirms our support for the creation of the Redmond South US 97 Urban Renewal District.

As the hub of Central Oregon, Redmond has experienced pronounced growth and development throughout the last twenty years. This growth is noticeable and problematic along the South US 97 corridor. As the primary north-south route through Redmond, US 97 improvements need to occur which address the safety, mobility and connectivity of the corridor while also catalyzing economic development.

A strategic investment of tax increment resources will help preserve and improve Redmond's small-town character and benefit the thriving industrial traded sector businesses.

We believe the projects proposed for the Redmond South US 97 Urban Renewal District will prove to bring about positive change and effectively leverage state, federal and private resources as build to a more prosperous future for all of Central Oregon.

We support the establishment of this District.

Sincerely,

Scott Reynolds
HDESD Board Chair

RAPRD
Redmond Area Park and Recreation District
P.O. Box 843 • 465 SW Rimrock Dr. • Redmond, OR 97756 • 541/548-7275

DATE: October 13, 2020
TO: Redmond City Council
FROM: Redmond Area Park and Recreation District
RE: Redmond South US 97 Urban Renewal District

On behalf of the Redmond Area Park and Recreation District Board of Directors, this letter confirms our support for the creation of the Redmond South US 97 Urban Renewal District.

Redmond has experienced pronounced growth and development throughout the last twenty years. This growth is noticeable and problematic along the South US 97 corridor. As the primary north-south route through Redmond, US 97 improvements need to occur which address the safety, mobility and connectivity of the corridor while also catalyzing economic development. Additionally, RAPRD encourages livability and recreation projects to be included in the plan where feasible.

A strategic investment of tax increment resources will help preserve and improve Redmond's small-town character and benefit the thriving industrial traded sector businesses.

We believe the projects proposed for the Redmond South US 97 Urban Renewal District will prove to bring about positive change and effectively leverage state, federal and private resources as build to a more prosperous future for all of Central Oregon.

We support the establishment of this District.

Sincerely,

Katie Hammer
Executive Director

"Always Ready To Play..."

DESCHUTES PUBLIC
LIBRARY

DATE: October 14, 2020
TO: Redmond City Council
FROM: Deschutes Public Library
RE: Redmond South US 97 Urban Renewal District

On behalf of the Deschutes Public Library Board of Directors, this letter confirms our support for the creation of the Redmond South US 97 Urban Renewal District.

We believe the projects proposed for the Redmond South US 97 Urban Renewal District will prove to bring about positive change and effectively leverage state, federal and private resources so as to build a more prosperous future for all of Central Oregon.

We support the establishment of this District.

Sincerely,

Martha Lawler

Martha Lawler
Board President

www.deschuteslibrary.org

CITY OF REDMOND

411 SW 9th STREET
REDMOND, OR 97756

541.923.7710
www.redmondoregon.gov

S. HWY. 97 URBAN RENEWAL DISTRICT:

Outreach Feedback and Frequently Asked Questions

URBAN RENEWAL/TAX INCREMENT FINANCING (TIF) GENERALLY

How does Tax Increment Financing work?

When property valuations for a designated area are not rising at the same rate as the area around it, an Urban Renewal District can be established. The District Plan lines out projects to help raise property values (and by extension tax collections) for the area. Once created, the existing or base tax collections still flow to the taxing districts (schools, local government, etc.) but the growth or increment in valuation is leverage by the District to invest in projects to raise the values. Once a District is closed, the new, higher valuation is returned to the taxing districts.

Does TIF increase property owners' taxes?

No. TIF is not a new tax on property and does not increase the amount a property owner pays in property taxes. Property taxes are based on the tax rate and the property's assessed value and increases as the assessed value grows. TIF does not increase the tax rate.

How does TIF generate revenue if it does not increase property taxes?

The financial impact of TIF is on taxing jurisdictions, not individual taxpayers. TIF revenues are generated from increases in assessed value of property within a TIF area after it is formed. While the TIF area is active, other taxing jurisdictions' revenue from that area remains largely fixed, and the tax revenue from the increase in assessed values goes to the Urban Renewal Agency to pay for projects that help to spur new investment. When the TIF area expires, taxing jurisdictions can expect to receive more tax revenue than they would have without a TIF area, due to the increased assessed values stemming from the increased investment in the area.

What are the steps for creating a TIF area/plan?

A TIF area is created through a process that includes community input, notice to impacted taxing jurisdictions, and review by the Urban Renewal Agency, the Planning Commission, Deschutes County Commission, and the Redmond City Council. The City Council hearing notice must be sent to each individual household in the City. Adoption of a plan must be by non-emergency ordinance by the City Council. The plan, together with an accompanying TIF report, identifies the goals of the TIF area and projects to be funded with TIF revenue, describes how the area complies with statutory requirements for blight, projects tax increment revenues, and identifies a maximum amount of debt a TIF area can incur, among other topics.

Does TIF affect school district funding?

School districts are not directly affected by TIF. Under Oregon's school funding law, the Oregon Department of Education combines property tax revenues with State School Fund revenues to achieve per-student funding targets. Under this system, property taxes foregone due to the use of tax increment financing are replaced with State School Fund revenues, as determined by the state

funding formula. While TIF statewide has an impact on the amount of funding in the State School Fund, the legislature can re-allocate other funding sources to the State School Fund.

What are the benefits of TIF?

Over the long term, the TIF area could produce significant revenues for capital projects and spur private investment/development. Some examples of TIF investments include:

- Capital improvement loans for small or startup businesses
- Storefront improvement grants for improvements to existing properties
- Streetscape improvements and transportation enhancements, including new lighting, trees, sidewalks, and intersection improvements
- Redevelopment projects, such as mixed-use or infill housing developments
- Historic preservation projects
- Parks and plazas
- Utility or infrastructure projects to support new development

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S. HWY. 97 URBAN RENEWAL DISTRICT

Financials

What is the Maximum Indebtedness for the District?

The Maximum Indebtedness is $85.5M. This includes all money spent on projects, programs, and administration of the Plan. It does not include indebtedness incurred to refund or refinance existing indebtedness, nor does it include interest payments.

Why does the Maximum Indebtedness not equal the lower cost of the projects added together?

The project costs include only the actual costs to complete the projects, while the Maximum Indebtedness includes other cost considerations related to the implementation of the Plan, such as Plan administration and staffing costs.

When can Overlapping Taxing Districts expect to receive the increased tax revenue once the District closes?

2046 is the last date to issue debt, and it typically takes 3-5 years after that date to pay off all the debt that has been issued. Once that indebtedness is fully paid then the base plus the increment (the tax revenue growth) flow back to the taxing jurisdictions.

How have other Urban Renewal Districts in Redmond performed?

Downtown Urban Renewal District: The Assessed Value has grown from a frozen base of $72M to $288M to date (4x growth rate). $9M has leveraged $46M; For every $1 of UR funding invested, Downtown has yielded $5 of private investment.

South Airport Urban Renewal District: The Assessed Value grew from a frozen base of $725K to $63M – 8:1 growth ratio.

When will enough TIF be generated to leverage state and federal funds (i.e. When will work begin)?

Projects are scheduled to begin in fiscal year 2021-22. ODOT is willing to partner with the City to begin the corridor work in full and on schedule.

Does the South Redmond Tract carry the majority of the projected tax revenue growth?

Financial projections have not been broken out specifically parcel-by-parcel in the Plan, but rather calculated in the District's entirety. However, the Plan and Report do breakout percentages of parcels by land use type, site condition, development status, exterior condition, and occupancy.

Projects and Activities

Why is the South Redmond Tract included in the Plan? Can the District just encompass the South US97 corridor?

The two areas are intrinsically tied together both in proximity, need, and improvement timelines. ODOT's road repaving timeline is a ticking clock, and they are required to repave that section of US97 within the next 3-5 years. We can save significant public resources by doing this work together, particularly the infrastructure, (public utilities, gas, power, communications, roads) at the same time under the same Urban Renewal financing umbrella. If we do not use tax increment financing to bring infrastructure to the South Redmond Tract, that prime job and employment land will remain undeveloped.

What is the current maintenance schedule for the South 97 Corridor?

The Oregon Department of Transportation is planning to repave US97 in 2025.

Did the Oregon Transportation Commission approve the Facility Plan?

The Facility Plan is expected to be adopted by the OTC at the beginning of 2021. It was adopted by the City with the formal adoption of the Transportation System Plan.

How will industrial incentive programs be developed?

Incentive program specifics are still being developed, however the Urban Renewal Agency plans to work closely with Redmond Economic Development, Inc. (REDI) for guidance on program development.

How did you define blight?

Staff referenced several points of evidence of blight as defined in the Plan. Blighting influences include large vacant sites, insufficient and undersized infrastructure, deteriorating or substandard buildings and property improvements, vacant buildings, inadequate and incomplete street and sidewalk systems, and inefficient and unsafe traffic conditions.

Where will the fire station go?

Generally speaking the service need is in the south side of the City. While a site has yet to be determined, it could likely be built near the airport or fairgrounds.

If a new fire station is built, does RF&R have the capacity and resources to staff it?

Yes. It could be staffed immediately and would be the busiest station on day 1. Equipment will need to be acquired, however at least one ambulance from the downtown station could transition over.

What can UR fund for the fire station? Can it pay for the entire project?

UR funding plays a role of gap financing and leveraging other resources. The funding planned for the station would only cover part of the facility and would be implemented as match dollars.

Is there a possibility for a facility partnership with other taxing districts?

Other than the fire station, there are no project activities contemplated in the Plan that specifically call out facility partnerships with other taxing districts.

Will there be lands set aside as open space in the South Redmond Tract?

The focus will be to provide infrastructure for the development of the industrial sector, however developers of that area may include open space as part of the master plan.

Will there be any new east-west connections to the South Redmond Tract?

The City is working on long-planning to eventually extend Quarry Avenue through the South Redmond Tract Area. This extension is not a specific part of the Urban Renewal Plan, but is part of the City long-range planning efforts for eventual development.

How do COID piping projects sync up with the ODOT?

We are coordinating with both agencies to ensure timelines and projects are synced up and proceed as efficiently as possible.

How will freight delivery be addressed?

The Corridor Plan design work suggests improved access with frontage roads. The final design work will be in cooperation with the business owners.

How will the new signalized intersections work?

The better coordinated signals will improve efficiencies. Less stacking at lights means that traffic can move through more efficiently.

Will there be housing developments funded by UR in this District?

The district would have a focus on safety and economics. UR housing funding in the downtown will continue to ramp up as we work with our partners to help address the housing crisis.

Would taxing district partners have representation on the District's advisory board, once it is formed?

Yes, we plan on having input and membership from all stakeholders to ensure a balanced decision-making process. We expect to begin forming this board summer of 2021.

Kelly Morse

From: Chloe Halvorson <halvoyang2002@gmail.com>
Sent: Wednesday, November 18, 2020 10:12 AM
To: Public Testimony
Subject: Public comment on S 97 urban renewal district

: This email originated from outside of the city. Do not click links or open attachments unless you recognize the sender and know the con

I would like to stress the need for safe pedestrian crossings, and bike lanes. Redmond is a prime example of the classic American architecture that centers itself around freeway driving. As Redmond's population expands and begins to include a number of citizens not involved in the farming community, this type of city plan is no longer reasonable. There needs to be crossings to accommodate shoppers, tourists, and in turn support the smaller businesses that rely on easy pedestrian access rather than drivers pulling off the freeway.

I hope that Redmond does not exclude an opportunity for an adequate bus lane. Redmond's rapid growth is tied distinctly to the increasing tourism industry of Bend, Oregon. To help congestion in the S 97 district, a bus system connecting (or maybe branching off of Bend's existing bus system) could potentially decrease the number of vehicles on the freeway. Many, if not most of these cars in this district, are on their way to or from Bend. Even if the bus route was exceedingly simple, stretching across a linear route of infrequent stops through Redmond, it would still be exceedingly useful for Redmond's young and poor population who lack access or funds to their own mode of transportation. Additionally, a bus route would create job opportunities in bus driving and management.

--
Mia Halvorson
she/her

Kelly Morse

From: Cecilia Bryant <celieb868@gmail.com>
Sent: Tuesday, December 1, 2020 8:37 AM
To: Public Testimony
Subject: Proposed south 97 Project

: This email originated from outside of the city. Do not click links or open attachments unless you recognize the sender and know the con

Hi, I have looked over the proposal. I agree that section of 97 definitely needs improvement. I have 2 concerns, however. One is the cost. We have just paid our tax bill which grows every year. The Urban renewal is a fairly large bite out of it, and prior to seeing this proposal I was hoping that in the very near future that this would be reduced. If this project goes forward this appears to be very unlikely.
My second concern is the traffic into the fairgrounds. (When things return to normal). I was under the impression way back that this was an important issue to address and there was going to be an arterial road on the south end to address this issue. I did not see this in the plan.
Thank you for your attention,
Cecilia Bryant

CITY OF REDMOND

ORDINANCE NO. 2020-19

AN ORDINANCE OF THE CITY OF REDMOND APPROVING THE ESTABLISHMENT OF THE SOUTH 97 URBAN RENEWAL DISTRICT AND DIRECTING THAT NOTICE OF APPROVAL BE PUBLISHED.

WHEREAS, the Redmond Urban Renewal Agency (the "Agency") has prepared and proposed to the City of Redmond City Council for its approval the South 97 Urban Renewal Plan and Report ("Plan"); and

WHEREAS, such Plan has been prepared in conformity with the requirements of ORS 457.085 and with public involvement in all stages of the development; and

WHEREAS, pursuant to applicable state and local law, the City of Redmond has provided public notice, including additional notice as required by ORS 457.120, and has considered public testimony regarding the Plan; and

WHEREAS, the Plan was forwarded to the Redmond Planning Commission for any recommendations as required by ORS 457.089 for the establishment of an urban renewal district, and the Planning Commission reviewed the Plan on September 21, 2020, and voted unanimously to forward their recommendation of support to City Council for its consideration; and

WHEREAS, the City mailed copies of the Plan to the taxing districts affected by the establishment of the proposed urban renewal district on August 30, 2020, and has received written concurrence of taxing districts imposing at least 75 percent of the amount of taxes imposed under permanent rate limits in the urban renewal area per ORS 457.470; and

WHEREAS, City Council has reviewed the Plan; and

WHEREAS, City Council finds the Plan should be adopted and approved, based on the findings listed below.

NOW, THEREFORE, THE CITY OF REDMOND ORDAINS AS FOLLOWS:

SECTION ONE: FINDINGS. In support of its adoption of the Plan, the following findings of fact and conclusions are adopted:

1. Based upon the Report accompanying the Plan and other information, the area described in the South 97 Urban Renewal Area, is blighted by virtue of:

    a. The Area contains a high percentage of parcels of vacant and undeveloped or underdeveloped land.

b. The Area lacks adequate multimodal access, circulation, and connectivity. In particular, east-west connections are highly limited.

c. The Area lacks adequate sidewalks with 62 percent of parcels with incomplete or missing sidewalks.

d. The Area lacks safe bicycle routes connecting key destinations.

e. Much of the Area has a poor aesthetic appearance. Landscaping and streetscapes are inconsistent and, in some locations, inadequate or lacking. Overhead utilities contribute to visual clutter and help produce an environment not conducive to new investment in the area.

f. The highway commercial properties lack alternative access to improve ingress and egress.

2. That the rehabilitation and redevelopment of the Plan area is necessary to protect the public health, safety or welfare of the City of Redmond.

3. That based on information contained in Sections 400, 600 and 700 of the Plan and other information, the Plan conforms to the City's Comprehensive Plan as a whole, and provides an outline for accomplishing the projects proposed.

4. That based on Section 400 of the Plan and Section 100 of the accompanying Report, the Plan conforms to the Economic Development goals of the City's Comprehensive Plan and that the City does not have a separate Economic Development Plan.

5. That the acquisition of real property as provided for in the Plan is necessary for purposes of ending blight in the geographic area as described in the Plan.

6. That based on Section 500 and Appendices A, B, C, D, and E of the Report accompanying the Plan and other information, the adoption and carrying out of the urban renewal plan is economically sound and feasible.

7. That the City shall assume and complete any activities prescribed by the urban renewal plan.

8. That the Redmond City Council hereby incorporates by reference the South 97 Urban Renewal Plan, attached to this Ordinance as Exhibit "A", as support for its above-mentioned findings.

9. That City Council further relies on the South 97 Urban Renewal Report, attached to this Ordinance as Exhibit "B", which is incorporated by reference.

SECTION TWO: INTENT OF CITY COUNCIL. It is anticipated the Plan will be reviewed periodically during the execution of the Project. The Plan may be changed, modified, or amended as future conditions warrant. All amendments shall be governed by state and local laws and ordinances.

SECTION THREE: BASED UPON THE FINDINGS IN SECTION ONE.

1. City Council hereby adopts and approves the South 97 Urban Renewal Plan, pursuant to the provisions of ORS 457.

2. City Council further directs the City Recorder as follows:

a) To record a copy of the Ordinance approving the South 97 Urban Renewal Plan with the Recording Officer of Deschutes County, Oregon, pursuant to ORS 457.125; and

b) To send a copy of this Ordinance to the Urban Renewal Agency for the City of Redmond, Oregon; and

c) To publish notice of adoption of the South 97 Urban Renewal Plan in accordance with ORS 457.095, 457.115 and 457.135 within four days following adoption of this Ordinance by City Council.

SECTION FOUR: EFFECTIVE DATE. January 8, 2021

PASSED by City Council and **APPROVED** by the Mayor this 8th day of December 2020.

_____

George Endicott, Mayor

ATTEST:

_____

Kelly Morse, City Recorder

December 2020

Urban Renewal Plan

South 97 Urban Renewal Area

Prepared for:

City of Redmond, Oregon
411 Southwest 9th Street
Redmond, Oregon 97756
www.redmondoregon.gov

Prepared by:

LELAND CONSULTING GROUP
610 SW Alder Street, Suite 1200
Portland, Oregon 97205
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EXECUTIVE SUMMARY

As the hub of Central Oregon, Redmond has experienced pronounced growth and development throughout the last 20 years. Attracting newcomers from all over, Redmond has become a mid-sized community of 30,000 residents, with an annual growth rate of approximately 2.4 percent. By 2040, the population is expected to grow to nearly 50,000.

Known for its progressive and innovative leadership, Redmond enjoys a state-wide reputation for its ability to successfully undertake efforts that improve the community. The most immediate challenge Redmond faces is how to strategically respond to rapid regional growth while preserving and improving assets like Redmond's small-town character, thriving traded sector and industrial businesses, distinct neighborhood identities, access to nature and outdoor recreation, and important public spaces like the Dry Canyon.

Managing the growth impacts of the South Redmond US Highway 97 (US97) corridor is critical. As the primary north-south route through Redmond, US97 is central to the community's ability to succeed in the areas of safety, mobility, connectivity, and economic development.

In 2019, following a decade of research and outreach, the Oregon Department of Transportation (ODOT), the City of Redmond (City), and local committees completed a joint study of the highway and made recommendations to accommodate its growing use. This study, referred to in this South 97 Urban Renewal Plan ("Plan") as the Redmond South US 97 Corridor Plan ("Corridor Plan"), included a recommended concept intended to enhance corridor safety, improve access to businesses, beautify the highway, create bicyclist- and pedestrian-friendly routes, develop east/west linkages, and enhance economic development and business vitality for long-term community health and sustainability.

The Corridor Plan also identifies several potential funding sources for these improvements, one of which is the creation of an urban renewal area. Urban renewal is one of the only funding mechanisms in the State of Oregon that can raise funds for projects without raising taxes for the local residents through the use of tax increment financing ("TIF").[1] The tax increment is the difference between the total assessed value of the urban renewal area in a given year and the original frozen base value. Tax revenue from the increment value is diverted from other taxing districts in the Urban Renewal Area ("Area") and invested in projects to make improvements in infrastructure that lead to jobs, advance public policy objectives, and accelerate growth in property taxes.

The City staff spent more than two years working with stakeholders to evaluate conditions in the corridor and potential investments that would benefit from tax increment financing. This work included a parcel-by-parcel assessment to understand the extent of the blighted conditions. A feasibility study found that urban renewal would be an appropriate tool to generate sufficient revenues to support the identified projects in the Plan.

[1] Similar tax increment funding was utilized by the City of Redmond for North Highway 97 and related improvements in the 2000s.

Figure 1. US 97 Corridor Plan Rendering

Source: SERA Architects (from US 97 SRC Facility Plan, "US 97 Corridor Plan")

Plan Boundary, Description, Condition

The 1330.5-acre Urban Renewal Area boundary was determined by the Corridor Plan Committee to include the US 97corridor. A subsequent Urban Renewal Feasibilty Study also included the South Redmond Tract - a state designated land area of nearly 1,000 acres with industrial development opportunities in southeast Redmond.

The South Redmond Tract accounts for approximately 71 percent of the total Area. Significant investments in infrastructure are necessary to realize its potential for substantial industrial development and employment growth.

The remaining land in the Area - approximately 300 acres along South Highway 97 - is zoned for commercial uses. Urban renewal funding is largely expected to provide local matching dollars necessary to leverage state and federal highway improvement funds.

A legal description for the project boundary is included in Attachment "A" of this Plan. The boundary of the Area is shown in Figure 2 on page 7 of this Plan.

Existing Conditions and Challenges of the District

The South Redmond US 97 corridor serves as the primary north-south arterial through Central Oregon. The corridor serves a mixture of state, regional, and local traffic traveling to, from, and within a variety of different destinations in the region. The city's location is not only the hub for transportation serving Central Oregon, but also has regional attractors, including a commercial airport, county fairgrounds, and many industrial and commercial areas.

The corridor currently has a number of challenges related to safety, mobility, and connectivity, including:

- The number of vehicle crashes (about 40 per year) is well above the statewide average.
- Congestion and unreliable travel times slow the movement of freight traffic.

- Lacking or substandard pedestrian facilities.
- Lacking or substandard bicyclist facilities.
- Limited east-west crossing opportunities for pedestrians and bicyclists.
- Limited east-west connectivity between the corridor and the neighborhoods to the west.

Anticipated employment and housing growth will exacerbate these challenges, with traffic activity expected to increase significantly by 2040. The number of vehicle crashes is projected to reach more than 70 per year if challenges are not addressed . The investments outlined in the Plan are critical to mitigating the negative impacts of growth, and significantly improve safety and operations.

Beyond these traffic-related concerns, there is untapped development potential due to a multitude of vacant or underdeveloped parcels along the corridor. The Area contains 77 vacant or mostly vacant parcels, representing 30.8 percent of the parcels, but 87.4 percent of the land area within the proposed boundary. The South Redmond Tract is largely undeveloped and underserved by infrastructure. This area is largely without streets, sidewalks, and utilities necessary for development. An opportunity exists to promote higher density industrial development on the undeveloped acreage.

Additionally, there are challenging corridor aesthetics. Approximately 42 percent of parcels in the Area have missing or deteriorated sidewalks, and 20.9 of parcels are considered to have poor or substandard site conditions.

Maximum Indebtedness/Implementing the Plan

The maximum amount of indebtedness that may be issued or incurred under the Plan is $85,458,900 (inflation-adjusted dollars). This total is based upon good faith estimates of the scope and costs of projects in the Plan and the schedule for their completionThe tax increment funding will help leverage state and other funding toward the estimated cost of $116.5 million of improvements (2020 dollars). Please see the accompanying Report for additional information.

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100. INTRODUCTION

This South 97 Urban Renewal Plan has been prepared pursuant to Oregon Revised Statute (ORS) Chapter 457, the Oregon Constitution, and all applicable laws and ordinances of the State of Oregon and City of Redmond respectively. All such applicable laws and ordinances are made a part of this Plan, whether expressly referred to in the text or not.

The proposed Urban Renewal Area is a single geographic area of approximately 1,330 acres. The Area is defined by a single contiguous boundary in which a variety of activities and projects are contemplated to eliminate blight and the cause of blight, as well as create an environment in which the private sector may develop uses compatible with the purposes of this Plan.

200. DEFINITIONS

The following definitions will govern the construction of this Plan unless the context otherwise requires:

"Area" means the area included within the boundaries of the South 97 Urban Renewal Area.

"Bonded Indebtedness" means any formally executed written agreement representing a promise by a unit of government to pay to another a specified sum of money, at a specified date or dates at least one year in the future.

"City" means the City of Redmond, Oregon.

"City Council" means the City Council of the City of Redmond, Oregon.

"Comprehensive Plan" means the City's 2020 Comprehensive Plan and its implementing Ordinances, policies, and development standards.

"Corridor Plan" means the Redmond South US 97 Corridor Plan.

"County" means the County of Deschutes, State of Oregon.

"Disposition and Development Agreement" means an agreement between the Urban Renewal Agency and a private developer which sets forth the terms and conditions which will govern the disposition of land to a private developer.

"Exhibit" means an attachment, either narrative or map, to the Urban Renewal Plan for the Urban Renewal Area.

"ORS" means Oregon Revised Statute (State Law) and specifically Chapter 457 thereof.

"Plan" means the Urban Renewal Plan for the South 97 Urban Renewal Area.

"Planning Commission" means the Urban Area Planning Commission of the City of Redmond, Oregon.

"Project, Activity or Project Activity" means any undertaking or activity within the Area, such as a public improvement, street project, or other activity which is authorized and for which implementing provisions are set forth in the Urban Renewal Plan.

"Report" refers to the report accompanying the Urban Renewal Plan, as provided in ORS 457.085(3).

"Redeveloper" means any individual or group acquiring property from the Urban Renewal Agency or receiving financial assistance for the physical improvement of privately or publicly held structures and land.

"State" means the State of Oregon.

"Urban Renewal Agency" or "Agency" means the Urban Renewal Agency of the City of Redmond, Oregon.

"Urban Renewal Area", " South 97 Urban Renewal Area", or " Area" means the geographic area for which this Urban Renewal Plan has been approved. The boundary of the Renewal Area is described in Exhibits made a part of this plan.

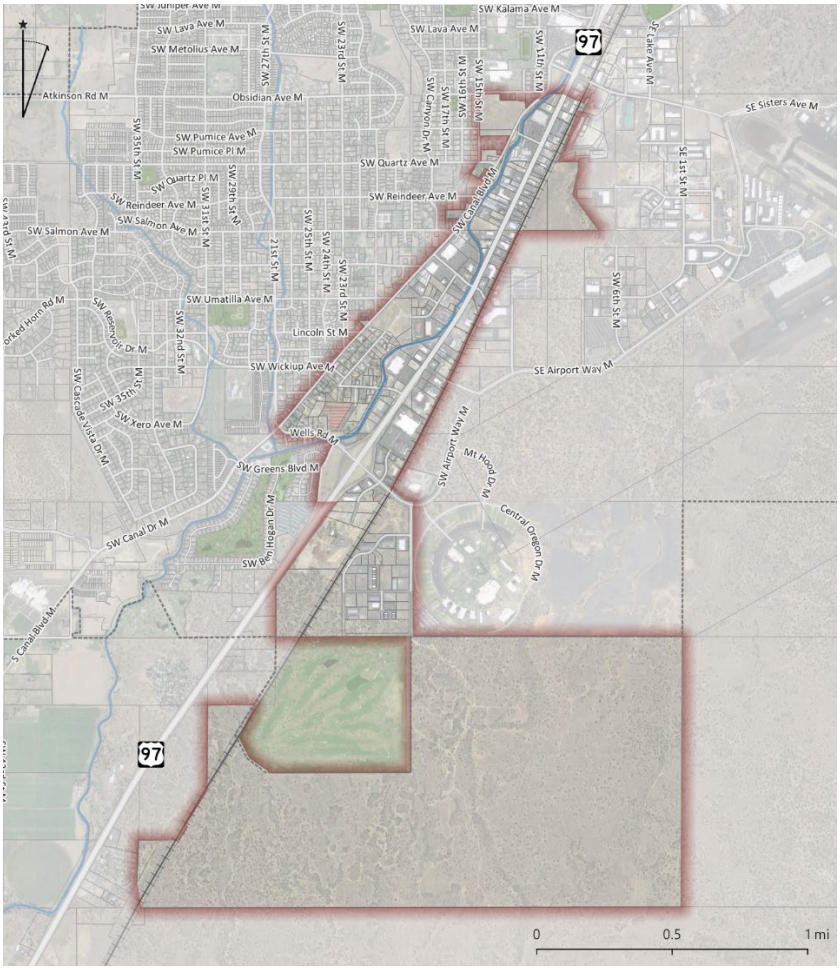
300. URBAN RENEWAL AREA BOUNDARY

The boundary of the South 97 Urban Renewal Area is shown below (Figure 2). A legal description for the Area boundary is included in Attachment "A" of this Plan.

The Urban Renewal Area boundary was determined by the Corridor Plan Committee to include the US 97 Corridor and the South Redmond Tract, a total area of 1,330.5 acres.

The City's current land area is approximately 10,449 acres. Per state statute, no more than 25 percent of the City's total land area can be designated as an urban renewal district. Added to the Redmond Downtown Urban Renewal District (701.7 acres), the total of all acreage in urban renewal areas represents 19.45 percent of the City's land area and is, therefore, within the 25 percent limitation.

Figure 2. South 97 Urban Renewal Area Boundary



Source: Leland Consulting Group

400. RELATIONSHIP TO LOCAL OBJECTIVES

The purpose of this Plan is to eliminate blighting influences found in the Urban Renewal Area, to implement goals and objectives of the City of Redmond 2020 Comprehensive Plan, and to create development strategies and objectives for the Area. The South 97 Urban Renewal Plan relates to the following guidance documents adopted by the City:

A. City of Redmond 2020 Comprehensive Plan

ORS 457.085 requires that an Urban Renewal Plan relate to local objectives. The Comprehensive Plan considers a wide range of goals and policies relating to land uses, transportation, public utilities, economic development, and housing, and serves as the guiding document to which this Plan relates. The Comprehensive Plan establishes a policy framework rooted in a factual basis that helps inform other critical planning documents and implementing tools that together serve as a coordinated, overarching strategy for the City. This approach establishes the structure for how the City works and the types of services it provides. Ultimately, the Comprehensive Plan outlines the direction the City will take when planning for land use and informs all land use decisions and actions, including how land is developed and services are provided.

If the primary goals for the Comprehensive Plan change, the goals, and policies for this Plan should be revised to appropriately reflect those changes.

Specific goals and policies found in the Comprehensive Plan concerning Area conditions and challenges are:

Chapter 9 – Economic Development

Goals

1. Expand, improve, and diversity the economy of the Redmond Urban Growth Boundary area while maintaining Redmond's quality of life.
3. Retain or create industrial, office, professional service, technology, medical, tourism, retail and other jobs through expansion and retention of existing businesses and recruitment of new businesses.
4. Improve the appearance of the community's employment districts, particularly along Highways 97 and 126, the Downtown, central east side industrial areas, and the Airport/Fairgrounds area.
9. Provide, maintain, and promote the enhancement of state of the art infrastructure, including, but not limited to, transportation systems, water, sewer, natural gas, power, telecommunications and air service to support the commercial and industrial needs of the community.
11. Maintain Redmond's favorable employment to housing ratio by taking affirmative steps to ensure economic development and employment growth keeps pace with population growth, especially for industrial employment.
12. To build a strong and thriving regional economy by coordinating public investments, policies, and regulations to support regional and state economic development objectives in Central Oregon as determined through the Central Oregon Large Lot Industrial Land Needs Analysis.

Policies

9. The City should give a high priority to extending and improving the infrastructure needed for economic development.
10. The City shall provide an incentive program encouraging the development of primary industry family wage jobs.

11. The City should provide incentives and innovative ways to encourage and promote an inventory of available industrial buildings and a pre-approved process to attract industrial uses.
12. General Objectives
    b. Encourage landscaping and other forms of city beautification for the purpose of enhancing the physical character of each area, and the overall city.
    f. Focus community efforts to improve the overall appearance of existing commercial areas and similar considerations encouraged to all new developments.
    i. Rehabilitate or re-develop older commercial areas in order to retain their values to the community, including the Downtown and Highway 97 corridor after the highway is re-routed to a limited access corridor.
33. Commercial development adjacent to arterial streets and State highways shall be subject to access restrictions.
34. C-1 commercial development along Highway 97 shall be encouraged to provide service access roads which feed into arterial and collector streets at designated points.
46. The City recognizes the importance of maintaining a large-lot industrial land supply that is readily developable in Central Oregon.

Findings: Plan's relationship to Chapter 9 – Economic Development.

- *The Plan's Industrial Opportunity Fund, Small Loan Program, and Incentive Funding project activities support Economic Development Goals 1, 3, 11, and 12 and Policies 10, 11, and 46 through programs that support the development or expansion of businesses and employment centers that retain and create job opportunities, help maintain a balance of jobs to housing, promote public-private and inter-agency coordination, and expand, diversify, and improve the local economy.*
- *The Plan's public utility, power, gas, and telecommunications project activities support Economic Development Goals 9, 11, and 12 and Policies 9 and 46 by extending and improving Redmond's infrastructure to meet the commercial and industrial needs of the community, thereby supporting job growth, supplying readily developable large-lot industrial land, and helping the City coordinate investments to support regional and state economic development objectives in Central Oregon.*
- *The Plan's transportation project activities support Economic Development Goals 4, 9, and 11 and Policies 33 and 34 by funding transportation investments that improve the appearance of transportation elements in the Area's employment districts, modify and enhance access and connectivity, and extend, develop, and improve infrastructure to serve the commercial and industrial needs of the community.*
- *The Plan's transportation project activities support Economic Development Goals 1, 4, 9, and 12 and Policies 12(b)(f)(i) and 34 by improving the Area's physical appearance, accessibility, and navigability by various modes of transportation, and strengthening the identity and vitality of both the US 97 Corridor and the broader Area.*

Chapter 10 – Housing

Goals

3. Establish residential neighborhoods that are safe, convenient, and attractive places to live, which are located close to schools, parks, shopping, and employment centers.
5. Provide a broad range of accessible and affordable housing.
6. Provide for higher densities in proximity to schools, services, parks, shopping, employment centers, and public transit.

Policies

23. Criteria for the location of multifamily housing shall include proximity to the City core, neighborhood commercial centers, major transportation corridors, schools, services, parks, shopping, employment centers, and transit corridors.

Findings: Plan's relationship to Chapter 10 – Housing.

- *The Plan's transportation and utility infrastructure project activities support Housing Goals 3, 5, and 6 and Policy 23 by reducing the cost burden on developers, thereby improving the prospects of new housing development, and potentially increasing the probability of higher density developments.*
- *The Plan's development assistance and incentive funding program activities support Goals 3, 4, 5, and 6 and Policy 23 by supporting employment growth along a major corridor, near shopping and employment centers, and near services.*

Chapter 11 – Public Facilities and Services

Goals

1. To provide for a close correlation between the provisions of urban services and urban development in order to bring about a more orderly and efficient development pattern, and thereby avoid unnecessary tax burdens and excessive utility costs normally associated with scattered, unrelated development.
2. To achieve a balance of public costs vs. benefits/revenues in the provision of public facilities and services.
3. To provide public and private utility systems - water, sanitary and storm sewer, energy, communications, garbage, and recycling - at levels necessary and suitable for existing and proposed uses.
5. Public facilities shall be available or under construction prior to the issuance of Building Permits.

Policies

2. The City should establish revenue sources to pay for its planned capital improvements.
3. The City Council should investigate funding alternatives to property taxes for funding public facilities and services.
11. The City shall continue to develop, operate, and maintain a water system, including wells, pumps, and reservoirs, capable of serving all urban development within the UGB.
15. Storm drainage facilities such as dry wells, landscaping, retention ponds or storm drains shall be used to control surface drainage.
26. The City shall encourage Natural Gas providers to provide service throughout the UGB area.
27. Property for future fire station locations should be planned for and purchased in advance in order to save costs of facility zoning construction. Attempts shall be made to combine future stations with other government entities in order to reduce infrastructure and operations costs.

Findings: Plan's relationship to Chapter 11 – Public Facilities and Services.

- *The Plan's public utility, power and gas, and communications projects support Goals 1, 2, and 3 and Policies 11, 15, and 26 by providing infrastructure deemed critical to attracting desired users to the Area and by providing the necessary infrastructure for existing businesses and industries to expand operations.*
- *The Plan's Fire Station project supports Goal 5 and Policy 27 by providing funding for a new fire station to serve south/southeast Redmond.*

- *The Plan supports Policies 2 and 3 by providing additional funding methodologies and funding alternatives to pay for and leverage planned capital improvements and programs.*
- *The Plan's Industrial Opportunity Fund, Incentive Funding, and Small Loan Program activities support Goals 1, 2, 3, and 5 and Policies 11, 15, and 26 by encouraging and accelerating the timing of the construction of critical infrastructure deemed necessary for the expansion of existing businesses and establishment of new users.*

Chapter 12 – Transportation

Goals

1. Reduce through traffic, congestion, and improve circulation along Highway 97.
2. Enhance east/west circulation.
3. Identify roadway system needs to serve undeveloped areas so that steps can be taken to preserve rights-of-ways and maintain adequate traffic circulation.
4. Increase the use of alternative travel modes through improved safety and service.

Objectives

1b. Improve intersection operations by adding left-turn phases, installing additional traffic signals, actuating and coordinating traffic signals, and/or increasing sight distance as needed.
2a. Develop a safe and efficient east-west arterial and collector system
2b. Enhance existing crossings and determine the best locations for additional crossings of Dry Canyon, Highway 97, Pilot Butte Canal, and BNSFRR line to link east and west Redmond.
3a. Integrate new arterial and collector routes into the existing city grid system.
4a. Provide additional sidewalks and improve existing sidewalk pavement for pedestrian safety and access.
4b. Provide additional bicycle routes and plan regular maintenance of existing routes for bicycle safety and access (per Redmond Bicycle Master Plan).
4c. Provide pedestrian and bicycle access, especially when direct motor vehicle access is not possible.

Policies

3. The function of existing and planned roadways as identified in the Redmond Urban Area Transportation Plan shall be protected through the application of appropriate access control measures.
10. The City shall work to acquire and develop a trail system that utilizes Redmond's irrigation canal system.
16. Sidewalks shall be included on all new streets except limited access roads or where equivalent alternative pedestrian circulation is provided in the UGB. Retrofitting existing streets with sidewalks shall proceed on a prioritized schedule.
20. Wherever practical, access to the highway will be provided via frontage roads, alternative local roads, or other means, rather than direct access to the highway.
22. A non-traversable median should be installed on the highway when operational or safety issues warrant installation. Directional breaks in the median will be provided as needed to provide safe traffic operation.
24. Medians installed in the state highways should provide bicycle and pedestrian crossings at least every 1/4 mile.
34. The City shall improve east-west and north-south traffic patterns in the central part of the community.
38. Alleys shall be an option in new residential areas, providing rear access and backyard parking.

FINDINGS: Plan's Relationship to Chapter 12 – Transportation.

- *The Plan's transportation improvement projects support Goals 1 and 3, Objective 1b, and Policies 3, 22, 24 by improving safety, efficiency, and operations through access and median treatments, supporting the development of new connections and alternatives routes to serve existing and underserved areas, and reducing through traffic by encouraging other modes of transportation.*
- *The Plan's US 97, local street, alley, and access improvement projects support Goals 1, 2, 3, and 4, Objectives 1b, 2a, 2b, and 3a, and Policies 20, 34, and 38 by enhancing crossings, improving intersection operations, addressing access through new alleys and alternative routes, and implementing circulation improvements necessary for new development.*
- *The Plan's canal improvement contribution, mixed-use path, US 97 median treatments, sidewalk improvements, and pedestrian infrastructure project activities support Goal 4, Objectives 2a, 4a, 4b, and 4c, and Policies 10, 16, and 24 by providing safer or alternative routes for pedestrians and bicyclists in the US 97 corridor and the surrounding streets, enhancing multimodal connections throughout the Area.*
- *Additionally, transportation improvements may be a key component of several projects in the Plan, such as the Industrial Opportunity Fund, which is intended to support a wide range of investments and project activities that will leverage private development.*

Chapter 15 – Livability

Goals

1. The City of Redmond shall create and maintain livability. The City of Redmond shall guide development and support community identity and pride by implementing policies that improve livability and are innovative creating a high quality of life, ample family-wage jobs, and a safe environment in which to raise and educate families.

Policies

8. Redmond shall plan for a variety of transportation choices.
9. Redmond shall plan for and promote attractive streetscapes free from clutter, confusion, and blight.
10. Redmond shall develop safe, reliable, and economical transportation choices to decrease household transportation costs, improve air quality, reduce greenhouse gas emissions, and promote public health.
11. The City of Redmond shall develop and maintain the environment that promotes and supports a strong, healthy, and diverse economic base.
12. Redmond shall promote economic competitiveness through sustainable choices for housing, transportation, education, cultural diversity and enrichment, and recreational opportunities as well as improve reliable and timely access to employment centers, educational opportunities, services, and other basic needs by workers.
13. Redmond shall help existing businesses within the City to grow and thrive.
14. Redmond shall help to create and foster new businesses of all types.
15. Redmond shall provide well planned and maintain high-quality infrastructure to provide a competitive advantage for business and community growth.

Findings: Plan's Relationship to Chapter 15 – Livability.

- *The Plan's transportation-related projects, such as US 97 improvements, local improvements, pedestrian connections, and other related projects, support Goal 1 and Policies 8, 9, 10, 11, and 12 by providing pedestrian and bicycle infrastructure to encourage walking and cycling, improving streetscapes by addressing*

blighted conditions (such as lacking sidewalks) and funding beautification efforts, and planning for improved access to current and future employment centers.

- *The Plan's Industrial Opportunity Fund, Small Loan Program, and Incentive Funding project activities support Goal 1 and Policies 11, 12, 13, 14, and 15 by providing funding to existing and future businesses to grow and create new employment opportunities.*
- *The Plan's public utility, power and gas, and communications projects support Goal 1 and Policies 12, 13, 15 by providing high-quality infrastructure as a catalyst for growth.*

B. Urban Renewal Objectives

The Plan objectives include:

1. Improve safety for drivers, bicyclists, and pedestrians.
2. Create opportunities for new development in the Area.
3. Provide adequate access to businesses along the US 97 corridor for both customers and freight/delivery.
4. Increase connectivity to surrounding neighborhoods.
5. Develop infrastructure to incent development in the Area.
6. Implement the goals and objectives of the 2020 Comprehensive Plan.

Findings: Plan's Relationship to Urban Renewal Plan Objectives.

The following project activities support Urban Renewal Objective 1 of improving safety for drivers, bicyclists, and pedestrians by funding projects along US97 and existing and planned local connections. Activities include raised medians and traffic signal systems to allow protected left-hand turning movements and U-turns at signalized intersections.These project activities provide areas for safe pedestrian refuge, pedestrian and bicyclist facilities, connections to a new shared-use path, and new access roads or alleyways to provide alternative access where new connections provide safe ingress and egress nearby.

- US Highway 97 Projects
- Local Transportation Projects

The following project activities support Urban Renewal Objective 2 of creating opportunities for new development in the area. The activities fund projects that improve the quality and increase the capacity of infrastructure necessary to support the commercial and industrial needs of the community, and provide programs to incentivize and catalyze new private investment in the Area.

- Public Utilities
- Industrial Development Opportunity Fund
- Small Loan Funding
- Incentive Funding

The following project activities support Urban Renewal Objective 3 of providing safe and adequate access to businesses along the US97 corridor for both customers and freight/delivery by funding median treatments, addressing access through new alleys, adding new connections and alternative routes to serve existing and underserved areas, enhancing pedestrian crossings and intersection operations, and reducing unnecessary through-traffic by encouraging other modes of transportation.

- US Highway 97 Projects
- Local Transportation Projects

The following project activities support Urban Renewal Objective 4 of increasing connectivity to the neighborhoods by funding transportation projects that will add new connections and alternative routes to serve existing and underserved areas, improve local streets to provide pedestrian and bicyclist infrastructure, improve intersection operations, implement circulation improvements, and enhance crossings and access.

- US Highway 97 Projects
- Local Transportation Projects
- Canal Improvement Contribution

The following project activities support Urban Renewal Objective 5 of connecting infrastructure for large lot industrial lands to incent development. The project activities will improve the quality and increase the capacity of Redmond's infrastructure to support the commercial and industrial needs of the community, and provide funding programs to assist with the development of critical infrastructure for underserved areas.

- Public Utilities
- Industrial Development Opportunity Fund
- Small Loan Funding
- Incentive Funding
- Natural Gas/Power Improvements
- Communications Improvements

The following project activities support Urban Renewal Objective 6 of implementing goals and objectives of the 2020 Comprehensive Plan, as identified in Section 400A.

- US Highway 97 Projects
- Local Transportation Projects
- Fire Station
- Public Utilities
- Industrial Development Opportunity Fund
- Small Loan Funding
- Incentive Funding
- Natural Gas/Power Improvements
- Communications Improvements
- Canal Improvement Contribution

C. Relationship to Other Plans

The Corridor Plan references several plans and describes its relevance to many goals and objectives of these plans. The plans include:

- Transportation Planning Rule (OAR 660-012) (Refreshed 2020)
- Oregon Highway Plan Amendment (2018)
- Statement Transportation Improvement Program (STIP) (2018)
- Oregon Freight Plan Amendment (2017)
- Oregon Bicycle and Pedestrian Plan (2016)
- Oregon Transportation Safety Action Plan (TSAP, 2016)
- Oregon State Rail Plan (2014)
- Oregon Resilience Plan (OSP) (2013)
- ODOT Highway Design Manual (HDM) (2012)

- Oregon Intersection Safety Implementation Plan (ISIP) (2012)
- Oregon Aviation Plan (2007)

While this section does not reiterate this Urban Renewal Plan's relationship to these plans and their objectives, it is assumed that due to the extensive processes undertaken during the Corridor Plan's development and the resulting recommended projects that now form the basis of this Urban Renewal Plan, the Corridor Plan adheres to most, if not all, of the same plans and objectives. Additionally, the Corridor Plan was also adopted into the City's Transportation System Plan.

500. PROPOSED LAND USES

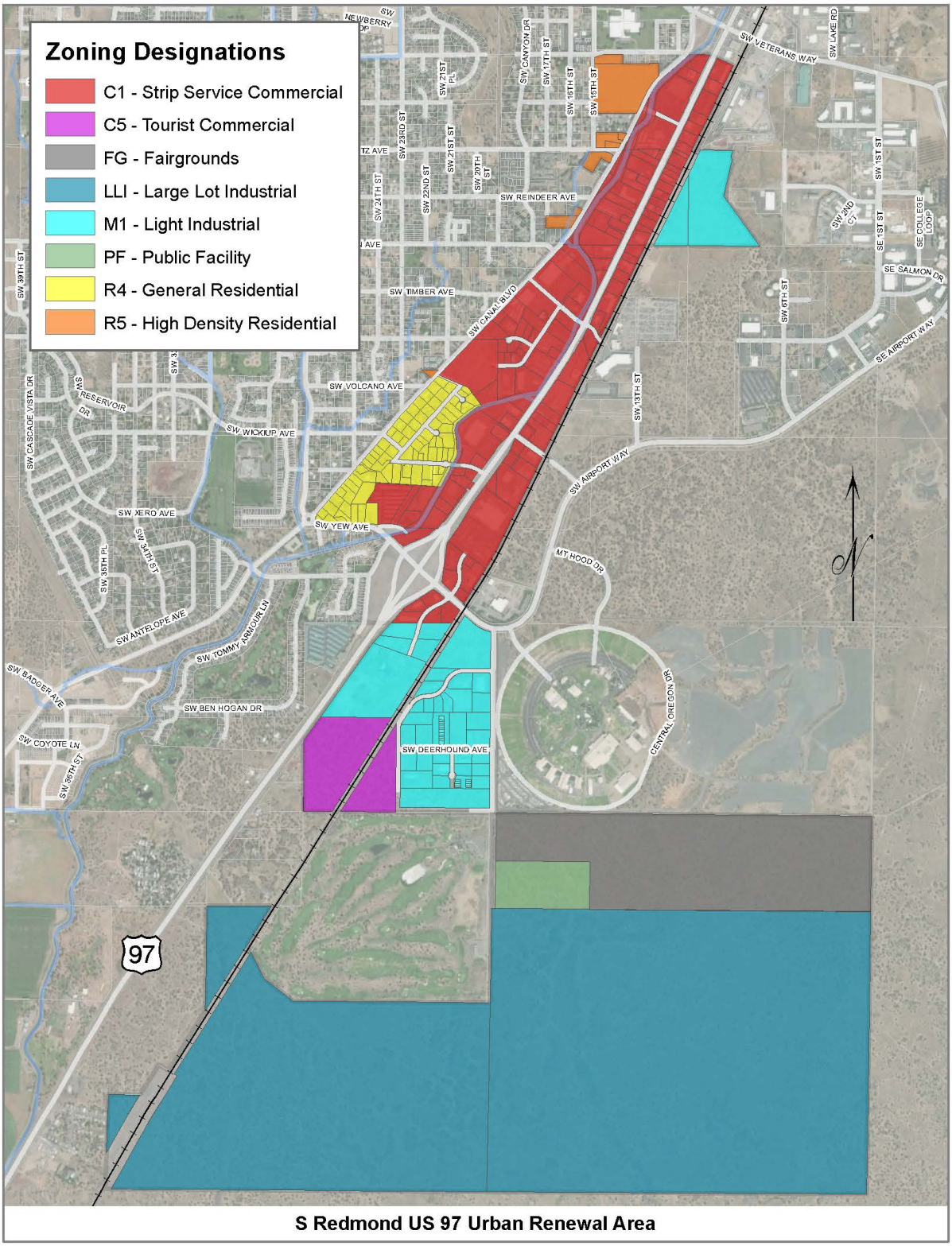
A. Land Use Plan

The map on the following page, the "Land Use Map" (figure 3) describes the locations of the principal land use classifications which apply to the Urban Renewal Area. This includes the type, location, and density of land development and redevelopment permitted in the future. The Comprehensive Plan Map is the same as the Zoning Map. The land use plan for the Urban Renewal Area is consistent with the Redmond Comprehensive Plan. The land use classifications are described below.

The Land Use Plan consists of the Comprehensive Plan and Zoning Map, the descriptive material and regulatory provisions contained in this Section (both directly stated and included by reference). This Plan shall be in accordance with the Redmond Comprehensive Plan and the Redmond Development Code, and with their implementing ordinances and policies. The zoning and development code serve as the major implementation mechanism of the Comprehensive Plan. Ordinances controlling the use and construction on the land, such as building codes, sign ordinances, subdivision and zoning ordinances, shall be adopted to carry out the Plan.

The use and development of land in the Urban Renewal Area shall be in accordance with the regulations prescribed in the Redmond Comprehensive Plan, the Redmond Development Code, Zoning Provisions, Subdivision Ordinance, City Charter, or any other applicable local, county, state or federal laws regulating the use of property in the Urban Renewal Area.

Figure 3. Land Use Map



Source: City of Redmond

C1 – Strip Service Commercial. To create and preserve areas suitable for commercial uses and services primarily oriented to automobile traffic, requiring extensive outdoor display and storage, and support of the central business district or principal downtown shopping area. In general, this zone shall be applied to those areas already existing and desirable to retain and for those areas that, because of new and/or changing traffic patterns, should be developed for such purpose. In addition, this zone allows for high-density residential development in these areas where such development will not adversely affect commercial development in the zone as a whole.

C5 –Tourist Commercial. To provide for commercial uses primarily oriented to travelers and tourists in locations complementary to existing facilities and future major transportation facilities and to provide incentives for public and private investments in traveler and tourist-related complexes.

R4 – General Residential. To provide high-density residential neighborhoods with a mix of single-family residences, duplexes, and some conditionally permitted multi-family residential development. Limited commercial uses such as offices are also conditionally permitted where compatible with surrounding development.

R5 – High-Density Residential. To provide high-density residential neighborhoods with an emphasis on multi-family development and smaller lot single-family and duplex developments. Limited commercial uses such as offices are also conditionally permitted where compatible with surrounding development.

M1 – Light Industrial. To provide for light industrial uses such as light manufacturing, research, transportation facilities, and similar uses which have a limited impact on surrounding properties and are compatible with clean non-polluting industries along with limited office and commercial activities which support these light industrial uses.

Large Lot Industrial. The South Redmond Tract, Large Lot Industrial (LLI) site, located directly south of the Deschutes County Fair & Expo Center, is designated as the only Large Lot Industrial site to be considered for light industrial development over 200 acres. The South Redmond Tract was selected to be the singular 200-plus acre site permitted by the State LLI Program. Following the purchase of the initial 200-plus acre industrial property, the remainder of the South Redmond Tract will be eligible for 50 to 200 acre light industrial sites. Staffing for these industries could be anywhere from two to 10 employees per acre. It is intended to appeal to technology and other light industrial, low impact uses that require large parcels of land. The land also abuts the airport and the highway, providing excellent transportation access.

The recent annexation of the land follows years of discussions and analysis at the local, regional, and state level. The 2012 Regional Economic Opportunity Analysis served as the basis for the Large Lot Annexation project and is supported by both the Regional Large Lot Industrial Program and the Central Oregon Large Lot Industrial Land Needs Analysis. It should be noted that the Deschutes County Fairgrounds expansion area (140 acres) and the Oregon Military Department Readiness Center area (20 acres), while included in the Urban Renewal Area, have a different zoning designation than the Large Lot Industrial lands, as indicated in Figure 3, above.

B. Plan and Design Review

The Urban Renewal Agency shall be notified of any Comprehensive Plan/Zoning amendment application, building permit, conditional use, or other development permits requested within the Area. Redevelopers, as defined in this Plan, shall comply with the Redeveloper's Obligations, Section 800 of this Plan.

C. Development Standards

Standards for future street and utility improvements are summarized below.

Streets

The 2010 Standards Specification Design Standards provide the Minimum Street design standards for the City of Redmond. Street standards are generally in conformance with the American Association of State Highway and Transportation Officials (AASHTO) Geometric Design of Highways and Streets, 2004 edition. General street right of way, roadway design, and cross-section standards are provided in Section II.A.1. Table 1, and City of Redmond Standard Drawing 2-1. Roadway functional class is determined by using the City's most current Transportation System Plan (TSP). Local transportation projects within the US97 South Redmond Corridor project include local roads, major collector roads, and commercial alley improvements. The South Redmond Tract large lot industrial parcels require streets designed to the City's industrial roadway standard.

Utilities

The 2010 Standards Specification Design Standards provide the minimum utility design standards for the City of Redmond. Stormwater systems are designed in accordance with the latest version of the Central Oregon Stormwater Manual (COSM). The City includes special provisions to the COSM in section II.B.2 of the 2010 Standard Specifications Design Standards. Underground Injection Control (UIC) systems such as dry wells are generally used throughout the City to provide quality and control for stormwater flows. Water and Sewer facilities are designed per the Oregon State Health Department, Oregon Department of Environmental Quality (DEQ), and the American Public Works Association (APWA) standards. Ductile iron pipe is currently the only approved material for water lines. Utility trenches and conduit must comply with Section E of the Design Standards and sections 101 and 212 of the City's Standards and Specifications.

600. OUTLINE OF DEVELOPMENT

The Urban Renewal Plan consists of activities and actions which treat the causes of blight and deterioration in the South 97 Urban Renewal Area. Large vacant sites and low utilization ratios of properties, deteriorated and substandard buildings/improvements, significant building vacancies, inadequate and incomplete street and sidewalk systems, and inefficient and unsafe traffic conditions have been identified as issues contributing to depressed conditions and values in the Area. The conditions also pose a constraint that will encumber successful future development envisioned and identified in the Comprehensive Plan.

Project activities to treat these conditions include:

a. Transportation projects, including:
    - US97 improvements, including new medians, signals, and beautification of US97.
    - New local streets to improve access, increase east-west connections, and provide a safer, more attractive multimodal environment.
    - Construction of sidewalks, landscaping, signage, and other streetscape improvements.
b. Street and sidewalk improvements to improve multimodal safety and circulation.
c. Acquisition and disposition of land for public improvements, rights-of-way, and utility improvements.
d. Infrastructure projects, including:
    - Public utilities, including water, sewer, and stormwater infrastructure.
    - Power and gas infrastructure.

- Communications infrastructure.

e. Funding and incentive programs to support economic development objectives, business expansion, employment growth, and other desired Plan outcomes.
f. Administration and coordination of development in the Urban Renewal Area.

Section 700, below, provides further descriptions of each urban renewal project to be undertaken within the Urban Renewal Area.

700. DESCRIPTION OF PROJECTS TO BE UNDERTAKEN

Several studies, reports, and plans that preceded the Plan development clearly articulate the need for these projects and justify the recommended project budgets in the Plan. These include the Transportation System Plan, Water System Plan, and the Corridor Plan.

Urban renewal projects authorized by the Plan are described below.[2]

Table 1. Urban Renewal Projects and Approximate Implementation

Project and Program Description	Dates
US Highway 97 Projects	2024-2032
Local Transportation Projects	2025-2040
Public Utilities	2022-2041
Fire Station	2030-2035
Industrial Opportunity Fund	2023-2042
Small Loan Program	2022-2042
Incentive Funding	2023-2042
Natural Gas/Power Improvements	2022-2041
Communications Improvements	2022-2041
Canal Improvement Contribution	2026-2032
Finance Fees and Program Administration	2022-2045

Source: LCG and GEL Oregon

A. US Highway 97 Projects

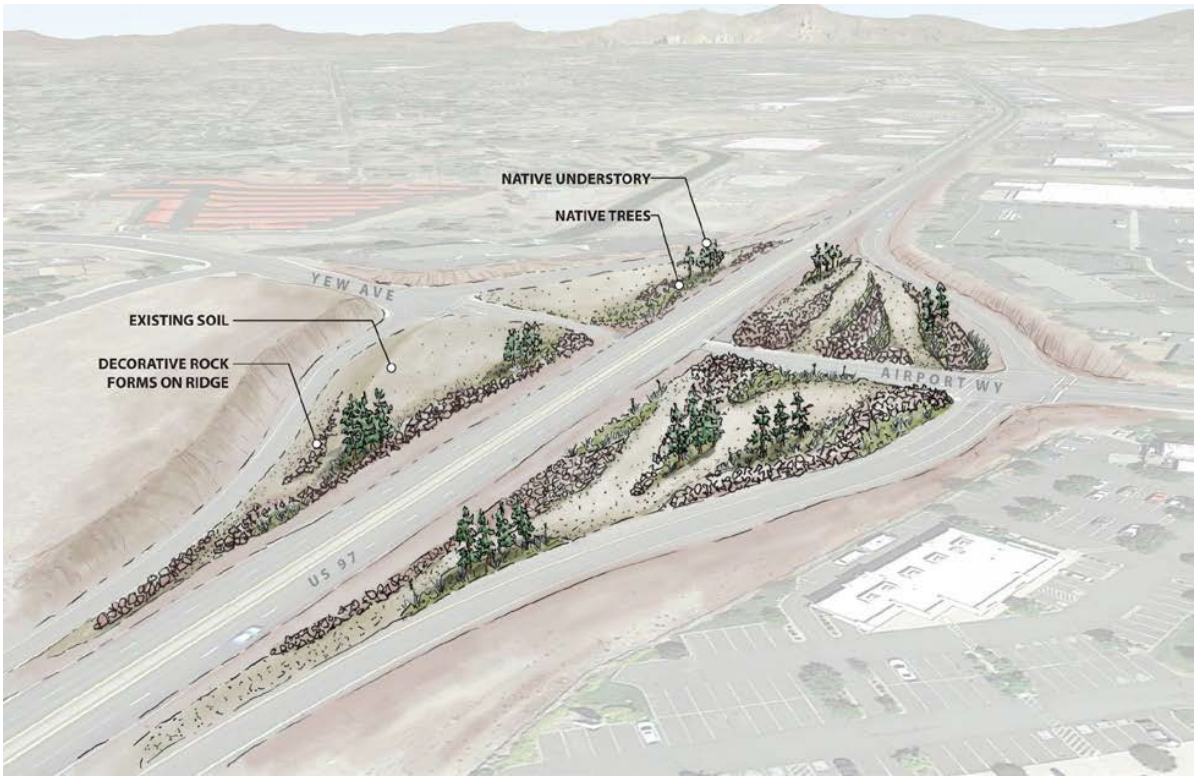
The City's Corridor Plan, in partnership with ODOT, included several recommended improvements, including:

- **US97 road construction**. Repair and replace existing pavement conditions along US97, acquire additional right-of-way as necessary.
- **Raised medians.** Traffic separators between the northbound and southbound lanes on US97 allowing protected left-hand turning movements and U-turns at signalized intersections, as well as providing areas for safe pedestrian refuge halfway across US97 to enhance pedestrian crossings (figure 5)
- **Pedestrian and bicyclist facilities.** New sidewalks and cycle track treatments throughout the length of the corridor to provide a more well-connected active transportation network.
- **Traffic signal systems.** Three new signalized intersections along US97 that allow protected U-turns.

[2] ORS 457.085 (2)(a) requires a description of each project. ORS 457.085 (3)(d) requires the cost of each project and source of funds. ORS 457.085 (3)(e) requires anticipated completion dates. See Report for details about cost and schedule.

- **Gateway Treatment.** A signature gateway design (figure 4) at the south end of the US97 Corridor will enhance the corridor as a regional destination and to improve the corridor as a welcoming route and entryway to downtown Redmond, local neighborhoods, the airport, and the fairgrounds.

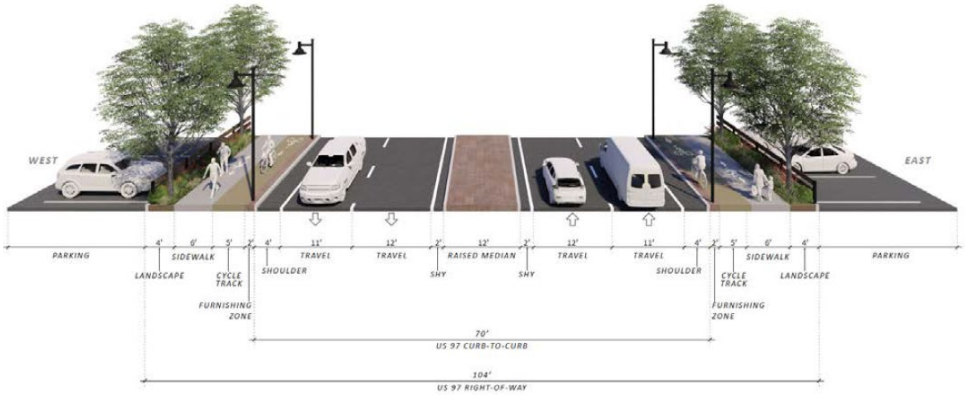
Figure 4. Concept illustration of the South Gateway



Source: SERA

These improvements aim to realize the following vision for the future of the South Redmond US97 Corridor:

*"The South US97 Corridor is a vibrant business district that is safe and accessible to shoppers traveling by car, bus, bike, or on foot. The corridor is aesthetically pleasing and provides opportunities for business and community interaction. Traffic moves efficiently and at a reasonable speed in both the north-south and east-west directions."*Figure 5. Proposed US97 Cross Section



Source: SERA

Initial ODOT funding will be used to help develop phasing and begin some of the advanced development work. Most of the remaining construction is intended to begin between 2024 to 2027. While there is currently no agreement in place between the City of Redmond and ODOT stipulating responsibilities, it is assumed that the City will be required to provide funding to complete the project in its entirety to match the Corridor Plan. As such, funds available through the Urban Renewal Area are critical to transforming the US97 Corridor to the Redmond community's vision.

B. Local Transportation Projects

Local transportation projects include collectors and distributors, and local streets (figure 6). These projects are informed by the Corridor Plan, the City's TSP, and other information provided by City staff.

Funds available through urban renewal are expected to fund a variety of projects, including:

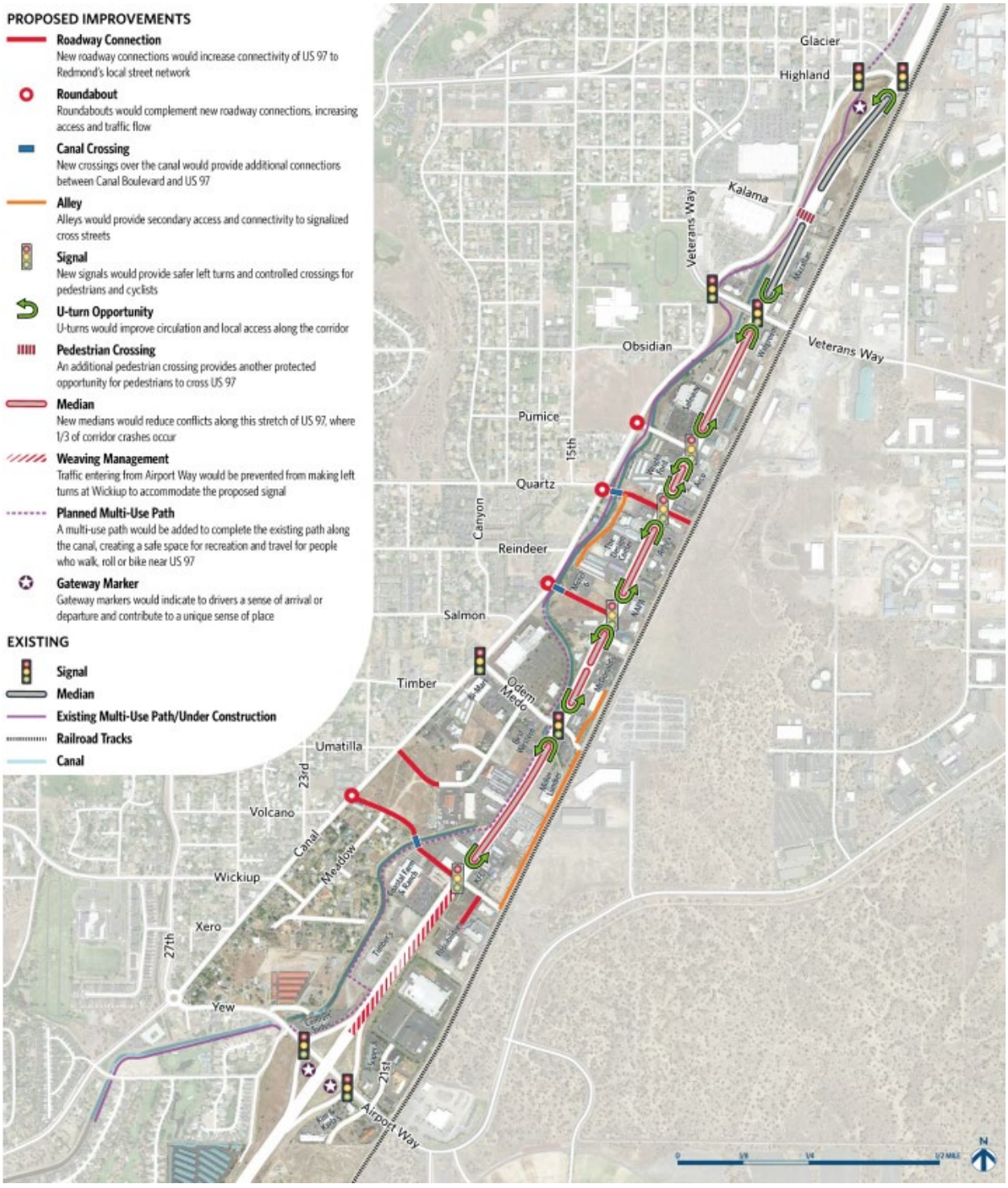
- **Connection road construction.** Three new road connections that cross the canal and connect US97 to Redmond neighborhoods on the west side of US97.
- **Connections to the new shared-use path** along Canal Boulevard and the canal itself.
- **A limited number of new access roads or alleyways** to provide alternative access where new connections provide safe ingress and egress nearby.
- **Pedestrian and bicyclist facilities.** New sidewalks and cycle track treatments along east/west connecting roads to provide a more well-connected active transportation network.
- **New streets.** Improve connectivity, circulation, and access throughout the Area with new or extended local streets. These streets include those not yet defined, such as the 19th Street extension into the South Redmond Tract.

These transportation projects are intended to provide a transportation network in the Area that supports the efficient movement of traffic, and a vibrant business district that is safe and accessible to customers traveling by car, bus, bike or on foot, with comfortable, interesting, and attractive streetscapes, especially along designated pedestrian streets.

The City is expected to include many of these projects in the Transportation System Plan (TSP) and fund them through system development charges (SDCs) and other sources. However, at present, just one new street connection at Quartz is currently planned and budgeted for in the City's TSP. Urban renewal is not expected to fund the entire cost of each project.

Urban Renewal funds are critical to accelerating the timing of these projects for economic development purposes and realizing currently untapped development and employment potential.

Figure 6. Recommended Corridor Plan Concept



Source: HDR (From Corridor Plan)

C. Public Utilities (Water, Stormwater, and Sewer Improvements)

The public utility projects are intended to address infrastructure deficiencies in the Area. This list includes the development of sewer, stormwater, and water infrastructure to support the development and expansion of

businesses in the Area. It also includes the construction of new stormwater facilities, repair of existing sewer lines, and extension or enlargement of existing water and sewer lines as needed to support desired development.

These projects will be largely funded and implemented by the City using non-TIF sources. However, including these projects in the Plan allows the City to provide gap funding assistance to developer-initiated projects and accelerate implementation as required to serve new development in the Area. As such, additional money, funded through tax increment financing, is available through the programmatic elements of the project list as needed for public utility improvements.

D. Fire Station

In order to better serve the community South Redmond and the adjacent unincorporated County area (served by Redmond Fire and Rescue), a new fire station will be constructed to reduce response times and serve new and existing commercial and residential users. As development potential is realized in the Area, lower response times are necessary, especially for users with a higher risk of fire and other hazards.

While neither the specific location nor the cost is currently known and could ultimately be outside of the proposed boundaries, the Plan includes the possibility of a partnership for the development of a new fire station..[3]

E. Industrial Development Opportunity Fund

This project activity includes a fund for public investments to support industrial development in the Area. Industrial development is a key component of realizing the City's employment growth opportunities, particularly in the South Redmond Tract. However, major new development is challenging in many places, primarily due to the lack of infrastructure in large vacant tracts of land.

While there is currently an agreement in place for the payment and construction of basic infrastructure on the lands that were recently annexed into the City, additional infrastructure investments and improvements are necessary for the area to better prepare for and attract new industrial development. To support and enhance this development, the Industrial Development Opportunity Fund is a flexible fund to help pay for the cost of public infrastructure required to support new development and business activity.

The Opportunity Fund reduces the financial burden of new development by providing gap financing to help prepare shovel-ready sites, thereby accelerating the timing of desired new employment-focused industrial development in the Area.

The Opportunity Fund will include eligibility and other important funding criteria, to be developed upon the adoption of this Plan. Assistance could take the form of gap financing (low or no interest loans), infrastructure (roads, sidewalks, utilities), and other tools.

[3] ORS 457.085 (2)(j) describes additional requirements for public buildings. HB 2174 narrowly defined public buildings as fire station, police station, public library, hospital, capitol building, school, college, university, city hall, etc.

F. Small Loan Program

The Small Loan Program provides direct low-interest and/or interest-free and/or forgivable loans as part of the City's effort to assist local businesses within the Urban Renewal Area. This program fills a niche not provided through traditional lending markets, and will include eligibility and other important funding criteria to be developed following the adoption of this Plan.

The Small Loan Program is anticipated to help retain economic vitality and increase property values within the Urban Renewal Area and Redmond through the restoration, rehabilitation, or expansion of existing properties and businesses.

G. Incentive Funding

As part of the City of Redmond's effort to enhance business vitality and support desired development within the South 97 Urban Renewal Area, Incentive Funding allows the Urban Renewal Agency to partner with property owners and developers to rehabilitate or redevelop property that will better serve the Area and the greater Redmond community. Assistance could take the form of direct developer assistance, grants, reimbursements, and or system development charge (SDC) credits for contributions to the transportation and utility system.

The Incentive Funding program is anticipated to help ensure economic growth, vitality, and property value increases within the Urban Renewal Area and citywide. The program will include eligibility and other important funding criteria, to be developed upon the adoption of this Plan.

H. Natural Gas/Power Improvements

The City may provide funding to accelerate the timing or upgrade the capacity of natural gas or power infrastructure. Investments in both gas and electricity are critical to accommodate a range of uses, including but not limited to industrial manufacturers and other significant employment-generating users.

While the construction of gas and power infrastructure is user-driven and paid for and constructed by Cascade Natural Gas and Pacific Power, respectively, to respond to user demands, this project activity allows the City to incentivize system upgrades that would not otherwise occur. As such, additional resources, funded through tax increment financing, are available through the programmatic elements of the project list as needed for gas and power improvements.

I. Communications Improvements

Communications Improvements include telephone and high-speed internet infrastructure. Broadband and other communications improvements are important for economic growth and business vitality. Broadband is the underpinning for some of today's most important transformations in business activity and government services.

While the City is not responsible for the cost of communications upgrades and improvements, this project activity provides seed funding to accelerate the timing of specific improvements to attract desired development projects. As such, additional money, funded through tax increment financing, is available through the programmatic elements of the project list as needed for communications improvements.

J. Canal Improvement Contribution

The Central Oregon Irrigation District (COID) plans to pipe 8.1 miles of the Pilot Butte Canal between Smith Rock and Bend, approximately one-quarter of which is located within the Urban Renewal Area. This project activity includes funding to help pipe at least 1.0 mile of the Canal to accommodate new roads and a multi-use path (figure 7). Once the piping is complete, the land will support road construction without additional structural reinforcements, significantly reducing the construction costs.

As the new east-west transportation connections identified in Section 700(B) do not include funding for bridge structures, the new streets in this section are directly tied to the piping of the canal. Connections to the new shared-use path along the canal are also directly tied to the piping project.

COID has yet to secure funding for piping the canal in the Area and may not do so for several years. Urban Renewal funding is therefore critical to providing gap financing to accelerate the timing of the piping project and other related transportation projects.

Figure 7. Multi-use Path Concept Illustration*

Source: 2012 Corridor Plan
** Due to new plans for the area since the development of the 2012 Corridor Plan, including the canal piping project, the illustration depicts an open canal, however the canal will eventually be rerouted via underground pipes.*

K. Finance Fees and Program Administration

The Plan provides for effective administration to complete the various activities contained within.

Project funds may be utilized to pay indebtedness associated with the preparation of the Plan, to carry out design plans, miscellaneous land use and public facility studies, engineering, market, and other technical studies as may be needed during the duration of the Plan.

This category allows for repayment of costs associated with the implementation of the Plan, including but not limited to ongoing administration and financing costs associated with issuing long and short-term debt, relocation costs, and other administrative costs.

Project funds also may be used to pay for personnel and other administrative costs incurred in the management of the Plan, such as the preparation of annual reports (ORS 457.060, HB 2174).

750. PROPERTY ACQUISITION AND DISPOSITION

The Plan authorizes the acquisition and disposition of property as described in this section. Property includes any and all interests in property, including fee simple ownership, lease, easements, licenses, or other rights to use. If a property is acquired it will be identified in the Plan through a Minor Amendment, as described in Section 1000. Identification of property to be acquired and its anticipated disposition is required by ORS 457.085(g).

A. Property Acquisition for Public Improvements

It is anticipated that the acquisition of real property will be necessary to carry out public use objectives of the Plan. These objectives include right-of-way acquisition for streets, roads, alleys, bicyclist and pedestrian ways, utility rights-of-way, and other public improvements, uses, and facilities described in Section 700 of this Plan. Before the acquisition, this Plan shall be amended to identify the specific property or interest to be acquired.

The Agency may acquire any property within the Area for the public improvement projects undertaken pursuant to the Plan by all legal means, including the use of eminent domain, as described in ORS 456.145[4]. Good faith negotiations for such acquisitions must occur before the institution of eminent domain procedures.

B. Property Disposition

The Agency will dispose of property acquired for a public improvement project by conveyance to the appropriate public agency responsible for the construction and/or maintenance of the public improvement. The Agency may retain such property during the construction of the public improvement.

The Agency may dispose of property by conveying any interest in property acquired. Property shall be conveyed at its fair reuse value. Fair reuse value is the value, whether expressed in terms of rental or capital price, at which the Agency, in its discretion, determines such property should be made available so that it may be developed, redeveloped, cleared, conserved, or rehabilitated for the purposes specified in the Plan. Because fair reuse value reflects limitations on the use of the property to those purposes specified in the Plan, the value may be lower than the property's fair market value.

Where property is sold or leased, the purchaser or lessee must agree to use the property for the purposes designated in the Plan, and to complete the building of its improvements within a period of time that the Agency determines is reasonable.

800. REDEVELOPER'S OBLIGATIONS

Redevelopers within the Urban Renewal Area will be subject to controls and obligations imposed by the provisions of this Plan. Redevelopers also will be obligated to the following requirements:

1. The Redeveloper shall develop or redevelop the property per the land use provisions and other requirements specified in this Plan.

[4] ORS 456.145 refers to the appropriate use of eminent domain in the State of Oregon

2. The Urban Renewal Agency may require the redeveloper to execute a development agreement acceptable to the Urban Renewal Agency as a condition of any form of Agency assistance. The Redeveloper shall accept all conditions and agreements as may be required by the Urban Renewal Agency.

3. The Redeveloper shall submit all plans and specifications for the construction of improvements on the land to the Urban Renewal Agency or its designated agent, for review and approval before distribution to reviewing bodies as required by the City.

4. The Redeveloper shall commence and complete the development of such property for the use provided in this Plan within a reasonable period of time as determined by the Agency.

5. The Redeveloper shall not affect any instrument whereby the sale, lease, or occupancy of the real property, or any part thereof, is restricted on the basis of age, race, color, religion, sex, marital status, or national origin.

900. RELOCATION

The Agency will provide required relocation assistance to all persons or businesses displaced by project activities. All persons or businesses which may be displaced will be contacted to determine such relocation needs. Available space information and financial assistance available will be provided based on relocation needs. Those persons or businesses displaced will be given financial assistance in finding replacement facilities and moving assistance. All persons or businesses displaced will be contacted to determine such relocation needs. They will be provided information on available space and will be assisted in moving. All relocation activities will be undertaken and payments made per the requirements of ORS 35.500 to 35.530 and any other applicable laws or regulations.

Relocation payments will be made as provided in ORS 35.510.

Payments made to persons displaced from dwellings will assure that they will have available to them decent, safe, and sanitary dwellings at costs or rents within their financial capability. Payment for moving expenses will be made to residences and businesses displaced. The Redmond Urban Renewal Agency may contract with the Oregon Department of Transportation (ODOT), or other appropriate agencies or parties for assistance in administering its relocation program.

1000. FUTURE AMENDMENTS

It is anticipated the Plan will be reviewed periodically during the execution of the Project. The Plan may be changed, modified, or amended as future conditions warrant. All amendments shall be governed by state and local laws and ordinances.

A. Minor Amendments

Minor changes to the Plan shall be made by a duly approved resolution of the Agency which describes the details of the minor change. Minor changes shall include:

1. Identification of property to be acquired or any purpose outlined in Section 750 of this Plan.

2. Changes to the Plan which are not specifically identified as requiring a Substantial Amendment or a Minor Amendment requiring Council Approval.

B. Minor Amendments Requiring Council Approval

Council-approved amendments to the Plan shall require only approval by the Agency by Resolution and approval by the City Council by Non-Emergency Ordinance. Council-approved amendments are:

1. Addition of a project, activity, or program that differs substantially from a project, program, or activity in the Plan, and is estimated to cost in excess of the equivalent of $500,000 in 2020 dollars throughout the Plan. The $500,000 threshold shall be adjusted annually at a rate equal to the Construction Cost Index (CCI), also referred to as the ENR Index for Construction published quarterly by the Engineering News Record.

2. Identification of land for acquisition which requires Council approval per Section 750 of this Plan.

3. Changes or modifications to the goals and objectives of this Plan, which in the Agency's discretion, warrant Council Approval.

C. Substantial Amendments

Substantial Amendments shall require the notice, hearing, and approval procedures required by statute. Substantial amendments consist of:

1. Adding land to the Urban Renewal Area, except for an addition of land that totals not more than one percent (1%) of the existing area of the Plan.

2. Increasing the maximum amount of indebtedness (excluding bonded indebtedness issued to refinance or fund existing bonded indebtedness) to be issued under the Plan.

3. Adding a public building(s) not identified in the Plan.

4. Any amendment defined by statute to be a substantial amendment.

1100. LATEST DATE FOR ISSUE OF BONDED INDEBTEDNESS

This Plan calls for a division of ad valorem taxes under ORS 457.440. No bonded indebtedness shall be issued with respect to the Plan, or any project undertaken with respect to the Plan later than June 30, 2042.

1200. FINANCING METHODS

A. General

The Plan will be financed using a combination of revenue sources. These include:

- Tax increment revenues;
- Advances, loans, grants, and any other form of financial assistance from federal, state, or local governments, or other public bodies;

- Loans, grants, dedications, or other contributions from private developers and property owners, including, but not limited to, assessment districts; and
- Any other public or private source.

Revenues obtained by the Urban Renewal Agency will be used to pay or repay the costs, expenses, advancements, and indebtedness incurred in (1) planning or undertaking project activities, or (2) otherwise exercising any of the powers granted by ORS Chapter 457 in connection with the implementation of this Plan.

The Urban Renewal Agency may borrow money and accept advances, loans, grants, and other forms of financial assistance from the federal government, the state, city, county or other public body, or from any sources, public or private for the purposes of undertaking and carrying out this Plan. In addition, the Agency may borrow money from, or lend money to a public agency in conjunction with a joint undertaking of a project authorized by this Plan. If such funds are loaned, the Agency may promulgate rules and procedures for the methods and conditions of payment of such loans.

The funds obtained by the Agency shall be used to pay or repay any costs, expenses, advances, and indebtedness incurred in planning or undertaking project activities or in otherwise exercising any of the powers granted by ORS Chapter 457.

B. Tax Increment Financing

It is contemplated that the Plan will be financed in whole or in part by tax increment financing, as authorized in ORS 457.420 through ORS 457.450.

The Plan may be financed, in whole or in part, by tax increment revenues allocated to the Agency, as provided in ORS Chapter 457. The ad valorem taxes, if any, levied by a taxing district in which all or a portion of the Area is located, shall be divided as provided in Section 1c, Article IX of the Oregon Constitution, and ORS 457.440. Amounts collected according to ORS 457.440 shall be deposited into the unsegregated tax collections account and distributed to the Agency based upon the distribution schedule established under ORS 311.390.

C. Prior Indebtedness

Any indebtedness permitted by law and incurred by the Urban Renewal Agency or the City in connection with preplanning for this Plan may be repaid from tax increment proceeds generated pursuant to this section.

D. Establishment of Maximum Debt

The maximum amount of indebtedness that may be issued or incurred under the Plan, based upon good faith estimates of the scope and costs of projects in the Plan and the schedule for their completion is $85,458,900. This amount is the principal of such indebtedness and does not include interest or indebtedness incurred to refund or refinance existing indebtedness or interest earned on bond proceeds. It does include initial bond financing fees and interest earned on tax increment proceeds, separate from interest on bond proceeds.

1300. CITIZEN PARTICIPATION

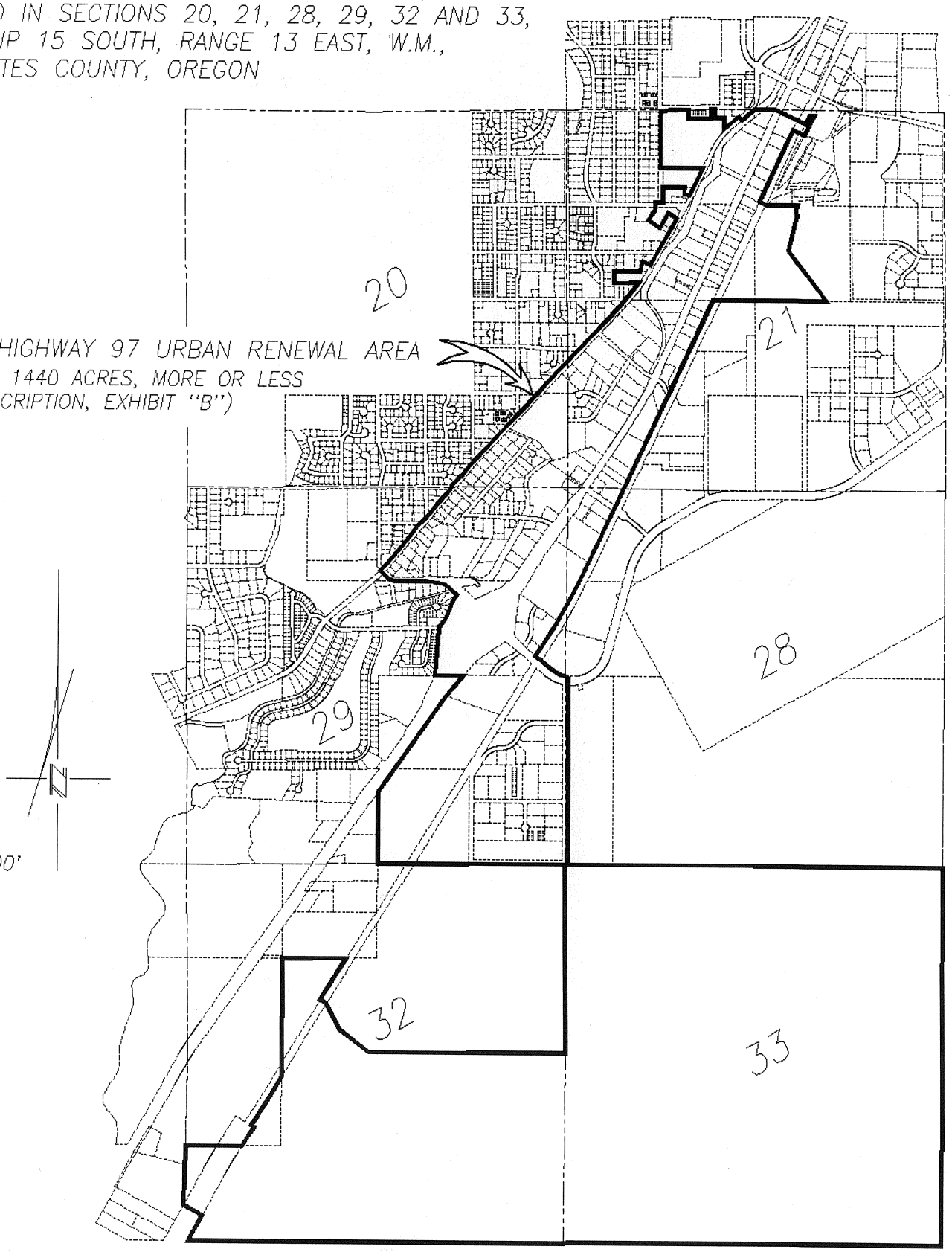
This Plan was developed under the guidance of the Redmond Urban Renewal Agency. In the course of formulating the Plan, the Agency conducted meetings on June 9, August 25, and October 6, 2020. All meetings of the Agency were open to the public for discussion and comment.

The Redmond Planning Commission met to review the Plan on July 20, 2020. The Redmond City Council held a public hearing on the adoption of this Plan on December 1, 2020. Additional notice on City Council adoption of the Plan was provided, as required by ORS 457.120.

ATTACHMENT A: LEGAL DESCRIPTION OF URBAN RENEWAL BOUNDARY

EXHIBIT "A"

SOUTH HIGHWAY 97 URBAN RENEWAL AREA,
LOCATED IN SECTIONS 20, 21, 28, 29, 32 AND 33,
TOWNSHIP 15 SOUTH, RANGE 13 EAST, W.M.,
DESCHUTES COUNTY, OREGON



SOUTH HIGHWAY 97 URBAN RENEWAL AREA
CONTAINS 1440 ACRES, MORE OR LESS
(SEE DESCRIPTION, EXHIBIT "B")

SCALE:
1" = 2000'

PREPARED JULY 3, 2020

POVEY AND ASSOC. LAND SURVEYORS
P.O. BOX 131, REDMOND, OR 97756
(541) 548-6778 20-078D.DWG

EXHIBIT "B"

DESCRIPTION –
SOUTH HIGHWAY 97 URBAN RENEWAL AREA,
LOCATED IN SECTIONS 20, 21, 28, 29, 32 AND 33,
TOWNSHIP 15 SOUTH, RANGE 13 EAST, W.M.,
DESCHUTES COUNTY, OREGON

DESCRIPTION OF A TRACT OF LAND LOCATED IN SECTIONS 20, 21, 28, 29, 32 AND 33, TOWNSHIP 15 SOUTH, RANGE 13 EAST, WILLAMETTE MERIDIAN, DESCHUTES COUNTY, OREGON, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEAST CORNER OF SAID SECTION 33; THENCE WEST ALONG THE SOUTH LINE OF SAID SECTION 33, 5296 FEET TO THE SOUTHWEST CORNER OF SAID SECTION 33; THENCE WEST ALONG THE SOUTH LINE OF SAID SECTION 32, 5232 FEET TO THE SOUTHEAST RIGHT–OF–WAY LINE OF THE BURLINGTON NORTHERN – SANTA FE (BNSF) RAILROAD, BEING 100 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N29°E ALONG SAID SOUTHEAST RIGHT–OF–WAY LINE, 406 FEET; THENCE N61°W, PERPENDICULAR TO SAID CENTERLINE, 300 FEET THE INTERSECTION OF THE NORTHWEST RIGHT–OF–WAY LINE OF SAID RAILWAY AND THE WEST LINE OF THE SW1/4 SW1/4 OF SAID SECTION 32, SAID INTERSECTION BEING 200 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N01°E ALONG SAID WEST LINE, 817 FEET TO THE NORTH LINE OF SAID SW1/4 SW1/4; THENCE EAST ALONG SAID NORTH LINE, 793 FEET TO SAID SOUTHEAST RIGHT–OF–WAY LINE, BEING 100 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N32°E ALONG SAID SOUTHEAST RIGHT–OF–WAY LINE, 310 FEET; THENCE N58°W ALONG SAID SOUTHEAST RIGHT–OF–WAY LINE, 50 FEET; THENCE N32°E ALONG SAID SOUTHEAST RIGHT–OF–WAY LINE, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY, 802 FEET TO THE WEST LINE OF THE NE1/4 SW1/4 OF SAID SECTION 32; THENCE N01°E ALONG SAID WEST LINE, 348 FEET; THENCE NORTH ALONG THE WEST LINE OF THE SE1/4 NW1/4 OF SAID SECTION 32, 1315 FEET TO THE NORTH LINE OF SAID SE1/4 NW1/4; THENCE EAST ALONG SAID NORTH LINE, 902 FEET TO SAID NORTHWEST RIGHT–OF–WAY LINE, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE S32°W ALONG SAID NORTHWEST RIGHT–OF–WAY LINE, 695 FEET; THENCE S58°E, PERPENDICULAR TO SAID CENTERLINE, 100 FEET TO THE INTERSECTION OF THE SOUTHEAST RIGHT–OF–WAY LINE OF SAID RAILWAY, AND THE NORTHEAST EASEMENT LINE OF BONNEVILLE POWER ADMINISTRATION'S REDMOND–BURNS NO. 1 TRANSMISSION LINE, SAID INTERSECTION BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY, AND BEING 50 FEET FROM THE CENTERLINE OF SAID POWER LINE; THENCE S27°E ALONG SAID NORTHEAST EASEMENT LINE, 417 FEET; THENCE S53°E ALONG SAID NORTHEAST EASEMENT LINE, 507 FEET TO THE SOUTH LINE OF SAID SE1/4 NW1/4; THENCE EAST ALONG SAID SOUTH LINE, AND ALONG THE SOUTH LINE OF THE NE1/4 OF SAID SECTION 32, 2750 FEET TO THE EAST LINE OF SAID NE1/4; THENCE NORTH ALONG SAID EAST LINE, 2649 FEET TO THE SOUTHEAST CORNER OF SAID SECTION 29; THENCE WEST ALONG THE SOUTH LINE OF THE SE1/4 OF SAID SECTION 29, 2634 FEET TO THE

WEST LINE OF THE SW1/4 OF SAID SE1/4; THENCE NORTH ALONG SAID WEST LINE, 992 FEET TO THE SOUTHEAST RIGHT-OF-WAY LINE OF U.S. HIGHWAY 97, BEING 90 FEET FROM THE CENTERLINE OF SAID HIGHWAY; THENCE N35°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 1659 FEET TO ENGINEER'S STATION 125+00, 90 FEET LEFT; THENCE N41°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 376 FEET TO THE NORTH LINE OF THE NW1/4 SE1/4 OF SAID SECTION 29; THENCE WEST ALONG SAID NORTH LINE, 401 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF SAID HIGHWAY (ALSO BEING THE NORTHWEST RIGHT-OF-WAY LINE OF SW 25TH PLACE), AS DESCRIBED IN VOLUME 234, PAGE 1995, DESCHUTES COUNTY DEED RECORDS; THENCE ALONG SAID NORTHWEST RIGHT-OF-WAY LINE AS FOLLOWS: N05°E, 670 FEET; THENCE N33°E, 175 FEET; THENCE N23°E, 255 FEET; THENCE N35°E, 91 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF SW YEW AVENUE, BEING A LINE OF VARIABLE WIDTH FROM THE CENTERLINE OF SAID ROADWAY; THENCE LEAVING SAID NORTHWEST RIGHT-OF-WAY LINE, AND 1190 FEET WESTERLY ALONG SAID SOUTH RIGHT-OF-WAY LINE, AND ALONG ITS NORTHWESTERLY PROLONGATION, TO A POINT WHICH BEARS N73°W, 1131 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING ON THE NORTHWEST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, AND BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE 5459 FEET NORTHEASTERLY ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, TO A POINT WHICH BEARS N42°E, 5449 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING 40 FEET FROM THE CENTERLINE OF SAID ROADWAY, AND BEING ON THE SOUTH BOUNDARY OF A TRACT OF LAND DESCRIBED IN DOCUMENT 2007-43829, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG SAID TRACT BOUNDARY AS FOLLOWS: WEST, 345 FEET; THENCE NORTH, 170 FEET; THENCE EAST, 367 FEET TO THE BOUNDARY OF PARCEL 2, AS DESCRIBED IN DOCUMENT NO. 2018-019368, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE LEAVING SAID TRACT BOUNDARY AND ALONG SAID PARCEL 2 BOUNDARY AS FOLLOWS: N13°E, 122 FEET; THENCE N37°E, 30 FEET; THENCE S61°E, 107 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE LEAVING SAID PARCEL 2 BOUNDARY, N30°E ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, 751 FEET TO THE BOUNDARY OF A TRACT OF LAND DESCRIBED IN DOCUMENT 2007-64854, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY OF SAID TRACT AS FOLLOWS: N59°W, 136 FEET; THENCE S31°W, 239 FEET; THENCE N56°W, 184 FEET; THENCE 214 FEET ALONG THE ARC OF A NON-TANGENT 658 FOOT RADIUS CURVE TO THE LEFT, THE CHORD OF WHICH BEARS N28°E, 213 FEET; THENCE LEAVING SAID TRACT BOUNDARY, NORTH, PERPENDICULAR TO THE NORTH LINE OF SAID TRACT, 60 FEET TO THE NORTH RIGHT-OF-WAY LINE OF SW QUARTZ AVENUE, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE EAST ALONG SAID NORTH RIGHT-OF-WAY LINE, 105 FEET TO THE BOUNDARY OF A TRACT OF LAND DESCRIBED IN DOCUMENT 2020-06416, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY OF SAID TRACT AS FOLLOWS: NORTH 214 FEET; THENCE S89°E, 304 FEET; THENCE S01°W, 96 FEET; THENCE S83°E, 74 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF

SW CANAL BOULEVARD, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE LEAVING SAID TRACT BOUNDARY, AND 422 FEET NORTHEASTERLY ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, TO A POINT WHICH BEARS N26°E, 422 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING AT THE SOUTHEAST CORNER OF TRACT 1, AS DESCRIBED IN DOCUMENT 2020-10963, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE WEST ALONG THE SOUTH LINE OF SAID TRACT 1, 591 FEET TO THE WEST LINE OF SAID TRACT 1; THENCE NORTH ALONG SAID WEST LINE, AND ALONG THE WEST LINE OF TRACT 2, AS DESCRIBED IN SAID DOCUMENT, 782 FEET TO THE NORTH LINE OF SAID TRACT 2; THENCE N74°E ALONG SAID NORTH LINE, 135 FEET; THENCE EAST ALONG SAID NORTH LINE, 265 FEET TO THE EAST LINE OF SAID TRACT 2; THENCE SOUTH ALONG SAID EAST LINE, 125 FEET TO THE NORTH LINE OF SAID TRACT 1; THENCE EAST ALONG SAID NORTH LINE, 312 FEET TO THE WEST RIGHT-OF-WAY LINE OF SW 13TH STREET, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE NORTH ALONG SAID WEST RIGHT-OF-WAY LINE, 125 FEET TO THE NORTH LINE OF THE NE1/4 NW1/4 OF SAID SECTION 21; THENCE EAST ALONG SAID NORTH LINE, 60 FEET TO THE EAST RIGHT-OF-WAY LINE OF SW 13TH STREET, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE SOUTH ALONG SAID EAST RIGHT-OF-WAY LINE, 120 FEET TO THE NORTH LINE OF SAID TRACT 1; THENCE EAST ALONG SAID NORTH LINE, 130 FEET TO THE EAST LINE OF SAID TRACT 1; THENCE SOUTH ALONG SAID EAST LINE, 159 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, BEING 40 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE N49°E ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, 280 FEET TO THE SOUTH LINE OF THE NORTH 96 FEET OF SAID NE1/4 NW1/4; THENCE S41°E, PERPENDICULAR TO SAID CENTERLINE, 70 FEET TO THE SOUTHEAST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE N49°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 228 FEET TO THE NORTH LINE OF THE NW1/4 NE1/4 OF SAID SECTION 21; THENCE EAST ALONG SAID NORTH LINE, 294 FEET TO THE PROLONGATION OF THE NORTHEAST LINE OF A TRACT OF LAND DESCRIBED IN VOLUME 279, PAGE 0839, DESCHUTES COUNTY DEED RECORDS; THENCE S65°E ALONG SAID PROLONGATION, AND ALONG SAID NORTHEAST LINE, 351 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE S65°E ALONG SAID PROLONGATION, 100 FEET TO THE SOUTHEAST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N26°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 126 FEET TO THE NORTH LINE OF THE FIRST EXCEPTION TO PARCEL 1, AS DESCRIBED IN DOCUMENT NO. 2018-005171, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE EAST ALONG SAID NORTH LINE, 67 FEET TO THE NORTHWEST LINE OF A TRACT OF LAND DESCRIBED IN DOCUMENT NO. 2009-52569, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE S26°W ALONG SAID NORTHWEST LINE, 306 FEET TO THE SOUTHEAST LINE OF SAID TRACT; THENCE N64°W, PERPENDICULAR TO SAID RAILWAY CENTERLINE, 160 FEET TO SAID NORTHWEST RIGHT-OF-WAY LINE; THENCE S26°W ALONG SAID

SOUTH HIGHWAY 97 URBAN RENEWAL AREA,
CONTINUED:

NORTHWEST RIGHT-OF-WAY LINE, 1110 FEET; THENCE S64°E, PERPENDICULAR TO SAID CENTERLINE, 100 FEET TO THE NORTHWEST CORNER OF PARCEL 4, AS DESCRIBED IN DOCUMENT NO. 2014-042282, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY OF SAID PARCEL 4 AS FOLLOWS: EAST, 449 FEET; THENCE S14°W, 73 FEET; THENCE S04°E, 82 FEET; THENCE S13°W, 501 FEET; THENCE S36°E, 859 FEET; THENCE WEST, 996 FEET TO THE CENTER 1/4 CORNER OF SAID SECTION 21; THENCE LEAVING SAID TRACT BOUNDARY, WEST ALONG THE SOUTH LINE OF THE SE1/4 NW1/4 OF SAID SECTION 21, 588 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE 5602 FEET SOUTHWESTERLY ALONG SAID NORTHWEST RIGHT-OF-WAY LINE TO A POINT WHICH BEARS S27°W, 5599 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING ON THE NORTHEAST RIGHT-OF-WAY LINE OF SW AIRPORT WAY, AND BEING 55 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE S52°E, 101 FEET TO THE INTERSECTION OF THE SOUTHEAST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD AND THE NORTHEAST RIGHT-OF-WAY LINE OF SW AIRPORT WAY, SAID INTERSECTION BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY, AND BEING 60 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE 444 FEET SOUTHEASTERLY ALONG SAID NORTHEAST RIGHT-OF-WAY LINE TO A POINT WHICH BEARS S60°E, 434 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING ON THE EAST LINE OF THE WEST 40 FEET OF THE SW1/4 OF SAID SECTION 28; THENCE SOUTH ALONG SAID EAST LINE (ALSO BEING THE EAST RIGHT-OF-WAY LINE OF SW 19TH STREET), 2624 FEET TO THE NORTH LINE OF SAID SECTION 33; THENCE EAST ALONG SAID NORTH LINE, 5246 FEET TO THE NORTHEAST CORNER OF SAID SECTION 33; THENCE SOUTH ALONG THE EAST LINE OF SAID SECTION 33, 5268 FEET TO THE SOUTHEAST CORNER OF SAID SECTION 33, AND TO THE POINT OF BEGINNING.

THE SAME CONTAINING 1440 ACRES, MORE OR LESS.

A SKETCH OF THE URBAN RENEWAL AREA DESCRIBED ABOVE IS SHOWN ON THE ATTACHED EXHIBIT "A", WHICH IS HEREBY INCORPORATED BY REFERENCE.

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JULY 15, 1983
WILLIAM G. BAHRKE
2039

Renewal Date: 12/31/21

PREPARED JULY 3, 2020

POVEY AND ASSOC. LAND SURVEYORS
P.O. BOX 131, REDMOND, OR 97756
(541) 548-6778 20-078D.DWG

December 2020

Report on the Urban Renewal Plan

South 97 Urban Renewal Area

Prepared for:

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INTRODUCTION

The following Report on the South 97 Urban Renewal Plan (the "Report") provides supporting information to the South 97 Urban Renewal Plan (the "Plan") according to the requirements of ORS 457.087. Gathered from a variety of resources, the Report contains background information on the South 97 Urban Renewal Area ("Area"), a blight analysis for the District, details for the projects added by the Plan, and financial feasibility analysis for the Plan. The Report accompanies the Plan to describe existing conditions in the Area, identify the estimated costs of projects and sources of funding, and perform the financial feasibility analysis. It is intended to provide public information and a basis for the findings made by the City Council as part of its approval of the Plan.

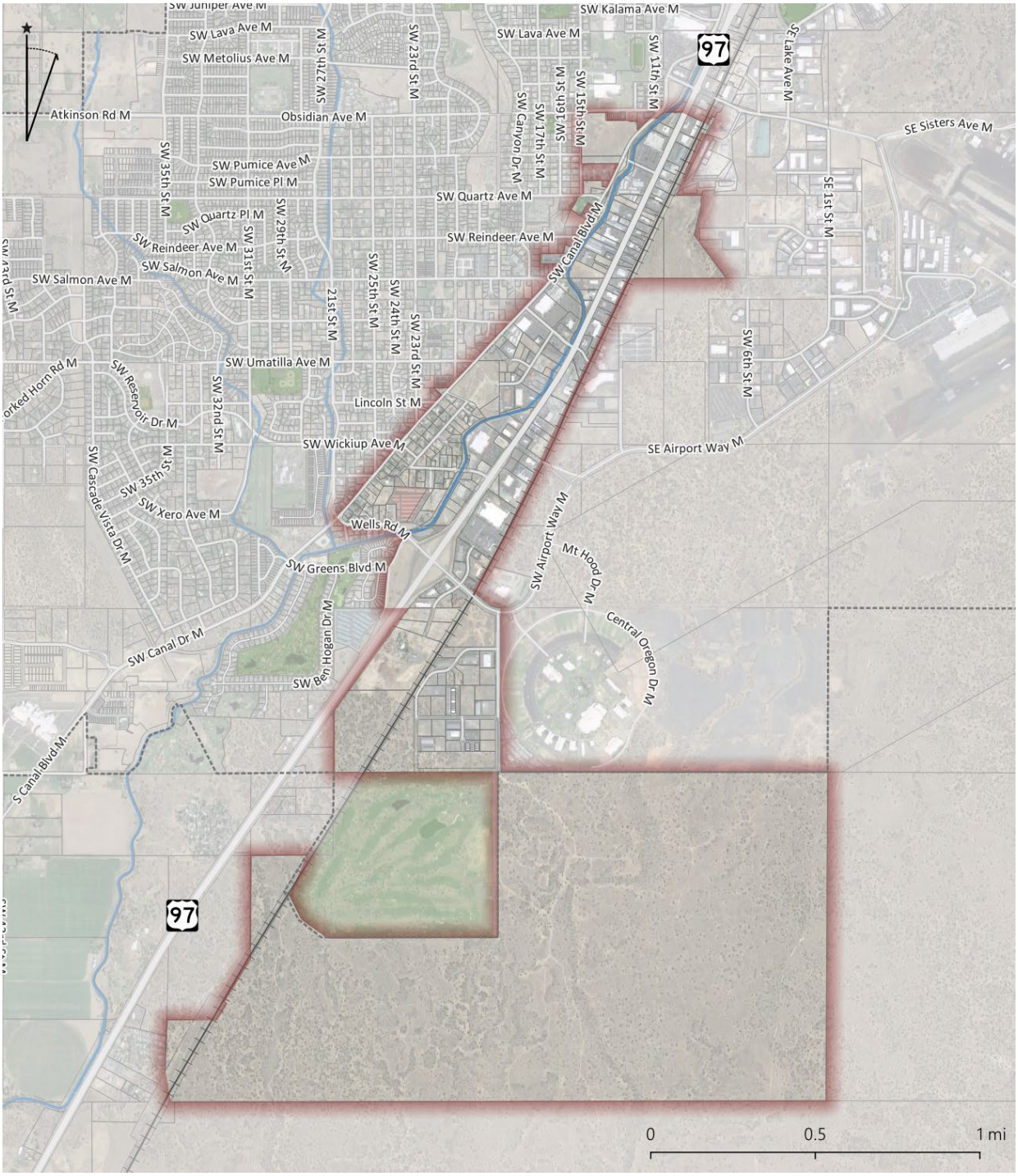
ORS 457.087 requires a report to include:

- A description of the physical, social, and economic conditions within the district and the impact of the plan, including fiscal impacts, in light of added services or increased population
- Reasons for the selection of the Urban Renewal Area (cure blight, implement recommendations from plans)
- Descriptions of land use and zoning, and references to the City's Comprehensive Plan, Capital Improvement Plan (CIP), Transportation System Plan (TSP)
- The relationship between each project and the conditions within the urban renewal area
- Project estimated costs and sources of funding (TIF and other)
- The estimated completion date for each project
- The estimated amount of money required for each urban renewal area and the anticipated year in which indebtedness will be retired or otherwise provided
- A financial analysis of the plan, with sufficient information to determine the feasibility of the plan
- The fiscal impact on overlapping taxing districts, both until and after the indebtedness is repaid
- A relocation report that includes:
    - An analysis of existing residents or business required to relocate temporarily or permanently as a result of the urban renewal agency's actions
    - A description of the methods to be used for the temporary or permanent relocation of persons living and businesses situated, in the urban renewal area
    - An enumeration, by cost range, of the existing housing units in the urban renewal areas of the plan to be destroyed or altered and the new units to be added

100. DESCRIPTION OF THE PHYSICAL, SOCIAL AND ECONOMIC CONDITIONS

The conditions described in this section pertain to the Urban Renewal Area (Area) shown in the following map (figure 1). A legal description for the Area boundary is included in this Report (Attachment F).

Figure 1. South 97 Urban Renewal Area Boundary



Source: Leland Consulting Group

A. Physical Conditions

1. Land Area

The South 97 Urban Renewal Area encompasses 1,330.5 acres of land area within the City limits.

ORS 457.420(2)(b)(B) provides that the total land area of a proposed urban renewal district, when added to the land area of existing renewal areas may not exceed 25 percent of the City's land area (for Cities with populations of less than 50,000). The City's current land area is approximately 10,449 acres. The Redmond Downtown Urban Renewal District includes 701.70 acres (6.7 percent of the total). The proposed South 97 Urban Renewal District boundary includes 1,330.52 acres (12.7 percent of the total). The total of all acreage in urban renewal areas represents 19.45 percent of the City's land area and is, therefore, within the 25 percent limitation.

Table 1. Urban Renewal Area Conditions

	Acres	% of Total
Total area within the City	10,449.0	
Redmond Downtown Urban Renewal District	701.7	6.7%
Proposed South Hwy 97 Urban Renewal District	1,330.5	12.7%
Total area within urban renewal districts	**2,032.2**	**19.5%**

Source: Deschutes County Assessor

2. Topology and Geography

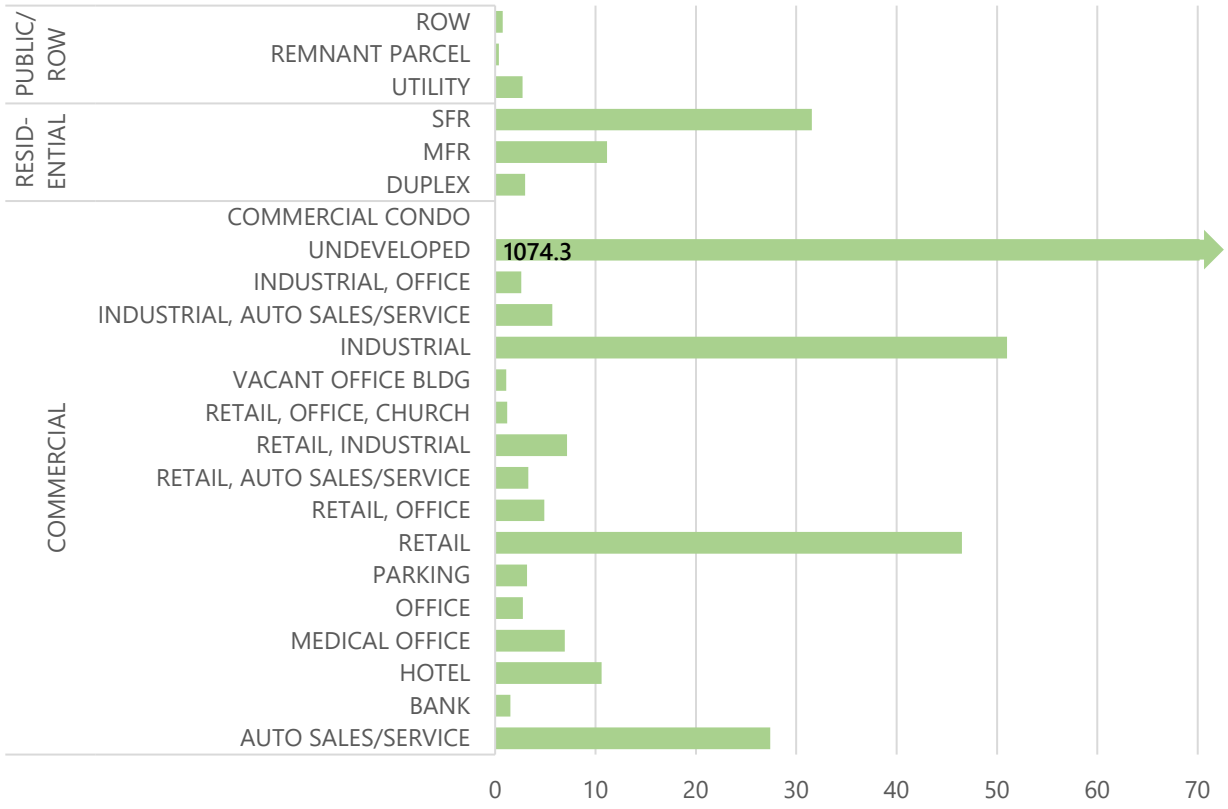
The Urban Renewal Area consists of predominately flat land, 0.0 to 8.0 percent slopes. The soil in the area is generally Deschutes-Stukel complex, which consists of shallow, well-drained soils from volcanic rock. The rocky nature of the area can add to the cost of excavation for building foundations, streets, and utilities. The Central Oregon Irrigation District (COID) Pilot Butte Canal runs adjacent to Highway 97 to the west and the Burlington Northern Santa Fe (BNSF) railway runs along the east. The irrigation canal and railway are barriers to east-west traffic circulation. US 97 South Corridor is mirrored by Canal Blvd. to the west which is the arterial roadway that collects most of the City's westbound traffic.

The South Redmond Tract is relatively level with scattered lava rock outcrops. Surrounding the rock outcrops are level areas of shallow, sandy soils. Elevation ranges from 3,050 to 3,180 feet. It is physically characterized as juniper woodland and considered rangeland. Vegetation includes western juniper and sagebrush and the soils are mostly sandy loam with basalt outcrops.

3. Existing Land Use and Development

A detailed parcel-by-parcel land use inventory of the Urban Renewal Area was undertaken in April 2020 and is summarized in the following table and charts. The inventory shows the Urban Renewal Area contains a significant amount of vacant and underdeveloped land. Of the categorized land uses, the largest percentage of the acreage is undeveloped. The Area contains 1,080.6 acres (83.2%) of land which is vacant or contains only non-structural improvements, such as parking lots, storage yards, etc. This area is mostly without streets, sidewalks, and utilities necessary for development. The four primary uses of developed acreage include industrial, retail, auto sales/service, and single-family residential. The opportunity exists to promote higher density development on the undeveloped acreage in the Urban Renewal Area.

Figure 2. Parcels by Land Use (Acres)



Source: Deschutes County Assessor, LCG

The most intense concentration of the Urban Renewal Area's commercial uses are found in the northern half. Commercial uses, which include retail, service, office, and auto-oriented uses, comprise 118 of the 283 parcels, or 41.7 percent of the total. Industrial uses, which include warehousing, manufacturing, and transportation uses, comprise 55 parcels, or 19.4 percent of the total.

Residential use comprises 81 of the 278 parcels in the Urban Renewal Area, or 29.1 percent of the total. However, reflecting the typically small parcel sizes generally associated with urban residential uses, residential parcels total only 46 acres, comprising only 3.5 percent of the total acreage within the Urban Renewal Area.

Of the 81 residential parcels, 69 are single family, three are multifamily (with one under construction), and 8 are duplexes. The bulk of the residential land uses in the Urban Renewal Area are located in the southwest section of the Area, between Canal Boulevard and US 97. A recently conducted market analysis suggests that future demand for new housing opportunities in the Urban Renewal Area exists.

4. Site Conditions

A survey of site conditions in the Urban Renewal Area was conducted in April 2020. The survey identified 77 parcels as vacant or partially vacant, representing 30.8 percent of the parcels, but 87.4 percent of the land area within the proposed boundary.

Development status was determined primarily through in-person observation and supported by aerial imagery analysis and tax roll data analysis.

The table below indicates a significant amount of potentially valuable property in the proposed renewal area appears to be under-developed, producing little property tax for the City and other taxing bodies.

The diminished property taxes resulting from a preponderance of undeveloped and/or low-value development can lead to service issues for the community. Lower property values due to lack of development and utilization of the area for tax producing purposes meet the ORS definition of blight.

Table 2. Site Development Status

Development Status	Vacant	Partially vacant	Improved
Parcels	60.0	17.0	173.0
% of Total	24.0%	6.8%	69.2%
Acres	1080.6	43.1	162.6
% of Total	84.0%	3.4%	12.6%

Source: Deschutes County Assessor, Leland Consulting Group

Additionally, site conditions of parcels for a significant majority of the proposed urban renewal area are poor or substandard (1,053.7 acres, 81.1 percent of the area). Poor and substandard site conditions include visible deterioration, drainage issues, overgrown vegetation, inefficient circulation or site configuration, etc. Less than 20 percent (18.9 percent) of the area, 200 parcels, have acceptable site conditions.

Table 3. Site Conditions

Site Condition	OK / Acceptable	Poor / Substandard
Parcels	200.0	53.0
% of Total	79.1%	20.9%
Acres	245.2	1053.7
% of Total	18.9%	81.1%

Source: Deschutes County Assessor, Leland Consulting Group

5. Building Occupancy and Conditions

A survey of building use and occupancy in the Urban Renewal Area was conducted in April 2020. The survey identified 187 parcels (66 percent of the total) in the Urban Renewal Area as containing buildings. The survey, which was of exterior building conditions only, evaluated the basic structural condition and level of maintenance of the buildings. Building conditions were categorized as "average to good", "fair (needing repair or maintenance) ", and "seriously substandard."

Building conditions in the proposed area are generally in average to good condition, 91.4 percent of parcels and 84.0 percent of developed acreage. Fair and seriously substandard buildings represent 15 parcels, 8.0 percent of the total parcels, and 15.8 percent of the developed acreage. Most of these properties in these categories are either commercial buildings suffering primarily from aesthetic obsolescence or older single-family houses that have fallen into disrepair over time.

Table 4. Building Conditions

Building Exterior Condition	Average to Good	Fair (Repair/ Maintain)	Seriously Substandard
Parcels	171.0	15.0	1.0
% of Total	91.4%	8.0%	0.5%
Acres	170.5	32.2	0.3
% of Total	84.0%	15.8%	0.2%

Source: Deschutes County Assessor, LCG

Within the study area, building occupancy is high, with 192.8 acres of 203.0 acres fully occupied (95.0 percent) representing 177 of 187 parcels with buildings (94.7 percent).

The survey results found that 10 buildings within the Renewal Area are either vacant or partially vacant. While these vacancies are scattered throughout the Area, there is a higher concentration of vacant or partially vacant commercial buildings along Highway 97.

Leland Consulting Group utilized CoStar commercial real estate data to determine existing long-term vacancies, which was supplemented with tax roll data and in-person observations.

Table 5. Building Occupancy Status

Building Occupancy	Vacant	Partially Vacant	Fully Occupied
Parcels	3.0	7.0	177.0
% of Total	1.6%	3.7%	94.7%
Acres	2.2	8.0	192.8
% of Total	1.1%	3.9%	95.0%

Source: Deschutes County Assessor, Leland Consulting Group

6. Conditions – Traffic and Circulation

The US 97 South Corridor serves as the primary north-south arterial through Redmond and is approximately three miles long from Highland Avenue to the south of the Yew Avenue/Airport Way interchange. The corridor serves a mixture of state, regional, and local traffic traveling to, from, and within a variety of different destinations in Central Oregon. The City is a destination that is not only the hub for transportation serving Central Oregon but also has regional attractors, including an airport, county fairgrounds, and many industrial and commercial areas.

Traffic signals exist at Odem Meadow Way, Veterans Way, and Highland Avenue. A 2017 traffic analysis indicated that most intersections within the corridor are within an acceptable level of service (LOS) per Highway Capacity Manual (HCM) standards. The traffic analysis also estimated 28,000 average daily trips along the corridor. A large majority of the traffic turns west on the various side streets along the corridor to reach the City's suburban areas. The commercial, industrial, fairgrounds and airport areas to the east are only accessible through Veterans Way and the off-ramps at Yew Avenue and Airport Way.

The US 97 Corridor Plan included 2040 traffic volume forecasts. Most of the land use growth in the study area forecast by the year 2040 is related to employment (i.e., commercial and industrial businesses), with a net increase of about 700 workers in the areas immediately adjacent to US 97 (a 97 percent increase over 2010). The employment growth, coupled with housing growth elsewhere in the City of Redmond and regional travel

growth on US 97, will increase traffic activity with average daily traffic volumes from approximately 28,000 vehicles in 2017 to approximately 36,000 vehicles in 2040. The improvements outlined in the Plan are expected to significantly improve operations and greatly mitigate the impacts of this growth.

Access to the South Redmond Tract is limited to a dead end on 19th Street. The 19th Street extension is critical to improving access to the area. On the north, 19th Street provides direct access to Airport Way and the Yew Avenue interchange at US 97.

7. Conditions – Sidewalks and Streetscape

Properties with missing sidewalks or sidewalks in need of repair are present throughout the Urban Renewal Area, in both residential and commercial areas. A field survey of sidewalk conditions was conducted in April 2020, which indicated that 42 percent of all parcels in the Area have missing or deteriorated sidewalks along their property frontage. The results of this survey are shown in the following table.

Given the vast majority of the area is undeveloped (due to the DSL property), a high proportion of the total acreage within the Area is without sidewalks. With regard to parcels, there is an especially high concentration of properties with missing sidewalks in the residential neighborhoods west of Canal Boulevard, in the central and southern commercial and industrial areas of the Urban Renewal Area.

Table 6. Sidewalk Conditions

Sidewalk Condition	Good Condition	No Sidewalk	Repair / Replace
Parcels	145.0	94.0	11.0
% of Total	58.0%	37.6%	4.4%
Acres	190.0	1078.3	17.9
% of Total	14.8%	83.8%	1.4%

Source: Deschutes County Assessor, LCG

8. Conditions – Sewer and Water Services

Most of the City's sewer flows within the US 97 South Corridor are collected via gravity sewer mains. The gravity sewer mains convey flows to the West Side Sewer Interceptor pipe located in the City's west and central area. The West Side Sewer Interceptor ultimately delivers all sewer flows by gravity to the City's Water Pollution Control Facility (WPCF). Sewer flows specifically from the south area, which includes the County Fairgrounds and the Fairgrounds Business Park subdivisions, are collected via gravity mains to the Yew lift station. The lift station directs flows via a sewer force main to a gravity main located along Canal Boulevard, which ultimately conveys flows to the West Side Sewer Interceptor. Capacity has not been identified as a constraint for all US 97 South Corridor improvements. The City recommends a new lift station and forced main to serve the South Redmond Tract. Alternately, the City is also open to a package treatment plant for the South Redmond Tract.

The City obtains 100 percent of its water supply from groundwater through drilled wells. The City's water distribution system is divided into various zones that operate at different capacities and pressures. Most of the US 97 South Corridor lies within Pressure Zone 2 which encompasses most of the City. The south area is within Pressure Zone 1, which is considered the high-pressure zone for the City. The City has identified several projects to align with the US 97 South Corridor improvements and also to provide water service to the South Redmond Tract. In summary, the projects identified include a new reservoir and well along with numerous new water pipeline projects which are required to meet future capacity and fire flow demands.

9. Conditions – Comprehensive Plan Goals and Objectives

The Redmond Comprehensive Plan addresses numerous conditions, deficiencies, and issues addressed in this Urban Renewal Plan. Specific goals and policies found in the Redmond Comprehensive Plan concerning area conditions and problems are:

CHAPTER 9 – ECONOMIC DEVELOPMENT

Goals

1. Expand, improve, and diversify the economy of the Redmond Urban Growth Boundary area while maintaining Redmond's quality of life.

3. Retain or create industrial, office, professional service, technology, medical, tourism, retail, and other jobs through expansion and retention of existing businesses and recruitment of new businesses.

4. Improve the appearance of the community's employment districts, particularly along Highways 97 and 126, the Downtown, central eastside industrial areas, and the Airport/Fairgrounds area.

9. Provide, maintain, and promote the enhancement of state of the art infrastructure, including, but not limited to, transportation systems, water, sewer, natural gas, power, telecommunications, and air service to support the commercial and industrial needs of the community.

11. Maintain Redmond's favorable employment to housing ratio by taking affirmative steps to ensure economic development and employment growth keeps pace with population growth, especially for industrial employment.

12. To build a strong and thriving regional economy by coordinating public investments, policies, and regulations to support regional and state economic development objectives in Central Oregon as determined through the Central Oregon Large Lot Industrial Land Needs Analysis.

Policies

9. The City should give a high priority to extending and improving the infrastructure needed for economic development.

10. The City shall provide an incentive program encouraging the development of primary industry family-wage jobs.

11. The City should provide incentives and innovative ways to encourage and promote an inventory of available industrial buildings and a pre-approved process to attract industrial uses.

12. General Objectives

    b. Encourage landscaping and other forms of city beautification for the purpose of enhancing the physical character of each area, and the overall city.
    f. Focus community efforts to improve the overall appearance of existing commercial areas and similar considerations encouraged to all new developments.
    i. Rehabilitate or re-develop older commercial areas in order to retain their values to the community, including the Downtown and Highway 97 corridor after the highway is re-routed to a limited access corridor.

33. Commercial development adjacent to arterial streets and State highways shall be subject to access restrictions.

34. C-1 commercial development along Highway 97 shall be encouraged to provide service access roads which feed into arterial and collector streets at designated points.

46. The City recognizes the importance of maintaining a large-lot industrial land supply that is readily developable in Central Oregon.

Findings: Plan's relationship to Chapter 9 – Economic Development.

- The Plan's Industrial Opportunity Fund, Small Loan Program, and Incentive Funding project activities support Economic Development Goals 1, 3, 11, and 12 and Policies 10, 11, and 46 through programs that support the development or expansion of businesses and employment centers that retain and create job opportunities, help maintain a balance of jobs to housing, promote public-private and inter-agency coordination, and expand, diversify, and improve the local economy.
- The Plan's public utility, power, gas, and telecommunications project activities support Economic Development Goals 9, 11, and 12 and Policies 9 and 46 by extending and improving Redmond's infrastructure to meet the commercial and industrial needs of the community, thereby supporting job growth, supplying readily developable large-lot industrial land, and helping the City coordinate investments to support regional and state economic development objectives in Central Oregon.
- The Plan's transportation project activities support Economic Development Goals 4, 9, and 11 and Policies 33 and 34 by funding transportation investments that improve the appearance of transportation elements in the Area's employment districts, modify and enhance access and connectivity, and extend, develop, and improve infrastructure to serve the commercial and industrial needs of the community.
- The Plan's transportation project activities support Economic Development Goals 1, 4, 9, and 12 and Policies 12(b)(f)(i) and 34 by improving the Area's physical appearance, accessibility, and navigability by various modes of transportation, and strengthening the identity and vitality of both the US 97 Corridor and the broader Area.

CHAPTER 10 – HOUSING

Goals

3. Establish residential neighborhoods that are safe, convenient, and attractive places to live, which are located close to schools, parks, shopping, and employment centers.

5. Provide a broad range of accessible and affordable housing.

6. Provide for higher densities in proximity to schools, services, parks, shopping, employment centers, and public transit.

Policies

23. Criteria for the location of multifamily housing shall include proximity to the City core, neighborhood commercial centers, major transportation corridors, schools, services, parks, shopping, employment centers, and transit corridors.

Findings: Plan's relationship to Chapter 10 – Housing.

- The Plan's transportation and utility infrastructure project activities support Housing Goals 3, 5, and 6 and Policy 23 by reducing the cost burden on developers, thereby improving the prospects of new housing development, and potentially increasing the probability of higher density developments.

- The Plan's development assistance and incentive funding program activities support Goals 3, 4, 5, and 6 and Policy 23 by supporting employment growth along a major corridor, near shopping and employment centers, and near services.

CHAPTER 11 – PUBLIC FACILITIES AND SERVICES

Goals

1. To provide for a close correlation between the provisions of urban services and urban development in order to bring about a more orderly and efficient development pattern, and thereby avoid unnecessary tax burdens and excessive utility costs normally associated with scattered, unrelated development.
2. To achieve a balance of public costs vs. benefits/revenues in the provision of public facilities and services.
3. To provide public and private utility systems - water, sanitary and storm sewer, energy, communications, garbage, and recycling - at levels necessary and suitable for existing and proposed uses.
5. Public facilities shall be available or under construction prior to the issuance of Building Permits.

Policies

2. The City should establish revenue sources to pay for its planned capital improvements.
3. The City Council should investigate funding alternatives to property taxes for funding public facilities and services.
11. The City shall continue to develop, operate, and maintain a water system, including wells, pumps, and reservoirs, capable of serving all urban development within the UGB.
15. Storm drainage facilities such as dry wells, landscaping, retention ponds or storm drains shall be used to control surface drainage.
26. The City shall encourage Natural Gas providers to provide service throughout the UGB area.
27. Property for future fire station locations should be planned for and purchased in advance in order to save costs of facility zoning construction. Attempts shall be made to combine future stations with other government entities in order to reduce infrastructure and operations costs.

FINDINGS: Plan's Relationship to Chapter 11 – Public Facilities and Services.

- The Plan's public utility, power and gas, and communications projects support Goals 1, 2, and 3 and Policies 11, 15, and 26 by providing infrastructure deemed critical to attracting desired users to the Area and by providing the necessary infrastructure for existing businesses and industries to expand operations.
- The Plan's Fire Station project supports Goal 5 and Policy 27 by providing funding for a new fire station to serve south/southeast Redmond.
- The Plan supports Policies 2 and 3 by providing additional funding methodologies and funding alternatives to pay for and leverage planned capital improvements and programs.
- The Plan's Industrial Opportunity Fund, Incentive Funding, and Small Loan Program activities support Goals 1, 2, 3, and 5 and Policies 11, 15, and 26 by encouraging and accelerating the timing of the construction of critical infrastructure deemed necessary for the expansion of existing businesses and establishment of new users.

CHAPTER 12 – TRANSPORTATION

Goals

1. Reduce through traffic, congestion, and improve circulation along Highway 97, especially along the 5th and 6th Street couplet.
2. Enhance east/west circulation.
3. Identify roadway system needs to serve undeveloped areas so that steps can be taken to preserve rights-of-ways and maintain adequate traffic circulation.
4. Increase the use of alternative travel modes through improved safety and service

Objectives:

1b. Improve intersection operations by adding left-turn phases, installing additional traffic signals, actuating and coordinating traffic signals, and/or increasing sight distance as needed.

2a. Develop a safe and efficient east-west arterial and collector system

2b. Enhance existing crossings and determine the best locations for additional crossings of Dry Canyon, Highway 97, Pilot Butte Canal, and BNSFRR line to link east and west Redmond.

3a. Integrate new arterial and collector routes into the existing city grid system.

4a. Provide additional sidewalks and improve existing sidewalk pavement for pedestrian safety and access.

4b. Provide additional bicycle routes and plan regular maintenance of existing routes for bicycle safety and access (per Redmond Bicycle Master Plan).

4c. Provide pedestrian and bicycle access, especially when direct motor vehicle access is not possible.

Policies

3. The function of existing and planned roadways as identified in the Redmond Urban Area Transportation Plan shall be protected through the application of appropriate access control measures.
10. The City shall work to acquire and develop a trail system that utilizes Redmond's irrigation canal system.
16. Sidewalks shall be included on all new streets except limited access roads or where equivalent alternative pedestrian circulation is provided in the UGB. Retrofitting existing streets with sidewalks shall proceed on a prioritized schedule.
20. Wherever practical, access to the highway will be provided via frontage roads, alternative local roads, or other means, rather than direct access to the highway.
22. A non-traversable median should be installed on the highway when operational or safety issues warrant installation. Directional breaks in the median will be provided as needed to provide safe traffic operation.
24. Medians installed in the state highways should provide bicycle and pedestrian crossings at least every 1/4 mile.
34. The City shall improve east-west and north-south traffic patterns in the central part of the community.
38. Alleys shall be an option in new residential areas, providing rear access and backyard parking.

FINDINGS: Plan's Relationship to Chapter 12 – Transportation.

- The Plan's transportation improvement projects support Goals 1 and 3, Objective 1b, and Policies 3, 22, 24 by improving safety, efficiency, and operations through access and median treatments, supporting the development of new connections and alternatives routes to serve existing and underserved areas, and reducing through traffic by encouraging other modes of transportation.
- The Plan's US 97, local street, alley, and access improvement projects support Goals 1, 2, 3, and 4, Objectives 1b, 2a, 2b, and 3a, and Policies 20, 34, and 38 by enhancing crossings, improving intersection operations, addressing access through new alleys and alternative routes, and implementing circulation improvements necessary for new development.
- The Plan's canal improvement contribution, mixed-use path, US 97 median treatments, sidewalk improvements, and pedestrian infrastructure project activities support Goal 4, Objectives 2a, 4a, 4b, and 4c, and Policies 10, 16, and 24 by providing safer or alternative routes for pedestrians and bicyclists in the US 97 corridor and the surrounding streets, enhancing multimodal connections throughout the Area.
- Additionally, transportation improvements may be a key component of several projects in the Plan, such as the Industrial Opportunity Fund, which is intended to support a wide range of investments and project activities that will leverage private development.

CHAPTER 15 – LIVABILITY

Goals

1. The City of Redmond shall create and maintain livability. The City of Redmond shall guide development and support community identity and pride by implementing policies that improve livability and are innovative, creating a high quality of life, ample family-wage jobs, and a safe environment in which to raise and educate families.

Policies

8. Redmond shall plan for a variety of transportation choices.
9. Redmond shall plan for and promote attractive streetscapes free from clutter, confusion, and blight.
10. Redmond shall develop safe, reliable, and economical transportation choices to decrease household transportation costs, improve air quality, reduce greenhouse gas emissions, and promote public health.
11. The City of Redmond shall develop and maintain the environment that promotes and supports a strong, healthy, and diverse economic base.
12. Redmond shall promote economic competitiveness through sustainable choices for housing, transportation, education, cultural diversity and enrichment, and recreational opportunities as well as improve reliable and timely access to employment centers, educational opportunities, services, and other basic needs by workers.
13. Redmond shall help existing businesses within the City to grow and thrive.
14. Redmond shall help to create and foster new businesses of all types.
15. Redmond shall provide well planned and maintain high-quality infrastructure to provide a competitive advantage for business and community growth.

FINDINGS: Plan's Relationship to Chapter 15 – Livability.

- The Plan's transportation-related projects, such as US 97 improvements, local improvements, pedestrian connections, and other related projects, support Goal 1 and Policies 8, 9, 10, 11, and 12 by providing pedestrian and bicycle infrastructure to encourage walking and cycling, improving streetscapes by addressing blighted conditions (such as lacking sidewalks) and funding beautification efforts, and planning for improved access to current and future employment centers.
- The Plan's Industrial Opportunity Fund, Small Loan Program, and Incentive Funding project activities support Goal 1 and Policies 11, 12, 13, 14, and 15 by providing funding to existing and future businesses to grow and create new employment opportunities.
- The Plan's public utility, power and gas, and communications projects support Goal 1 and Policies 12, 13, 15 by providing high-quality infrastructure as a catalyst for growth.

B. Social and Economic Conditions

1. Property Values and Utilization

The total assessed valuation for the City of Redmond for the 2019-20 tax year was $2.5 billion. The total assessed value of property within the Urban Renewal Area for the 2019-20 tax year was calculated at $142.5 million (commercial property was $104.8 million, residential property $12.8 million, industrial property $23.1 million, and municipal property $1.8 million).

The overall value of improvements to land in the Renewal Area is quite low. Improvements represent approximately $130.2 million while land represents approximately $106.0 million in value. This equates to an improvement to land value ratio of only 1.23.

Mature urban areas are expected to exhibit improvement to value ratios in the 2:1 to 3:1 range. It was noted earlier that the Urban Renewal Area contained an exceptionally high percentage of land acreage either vacant or under-developed. The low level of utilization within the Area indicates it is far from reaching its potential in terms of generating jobs and tax base for the community.

A survey of existing land use and physical conditions in the Area conducted in April of 2020 found that the Area has a significant supply of vacant and underutilized properties. These vacant properties undermine the vitality of the Area's employment districts and represent wasted opportunities to generate economic activity that would benefit the Area.

Specifically, the survey identified 117 parcels as underutilized (46.2 percent of all parcels), totaling 1,181.5 acres (91.0 percent of total acreage).

Table 7. Site Utilization Status

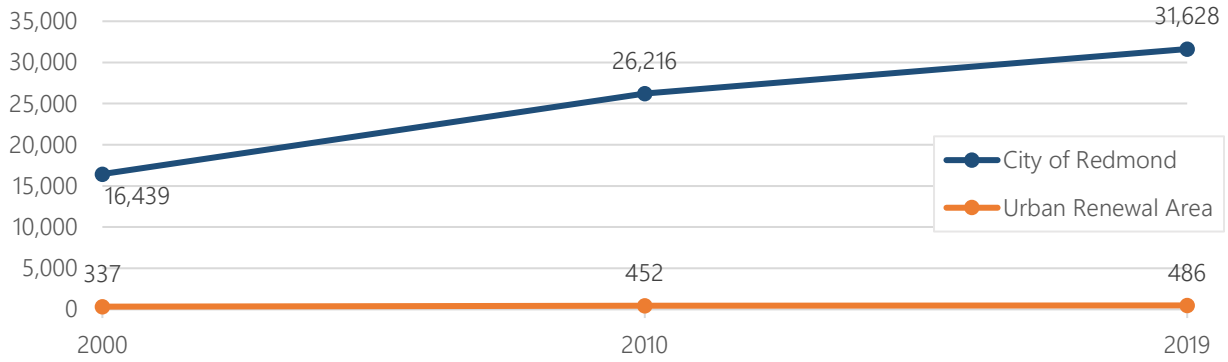
Site Utilization	Not Underutilized	Underutilized
Parcels	136.0	117.0
% of Total	53.8%	46.2%
Acres	117.3	1,181.5
% of Total	9.0%	91.0%

Source: Deschutes County Assessor, Leland Consulting Group

2. Population and Housing

In 2019, with just around 500 residents, the Area contained 1.5 percent of the City's total population of 31,628 residents.

Figure 3. Estimated Population, Urban Renewal Area & City of Redmond



Source: ESRI

As shown in the figure above, between 2000 and 2019, the Urban Renewal Area showed only a marginal population increase of nearly 150 residents. In contrast, during this same timeframe, the City's population increased significantly, adding over 15,000 residents as a result of growth and development in areas outside of the Renewal Area.

In 2019, the City of Redmond comprised an estimated 11,873 housing units. Only 178 or 1.5 percent of these housing units are located in the Renewal Area. At 37 percent, the Area's homeownership rate is significantly lower than the citywide homeownership rate of 56 percent. Further, the Area has a lower percentage of vacant housing units (6.3 percent) relative to the City (9.2 percent).

The recent Redmond Housing Needs Analysis identified the following key findings for housing needs over the 2019-2039 twenty-year planning period:

- Redmond's population is forecast to grow slower than in the past.
- Redmond needs to plan for 6,963 new dwelling units.
- Redmond needs to plan for more single-family attached and multifamily dwelling units.
- Redmond has a deficit of land for single-family and multifamily housing.
- Redmond's development occurred at relatively low densities since 2008.
- Redmond has a deficit of housing affordable to extremely low- and very low-income households.
- Redmond has a deficit of housing affordable to low- and middle- income households.

3. Income

Relative to the City, incomes in the Area are significantly lower. In 2019, the Area's median household income (MHI) was $30,973, more than $23,250 lower than the citywide MHI.

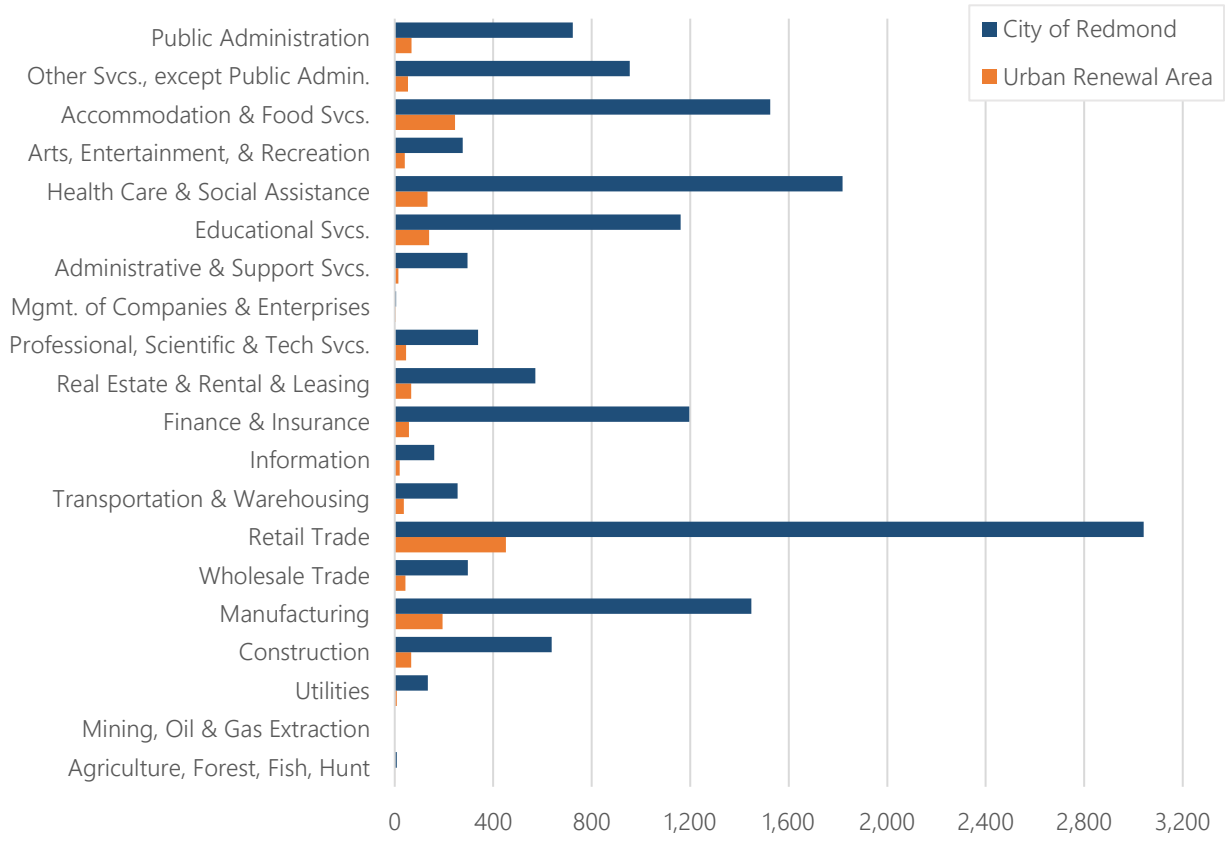
4. Employment

The following figure shows jobs by industry in the Area and the City in 2019. Key findings, based on the 2018 employment data, are summarized below.

- The Area employed 11 percent of citywide jobs in 2019.

- There are an estimated 1,692 jobs in the Area relative to 14,847 jobs in the City of Redmond.
- The majority of jobs in the Area are in the retail trade, with 451 jobs, as is the case citywide, with 3,041 jobs. Retail jobs in the Area comprise approximately 15 percent of the City's retail jobs.
- Industrial jobs, which include the industries of manufacturing, wholesale trade, construction, and transportation and warehousing, comprise 755 jobs in the Area of the 5,423 total jobs citywide (13.9 percent).
- Office jobs—which include the industries of professional, scientific and technical services, information, management of companies and enterprises, finance and insurance, and real estate and rental and leasing—comprise just 194 jobs in the Area of the 2,272 total jobs citywide (8.5 percent)
- Accommodations and Food Service jobs in the Area comprise 16 percent of citywide Accommodations and Food Service jobs.

Figure 4. Estimated 2019 Employment by Industry (NAICS)



Source: ESRI

200. EXPECTED SERVICE AND POPULATION IMPACTS OF THE PLAN

The Plan is expected to produce positive fiscal and service impacts for Redmond. Plan activities are intended to eliminate current and prevent future blighting conditions in the Area. The Plan also supports activities intended to alleviate traffic, circulation, and safety problems, and upgrade streets, sidewalks, and building conditions in the Urban Renewal Area.

The Plan will utilize tax increment revenues. The investments made with tax increment funds from the Urban Renewal Area are expected to produce a more robust tax base from redevelopment and rehabilitation. Development opportunities that may arise as a direct result of these investments are described as follow.

The US 97 Corridor Plan, which involved a significantly smaller study area within the greater Urban Renewal Area, identified a likely development program based on a range of development opportunities and likely real estate projects over the next 10 to 20 years. In 2019, it was determined that this development program would likely accommodate up to 300 units of new housing, almost 90,000 square feet of new employment space, two new hotels, and approximately 160,000 square feet of new retail services.

The addition of the South Redmond Tract provides the opportunity for significantly more development activity and employment growth. While no new analysis was conducted for this additional area within the Urban Renewal Area, the land is expected to accommodate up to three million square feet of new development. New jobs associated with this development will generate significant new state income tax revenues. The Plan supports this growth through numerous transportation and utility infrastructure project activities and programs aimed at incentivizing and catalyzing growth.

Specific impacts of the Plan to the City and other taxing jurisdictions are as follows.

City of Redmond. Demands for City policing will increase in the area as development occurs. Funding for these services will be limited to existing property taxes and additional lodging taxes (from new hotels in the Area), franchise fees; electric, natural gas, cable, water, sewer, stormwater and phone, from new development. The primary development anticipated is industrial, therefore, service demand for police services is anticipated to be limited. Revenue generated from franchise fees will offset a portion of these costs.

Water and sewer service needs, as described in the Physical Conditions in Section 100 of this Report, are generally identified in the City's Capital Improvement Plan and would be funded either by system development charges associated with the new development or with the planned project activities of the Plan.

Fire District. Demands for Fire and Rescue services will increase in the area as development occurs. Funding for these services during the duration of the urban renewal district will be limited to existing property tax revenue. The primary development anticipated is industrial, which will have considerable fire, life safety design standards and will likely be built to the most current building code and equipped with modern fire prevention and public safety features, reducing service demand for fire and rescue services. Revenue generated from existing property taxes is not anticipated to be adequate to pay for services provided during the duration of the urban renewal district.

However, currently, there are many vacant and underutilized properties in the Area which contribute disproportionately to demand for fire and police services. Since the Plan has project activities intended to encourage reinvestment in these blighted properties, it is expected that the Plan would reduce service demand associated with nuisance properties.

The Plan also supports the redevelopment and rehabilitation of older properties, which will bring them up to modern building, safety, and fire codes and is therefore expected to reduce the demand for fire services.

County and County Service Districts. Demands for County services, including but not limited to Sheriff, Library, County Clerk, District Attorney, and Assessor, are anticipated to increase marginally as development within the urban renewal area as new development is anticipated to be industrially driven with limited housing. Local public safety services are provided by the City police department. District Attorney and related court services will have limited impacts resulting from the new development. The Clerk is anticipated to generate

revenue from fees related to recoding and other development services to offset costs, and the Assessor will have impacts resulting from new development. Existing property tax revenue from the urban renewal area will offset a portion of costs during the duration of the urban renewal district, with revenue received subsequently considerably greater than the cost of delivering services within the area.

Parks District. Due to the anticipated nature of development within the urban renewal area, demands for park facilities are anticipated to be limited. Revenue from existing property taxes is anticipated to offset the cost of providing these services to residents within the service area.

Redmond School District. Due to the anticipated nature of development within the Urban Renewal Area, demands for school facilities and operations are anticipated to be limited. State school funding is provided on a per student basis, therefore, any deficiency in local property tax funding is offset by the State school funding formula. Upon the expiration of the urban renewal district, significant local funding will be forthcoming for schools, however, the amount of additional local funding received will be offset with reductions by the State to achieve equitable per student funding across the State.

Central Oregon Community College. Due to the anticipated nature of development within the urban renewal area, demands for higher education facilities and operations are anticipated to be limited. Property tax funding from the urban renewal area will be limited to existing property taxes until the urban renewal district is closed.

Education Service District. Due to the anticipated nature of development within the urban renewal area, demands for pre-kindergarten through high school education facilities and operations are anticipated to be limited. Property tax funding from the urban renewal area will be limited to existing property taxes until the urban renewal district is closed.

Note: Should residential development demand be greater than presently anticipated, impacts on local government services could be significantly different than what is described above.

300. REASONS FOR SELECTING THE URBAN RENEWAL PLAN AREA

The Urban Renewal Plan Area was selected based on Redmond Comprehensive Plan goals, objectives, and policies, and on the existence of blighting conditions within the Area. The blight is evidenced by the lack of proper utilization of land planned for commercial, industrial, residential, and public purposes, traffic and pedestrian conflicts and deficiencies, poor visual and aesthetic conditions, substandard building conditions, the prevalence of low values and lack of investment in the project area, and reduced tax receipts resulting therefrom.

Conditions within the Urban Renewal Area meet the definitions of blight in ORS 457.010. These conditions are described in the previous section, and are summarized below:

- The Area contains a high percentage of parcels of vacant and undeveloped or underdeveloped land.
- The Area lacks adequate multimodal access, circulation, and connectivity. In particular, east-west connections are highly limited.
- The Area lacks adequate sidewalks with 62 percent of parcels with incomplete or missing sidewalks.
- The Area lacks safe bicycle routes connecting key destinations.
- Much of the Area has a poor aesthetic appearance. Landscaping and streetscapes are inconsistent and, in some locations, inadequate or lacking. Overhead utilities contribute to visual clutter and help produce an environment not conducive to new investment in the area.
- The highway commercial properties lack alternative access to improve ingress and egress.

400. RELATIONSHIP BETWEEN EACH PROJECT ACTIVITY AND EXISTING CONDITIONS

The projects in Section 700 of the Plan were identified to specifically address the presence of physical, economic, and other conditions of blight present in the Area. The relationship between these projects and these conditions is described below.

A. US 97 Improvements

Description: This project activity will provide funding to carry out the highway-related improvements from the City of Redmond's US 97 Corridor Plan, including road construction, median and access treatments, pedestrian and bicycle facilities, traffic signal systems, and gateway treatments.

Relationship to Existing Conditions: An efficient and well-planned highway is a critical component of a successful employment district. Under existing conditions, US 97 is inefficient, not aesthetically pleasing, and unsafe, with crashes predicted to increase significantly by 2040. Pedestrian and bicycle connections are also missing or highly limited.

Proposed medians, signals, and access treatments will improve safety in the US 97 Corridor by reducing the frequency and severity of crashes. These projects are also critical to improving the aesthetics of the corridor, providing opportunities for business and community interaction, maintaining freight operations, and improving efficiency.

Bicycle and pedestrian improvements, and the preservation of Highway 97 access, are necessary to support commercial, industrial, and medical-related employment—particularly in the northern portion of the Area. Improvements that improve traffic circulation, such as the signalization of key intersections will also strengthen the Area's capacity to attract private investment.

B. Local Transportation Projects

Description: Local transportation projects include connection roads (including east-west collectors, distributors, and local streets), connections to and construction of a new shared-use path, new access roads or alleyways, pedestrian and bicycle facilities, and other new streets as needed to attract or support private investment.

Relationship to Existing Conditions: Under existing conditions, many parts of the Area, particularly commercial and industrial zoned areas to the north,have poor multimodal access and connectivity. There are few alternatives to US 97, unnecessarily increasing local trips on the highway.

These transportation projects are intended to provide a transportation network in the Area that supports the efficient movement of traffic, reduces traffic volumes on US 97 by providing alternative routes and promoting other transportation modes, and supports a vibrant business district.The projects are also critical to realizing currently untapped development and employment potential.

C. Public Utilities (Water, Stormwater, and Sewer Improvements)

Description: Public utility projects include the development of sewer, stormwater, and water infrastructure to accommodate future development, particularly for the South Redmond Tract. Projects also include the

construction of new stormwater facilities, repair of existing sewer lines, and extension or enlargement of existing water and sewer lines as needed to support the expansion of existing businesses or new development.

- Water, Wastewater, and Stormwater systems will need to be constructed for the area to develop. The City's master plans anticipate these improvements. Funding for these improvements is generally provided by system development charges and utility rates.
- The schedule includes $22.5 million of funding to assist developers with the cost of these facilities (Industrial Opportunity Fund, Incentive Funding)

Relationship to Existing Conditions: The projects are intended to address infrastructure deficiencies in the Area. The lack of costly utility infrastructure within the urban renewal area is a significant barrier to development. The program funding channels noted above provide financial assistance to facilitate timely and orderly completion of utility infrastructure to support development within the urban renewal area.

While most, if not all, of these projects, may currently be planned by the City, accelerating the timeline of their implementation may be required to serve new development in the Area. As such, additional money, funded through tax increment financing, is available for these projects as needed.

Note that the funding for City utilities and infrastructure and other utilities could be structured in a variety of ways. Total funding allocated to assist developers and the utilities with completion of the required improvements to serve the Area is $22.5 million.

D. Fire Station

Description: A fire station will be needed in South Redmond to reduce response times and serve new and existing commercial and residential users. As the area develops, lower response times are necessary, especially for users with a higher risk of fire and other hazards.

- Funding of $4.5 million is included for this project

Relationship to Existing Conditions: The project addresses the present lack of fire and rescue facilities and operations within proximity of the anticipated development within the urban renewal area.

Note: If public building(s) are included in the Urban Renewal Plan, a legislative change in 2017 requires the concurrence of three of four taxing districts that are estimated to forego the most property tax revenue (The City, County, School District, and Fire District). Concurrence requires a vote of the governing body of each of the four taxing districts. Failure of a governing body to take action (resolution) within 45 days of notice is considered concurrence.

E. Industrial Opportunity Fund

Description: This project activity includes a fund for public investments to prepare readily-available industrial lands and support large-scale industrial development in the Area. Assistance could take the form of gap financing (low or no interest loans), infrastructure (roads, sidewalks, utilities), and other tools.

- Funding of $12.5 million is included for this project

Relationship to Existing Conditions: The project addresses the presence of vacant and underutilized land in the area and supports Comprehensive Plan goals related to job creation, business development, and the diversification of Redmond's economy.

F. Small Loan Program

Description: This program offers financial support to assist properties and businesses within the urban renewal to help retain economic vitality and increase property values.

- $2.0 million is allocated towards this program.
- Funding for this program is consistent with tax increment financing requirements as described in ORS 457.170(2) and 457.180. A resolution adopted by the City Council may be appropriate to set forth the economic conditions and other criteria for this program.

Relationship to Existing Conditions: While the number of vacant buildings is currently low, challenging economic conditions may cause additional vacancies or a rise in dilapidated sites and building conditions. This program will support job retention and creation, and retention of property values within the urban renewal area.

G. Incentive Funding

Description: This activity creates funding to allow the Urban Renewal Agency to stimulate redevelopment in the Area by partnering with private property owners, repositioning property for redevelopment, and other activities. As part of the City of Redmond's effort to enhance business vitality and support desired development within the South 97 Urban Renewal Area, Incentive Funding is aimed at incentivizing property owners and developers to rehabilitate or redevelop property that will better serve the City's goals for the Area and the greater Redmond community. Assistance could take the form of direct developer assistance, grants, reimbursements, and or system development charge (SDC) credits for contributions to the transportation and utility system.

- Funding of $10.0 million is included for this project

Relationship to Existing Conditions: The corridor's existing site and building conditions require significant improvements. Existing property and business owners do not currently have the incentives to make the necessary improvements to their sites or building that would result in increased taxable property values, corridor aesthetics, or other economic development-related outcomes. The Incentive Funding program will support the redevelopment or rehabilitation of vacant and undeveloped or underdeveloped properties in the Area, which in turn will support job creation and the mitigation of existing transportation conditions that are a barrier to development today.

H. Natural Gas/Power Improvements

Description: The City may provide funding to accelerate the timing or upgrade the capacity of natural gas or power infrastructure, especially for underserved locations such as the South Redmond Tract.

- The schedule includes $22.5 million of funding to assist developers with the cost of these facilities (Industrial Opportunity Fund, Incentive Funding)

Relationship to Existing Conditions: The lack of costly utility infrastructure within the urban renewal area is a significant barrier to development. The program funding channels noted above provide financial assistance to facilitate timely and orderly completion of utility infrastructure to support development within the urban renewal area. Investments in both gas and electricity are critical to accommodate a range of uses, including but not limited to industrial manufacturers and other significant employment-generating users.

I. Communications Improvements

Description: Communications Improvements include telephone and high-speed internet infrastructure. While the City is not responsible for the cost of communications upgrades and improvements, this project activity provides seed funding to accelerate the timing of specific improvements to attract desired users.

- The schedule includes $22.5 million of funding to assist developers with the cost of these facilities (Industrial Opportunity Fund, Incentive Funding)

Relationship to Existing Conditions: Broadband and other communications improvements are important for economic growth and business vitality. Broadband is the underpinning for some of today's most important transformations in business activity and government services. Much of the Area is currently lacking telecommunications infrastructure, posing a significant barrier to attracting desired users to the Area.

J. Canal Improvement Contribution

Description: This project activity includes funding to help the Central Oregon Irrigation District (COID) pipe at least 1.0 mile of the canal to accommodate new road construction and a multi-use path along the canal.

- Funding of $4.0 million is included for this project

Relationship to Existing Conditions: New east-west transportation connections identified in Section 700(B) requires the piping of the canal to mitigate project costs. Bridging the canal would add significant costs to these new connections. Urban Renewal funding made available through this project activity is therefore critical to providing gap financing to accelerate the timing of the piping project and other related transportation projects.

500. FINANCIAL ANALYSIS OF PLAN

A. Estimated Project Cost and Revenue Sources

The table below shows the estimated total costs of the various projects and programs associated with the South 97 Urban Renewal Area. From the inception of the Plan in fiscal year 2020-21 until its anticipated termination in fiscal year 2044-45, total costs for additional project activities, exclusive of debt service, are estimated at $84.2 million in inflation-adjusted dollars, or $68,269,000 in 2020 dollars. An additional $1.3 million is anticipated for debt issuance related costs. Therefore, the total inflation-adjusted costs for projects, programs, administration, and debt issuance costs to complete the Plan, requires a maximum indebtedness of $85,458,900.

Table 8. Urban Renewal Projects and Program Funding

Project and Program Description	Urban Renewal Funding	Dates	Future Estimated Cost
US Highway 97 Projects	$24,018,000	2024-2032	$27,892,200
Local Transportation Projects	$5,328,000	2025-2040	$6,782,100
Fire Station	$4,500,000	2030-2035	$5,709,200
Industrial Opportunity Fund	$12,500,000	2023-2042	$16,325,500
Small Loan Program	$2,000,000	2022-2042	$2,527,800
Incentive Funding	$10,000,000	2023-2042	$12,820,100
Canal Improvement Contribution	$4,000,000	2026-2032	$4,736,000
Program Administration	$5,923,000	2022-2045	$7,405,500
Total Urban Renewal Project Funding	**$68,269,000**		**$84,198,400**

Source: LCG and GEL Oregon

The principal method of funding the project share of costs will be through the use of tax increment financing as authorized by ORS 457. In addition, the Agency will apply for, and make use of funding from other federal, state, local, or private sources as such funds become available.

Tax increment financing is based upon the premise that new taxes generated by the improvements implemented by the urban renewal district pay for the projects. The tax increment is the difference in property taxes generated by the increase in assessed value in the Area over the original frozen base value when the renewal area was first established.

Note – Urban renewal does not increase the taxes that property owners within the Urban Renewal Area pay, nor does it impact existing tax collections by overlapping taxing districts. It merely redirects any future taxes over the amount that the property owner was paying when the district was established to the Urban Renewal Agency to help pay for projects in the Renewal Area. Without urban renewal, the projects in the Plan may not be implemented due to a lack of funding.

B. Anticipated Start and Finish Dates of Project Activities

The following table shows the anticipated start and finish dates for each project and program activity. Project activities are anticipated to begin in fiscal year 2021-22, and it is estimated that all activities proposed in this plan will be completed by fiscal year 2041-42. At that time, it is estimated that there will be sufficient funds to complete all programmed project activities. Sufficient funds to retire all debt obligations is anticipated in fiscal year 2044-45. An annual schedule of anticipated start and finish dates is provided in Appendix B.

Many project activities will be partially funded with outside sources or will involve outside investment. As a result, the anticipated urban renewal spending will be significantly exceeded by additional investment tied directly to the urban renewal projects.

Table 9. Project Activities Start and Finish Dates and Funding Sources

Project Description	Amount	Dates	Funding
US 97 South Redmond Corridor Plan	**$50,266,700**		
US 97 Highway improvements	$26,248,700	2024-2032	ODOT
Pedestrian and non-street improvements	13,143,000	2025-2033	TIF
SW Volcano Avenue improvements	3,378,000	2025-2033	TIF
SW Umatilla Avenue improvements	1,030,000	2025-2033	TIF
"Reimon" Avenue improvements	2,925,000	2025-2033	TIF
SW Quartz Avenue improvements	2,901,000	2025-2033	TIF
Pumice Roundabout improvements	641,000	2025-2033	TIF
Other Local Transportation Projects	**$5,328,000**		
Commercial Alley Improvements	$1,308,000	2025-2033	TIF
COID Canal Shared-Use Path Improvements	4,020,000	2030-2040	TIF
Public Buildings			
Fire Station	6,000,000	2030-2035	TIF ($4,500,000) Fire & Rescue District
Other Public Facilities			
Canal improvement contribution	4,000,000	2026-2032	TIF/COID
Local Public Utility Projects	**$16,320,000**		
E1 - New Reservoir at Reservoir Dr	$5,000,000	2021	City/TIF
E2 - New Booster Station & Well at Reservoir Dr	7,000,000	2021	City/TIF
E3 - 43rd St Water Line Improvements	999,000	2020	City/TIF
E4 - SW Canal Water Line Improvements	380,000	2020	City/TIF
E5 - SW 19th St Water Line Improvements	265,000	2022	City/TIF
E7 - SW Deerhound Water Line Improvements	335,000	2022	City/TIF
East Hwy 97 Waterline Improvements	1,200,000	2026	City/TIF
West Hwy 97 Waterline Improvements	800,000	2028	City/TIF
Hwy 97 Sewer Improvements	341,000	2026	City/TIF
Developer Projects	**$34,545,000**		
Large Lot Industrial - North public infrastructure	$13,291,000	2030	Dev/TIF
Large Lot Industrial - South public infrastructure	13,779,000	2040	Dev/TIF
CNG - Airport Way Main Extension	475,000	2030	Dev/TIF
Natural gas/electricity improvements	4,000,000	2022-2041	Dev/TIF
Communications improvements	1,000,000	2022-2041	Dev/TIF
700 gpm Lift Station and Force main	2,000,000	2030	Dev/TIF
Total Infrastructure Projects	**$116,459,700**		

Source: LCG, HDR, and GEL Oregon

C. Estimated Expenditures and Year of Debt Retirement

It is estimated that the development activities within the Urban Renewal Area will produce approximately $110.4 million in tax increment revenue between fiscal years 2021-22 and 2044-45. These funds, along with other resources, will be utilized to finance project activities and pay all debt service costs associated with undertaking these project activities.

It is anticipated that available tax increment revenues and funds accumulated in a dedicated debt service fund for debt redemption will be sufficient to retire all outstanding bonded indebtedness in fiscal year 2045-46, and at that time terminate the tax increment financing provisions of the Agency.

The following table provides a schedule of District revenue and expenditures, exclusive of debt proceeds, and principal repayment. A detailed schedule of sources and uses is provided in Appendix C.

Table 10. Schedule of Project and Program Related Expenditures (amounts in thousands)

Fiscal Year Ending June 30	Administration	Capital Outlay	Other[1]	Total Expenditures
2022	204	-	-	204
2023	208	104	20	332
2024	212	1,167	20	1,400
2025	333	4,440	80	4,854
2026	369	4,921	80	5,371
2027	433	5,771	110	6,313
2028	441	5,886	110	6,437
2029	450	6,004	120	6,574
2030	459	6,124	120	6,703
2031	551	7,343	150	8,044
2032	562	7,490	150	8,202
2033	224	2,987	70	3,281
2034	266	3,550	60	3,876
2035	272	3,621	70	3,962
2036	236	2,482	30	2,747
2037	240	2,532	30	2,802
2038	245	2,582	20	2,847
2039	250	2,634	20	2,904
2040	255	2,687	-	2,941
2041	260	2,212	-	2,472
2042	265	2,257	-	2,522
2043	271	-	-	271
2044	276	-	-	276
2045	124	-	-	124
Totals	**7,406**	**76,793**	**1,260**	**85,459**

Source: GEL Oregon

[1] Includes bond issuance expenses

Table 11. Schedule of Tax Increment Revenue and interest earnings (amounts in thousands)

Fiscal Year Ending June 30	Property taxes	Interest Earnings	Total Current Year Resources
2022	249	-	249
2023	623	-	623
2024	942	6	948
2025	1,210	9	1,219
2026	1,489	10	1,499
2027	1,769	10	1,779
2028	2,067	10	2,077
2029	2,387	9	2,396
2030	2,729	8	2,737
2031	3,097	9	3,106
2032	3,493	8	3,501
2033	3,917	7	3,924
2034	4,373	12	4,385
2035	4,863	10	4,873
2036	5,389	14	5,403
2037	5,954	17	5,971
2038	6,560	21	6,581
2039	7,211	27	7,238
2040	7,911	33	7,944
2041	8,398	40	8,438
2042	8,626	44	8,670
2043	8,859	73	8,932
2044	9,098	119	9,217
2045	9,347	168	9,515
Total	**110,562**	**664**	**111,226**
2022	249	-	249

Source: GEL Oregon

D. Impacts of Tax Increment Financing

1. Estimated Financial Effect to Local Governments

The net fiscal impacts to local government jurisdictions shown in the table below represent the total amount of property taxes estimated to be redirected, or foregone, from within the boundaries of Redmond. The word "redirected" or "foregone" must be used in context, for those revenues will not be lost to the Redmond community, but will instead be dedicated to capital improvements or public improvements within the Area. To the extent that the Urban Renewal Area increases in assessed value over what would otherwise have occurred without urban renewal investment, the overlapping taxing districts will see an increase in tax revenue in the long-term.

The following tables show the estimated foregone real property taxes during the life of the urban renewal district with an urban renewal district and without a district. Additionally, the forecast annual property taxes in fiscal year 2045-46 (the year after the district is projected to close) are shown, the payback in years for the foregone property taxes if no urban renewal district were created and the return on investment (ROI) (year by

year foregone property taxes information is provided in the appendix for both no urban renewal district and with an urban renewal district).

Table 12. Forecast Foregone Taxes – Governments (Fiscal years 2022-2045)

Taxing Jurisdiction	City of Redmond	Deschutes County	County Library	Countywide Law Enforcement	County Extension - 4H	9-1-1	Redmond Fire & Rescue	Redmond Park & Recreation	Total General Government
No Urban Renewal	17,020,217	4,701,873	2,122,655	4,168,123	86,449	1,396,318	6,770,110	1,434,528	37,700,273
Urban Renewal	32,405,169	8,952,002	4,041,368	7,935,781	164,595	2,658,488	12,889,764	2,731,228	71,778,395
Difference	15,384,952	4,250,129	1,918,713	3,767,658	78,146	1,262,170	6,119,654	1,296,700	34,078,122

Source: GEL Oregon

Table 13. Forecast taxes – Fiscal Year 2045-46 Government; payback of foregone taxes and return on investment (ROI)

Taxing Jurisdiction	City of Redmond	Deschutes County	County Library	Countywide Law Enforcement	County Extension - 4H	9-1-1	Redmond Fire & Rescue	Redmond Park & Recreation	Total General Government
No Urban Renewal	1,479,399	408,687	184,501	362,294	7,514	121,368	588,459	124,689	3,276,911
Urban Renewal	3,906,410	1,079,154	487,183	956,650	19,842	320,477	1,553,847	329,247	8,652,810
Difference	2,427,011	670,467	302,682	594,356	12,328	199,109	965,388	204,558	5,375,899
Payback – Years	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01
ROI	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%

Source: GEL Oregon

2. Forecast Revenue Sharing by Taxing Jurisdiction

Oregon Revised Statute 457.470 (2)(b) provides that beginning with the later of the 11th year after the initial approval of the plan or the year in which the maximum division of taxes equals or exceeds 10 percent of the initial maximum indebtedness in the plan (10% of $85,458,900, or $8,545,890), the Urban Renewal Agency] shall notify the County Assessor to compute the division of taxes for the urban renewal area using the assessed value that is not greater than the sum of:

A. The amount of assessed value (AV) the Urban Renewal Agency estimates will produce division of taxes revenues equal to 10 percent of the initial maximum indebtedness ($8,545,890) in the Plan, and
B. 25 percent of the amount by which the assumed increment exceeds the AV of the increment the Urban Renewal Agency estimates will produce division of tax revenue equal to 10 percent of the initial maximum indebtedness in the plan.

Additionally, ORS 457.470(2)(c) provides that, beginning with the first year after the year in which division of taxes equals or exceeds 12.5 percent of the initial maximum indebtedness in the Plan (12.5% of $85,458,900, or $10,682,363), the Urban Renewal Agency shall notify the County Assessor pursuant to ORS 457.440 (computation of amounts to be raised from property taxes) (2)(d) to compute the division of taxes for the urban renewal area using an amount of assessed value that the agency estimates will produce division of tax revenues that do not exceed 12.5 percent of the initial maximum indebtedness in the plan ($10,682,363).

Based on the above limitations, the Agency is expected to be limited in its division of tax collections beginning in fiscal year 2041, continuing through fiscal year 2045, when the Agency is anticipated to have sufficient resources to pay all outstanding debt and close the district.

Table 14. Forecast Revenue Sharing – Government

Fiscal Year Ending June 30	City of Redmond	Deschutes County	County Library	Countywide Law Enforcement	County Extension - 4H	9-1-1	Redmond Fire & Rescue	Redmond Park & Recreation	Total General Government
2041	81,717	22,574	10,191	20,012	415	6,704	32,504	6,887	181,004
2042	258,682	71,461	32,261	63,349	1,314	21,222	102,896	21,803	572,988
2043	448,725	123,961	55,962	109,889	2,279	36,813	178,489	37,820	993,938
2044	652,823	180,344	81,416	159,871	3,316	53,557	259,672	55,022	1,446,021
2045	872,009	240,894	108,751	213,548	4,429	71,539	346,858	73,496	1,931,524
Totals	**2,313,956**	**639,234**	**288,581**	**566,669**	**11,753**	**189,835**	**920,419**	**195,028**	**5,125,475**

Source: GEL Oregon

Table 15. Forecast Revenue Sharing – Education

Fiscal Year Ending June 30	Central Oregon Community College	High Desert ESD	Redmond School District #2J	Total
2041	11,496	1,786	93,112	106,394
2042	36,391	5,655	294,756	336,802
2043	63,125	9,809	511,301	584,235
2044	91,837	14,270	743,860	849,967
2045	122,672	19,061	993,613	1,135,346
Totals	**325,521**	**50,581**	**2,636,642**	**3,012,744**

Source: GEL Oregon

3. Estimated Financial Effect on Schools

Financial impacts on Redmond School District #2J are offset by the State school funding allocation, which provides funding on a per enrolled student basis. As a result, urban renewal will not result in lost revenue to the Redmond School District.

From a more global perspective, the State receives a majority of its general fund revenue which is used for school support from personal income taxes. The anticipated development and resulting jobs created in the Urban Renewal Area will create additional personal income tax paid to the State providing an offset and likely a surplus to the amount of property taxes that are redirected.

Central Oregon Community College and the High Desert ESD are not subject to the school funding formula and will realize reduced revenue.

The following tables show the estimated foregone real property taxes during the life of the urban renewal district with an urban renewal district and without a district. Additionally, the forecast annual property taxes in fiscal year 2045-46 (the year after the district is projected to close) are shown, the payback in years for the foregone property taxes if no urban renewal district were created and the return on investment (ROI) (year by year foregone property taxes information is provided in the appendix for both no urban renewal district and with an urban renewal district).

Table 16. Foregone Taxes – Education (Fiscal years 2022-2045)

Taxing Jurisdiction	Central Oregon Community College	High Desert ESD	Redmond School District #2J	Total Education
No Urban Renewal	2,394,356	372,042	19,393,732	22,160,130
Urban Renewal	4,558,665	708,340	36,924,156	42,191,161
Difference	2,164,309	336,298	17,530,424	20,031,031

Source: GEL Oregon, Inc.

Table 17. Forecast taxes – Fiscal Year 2045-46; payback of foregone taxes and return on investment (ROI)

Taxing Jurisdiction	Central Oregon Community College	High Desert ESD	Redmond School District #2J	Total Education
No Urban Renewal	208,118	32,338	1,685,705	1,926,161
Urban Renewal	549,543	85,390	4,451,168	5,086,101
Difference	341,425	53,052	2,765,463	3,159,940
Payback – Years	7.01	7.01	7.01	7.01
ROI	14.3%	14.3%	14.3%	14.3%

Source: GEL Oregon, Inc.

4. Effect on Bond Rates Financial

The forecast amount of debt proceeds, approximately $63.0 million, issued over a period of approximately 17 years (fiscal years 2023-2039), secured by tax increment revenue, and the City's full faith and credit are forecast to have no less than a 1.13 debt coverage ratio (DCR). The DCR is projected to be greater than 1.25 in all but five fiscal years (FY 2031-2035). Debt issues are assumed to have terms of 20 years, with an interest rate of three and one-half percent (3.50%). The maximum outstanding debt balance during the life of the district is forecast at $44.6 million in fiscal year 2035.

Due to the conservative nature of the debt coverage, excess value of real market value to assessed value within the district, among other factors the debt associated with the district is not anticipated to have a material effect on interest rates of bonds issued by the City. As development occurs within the Urban Renewal Area and property values increase, the total property valuation for Redmond is anticipated to provide benefits to the City for general obligation debt and or other debt issued by the City.

5. Feasibility of Plan

A feasibility study was completed in May 2020 that found the creation of the district was feasible with respect to ORS requirements for an urban renewal district. The feasibility report is attached in Appendix F.

This report updates the financial forecasting for projects and programs, their timing, the use of debt, and repayment of debt. Additionally, comprehensive financial proformas for the Agency's implementation and execution of the plan is prepared that demonstrate the financial feasibility of the Plan.

Factors beyond the Agency's control could negatively impact the Agency's ability to complete the plan as projected. These may include but are not limited to lesser development than projected, increased borrowing costs, inflationary impacts on project costs, and delays with project implementation due to a variety of factors. If these conditions were to occur and were to be material, the Agency could adjust project and program scope and timing in order to maintain financial feasibility.

600. RELOCATION

A. Properties Requiring Relocation

At the time of this report, no specific properties associated with potential project activities have been identified as requiring relocation of businesses, households, or buildings. In addition, no housing units have been identified for destruction or alteration. As a result, no relocation surveys have been conducted at this time. The Plan contemplates the acquisition of right-of-way for various transportation improvements, however, there are no relocations anticipated to be associated with this project activity.

B. Relocation Methods

In the event of any future activity involving relocation, the Renewal Agency will explore the possibility of physically moving buildings and other improvements and will discuss with potentially impacted parties' other possible means of assisting with replacement housing if applicable. Prior to any actual relocation, the Renewal Agency will establish a Relocation Policy which will call for assistance to those residents and businesses displaced. Such assistance will include providing information regarding suitable locations, payment of moving expenses, and other payment as deemed necessary.

All relocation activities will be undertaken, and payments made in accordance with the requirements of ORS 281.045 281.105 and any other applicable laws or regulations. Relocation payments will be made as provided in ORS 281.060.

APPENDIX A: REVENUE ASSUMPTIONS FOR THE URBAN RENEWAL AREA

A. New Values Added in Area

The following specific developments are under construction at the time of writing this report:

- Two hotels, totaling 207 units,
- A commercial retail pad, and
- An apartment complex consisting of 116 units.

The following incremental real market values, as work is completed, are projected by fiscal year 2022-23.

Table 18. New Developments

Description	2022	2023	2024	2025	2026
Hotels, Retail Pad	13,432,000	20,148,000	-	2,680,000	2,000,000
Apartments	6,000,000	12,000,000	12,000,000	-	-
Total	19,432,000	32,148,000	12,000,000	2,680,000	2,000,000

Source: GEL Oregon

The taxable assessed value (TAV) to real market value ratio of 60.3% is used to estimate the TAV created by these developments.

Additionally, annual increases in TAV of existing properties are assumed to be 2.9%, slightly below the maximum property by property maximum of 3.0% annually. Lastly, growth from new development is assumed to increase TAV for the area by 1.0% annually, in addition to the project-specific development noted above, during fiscal years 2021-2023, and 4.5% annually thereafter. The increases noted above are categorized into commercial and residential.

Presently, the assessed valuation of property in the area (FY 2020-21) consists of the following types of development:

Table 19. Assessed Value by Use

Use	Commercial	Residential	Industrial	Municipal	Non-identified	Total
Assessed Value	104,849,416	12,766,770	23,109,510	1,804,290	1,620	142,529,986
Percent of Total	73.6%	9.0%	16.2%	1.3%	0.0%	

Source: GEL Oregon

The forecasts assume that future development will be similar proportionately to existing conditions.

B. Frozen Base

The "frozen base" assessed value of the district, with timely adoption of the Plan subsequent to December 2020, is estimated to be $148,072,000. This amount is the estimated total assessed value for fiscal year 2021, based on estimated values as of January 1, 2020 within the urban renewal area. This estimate reflects the current existing assessed value increased by 2.9%, plus 1.0% new assessed value due to development within the area during the calendar year 2019.

C. Tax Rates of Overlapping Taxing Jurisdictions

Table 20. Tax Rates

Taxing Districts	Operating Tax Rate	Local Option Rate	Bonded Debt Rate	Total	% of Total Levy Rate
City of Redmond	4.4101	-	-	4.4101	28.43%
Deschutes County	1.2183	-	-	1.2183	7.85%
County Library	0.5500	-	-	0.5500	3.55%
Countywide Law Enforcement	1.0800	-	-	1.0800	6.96%
County Extension - 4H	0.0224	-	-	0.0224	0.14%
9-1-1	0.3618	-	-	0.3618	2.33%
Redmond Fire & Rescue	1.7542	-	-	1.7542	11.31%
Redmond Park & Recreation	0.3717	-	-	0.3717	2.40%
Total General Government	**9.7685**	**-**	**-**	**9.7685**	**62.98%**
Central Oregon Community College	0.6204	-	-	0.6204	4.00%
High Desert ESD	0.0964	-	-	0.0964	0.62%
Redmond School District #2J	5.0251	-	-	5.0251	32.40%
Total Education	**5.7419**	**-**	**-**	**5.7419**	**37.02%**
Total	**15.5104**	**-**	**-**	**15.5104**	**100.00%**

Source: GEL Oregon

APPENDIX B: SCHEDULE OF PROJECTIONS AND PROGRAMS

Table 21. Schedule of Projections and Programs: 2022-2025

Project	Start Year	End Year	Total - Inflation Adjusted $	2022	2023	2024	2025
Program Administration	2022	2044	$7,405,500	$204,000	$208,100	$212,200	$313,100
US 97 Projects	2024	2032	27,892,200	0	0	0	3,249,700
Fire Station	2030	2035	5,709,200	0	0	0	0
Local Transportation Projects	2025	2040	6,782,100	0	0	0	0
Industrial Opportunity Fund	2023	2042	16,325,500	0	0	530,600	541,200
Incentive Funding	2023	2042	12,820,100	0	0	530,600	541,200
Small Loan Program	2022	2042	2,527,800	0	104,000	106,100	108,200
Canal Improvement Cont's.	2026	2032	4,736,000	0	0	0	0
			$84,198,400	**$204,000**	**$312,100**	**$1,379,500**	**$4,773,400**

Schedule: 2026-2030

Project	Start Year	End Year	2026	2027	2028	2029	2030
Program Administration	2022	2044	$369,100	$432,800	$441,400	$450,300	$459,300
US 97 Projects	2024	2032	3,314,700	3,381,000	3,448,600	3,517,600	3,588,000
Fire Station	2030	2035	0	0	0	0	0
Local Transportation Projects	2025	2040	392,200	400,000	408,000	416,200	424,500
Industrial Opportunity Fund	2023	2042	552,000	563,100	574,300	585,800	597,500
Incentive Funding	2023	2042	552,000	563,100	574,300	585,800	597,500
Small Loan Program	2022	2042	110,400	112,600	114,900	117,200	119,500
Canal Improvement Cont's.	2026	2032	0	750,800	765,800	781,100	796,100
			$5,290,400	**$6,203,400**	**$6,327,300**	**$6,454,000**	**$6,583,000**

Schedule: 2031-2035

Project	Start Year	End Year	2031	2032	2033	2034	2035
Program Administration	2022	2044	$550,700	$561,800	$224,000	$266,200	$271,500
US 97 Projects	2025	2033	3,659,700	3,732,900	0	0	0
Fire Station	2030	2035	1,097,100	1,119,000	1,141,400	1,164,200	1,187,500
Local Transportation Projects	2025	2040	433,000	441,600	450,500	459,500	468,700
Industrial Opportunity Fund	2022	2041	609,500	621,700	634,100	1,078,000	1,099,600
Incentive Funding	2022	2041	609,500	621,70	634,100	718,700	733,000
Small Loan Program	2022	2042	121,900	124,300	126,800	129,400	131,900
Canal Improvement Cont's.	2025	2033	812,700	828,900	0	0	0
			$7,894,100	**$8,051,900**	**$3,210,900**	**$3,816,000**	**$3,892,200**

Schedule: 2036-2040

Project	Start Year	End Year	2036	2037	2038	2039	2040
Program Administration	2022	2044	$235,500	$240,200	$245,000	$249,900	$254,900
US 97 Projects	2025	2033	0	0	0	0	0
Fire Station	2030	2035	0	0	0	0	0
Local Transportation Projects	2025	2040	478,100	487,600	497,400	507,300	517,500
Industrial Opportunity Fund	2022	2041	1,121,600	1,144,000	1,166,900	1,190,200	1,214,000
Incentive Funding	2022	2041	747,700	762,700	777,900	793,500	809,300
Small Loan Program	2022	2042	134,600	137,300	140,000	142,800	145,700
Canal Improvement Cont's.	2025	2033	0	0	0	0	0
			$2,717,500	**$2,771,800**	**$2,827,200**	**$2,883,700**	**$2,941,400**

Schedule: 2041-2044

Project	Start Year	End Year	2041	2042	2043	2044	2045
Program Administration	2022	2044	$260,000	$265,200	$270,500	$276,000	$123,800
US 97 Projects	2025	2033	0	0	0	0	0
Fire Station	2030	2035	0	0	0	0	0
Local Transportation Projects	2025	2040	0	0	0	0	0
Industrial Opportunity Fund	2022	2041	1,238,300	1,263,100	0	0	0
Incentive Funding	2022	2041	825,500	842,000	0	0	0
Small Loan Program	2022	2042	148,600	151,600	0	0	0
Canal Improvement Cont's.	2025	2033	0	0	0	0	0
			$2,472,400	**$2,521,900**	**$270,500**	**$276,000**	**$123,800**

Source: GEL Oregon

APPENDIX C: DETAILED SOURCES AND USES SCHEDULE

The following sources and uses schedule show the various sources totaling $196.7 million, including $110.6 million in tax increment property tax income, to fund the various projects, programs, administration, and debt repayment to execute the Plan.

Following the sources and uses schedule are the year-by-year forecast fund activity for the District's general fund (capital projects fund) and debt service fund.

Table 22. Sources and Uses Schedule (amounts in thousands)

Sources	
Property taxes	$ 110,562
Interest earnings	802
Debt proceeds - long-term	63,000
Debt proceeds - overnight	22,325
Total sources	**$ 196,689**
Uses	
Projects and programs	$ 76,793
Debt principal - long-term	63,000
Debt principal - overnight	22,325
Debt interest	22,520
Administration	7,406
Debt issuance costs	1,260
Ending balance	3,385
Total uses	**$ 196,689**

Source: GEL Oregon

General Fund:

The general fund accounts for debt proceeds, including overnight borrowing (du jour), interest, and other resources to fund the urban renewal projects, programs, administration, and debt issuance costs.

Table 23. General Fund (amounts in thousands)

	Resources					Expenditures						
Fiscal Year Ending June 30	Interest earnings	Debt proceeds - long-term	Debt proceeds - du jour	Total current year resources	Total Resources	Administration	Capital outlay	Other	Total expenditures	Resources over (under) expenditures	Beginning fund balance	Ending fund balance
2021	-	-	-	-	-	-	-	-	-	0	-	-
2022	-	-	225	225	225	204	-	-	204	21	-	21
2023	0	1,000	-	1,000	1,021	208	104	20	332	668	21	689
2024	7	1,000	600	1,607	2,296	212	1,167	20	1,400	207	689	897
2025	9	4,000	800	4,809	5,706	333	4,440	80	4,854	(45)	897	852
2026	9	4,000	900	4,909	5,761	369	4,921	80	5,371	(462)	852	390
2027	4	5,500	900	6,404	6,794	433	5,771	110	6,313	90	390	480
2028	5	5,500	900	6,405	6,885	441	5,886	110	6,437	(33)	480	448
2029	5	6,000	800	6,805	7,252	450	6,004	120	6,574	231	448	678
2030	7	6,000	600	6,607	7,285	459	6,124	120	6,703	(96)	678	582
2031	6	7,500	600	8,106	8,688	551	7,343	150	8,044	62	582	644
2032	6	7,500	500	8,006	8,650	562	7,490	150	8,202	(196)	644	448
2033	5	3,500	-	3,505	3,953	224	2,987	70	3,281	224	448	672
2034	7	3,000	800	3,807	4,478	266	3,550	60	3,876	(69)	672	602
2035	6	3,500	600	4,106	4,708	272	3,621	70	3,962	144	602	746
2036	8	1,500	1,000	2,508	3,254	236	2,482	30	2,747	(240)	746	506
2037	5	1,500	1,300	2,805	3,311	240	2,532	30	2,802	3	506	510
2038	5	1,000	1,700	2,705	3,215	245	2,582	20	2,847	(142)	510	368
2039	4	1,000	2,300	3,304	3,671	250	2,634	20	2,904	400	368	767
2040	8	-	2,800	2,808	3,575	255	2,687	-	2,941	(134)	767	634
2041	6	-	3,600	3,606	4,240	260	2,212	-	2,472	1,134	634	1,768
2042	18	-	1,400	1,418	3,185	265	2,257	-	2,522	(1,104)	1,768	663
2043	7	-	-	7	670	271	-	-	271	(264)	663	400
2044	4	-	-	4	404	276	-	-	276	(272)	400	128
2045	1	-	-	1	129	124	-	-	124	(123)	128	5
Totals	**139**	**63,000**	**22,325**	**85,464**		**7,406**	**76,793**	**1,260**	**85,459**	**5**	**-**	**5**

.Source: GEL Oregon

Debt Service Fund

The urban renewal debt service fund accounts for the receipt of tax increment property taxes, interest income, and the repayment of debt issued, both long-term and overnight borrowing. The urban renewal district is anticipated to have sufficient fund balance at the end of fiscal year 2045 to call and defease all outstanding debt of the district.

Table 24. Debt Serve Fund (amounts in thousands)

	Resources				Expenditures								
Fiscal Year Ending June 30	Property taxes	Interest earnings	Total current year resources	Total Resources	Principal	Interest	Du juor debt payments	Total expenditures	Resources over (under) expenditures	Beginning fund balance	Ending fund balance	DCR	Outstanding debt balance
2021	-		-	-				-	0	-	-	-	
2022	249	-	249	249	-	-	225	225	24	-	24	-	-
2023	623	-	623	648	17	18	-	35	588	24	613	-	983
2024	942	6	948	1,561	53	52	600	705	243	613	856	8.98	1,929
2025	1,210	9	1,219	2,075	143	137	800	1,080	139	856	995	4.32	5,786
2026	1,489	10	1,499	2,494	289	271	900	1,460	40	995	1,035	2.66	9,497
2027	1,769	10	1,779	2,814	466	425	900	1,792	(13)	1,035	1,022	1.98	14,531
2028	2,067	10	2,077	3,099	677	600	900	2,176	(99)	1,022	923	1.62	19,354
2029	2,387	9	2,396	3,318	903	775	800	2,479	(83)	923	840	1.42	24,451
2030	2,729	8	2,737	3,577	1,147	952	600	2,698	39	840	879	1.30	29,304
2031	3,097	9	3,106	3,985	1,425	1,146	600	3,170	(64)	879	815	1.21	35,380
2032	3,493	8	3,501	4,315	1,739	1,356	500	3,595	(94)	815	720	1.13	41,140
2033	3,917	7	3,924	4,645	1,995	1,484	-	3,480	445	720	1,165	1.13	42,645
2034	4,373	12	4,385	5,550	2,180	1,527	800	4,507	(122)	1,165	1,043	1.18	43,464
2035	4,863	10	4,873	5,916	2,372	1,563	600	4,534	339	1,043	1,382	1.24	44,593
2036	5,389	14	5,403	6,785	2,544	1,565	1,000	5,109	294	1,382	1,676	1.31	43,549
2037	5,954	17	5,971	7,646	2,687	1,527	1,300	5,514	456	1,676	2,132	1.41	42,362
2038	6,560	21	6,581	8,713	2,826	1,476	1,700	6,002	579	2,132	2,711	1.53	40,536
2039	7,211	27	7,238	9,950	2,961	1,411	2,300	6,672	567	2,711	3,278	1.65	38,576
2040	7,911	33	7,944	11,222	3,083	1,323	2,800	7,206	737	3,278	4,016	1.80	35,493
2041	8,398	40	8,438	12,453	3,192	1,215	3,600	8,006	431	4,016	4,447	1.91	32,301
2042	8,626	44	8,670	13,117	3,305	1,102	1,400	5,806	2,863	4,447	7,310	1.96	28,996
2043	8,859	73	8,932	16,242	3,386	985	-	4,372	4,561	7,310	11,871	2.03	25,610
2044	9,098	119	9,217	21,087	3,435	866	-	4,302	4,915	11,871	16,786	2.11	22,175
2045	9,347	168	9,515	26,301	3,381	746	-	4,127	5,389	16,786	22,174	2.27	18,793
Totals	**110,562**	**664**	**111,226**	**177,764**	**44,207**	**22,520**	**22,325**	**89,052**	**22,174**	**-**	**22,174**		

Source: GEL Oregon

APPENDIX D: PROJECTED INCREMENTAL TAXABLE VALUE OF DISTRICT

Table 25. Projected Incremental Taxable Value

Fiscal Year Ending June 30	Frozen Base (000's)	TAV - 4.5% (000s)
2021	-	148,072
2022	148,072	165,552
2023	148,072	191,384
2024	148,072	212,767
2025	148,072	230,109
2026	148,072	248,323
2027	148,072	266,678
2028	148,072	286,389
2029	148,072	307,557
2030	148,072	330,291
2031	148,072	354,705
2032	148,072	380,925
2033	148,072	409,083
2034	148,072	439,323
2035	148,072	471,799
2036	148,072	506,675
2037	148,072	544,129
2038	148,072	584,351
2039	148,072	627,547
2040	148,072	673,937
2041	148,072	723,756
2042	148,072	777,259
2043	148,072	834,716
2044	148,072	896,422
2045	148,072	962,690

.Source: GEL Oregon

APPENDIX E: ESTIMATED IMPACT ON TAX RATES AND REVENUE — OVERLAPPING TAXING JURISDICTIONS

Under Oregon's present property tax-based system, total tax rates will not change as a result of adopting an urban renewal program. Thus, there will be no effect on taxpayers from the establishment of an urban renewal district. Instead, the potential revenues raised by taxing bodies will be affected. The new value created within the urban renewal area after the formation of the renewal district (these values are called "incremental" or "excess" values) will not be available to other taxing bodies for raising property tax revenues. The revenues from those incremental values will instead be directed to the renewal agency for the purpose of paying off indebtedness to carry out project activities. The effects of this foregone revenue will vary with the size of the tax bodies' tax rates and the cumulative level of incremental values in the renewal area.

K-12 Schools: It should be noted that under the current system of funding K-12 schools, establishing an urban renewal area does not impact the per-student revenue for schools. The funding per student is derived from a complex formula that establishes a uniform-per-student funding level throughout the State. The amount of funds received by Redmond schools is determined by this formula, not by the amount of property taxes raised locally.

The following schedule shows the estimated foregone property tax revenue for the overlapping taxing jurisdictions based on the value growth assumptions outlined in this report. **It is important to keep the following in mind when looking at the schedule:**

- The potential impact on the school district is shown simply to demonstrate the tax rate calculation. As noted above, however, urban renewal will have no impact on K-12 per student funding (i.e., there will be no reduction in school funding resulting from the creation of an urban renewal district).
- The estimated amounts of foregone revenue assume all the development and increased property values would occur, even without the renewal programs' outlays for area improvements. In reality, the value created by new development would be less or slower without the tax increment funding.

Table 26. Estimated Foregone Property Tax Revenue – Government, Fiscal Years 2022-2045 (assuming urban renewal district created)

Fiscal Year Ending June 30	City of Redmond	Deschutes County	County Library	Countywide Law Enforcement	County Extension - 4H	9-1-1	Redmond Fire & Rescue	Redmond Park & Recreation	Total General Government
2022	77,089	21,296	9,614	18,878	392	6,324	30,663	6,497	170,753
2023	191,010	52,767	23,822	46,777	970	15,670	75,978	16,099	423,093
2024	285,311	78,818	35,582	69,871	1,449	23,407	113,488	24,047	631,973
2025	361,791	99,946	45,120	88,600	1,838	29,681	143,909	30,493	801,378
2026	442,117	122,136	55,138	108,271	2,246	36,271	175,860	37,263	979,302
2027	523,064	144,498	65,233	128,095	2,657	42,912	208,059	44,086	1,158,604
2028	609,992	168,512	76,074	149,382	3,098	50,043	242,636	51,412	1,351,149
2029	703,345	194,301	87,717	172,244	3,572	57,702	279,769	59,281	1,557,931
2030	803,604	221,997	100,220	196,797	4,082	65,927	319,649	67,731	1,780,007
2031	911,272	251,741	113,648	223,164	4,629	74,760	362,476	76,805	2,018,495
2032	1,026,905	283,685	128,069	251,481	5,216	84,246	408,471	86,551	2,274,624
2033	1,151,085	317,990	143,556	281,892	5,847	94,434	457,865	97,018	2,549,687
2034	1,284,446	354,831	160,188	314,551	6,524	105,375	510,913	108,258	2,845,086
2035	1,427,668	394,397	178,050	349,625	7,251	117,124	567,882	120,329	3,162,326
2036	1,581,475	436,886	197,232	387,291	8,033	129,743	629,061	133,293	3,503,014
2037	1,746,651	482,516	217,831	427,742	8,872	143,293	694,763	147,214	3,868,882
2038	1,924,034	531,519	239,953	471,181	9,773	157,846	765,321	162,165	4,261,792
2039	2,114,533	584,144	263,711	517,833	10,740	173,474	841,095	178,221	4,683,751
2040	2,319,117	640,661	289,226	567,934	11,779	190,258	922,472	195,464	5,136,911
2041	2,457,107	678,781	306,435	601,727	12,480	201,579	977,360	207,094	5,442,563
2042	2,516,096	695,077	313,792	616,173	12,780	206,418	1,000,824	212,066	5,573,226
2043	2,579,443	712,577	321,692	631,686	13,102	211,615	1,026,022	217,405	5,713,542
2044	2,647,476	731,371	330,177	648,347	13,447	217,196	1,053,083	223,139	5,864,236
2045	2,720,538	751,555	339,288	666,239	13,818	223,190	1,082,145	229,297	6,026,070
Totals	**32,405,169**	**8,952,002**	**4,041,368**	**7,935,781**	**164,595**	**2,658,488**	**12,889,764**	**2,731,228**	**71,778,395**

Source: GEL Oregon, Inc.

Table 27. Estimated Foregone Property Tax Revenue – Government, Fiscal Years 2022-2045 (assuming no urban renewal district created, i.e., 1.0% projected growth in TAV annually)

Fiscal Year Ending June 30	City of Redmond	Deschutes County	County Library	Countywide Law Enforcement	County Extension - 4H	9-1-1	Redmond Fire & Rescue	Redmond Park & Recreation	Total General Government
2022	77,089	21,296	9,614	18,878	392	6,324	30,663	6,497	170,753
2023	191,010	52,767	23,822	46,777	970	15,670	75,978	16,099	423,093
2024	255,773	70,658	31,898	62,637	1,299	20,983	101,738	21,557	566,543
2025	298,264	82,396	37,198	73,043	1,515	24,469	118,640	25,139	660,664
2026	340,605	94,093	42,478	83,412	1,730	27,943	135,482	28,708	754,451
2027	379,273	104,775	47,301	92,881	1,926	31,115	150,863	31,967	840,101
2028	419,440	115,871	52,310	102,718	2,130	34,410	166,840	35,352	929,071
2029	461,177	127,401	57,515	112,939	2,342	37,835	183,442	38,870	1,021,521
2030	504,537	139,380	62,923	123,557	2,563	41,392	200,689	42,524	1,117,565
2031	549,591	151,826	68,542	134,591	2,792	45,088	218,610	46,322	1,217,362
2032	596,391	164,754	74,378	146,052	3,029	48,927	237,226	50,266	1,321,023
2033	645,017	178,187	80,442	157,960	3,276	52,917	256,568	54,364	1,428,731
2034	695,530	192,142	86,742	170,330	3,533	57,061	276,660	58,622	1,540,620
2035	748,015	206,641	93,288	183,183	3,799	61,366	297,537	63,046	1,656,875
2036	802,546	221,705	100,088	196,537	4,076	65,840	319,228	67,642	1,777,662
2037	859,202	237,357	107,154	210,412	4,364	70,488	341,764	72,417	1,903,158
2038	918,068	253,618	114,496	224,828	4,663	75,317	365,179	77,378	2,033,547
2039	979,214	270,510	122,121	239,802	4,974	80,334	389,501	82,532	2,168,988
2040	1,042,742	288,060	130,044	255,360	5,296	85,545	414,770	87,886	2,309,703
2041	1,108,748	306,294	138,276	271,524	5,632	90,960	441,025	93,449	2,455,908
2042	1,177,325	325,239	146,829	288,318	5,980	96,586	468,303	99,229	2,607,809
2043	1,248,570	344,920	155,714	305,765	6,342	102,431	496,642	105,234	2,765,618
2044	1,322,593	365,369	164,946	323,893	6,718	108,504	526,086	111,473	2,929,582
2045	1,399,497	386,614	174,536	342,726	7,108	114,813	556,676	117,955	3,099,925
Totals	**17,020,217**	**4,701,873**	**2,122,655**	**4,168,123**	**86,449**	**1,396,318**	**6,770,110**	**1,434,528**	**37,700,273**

Source: GEL Oregon

Table 28. Estimated Foregone Property Tax Revenue – Education, Fiscal Years 2022-2045 (assuming urban renewal district created)

Fiscal Year Ending June 30	Central Oregon Community College	High Desert ESD	Redmond School District #2J	Total Education
2022	10,845	1,685	87,839	100,369
2023	26,871	4,175	217,647	248,693
2024	40,137	6,237	325,099	371,473
2025	50,896	7,908	412,244	471,048
2026	62,196	9,664	503,771	575,631
2027	73,583	11,434	596,007	681,024
2028	85,812	13,334	695,057	794,203
2029	98,944	15,374	801,428	915,746
2030	113,049	17,566	915,669	1,046,284
2031	128,195	19,919	1,038,351	1,186,465
2032	144,462	22,447	1,170,110	1,337,019
2033	161,931	25,161	1,311,606	1,498,698
2034	180,692	28,077	1,463,566	1,672,335
2035	200,840	31,207	1,626,760	1,858,807
2036	222,477	34,569	1,802,016	2,059,062
2037	245,714	38,180	1,990,226	2,274,120
2038	270,667	42,057	2,192,346	2,505,070
2039	297,466	46,221	2,409,410	2,753,097
2040	326,247	50,693	2,642,524	3,019,464
2041	345,659	53,710	2,799,757	3,199,126
2042	353,957	54,999	2,866,972	3,275,928
2043	362,869	56,384	2,939,154	3,358,407
2044	372,439	57,871	3,016,673	3,446,983
2045	382,717	59,468	3,099,924	3,542,109
Totals	**4,558,665**	**708,340**	**36,924,156**	**42,191,161**

Source: GEL Oregon

Note: The difference between the forecast tax collections ($110.6 million) and the foregone tax revenue (levies) of $114.0 million, or $3.4 million is due to discounts taken by taxpayers paying taxes in November of the levy year, approximately 2.5%, with the exception of fiscal years 2043-44 through fiscal year 2044-45, when delinquent tax collections are not fully collected or recognized until after those years.

Table 29. Estimated Foregone Property Tax Revenue – Education, Fiscal Years 2022-2045 (assuming no urban renewal district created, i.e., 1.0% projected growth in TAV annually)

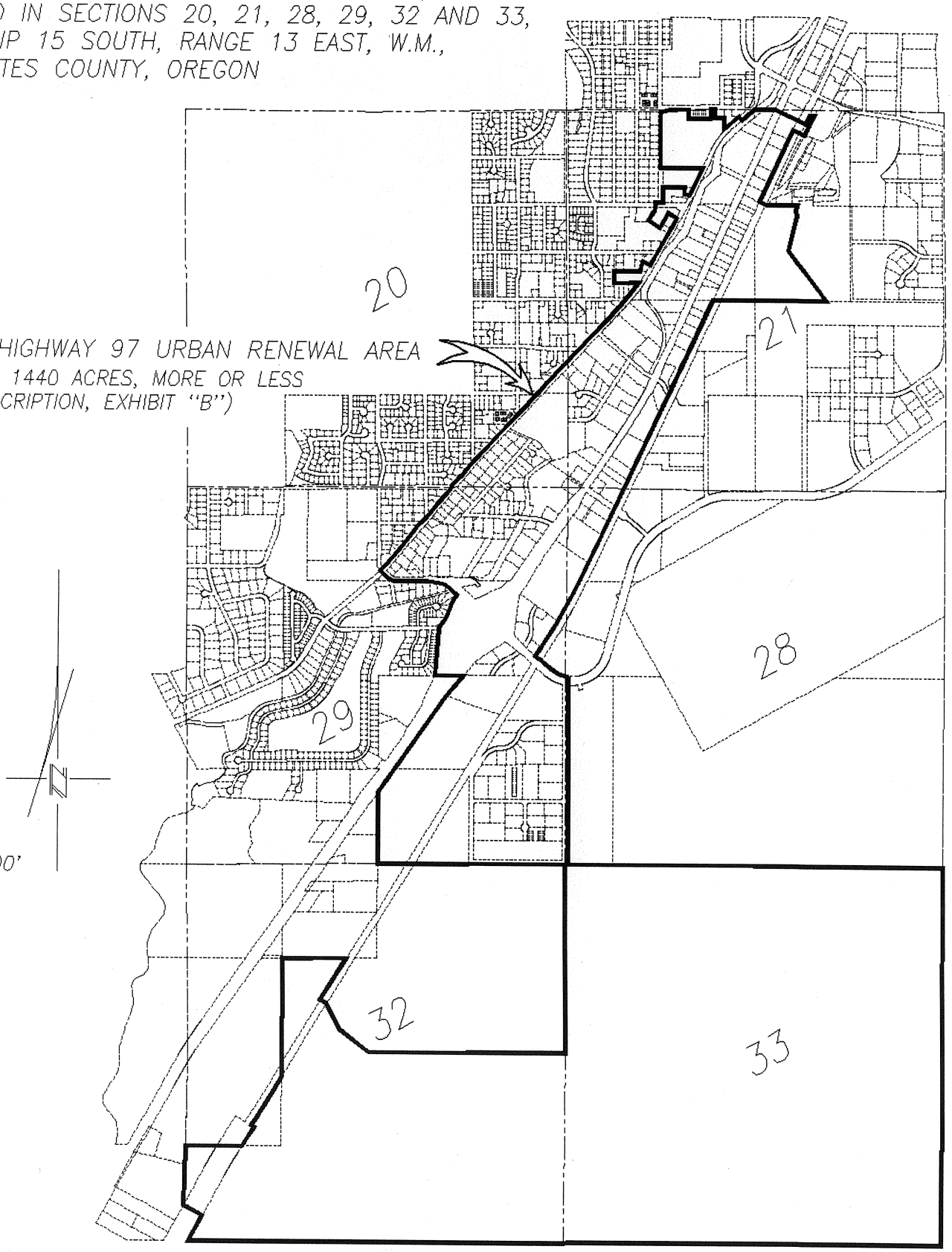
Fiscal Year Ending June 30	Central Oregon Community College	High Desert ESD	Redmond School District #2J	Total Education
2022	10,845	1,685	87,839	100,369
2023	26,871	4,175	217,647	248,693
2024	35,981	5,591	291,441	333,013
2025	41,959	6,520	339,858	388,337
2026	47,915	7,445	388,104	443,464
2027	53,355	8,290	432,164	493,809
2028	59,006	9,169	477,932	546,107
2029	64,877	10,081	525,490	600,448
2030	70,977	11,029	574,897	656,903
2031	77,315	12,013	626,233	715,561
2032	83,899	13,036	679,559	776,494
2033	90,739	14,099	734,966	839,804
2034	97,845	15,204	792,524	905,573
2035	105,229	16,351	852,327	973,907
2036	112,900	17,543	914,463	1,044,906
2037	120,870	18,781	979,020	1,118,671
2038	129,151	20,068	1,046,095	1,195,314
2039	137,753	21,405	1,115,768	1,274,926
2040	146,690	22,793	1,188,155	1,357,638
2041	155,975	24,236	1,263,365	1,443,576
2042	165,623	25,735	1,341,506	1,532,864
2043	175,645	27,292	1,422,686	1,625,623
2044	186,059	28,910	1,507,033	1,722,002
2045	196,877	30,591	1,594,660	1,822,128
Totals	**2,394,356**	**372,042**	**19,393,732**	**22,160,130**

Source: GEL Oregon

APPENDIX F: LEGAL DESCRIPTION OF URBAN RENEWAL BOUNDARY

EXHIBIT "A"

SOUTH HIGHWAY 97 URBAN RENEWAL AREA,
LOCATED IN SECTIONS 20, 21, 28, 29, 32 AND 33,
TOWNSHIP 15 SOUTH, RANGE 13 EAST, W.M.,
DESCHUTES COUNTY, OREGON



SOUTH HIGHWAY 97 URBAN RENEWAL AREA
CONTAINS 1440 ACRES, MORE OR LESS
(SEE DESCRIPTION, EXHIBIT "B")

SCALE:
1" = 2000'

PREPARED JULY 3, 2020

POVEY AND ASSOC. LAND SURVEYORS
P.O. BOX 131, REDMOND, OR 97756
(541) 548-6778 20-078D.DWG

EXHIBIT "B"

DESCRIPTION –
SOUTH HIGHWAY 97 URBAN RENEWAL AREA,
LOCATED IN SECTIONS 20, 21, 28, 29, 32 AND 33,
TOWNSHIP 15 SOUTH, RANGE 13 EAST, W.M.,
DESCHUTES COUNTY, OREGON

DESCRIPTION OF A TRACT OF LAND LOCATED IN SECTIONS 20, 21, 28, 29, 32 AND 33, TOWNSHIP 15 SOUTH, RANGE 13 EAST, WILLAMETTE MERIDIAN, DESCHUTES COUNTY, OREGON, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEAST CORNER OF SAID SECTION 33; THENCE WEST ALONG THE SOUTH LINE OF SAID SECTION 33, 5296 FEET TO THE SOUTHWEST CORNER OF SAID SECTION 33; THENCE WEST ALONG THE SOUTH LINE OF SAID SECTION 32, 5232 FEET TO THE SOUTHEAST RIGHT–OF–WAY LINE OF THE BURLINGTON NORTHERN – SANTA FE (BNSF) RAILROAD, BEING 100 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N29°E ALONG SAID SOUTHEAST RIGHT–OF–WAY LINE, 406 FEET; THENCE N61°W, PERPENDICULAR TO SAID CENTERLINE, 300 FEET THE INTERSECTION OF THE NORTHWEST RIGHT–OF–WAY LINE OF SAID RAILWAY AND THE WEST LINE OF THE SW1/4 SW1/4 OF SAID SECTION 32, SAID INTERSECTION BEING 200 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N01°E ALONG SAID WEST LINE, 817 FEET TO THE NORTH LINE OF SAID SW1/4 SW1/4; THENCE EAST ALONG SAID NORTH LINE, 793 FEET TO SAID SOUTHEAST RIGHT–OF–WAY LINE, BEING 100 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N32°E ALONG SAID SOUTHEAST RIGHT–OF–WAY LINE, 310 FEET; THENCE N58°W ALONG SAID SOUTHEAST RIGHT–OF–WAY LINE, 50 FEET; THENCE N32°E ALONG SAID SOUTHEAST RIGHT–OF–WAY LINE, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY, 802 FEET TO THE WEST LINE OF THE NE1/4 SW1/4 OF SAID SECTION 32; THENCE N01°E ALONG SAID WEST LINE, 348 FEET; THENCE NORTH ALONG THE WEST LINE OF THE SE1/4 NW1/4 OF SAID SECTION 32, 1315 FEET TO THE NORTH LINE OF SAID SE1/4 NW1/4; THENCE EAST ALONG SAID NORTH LINE, 902 FEET TO SAID NORTHWEST RIGHT–OF–WAY LINE, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE S32°W ALONG SAID NORTHWEST RIGHT–OF–WAY LINE, 695 FEET; THENCE S58°E, PERPENDICULAR TO SAID CENTERLINE, 100 FEET TO THE INTERSECTION OF THE SOUTHEAST RIGHT–OF–WAY LINE OF SAID RAILWAY, AND THE NORTHEAST EASEMENT LINE OF BONNEVILLE POWER ADMINISTRATION'S REDMOND–BURNS NO. 1 TRANSMISSION LINE, SAID INTERSECTION BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY, AND BEING 50 FEET FROM THE CENTERLINE OF SAID POWER LINE; THENCE S27°E ALONG SAID NORTHEAST EASEMENT LINE, 417 FEET; THENCE S53°E ALONG SAID NORTHEAST EASEMENT LINE, 507 FEET TO THE SOUTH LINE OF SAID SE1/4 NW1/4; THENCE EAST ALONG SAID SOUTH LINE, AND ALONG THE SOUTH LINE OF THE NE1/4 OF SAID SECTION 32, 2750 FEET TO THE EAST LINE OF SAID NE1/4; THENCE NORTH ALONG SAID EAST LINE, 2649 FEET TO THE SOUTHEAST CORNER OF SAID SECTION 29; THENCE WEST ALONG THE SOUTH LINE OF THE SE1/4 OF SAID SECTION 29, 2634 FEET TO THE

WEST LINE OF THE SW1/4 OF SAID SE1/4; THENCE NORTH ALONG SAID WEST LINE, 992 FEET TO THE SOUTHEAST RIGHT-OF-WAY LINE OF U.S. HIGHWAY 97, BEING 90 FEET FROM THE CENTERLINE OF SAID HIGHWAY; THENCE N35°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 1659 FEET TO ENGINEER'S STATION 125+00, 90 FEET LEFT; THENCE N41°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 376 FEET TO THE NORTH LINE OF THE NW1/4 SE1/4 OF SAID SECTION 29; THENCE WEST ALONG SAID NORTH LINE, 401 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF SAID HIGHWAY (ALSO BEING THE NORTHWEST RIGHT-OF-WAY LINE OF SW 25TH PLACE), AS DESCRIBED IN VOLUME 234, PAGE 1995, DESCHUTES COUNTY DEED RECORDS; THENCE ALONG SAID NORTHWEST RIGHT-OF-WAY LINE AS FOLLOWS: N05°E, 670 FEET; THENCE N33°E, 175 FEET; THENCE N23°E, 255 FEET; THENCE N35°E, 91 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF SW YEW AVENUE, BEING A LINE OF VARIABLE WIDTH FROM THE CENTERLINE OF SAID ROADWAY; THENCE LEAVING SAID NORTHWEST RIGHT-OF-WAY LINE, AND 1190 FEET WESTERLY ALONG SAID SOUTH RIGHT-OF-WAY LINE, AND ALONG ITS NORTHWESTERLY PROLONGATION, TO A POINT WHICH BEARS N73°W, 1131 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING ON THE NORTHWEST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, AND BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE 5459 FEET NORTHEASTERLY ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, TO A POINT WHICH BEARS N42°E, 5449 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING 40 FEET FROM THE CENTERLINE OF SAID ROADWAY, AND BEING ON THE SOUTH BOUNDARY OF A TRACT OF LAND DESCRIBED IN DOCUMENT 2007-43829, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG SAID TRACT BOUNDARY AS FOLLOWS: WEST, 345 FEET; THENCE NORTH, 170 FEET; THENCE EAST, 367 FEET TO THE BOUNDARY OF PARCEL 2, AS DESCRIBED IN DOCUMENT NO. 2018-019368, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE LEAVING SAID TRACT BOUNDARY AND ALONG SAID PARCEL 2 BOUNDARY AS FOLLOWS: N13°E, 122 FEET; THENCE N37°E, 30 FEET; THENCE S61°E, 107 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE LEAVING SAID PARCEL 2 BOUNDARY, N30°E ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, 751 FEET TO THE BOUNDARY OF A TRACT OF LAND DESCRIBED IN DOCUMENT 2007-64854, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY OF SAID TRACT AS FOLLOWS: N59°W, 136 FEET; THENCE S31°W, 239 FEET; THENCE N56°W, 184 FEET; THENCE 214 FEET ALONG THE ARC OF A NON-TANGENT 658 FOOT RADIUS CURVE TO THE LEFT, THE CHORD OF WHICH BEARS N28°E, 213 FEET; THENCE LEAVING SAID TRACT BOUNDARY, NORTH, PERPENDICULAR TO THE NORTH LINE OF SAID TRACT, 60 FEET TO THE NORTH RIGHT-OF-WAY LINE OF SW QUARTZ AVENUE, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE EAST ALONG SAID NORTH RIGHT-OF-WAY LINE, 105 FEET TO THE BOUNDARY OF A TRACT OF LAND DESCRIBED IN DOCUMENT 2020-06416, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY OF SAID TRACT AS FOLLOWS: NORTH 214 FEET; THENCE S89°E, 304 FEET; THENCE S01°W, 96 FEET; THENCE S83°E, 74 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF

SOUTH HIGHWAY 97 URBAN RENEWAL AREA,
CONTINUED:

SW CANAL BOULEVARD, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE LEAVING SAID TRACT BOUNDARY, AND 422 FEET NORTHEASTERLY ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, TO A POINT WHICH BEARS N26°E, 422 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING AT THE SOUTHEAST CORNER OF TRACT 1, AS DESCRIBED IN DOCUMENT 2020-10963, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE WEST ALONG THE SOUTH LINE OF SAID TRACT 1, 591 FEET TO THE WEST LINE OF SAID TRACT 1; THENCE NORTH ALONG SAID WEST LINE, AND ALONG THE WEST LINE OF TRACT 2, AS DESCRIBED IN SAID DOCUMENT, 782 FEET TO THE NORTH LINE OF SAID TRACT 2; THENCE N74°E ALONG SAID NORTH LINE, 135 FEET; THENCE EAST ALONG SAID NORTH LINE, 265 FEET TO THE EAST LINE OF SAID TRACT 2; THENCE SOUTH ALONG SAID EAST LINE, 125 FEET TO THE NORTH LINE OF SAID TRACT 1; THENCE EAST ALONG SAID NORTH LINE, 312 FEET TO THE WEST RIGHT-OF-WAY LINE OF SW 13TH STREET, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE NORTH ALONG SAID WEST RIGHT-OF-WAY LINE, 125 FEET TO THE NORTH LINE OF THE NE1/4 NW1/4 OF SAID SECTION 21; THENCE EAST ALONG SAID NORTH LINE, 60 FEET TO THE EAST RIGHT-OF-WAY LINE OF SW 13TH STREET, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE SOUTH ALONG SAID EAST RIGHT-OF-WAY LINE, 120 FEET TO THE NORTH LINE OF SAID TRACT 1; THENCE EAST ALONG SAID NORTH LINE, 130 FEET TO THE EAST LINE OF SAID TRACT 1; THENCE SOUTH ALONG SAID EAST LINE, 159 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, BEING 40 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE N49°E ALONG SAID NORTHWEST RIGHT-OF-WAY LINE, 280 FEET TO THE SOUTH LINE OF THE NORTH 96 FEET OF SAID NE1/4 NW1/4; THENCE S41°E, PERPENDICULAR TO SAID CENTERLINE, 70 FEET TO THE SOUTHEAST RIGHT-OF-WAY LINE OF SW CANAL BOULEVARD, BEING 30 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE N49°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 228 FEET TO THE NORTH LINE OF THE NW1/4 NE1/4 OF SAID SECTION 21; THENCE EAST ALONG SAID NORTH LINE, 294 FEET TO THE PROLONGATION OF THE NORTHEAST LINE OF A TRACT OF LAND DESCRIBED IN VOLUME 279, PAGE 0839, DESCHUTES COUNTY DEED RECORDS; THENCE S65°E ALONG SAID PROLONGATION, AND ALONG SAID NORTHEAST LINE, 351 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE S65°E ALONG SAID PROLONGATION, 100 FEET TO THE SOUTHEAST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE N26°E ALONG SAID SOUTHEAST RIGHT-OF-WAY LINE, 126 FEET TO THE NORTH LINE OF THE FIRST EXCEPTION TO PARCEL 1, AS DESCRIBED IN DOCUMENT NO. 2018-005171, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE EAST ALONG SAID NORTH LINE, 67 FEET TO THE NORTHWEST LINE OF A TRACT OF LAND DESCRIBED IN DOCUMENT NO. 2009-52569, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE S26°W ALONG SAID NORTHWEST LINE, 306 FEET TO THE SOUTHEAST LINE OF SAID TRACT; THENCE N64°W, PERPENDICULAR TO SAID RAILWAY CENTERLINE, 160 FEET TO SAID NORTHWEST RIGHT-OF-WAY LINE; THENCE S26°W ALONG SAID

SOUTH HIGHWAY 97 URBAN RENEWAL AREA,
CONTINUED:

NORTHWEST RIGHT-OF-WAY LINE, 1110 FEET; THENCE S64°E, PERPENDICULAR TO SAID CENTERLINE, 100 FEET TO THE NORTHWEST CORNER OF PARCEL 4, AS DESCRIBED IN DOCUMENT NO. 2014-042282, DESCHUTES COUNTY OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY OF SAID PARCEL 4 AS FOLLOWS: EAST, 449 FEET; THENCE S14°W, 73 FEET; THENCE S04°E, 82 FEET; THENCE S13°W, 501 FEET; THENCE S36°E, 859 FEET; THENCE WEST, 996 FEET TO THE CENTER 1/4 CORNER OF SAID SECTION 21; THENCE LEAVING SAID TRACT BOUNDARY, WEST ALONG THE SOUTH LINE OF THE SE1/4 NW1/4 OF SAID SECTION 21, 588 FEET TO THE NORTHWEST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD, BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY; THENCE 5602 FEET SOUTHWESTERLY ALONG SAID NORTHWEST RIGHT-OF-WAY LINE TO A POINT WHICH BEARS S27°W, 5599 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING ON THE NORTHEAST RIGHT-OF-WAY LINE OF SW AIRPORT WAY, AND BEING 55 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE S52°E, 101 FEET TO THE INTERSECTION OF THE SOUTHEAST RIGHT-OF-WAY LINE OF THE BNSF RAILROAD AND THE NORTHEAST RIGHT-OF-WAY LINE OF SW AIRPORT WAY, SAID INTERSECTION BEING 50 FEET FROM THE CENTERLINE OF SAID RAILWAY, AND BEING 60 FEET FROM THE CENTERLINE OF SAID ROADWAY; THENCE 444 FEET SOUTHEASTERLY ALONG SAID NORTHEAST RIGHT-OF-WAY LINE TO A POINT WHICH BEARS S60°E, 434 FEET FROM THE END OF THE PREVIOUS COURSE, SAID POINT BEING ON THE EAST LINE OF THE WEST 40 FEET OF THE SW1/4 OF SAID SECTION 28; THENCE SOUTH ALONG SAID EAST LINE (ALSO BEING THE EAST RIGHT-OF-WAY LINE OF SW 19TH STREET), 2624 FEET TO THE NORTH LINE OF SAID SECTION 33; THENCE EAST ALONG SAID NORTH LINE, 5246 FEET TO THE NORTHEAST CORNER OF SAID SECTION 33; THENCE SOUTH ALONG THE EAST LINE OF SAID SECTION 33, 5268 FEET TO THE SOUTHEAST CORNER OF SAID SECTION 33, AND TO THE POINT OF BEGINNING.

THE SAME CONTAINING 1440 ACRES, MORE OR LESS.

A SKETCH OF THE URBAN RENEWAL AREA DESCRIBED ABOVE IS SHOWN ON THE ATTACHED EXHIBIT "A", WHICH IS HEREBY INCORPORATED BY REFERENCE.

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JULY 15, 1983
WILLIAM G. BAHRKE
2039

Renewal Date: 12/31/21

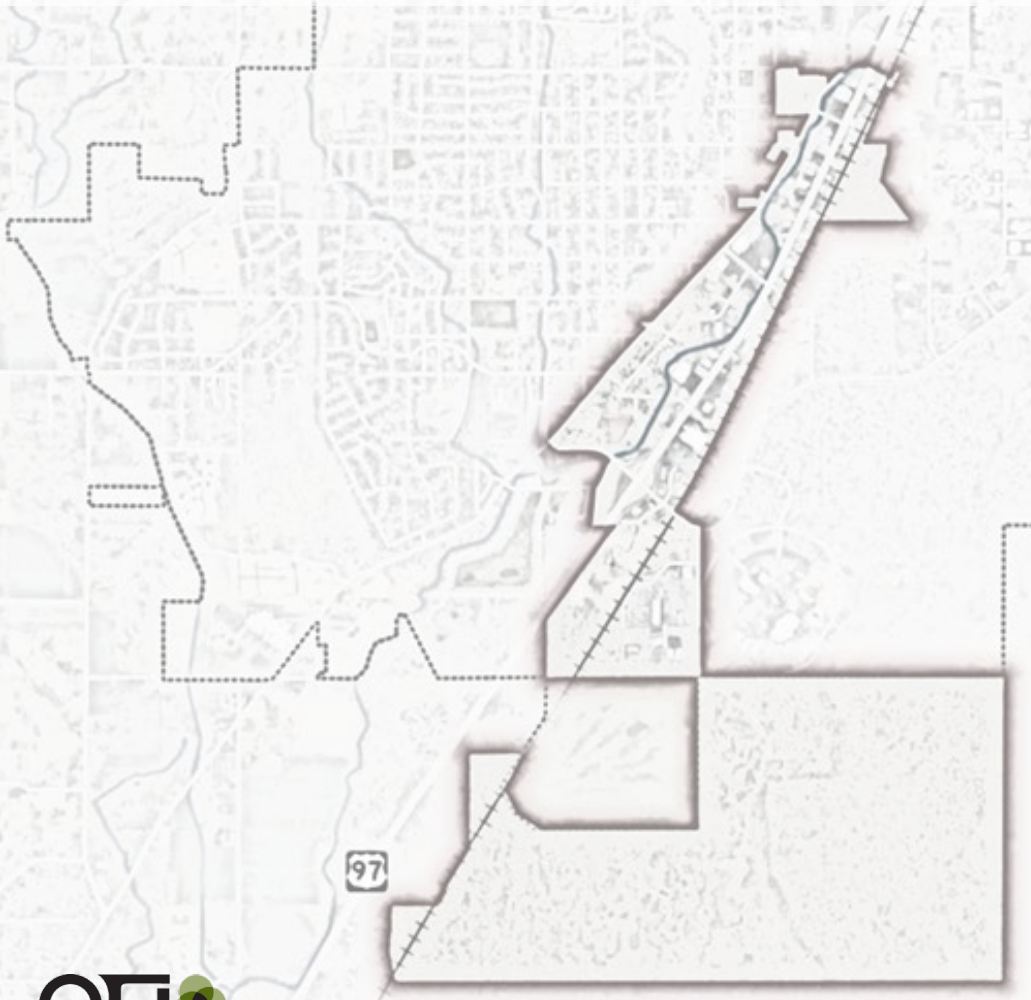
PREPARED JULY 3, 2020

POVEY AND ASSOC. LAND SURVEYORS
P.O. BOX 131, REDMOND, OR 97756
(541) 548-6778 20-078D.DWG

APPENDIX G: URBAN RENEWAL FEASIBILITY STUDY

City of Redmond
May 2020

Feasibility Study
SOUTH 97 URBAN RENEWAL PROJECT



GEL OREGON inc
LELAND CONSULTING GROUP
www.lelandconsulting.com

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INTRODUCTION

The urban renewal agency for the City of Redmond is considering an opportunity to create a new urban renewal district along US 97 to facilitate the use of tax increment financing (TIF) to primarily support infrastructure and capital investments required to implement the South U.S. 97 Framework Implementation Plan adopted by City Council in 2019.

One of the first steps in the creation of an urban renewal district is to conduct a feasibility study to determine whether physical and economic conditions are present that meet the eligibility criteria established in ORS 457.095(1), ORS 457.085(3)(a), and ORS 457.010(1):

- ✓ ORS 457.095(1) requires the municipal governing body find conditions of blight within the TIF district.
- ✓ ORS 457.085(3)(a) requires that a TIF report accompanying a TIF plan describe the physical, social, and economic conditions in the TIF areas of the plan.
- ✓ ORS 457.010(1) defines blighted areas.

To meet this requirement, the City of Redmond engaged Leland Consulting Group (LCG) to analyze existing conditions in the proposed urban renewal area (the Study Area).

Background

Why an Urban Renewal Area?

An urban renewal area facilitates the use of tax increment financing, which allows, within limits, the property tax revenues on growth in assessed value to be used to fund capital projects. These public resources are directed to a specific area to encourage and catalyze private investment that might not otherwise occur.

For the proposed urban renewal area, urban renewal provides the City with the mechanism to fund important safety, mobility, and connectivity improvements along South Highway 97 while also improving the economic viability of development for current and future developers, property owners, and business owners.

Specifically, an urban renewal area is critical to implementing the recommendations from the South Redmond US 97 Corridor Plan—a recently completed study for the Oregon Department of Transportation and the City of Redmond. The Corridor Plan includes recommended transportation and other related improvements on South Highway 97 and local connecting streets and suggests tax increment as a logical source of funding for the local improvements which can help leverage state and federal dollars for nearly $100 million required to transform the corridor. The overall objectives of the Corridor Plan are to improve the safety and mobility of U.S. 97 and enhance the economic viability of properties along the corridor.

The proposed boundary also includes nearly 1,000 acres of industrially zoned land which has multiple infrastructure needs (water, transportation, etc.) before it can be developed. The land presents a rare opportunity for significant industrial development and employment growth. An urban renewal area provides the City of Redmond with the resources to invest in infrastructure projects and incentive and grant programs that are critical in realizing these opportunities. Specific programs can encourage workforce and economic development, remove barriers that may discourage development, and facilitate and accelerate the expansion and businesses and job growth in the City of Redmond to create a more vibrant economic landscape.

Similar tax increment funding was utilized by the City of Redmond for North Highway 97 and related improvements in the 2000s.

Purpose of the Feasibility Study

This feasibility study examines key data and assumptions underlying the financial capacity and public benefit of urban renewal district investments. The study determines whether a district as proposed in this feasibility study would comply with the basic requirements of the Oregon statute governing the formation of urban renewal areas, (ORS 457) and is feasible from a financial and policy standpoint.

The study documents the City's forecasted financial capabilities to implement recommendations from the South Redmond US 97 Corridor Plan, as well as other projects and programs that have been determined as critical to the economic viability of the area.

Issues Evaluated in the Study

The following is a schedule of legal requirements the consultants addressed in determining the feasibility of the Urban Renewal District:

- ✓ A boundary for the area has been established,
- ✓ Blighting conditions as defined in ORS 457 are documented,
- ✓ The value and area within the boundary are documented to ensure each is within limitations established by ORS 457,
- ✓ Eligibility of the use of tax increment funding for proposed project activities,
- ✓ Estimated project costs and tax increment revenue, and
- ✓ Estimated completion dates for all project activities.

Note: This feasibility report has no legal status as an urban renewal plan as defined in ORS 457. It is prepared purely for information purposes. The City of Redmond will have to take numerous procedural steps, all in conformance with ORS 457, in order to create an urban renewal district and an urban renewal plan that meet all ORS 457 requirements.

Process and Approach

The analysis summarized here is explicitly intended to provide an objective assessment of conditions within the proposed urban renewal area. This documentation is intended to provide RURA and City leadership with evidence to aid those bodies in their official decision as to whether the Study Area constitutes a deteriorated area or deteriorating area eligible to be designated as an urban renewal project area.

Evidence of Study Area conditions was gathered using the following methods:

- Direct field observation,
- Geographic information systems (GIS) analysis of spatial data (including Deschutes County Assessor's parcel data, aerial imagery, and topographical data),
- Follow-up web-based research, and
- Discussions with City of Redmond staff.

Both the field observations and GIS analysis initially employed a detailed mapping of individual parcels in the proposed district to help ensure a thorough and exhaustive survey of the entire area. Findings, however, are reported and mapped here using individual points and areas without direct reference to individual parcels. This approach balances a reasonable effort to respect the privacy of owners and residents while still preserving the specificity of evidence for purposes of reaching eligibility conclusions.

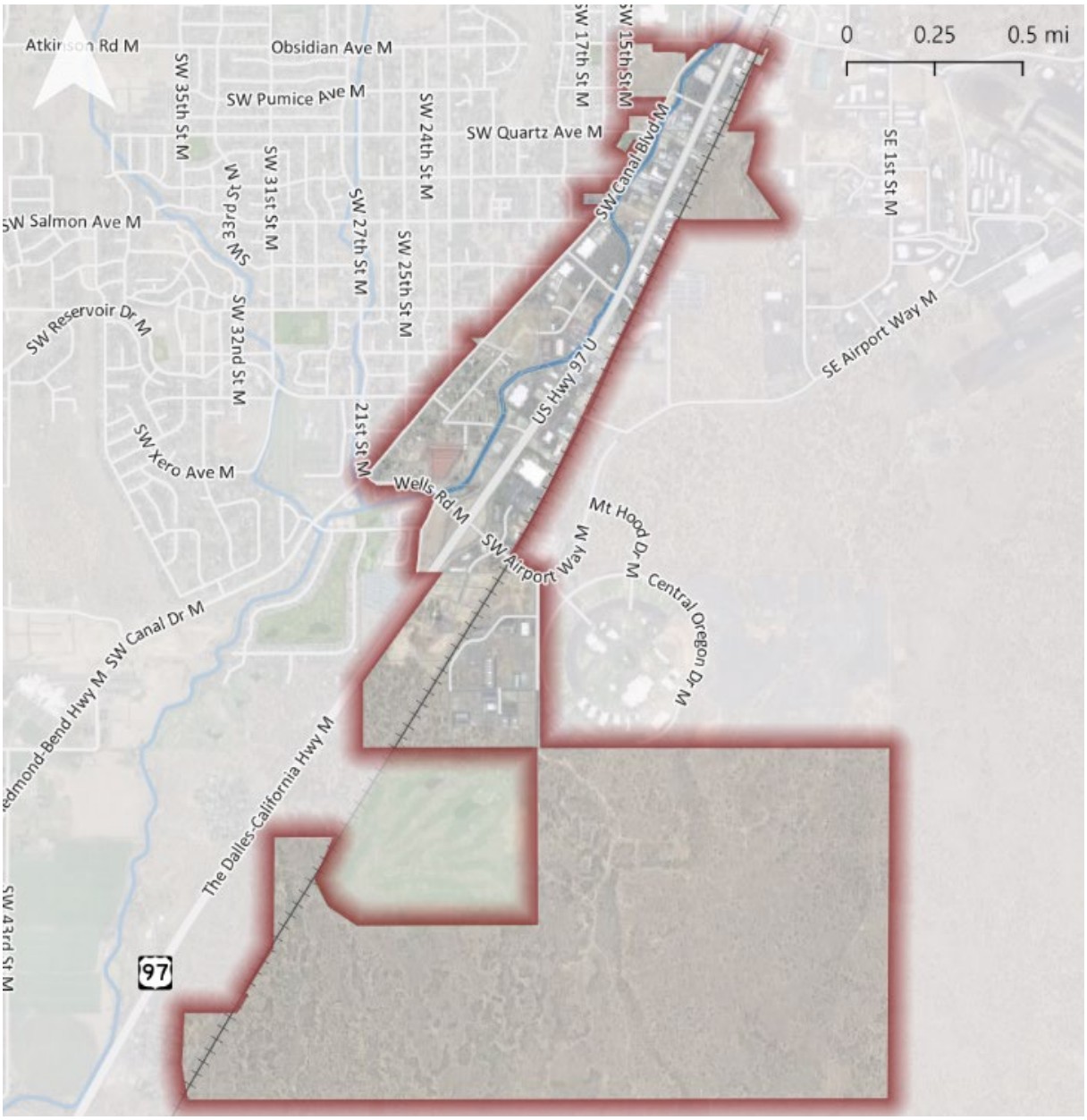
FEASIBILITY ANALYSIS AND FINDINGS

1. Boundary and Acreage Limitations

Study Area Geography

A preliminary urban renewal area boundary was determined by City staff prior to the commencement of this feasibility study. The acreage associated with that boundary is 1,330.5 acres (see proposed boundary below). The preliminary boundary was shown to representatives of overlapping taxing districts in initial meetings for their review and comment. As of the date of this report, no changes have been requested.

Figure 1. Proposed District Boundary



Source: Leland Consulting Group

ORS Requirements

ORS 457.420(2)(b)(B) essentially states that no more than 25 percent of the city's total land area can be designated as an urban renewal district (for Cities with populations of less than 50,000). As demonstrated in the following table, the City's current land area is approximately 10,449 acres. The Redmond Downtown Urban Renewal District includes 701.70 acres (6.7 percent of the total). The proposed South Highway 97 Urban Renewal District boundary includes 1,330.52 acres (12.7 percent of the total). The total of all acreage in urban renewal areas represents 19.45 percent of the City's land area and is, therefore, within the 25 percent limitation.

Table 1. Area Conditions

	Acres	% of Total
Total area within the City	10,449.0	
Redmond Downtown Urban Renewal District	701.7	6.7%
Proposed South Hwy 97 Urban Renewal District	1,330.5	12.7%
Total area within urban renewal districts	**2,032.2**	**19.5%**

Source: Deschutes County Assessor

Finding: The preliminary boundary for the proposed urban renewal area is within the ORS acreage limitation of 25% of land within the City.

2. Blighting Conditions

ORS Requirements

In order to form an urban renewal district, the City of Redmond must find that blighted areas exist within the urban renewal boundary. ORS 457.010 sets forth the definitions for "blighted areas" and blighting conditions as follows:

457.010 Definitions. As used in this chapter, unless the context requires otherwise:
(1)"Blighted areas" means areas that, by reason of deterioration, faulty planning, inadequate or improper facilities, deleterious land use or the existence of unsafe structures, or any combination of these factors, are detrimental to the safety, health or welfare of the community. A blighted area is characterized by the existence of one or more of the following conditions:

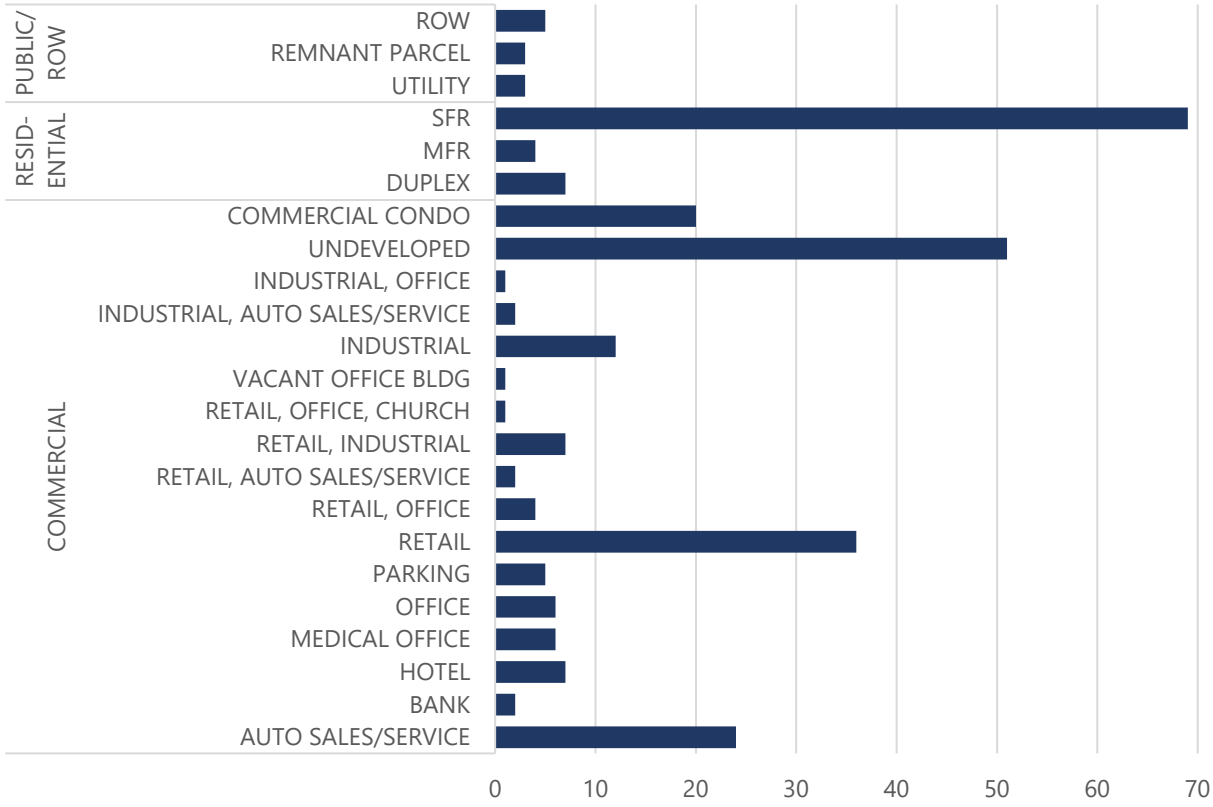
a) The existence of buildings and structures, used or intended to be used for living, commercial, industrial or other purposes, or any combination of those uses, that are unfit or unsafe to occupy for those purposes because of any one or a combination of the following conditions:
    A. Defective design and quality of physical construction;
    B. Faulty interior arrangement and exterior spacing;
    C. Overcrowding and a high density of population;
    D. Inadequate provision for ventilation, light, sanitation, open spaces and recreation facilities; or
    E. Obsolescence, deterioration, dilapidation, mixed character or shifting of uses;
b) An economic dislocation, deterioration or disuse of property resulting from faulty planning;
c) The division or subdivision and sale of property or lots of irregular form and shape and inadequate size or dimensions for property usefulness and development;
d) The laying out of property or lots in disregard of contours, drainage and other physical characteristics of the terrain and surrounding conditions;

e) The existence of inadequate streets and other rights of way, open spaces and utilities;
f) The existence of property or lots or other areas that are subject to inundation by water;
g) A prevalence of depreciated values, impaired investments and social and economic maladjustments to such an extent that the capacity to pay taxes is reduced and tax receipts are inadequate for the cost of public services rendered;
h) A growing or total lack of proper utilization of areas, resulting in a stagnant and unproductive condition of land potentially useful and valuable for contributing to the public health, safety and welfare; or
i) A loss of population and reduction of proper utilization of the area, resulting in its further deterioration and added costs to the taxpayer for the creation of new public facilities and services elsewhere.

Blighting Conditions Within Preliminary Boundary

The study area has the following land uses by parcel count.

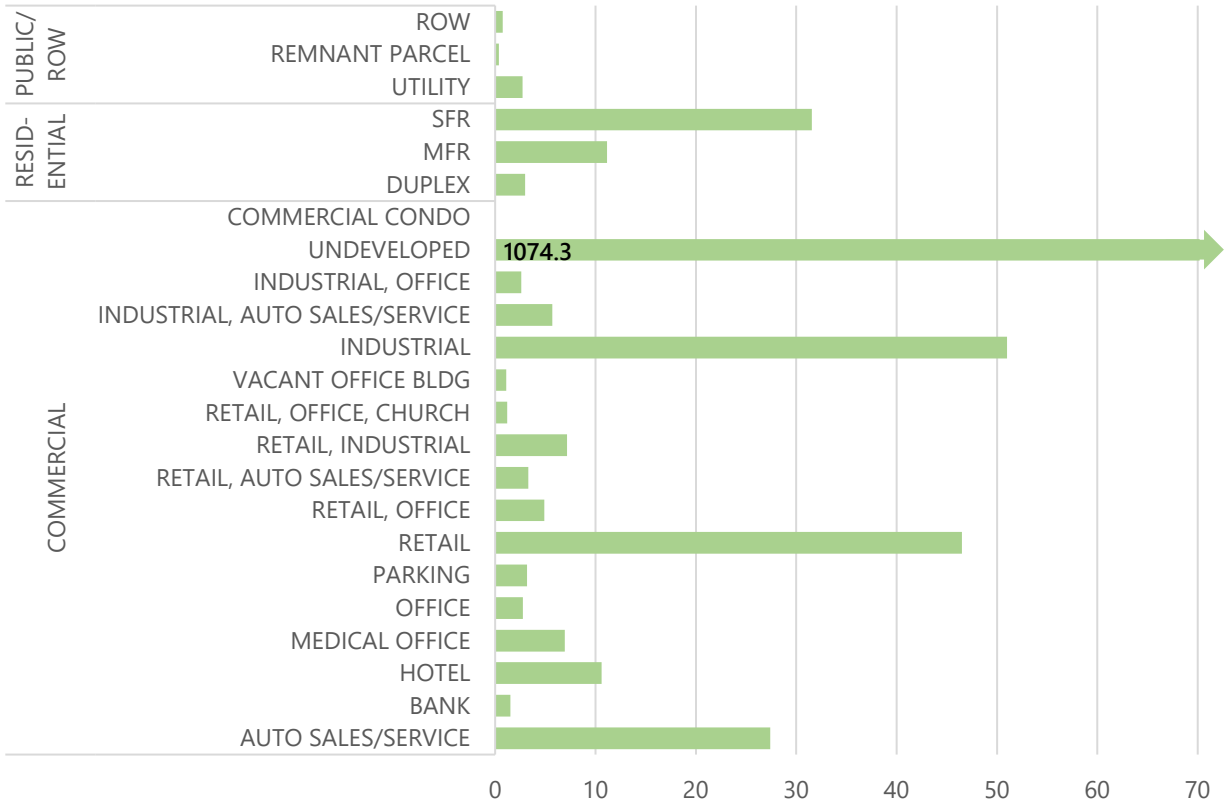
Figure 2. Parcels by Land Use (Total Lots)



Source: Deschutes County Assessor, LCG

Additionally, the study area includes the following uses by acres.

Figure 3. Parcels by Land Use (Acres)



Source: Deschutes County Assessor, LCG

The vast majority of acreage within the urban renewal study area is undeveloped, 1,074.3 acres (80.7%). This area is without streets, sidewalks, and utilities necessary for development. The four primary uses of developed acreage incudes industrial, retail, auto sales/service and single family residential.

The blight analysis reveals the following conditions that constitute blight within the preliminary boundary.

Value of Developed Properties Within the Area

Deschutes County assessor records indicate there are 283 tax accounts in the renewal study area. Of those, 14 accounts are shown in exempt property classes, and have no assessed value, including four accounts for canal purposes and a 948.97 acre parcel owned by the State of Oregon for large-lot industrial development.

The data shows, as the following table indicates, a total of 173 (61.1 percent of total) commercial or industrial property class accounts, and 88 (31.1 percent) residential class accounts.

Table 2. Parcel Summary

Property Class	Number of Parcels	% of Total	Assessed Value	% of Total
Residential	86	30.4	12,120,750	8.5
Commercial	118	41.7	104,849,416	73.6
Industrial	55	19.4	23,109,510	16.2
Multifamily	2	0.7	646,020	0.5
Municipal	12	4.2	1,804,290	1.3
Not Identified	10	3.5	0	0.0
Total	**283**	**100.0**	**142,529,986**	**100.0**

Source: Deschutes County Assessor

The data also shows 117 parcels are underutilized (46.2 percent), with the acreage underutilized at 1,181.5 acres (91.0 percent).

Utilization status was determined primarily by the improvement value to land value ratio (I:L ratio), and checked by in-person observation. An improvement value to land value ratio of less than 1.0 typically indicates underutilized property. Less than 0.5 typically indicates vacant or highly underutilized land.

Table 3. Site Utilization Status

Site Utilization (I:L Ratio by RMV*)	Not Underutilized	Underutilized
Parcels	136.0	117.0
% of Total	53.8%	46.2%
Acres	117.3	1,181.5
% of Total	9.0%	91.0%

Source: Deschutes County Assessor, Leland Consulting Group

Additionally, 77 parcels are vacant or partially vacant, representing 30.8 percent of the parcels, but 87.4 percent of the land area within the proposed boundary.

Development status was determined primarily through in-person observation and supported by aerial imagery analysis and tax roll data analysis.

Table 4. Site Development Status

Development Status	Vacant	Partially vacant	Improved
Parcels	60.0	17.0	173.0
% of Total	24.0%	6.8%	69.2%
Acres	1080.6	43.1	162.6
% of Total	84.0%	3.4%	12.6%

Source: Deschutes County Assessor, Leland Consulting Group

Within the study area, building occupancy is high, 95 percent with 192.8 acres of 203.0 acres fully occupied (95.0 percent) representing 177 of 187 parcels with buildings (94.7 percent).

Leland Consulting Group utilized Costar to determine existing long-time vacancies, as well as tax roll data and in-person observation.

Table 5. Building Occupancy Status

Building Occupancy	Vacant	Partially Vacant	Fully Occupied
Parcels	3.0	7.0	177.0
% of Total	1.6%	3.7%	94.7%
Acres	2.2	8.0	192.8
% of Total	1.1%	3.9%	95.0%

Source: Deschutes County Assessor, Leland Consulting Group

The above findings indicate a significant amount of potentially valuable property in the proposed renewal area appears to be under-developed, producing little property tax for the City, and other taxing bodies.

The diminished property taxes resulting from a preponderance of undeveloped and/or low-value development can lead to service issues for the community. Lower property values due to lack of development and utilization of the area for tax producing purposes meets the ORS definition of blight.

Building Exterior and Site Conditions

Building conditions in the proposed area are generally in average to good condition, 91.4 percent of parcels and 84.0 percent of developed acreage. Fair and seriously substandard buildings represent 15 parcels, 8.0 percent of the total parcels and 15.8 percent of the developed acreage.

Table 6. District Building Conditions

Building Exterior Condition	Average to Good	Fair (Repair/ Maintain)	Seriously Substandard
Parcels	171.0	15.0	1.0
% of Total	91.4%	8.0%	0.5%
Acres	170.5	32.2	0.3
% of Total	84.0%	15.8%	0.2%

Source: Deschutes County Assessor, LCG

Additionally, site conditions of parcels for a significant majority of the proposed urban renewal area are poor or substandard (1,053.7 acres, 81.1 percent of the area). Less than 20 percent (18.9 percent) of the area, 200 parcels, have acceptable site conditions.

Table 7. District Site Conditions

Site Condition	OK / Acceptable	Poor / Substandard
Parcels	200.0	53.0
% of Total	79.1%	20.9%
Acres	245.2	1053.7
% of Total	18.9%	81.1%

Source: Deschutes County Assessor, LCG

Substandard or Inadequate Public Facilities

As noted above, the vast majority of the area is undeveloped, therefore much of the proposed urban renewal area is without sidewalks. The developed parcels have sidewalks that are in good condition, 145, with only 11 parcels that have sidewalks the require repair and or replacement. However, only 14.8% (190.0 acres) of the area

has good condition sidewalks, with 85.2% (1,096.2 acres) having no sidewalks or have sidewalks that require repair or replacement.

Table 8. District Sidewalk Conditions

Sidewalk Condition	Good Condition	No Sidewalk	Repair / Replace
Parcels	145.0	94.0	11.0
% of Total	58.0%	37.6%	4.4%
Acres	190.0	1078.3	17.9
% of Total	14.8%	83.8%	1.4%

Source: Deschutes County Assessor, LCG

Findings: The conditions within the preliminary boundary area meet the ORS definition of blight.

3. Assessed Value Limitations

ORS Requirements

Oregon urban renewal law limits the total assessed valuation in cities under 50,000 population to 25% of the total assessed value in the city.

Assessed Value Conditions

The tax roll for the 2019-20 year shows that Redmond contains approximately $2.549 million in assessed value. This value allows area within urban renewal areas to total approximately $637.1 million in assessed value.

Table 9. Assessed Value

	Assessed Value	% of Total
Total assessed value City of Redmond	$2,548,546,802	100.0%
Assessed value Downtown Urban Renewal District	$288,796,593	11.3%
Assessed value Preliminary Urban Renewal Boundary Area	$142,529,986	5.6%
Total assessed valued within urban renewal areas	**$431,326,579**	16.9%

Source: Deschutes County Assessor

Finding: The combined assessed value of the Downtown Urban District ($288.8 million, 11.3 percent) and the preliminary urban renewal study area boundary ($142.5 million, 5.6 percent) is $431.3 million, or 16.9% of the total assessed value in the City of Redmond. The total combined assed value within the urban renewal boundaries is within the 25 percent assessed value limit.

4. Eligibility of Proposed Activities

ORS Requirements

ORS 457.170 provides for the activities that an urban renewal agency may plan or undertake consistent with an approved urban renewal plan. ORS 457.170 includes the following authorized activities:

- To carry out any work or undertaking and exercise any powers which a housing authority is authorized to perform or exercise under ORS 456.055 to 456.235, subject to the provisions of this chapter

provided, however, that ORS 456.155 and 456.160 do not limit the power of the agency in the event of a default by a purchaser or lessee of land in an urban renewal plan to acquire property and operate it free from the restrictions in those sections.

- To carry out any rehabilitation or conservation work in an urban renewal area.
- To acquire real property, by condemnation if necessary, when needed to carry out the plan.
- To clear any areas acquired, including the demolition, removal or rehabilitation of buildings and improvements.
- To install, construct or reconstruct streets, utilities, and site improvements in accordance with the urban renewal plan.
- To carry out plans for a program of the voluntary repair and rehabilitation of buildings or other improvements in an urban renewal area in accordance with the urban renewal plan.
- To assist in relocating persons living in, and property situated in, the urban renewal area in accordance with the approved urban renewal plan and to make relocation payments.
- To dispose of, including by sale or lease, any property or part thereof acquired in the urban renewal area in accordance with the approved urban renewal plan.
- To plan, undertake and carry out neighborhood development programs consisting of urban renewal project undertakings in one or more urban renewal areas which are planned and carried out on the basis of annual increments in accordance with the provisions of this chapter for planning and carrying out urban renewal plans.
- To accomplish a combination of the things listed in this section to carry out an urban renewal plan.

Additionally, activities must be consistent with the goals and policies set forth in the City's Comprehensive Plan and other adopted policy documents and must be located within the renewal area boundary. Limited exceptions may apply on a proportionality basis, e.g. a sewage treatment plant which serves the Urban Renewal area.

Identified and Potential Project Activities

At the time of preparing this feasibility report, there was no formal list of approved project activities for the preliminary urban renewal project area. However, the City's primary purpose for creating the urban renewal district is to fund local costs associated with completing the South Redmond Corridor Plan. Other eligible projects have been identified through thorough reviews of existing capital facility master plans and interviews with staff of the City, overlapping taxing districts, and utility providers in the area.

The schedule presented in the table below provides estimated project costs and likely timing for the Highway 97 South Redmond Corridor Plan. Estimated funding for other eligible projects and activities are also included.

Table 10. Proposed Project Activities

Description	Amount	Dates	Inflation Adjusted Amount
US 97 South Redmond Corridor Plan	$30,829,000	2025-2033	$36,844,000
Fire Station	4,500,000	2033-2037	6,056,400
Natural Gas/Electricity improvements	4,000,000	2022-2042	5,073,000
Industrial Opportunity Fund	5,000,000	2022-2042	6,341,000
Incentive Funding - SDCs, Capital Infrastructure	8,000,000	2022-2042	10,146,000
Small Loan Program	2,000,000	2022-2042	2,536,000
Communications improvements	1,000,000	2022-2042	1,268,000
Canal improvement contribution	4,000,000	2025-2033	4,780,000
Program administration - 9.5% of project costs	5,636,000	2021-2047	7,148,000
	$64,965,000		**$82,391,000**

Source: LCG

Transportation improvements

US 97 South Redmond Corridor Plan Project

- Joint project with Oregon Department of Transportation (ODOT)
- Improved connectivity of City street system to S. Highway 97 including but not limited to:
    A. Roadway construction
    B. Pedestrian facilities
    C. Raised medians
    D. Stormwater improvements
    E. Traffic signal improvements
    F. Design, construction engineering, right of way fee, right of way acquisition

Public Buildings

Fire Station

- A fire station will be needed to serve the area as the area develops
- Funding of $4.5 million is included for this project

Note: If public building(s) are included in the Urban Renewal Plan, a legislative change in 2017 requires the concurrence of three of four taxing districts that are estimated to forego the most property tax revenue (The City, County, School District, and Fire District). Concurrence requires a vote of the governing body of each of the four taxing districts. Failure of a governing body to take action (resolution) within 45 days of notice is considered concurrence.

Utilities to Serve the Area Within the Preliminary Boundary

City Utilities and Infrastructure

- Water, Wastewater and Stormwater systems will need to be constructed in order for the area to develop. The City's master plans anticipate these improvements. Funding for these improvements are generally provided by system development charges and utility rates.
- Local street and sidewalk improvements will need to be constructed in order for the area to develop. The City's master plans anticipate these improvements. Funding for these improvements are generally provided by developers.
- The schedule above includes $13.0 million of funding to assist developers with the cost of these facilities (Industrial Opportunity Fund, Incentive Funding)

Other Utilities

- Cascade Natural Gas - natural gas improvements
- Pacific Power - electricity infrastructure
- Irrigation District – piping canal
- Communications – telephone and high speed internet

The schedule above includes $9.0 million in funding assistance for these utilities.

Note that the funding for City utilities and infrastructure and other utilities could be structured in a variety of ways. Total funding allocated to assist developers and the utilities with completion of the required improvements to serve the area in the feasibility analysis is $22.0 million.

Small Loan Program

- Program to facilitate improvements to existing properties.
- $2.0 million is allocated towards this program.

Program Administration

- Program administration is estimated at 9.5% of project costs.
- Estimated program administration costs are $5.6 million.

Finding: The project activities in the schedule above meet the requirements of ORS 457 and will help to remove the deficient conditions found within the preliminary urban renewal area. The improvement projects listed are similar to those typically undertaken in other urban renewal districts in Oregon.

5. Financial Feasibility

ORS Requirements

ORS 457.085 (3) (g) requires that a renewal plan be accompanied by "a financial analysis of the plan with sufficient information to determine feasibility." A feasibility analysis typically estimates the tax increment resources that will be available to carry out the proposed activities, estimates when the resources will be available, and the period of time necessary to fund the cost of proposed activities. Determining financial feasibility relies on making reasonable economic and financial assumptions, including but not limited to increases in assessed value, the pace of anticipated development, property tax rates, limits or restrictions on revenue, identification of other resources, the use of debt, its timing, the scope, cost, timing and interrelations

of planned capital investment requirements to facilitate growth and increases to assessed value and other program requirements.

Estimate of Revenues to Pay for Plan Activities

The tax increment revenues to pay for project activities will be generated by the increase in assessed values within the preliminary area boundary. Under Ballot Measure 50, growth in assessed values can come in two ways:

- A maximum of three percent growth in value from the previous years' assessed value on a property by property basis.
- The assessed value from new construction or major renovation projects in the area.

Therefore, even if there is no new construction within a renewal area, overall values may increase by up to the three percent allowed by Ballot Measure 50.

For purposes of providing an estimate of revenues, we have made the following assumptions:

- The duration of tax increment collection for the renewal plan is 25 years.
- The frozen base assessed value is $142,529,986, the value within the preliminary boundary area as of January 1, 2019.
- The plan will be adopted prior to August 31, 2020.
- The first tax increment revenue will be received in November 2021.
- The combined tax rate for calculating tax increment revenue is $15.5104.
- Projected annual growth of 4.5 percent in existing incremental values in the area, together with the value of three significant projects underway at the time of writing this feasibility analysis (two hotels and an apartment complex). A growth rate of 4.5 percent is determined to be reasonable given the substantial amount of land available for new development in the area.

Table 11. Forecasted Tax Increment Revenue, Fiscal Years 2021-2046, 4.5% Growth Assumed

Year	Fiscal Year Ending June 30	Frozen Base (000's)	Forecast Assessed Value (AV) (000s)	Annual Change in AV (000s)	Cumulative Change in AV (000s)	Projected Tax Levy	Debt Capacity (millions)	Cumulative Tax Increment Revenue	Net Present Value - Discount Rate 3.5%
0	2021	0	157,060			0	0.00	0	0
1	2022	142,530	182,387	39,857	39,857	618,198	7.03	568,742	549,509
2	2023	142,530	209,256	66,726	106,583	1,034,947	11.77	1,536,348	1,452,780
3	2024	142,530	231,960	89,430	196,013	1,387,095	15.77	2,847,623	2,635,475
4	2025	142,530	250,721	108,191	304,204	1,678,086	19.08	4,450,936	4,032,669
5	2026	142,530	269,252	126,722	430,926	1,965,509	22.35	6,337,486	5,621,094
6	2027	142,530	289,153	146,623	577,549	2,274,182	25.86	8,524,848	7,400,514
7	2028	142,530	310,526	167,996	745,545	2,605,685	29.63	11,033,588	9,372,361
8	2029	142,530	333,479	190,949	936,494	2,961,696	33.67	13,887,086	11,539,341
9	2030	142,530	358,129	215,599	1,152,093	3,344,027	38.02	17,110,831	13,904,702
10	2031	142,530	384,599	242,069	1,394,162	3,754,587	42.69	20,732,162	16,471,932
11	2032	142,530	413,027	270,497	1,664,659	4,195,517	47.70	24,780,488	19,244,815
12	2033	142,530	443,556	301,026	1,965,685	4,669,034	53.09	29,287,366	22,227,392
13	2034	142,530	476,344	333,814	2,299,499	5,177,589	58.87	34,286,726	25,424,003
14	2035	142,530	511,554	369,024	2,668,523	5,723,710	65.08	39,814,948	28,839,238
15	2036	142,530	549,368	406,838	3,075,361	6,310,220	71.75	45,911,144	32,478,000
16	2037	142,530	589,977	447,447	3,522,808	6,940,082	78.91	52,617,296	36,345,478
17	2038	142,530	633,589	491,059	4,013,867	7,616,522	86.60	59,978,507	40,447,173
18	2039	142,530	680,424	537,894	4,551,761	8,342,951	94.86	68,043,189	44,788,884
19	2040	142,530	730,722	588,192	5,139,953	9,123,093	103.73	76,863,358	49,376,745
20	2041	142,530	784,738	642,208	5,782,161	9,960,903	113.25	86,494,858	54,217,208
21	2042	142,530	842,747	700,217	6,482,378	10,860,646	123.48	96,997,665	59,317,066
22	2043	142,530	905,045	762,515	7,244,893	11,826,913	134.47	108,436,201	64,683,462
23	2044	142,530	971,949	829,419	8,074,312	12,864,621	146.27	120,879,649	70,323,898
24	2045	142,530	1,043,800	901,270	8,975,582	13,979,058	150.00	134,402,313	76,246,246
25	2046	142,530	1,120,964	978,434	9,954,016	15,175,903	150.00	149,083,993	82,458,754

Source: LCG, GEL Oregon

Findings: The net present value of forecast tax increment revenue through fiscal year 2046 (25 years) is $82.5 million using a 3.5 percent discount rate on cash flows. The forecast assumes the completion of known new construction projects within the area in years one and two, with 4.5 percent annual growth due to development thereafter. Additionally, the assessed value of existing properties is assumed to increase annually by 2.9 percent for real property and 2.0 percent for personal and utility property.

The forecast debt capacity, by fiscal year, of the proposed urban renewal district projects the Agency will have the capability to finance project and program costs totaling $22.3 million by fiscal year 2026 (year 5), $42.7

million by fiscal year 2031 (year 10) and $86.6 million by fiscal year 2038 (year 17). This assumes the use of full faith and credit obligations (FFCO) with a term of 20 years and interest rate of 3.5 percent, as presented above.

Estimate of Project Costs

At the time of preparing this feasibility report, there were no estimates of project costs available, other than the primary project, i.e., the US 97 South Redmond Corridor Plan. In the absence of details on the scope of the possible activities shown in Section 4, our analysis instead uses a "revenue-side" approach to identifying costs. This approach involves estimating revenues to establish an estimate of funds available for anticipated capital development requirements within the area. The total tax increment revenues anticipated over a 20-year period are approximately $149.1 million.

To determine what the forecast revenue stream is worth in 2020 dollars, the consultant applied a 3.5 percent discount rate to the annual revenues shown above. This indicates, in 2020 dollars, the revenues may support approximately $82.5 million in project costs over the plan duration.

Estimate of Time Needed to Carry Out Plan Activities

ORS 457 imposes no time restrictions on carrying out an urban renewal plan. There is, however, a local policy issue and decision regarding how long the plan may operate before it can retire project indebtedness and return increased assessed value in the area to the tax rolls of the overlapping taxing districts.

The revenue projections shown above are limited to a 25-year period. This period appears adequate to collect sufficient tax increment to pay the anticipated eligible project and program costs. Should there be any changes to the projects, programs, costs, timing, or other assumptions regarding the amount and timing of tax increment collections, the time necessary to pay eligible project and program costs could change significantly.

Estimate of Maximum Indebtedness to Carry Out Plan Activities

With the passage of Ballot Measure 50, ORS 457 requires that a "maximum indebtedness" figure be put into the renewal plan. This figure represents the limit of the tax increment revenue that the City may take in to cover project costs, excluding interest on debt. ORS 457 imposes no restrictions on the maximum indebtedness of a renewal plan. The debt limit is based on good faith estimates of costs and inflation. No maximum indebtedness figure needs to be established at this stage. Projects and project costs should be defined through the public process in developing an urban renewal plan, and at that time the maximum indebtedness for the plan will be established.

Financial Feasibility Evaluation

The forecast of tax increment revenues shows the collection of approximately $149.1 million during the 25-year duration of the plan ("Cumulus Tax Increment Revenue" column, year 25). Adjusted to 2020 dollars, this would allow the City to undertake roughly $82.5 million in project and program activities over the duration of the plan. This amount allows the City to make meaningful and timely contributions to the project activities included in the list of recommendations in Section 4 of this report.

Findings: The estimated tax increment revenues are sufficient, discounted to 2020 dollars, to carry out or assist in carrying out the projects listed in Section 4 of this report. The revenue estimates are based on good faith assumptions about growth in the area. If those assumptions prove incorrect, project and program activities may

need to be deferred and or reduced in scope, other funding secured, or the duration of the plan extended. The assumption of a 25-year duration of tax increment collection is presented to demonstrate feasibility only.

An urban renewal district formed within the preliminary boundaries identified appears to be financially feasible.

6. Tax Impacts of an Urban Renewal Plan

Under Oregon's present property tax-based system, total tax rates will not change as a result of adopting an urban renewal program. Thus, there will be no effect on taxpayers from the establishment of an urban renewal district. Instead, the potential revenues raised by taxing bodies will be affected. The new value created within the urban renewal area after the formation of the renewal district (these values are called "incremental" or "excess" values) will not be available to other taxing bodies for raising property tax revenues. The revenues from those incremental values will instead be directed to the renewal agency for the purpose of paying off indebtedness to carry out project activities. The effects of this foregone revenue will vary with the size of the tax bodies' tax rates and the cumulative level of incremental values in the renewal area.

K-12 Schools: It should be noted that under the current system of funding K-12 schools, establishing an urban renewal area does not impact the per-student revenue for schools. The funding per student is derived from a complex formula that establishes a uniform-per-student funding level throughout the State. The amount of funds received by Redmond schools is determined by this formula, not by the amount of property taxes raised locally.

The following schedule shows the estimated foregone property tax revenue for the overlapping taxing jurisdictions based on the value growth assumptions outlined in this report. **It is important to keep the following in mind when looking at the schedule:**

- The potential impact on the school district is shown simply to demonstrate the tax rate calculation. As noted above, however, urban renewal will have no impact on K-12 per student funding, i.e., there will be no reduction in school funding resulting from the creation of an urban renewal district.
- The estimated amounts of foregone revenue assume all the development and increased property values would occur, even without the renewal programs' outlays for area improvements. In reality, the value created by new development would be less or slower without the tax increment funding.

Table 12. Estimated Foregone Property Tax Revenue – Government, Fiscal Years 2021-2046

Fiscal Year Ending June 30	City of Redmond	Deschutes County	County Library	Countywide Law Enforcement	County Extension - 4H	9/1/2001	Redmond Fire & Rescue	Redmond Park & Recreation	Total General Government
2020	-	-	-	-	-	-	-	-	-
2021	-	-	-	-	-	-	-	-	-
2022	175,773	48,558	21,921	43,046	893	14,420	69,917	14,815	**389,343**
2023	294,268	81,292	36,699	72,064	1,495	24,141	117,051	24,802	**651,812**
2024	394,395	108,953	49,187	96,584	2,003	32,356	156,878	33,241	**873,597**
2025	477,133	131,809	59,505	116,846	2,423	39,144	189,789	40,215	**1,056,864**
2026	558,857	154,385	69,697	136,860	2,839	45,848	222,296	47,103	**1,237,885**
2027	646,622	178,631	80,643	158,353	3,284	53,048	257,206	54,500	**1,432,287**
2028	740,879	204,670	92,398	181,436	3,763	60,781	294,699	62,444	**1,641,070**
2029	842,104	232,633	105,022	206,225	4,277	69,085	334,963	70,976	**1,865,285**
2030	950,813	262,664	118,579	232,847	4,829	78,004	378,204	80,138	**2,106,078**
2031	1,067,549	294,913	133,138	261,435	5,422	87,581	424,637	89,977	**2,364,652**
2032	1,192,919	329,547	148,773	292,137	6,059	97,866	474,506	100,544	**2,642,351**
2033	1,327,555	366,740	165,564	325,108	6,743	108,911	528,060	111,891	**2,940,572**
2034	1,472,153	406,686	183,598	360,519	7,477	120,774	585,577	124,079	**3,260,863**
2035	1,627,433	449,582	202,963	398,546	8,266	133,513	647,342	137,166	**3,604,811**
2036	1,794,196	495,651	223,761	439,385	9,113	147,194	713,675	151,222	**3,974,197**
2037	1,973,286	545,125	246,096	483,243	10,023	161,886	784,912	166,316	**4,370,887**
2038	2,165,619	598,257	270,082	530,344	11,000	177,665	861,416	182,527	**4,796,910**
2039	2,372,166	655,316	295,842	580,926	12,049	194,610	943,574	199,935	**5,254,418**
2040	2,593,986	716,594	323,506	635,247	13,176	212,808	1,031,806	218,631	**5,745,754**
2041	2,832,202	782,402	353,214	693,585	14,385	232,351	1,126,561	238,709	**6,273,409**
2042	3,088,027	853,074	385,119	756,234	15,685	253,339	1,228,321	260,271	**6,840,070**
2043	3,362,767	928,972	419,383	823,516	17,080	275,878	1,337,604	283,427	**7,448,627**
2044	3,657,821	1,010,481	456,180	895,773	18,579	300,084	1,454,967	308,295	**8,102,180**
2045	3,974,691	1,098,017	495,699	973,372	20,188	326,079	1,581,008	335,002	**8,804,056**
2046	4,314,992	1,192,026	538,139	1,056,709	21,917	353,997	1,716,369	363,684	**9,557,833**
Totals	**43,898,206**	**12,126,978**	**5,474,708**	**10,750,340**	**222,968**	**3,601,363**	**17,461,338**	**3,699,910**	**97,235,811**

Source: GEL Oregon

Table 13. Estimated Foregone Property Tax Revenue – Education, Fiscal Years

Fiscal Year Ending June 30	Central Oregon Community College	High Desert ESD	Redmond School District #2J	Total Education	Total
2020	-	-	-	-	-
2021	-	-	-	-	-
2022	24,727	3,842	200,285	228,854	618,197
2023	41,397	6,432	335,305	383,134	1,034,946
2024	55,482	8,621	449,395	513,498	1,387,095
2025	67,122	10,430	543,671	621,223	1,678,087
2026	78,618	12,216	636,791	727,625	1,965,510
2027	90,965	14,134	736,795	841,894	2,274,181
2028	104,225	16,195	844,197	964,617	2,605,687
2029	118,465	18,407	959,538	1,096,410	2,961,695
2030	133,758	20,784	1,083,407	1,237,949	3,344,027
2031	150,180	23,335	1,216,421	1,389,936	3,754,588
2032	167,816	26,076	1,359,275	1,553,167	4,195,518
2033	186,757	29,019	1,512,686	1,728,462	4,669,034
2034	207,098	32,180	1,677,449	1,916,727	5,177,590
2035	228,942	35,574	1,854,383	2,118,899	5,723,710
2036	252,402	39,219	2,044,402	2,336,023	6,310,220
2037	277,596	43,134	2,248,466	2,569,196	6,940,083
2038	304,653	47,338	2,467,621	2,819,612	7,616,522
2039	333,709	51,853	2,702,971	3,088,533	8,342,951
2040	364,914	56,702	2,955,724	3,377,340	9,123,094
2041	398,426	61,909	3,227,159	3,687,494	9,960,903
2042	434,415	67,501	3,518,661	4,020,577	10,860,647
2043	473,064	73,506	3,831,714	4,378,284	11,826,911
2044	514,572	79,956	4,167,913	4,762,441	12,864,621
2045	559,148	86,882	4,528,972	5,175,002	13,979,058
2046	607,020	94,321	4,916,729	5,618,070	15,175,903
Totals	**6,175,471**	**959,566**	**50,019,930**	**57,154,967**	**154,390,778**

Source: GEL Oregon

Note: The difference between the forecast tax collections ($149.1 million) and the foregone tax revenue (levies) of $154.4 million, or $5.3 million is due to discounts taken by taxpayers paying taxes in November of the levy year, approximately 2.5%, with the exception of years 23-25, when delinquent tax collections are not fully recognized until after year 25.

SUMMARY OF FEASIBILITY FINDINGS

The previous sections of this analysis have provided information on each of the key issues that should be evaluated in making the decision to proceed with an urban renewal plan. In summary, the feasibility findings are:

- The plan area proposed is within the acreage and total value limits established by ORS 457.
- The preliminary area proposed contains blighting conditions as defined by ORS 457.
- The scheduled project activities meet the eligibility requirements for tax increment funding.
- The assumptions used to estimate tax increment revenues are good faith assumptions, based on the information available, and concurred to by City staff.
- The duration needed to carry out plan activities is estimated at twenty five years and is typical of the duration used for newly adopted urban renewal plans.
- Given the tax increment revenue assumptions, project cost information, and program funding included in the feasibility study, forecasted tax increment revenue is adequate to fund the scheduled project activities to achieve the plan objectives.

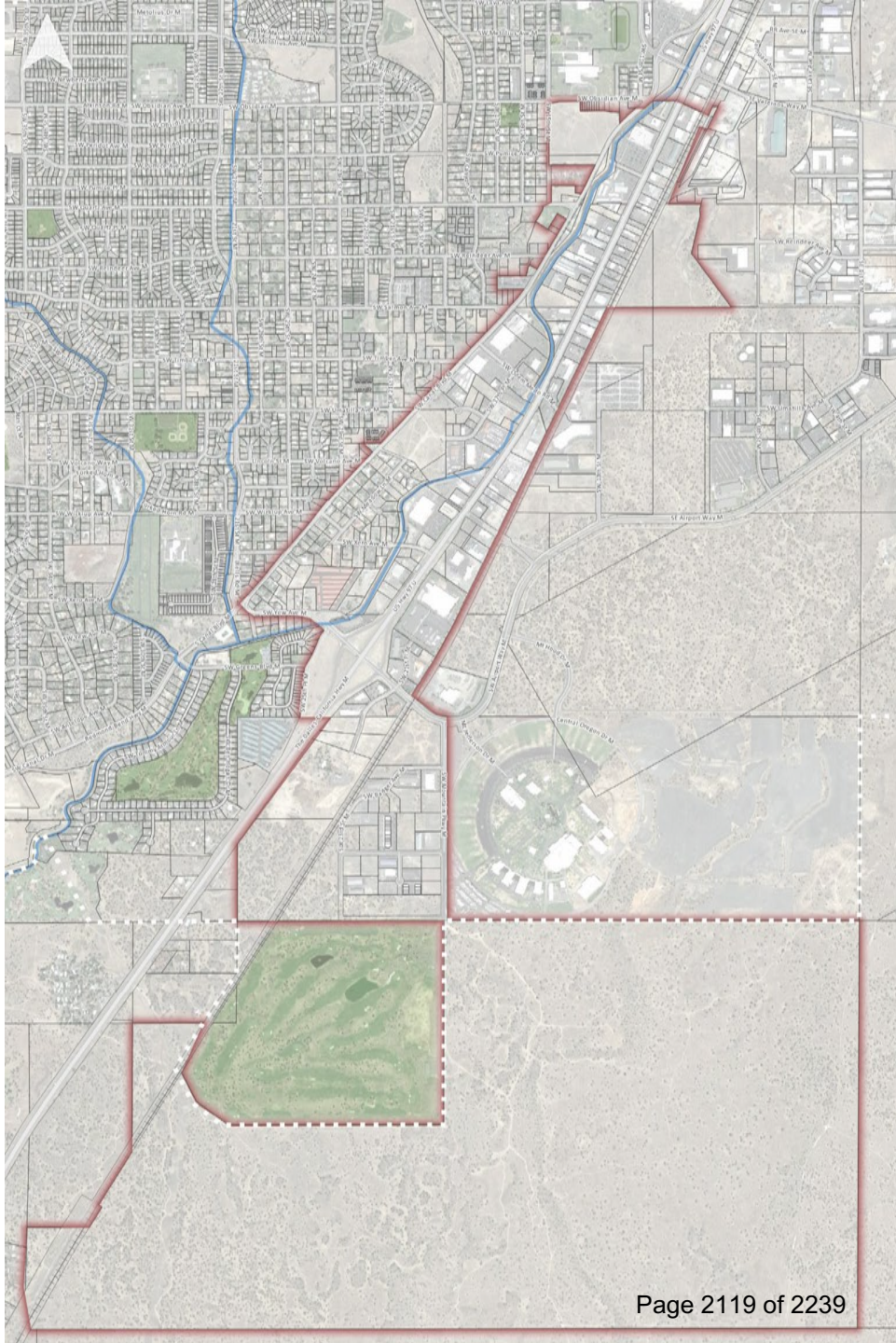
On the basis of the above findings, there is no evidence of any technical or legal obstacles to the feasibility of establishing an urban renewal plan for the study area shown on the boundary map.

SOUTH 97 URBAN RENEWAL DISTRICT

REDMOND CITY COUNCIL, DECEMBER 8, 2020

MEETING PURPOSE

- REVIEW OF DISTRICT PURPOSE AND OBJECTIVES
- PRESENT ORDINANCE #2020-19 FOR COUNCIL APPROVAL



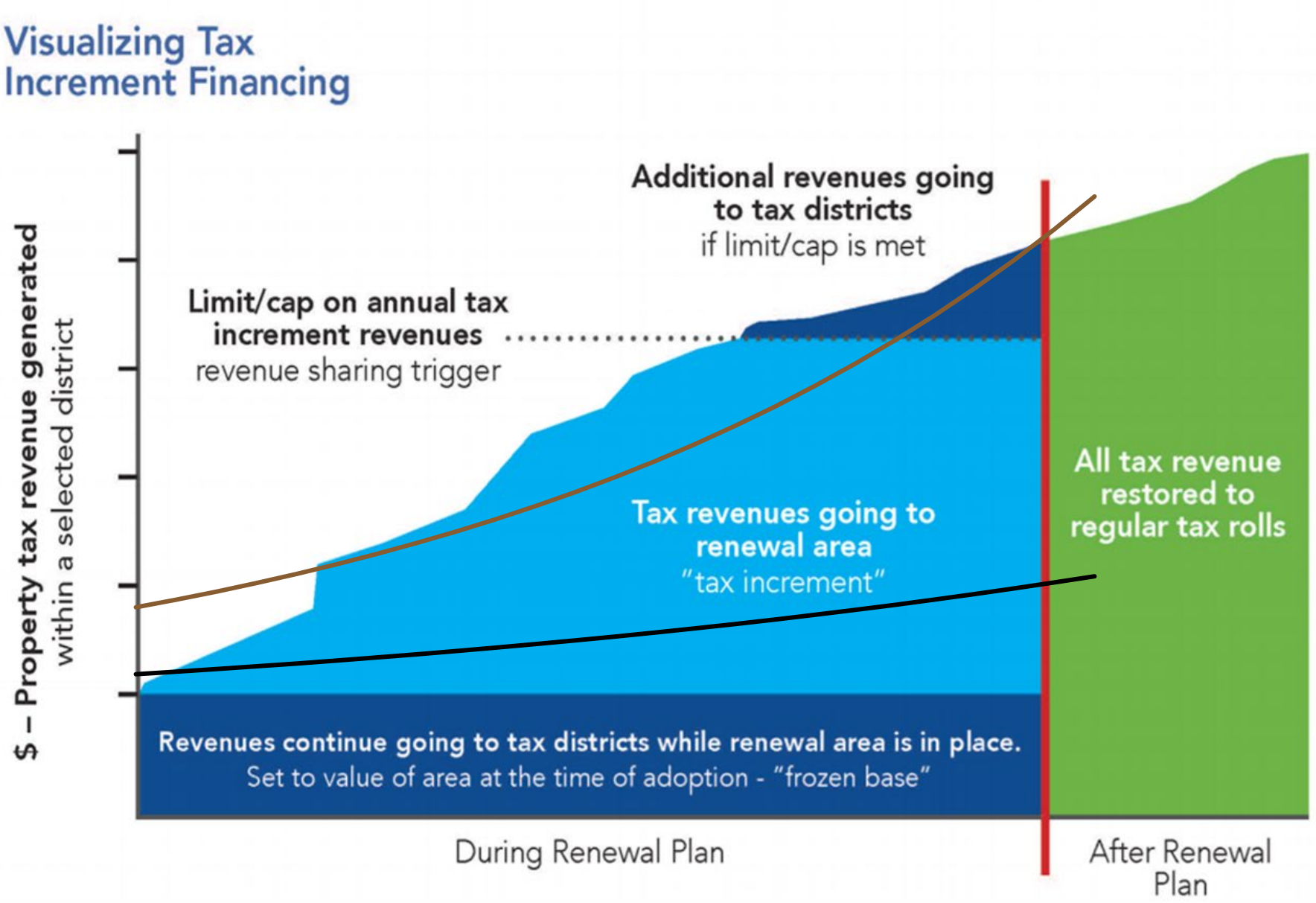
THREE TOPICS

01 PROJECT OVERVIEW

02 DISTRICT PURPOSE AND FINANCIAL IMPACTS

03 QUESTIONS AND FEEDBACK

TAX INCREMENT FINANCING



DISTRICT PROFILE

SOUTH 97 URBAN RENEWAL DISTRICT

ESTABLISHMENT TARGET DATE: 2020

LAST DATE TO ISSUE DEBT	MAXIMUM INDEBTEDNESS (NEAREST MILLION)	TOTAL ACREAGE OF DISTRICT
2046	$85M	1330 ACRES

TOP ISSUES/OPPORTUNITIES (12 - 36 MONTHS)

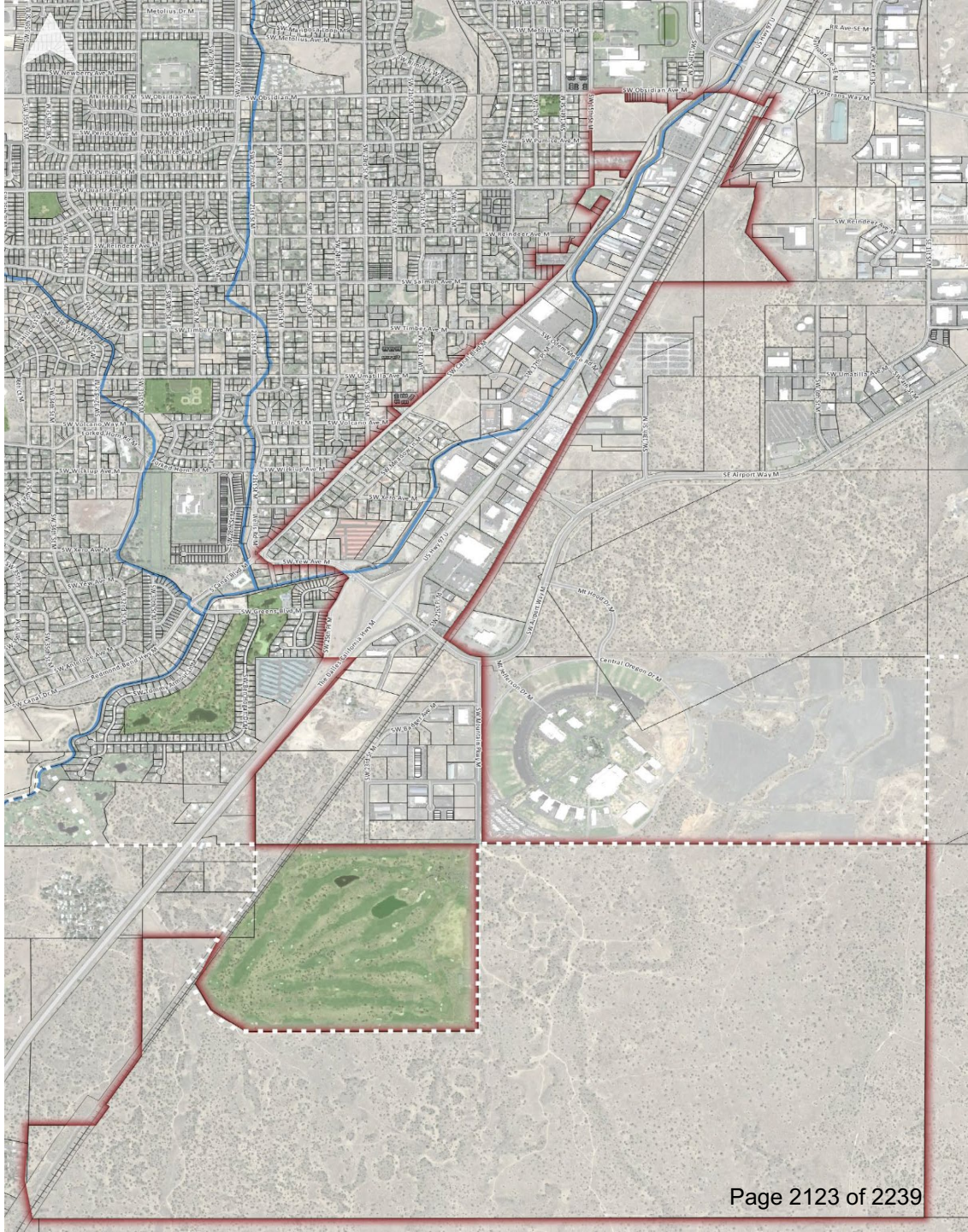
- **Leverage -** State and Federal Hwy. $$ with TIF (BUILD Grant by 2022)
- **Safety & First Responder -** Needs for South Redmond
- **Infrastructure -** Loans to Traded Sector Companies

DISTRICT CHARACTER

- Deteriorating infrastructure
- Jobs and employment lands
- Major County thoroughfare
- Under-invested commercial corridor

SOUTH 97 URBAN RENEWAL DISTRICT – PROPOSED BOUNDARY

1330 ACRES IN SOUTHERN REDMOND



IMPETUS FOR DISTRICT:

SOUTH HWY 97 CORRIDOR REBUILD

$50M - $70M

SAFETY

- 214 crashes 2010-2015 – average of 43/year
- Increases to 76/year by 2040 with no improvements
- Crash rates higher than state average
- Improvements will: reduce crashes and crash severity
- Partnership with RF&R for fire station

MOBILITY

FREIGHT/VEHICLE

- Traffic time improves
- East-West connects

PEDESTRIAN

- Halfway refuge
- Sidewalks
- Connect to Canal path
- Cycle track

NEIGHBORHOOD CONNECTIVITY

ECONOMIC VITALITY

- Low value density, limited development along US97
- Aging, limited infrastructure
- 84% lot vacancy in proposed area

URBAN RENEWAL:

PRIMARY INVESTMENTS 2021 – 2046

PRIMARY INVESTMENTS 2021-2046

US 97 SOUTH REDMOND CORRIDOR PLAN	$37M
UTILITIES AND INFRASTRUCTURE	$11M
FIRE STATION	$ 4M
BUSINESS/PROPERTY DEV. PROGRAMS	$19M
UR FUNDING FOR CAPITAL PROJECTS	**$71M**

THE PROJECT:

US97 CORRIDOR

Scalable, built through multiple phases

Raised median with protected left-turns; u-turns at intersections

3 new signalized intersections between Quince Ave. and Wickiup Ave.

3 new roads between Canal Blvd. and US97

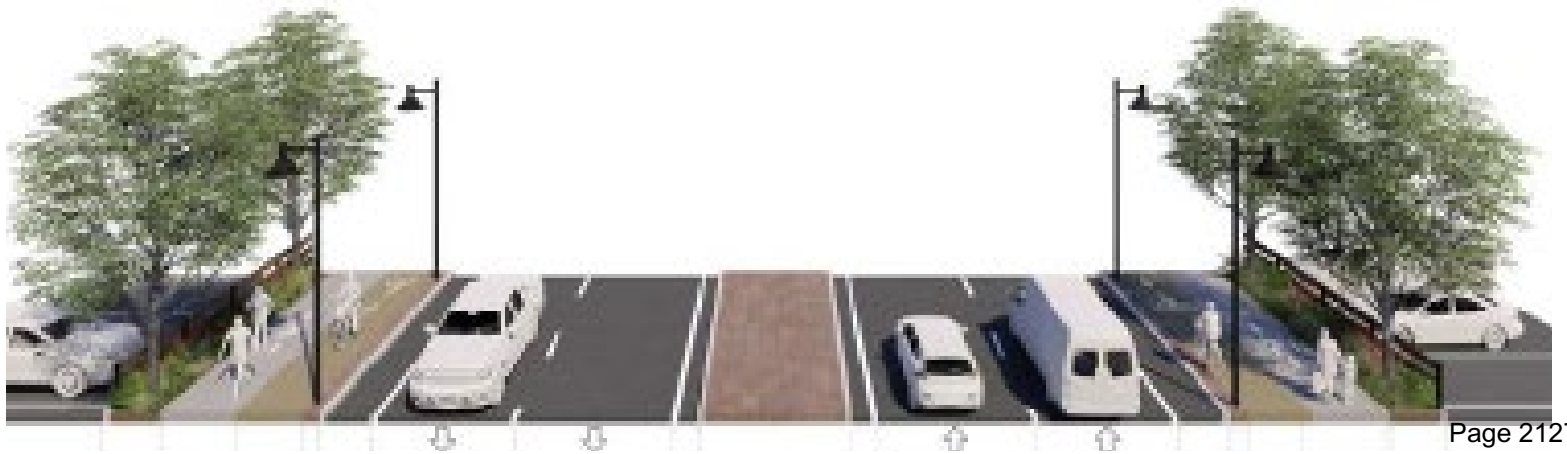
Frontage and/or backage roads to businesses

Sidewalks, cycle track treatments, better pedestrian crossings

TAXING JURISDICTION IMPACT

	Current Annual Property Tax	Foregone Revenue over Life of District (25 years)	Projected Property Tax at Sunset – Without UR	Projected Property Tax at Sunset – With UR
All Districts	$2.3M	$59.9M	$5.2M	**$13.7M**
City of Redmond	$653K	$17M	$1.5M	**$3.9M**

Payback (in years)	7.0
ROI	14.3%



REDMOND URBAN RENEWAL SUCCESS

SOUTH AIRPORT URD

Frozen Base: $725K
Closed: $63M

Growth Rate: 87x

DOWNTOWN URD

Frozen Base: $ 72M
Current: $305M

Growth Rate: 4x

Leverage Ratio: $1:$5

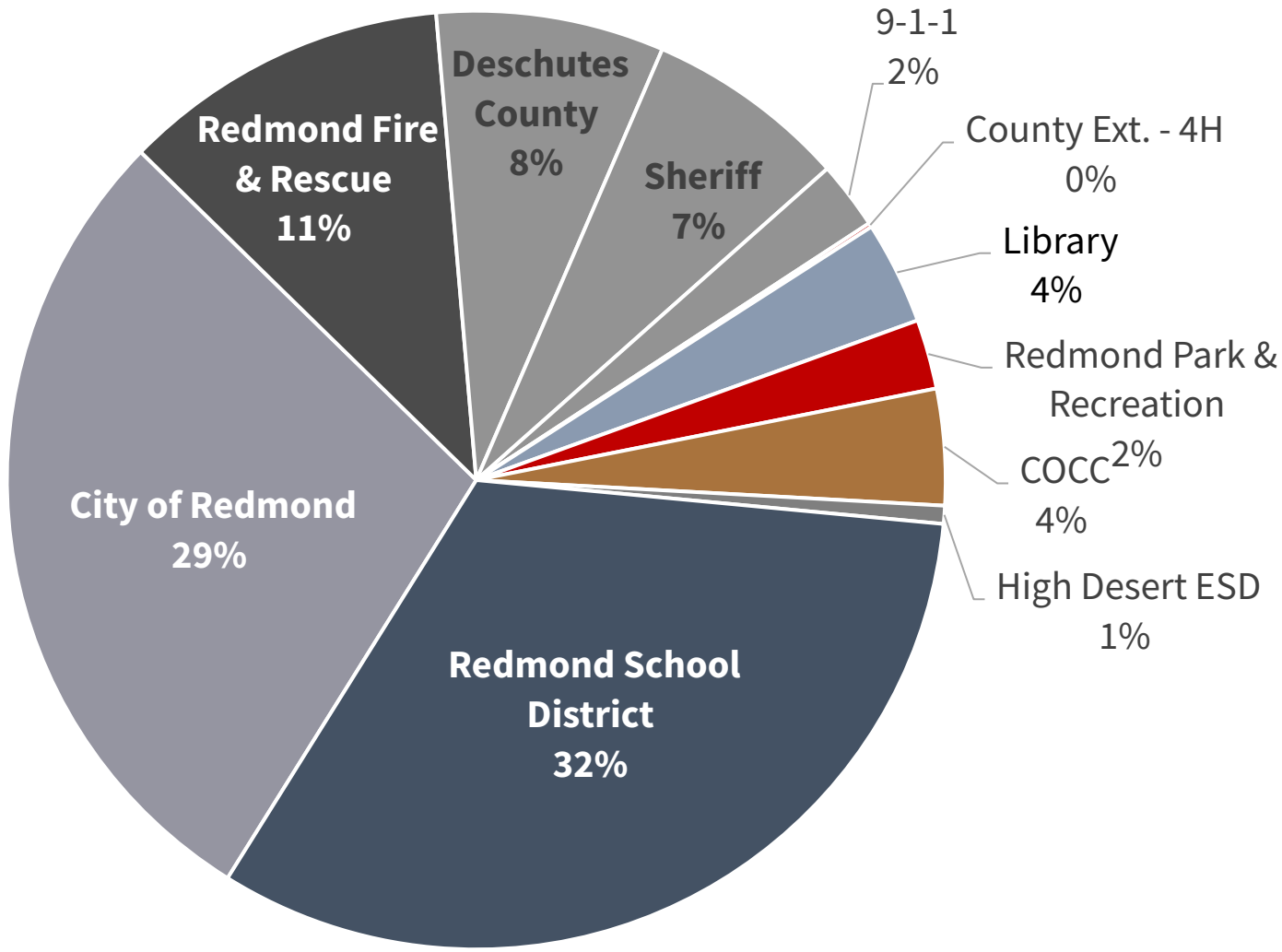
US97 URD

Growth Rate (projected): 6X

TAXING JURISDICTION IMPACT

($59.9M OVER 25 YEARS)

OVERLAPPING TAXING DISTRICT LEVY RATES



SUPPORT FROM OVERLAPPING TAXING DISTRICTS

BOARD VOTE RESULTS:

- HIGH DESERT ESD
- LIBRARY DISTRICT
- REDMOND PARKS
- FIRE DISTRICT
- DESCHUTES COUNTY
- REDMOND SCHOOL DISTRICT

NEXT STEPS

JULY/AUGUST	Outreach to taxing district partners, community groups, and stakeholder groups to introduce Project
AUGUST 31	Plan and Report Distributed to Partners
SEPTEMBER 8	City Council meeting: Status update
SEPT./OCT.	Outreach round #2 to taxing district partners and community groups
SEPTEMBER 23	Board of County Commissioners Meeting
OCTOBER 15	Recommendations due from stakeholder groups and taxing district partners
DECEMBER 1	City Council meeting: hear recommendations/public comments
DECEMBER 8	City Council meeting: Plan adoption decision

Q & A

CITY OF REDMOND

411 SW 9th Street
Redmond, OR 97756

(541) 923-7710
Fax: (541) 548-0706
info@ci.redmond.or.us
www.ci.redmond.or.us

STAFF REPORT

DATE: December 8, 2020
TO: Mayor and Council Members
FROM: Jason Neff, Chief Financial Officer
THROUGH: Keith Witcosky, City Manager
SUBJECT: Adopt FY 2020/21 Budget Adjustment #1 Resolution

Addresses Council Goal:
1. SUSTAIN OPERATION: Provide or enhance current levels of operations in all facets of municipal service delivery.

Report in Brief:
The action requests City Council authorize budget adjustments to eight funds due to unplanned expenditures and revenues in the Fiscal Year (FY) 2020/21 budget.

Background:
Supplemental budgets are permitted under Oregon Revised Statutes 294.471 (ORS). Item #1 is a supplemental budget. Per the ORS, a notice of the meeting to discuss a supplemental budget was published greater than or equal to five days in advance of this City Council meeting.

ORS 294.338 provides for certain exceptions to Local Budget Law which do not require a supplemental budget and budget adjustments can be authorized by resolution of the governing body. This includes the expenditure of specific purpose grants such as Federal Coronavirus Relief Funds (CRF) which are included in items #2 and #3.

Discussion:
The resolution includes budget adjustments to the following funds:

- #1 - General Operating & Utility Funds (Pay Off Public Works Facility / Timber Water Line Bond): Prior to COVID-19, staff's draft FY 2020/21 budget included a recommendation to pay off the 2010 Public Works Facility / Timber Water Line bond. This recommendation was changed due to uncertainty of General Operating Fund resources associated with the economic slowdown created by COVID-19 (Beginning Fund Balance, Property Taxes, Lodging Tax, State Shared Revenues, etc.).

  The General Operating Funds are expected (high confidence) to have a fund balance which significantly exceeds the City's policy level at the end of FY 2020/21 (estimated at $7.37 million versus a policy of $6.26 million or $1.1 million above policy). This higher balance is being primarily driven by the following:

  - Beginning Fund Balances (a combination of resources higher than expected and expenses lower than expected in the latter part of FY 2019/20) are about $522k higher than budget.
  - Property Tax Assessed Value grew by 8.5% versus 6.2% in FY 2020/21 or about $217,000 higher than budget.

- Franchise Fees are expected to be 4.3% higher than budget, or approximately $250,000, primarily driven by a franchise fee rate increase for Cascade Natural Gas, a consumer rate increase for Republic Services and a higher than anticipated population growth over the past year.
- Lodging Taxes are trending to be $244,000 higher than budget ($136,000 is assumed in the budget adjustment).

Staff is recommending these additional resources ($1.1 million of excess fund balance) be utilized to pay off the 2010 bond in early 2021. The bond became pre-payable in June 2020 and is one of the City's highest interest debts at 4.5%. The table below shows the allocation of debt payments by Public Works sub-funds.

Sub-Fund	Share	Remaining Principal	Remaining Interest
Transportation Operations*	35%	$ 740,000	$175,500
Parks Operations*	16%	$ 345,000	$ 81,400
Water Operations	31%	$ 655,000	$155,300
Wastewater Operations	12%	$ 250,000	$ 58,300
Stormwater Operations	6%	$ 140,000	$ 32,100
TOTAL	**100%**	**$ 2,130,000**	**$502,600**

* Part of General Operating Funds

In short, paying this bond off will save the City about $502,600 in interest with the General Operating Funds specifically saving $256,900. Paying the bonds off will free up approximately $148,000 in annual General Operating Funds cash flow beginning in the FY 2021/22 budget. This cash flow can be put towards other General Operating Funds financial challenges / priorities such as additional police officers or parks staffing (Budget Committee consideration).

The Water Fund will utilize the existing reserve requirement the bond ($292,700) of to cover a portion of the Water Fund's payoff amount, with the remaining amount ($362,300) coming from operating reserves (about $3.2 million in total). The Wastewater Fund can pay off its portion through a higher than anticipated Beginning Fund Balance while the Stormwater Fund will need to utilize $140,000 of operating reserves (about $540,000 in total). Over the long-term all funds will benefit from the interest savings. Below is a list of the budget adjustments necessary to payoff of the debt.

General Fund (General & Lodging Tax & Tourism Sub-Funds)

Beginning Fund Balance	$ 265,000		
Property Taxes	$ 217,000		
Franchise Fees	$ 250,000	Tourism Promotion	$ 39,593
Room/Lodging	$ 135,593	Transfers	$ 828,000
Total Change to Resources	$ 867,593	Total Change to Expenditures	$ 867,593

Police Fund (Operations Sub-Fund)

Beginning Fund Balance	$ 87,000		
Interfund Transfers	($ 87,000)		
Total Change to Resources	$ 0	Total Change to Expenditures	$ 0

Transportation Fund (Operations Sub-Fund)

Beginning Fund Balance	$ 97,000	Special Payments (Debt Pay Off)	$ 740,000
Interfund Transfers	$ 643,000		
Total Change to Resources	$ 740,000	Total Change to Expenditures	$ 740,000

Parks & Facilities Fund (Operations Sub-Fund)

Beginning Fund Balance	$ 73,000	Special Payments (Debt Pay Off)	$ 345,000
Interfund Transfers	$ 272,000		
Total Change to Resources	$ 345,000	Total Change to Expenditures	$ 345,000

Water Fund (Operations & Debt Service Reserve Sub-Funds)

		Reserve for Debt Service	($ 292,700)
		Reserve for Future Expend	($ 362,300)
		Special Payments (Debt Pay Off)	$ 655,000
Total Change to Resources	$ 0	Total Change to Expenditures	$ 0

Wastewater Fund (Operations Sub-Fund)

Beginning Fund Balance	$ 250,000	Special Payments (Debt)	$ 250,000
Total Change to Resources	$ 250,000	Total Change to Expenditures	$ 250,000

Stormwater Fund (Operations Sub-Fund)

		Reserve for Future Expend	($ 140,000)
		Special Payments (Debt)	$ 140,000
Total Change to Resources	$ 0	Total Change to Expenditures	$ 0

- #2 - General Fund (Information Technology (IT) Expenses Related to COVID-19):
The City's IT Department is expecting approximately $124,500 of costs related to COVID-19 which is reimbursable from CRF. Below is a breakout and description of the costs:

  - $15,200 - Various equipment needed to support staff teleworking such as headsets and webcams.
  - $65,000 – Upgrades to the audio/visual in the City Hall Civic Rooms will create the opportunities for virtual meetings and televised meetings for events such as Budget Committee. This increase in transparency will be a near term benefit during COVID-19 and beyond. These amenities were proposed, but not pursued for budget reasons, during the initial renovation of the building.
  - $26,100 – Audio/visual upgrades for other City Hall conference rooms are planned to support for virtual meetings driven by COVID-19.
  - $18,200 - Additional software to better secure, monitor and maintain the City's growing telecommunication technologies because of COVID-19.

General Fund (Information Technology Sub-Fund)

Federal Grants & Awards	$ 124,500	Materials & Services	$ 124,500
Total Change to Resources	$ 124,500	Total Change to Expenditures	$ 124,500

- #3 - Community Development Fund (Rental Assistance / Utility Arrears for COVID-19 Hardship):
Staff recommends $100,000 of CRF be allocated towards supporting Redmond residents with rental assistance and/or utility arrears, which is needed because of a COVID-19 hardship. These funds will be passed through and administered by Thrive Central Oregon and the Latino Community Association.

Community Development Fund (CDD Operations Sub-Fund)

Federal Grants & Awards	$ 100,000	Materials & Services	$ 100,000
Total Change to Resources	$ 100,000	Total Change to Expenditures	$ 100,000

Alternative Courses of Action:

1. Adopt the FY 2020/21 budget adjustment.
2. Do not adopt the budget adjustment.
3. Request more information.

Recommendation/Suggested Motion:

"I move to adopt Resolution #2020-22 adjusting the City's FY 2020/21 budget."

CITY OF REDMOND
RESOLUTION NO. 2020-22

A RESOLUTION OF THE CITY OF REDMOND TO MAKE BUDGET ADJUSTMENTS.

WHEREAS, the City of Redmond will have unexpected and unbudgeted resources and expenditures for FY 2020/21.

WHEREAS, Supplemental budgets are permitted under Oregon Revised Statutes 294.471.

WHEREAS, Oregon Revised Statue 294.338 provides for certain exceptions to Local Budget Law which do not require a supplemental budget and budget adjustments can be authorized by resolution of the governing body. This includes the expenditure of specific purpose grants.

NOW, THEREFORE, be it resolved by the City Council for the City of Redmond as follows:

SECTION ONE: The City of Redmond City Council hereby adopts the following Budget Adjustments for FY 2020/21, in the following fund with the following changes, now on file at City Hall.

SECTION TWO: The amounts for the fiscal year beginning July 1, 2020, are hereby adjusted as follows:

GENERAL FUND	Resources	Expenditures
Beginning Fund Balance	$ 265,000	
Property Taxes	$ 217,000	
Franchise Fees	$ 250,000	
Room/Lodging	$ 135,593	
Tourism Promotion		$ 39,593
Transfers		$ 828,000
Change to General Fund		**$ 867,593**
Change to General Fund – Total Appropriations		**$ 867,593**

POLICE FUND	Resources	Expenditures
Beginning Fund Balance	$ 87,000	
Interfund Transfers	($ 87,000)	
Change to Police Fund		**$ 0**
Change to Police Fund – Total Appropriations		**$ 0**

TRANSPORTATION FUND	Resources	Expenditures
Beginning Fund Balance	$ 97,000	
Interfund Transfers	$ 643,000	
Special Payments (Debt Pay Off)		$ 740,000
Change to Transportation Fund		**$ 740,000**
Change to Transportation Fund – Total Appropriations		**$ 740,000**

PARKS & FACILITIES FUND	Resources	Expenditures
Beginning Fund Balance	$ 73,000	
Interfund Transfers	$ 272,000	
Special Payments (Debt Pay Off)		$ 345,000
Change to Parks & Facilities Fund		**$ 345,000**
Change to Parks & Facilities Fund – Total Appropriations		**$ 345,000**

WATER FUND	Resources	Expenditures
Reserve for Debt Service		($ 292,700)
Reserve for Future Expend		($ 362,300)
Special Payments (Debt Pay Off)		$ 655,000
Change to Water Fund		**$ 0**
Change to Water Fund – Total Appropriations		**$ 655,000**

WASTEWATER FUND	Resources	Expenditures
Beginning Fund Balance	$ 250,000	
Special Payments (Debt Pay Off)		$ 250,000

Change to Wastewater Fund		**$ 250,000**
Change to Wastewater Fund – Total Appropriations		**$ 250,000**

STORMWATER FUND	Resources	Expenditures
Reserve for Future Expend		($ 140,000)
Special Payments (Debt Pay Off)		$ 140,000
Change to Stormwater Fund		**$ 0**
Change to Stormwater Fund – Total Appropriations		**$ 140,000**

Pay Off Public Works Facility / Timber Water Line Bond: Prior to COVID-19, staff's draft FY 2020/21 budget included a recommendation to pay off the 2010 Public Works Facility / Timber Water Line bond. This recommendation was tabled because of the uncertainty of General Operating Fund resources (Beginning Fund Balance, Property Taxes, Lodging Tax, State Shared Revenues, etc.) because of COVID-19.

The General Operating Funds are expected (high confidence) to have a fund balance which significantly exceeds the City's policy level at the end of FY 2020/21 (estimated at $7.37 million versus a policy of $6.26 million or $1.1 million above policy). This higher balance is being primarily driven by the following:

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TOTAL	**100%**	**$ 2,130,000**	**$502,600**

* Part of General Operating Funds

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The Water Fund will utilize the existing reserve requirement the bond ($292,700) of to cover a portion of the Water Fund's payoff amount, with the remaining amount ($362,300) coming from operating reserves (about $3.2 million in total). The Wastewater Fund can pay off its portion through a higher than anticipated Beginning Fund Balance while the Stormwater Fund will need to utilize $140,000 of operating reserves (about $540,000 in total).

GENERAL FUND	Resources	Expenditures
Federal Grants & Awards	$ 124,500	
Information Technology (OU)		$ 124,500
Change to General Fund		**$ 124,500**
Change to General Fund – Total Appropriations		**$ 124,500**

Information Technology (IT) Expenses Related to COVID-19: The City's IT Department is expecting approximately $124,500 of costs related to COVID-19 which is reimbursable from Federal Coronavirus Relief Funds (CRF). Below is a breakout and description of the costs:

- $15,200 - Various equipment needed to support staff teleworking such as headsets, and webcams.
- $65,000 - City Hall civic room audio visual upgrades are planned to support for virtual meetings driven by COVID-19. During the construction of City Hall these capabilities were taken out of the project scope due to budget concerns.
- $26,100 - City Hall conference room audio visual upgrades are planned to support for virtual meetings driven by COVID-19.
- $18,200 - Additional software to better secure, monitor and maintain the City's growing telecommunication technologies because of COVID-19.

COMMUNITY DEVELOPMENT FUND	Resources	Expenditures
Federal Grants & Awards	$ 100,000	
Community Development (OU)		$ 100,000
Change to Community Development Fund		**$ 100,000**
Change to Community Development Fund – Total Appropriations		**$ 100,000**

Rental Assistance / Utility Arrears for COVID-19 Hardship: Staff recommends $100,000 of Federal Coronavirus Relief Funds (CRF) be allocated towards supporting Redmond residents with rental assistance and/or utility arrears, which is needed because of a COVID-19 hardship. These funds will be passed through and administered by Thrive Central Oregon and the Latino Community Association.

SECTION THREE: This resolution shall be effective this 8th day of December 2020

ADOPTED by the City Council and **SIGNED** by the Mayor this 8th day of December 2020.

George Endicott, Mayor

ATTEST:

Kelly Morse, City Recorder

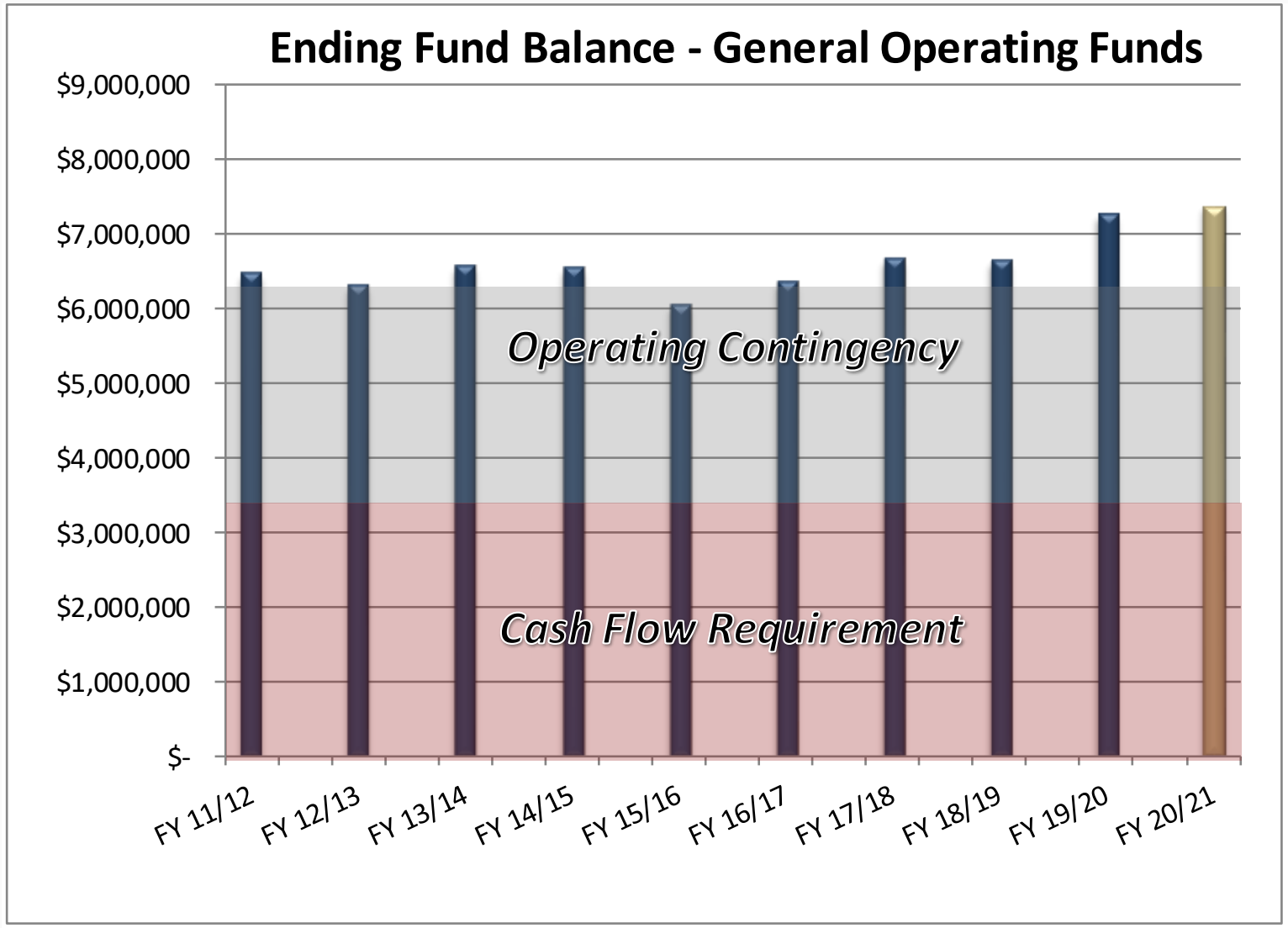
FISCAL YEAR 2020/21 BUDGET ADJUSTMENT #1

Redmond City Council

December 8, 2020

GENERAL OPERATING FUND BALANCE

Fund Balance expected to significantly exceed policy level.



Policy = $6.26 Million

End of FY 20/21 (High Confidence) = $7.37 Million

PAY OFF 2010 BOND

Allocated across Public Works Funds

Sub-Fund	Share	Remaining Principal	Remaining Interest
Trans. Operations*	35%	$ 740,000	$175,500
Parks Operations*	16%	$ 345,000	$ 81,400
Water Operations	31%	$ 655,000	$155,300
Wastewater Operations	12%	$ 250,000	$ 58,300
Stormwater Operations	6%	$ 140,000	$ 32,100
TOTAL	**100%**	**$ 2,130,000**	**$502,600**

* Part of General Operating Funds

General Operating Funds Annual Cash Flow = $148,000

PAY OFF 2010 BOND

GENERAL FUND	Resources	Expenditures
Beginning Fund Balance	$ 265,000	
Property Taxes	$ 217,000	
Franchise Fees	$ 250,000	
Room/Lodging	$ 135,593	
Tourism Promotion		$ 39,593
Transfers		$ 828,000
Change to General Fund		**$ 867,593**
Change to General Fund – Total Appropriations		**$ 867,593**

POLICE FUND	Resources	Expenditures
Beginning Fund Balance	$ 87,000	
Interfund Transfers	($ 87,000)	
Change to Police Fund		**$ 0**
Change to Police Fund – Total Appropriations		**$ 0**

TRANSPORTATION FUND	Resources	Expenditures
Beginning Fund Balance	$ 97,000	
Interfund Transfers	$ 643,000	
Special Payments (Debt Pay Off)		$ 740,000
Change to Transportation Fund		**$ 740,000**
Change to Transportation Fund – Total Appropriations		**$ 740,000**

PARKS & FACILITIES FUND	Resources	Expenditures
Beginning Fund Balance	$ 73,000	
Interfund Transfers	$ 272,000	
Special Payments (Debt Pay Off)		$ 345,000
Change to Parks & Facilities Fund		**$ 345,000**
Change to Parks & Facilities Fund – Total Appropriations		**$ 345,000**

PAY OFF 2010 BOND

WATER FUND	Resources	Expenditures
Reserve for Debt Service		($ 292,700)
Reserve for Future Expend		($ 362,300)
Special Payments (Debt Pay Off)		$ 655,000
Change to Water Fund		**$ 0**
Change to Water Fund – Total Appropriations		**$ 655,000**

WASTEWATER FUND	Resources	Expenditures
Beginning Fund Balance	$ 250,000	
Special Payments (Debt Pay Off)		$ 250,000
Change to Wastewater Fund		**$ 250,000**
Change to Wastewater Fund – Total Appropriations		**$ 250,000**

STORMWATER FUND	Resources	Expenditures
Reserve for Future Expend		($ 140,000)
Special Payments (Debt Pay Off)		$ 140,000
Change to Stormwater Fund		**$ 0**
Change to Stormwater Fund – Total Appropriations		**$ 140,000**

IT COVID-19 COSTS

Costs are reimbursed by Coronavirus Relief Funds (CRF)

GENERAL FUND	Resources	Expenditures
Federal Grants & Awards	$ 124,500	
Information Technology (OU)		$ 124,500
Change to General Fund		**$ 124,500**
Change to General Fund – Total Appropriations		**$ 124,500**

RENTAL ASSISTANCE / UTILITY ARREARS

Support is administered by Thrive and the Latino Community Association and reimbursed by Coronavirus Relief Funds (CRF)

COMMUNITY DEVELOPMENT FUND	Resources	Expenditures
Federal Grants & Awards	$ 100,000	
Community Development (OU)		$ 100,000
Change to Community Development Fund		**$ 100,000**
Change to Community Development Fund – Total Appropriations		**$ 100,000**

REDMOND
1910
2010
THE HUB

CITY OF REDMOND

CITY HALL
411 SW 9th STREET
REDMOND, OR 97756
541.923.7710
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info@redmondoregon.gov
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STAFF REPORT

DATE: December 8, 2020
TO: Redmond City Council
THROUGH: Keith Witcosky, City Manager
John Roberts, Deputy City Manager
FROM: Mike Caccavano, City Engineer
Bill Duerden, Public Works Director
SUBJECT: Resolution #2020-23 - A resolution setting fees and charges imposed by the City of Redmond.

Addresses Council Goal:
1.C Explore opportunities to augment revenues to support existing operations and infrastructure maintenance.

Report in Brief:
The attached resolution makes changes to the current City of Redmond Fee Schedule. Words redlined are added and ~~words struck out are to be deleted~~. All areas containing a change have been highlighted in yellow for ease in locating on the fee schedule (Exhibit A). The updated schedule becomes effective January 1, 2021.

Background:
CDD PLANNING AND ENGINEERING LAND-USE FEES:

The transcript preparation fee is needed to align with requirements identified in sections 8.1510 Filing Appeals and 8.1525 Transcript Requirement of the City Code Chapter 8 (Development Code). The fee would enable cost recovery of preparing a transcript as part of the land use appeal process.

ENGINEERING SERVICE & PRODUCTS FEES:

Overview: The fees charged by the Engineering Department for development review and review of public improvement construction plans associated with development do not accurately reflect the level of effort required. The current engineering fees were developed after a 2008 fee study that was completed in coordination with the Community Development Department. Development and construction plan review fees have not changed since 2008.

Over the past year, Engineering staff updated the fee study using the same methodology used by the consultant in 2008. Staff time was estimated for the various review tasks and employee costs updated to current amounts. In addition, the structure of some fees was updated and development related tasks that were previously uncompensated were added.

The primary reason for the updates is to ensure that development pays for costs incurred and is not subsidized as much by Public Works enterprise and other funds. In the fiscal year 2020-21 budget, development revenue is 19 percent of the total revenue for Engineering and Inspection, but development related work amounts to roughly 50 percent of the Engineering workload.

Details of the proposed fee changes follow. In general, for plan reviews, a submittal fee was added. The current fee methodology bases review costs on the size of the plan set, but this does not accurately reflect administrative effort which is not related to the size. The proposed submittal fee captures the administrative cost.

Fees based on the size of the plan set, or per sheet charges, were revised to reflect the level of effort. The previous methodology assumed no difference in effort between reviewing the various types of plans, but stormwater and grading plans take significantly longer to review than water and transportation with sewer plans taking the least time. Most fees were increased, but some were decreased.

Street cut permits are a new fee for Engineering, but this program was previously administered by the Transportation Division. The Engineering Department is better equipped to handle the administration of street cut permits and can ensure that other divisions of Public Works are notified when their infrastructure may be impacted by excavation in the street. The previous fee of $20 was inadequate. Unlike other Engineering fees, the proposed fee does not capture staff cost, only those paid to our materials testing contractor who ensure that trench backfill is compliance tested to avoid settlement of the pavement.

For development reviews, Engineering Department fees are incorporated with Planning Department fees. To update the fees, the Engineering amount was separated, reviewed for time requirements and added back in. The combined Engineering and Planning fee is described below and shown on the proposed fee schedule revision. There are increases and decreases proposed for these fees.

FEE REDUCTIONS (adjusted to cover actual cost)

Public Improvement Plans Plan Review Fees:

- Sewer Per Sheet Fee: A fee reduction from $252.00 to $245.00.

Commercial Site Plans Plan Review Fees:

- Grading Per Sheet Fee: A fee reduction from $252.00 to $163.00.
- Storm Per Sheet Fee: A fee reduction from $252.00 to $163.00.
- Fire Line Per Sheet Fee: A fee reduction from $209.00 to $163.00.

Engineering-Only Portion of Planning and Engineering Land-Use Fees

Development Fees:

- Cluster Development (CLD): A fee decrease of $341.12.

NEW FEES

Submittal Fees (to recover associated administrative costs above and beyond existing fees for plan review)

- Public Improvement Plans: A new fee ($1,260.00) due upon submittal of public improvement plans.
- Commercial Site Plans: A new fee ($605.00) due upon submittal of commercial site plans.
- Change Orders: A new fee ($180.00) due upon submittal of a Public Improvement Plan or Commercial Site Plan (formal) Change Order.

Sewer and Water Connections: A new per sheet fee ($82.00) for site improvement permits.

Revision Fee: A new ($89.00) fee due upon submittal of a Public Improvement Plan or Commercial Site Plan (minor) Revision.

Commercial Building Permit Site Review Fees: A new fee ($82.00) for Engineering staff to review commercial building permits (new construction, additions, tenant improvement/remodel) building permits.

Residential Building Permit Storm Drainage Review Fees: A new fee ($82.00) for Engineering staff to review storm drainage for residential (new construction, additions, and remodel) building permits to recover associated plan review costs.

Driveway Approach and Sidewalk Fees:

- Existing Driveway Approach Replacement permit: A new fee ($73.00), less expensive than a new driveway permit ($146.00) to recover actual costs.
- Existing Sidewalk Replacement permit: A new fee ($73.00), less expensive than a new sidewalk permit ($146.00) to recover actual costs.
- Reinspection Fee (each after 2 inspections): A new fee ($73.00) to cover costs associated with multiple re-

inspections that a regular permit fee does not capture.

Advanced Grading Permit (as part of an existing SD plan review): A new fee ($70.00) to recover the actual costs of providing permit before plan review is approved.

Systems Development Charge Credit transfer/authorization requests: A new fee ($40.00) per request to transfer full ownership, partial ownership, or to authorize the use of an existing Certificate of Credit to recover the actual costs to process a credit transfer or authorization.

MINIMAL FEES TO RECOVER COSTS (less than $100 increase)

Public Improvement Plans Plan Review Fees:

- Streets Per Sheet Fee: A fee increase from $252.00 to $285.00.
- Waterline Per Sheet Fee: A fee increase from $209.00 to $285.00.
- Change Order Per Sheet Fee: A fee increase from $114.00 to $163.00

Commercial Site Plans Plan Review Fees:
Stormwater Repair/Upgrade Plan Review/Inspection Fees: A fee increase from $315.00 to $395.00.
Additional Plan Reviews (over 3) Per Sheet Fee: A fee increase from $114.00 to $122.00.
Inspection Time Billing Rate: A fee increase from $71.00 to $73.16.

City of Redmond Construction Specifications: A fee increase from $50.00 to $55.00 to mail a single Standard Specifications book.

Engineering-Only Portion of Planning and Engineering Land-Use Fees (to recover actual cost)

- First Appeal to a Hearing: A fee increase of $250.00 to recover actual cost (current Engineering portion of this fee is $0.)
- Extension Request: A fee increase of $13.78.
- Final Plan Review: A fee increase of $96.26.
- Improvement Agreements: A fee increase of $26.51.
- Lot of Record Verification: A fee increase of $37.66.
- Measure 49: A fee increase of $46.11.
- Modification of Approval: A fee increase of $47.40.

SIGNIFICANT COST RECOVERY FEE INCREASES (greater than $100 increase)

Public Improvement Plans Plan Review Fees:

- Storm Water and Grading Per Sheet Fee: A fee increase from $252.00 to $410.00 includes added grading plan review.

Driveway Approach and Sidewalk Fees:

- Commercial or Residential permit: A fee increase from $40.00 to $146.00.

Street Cut Permit and Deposit: The FY 2020/21 proposed fee schedule includes an increase for Street Cut Permits to recover costs for a material testing consultant to certify trench backfill and compaction. This fee does not compensate for staff inspection time. This is the first fee increase for Street Cut Permits since they were initiated by Public Works. The current Street Cut permit fee of $20.00 will increase to $300.00 per permit, which cost is lower when compared to other local jurisdictions for these services.

Engineering-Only Portion of Planning and Engineering Land-Use Fees (to recover actual cost)
Development Fees:

- Planned Unit Development (PUD): A fee increase of $480.50.
- Cottage Development (COD): A fee increase of $198.88.

Site Plan Fees:

- Residential 21-50 Units: A fee increase of $474.97.
- Comm/Ind 50,001-200,000 SF: A fee increase of $433.92
- Comm/Ind >200,001 SF: A fee increase of $468.16.
- Conversion of Existing Res to Com: A fee increase of $366.81.
- Minor Alteration to Site Plan: A fee increase of $578.68.
- Partition (up to 3 lots): A fee increase of $260.28.
- Subdivision 4-20 Lots: A fee increase of $444.41.

Other Fees:

- **UGB or UAR expansion:** A fee increase of $1,481.87.

PUBLIC WORKS FEES:

Water: The FY 2020/21 budget includes a 4% increase to water rates in order to keep pace with inflation, and the incremental cost of sustaining operations and to facilitate necessary capital maintenance projects. Current residential water rates are $15.20, plus $1.22 per 100 cubic feet of water used. A 4% increase will adjust the charge to $15.81, plus $1.27 per 100 cubic feet of water used. For a resident who consumes 1,500 cubic feet of water per month, the rate increase will result in a $1.36 increase per month. A 4% increase will also be applied to the fees for Fire Hydrant Use Permits, Non-Metered Residential Accounts, Fire Standby Charge, Standpipe Water Accounts, and Irrigation Rate.

Wastewater: The FY 2020/21 budget includes a 3% increase for wastewater rates to keep pace with inflation, the incremental cost of sustaining operations, as well as facilitate necessary capital maintenance projects while maintaining an appropriate operating contingency. The current residential sewer rate is $31.63 per month. A 3% increase will adjust the charge to $32.58 per month, an increase of $0.95 per month.

Parks SDC Fees: In June 2019, City Council approved Res. #2019-17 adopting new SDC rates and a phase-in plan for the Parks SDC per the table below:

System	July 1, 2019	January 1, 2020	July 1, 2020	January 1, 2021
Parks (Single Family)	$3,289.00	$3,906.00	$4,523.00	$5,139.00
Parks (Multi-Family)	$3,000.00	$3,328.00	$3,656.00	$3,985.00

This update to the Fee Schedule implements the January 1, 2021, Parks SDC rate for Single Family and Multi-Family development.

Wastewater Service Fees: A 3% fee increase for sewer services is proposed to keep pace with inflation costs associated with maintaining and operating the wastewater treatment and collection systems. The 3% fee increase will be applied to Sewer Reconnection, Service Calls, Sewer Taps, Dye Testing, Wastewater Permits (short duration discharge), Discharge Permit Issuance (short duration discharge), and Sewer Flow Tests.

Existing Sewer Line Inspections: A fee increase for existing sewer line inspections from $430.00 to $600.00 minimum for the first lineal 400 feet, plus an increase from $1.11 to $1.50 per additional lineal foot of existing sewer line inspected is proposed. Fee increase for inspections is necessary to keep pace with inflation and recover personnel and operational costs associated with onsite inspections.

New Sewer Line Inspections: A fee increase for new sewer line inspections from $880.00 to $1,200.00 minimum for the first lineal 400 feet, plus an increase from $2.22 to $3.00 per additional lineal foot of new sewer line inspected is proposed. This includes cleaning and video for initial acceptance and one-year warranty inspection. Fee increase for inspections is necessary to keep pace with inflation and recover personnel and operational costs associated with onsite inspections. This proposed fee is lower than other local jurisdictions.

Non-compliant Inspection Fee (Wastewater/Stormwater): The FY 2020/21 proposed fee schedule includes a new fee for onsite inspections when they have been scheduled prematurely or are non-compliant and require reinspection. This

fee recovers personnel and administrative costs associated with unnecessary and repeat onsite visits. The proposed fee is $150.00 per occurrence.

RV Dump Station: A fee increase for the RV Dump Station is also included in the proposed fee schedule, raising the fee from $5.00 to $6.00. This fee has not been raised since 2010 and the new proposed fee is still below dumping fees in other Central Oregon locations.

Residential Sewer Account RV Token (limit 10 per year): City of Redmond utility rate payers are eligible to purchase up to 10 discounted RV Dump Tokens per year. The proposed fee increase is $1.00, from $3.00 per token to $4.00 each.

Discussion:
It is recognized the onset of COVID-19 in March 2020, created uncertainty regarding the economy. Due to the economic uncertainty, proposed fee changes were not brought to City Council in June 2020. That enabled more time to evaluate or assess the economic impacts on development activity in Redmond. Overall, Redmond and Central Oregon's growth and development have been very strong. In Redmond, land use and building permit activity has increased 24 percent in 2020 over 2019. No slowdown has been experienced in any facet of development in the community; whether residential, commercial or industrial.

The proposed changes to the fee schedule are intended to represent only those that were either previously accepted and approved by City Council or are considered necessary to recover operating costs to maintain existing service levels.

Fiscal Impact:
The changes were not significant enough to influence budget forecasting for FY 20/21. Albeit limited in scope, the changes will help balance the City's budget, maintain the City's long-term fiscal sustainability, and off-set costs associated with the provision of increasing demands on public services.

Alternative Courses of Action:

1. Adopt Res. #2020-23.
2. Do not accept Res. #2020-23.
3. Request more information.

Recommendation / Suggested Motion:
"I move to adopt Res. #2020-23."

CITY OF REDMOND
RESOLUTION NO. 2020-23

A RESOLUTION SETTING FEES AND CHARGES IMPOSED BY THE CITY OF REDMOND.

WHEREAS, it is necessary to review fees and charges imposed the by City of Redmond to ensure that revenues are comparable with costs of services provided; and

WHEREAS, staff has identified the need to amend the City's fee schedule; and

WHEREAS, it should be understood that these charges are an important part of the resources for the operation of the City.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF REDMOND, OREGON, AS FOLLOWS:

Section 1. The fees and charges on the attached Exhibit A are hereby established effective January 1, 2021. All other fees contained within the City's Fee Schedule which have not been modified as part of this resolution will remain in effect.

Section2. The fees are adopted until next review is presented to Council.

ADOPTED by the City Council and **SIGNED** by the Mayor this 8th day of December 2020.

_____
George Endicott, Mayor

ATTEST:

_____
Kelly Morse, City Recorder

Exhibit A

CITY OF REDMOND
FEE SCHEDULE
Effective ~~November 1, 2020~~ January 1, 2021

DEPARTMENT / ITEM	FEE
AIRPORT FEES	
Advertising	
Back-lit Dioramas	$ 300.00/month
Brochure Rack	$ 50.00/month
Parking Lot Light Poles	$ 200.00/month
Telephone Board	$ 100.00/month plus long distance charges
Wall and/or Free Standing Displays	$ 600.00/month
Digital Advertising	
Single Spot Rotating Still Images	$ 300.00/month – 10 second rotating spot
Package of 2 Spots Rotating Still Images	$ 500.00/month – 10 second each rotating spot
Single Commercial Spot (video no audio)	$ 300.00/month – 10 second rotating spot
Package of 2 Commercial Spots (video no audio)	$ 500.00/month – 10 second each rotating spot
Standing Banners (Max size 36” x 89”)	$ 200.00/month
Customized Advertising	Between $200.00 and $1,000.00 per month depending on size, location, medium and investment.
Customer Facility Charge for Rental Car	$ 3.00/day of each rental, not exceeding seven (7) consecutive days
Landing Fees	$ 3.08/1000 lbs landed weight (Part 125, 135, and 137)
Leases-Airside	
Aircraft Fuel	$ .07/gallon
Aircraft Tiedown	$ 50.00/month
Single	$ 5.00/night
Twin	$ 8.00/night
Helicopter	$ 10.00/night
Jet	$ 10.00/night
Assignment of Lease	$ 500.00/each
Leases - Terminal	
Passenger Facility Charge	$ 4.50/passenger
Leases - Other	
Antenna/Radio Lease Space	$ 100.00/month

Parking	
Parking/Vehicle	$ 1.00/first ½ hour $ 1.00/second ½ hour $ 2.00/each additional hour $ 15.00/day
Insufficient Funds Late Fee	$ 50.00 plus legal fees if not paid within 10 calendar days
Airport Parking Violations	See Bail Fees (Police Department Fees)
Transient Airline Employees	$ 90.00/quarter or $300/year
Transient Airline Employees Parking Card Replacement	$ 25.00 each (Non-Refundable)
Parking – Employee	
Employee Parking Card Replacement	$ 25.00 each (Non-Refundable)
Parking – Terminal Tenants	
Terminal Tenants Parking Card	$ 10.00 each (Non-Refundable)
Terminal Tenants Parking Card Replacement	$ 25.00 each (Non-Refundable)
Security	
Airport Operations Area (AOA) Badge	$ 50.00 each ($25.00 of which is refundable)
SIDA/Sterile Fingerprinting for CHRC	$ 50.00 each (Non-Refundable)
Security Access Card	$ 25.00 each (Non-Refundable)
SIDA/Sterile Badge with fingerprinting	$ 75.00 each (Non-Refundable)
AOA/Sterile/SIDA Badge Replacement – Lost/Stolen	$ 100.00 (Non-Refundable)
Other Fees/Charges	
Conference Rooms	
Large Room	$ 100.00/hour-minimum three hours
Terminal Tenants	$ 50.00/hour
Terminal Greeting Space	
Greeting Space	$ 25.00/hour-minimum two hours $ 75.00 per day
Television Commercials	$ 1,000.00 + $50.00/hour staff time per employee
Ground Transportation	
Annual Application	$ 100.00
Gate Access	$ 1.00/gate access
Gate Access Badge	$ 12.50 each
Gate Access Badge Replacement – Lost/Stolen	$ 25.00 each
Gate Access Badge Reactivation	$ 10.00 each
COMMUNITY DEVELOPMENT	
Planning and Engineering Land-Use Fees	
Amendments:	

Combined Comp Plan Map / Zoning Map Amendments	$ 11,973.03
Comp Plan Map Amendment	$ 9,855.89
Comp Plan Text Amendment	$ 14,814.42
Redmond Development Code Text Amendment	$ 6,254.72
Zoning Map Amendment	$ 7,159.06
Annexation (Includes City Recorder's Fee of $350)	$ 953.69
Appeals:	
First Appeal to a Hearings Body	$ ~~250.00~~ $500.00
Appeal of Hearings Body Decision	$ 4,211.07
Subsequent Appeal to the State/LUBA	$ 6,991.71
Area Plans:	
Conceptual Area Plan	$ 10,393.60
Final Area Plan	$ 38,862.52
Area Plan Map or Text Amendment	$ 7,736.74
Consolidated (Conceptual/Final) Area Plan	$ 43,387.66
Public Area Plan (minimum 75% of an area is used for public uses	$ 5,314.33
Conditional Use:	
Residential, Public, Semi-Public	$ 5,085.61
Commercial, Industrial	$ 6,117.18
Billboard Relocation	$ 1,537.43
Communication Tower – Residential/Public Zone	$ 19,117.57 **Includes a flat fee for conditional use review and hearings officer decision of $7,677.89, and a deposit of $11,433.14 for appeal fees, which will be calculated on actual costs of service.**
Communication Tower – Commercial/Industrial Zone	$ 6,117.18 **Does not include Public Hearing Fees**
Declaratory Ruling	$ 3,076.36
Developments:	
Planned Unit Development (P.U.D.)	$ ~~22,765.50~~ $22,285.00 **Does not include Final Plat or Public Hearing Fees**
Cluster Development (C.L.D)	$ ~~17,483.88~~ $17,825.00 **Does not include Final Plat or Public Hearing Fees**
Cottage Development (C.O.D.)	$ ~~12,201.12~~ $12,400.00 **Does not include Final Plat or Public Hearing Fees**
Expedited Land Divisions	$ 11,723.17
Extension Request	$ ~~911.22~~ $925.00
Final Plan Review (required for filing final plats)	$ ~~1,048.74~~ $1,145.00 + $80.34 per lot
Hearing (Specially Set); Non-Hearings Officer **DEPOSIT ONLY**	$ 3,409.63 **Fee May Be Higher Based on Actual Cost of Services**

Hearing (Specially Set); Hearings Officer **DEPOSIT ONLY**	$ 2,822.61 **Fee May Be Higher Based on Actual Cost of Services**
Improvement Agreements (Initial Agreement Included in Fee)	$ ~~858.49~~ $885.00
Lot Line Adjustment	$ 1,380.00
Lot of Record Verification	$ ~~512.34~~ $550.00
Master Development Plan (Including Comp Plan Map Amendment and Zoning Map Amendment):	$ 38,862.52 **Does not include Public Hearing Fees**
Partial Master Development Plan (Including Comp Plan Map Amendment and Zoning Map Amendment):	$ 22,765.50 **Does not include Public Hearing Fees**
Measure 49	$ ~~13,053.89~~ $13,100.00
Modification of Approval	$ ~~1,392.60~~ $1,440.00
Modification or Alteration of a Non-Conforming Use or Structure	$ 1,392.60
Re-Inspection Fee	$ 75.00
Historical Landmarks Alteration	**NO CHARGE**
Urban Growth Boundary or Urban Reserve Area Expansion	$ ~~37,448.13~~ $38,930.00
Temporary Residences for Medical Hardship	$ 1,392.60
Pre-Development Services	**NO CHARGE**
Sign Permits:	
Sign Permit ($50.00 until December 31, 2010)	$ 171.93 **Does not include Building Permit Fee if Required**
Sign Requiring a Building Permit	**See CDD Building Division Fees Below**
Sign Permit - Temporary	**NO CHARGE**
Site Plan:	
Residential: 3 - 20 Units	$ 6,166.47
Residential: 21- 50 Units	$ ~~8,625.03~~ $9,100.00
Residential: 51 + Units	$ 12,233.21
Commercial/Industrial: Up to 3,499 Square Feet	$ 3,700.00
Commercial/Industrial: 3,500-50,000 Square Feet	$ 7,390.59
Commercial/Industrial: 50,001-200,000 Square Feet	$ ~~17,156.08~~ $17,590.00
Commercial/Industrial: 200,001 + Square Feet	$ ~~22,391.84~~ $22,860.00
Conversion of Existing Residential Structure and Site to Commercial	$ ~~4,298.19~~ $4,665.00
Minor Alteration to Site Plan	$ ~~1,343.32~~ $1,925.00
Partition (up to 3 lots)	$ ~~3,695.28~~ $4,435.00
Subdivision:	
4 - 20 Lots	$ ~~11,985.59~~ $12,430.00
21 - 50 Lots	$ 14,780.03
51 > Lots	$ 19,304.02
Replat	$ 9,335.66

Transcript Preparation Fee	$ 75.00
Variance:	
Minor	$ 3,072.91
Major	$ 5,703.41
Actual Cost of Service (for services not listed above)	$ 75.00 per hour
CDD Building Division Fees (see Tables 3-A through 3-M)	
Addressing/Street Numbering	$85.00/building permit – new structures only
Code Compliance (Charged at Time of Building Permit Issuance)	0.07% of Building Valuation
Master Plan Program:	
Upon completion of Master Plan Approval, additional units charged as follows:	1/2 of the original plan review fee
Sign Requiring a Building Permit	Building Fee Based on Valuation Table (See Table 3-A) in Addition to Planning Fee
CDD Service Fees	
Revocable Permit Application Fee	$ 250.00
Rebuild Letter Fee	$ 50.00
Code Enforcement Hearing (Specially Set); Hearings Officer **DEPOSIT ONLY** [Section 5.351(2)(C)(2)]	$ 850.00 **FEE MAY BE HIGHER BASED ON ACTUAL COST OF SERVICES**
Appeal Fee – Citation Hearing [Section 2.797]	$ 250.00
Appeal Fee – Interpretation of City Code & Hearing [Section ~~X.XXX~~ 5.359]	$ 250.00
CDD Product Fees	
Comprehensive Plan Copy	$ 10.00
Comprehensive Plan Addendum Copy	$ 20.00
Development Code Copy	$ 50.00
Sign Code Copy	$ 5.00
Extra Small Map (8 ½ x 11)	$ 5.00
Small Map (11 x 17)	$ 7.00
Large Map (17 x 24)	$ 10.00
Extra Large Map (32 x 38)	$ 20.00
Custom Map	$ 50.00/hr (minimum $20.00)
Engineering Service Fees	
Plan Reviews (Public Improvement Plans):	

Submittal Fee	$ 1,260.00
Storm Water and Grading / per sheet	$ ~~252.00~~ $410.00
Sewer / per sheet	$ ~~252.00~~ $245.00
Streets / per sheet	$ ~~252.00~~ $285.00
Waterline / per sheet	$ ~~209.00~~ $285.00
Additional Plan Reviews (over 3) / per sheet	$ ~~114.00~~ $122.00
Change Order Submittal	$ 180.00
Change Order / per sheet	$ ~~114.00~~ $163.00
Revision	$ 89.00
Plan Reviews (Commercial Site Plans):	
Submittal	$ 605.00
Sewer and Water Connections / per sheet	$ 82.00
Grading Review / per sheet	$ ~~252.00~~ $163.00
Storm Review / per sheet	$ ~~252.00~~ $163.00
Fire Line Review / per sheet	$ ~~209.00~~ $163.00
Revision	$ 89.00
Plan Reviews (Building/STR Permits)	
Commercial TI/Remodel	$ 82.00
Commercial/Industrial Addition	$ 82.00
New Commercial/Industrial	$ 82.00
New Multi-Family	$ 82.00
Plan Reviews (Residential Storm Drainage)	
Single Family Residential Stormwater-New Construction	$ 82.00
Single Family Residential Stormwater-Remodel/Alter.	$ 82.00
Single Family Residential Stormwater-Addition	$ 82.00
Infrastructure Allocation Analysis	$ 750.00
Stormwater Repair / Upgrade Review and Inspection	$ ~~315.00~~ $395.00 (~~$200.00~~ $280.00 for plan review / $115.00 for inspection)
Inspection:	
$0-$100,000 value –	3.75% of Estimated Construction Cost
$100,001-$250,000 value –	2.25% of Estimated Construction Cost
$250,001-$500,000 value –	2.0% of Estimated Construction Cost
$500,001-$1,000,000 value –	1.5% of Estimated Construction Cost
>$1,000,000 value –	1% of Estimated Construction cost
Stormwater Inspection Fee Estimate	$ 200.00 per drywell and $115.00 per pond
Grading Fee Estimate	$ 180.00 per 10,000 sq. ft.
Inspection Time Billing Rate	$ ~~71.00~~ $73.16 per hour

Reimbursement District	$ 200.00 Application Fee
Street Vacation	$ 600.00 Application Fee
Small Wireless Facilities	
Up to five (5) small wireless facilities in the same application	$ 500.00
Each small wireless facility beyond five (5) in the same application	$ 100.00
Installation of non-recurring new pole to support small wireless facility in the right-of-way	$ 1,000.00
Extension (1-year)	$ 750.00
Expedited and/or Third-Party Professional Review	Actual cost or $125.00; whichever is greater.
Engineering Product Fees	
Driveway Approach	
Commercial	$ ~~40.00~~ $146.00
Residential	$ ~~40.00~~ $146.00
Existing Driveway Approach Replacement	$ 73.00
Reinspection Fee (each after 2 inspections)	$ 73.00
~~Traffic Impact Analysis~~	~~$ 1,200.00~~
Sidewalk Permit	$ ~~40.00~~ $146.00
Existing Sidewalk Replacement	$ 73.00
Reinspection Fee (each after 2 inspections)	$ 73.00
Advanced Grading Permit	$ 70.00
SDC Credit Transfer/Authorization	$ 40.00
City of Redmond Construction Specifications Picked Up At Public Works	$ 45.00/copy
Mailed	$ 50.00/copy
Sewer & Water Master Plans Picked up at Public Works	$ 45.00/copy
Mailed	$ 50.00/copy
Public Facilities Plan Picked up at Public Works	$ 45.00/copy
Mailed	$ ~~50.00~~ $55.00/copy
Record Drawing Copies	$ 5.00/copy
GIS Service Fee	
GIS Staff Rate	$ 50.00/hour

GIS Product Fee	
Digital Photogrammetric Products	
1/4 Section Tiles	
1/4 Section Planmetric & Countour CAD File	$ 250.00/tile
1/4 Section Orthophography (Mr. Sid, TIFF)	$ 100.00/tile
Planimeter Packages	
Urban Reserve Area 1/4 Sections Package (37 tiles)	$ 5,000.00
Urban Growth Boundary 1/4 Section Package (71 Tiles)	$ 5,000.00
North Mapping Area 1/4 Section Package (32 Tiles)	$ 2,500.00
Entire Redmond Area (140 Tiles)	$ 10,000.00
Orthophotography Mosaics	
Redmond Mosaic (UGB & URA)	$ 2,500.00
Wastewater Effluent Areas	$ 1,000.00
Hard Copy Photogrammetic Plots	
1/4 Planimetric or Orthophoto Plot (1"=100')	$ 10.00
City of Redmond Hard Copy Map Series	
18" x 24" GIS Color Map	$ 10.00
30" x 36" GIS Color Map	$ 15.00
26" x 48" GIS Color Map	$ 20.00
Custom Hard Copy Map Series	
8.5" x 11" or 11" x 17" Color Map	$ 5.00 + Technician Time at $50.00 per hour
CEMETERY FEES	
Recording Fee	$ 50.00
Adult Lot	$ 850.00 + $150.00 Perpetual Maintenance
Infant Lot	$ 75.00 includes Perpetual Maintenance
Ash Lot	$ 350.00 + $150.00 Perpetual Maintenance
Adult Open/Close	$ 700.00*
Infant Open/Close	$ 85.00*
Ash Placement	$ 200.00*
Adult Liner	$ 455.00
Infant Liner	$ 110.00
Columbarium Niche	$ 515.00 +$100.00 Perpetual Maintenance

Columbarium Name Plaque and One Name Bar	$ 350.00
Columbarium Second Name Bar	$ 200.00
Flower Vase for Columbarium Niche	$ 120.00
Flower Vase	$ 45.00
City Marker Placement	$ 75.00 per stone foot
Marker Placement Permit (Contractor)	$ 75.00
Weekday Overtime	$ 50.00/hour
*On Saturdays, in addition to the above charges, a fee of $450.00 will be charged. There shall be no services on Sundays or Holidays.	
CITY RECORDER FEES	
Annexation	**See CDD Planning Division Fees Above**
Research Fee (City Staff)	$ 36.23/hour
Public Records Review Fee (City Attorney)	$ 130.00/hour
Audio Tapes	$ 17.00/tape
FINANCE DEPARTMENT FEES	
Business License	
Outside City	$ 70.00
Inside City	$ 55.00
Employees	$ 1.50 each
Itinerant Merchant Permit	$ 50.00
Temporary Business Permit	$ 250.00
Amusement Machines [Section 7.042(1)]	$ 60.00/machine
Liquor License	
Initial original application	$ 100.00
Change in ownership, change in location, or change in privilege application	$ 75.00
Renewal or temporary application	$ 35.00
Social Gaming License [Section 7.298]	$ 300.00
Non-Refundable Investigation Fee [Section 7.284(1)]	$ 70.00
Bingo License [Section 7.456]	$ 40.00
Circus/Tent Show License Fee [Section 7.344(1)]	$ 275.00/day
Theatrical Tent Show License Fee [Section 7.344(2)]	$ 100.00/day
Assembly Permit	
Application Fee when street closures are not being requested	$ 75.00
Application Fee when street closures are requested	$ 150.00

Application Fee when closing 5th or 6th Street is requested	$ 200.00
Public Works staff time set up/break down (barricade, review of traffic control plan, etc.)	$ 30.00/hr
Deposit for trash, restrooms clean up, etc.	$ 250.00 (Refundable)
Transient Room Tax / Additional Req. [Section 7.102]	Calculated at 9% (.090) and rounded up to the next full cent for any portion of a cent equal to or greater than $.005. Each transient lodging provider may retain 5% of their tax revenues collected as a collection reimbursement charge.
Street Vendor License [Section 7.510(2)]	$ 83.00/cart
Merchant Police License [Section 7.614]	$ 55.00
Vehicle For Hire License	
1-2 Drivers	$ 75.00
3-5 Drivers	$ 125.00
6-15 Drivers	$ 250.00
16-50 Drivers	$ 500.00
51+ Drivers	$ 1,000.00
Drivers Permit	$ 10.00
Tow Driver Permit	$ 25.00
Ice Cream Truck Driver Permit	$ 25.00
Ambulance Service License [Section 7.710-]	$ 55.00/vehicle plus
Investigation	$ 11.00/incident
Driver/EMT License [Section 7.718(7)]	$ 17.00/person
Pawn Broker	$ 165.00
Electronic Lien Check	$ 25.00
Hazardous Vegetation Abatement	Full Cost Reimbursement ($100/minimum)
Xerox Copies	$ .25/page
Fax Charges	$ 1.00/page
Returned Item Charge	$ 25.00
Check Re-issuance Fee	$ 35.00
Delinquent Utility Charge	1.5%/month (18% APR)
Delinquent Fees / Lien Charge	10% APR
Reimbursement Agreements	
Application Fee (Due at time of application)	$ 200.00
Reimbursements and Reconveyances	$ 35.00/property (due upon approval of application)
Notification and Postage	$ 5.00/property (due upon approval of application)
Collection Agency Referral Fee on Outstanding Debt	35% of amount outstanding not to exceed the percentage retained by the private collection agency

Utility Deposits for Tenant/Renters	
Commercial	$ 300.00 or an amount equal to 2½ times the average monthly billing for a commercial account, whichever is greater per initiation of service.
GARBAGE RATES	
Residential Service	
35 Gallon Cart	
Curb	$ 14.51
Yard (Disabled)	$ 15.88
Curb (Low Income)	$ 10.88
Yard (Low Income / Disabled)	$ 11.91
Every Other Week	$ 10.88
Every Other Week (Disabled)	$ 8.93
Every Other Week (Low Income)	$ 8.16
65 Gallon Cart	
Curb	$ 21.89
Yard (Disabled)	$ 23.29
Curb (Low Income)	$ 16.42
Yard (Low Income / Disabled)	$ 17.46
Every Other Week	$ 16.42
Every Other Week (Disabled)	$ 13.09
Every Other Week (Low Income)	$ 12.32
95 Gallon Cart	
Curb	$ 26.64
Yard (Disabled)	$ 28.06
Curb (Low Income)	$ 19.99
Yard (Low Income / Disabled)	$ 21.05
Every Other Week	$ 19.99
Every Other Week (Disabled)	$ 15.79
Every Other Week (Low Income)	$ 15.00
Additional Weekly Garbage	
First Extra Can	$ 4.88
Each Additional Can	$ 3.20
Extra Large Bag	$ 3.89
Extra Small Bag	$ 3.05
95 Gallon Cart EOW Yard Debris Collection	
Curbside EOW	$ 5.35

Commercial Service	
35 Gallon Cart – Curb	$ 15.25
65 Gallon Cart – Curb	$ 26.21
95 Gallon Cart – Curb	$ 37.18
Containers:	
1 yard/once per week	$ 74.05
Additional weekly dumps	$ 65.35
1-1/2 yard/once per week	$ 99.00
Additional weekly dumps	$ 89.79
2 yards/once per week	$ 132.52
Additional weekly dumps	$ 119.93
3 yards/once per week	$ 182.96
Additional weekly dumps	$ 168.49
4 yards/once per week	$ 228.13
Additional weekly dumps	$ 210.70
5 yards/once per week	$ 269.53
Additional weekly dumps	$ 248.23
6 yards/once per week	$ 305.68
Additional weekly dumps	$ 278.89
Other	
Bulk Rate for the Collection of Bulk Refuse	$ 13.95
Not at Curb / Heavy Can Extra Charge	$ 3.34
Late Out / Go Back Charge	$ 5.97
Yard Debris Recycling	$ 5.35
GENERAL FEES	
Room Fees	
City Hall Civic Room 207	Priority 1, 2 and 3: No Charge Priority 4: $50.00/first 3 hours, $10.00 each additional hour
City Hall Civic Room 208	Priority 1, 2 and 3: No Charge Priority 4: $50.00/first 3 hours, $10.00 each additional hour
City Hall Civic Rooms 207 & 208	Priority 1, 2 and 3: No Charge Priority 4: $75.00/first 3 hours, $10.00 each additional hour
Public Works Training Room East	Priority 1, 2 and 3: No Charge Priority 4: $50.00/first 3 hours, $10.00 each additional hour

Public Works Training Room West	Priority 1, 2 and 3: No Charge Priority 4: $50.00/first 3 hours, $10.00 each additional hour
Public Works Training Room East & West	Priority 1, 2 and 3: No Charge Priority 4: $75.00/first 3 hours, $10.00 each additional hour
Non-Refundable Cleaning Fee for Civic Rooms and Public Works Training Rooms	Priority 1 and 2: No Charge Priority 3: $25.00 for ≤50 attendees, $50.00 for >50 attendees Priority 4: $25.00 for ≤50 attendees, $100.00 for >50 attendees
POLICE DEPARTMENT FEES	
Police Fees	
Police Reports	$ 20.00 up to 10 pages / $0.25 for each additional page
Large Report Requests / Research on Individuals	No charge for first hour. $30.00 for each additional hour
Clearance Letter	$30.00
Tapes	
Video	$ 30.00
Audio	$ 30.00
CD's	$ 30.00
Floppy Disks	$ 30.00
Finger Printing	
One Card	$ 20.00
Additional Cards	$ 5.00 each
Vehicle Storage Fee	$ 30.00/day
Research Fee / Records Check	$ 25.00
Police Impound Tow Administrative Fee	$ 125.00
Unpermitted Alarm System (per calendar year)	
1st Response	$ 250.00 (Fee waived if permit obtained within 30 days of alarm response)
2nd Response	$ 250.00
3rd & more Responses	$ 500.00 each
Permitted Alarm System (per calendar year)	
1st False Alarm	Warning
2nd False Alarm	$ 100.00
3rd & more False Alarms	$ 250.00 each
Other Permit Fees	
Initial Permit	$ 40.00
Transfer	$ 40.00
Permit Renewal	$ 10.00

Bail Fees	
Parking Violations [Section 6.200]	
2-Hour Parking Violation (on street):	
First Overtime	$ 15.00
Each Additional Overtime Unit	$ 10.00
Violation for Employer/Employees	$ 50.00
Airport Parking Violation	$ 50.00
All Other Parking Violations	$ 25.00
If Not Paid Within 5 Days of Ticket	$ 10.00 additional
Prohibited Parking Violation [Section 6.167]	$ 40.00
Administrative Infractions: [Section 2.782(3)]	
Class 'C'	$ 100.00
Class 'B'	$ 250.00
Class 'A'	$ 500.00
Court Cost [Section 2.706(1)]	$ 10.00
Court Cost [Section 2.706(4)]	$ 15.00
Civil Infractions: [Section 2.782(3)]	
Class 'C'	$ 100.00
Class 'B'	$ 250.00
Class 'A'	$ 500.00
Duty to Send Children to School [Section 5.137]	
Superintendent Citation, up to	$ 100.00
Dog at Large [Section 5.252]	$ 100.00
Fail to License Dog [Section 5.255]	$ 100.00
Animals at Large [Section 5.265]	$ 100.00
Animal Nuisances [Section 5.270]	$ 100.00
Noise Violations [Section 5.335(14)(A) and ORS 467.100]	$ 250.00
PUBLIC WORKS FEES	
Parks Division Fees	
Parks Amenity Reservations	
Resident	$ 40.00 per reservation
Non-Resident	$ 60.00 per reservation
Sports Court Reservations	
Resident	$ 20.00/court/day
Non-Resident	$ 30.00/court/day
Sports Field Reservations	
Local Nonprofits, Government and Education	$ 40.00/field/day

Organizations and Private Redmond Residents	
Local Nonprofit Youth Club Sports and Recreation League Season Rate	$ 75.00/field/month
Commercial Use	$ 25.00/game/field
All Other Uses	$ 75.00/field/day
Deposit	$ 50.00 (refundable)
Additional Staff Support	$ 51.07/hour
Water/Sewer/Stormwater/Parks/Transportation	
System Development Charges (Reimbursement & Improvement):	
Sewer – Meter Size (Water):	
5/8”	$ 4,124.00
1”	$ 10,309.00
1-1/2”	$ 20,618.00
2”	$ 32,988.00
3”	$ 65,976.00
4”	$103,088.00
6”	$206,176.00
Water – Meter Size:	
5/8”	$ 2,643.00
1”	$ 6,607.00
1-1/2”	$ 13,214.00
2”	$ 21,143.00
3”	$ 42,284.00
4”	$ 66,069.00
6”	$132,139.00
Parks (residential units only)	
Single Family	$ ~~4,523.00~~ $5,139.00/dwelling unit
Multi-Family	$ ~~3,656.00~~ $3,985.00/dwelling unit
Transportation	$ 4,132.00/PM peak hour trip
SDC Installment Payment Contract Application Fee	$ 150.00
Interest Rate for SDC Installment Payment Contract	The annual rate of interest on the unpaid balance shall equal the

	prime lending rate, as published in the Wall Street Journal, plus two and one-half (2-1/2) percentage points.
Miscellaneous Water, Wastewater, and Stormwater Fees:	
5/8” x 3/4” Meter Installation Fee	$ 333.92
1” Meter Installation Fee	$ 432.05
1-1/2” Installation Fee	$ 892.00
2” Meter Installation Fee	$ 870.00
3” and Larger Meters	Call for Current Quote
AMR Tampering Fee	$ 200.00
Water Tap Fee	$ 500.00
¾”	$ 275.00
1”	$ 300.00
2”	$ 800.00
3” and larger, Fire Hydrant, Fire Line installation	$ 230.00/per hour (Material and tap provided by other)
Meter Test	Calculated on time and materials
Hydrant Flow Test	$ 150.00/per hydrant
Utility Service Fee	$ 20.00
Owner, Landlord and/or Property Management Utility Service Fee	$ 10.00
Shut Off Notice Fee	$ 5.00
Utility Deposits as Required by City Manager [Section 4.013]:	
Residential	$ 100.00, or an amount equal to two and one-half (2-1/2) times the average monthly billing, whichever is greater
Non-Residential	$ 100.00, or an amount equal to two and one-half (2-1/2) times the average monthly billing, whichever is greater
Water Re-Connection Service [Section 4.015(3)]	$ 45.00, before services are restored, during regular business hours $ 60.00, meter replacement, during regular business hours $ 125.00, after regular working hours, weekends, holidays
Sewer Reconnection Fee [Section 4.344(8)]	$ ~~300.00~~ $309.00
Service Call	$ ~~125.00~~ $129.00, same day reconnection or after business hours
Sewer Tap Fee	$ ~~490.00~~ $505.00 per 4” service $ ~~525.00~~ $541.00 per 6” service
Dye Testing	$ ~~100.00~~ $103.00 (Service Discharges into Manhole) $ ~~350.00~~ $361.00 (Service Discharges into Sewer Main)

Existing Sewer Line Inspection	$ ~~440.00~~ $600.00 minimum plus an additional charge of ~~$1.11~~ $1.50/lineal foot over 400'
New Sewer Line Inspection	$ ~~880.00~~ $1,200.00 minimum plus an additional charge of ~~$2.22~~ $3.00/lineal foot over 400'
Wastewater Monitoring (sampling and analysis)	$ 300.00 per sample event
Wastewater Permit (Significant Industrial User)	$ 900.00 per issuance and upon permit renewal date
Wastewater Permit Annual Fee (Significant Industrial User)	$ 200.00
Wastewater Permit Modification Requested by User (Significant Industrial User)	$ 200.00
Wastewater Permit (short duration discharge)	$ ~~103.00~~ $106.00/permit
Discharge Permit Issuance (short duration discharge)	$ ~~0.31~~ $0.32/gallon (fee may be adjusted based on strength of discharged wastewater)
Source Detection Inspection	$ 100.00/hour
Maximum Wastewater Administrative and Civil Penalties	$ 10,000.00/violation per day
Wastewater Interceptor Maintenance and FOG Discharge Violations (amount due doubles if unpaid after 30 days)	$ 125.00/violation per day – First Offense $ 250.00/violation per day – Second Offense $ 500.00/violation per day – Third Offense $ 1,000.00/violation per day – Fourth Offense $ 2,000.00/violation per day – Fifth Offense $ 2,500.00/violation per day – Sixth and Subsequent Offenses
Wastewater Non-Permittee Reporting Violations	$ 125.00/violation
Wastewater Permittee Violations	See Table 1-A
Wastewater Penalty Appeal Fee	$ 60.00 per appeal
Flow Testing	$ ~~406.85~~ $419.00/location
RV Dump Station	$ ~~5.00~~ $6.00 per use
Residential Sewer Account RV Token (limit 10 per year)	$ ~~3.00~~ $4.00 per token
Public Works Equipment Reimbursement Rates:	
Use of Vehicles and Equipment	Unless otherwise specified, use of vehicles and equipment will be charged at current Federal Emergency Management Agency (FEMA) rate, per the FEMA Schedule of Equipment Rates.
CCTV Sewer Inspection Truck	$ 86.94/hour
Public Works Material Reimbursement Rates:	
Asphalt	$ 92.00/ton
Sand	$ 12.00

Public Works Personnel Reimbursement Rates:	
Temp Personnel	$ 21.50/hour
Utility I	$ 46.00/hour
Utility II/Wastewater Operator I	$ 49.00/hour
Utility III/Wastewater Operator II	$ 53.00/hour
Lead Worker/Wastewater Operator III	$ 57.00/hour
Vehicle Maintenance Shop	$ 78.00/hour
Emergency and Non-Scheduled Work Equipment and Personnel Multiplier	1.5
Monthly Sewer Rates:	
Residential (one dwelling unit per water meter)	$ ~~31.63~~ $32.58/account
Multi-Family Residential (multiple dwelling units per water meter)	$ ~~24.59~~ $25.33/dwelling unit
Commercial / Industrial:	
Strength Category:	
Low	$ ~~31.63~~ $32.58/account and ~~$2.77~~ $2.85 per 100 cubic feet winter months average water usage above 700 cf.*
Medium	$ ~~31.63~~ $32.58/account and ~~$3.41~~ $3.51 per 100 cubic feet winter months average water usage above 700 cf.*
High	$ ~~31.63~~ $32.58/account and ~~$4.09~~ $4.21 per 100 cubic feet winter months average water usage above 700 cf.*
Very High	$ ~~31.63~~ $32.58/account and ~~$4.72~~ $4.86 per 100 cubic feet winter months average water usage above 700 cf.*
* Winter months average defined for all categories as the average of the water usage billed in the months December through March.	
Monthly Stormwater Rates:**	
Residential	$ 8.18/account
Multi-Family Residential	$ 7.74/dwelling unit
Non-Residential	$ 6.73/account and $0.060/daily trip end (based on current Institute of Transportation Engineers Trip Generation Manual)
****Properties served by City water:** Residential rate applies when a single dwelling unit is served by a water meter; Multi-Family Residential rate applies when multiple dwelling units are served by a common water meter. **Properties not served by City water:** Residential rate applies when one dwelling unit exists per tax lot; Multi-Family Residential rate applies when multiple dwelling units exist per tax lot.	

Monthly Water Rates:	
Fixed Rate Based on Meter Size (Plus Consumption Charge)	$ ~~1.22~~ $1.27 per 100 cu. ft. of water used
5/8”	$ ~~15.20~~ $15.81
3/4"	$ ~~19.57~~ $20.35
1”	$ ~~28.42~~ $29.56
1-1/2”	$ ~~50.41~~ $52.43
2”	$ ~~76.88~~ $79.96
3”	$ ~~147.31~~ $153.20
4”	$ ~~226.68~~ $235.75
6”	$ ~~446.81~~ $464.68
Or larger	By Negotiation
Fire Hydrant Use Permit	$ ~~108.76~~ $113.11 permit fee
	$ ~~108.76~~ $113.11 relocation fee
	$ ~~76.88~~ $79.96 base rate
Non-Metered Residential Accounts	$ ~~37.07~~ $38.55/month
Fire Standby Charge	$ ~~2.56~~ $2.66/inch/month
Standpipe Water Accounts	$ ~~20.46~~ $21.28/month + ~~$1.22~~ $1.27 per 100 cu. ft.
Irrigation Rate Per Ten (10) Square Feet	$ ~~0.052~~ $0.054/month (April 1 through October 30)
Backflow Assembly Testing Services	$ 1.18/month
Street Cut Permit and Deposit	$ ~~20.00~~ $300.00 for excavating contractors not working for a franchise utility. And, a deposit: $10.00 per square foot of anticipated street and curb disturbance. Deposit returned when all work is completed and accepted by the City.
Street Cut Permit and Deposit for Franchise Utilities	$ 2,500.00 one-time deposit, which balance shall be maintained at all times by the franchisee.

TABLE 1-A
INDUSTRIAL WASTEWATER PRETREATMENT PROGRAM PENALTIES

All penalty amounts are doubled for large volume discharges (>5% of POTW hydraulic or organic load design capacity)		**Level I Penalty**	**Level II Penalty**		**Level III Penalty**	
Description of Violation		***No Harm***	***No Harm***	***Criteria***	***SNC or Evidence of Harm***	***SNC Criteria***
Unauthorized Discharges (No Permit)						
Unpermitted Discharge (per day)		$125 ($0 if 1st violation)	$750	e	$2,500	C,D,H
Discharge Violations						
Excess of limit	Limit exceedance (penalties per pollutant per day) includes debris, accumulations and/or violation of prohibited discharge standards outlined in current city code.	$125	$750	a,b,c,d	$2,500	A,B,C,D,H
	Reported slug (per event)	$125	$750	c,e	$2,500	A,B,C,D,H
Monitoring and Reporting Violations						
Reporting Violation	Improperly signed or certified (per event)	$125	$750	c,d,e	$1,500	F
	Improperly signed or certified after notice (per day)	$125	$750	c,d,e	$1,500	F
	Isolated, not significant error (late, incomplete, etc.)	$125 ($0 if 1st violation)	$750	c,d,e	$1,500	F
	Significant error in report (per event)	$125	$750	c,d,e	$1,500	F
	Failure to immediately report spill, slug, non-compliance or changed discharge (per event)	$500	$1,500	c,e	$2,500	G,H
	Falsification of any kind (per event)	$1,000	$2,000	c,e	$2,500	H
Failure to monitor all pollutants required by permit (per day)		$125	$750	c,e	$2,500	H
Improper sampling (per event)		$125	$750	c,e	$2,500	H
Incomplete files (per event)		$125	$750	c,e	$1,500	H
Failure to report additional monitoring (per event)		$500	$750	c,e	$1,500	H
Failure to install monitoring	< 30 days (per day)	$125	$750	c,d,e	$2,500	E
	> 30 days (per day)	$250	$1,000	c,d,e	$2,500	E
Compliance schedules	< 30 days, no impact on final (per compliance deadline)	$125	$750	c,d,e	$1,500	E
	> 30 days OR will affect final (per compliance deadline)	$250	$1,000	c,d,e	$2,000	E

Other Permit Violations						
Failure to renew or apply within time frame given (per event)		$125	$750	c,d,e	$1,500	H
Failure to apply after given notice (per day)		$250	$1,000	c,d,e	$2,000	H
Failure to mitigate or correct (per day)		$1,000	$1,500	c,d,e	$2,500	C,D,H
Failure to operate and maintain pretreatment (per day)		$500	$1,500	c,d,e	$2,500	C,D,H
Use of dilution instead of treatment (per event)		$500	$1,500	c,d,e	$2,500	H
Site Visit Violations						
Entry denial	Entry denied or revoked (per event)	$2,500	$2,500	c,d,e	$2,500	H
	Records denied (per event)	$2,500	$2,500	c,d,e	$2,500	H

Level II Penalty Criteria Definitions:

a Repeated violations of wastewater discharge limits, defined here as those in which sixty-six percent (66%) or more of all of the measurements taken during a three-month period exceed (by any magnitude) the daily maximum limit or the average limit for the same pollutant parameter.

b Thirty-three percent (33%) or more of all of the measurements for each pollutant parameter taken during a three-month period equal or exceed the product of the daily maximum limit or the average limit multiplied by the applicable magnitude factor (1.4 for BOD, TSS, fats, oil, and grease, and 1.2 for all pollutants except pH).

c No change or an increase in the magnitude of non-compliance for a given pollutant, or no change or an increase in the number of violations or non-compliance events after a Level I enforcement action and implementation of compliance measures.

d Failure to meet, within 60 days after the schedule date, a reporting, correction or application due date, or a compliance schedule milestone contained in a local control mechanism or enforcement order for starting construction, completing construction, or attaining final compliance.

e Continued non-compliance with the intent to impede or delay the implementation of the IPP and permitting requirements, as determined by the Control Authority.

Level III Penalty & SNC Criteria Definitions (from 40 CFR 403.8(f)(2)(viii)):

A Chronic violations of wastewater discharge limits defined here as those in which sixty-six (66%) or more of all of the measurements taken during a six-month period exceed (by any magnitude) the daily maximum limit or the average limit for the same pollutant

B Technical Review Criteria (TRC) violations, defined here as those in which thirty-three percent (33%) or more of all of the measurements for each pollutant parameter taken during a six-month period equal or exceed the product of the daily maximum limit or the average limit multiplied by the applicable TRC (TRC=1.4 for BOD, TSS, fats, oil, and grease, and 1.2 for all other pollutants except pH)

C Any other violation of a pretreatment effluent limit (daily maximum or longer-term average) that the Control Authority determines has caused, alone or in combination with other discharges, interference or pass through (including endangering the health of POTW personnel or the general public).

D Any discharge of a pollutant that has caused imminent endangerment to human health, welfare or to the environment or has resulted in the POTW's exercise of its emergency authority under paragraph (f)(1)(vi)(B) of this section to halt or prevent such a discharge.

E Failure to meet, within 90 days after the schedule date, a compliance schedule milestone contained in a local control mechanism or enforcement order for starting construction, completing construction, or attaining final compliance.

F Failure to provide, within 30 days after the due date, required reports such as baseline monitoring reports, 90-day compliance reports, periodic self-monitoring reports, and reports on compliance with compliance schedules.

G Failure to accurately report non-compliance.

H Any other violation or group of violations which the Control Authority determines will adversely affect the operation or implementation of the local pretreatment program.

TABLE 3-A
BUILDING PERMIT FEES

TOTAL VALUATION	FEE
$ 1.00 to $ 10,000.00	$90.00
$ 10,001.00 to $ 50,000.00	$90.00 for the first $10,000.00 plus $6.48 for each additional $1,000.00 or fraction thereof, to and including $50,000.00
$ 50,001.00 to $100,000.00	$349.20 for the first $50,000.00 plus $4.08 for each additional $1,000.00 or fraction thereof, to and including $100,000.00
$100,001.00 to $200,000.00	$553.20 for the first $100,000.00 plus $3.24 for each additional $1,000.00 or fraction thereof, to and including $200,000.00
$200,001.00 to $500,000.00	$877.20 for the first $200,000.00 plus $3.00 for each additional $1,000.00 or fraction thereof, to and including $500,000.00
$500,001.00 and up	$1,777.20 for the first $500,000.00 plus $2.80 for each additional $1,000.00 or fraction thereof
Other Inspections and Fees:	
Residential Standalone Fire Suppression 13R	See Table 3-G
Inspections outside of normal business hours, per hour (minimum charge – two hours)	$ 90.00/hour
Re-Inspection fees (each)	$ 90.00/hour
Inspections for which no fee is specifically indicated, per hour (minimum charge – two hours)	$ 50.00/hour
Investigation Fee (work commenced without permit), per hour (minimum charge – one hour)	$150.00
Additional plan review required by changes, additions or revisions to approve plans, per hour (minimum charge – one hour)	$ 90.00/hour
Phased Permit Fee	$300.00 application fee + 10% of the total building project permit fee, for each phase of work. Not to exceed $1,500.00 per phase.
Deferred Permit Fee	65% of the value of the building permit fee calculated using the valuation for the deferred portion with a $100.00 minimum.
Structural Plan Review Fee	100% of the building permit fee
Fire Life and Safety Plan Review Charge	40% of the building permit fee
Temporary Certificate of Occupancy (TCO) – Commercial	Based on Permit Valuation
$1.00 to $100,000	$ 250

$100,001 to $500,000	$ 500
$500,001 to $750,000	$ 750
$750,001 and up	$1,000
Temporary Certificate of Occupancy (TCO) – Residential	$ 350

TABLE 3-B
SOLAR STRUCTURAL INSTALLATION PERMIT FEES

TOTAL VALUATION	FEE
Solar Photovoltaic (prescriptive) includes Plan Review and Permit Fee	$175.00
Solar Photovoltaic (non-prescriptive) Additional Plan Review required by charges, additions or revisions to approve plans, per hour (minimum charge – one hour)	$90.00
Solar Photovoltaic (non-prescriptive) Permit Fee	Based on valuation of the project (Refer to Table 3-A)
Solar Photovoltaic (non-prescriptive) Plan Review Fee	100% of permit fee based on valuation of the particular portion or portions of the project.

TABLE 3-C
ELECTRICAL PERMIT FEES

	FEE
NEW Residential Single or Multi-Family Dwelling, Service Include:	
1,000 sq. ft. or less	$193.20
Each additional 500 sq. ft. or portion thereof	$ 42.00
Multi-family (largest unit uses above sq. ft. and each additional unit 50%)	
Limited Energy (residential w/above sq. ft.)	$ 42.00
Limited Energy (multi-family w/above sq. ft.) – per floor for each	$ 42.00
Each Manufactured Home or Modular Dwelling Service	$103.20
Limited Energy (without above sq. ft.)	
Residential	$ 55.20
Commercial (each system)	$ 55.20
Services or Feeders – Installations, Alterations, Relocation	
200 amp or less	$103.20
201 amps to 400 amps	$130.80
401 amps to 600 amps	$206.40
601 amps to 1000 amps	$276.00
Over 1000 amps or volts	$607.20
Reconnect only	$ 90.00
Temporary Services or Feeders – Installation, Alterations or Relocation	
200 amps or less	$ 82.80
201 amps to 400 amps	$ 96.00
401 amps to 600 amps	$172.80
601 amps to 1000 amps	$206.40
Over 1000 amps or volts	$276.00
Branch Circuits with purchase of service of feeder	
Each branch circuit	$ 9.60
Branch Circuits without purchase of service or feeder fee	
First Branch Circuit	$ 82.80
Each additional branch circuit	$ 9.60

Miscellaneous (service or feeder not included)	
Each pump or irrigation cycle	$ 68.40
Each sign or outline lighting	$ 68.40
Signal Circuit(s) or a limited energy pane, alteration, or extension	$ 68.40
Residential Plan Review	25% of permit fee charged (not to include surcharge)
Commercial Plan Review	25% of permit fee charged (not to include surcharge)
Other inspections and fees:	
Inspection outside of normal business hours, per hour (minimum charge – two hours)	$90.00
Re-inspection Fee (each)	$90.00
Inspection for which no fee is specifically indicated, per hour (minimum charge – two hours)	$90.00
Investigation fee (work commenced without permit), per hour (minimum charge – one hour)	$150.00
Additional plan review required by changes, additions or revisions to approved plans, per hour (minimum charge – one hour)	$90.00
Master Permit Fee (one-time setup)	$200.00
Master Permit Inspection Fee	$90.00
Renewable Electrical Energy:	
5 KVA or less	$115.00
5.01 to 15 KVA	$150.00
15.01 to 25 KVA	$190.00
Over 25 KVA	$190.00
Solar Generation Systems	$190.00 + $10.00 for each additional KVA. Not to exceed $940.00
Wind Generation Systems:	
25.01 to 50 KVA	$240.00
50.01 to 100 KVA	$480.00
Over 100 KVA	Calculated based on Service or Feeder sizes and Branch Circuits
Minimum Permit Fee	$90.00

TABLE 3-D
RESIDENTIAL MECHANICAL PERMIT FEES

	FEE
Furnaces	
For the installation or relocation of each forced-air or gravity-type furnace or burner, including ducts and vents attached to such appliance, up to and including 100,000 Btu/h (29.3 k W)	$16.80
For the installation or relocation of each forced-air or gravity-type furnace or burner, including ducts and vents attached to such appliance over 100,000 Btu/h (29.3 k W)	$21.60
For the installation or relocation of each floor furnace, including vent	$16.80
For the installation or relocation of each suspended heater, recessed wall heater or floor-mounted unit heater	$16.80
Appliance Vents	
For the installation, relocation or replacement of each appliance vent installed and not included in an appliance permit	$10.80
Repairs or Additions	
For the repair of, alteration of, or addition to each heating appliance, refrigeration unit, cooling unit, absorption unit, or each heating, cooling, absorption or evaporative cooling system	$15.60
Boilers, or Hydronic Heating Systems	
For the installation or relocation of each residential boiler or compressor (radiator or hydronic)	$16.80
Hydronic hot water system	$16.80
Evaporative Coolers`	
For each evaporative cooler other than portable type	$14.40
Other Fuel Appliances	
Chimney liner/flue/vent	$10.80
Flue vent for water heater or gas fireplace	$10.80

Gas fireplace	$16.80
Log lighter (gas)	$16.80
Mini Split	$16.80
Water heater	$16.80
Wood/pellet stove	$16.80
Wood fireplace/insert	$16.80
Other	$16.80
Ventilation and Exhaust	
For each ventilation fan connected to a single duct	$10.80
For each ventilation system which is not a portion of heating or air-conditioning system authorized by a permit	$14.40
For the installation of each hood which is served by mechanical exhaust, including the ducts for such hood	$14.40
Miscellaneous	
For each appliance or piece of equipment regulated by the Mechanical Code but not classed in other appliance categories, or for which no other fee is listed in the code	$14.4
Gas Piping	
For each gas-piping system of one to four outlets	$ 6.60
For each gas-piping system, additional outlets over five, each	$ 1.20
Other Inspections and Fees:	
Residential Plan Review Fee:	25% of permit fee charged (not to include Surcharge)
Inspection outside of normal business hours, per hour (minimum charge – two hours)	$90.00
Re-inspection fees (each)	$90.00
Inspection for which no fee is specifically indicated (per hour)	$90.00
Investigation Fee (work commenced without permit), per hour (minimum charge – one hour)	$150.00
Additional plan review required by changes, additions, or revisions to approve plans, per hour (minimum charge – one hour)	$90.00
Minimum Permit Fee	$90.00

TABLE 3-E
COMMERCIAL MECHANICAL PERMIT FEES

TOTAL VALUATION	FEE
$ 1.00 to $ 5,000.00	$90.00
$ 5,001.00 to $ 10,000.00	$90.00 for the first $5,000.00 plus $1.50 for each additional $100.00 or fraction thereof, to and including $10,000.00
$ 10,001.00 to $ 50,000.00	$165.00 for the first $10,000.00 plus $1.05 for each additional $100.00 or fraction thereof, to and including $50,000.00
$ 50,001.00 to $100,000.00	$585.00 for the first $50,000.00 plus $.78 for each additional $100.00 or fraction thereof, to and including $100,000.00
$100,000.00 and up	$975.00 for the first $100,000.00 plus $.60 for each additional $100.00 or fraction thereof
Commercial Plan Review	25% of permit fee charged (not to include surcharge)
Other Inspections and Fees:	
Inspections outside of normal business hours, per hour (minimum charge – two hours)	$90.00
Re-inspection fee (each)	$90.00
Inspections for which no fee is specifically indicated, per hour (minimum charge – two hours)	$90.00
Investigation Fee (work commenced without permit) per hour (minimum charge – one hour)	$150.00
Additional Plan review required by changes, additions or revisions to approved plans, per hour (minimum charge – one hour)	$90.00

TABLE 3-F
PLUMBING PERMIT FEES

NEW One and Two Family "Includes first 100 feet of water and sewer lines, hose bibbs, icemakers, underfloor low point drains, and rain drain packages that include the piping, gutters, downspouts, and perimeter systems [storm]" – see Division 50 918-050-0100(1)(a)(A). There is no charge by fixture count.	**FEE**
One and Two Family: 1 Bath & 1 Kitchen	$135.60
One and Two Family: 2 Bath & 1 Kitchen	$218.40
One and Two Family: 3 Bath & 1 Kitchen	$256.80
Each Additional Bath or Kitchen	$ 54.00
One and Two Family: Solar (when connected with potable water)	$ 56.40
Fire Sprinklers (multi-purpose/continuous loop 13D systems)	See Table 3-G
Fee Fixture	
Absorption valve	$ 19.80
Backflow preventer	$ 19.80
Backwater valve	$ 19.80
Clothes washer	$ 19.80
Dishwasher	$ 19.80
Drinking fountain	$ 19.80
Ejectors/sump	$ 19.80
Expansion tank	$ 19.80
Fixture/sewer cap	$ 19.80
Floor drain/floor sink/hub	$ 19.80
Garbage disposal	$ 19.80
Hose bib	$ 19.80
Ice maker	$ 19.80
Interceptor/grease trap	$ 19.80
Primer	$ 19.80
Roof drain (commercial)	$ 19.80
Sink/basin/lavatory	$ 19.80
Tub/shower/shower pan	$ 19.80

Urinal	$ 19.80
Water closet	$ 19.80
Water heater	$ 19.80
Other	$ 19.80
Water Service/Sanitary/Storm Sewer:	
Water Service (first 100 feet or fraction thereof)	$ 57.12
Water Service (each additional 100 feet or fraction thereof	$ 31.50
Building Sewer (first 100 feet or fraction thereof)	$ 57.12
Building Sewer (each additional 100 feet or fraction thereof	$ 31.50
Storm Sewer or Rain Drain (first 100 feet or fraction thereof	$ 57.12
Storm Sewer or Rain Drain (each additional 100 feet or fraction thereof	$ 31.50
Alternate Potable Water Heating Systems (coil, extractor, heat pumps, etc.	$ 57.12
Manufactured Homes	
M/H park sewer connection and Water Distribution System (per space)	$ 72.00
M/H service connection (sewer, water and storm) not within a M/H park	$ 72.00
Other Inspections and Fees:	
Prefabricated Structures site inspections (includes site development and connection of the prefabricated structure)	$ 72.00
Residential Plan Review Fee	25% of permit fee charged (not to include surcharge)
Commercial Plan Review	25% of permit fee charged (not to include Surcharge)
Re-Inspection Fee	$ 90.00
Investigation Fee (work commenced without permit) per hour, (minimum charge – one hour)	$150.00
Additional Plan review required by changes, additions or revision to approved plans, per hour (minimum charge – one hour)	$ 90.00
Medical Gas	See Table 3-H
Minimum Permit Fee	$ 90.00

TABLE 3-G
STRUCTURAL – RESIDENTIAL FIRE SUPPRESSION SYSTEMS STANDALONE 13R

PLUMBING – RESIDENTIAL FIRE SUPPRESSION SYSTEMS (MULTI-PURPOSE/CONTINUOUS LOOP 13D SYSTEMS

Up to 2,000 square feet	$163.50
2,001 to 3,600 square feet	$220.50
3,601 to 7,200 square feet	$277.50
7,201 square feet and greater	$330.00

TABLE 3-H
PLUMBING – MEDICAL GAS SYSTEMS

VALUATION	FEE
$ 1.00 to $ 5,000.00	$292.50
$ 5,001.00 to $10,000.00	$292.50 for the first $5,000.00 plus $1.50 for each additional $100.00 or fraction thereof, to and including $10,000.00
$10,001.00 to $25,000.00	$367.50 for the first $10,000.00 plus $1.20 for each additional $100.00 or fraction thereof, to and including $25,000.00
$25,001.00 to $50,000.00	$547.50 for the first $25,000.00 plus $1.05 for each additional $100.00 or fraction thereof, to and including $50,000.00
$50,001.00 and up	$810.00 for the first $50,000.00 plus $.90 for each additional $100.00 or fraction thereof

TABLE 3-I
GRADING PLAN REVIEW FEES

	FEE
50 cubic yards (38.2 m^3) or less	No fee
51 to 100 cubic yards (40 to 76.5 m^3)	$ 33.00
101 to 1,000 cubic yards (77.2 to 764.6 m^3)	$ 49.50
1,001 to 10,000 cubic yards (765.3 to 7,645.5 m^3)	$ 66.00
10,001 to 100,000 cubic yards (7,646.3 to 76,455 m^3)	$ 66.00 for the first 10,000 cubic yards (7,645.5 m^3), plus $ 33.00 for each additional 10,000 cubic yards (7,645.5 m^3) or fraction thereof
100,001 to 200,000 cubic yards (76,456 to 152,911 m^3)	$363.00 for the first 100,000 cubic yards (76,455 m^3), plus $ 19.50 for each additional 10,000 cubic yards (7,645.5 m^3) or fraction thereof
200,001 cubic yards (152,912 m^3) or more	$558.00 for the first 200,000 cubic yards (152,911 m^3), plus $ 9.75 for each additional 10,000 cubic yards (7,645.5 m^3) or fraction thereof
Other Inspections and Fees:	
Inspections outside of normal business hours, per hour (minimum charge – two hours	$90.00
Re-inspection fee (each)	$90.00
Inspections for which no fee is specifically indicated, per hour (minimum charge – two hours)	$90.00
Investigation Fee (work commenced without permit), per hour (minimum charge – one hour)	$150.00
Additional plan review required by changes, additions or revisions to plans or to plans for which an initial review has been completed	$90.00

TABLE 3-J
GRADING PERMIT FEES

	FEE
50 cubic yards (38.2 m^3) or less	No fee
51 to 100 cubic yards (40 to 76.5 m^3)	$ 49.50
101 to 1,000 cubic yards (77.2 to 764.6 m^3)	$ 49.50 for the first 100 cubic yards (76.5 m^3), plus $ 23.25 for each additional 100 cubic yards (76.5 m^3) or fraction thereof
1,001 to 10,000 cubic yards (765.3 to 7,645.5 m^3)	$ 258.75 for the first 1,000 cubic yards (764.6 m^3), plus $ 19.50 for each additional 1,000 cubic yards (764.6 m^3) or fraction thereof
10,001 to 100,000 cubic yards (7,646.3 to 76,455 m^3)	$ 434.25 for the first 10,000 cubic yards (7,645.5 m^3), plus $ 88.50 for each additional 10,000 cubic yards (7,645.5 m^3) or fraction thereof
100,001 to 200,000 cubic yards (76,456 m^3) or more	$1,230.75 for the first 100,000 cubic yards (76 455 m^3), plus $ 48.75 for each additional 10,000 cubic yards (7645.5 m^3) or fraction thereof
Other Inspections and Fees:	
Inspection outside of normal business hours, per hour (minimum charge – two hours)	$90.00
Re-inspection fees assessed under provisions of Section 305.8, per inspection	$90.00
Inspections for which no fee is specifically indicated, per hour (minimum charge – one hour)	$90.00
Investigation Fee (work commenced without permit), per hour (minimum charge – one hour)	$150.00

TABLE 3-K
MANUFACTURED DWELLING
INSTALLATION FEES

	FEE
Manufactured Dwelling Installation Permit Fee	$192.00 – includes concrete slab, runners or foundation, skirting, electrical feeder and plumbing connections and all cross-over connections up to 30 lineal feet of all utility connections
Plumbing Fees:	Plumbing Permit required beyond 30 lineal ft
Water/Sewer Connection	$57.12 (each additional 100 feet or fraction thereof over 30 feet)
New Water Service	$57.12 (each additional 100 feet or fraction thereof over 30 feet)
New Sanitation/Storm Sewer	$57.12 (each additional 100 feet or fraction thereof over 30 feet)
Inspections outside of normal business hours, per hour (minimum charge – two hours)	$90.00
Other Inspections and Fees:	
Re-Inspection (per hour)	$90.00
Inspections for which no fee is specifically indicated (minimum charge – one half hour)	$90.00
Investigation Fee (work commenced without permit), per hour (minimum charge – one hour)	$150.00
Additional Plan review required by changes, additions or revisions to approve plans, per hour (minimum charge – one hour)	$90.00
Statewide Fee as Required by ORS 455.220(2) to be collected by the jurisdiction and remitted to the BCD	$30.00

TABLE 3-L
MANUFACTURED DWELLING PARK PERMIT FEES

TOTAL VALUATION	FEE
$1.00 to $500.00	$ 26.40
$501.00 to $2,000.00	$ 26.40 for the first $500.00 plus $ 3.30 for each additional $100.00 or fraction thereof, to and including $2,000.00
$2,001.00 to $25,000.00	$ 75.90 for the first $2,000.00 plus $ 15.00 for each additional $1,000.00 or fraction thereof, to and including $25,000.00
$25,001.00 to $50,000.00	$ 420.90 for the first $25,000.00 plus $ 10.80 for each additional $1,000.00 or fraction thereof, to and including $50,000.00
50,001.00 to $100,000.00	$ 690.90 for the first $50,000.00 plus $ 7.50 for each additional $1,000.00 or fraction thereof, to and including $100,000.00
$100,001.00 to $500,000.00	$1,065.90 for the first $100,000.00 plus $ 6.00 for each additional $1,000.00 or fraction thereof, to and including $500,000.00
$500,001.00 to $1,000,000.00	$3,465.90 for the first $500,000.00 plus $ 5.10 for each additional $1,000.00 or fraction thereof, to and including $1,000.000.00
$1,000,001.00 and up	$6,015.90 for the first $1,000,000.00 plus $ 3.30 for each additional $1,000.00 or fraction thereof
Valuation of Mobile Home or Manufactured Home Park	Valuation determined per OAR 918-600-0030 Table 2-MD
Other Inspections and Fees:	
Manufactured Home Park Plan review Fee	65% of permit fee charged (not to include surcharge)
Inspections outside of normal business hours, per hour (minimum charge – two hours)	$ 90.00 per hour
Re-Inspection fees assessed under provisions of Section 305.8	$ 90.00 per hour
Inspections for which no fee is specifically indicated (minimum charge – one-half hour)	$ 90.00 per hour
Additional plan review required by changes, additions or revisions to plans (minimum charge – one-half hour)	$ 42.00 per hour

TABLE 3-M
RECREATIONAL VEHICLE PARK PERMIT FEES

TOTAL VALUATION	FEE
$1.00 to $500.00	$ 26.40
$501.00 to $2,000.00	$ 26.40 for the first $500.00 plus $ 3.30 for each additional $100.00 or fraction thereof, to and including $2,000.00
$2,001.00 to $25,000.00	$ 75.90 for the first $2,000.00 plus $ 15.00 for each additional $1,000.00 or fraction thereof, to and including $25,000.00
$25,001.00 to $50,000.00	$ 420.90 for the first $25,000.00 plus $ 10.80 for each additional $1,000.00 or fraction thereof, to and including $50,000.00
$50,001.00 to $100,000.00	$ 690.90 for the first $50,000.00 plus $ 7.50 for each additional $1,000.00 or fraction thereof, to and including $100,000.00
$100,001.00 to $500,000.00	$1,065.90 for the first $100,000.00 plus $ 6.00 for each additional $1,000.00 or fraction thereof, to and including $500,000.00
$500,001.00 to $1,000,000.00	$3,465.90 for the first $500,000.00 plus $ 5.10 for each additional $1,000.00 or fraction thereof, to and including $1,000,000.00
$1,000,001.00 and up	$6,015.90 for the first $1,000,000.00 plus $ 3.30 for each additional $1,000.00 or fraction thereof
Valuation of Recreational Vehicle (RV) Park	Valuation of Park determined per OAR 918-600-0030 Table 2-RV
Other Inspections and Fees:	
Inspections outside of normal business hour, per hour (minimum charge – two hours)	$ 90.00
Re-Inspection fees assessed under provisions of Section 305.8	$ 90.00
Inspections for which no fee is specifically indicated, per hour (minimum charge – one-half hour)	$ 90.00
Additional plan review required by changes, additions or revisions to plans, per hour (minimum charge – one-half hour)	$ 90.00

FEE SCHEDULE UPDATE

PUBLIC WORKS, ENGINEERING AND COMMUNITY DEVELOPMENT FEES

CITY COUNCIL MEETING

DECEMBER 8, 2020

WASTEWATER RATE INCREASE

3% Increase to Wastewater Rate

- Approved in FY 2020/21 Budget

Fee	Current Rate	Proposed Rate
Monthly Sewer Rates:		
Residential	$31.63/account	$32.58/account
Multi-Family Residential	$24.59/dwelling unit	$25.33/dwelling unit
Commercial / Industrial:		
Strength Category:		
Low	$31.63/account and $2.77 per unit*	$32.58/account and $2.85 per unit*
Medium	$31.63/account and $3.41 per unit*	$32.58/account and $3.51 per unit*
High	$31.63/account and $4.09 per unit*	$32.58/account and $4.21 per unit*
Very High	$31.63/account and $4.72 per unit*	$32.58/account and $4.86 per unit*

***per 100 cubic feet winter months average water usage above 700 cubic feet**

WATER RATE INCREASE

4% Increase to Water Rate

- Approved in FY 2020/21 Budget

Fee	Current Rate	Proposed Rate
Monthly Water Rates:		
Fixed Rate Based on Meter Size (Plus Consumption Charge)	$1.22 per 100 cu. ft. of water	$1.27 per 100 cu. ft. of water
5/8”	$15.20	$15.81
3/4"	$19.57	$20.35
1”	$28.42	$29.56
1-1/2”	$50.41	$52.43
2”	$76.88	$79.96
3”	$147.31	$153.20
4”	$226.68	$235.75
6”	$446.81	$464.68
Fire Hydrant Use Permit	$108.76 permit fee	$113.11 permit fee
	$108.76 relocation fee	$113.11 relocation fee
	$76.88 base rate	$79.96 base rate
Non-Metered Residential Accounts	$37.07/month	$38.55/month
Fire Standby Charge	$2.56/inch/month	$2.66/inch/month
Standpipe Water Accounts	$20.46/month + $1.22 per 100 cf	$21.28/month + $1.27 per 100 cf
Irrigation Rate Per Ten (10) Square Feet	$ 0.052/month	$0.054/month

PARKS SDC INCREASE

Parks System Development Charge Implementation

- Resolution #2019-17 adopted a phase-in schedule

SDC	July 1, 2019	Jan 1, 2020	July 1, 2020	Jan 1, 2021
Parks (Single-Family)	$ 3,289	$ 3,906	$ 4,523	$ 5,139
Parks (Multi-Family)	$ 3,000	$ 3,328	$ 3,656	$ 3,985

Fee	Current Rate	Proposed Rate
Parks SDC (residential units only)		
Single Family	$4,523.00/dwelling unit	$5,139.00/dwelling unit
Multi-Family	$3,656.00/dwelling unit	$3,985.00/dwelling unit

Total SDC for Single Family Home is $16,038

- Sewer $4,124
- Water $2,643
- Parks $5,139
- Transportation $4,132

VARIOUS WASTEWATER FEES

SLIDE 5

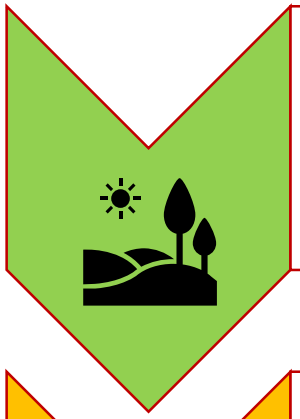
Increases to recover operating cost

Fee	Current Rate	Proposed Rate
Sewer Reconnection Fee	$300.00	$309.00
Service Call	$125.00, same day reconnection or after business hours	$129.00, same day reconnection or after business hours
Sewer Tap Fee		
4”	$490.00 per service	$505.00 per service
6”	$525.00 per service	$541.00 per service
Dye Testing	$100.00 (into manhole) $350.00 (into main)	$103.00 (into manhole) $361.00 (into main)
Existing Sewer Line Inspection	$440.00 plus $1.11/lineal foot over 400’	$600.00 plus $1.50/lineal foot over 400’
New Sewer Line Inspection	$880.00 plus $2.22/lineal foot over 400’	$1,200.00 plus $3.00/lineal foot over 400’
Wastewater Permit (short duration discharge)	$103.00/permit	$106.00/permit
Discharge Permit Issuance (short duration discharge)	$0.31/gallon	$0.32/gallon
Flow Testing	$406.85/location	$419.00/location
RV Dump Station	$5.00 per use	$6.00 per use
Residential Sewer Account RV Token	$3.00 per token	$4.00 per token

ENGINEERING FEES

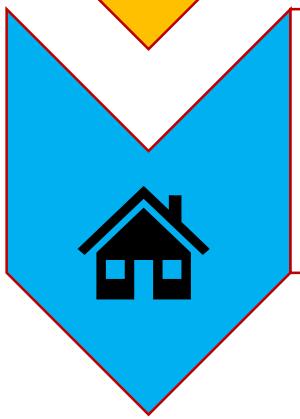
PROCESS

Development Review Process – Residential Subdivision



- Pre-Development
- Development Review

- Public Infrastructure Construction Plan Review
- Street, Water, Stormwater, Sewer, Site Grading



- Individual Lot Site Grading and Stormwater

ENGINEERING FEES

CONSTRUCTION PLAN REVIEW

SLIDE 7

Increases to ensure that development pays for costs incurred

Fee	Current Fee	Proposed Fee
Public Improvement Plan Review		
Submittal	NEW	**$1,260**
Storm Water & Grading (per sheet)	$252	**$410**
Sewer (per sheet)	$252	**$245**
Streets (per sheet)	$252	**$285**
Waterline (per sheet)	$252	**$285**
Additional Plan Review (per sheet)	$114	**$122**
Change Order Submittal	NEW	**$180**
Change Order (per sheet)	$114	**$163**
Revision (per sheet) (NEW)	$114	**$89**
Commercial Site Plan Review		
Submittal	NEW	**$605**
Sewer & Water Connections (per sheet)	NEW	**$82**
Grading (per sheet)	$252	**$163**
Storm Review (per sheet)	$252	**$163**
Fire Line Review (per sheet)	$209	**$163**
Revision	NEW	**$89**

Fee Increase Greater than $100	Fee Increase $1 to $100	Fee Decrease

ENGINEERING FEES

BUILDING PERMIT REVIEW, INSPECTION & MISCELLANEOUS

Fee	Current Fee	Proposed Fee
Building Permit Reviews		
Commercial/Industrial New Building, Tenant Improvement, Remodel, Addition	NEW	**$82**
New Multi-Family	NEW	**$82**
Single Family Residential Stormwater-New	NEW	**$82**
Inspection		
Stormwater Repair/Upgrade Review & Inspection	$315	**$395**
Inspection Billing Rate	$71	**$73.16**
Commercial & Residential Driveway Approach	$40	**$146**
Existing Driveway or Sidewalk Replacement	$40	**$73**
Reinspection Fee (after 2 inspections)	NEW	**$73**
Miscellaneous		
Advance Grading Permit	NEW	**$70**
SDC Credit Transfer/Authorization	NEW	**$40**
Public Facilities Plans (mailed)	$50	**$55**
Street Cut Permit (Public Works Fee)	$20	**$300**

Fee Increase Greater than $100	Fee Increase $1 to $100	Fee Decrease

ENGINEERING FEES

LAND USE REVIEW

Fee	Current Fee	Proposed Fee
Planning + Engineering Land Use Review Combined Fee (Only Engineering Portion Changed)		
Planned Unit Development	$22,765.50	**$22,285**
Cluster Development	$17,483.88	**$17,825**
Cottage Development	$12,201.42	**$12,400**
Extension Request	$911.22	**$925**
Final Plan Review	$1,048.74	**$1,145**
Improvement Agreements	$858.49	**$885**
Lot of Record Verification	$512.34	**$550**
Measure 49	$13,053.89	**$13,100**
Modification of Approval	$1,392.60	**$1,440**
Urban Growth Boundary Expansion	$37,448.13	**$38,930**
Site Plan Review 21-50 Units	$8,625.03	**$9,100**
Commercial/Industrial Review 50,001-200,000 SF	$17,156.08	**$17,590**
Commercial/Industrial Review 200,001+ SF	$22,391.84	**$22,860**
Conversion from Residential to Commercial	$4,298.19	**$4,665**
Minor Alteration to Site Plan	$1,343.42	**$1,925**
Partition	3,695.28	**$4,435**
Subdivision (4-20 lots)	$11,985.59	**$12,430**

Fee Increase Greater than $100	Fee Increase $1 to $100	Fee Decrease

ENGINEERING FEES

IMPACT

Cost Impact for 36 Lot Residential Subdivision

- 36 Lot Subdivision
- $1.86M Construction Cost for Public Improvements

Activity	Current Fee	Proposed Fee
Development Review	$1,752	$1,752
Infrastructure Construction Plan Review	$7,733	$10,442
Construction Inspection	$18,630	$18,630
Residential Grading/Storm	$0	$2,952
TOTAL	$28,115	$33,776
Per Lot Cost	$781	$938

- **Engineering Fees are roughly 1.8% of infrastructure construction cost**
- **Or 0.25% of the cost of a $375,000 House**

ENGINEERING FEES

COMPARISON

How do Redmond Fees Compare?

- 36 Lot Subdivision
- $1.86M Construction Cost for Public Improvements

Activity	Redmond	Bend
Development Review	$1,752	$3,264
Infrastructure Construction Plan Review	$10,442	$25,784
Construction Inspection	$18,630	$10,485*
Residential Grading/Storm	$2,952	$13,032
TOTAL	**$33,776**	**$52,565**

*Bend requires design engineer to be the primary inspector. This number is an estimate for city oversight.

Activity	Redmond	Oregon City	Grants Pass	Sherwood	Klamath Falls
Infrastructure Construction Plan Review	$10,442	$46,500		$74,400	
Construction Inspection	$18,630	$46,500	$63,240	$93,000	
TOTAL	**$29,072**	**$93,000**		**$167,400**	**$37,400**

QUESTIONS?

CITY OF REDMOND
STUDENT PARTICIPATION IN CITY COMMISSIONS

Did you realize that you can have an impact on the future of your community? How it is built, how it is planned, what types of park amenities are provided, etc. Every month over 100 city volunteers meet and work with city staff on recommendations for the Redmond City Council regarding the future of the City of Redmond. However, most of the volunteers are adults and we are interested in hearing from you too – the youth of our community. The City of Redmond is interested in having a student participate on the City's commissions and committees who can provide the perspective of how these decisions impact the youth of our community and what living in Redmond feels like for the youth. You are our future and we are planning our future so it is vital that your voice is heard in this process. The appointment is for one school year. This is a great opportunity to do something for your community and gain "real-world" experience in planning and government.

If you are interested, please fill out the application below and return to the City Recorder at the City of Redmond, 411 SW 9th St, Redmond, OR 97756, or kelly.morse@ci.redmond.or.us.

WHAT COMMISSION/COMMITTEE ARE YOU APPLYING FOR: Airport Committe

NAME: Evan Eby

SCHOOL YOU ATTEND: Sisters High School **GRADE:** 11

ADDRESS: [redacted]

EMAIL: [redacted] **PHONE NUMBER:** [redacted]

How long have you lived in the City of Redmond? 6 years

Why are you interested in this commission? I am personally working towards earning my private pilots licence and am looking for ways to get involved in my Community and I think this is a Carrier fild I am very Interested in would love to help impact!

'20 NOV 6 AM 11:36:03

CITY OF REDMOND
BICYCLE AND PEDESTRIAN ADVISORY COMMITTEE
(BPAC)

The purpose of the BPAC is to advise City Council on bicycle and pedestrian issues in the City of Redmond for quality of life initiatives, innovations in bike/pedestrian transit tools, and transportation cost-saving measures. The City is looking for volunteers who reside within the Redmond Urban Growth Boundary (a majority should live within city limits) and should be comprised of at least three (3) member who represent pedestrian interests and at least (3) three members who represent basic bicycle interests.

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at 541-923-7751. Thank you for your time and interest in making Redmond more bicycle and walking friendly.

I, Cathy Drzyzgula, respectfully request to be considered as an applicant for a
(Please print first and last name)
position on the City of Redmond's Bicycle and Pedestrian Advisory Committee.

[redacted]
(Address)

[redacted] [redacted]
(Home phone) (Cell phone)

[redacted]
(E-mail)

Please answer the following questions:

Do you live within the city limits of Redmond? Yes

If not, do you live within the City of Redmond Urban Growth Boundary? _____

Would you characterize your interest in the BPAC as more pedestrian or bicycle oriented? Ped w/some bike

Please elaborate on your pedestrian or bike orientation and your reasons for wanting to be on BPAC:

I mostly walk for errands or exercise but also bike for recreation with my husband or for some errands. I am proud of Redmonds bike & ped. facilities and hope to promote expanding them, improving them and making them accesible to as many users as possible. I have served on city committees in other areas.

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this commission is subject to public records disclosure.

[redacted] 11-6-20
(S) (Date)

'20 OCT 13 PM2:28:54

CITY OF REDMOND
BICYCLE AND PEDESTRIAN ADVISORY COMMITTEE
(BPAC)

The purpose of the BPAC is to advise City Council on bicycle and pedestrian issues in the City of Redmond for quality of life initiatives, innovations in bike/pedestrian transit tools, and transportation cost-saving measures. The City is looking for volunteers who reside within the Redmond Urban Growth Boundary (a majority should live within city limits) and should be comprised of at least three (3) member who represent pedestrian interests and at least (3) three members who represent basic bicycle interests.

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at 541-923-7751. Thank you for your time and interest in making Redmond more bicycle and walking friendly.

I, Diane Hower, respectfully request to be considered as an applicant for a
(Please print first and last name)
position on the City of Redmond's Bicycle and Pedestrian Advisory Committee.

[redacted]
(Address)

[redacted]
(Home phone)

[redacted]
(Cell phone)

[redacted]
(E-mail)

Please answer the following questions:

Do you live within the city limits of Redmond? yes

If not, do you live within the City of Redmond Urban Growth Boundary? _____

Would you characterize your interest in the BPAC as more pedestrian or bicycle oriented? BOTH

Please elaborate on your pedestrian or bike orientation and your reasons for wanting to be on BPAC: My husband and I have 2 dogs, we walk 2X daily and when given options we walk beyond exercise. my husband bike commutes, and rides a road bike as a passion. I also bike for exercise. We have a blind daughter with mild mobility issues and I recently had a hip replaced. I Think We need to also be looking at accessibility issues also.

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this commission is subject to public records disclosure.

[redacted]
(Signature)

10/9/2020
(Date)

'20 OCT 7 PM2:42:45

CITY OF REDMOND
BICYCLE AND PEDESTRIAN ADVISORY COMMITTEE
(BPAC)

The purpose of the BPAC is to advise City Council on bicycle and pedestrian issues in the City of Redmond for quality of life initiatives, innovations in bike/pedestrian transit tools, and transportation cost-saving measures. The City is looking for volunteers who reside within the Redmond Urban Growth Boundary (a majority should live within city limits) and should be comprised of at least three (3) member who represent pedestrian interests and at least (3) three members who represent basic bicycle interests.

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at 541-923-7751. Thank you for your time and interest in making Redmond more bicycle and walking friendly.

I, Jennifer Gottfried, respectfully request to be considered as an applicant for a
(Please print first and last name)
position on the City of Redmond's Bicycle and Pedestrian Advisory Committee.

[redacted] Redmond Or 97756
(Address)

—
(Home phone)

[redacted]
(Cell phone)

(E-m[redacted]

Please answer the following questions:

Do you live within the city limits of Redmond? Yes

If not, do you live within the City of Redmond Urban Growth Boundary? _____

Would you characterize your interest in the BPAC as more pedestrian or bicycle oriented? equally both

Please elaborate on your pedestrian or bike orientation and your reasons for wanting to be on BPAC: As a Redmond citizen who walks/bikes frequently, I want to make non-motorized options available to locals. We need well maintained, easily accesible routes throughout all of Redmond. I want to help that happen.

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this commission is subject to public records disclosure.

[redacted]

10-6-2020
(Date)

CITY OF REDMOND
STUDENT PARTICIPATION IN CITY COMMISSIONS

Did you realize that you can have an impact on the future of your community? How it is built, how it is planned, what types of park amenities are provided, etc. Every month over 100 city volunteers meet and work with city staff on recommendations for the Redmond City Council regarding the future of the City of Redmond. However, most of the volunteers are adults and we are interested in hearing from you too – the youth of our community. The City of Redmond is interested in having a student participate on the City's commissions and committees who can provide the perspective of how these decisions impact the youth of our community and what living in Redmond feels like for the youth. You are our future and we are planning our future so it is vital that your voice is heard in this process. The appointment is for one school year. This is a great opportunity to do something for your community and gain "real-world" experience in planning and government.

If you are interested, please fill out the application below and return to the City Recorder at the City of Redmond, 411 SW 9th St, Redmond, OR 97756, or kelly.morse@ci.redmond.or.us.

WHAT COMMISSION/COMMITTEE ARE YOU APPLYING FOR: Bicycle and Pedestrian Advisory

NAME: Alexandra Lunny (Alex)

SCHOOL YOU ATTEND: Redmond Proficiency Academy **GRADE:** 6th

ADDRESS: [redacted]

EMAIL: [redacted] **PHONE NUMBER:** [redacted]

How long have you lived in the City of Redmond? 10+ years

Why are you interested in this commission? I am interested in this commission because I am a bicyclist and would like to help make decisions to make Redmond more bicycle friendly.

CITY OF REDMOND
BUDGET COMMITTEE APPLICATION

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at 541-923-7751. Thank you for your time and interest in the City of Redmond. Attach additional sheets if necessary.

I, Troy Baker, respectfully request to be considered as an applicant for a position on the City of Redmond Budget Committee.

(Please print first and last name)

[redacted] Redmond, OR 97756
(Address)

(Home phone)

[redacted]
(Cell phone)

[redacted]
(E-mail)

Civil Engineer
(Occupation)

Anderson Perry & Associates, Inc.
(Place of Employment)

A qualified applicant must reside within the Redmond City Limits, be 18 years of age or older, and a registered voter.

Are you 18 years of age or older?	Yes ■	No ☐
Do you reside within the Redmond city limits?	Yes ■	No ☐
How long have you been a resident?	Years: 3	Months: 10
Are you a registered voter in Deschutes County?	Yes ■	No ☐

Education / Activities:

Please list academic background: BS Geology, Boise State University

Master of Engineering, Civil Engineering, University of Idaho

Registered Professional Engineer, Oregon, Washington and Idaho

Please list any current or prior Civic or Professional organizations / activities:

Water Environment Federation, American Water Works Association, Pacific Northwest Clean Water Association, Sunriver La Pine Economic Development (SLED) program

Related Experience:

What prior work or volunteer experience have you had that would be helpful if you were appointed to this position?

25 years experience working as a civil engineer planning, designing and managing the construction of multi-million dollar water and wastewater systems improvements projects. Cost estimating, developing and managing budgets, water and wastewater master planning, financial and SDC analysis, water and sewer rate studies.

What other special skills, interested, hobbies, or training do you have that would bring special value to your ability to serve on this committee? Working with many Oregon communities and city councils developing infrastructure

improvements projects, funding applications, working with various state and federal funding and regulatory agencies, review of city budgets and audit reports.

How did you hear about this position? City of Redmond Website

Have you ever attended a budget committee meeting before? No

Are you available to attend special meetings, in addition to the regularly scheduled meetings? Yes, I would be available to attend special meetings.

Why are you applying for this position? I'm interested in the City's budgeting process and would like to offer my time and expertise to help the City and community.

What community topics concern you that relate to this committee? Adequate funding and budgeting for on-going operations, maintenance, and improvements for the City's water and wastewater systems, transportation system, managing rapid development occurring.

What specific contributions do you hope to make? Use my experience with working with communities during my career to contribute to the committee's responsibility of helping establishment of the City's budgets.

If you were elected to the Budget Committee, how would you determine service priorities for the City of Redmond? Work with other committee members, engage members of the community, and work with City Council and staff to educate myself on what services within the City of Redmond are needed. This process would provide the basis of evaluating and assigning the service priorities.

How do you think these service priorities should be financed (i.e. user charges, property taxes, fees, special licenses, taxes)? Depends upon the service and situation. Some may be more appropriately financed by SDCs, while others may be more appropriately financed by user charges.

Do you have experience in group processes and decision making? Please describe:
I have worked on many project teams and worked with city councils during projects to make decisions. Prepared and made presentations to groups, boards and councils.

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this commission is subject to public records disclosure.

[redacted]

10-12-2020
(Date)

CITY OF REDMOND
BUDGET COMMITTEE APPLICATION

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at 541-923-7751. Thank you for your time and interest in the City of Redmond. Attach additional sheets if necessary.

I, Phillip Meagher, respectfully request to be considered as an applicant for a position on the City of Redmond Budget Committee.
(Please print first and last name)

[redacted] Redmond, OR 97756
(Address)

(Home phone)

[redacted]
(Cell phone)

[redacted]
(E-mail)

Credit Analyst
(Occupation)

First Interstate Bank
(Place of Employment)

A qualified applicant must reside within the Redmond City Limits, be 18 years of age or older, and a registered voter.

Are you 18 years of age or older?	Yes ☒	No ☐
Do you reside within the Redmond city limits?	Yes ☒	No ☐
How long have you been a resident?	Years: 5	Months: 0
Are you a registered voter in Deschutes County?	Yes ☒	No ☐

Education / Activities:

Please list academic background: Bachelor of Science in Business Management

Please list any current or prior Civic or Professional organizations / activities:

Redmond Chamber of Commerce Member since 2018

Related Experience:

What prior work or volunteer experience have you had that would be helpful if you were appointed to this position?

Underwriting and financial analysis of various government entities, private businesses non-profits and individuals

What other special skills, interested, hobbies, or training do you have that would bring special value to your ability to serve on this committee? I have worked in various industries including non-profit,

manufacturing, parks & recreation and finance. We are also small business owners in Redmond. We go to the parks often and as many events as we can.

How did you hear about this position? Through a social media post

Have you ever attended a budget committee meeting before? No

Are you available to attend special meetings, in addition to the regularly scheduled meetings? Yes

Why are you applying for this position? I hope to offer any assistance I can in this field to better our community

What community topics concern you that relate to this committee? The anticipated growth within the city and UGB and how the budget committee is preparing for that.

What specific contributions do you hope to make? Assistance in understanding costs associated within the budget

If you were elected to the Budget Committee, how would you determine service priorities for the City of Redmond? Safety & Education would be primary followed by infrastructure improvements to prepare for the continued growth of the community.

How do you think these service priorities should be financed (i.e. user charges, property taxes, fees, special licenses, taxes)? Safety & Education through property taxes. infrastructure through SDC's based on the impact new development will have on current services.

Do you have experience in group processes and decision making? Please describe: Yes, I have worked in team environments my entire life including now where I collaborate with bank employees and customers to determine a beneficial outcome for both parties.

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this commission is subject to public records disclosure.

[redacted]

10/16/20
(Date)

CITY OF REDMOND
BUDGET COMMITTEE APPLICATION

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at 541-923-7751. Thank you for your time and interest in the City of Redmond. Attach additional sheets if necessary.

I, Ron Osmundson, respectfully request to be considered as an applicant for a
(Please print first and last name)
position on the City of Redmond Budget Committee.

[redacted], Redmond, OR 977[redacted]
(Address)

[redacted]
(Home phone)

(Cell phone)

[redacted]
(E-mail)

Daycare Co-Owner
(Occupation)

Self-employed
(Place of Employment)

A qualified applicant must reside within the Redmond City Limits, be 18 years of age or older, and a registered voter.

Are you 18 years of age or older?	Yes ☑	No ☐
Do you reside within the Redmond city limits?	Yes ☑	No ☐
How long have you been a resident?	Years: 15	Months:
Are you a registered voter in Deschutes County?	Yes ☑	No ☐

Education / Activities:

Please list academic background: Klamath Community College - Early Education, Oregon Tech - Communications

Please list any current or prior Civic or Professional organizations / activities: None

Related Experience:

What prior work or volunteer experience have you had that would be helpful if you were appointed to this position?

Auditor, Community involvement, youth activities, and parks and rec sports programs

What other special skills, interested, hobbies, or training do you have that would bring special value to your ability to serve on this committee? Involvement in politics at the county and state level

How did you hear about this position? Mayor Endicot

Have you ever attended a budget committee meeting before? No

Are you available to attend special meetings, in addition to the regularly scheduled meetings? Yes

Why are you applying for this position? I would like to be more involved in the fiscal aspect of our city government.

What community topics concern you that relate to this committee? Housing development, airport, Parks and rec

What specific contributions do you hope to make? I would like to be involved in Redmond's budgeting and help with making those fiscal decisions.

If you were elected to the Budget Committee, how would you determine service priorities for the City of Redmond? I would research and find out what the needs are vs the wants

How do you think these service priorities should be financed (i.e. user charges, property taxes, fees, special licenses, taxes)? Not through property taxes, fees, user charges, SDC's

Do you have experience in group processes and decision making? Please describe: Yes, I can make conservative decisions.

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this commission is subject to public records disclosure.

[redacted]

(Signature)

11/4/20

(Date)

CITY OF REDMOND
DOWNTOWN URBAN RENEWAL DISTRICT CITIZENS ADVISORY COMMITTEE APPLICATION

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at 541-923-7751. Thank you for your time and interest in the City of Redmond. Attach additional sheets if necessary.

I, TOBIAS R. COLVIN (Please print name), respectfully request to be considered as an applicant for a position on the City of Redmond Downtown Urban Renewal District Citizens Advisory Committee.

[redacted] (Address)

REDMOND, OR 97756

[redacted] (Phone) [redacted] (Email)

Are you a downtown property owner? NO How long? _____
Are you a downtown business owner? NO How long? _____

What reasons do you have for wanting to be a member of this Committee? I FEEL LIKE I CAN BE AN ASSET TO THE COMMITTEE WITH MY 20 YEARS OF EXPERIENCE IN BUSINESS AND OUR ABILITY TO HELP FROM A MAJOR DOWNTOWN BUSINESS. (SCP REDMOND, FORMERLY 'THE NEW REDMOND HOTEL')

Brief outline of experience and occupations. I'VE BEEN IN HOSPITALITY & TOURISM FOR 20+ YEARS FROM HOTELS, RESORTS, TOURS AND EVEN A WINERY. I'VE HELD LEADERSHIP ROLES ON EXECUTIVE COMMITTEES FOR THE LAST 10 YEARS AND HAVE LIVED IN REDMOND SINCE 2017. CURRENTLY I AM THE GENERAL MANAGER @ SCP REDMOND HOTEL.

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this commission is subject to public records disclosure.

[redacted]

11/11/2020 (Date)

CITY OF REDMOND
DOWNTOWN URBAN RENEWAL DISTRICT CITIZENS ADVISORY COMMITTEE APPLICATION

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at 541-923-7751. Thank you for your time and interest in the City of Redmond. Attach additional sheets if necessary.

I, Monica M. Hvey (Please print name), respectfully request to be considered as an applicant for a position on the City of Redmond Downtown Urban Renewal District Citizens Advisory Committee.

[redacted] (Address)

Redmond, OR 97756

[redacted] (Phone) [redacted]

Are you a downtown property owner? no How long? _____
Are you a downtown business owner? no How long? _____

What reasons do you have for wanting to be a member of this Committee?

see attached.

Brief outline of experience and occupations.

see attached.

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this commission is subject to public records disclosure.

[redacted]

11/12/2020 (Date)

November 12, 2020

Attachment for City of Redmond Downtown Urban Renewal District Citizens Advisory Committee Application:

What reasons do you have for wanting to be a member of this Committee?

Thank you for considering my application. My reasons for applying are to use my professional experience and citizen experience to become a contributing member of The City of Redmond community. I hold a degree in Fine Arts from Lewis & Clark College and have spent my professional career in retail management in thriving destination communities. Initially as Sales Manager for a large art gallery in Sedona, Arizona for seven years, and most recently as a manager at Silverado Jewelry Gallery in Downtown Bend for five years. Currently I am a fulltime parent and caregiver to an eight-year-old in the dual language program in Redmond and a two-year-old born with developmental disabilities and chronic medical conditions. I have been a home owner in Redmond for 5 years and was raised in Bend. My husband has been a restaurant and wine professional for 15 years, and frequenting our local eateries is our primary hobby. All of these experiences combined give me perspective and interest in joining the Downtown Urban Renewal Committee. I am impressed by the direction Downtown Redmond is going, the changes in the five years I've been a Redmond resident are significant. I'd like to contribute and be a part of the continued growth and success in Downtown Redmond.

Brief outline of experience and occupations:

1999 - Highschool Graduate, Mountain View High School, Bend, OR

2003 - Degree in Liberal Arts, Fine Arts Major, Lewis & Clark College, Portland, OR

2005-2013 – Art Consultant & Sales Manager, Exposures International Gallery of Fine Art, Sedona, AZ

2013-2018 – Floor Manager, Silverado Jewelry Gallery, Downtown Bend, OR

2018-Current – Fulltime Caregiver & Parent

2019-2020 – Volunteer Secretary of Sage Elementary Parent Teacher Connection

CITY OF REDMOND
STUDENT PARTICIPATION IN CITY COMMISSIONS

Did you realize that you can have an impact on the future of your community? How it is built, how it is planned, what types of park amenities are provided, etc. Every month over 100 city volunteers meet and work with city staff on recommendations for the Redmond City Council regarding the future of the City of Redmond. However, most of the volunteers are adults and we are interested in hearing from you too – the youth of our community. The City of Redmond is interested in having a student participate on the City's commissions and committees who can provide the perspective of how these decisions impact the youth of our community and what living in Redmond feels like for the youth. You are our future and we are planning our future so it is vital that your voice is heard in this process. The appointment is for one school year. This is a great opportunity to do something for your community and gain "real-world" experience in planning and government.

If you are interested, please fill out the application below and return to the City Recorder at the City of Redmond, 411 SW 9th St, Redmond, OR 97756, or kelly.morse@ci.redmond.or.us.

WHAT COMMISSION/COMMITTEE ARE YOU APPLYING FOR: Downtown Urban Renewal / Art in Public Places

NAME: [redacted]

SCHOOL YOU ATTEND: Ridgeview High School **GRADE:** 10th

ADDRESS: [redacted] Redmond, OR 97756

EMAIL: [redacted] **PHONE NUMBER:** [redacted]

How long have you lived in the City of Redmond? 8 years

Why are you interested in this commission? I am interested in government and consider this a great opportunity to get entry level experience in it. I would like to help my community out, as well as, further develop my leadership skills.

CITY OF REDMOND
HISTORIC LANDMARKS COMMISSION

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at (541) 923-7751. Thank you for your time and interest in the City of Redmond. Attach additional sheets if necessary.

I, Chrisie Lockwood, respectfully request to be considered as an applicant for a
(Please print first and last name)
position on the City of Redmond's HISTORIC LANDMARKS COMMISSION.

[redacted] Redmond, OR 97756
(Address)

—
(Home phone)

[redacted]
(Cell phone)

[redacted]
(E-mail)

unemployed
(Occupation)

—
(Place of Employment)

The REDMOND HISTORIC LANDMARKS COMMISSION shall be composed of five members with interest, knowledge, or competence in historic preservation and who reside within the Redmond School District 2J boundary.

The purpose of the REDMOND HISTORIC LANDMARKS COMMISSION is to preserve and promote Redmond's history and culture by identifying, evaluating, and designating historic and cultural resources in the City of Redmond as landmarks; inform and educate the public on the historic and architectural significance of the designated landmarks; inform and educate the public on the value of preserving Redmond's historic and cultural resource; and solicit grants and other resources to help promote, advocate and undertake preservation projects in the City of Redmond.

What reasons do you have for wanting to be a member of this Commission? Please see attachment.

Local history/historic preservation activities (publications, committee work, etc):

Do you have any experience in architecture, history, architectural history, planning, prehistoric and historic archeology, folklore, cultural anthropology, curation, conservation, and landscape architecture, or related disciplines. Please provide a brief outline of relevant experience and occupations.

What other boards / committees do you serve on? _____

What contributions do you feel you can make to the Commission? _____

Education: Colleges/Universities attended with degrees, areas of study and dates completed. _____

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this commission is subject to public records disclosure.

[redacted] 10/13/20

(Signature) (Date)

CITY OF REDMOND
HISTORIC LANDMARKS COMMISSION

What reasons do you have for wanting to be a member of this Commission?

As a member of this Commission, I would be able to give back to and become more involved in my community. I would be able to assist in helping to preserve valuable historic resources and to educate the citizens and visitors on the history of Redmond.

Local history/historic preservation activities (publications, committee work, etc):

I do not have any local experience in history or historic preservation. I was an archeologist in Pennsylvania and Wisconsin. I participated in historic and prehistoric preservation and education activities. Please see attached document for field work, education, publications, and committee activities.

Do you have any experience in architecture, history, architectural history, planning, prehistoric and historic archeology, folklore, cultural anthropology, curation, conservation, and landscape architecture, or related disciplines. Please provide a brief outline of relevant experience and occupations.

I was a practicing archaeologist from 1998-2005. I have experience in both historic and prehistoric archaeology and preservation. I participated in and conducted fieldwork, assisted in documenting historic and prehistoric sites, conducted research, and published articles. I was a program assistant at the University of Wisconsin-Milwaukee and was responsible for the archaeological collections housed in the archaeology lab and curation facility. Additional tasks included layout editor for the Wisconsin Archeologist. In addition, I was a teaching assistant/adjunct professor/field technician for UWM. Please see attached sheets for a more detailed description of experience.

What other boards/committees do you serve on?

None.

What contributions do you feel you can make to the Commission?

I will work diligently to preserve historic resources and educate the public about Redmond history. I enjoy research and hope to uncover information about historic and prehistoric sites in Redmond, that can be utilized for tourism, grant proposals, education, and city recognition. I have helped edit publications, conducted numerous public outreach activities, and have worked with multiple city governmental departments in the past. I believe my experience in these activities will allow me to assist the Commission in its goals of education.

Education:

University of Wisconsin-Milwaukee
B.S. Criminal Justice

University of Wisconsin-Milwaukee
M. S. Anthropology (Archaeology)

Indiana University of Pennsylvania
B.S. Anthropology (Archaeology)
(Cum Laude)

Chrisie L. Lockwood

Redmond, Oregon [redacted]

SUMMARY: I have always been fascinated with prehistory and history and saught a career in archaeology. Unfortunatley, for health reasons, I had to seek a new career. I continuously read up on, watch documentaries, and visit historic/prehistoric sites whenever possible. I will always be fascinated by the past and enjoy learning and sharing knowledge with others.

ARCHAEOLOGICAL EMPLOYMENT HISTORY:

- **University of Wisconsin-Milwaukee** (2003-2005) Teaching Assistant/Adjunct Instructor/Field Technician: I taught the lab component of introduction to Archaeology for two years and was lead teaching assistant for the archaeological field school seasons (2002 and 2004). We conducted field school at The Crescent Bay Hunt Club site, a prehistoric site in southeast Wisconsin. My tasks included teaching students how to survey, excavate, and properly document archaeological sites; keep track of paperwork and assist other teaching assistants in meeting the goals for excavation and education set by Dr. Robert J. Jeske, whom was the professor in charge of the class. After field school was over in 2004, I conducted research at the Blue Heron site and Carcajou Point site, closely located to the Crescent Bay Hunt Club site. Site reports were submitted to the SHPO. As an adjunct instructor, I taught forensic anthropology to undergraduate and graduate students. When not teaching field school in the summers, I worked as a field and lab technician for the UWM-CRM (Cultural Resource Management) firm, Historic Resource Management Services (HRMS) program. I worked on prehistoric sites in the Door Peninsula of Wisconsin, that were in the way of new road construction. It was our responsibility to excavate and document the sites quickly and accurately to uncover as much information prior to the road being constructed.

- **University of Wisconsin-Milwaukee** (2000-2003) Project Assistant: As a project assistant, I was responsible for the archaeological collections housed at the UWM Archaeological Laboratory and its curation facility. I catalogued the collections, utilized a database to track the collections, and created loan agreements for the temporary use of collections by individuals for research purposes. I was involved in a survey to identify historic farmhouses in Southeast Wisconsin, document them, and provided a brief history of the structure. I conducted surveys of prehistoric sites for a grant acquired by the archaeology lab faculty. New sites were documented by submitting paperwork to the SHPO. The Wisconsin Archeologist was published out of UWM during my tenure as a project assistant. I assisted the editors in layout editing for the biannual publication of The Wisconsin Archeologist and publication and distribution of the monthly newsletter.

- **Indiana University of Pennsylvania** (June 1998-August 1999): Field student and technician. I participated in a historic archaeological field school and then became employed by the IUP Archaeology Lab, to excavate and survey historic and prehistoric sites and to clean and document artifacts.

PUBLICATIONS:

- **Hunter, Chrisie L.**

2002. Understanding Upper Mississippian Subsistence and Settlement Through the Use of Catchment Analysis: An Oneota and Langford Perspective. Wisconsin Archeologist 83:76-97.

- **Jeske, Robert J., Daniel M. Winkler, and Chrisie L. Hunter**

2002. Paleoindian and Archaic Occupations of the Kelly North Tract at Carcajou Point in Southeast Wisconsin. Wisconsin Archeologist 83:5-31.

- **Hunter, Chrisie L.**

2002. A Comparative Study of Oneota and Langford Traditions (Master's Thesis)

COMMITTEES:

- Wisconsin Archaeologist Corresponding Secretary (2002-2003)
- Wisconsin Human Burials Certified Archaeologist (2002 – present)
- Midwest Archaeology Conference planning committee (hosted by UWM-Archaeology Lab - 2003).

PUBLIC OUTREACH:

- Annually, I would participate in Archaeology Week activities. I was a guest lecturer on several occasions on behalf of the UWM Archaeology Lab and participated in show and tell activities for the public.
- Guest lecturer for the UWM Anthropology Club (2002)
- Guest lecturer for The Wisconsin Archeologist monthly lecture series (2002)
- Guest Lecturer for the Kenosha Public Museum (2002)
- Instructor for a week-long senior citizen seminar on Wisconsin archaeology. The seminar incorporated instruction, field trips to local Native American museums, and artifact workshops.

EDUCATION:	HARD SKILLS:	SOFT SKILLS:
University of Wisconsin-Milwaukee B.S. Criminal Justice University of Wisconsin-Milwaukee M. S. Anthropology Indiana University of Pennsylvania B.S. Anthropology (Cum Laude)	Computer Software Customer Service Critical Thinking Word Processing Microsoft Office Data Analysis Data Entry	Effective Communication Research Problem Solving Time Management Leadership Reliable Teamwork Work Ethic Organized

CITY OF REDMOND
REDMOND HOUSING AND COMMUNITY DEVELOPMENT COMMITTEE

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th Street, Redmond OR 97756. If you have any questions, please feel free to contact the City Recorder at 541-923-7751. Thank you for your interest in the City of Redmond. Attach additional sheets if necessary.

I, Shannon Dills, respectfully request to be considered as an applicant
(Please print first and last name)
for a position on the City of Redmond's Housing and Community Development Committee.

[redacted] Redmond OR 97756
Street Address | City | State | Zip

Home Phone | [redacted] Cell Phone

[redacted]
E-mail Address

Accounting Specialist | Sisters Coffee Company
Occupation | Place of Employment

The Redmond Housing and Community Development Committee shall be comprised of nine members and a majority of which should reside within the Redmond Urban Growth Boundary.

Address: [redacted]
City Limits: _____ Urban Growth Boundary: X County: Deschutes
How long have you been a resident? Years: 2 Months: _____

The purpose of the Redmond Housing and Community Development Committee is to review and recommend housing, neighborhood revitalization, and community development programs addressing the continuum of housing and human services needs for the purpose of enhancing community health and well-being.

Do you possess knowledge, qualifications, or experience in the following areas? Please check all that apply:

☑ Housing construction industry ☑ Housing development industry ☐ Human service industry (Social Services)

Have you been a recipient of housing assistance? ☐ Yes ☑ No
Have you been a recipient of human services (social services) programs? ☐ Yes ☑ No

What reasons do you have for wanting to be a member of this Committee? When I moved to Redmond I fell in love with its small town charm. I believe that this small town charm is one of the many great things that sets us apart from Bend. I came to Redmond from a place that is failing its communities with bad policies and poor planning and I've experienced it's devastation first hand. I want to do everything I can to prevent that from happening to our wonderful town. I believe that we can preserve our small town feel and values while also allowing it to grow.

Please provide a brief outline of relevant experience and occupations. I was a realtor for several years in a major metropolitan area as well as small towns. I have witnessed first hand the consequences that bad planning can do to a city/town. I have also seen the benefits that well thought out planning can have. In my role as a realtor, I worked with many community members as well as those in the construction and development industry which has given me knowledge from many sides of what works and what doesn't.

What other city boards / committees do you serve on? None

What other non-city boards / organizations do you serve on? None

What contributions do you feel you can make to the Committee? I have lived in small towns and large cities. I believe my years of work in the housing industry has given me a great deal of insight on many levels as to what works and what doesn't. I love Redmond and I am passionate about protecting our town and the things we love about it while also allowing it to grow.

How did you hear about this position? City website

Are you available to attend special meetings, in addition to the regularly scheduled meetings? Yes

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this commission is subject to public records disclosure.

Signature [redacted]

Date 10/8/2020

CITY OF REDMOND
REDMOND HOUSING AND COMMUNITY DEVELOPMENT COMMITTEE

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond OR 97756. If you have any questions, please feel free to contact the City Recorder at 541-923-7751. Thank you for your interest in the City of Redmond. Attach additional sheets if necessary.

I, Ron Osmundson, respectfully request to be considered as an applicant
(Please print first and last name)
for a position on the City of Redmond's Housing and Community Development Committee.

[redacted] Redmond OR 9775
Street Address | City | State | Zip

Mailing Address (if different) | City | State | Zip

[redacted]
Home Phone | Cell Phone

[redacted]
E-mail Address

Daycare Co-Owner | Self-employed
Occupation | Place of Employment

The Redmond Housing and Community Development Committee shall be comprised of nine members and a majority of which should reside within the Redmond Urban Growth Boundary.

Addr [redacted]

City Limits: Redmond Urban Growth Boundary: Yes County: Deschutes

How long have you been a resident? Years: 15 Months: _____

The purpose of the Redmond Housing and Community Development Committee is to review and recommend housing, neighborhood revitalization, and community development programs addressing the continuum of housing and human services needs for the purpose of enhancing community health and well-being.

Do you possess knowledge, qualifications, or experience in the following areas? Please check all that apply:

□ Housing construction industry □ Housing development industry □ Human service industry (social services)

Have you been a recipient of housing assistance? ☑ Yes □ No

Have you been a recipient of human services (social services) programs? ☑ Yes □ No

What reasons do you have for wanting to be a member of this Committee?

I would like to serve to make the community more beneficial for all.

Please provide a brief outline of relevant experience and occupations. Daycare co-owner, Redmond Child Care Taskforce, volunteer football coach

What other city boards / committees do you serve on? None

What other non-city boards / organizations do you serve on? None

What contributions do you feel you can make to the Committee? I can offer insight from a person who is a renter and who has recieved assistance from a housing program and can help i prove it for those who wish to be independent.

How did you hear about this position? Mayor Endicot

Are you available to attend special meetings, in addition to the regularly scheduled meetings? Yes

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this commission is subject to public records disclosure.

[redacted]

11/4/20
Date

'20 NOV 18 AM 10:37:52

CITY OF REDMOND
JUNIPER GOLF COMMITTEE APPLICATION

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at 541-923-7751. Thank you for your time and interest in the City of Redmond. Attach additional sheets if necessary.

I, Wells Green, respectfully request to be considered as an applicant
(Please print name)

for a position on the City of Redmond Juniper Golf Committee.

[redacted]
(Address)

REDMOND, OR 97756

[redacted] [redacted]
(Phone) (Email)

Do you play golf? Yes. How often do you play? Once a week

Are you a member of the Juniper Golf Club? No. How long have you been a member ? N/A

What reasons do you have for wanting to be a member of this Committee? I really enjoy golf and I'm looking to get more involved in the community of Redmond!

Brief outline of experience and occupations. I am a retired Navy F-18 pilot and am currently flying air tankers for the US Forestry Service. I've got free time when I'm not flying and I would like to serve the Redmond community.

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this commission is subject to public records disclosure.

[redacted]
(Signature)

11/9/20
(Date)

Wells W. Green

[redacted]
Redmond, OR 97756
[redacted]

PROFILE

Experienced Aviator who just finished a twenty year career in the United States Navy and is now flying for Aeroflite Inc. in support of the US Forest Service. 3000+ hours of tactical flying across multiple Type/Model/Series, primarily in the F/A-18 Hornet and Super Hornet. Most recently type rated in the RJ-85 Aerial Firefighting platform. Confident, team player excited for the transition to civilian aviation and all the new challenges it is sure to bring.

AVIATION EXPERIENCE

Aerial Firefighter, Aeroflite Inc — Present

Operates the RJ-85 Large Air Tanker (LAT) in support of the US Forestry Service efforts to protect our nation from wild fires. Currently executing Second in Command (SIC) duties and working towards a Pilot in Command (PIC) qualification.

Carrier Air Wing Two Operations Officer — 2015 - 2018

Planned and executed complex operations onboard the USS CARL VINSON (CVN-70). Responsible for the safe-efficient execution of over 100 fixed wing and rotary wing sorties on a daily basis. One of the senior Air Wing aviators, entrusted to lead junior aviators through the planning and airborne execution of all missions.

Strike/Fighter Pilot VFA-86/VFA-151 — 2010 - 2012

Department Head Tour based out of Beaufort, SC and Lemoore, CA. Senior flight lead position mentoring and instructing junior aviators in both the F/A-18C and F/A-18E variants. Hand selected to augment VFA-151 onboard the USS ABRAHAM LINCOLN (CVN-74) during combat operations in support of OPERATION ENDURING FREEDOM.

Strike/Fighter Pilot VFA-25 — 2005 - 2008

Junior Officer tour based out of Lemoore, CA. Conducted multiple deployments onboard the USS RONALD REAGAN (CVN-76) in support of OPERATION IRAQI FREEDOM along with various Theater Security Cooperation Initiatives (TSCI) across the Western Pacific, Philippine Sea, and South China Sea.

EDUCATION

United States Naval War College — Masters, June 2009

Colorado State University — Bachelors, May 1997

SKILLS

F/A-18 Combat Lead, Functional Check Pilot, Tactical Flight Instructor, Instrument Check Pilot, and Ground Instructor. Landing Signals Officer (LSO). Commercial Flight Instructor (CFII/MEI).

CITY OF REDMOND
JUNIPER GOLF COMMITTEE APPLICATION

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at 541-923-7751. Thank you for your time and interest in the City of Redmond. Attach additional sheets if necessary.

I, Jim McDonald (Please print name), respectfully request to be considered as an applicant for a position on the City of Redmond Juniper Golf Committee.

[redacted] (Address)

Redmond, Or 97756

[redacted] (Phone) [redacted]

Do you play golf? Yes. How often do you play? weekly

Are you a member of the Juniper Golf Club? No. How long have you been a member ? N/A

What reasons do you have for wanting to be a member of this Committee? I am a retired resort manager and have been around golfing all my life and cant seem to get it out of my soal so why not use what I know

Brief outline of experience and occupations. Paradise Golf club Arizona, San Luis Bay Inn Avila Beach Cal. S, Kah-Nee-ta Resort, Warm Springs, Or Tolvona Inn Cannon Beach, Or. Have been on Oregon since 1975.

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this commission is subject to public records disclosure.

[redacted]

11/5/2020 (Date)

CITY OF REDMOND
NUISANCE APPEAL BOARD APPLICATION

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at (541) 923-7751. Thank you for your time and interest in the City of Redmond. Attach additional sheets if necessary.

[redacted]

I, Adam DuQuette, respectfully request to be considered
(Please print first and last name)
as an applicant for a position on the City of Redmond Nuisance Appeal Board.

[redacted]
(Address)
Redmond, OR 97756

[redacted] [redacted]
(Phone) (Email)

All Nuisance Appeal Board applicants must reside within the Redmond Urban Growth Boundary.

Do you reside within the Urban Growth Boundary? Yes
How long have you been a resident? Years: 2 Months: 2

What reasons do you have for wanting to be a member of this Board?
My wife and I moved our family o Redmond from Bend a few years ago and love the city. We are always looking for ways to give back, and this is one I have considered for a while. I want to learn more about how our local government functions through participation.

Do you have experience in group processes and decision making? Please describe:
My current job requires I am in a decision-making, leadership role at my current job as a software engineer. It requires clear and timely communication across multiple teams in many time zones. Previously, I was the lead instructor at COCC's "coding boot camp" and personally managed 3 teaching assistants and a class of 10+ professional adults. I can speak to more experience.

What other City Boards/Committees/Commissions do you currently serve on?
None at this time. I did deliver for Meals on Wheels over the summer through the Redmond Senior Center.

Have you had past code enforcement interactions? Please describe:

No.

What contributions do you feel you can make to the Board:

I've had to manage conflict deescalation in several different positions in my career: college instructor (COCC+OSU Cascades), customer service supervisor (4 yrs call center, many more in various retail/restraunt). I will bring same work ethic and eye towards detail that helped me launch/grow BendJS (local developer community), start/grow OSU-Cascades CompSci student organization (Student Org. President of the year I graduated), and find success in my paid career.

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this commission is subject to public records disclosure.

[redacted]
(Signature)

10/5/2020
(Date)

CITY OF REDMOND
NUISANCE APPEAL BOARD APPLICATION

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at (541) 923-7751. Thank you for your time and interest in the City of Redmond. Attach additional sheets if necessary.

I, Cameo Chambers, respectfully request to be considered
(Please print first and last name)
as an applicant for a position on the City of Redmond Nuisance Appeal Board.

[redacted]
(Address)
Redmond, OR 97756

[redacted] [redacted]
(Phone) (Email)

All Nuisance Appeal Board applicants must reside within the Redmond Urban Growth Boundary.

Do you reside within the Urban Growth Boundary? Yes
How long have you been a resident? Years: 18 Months: 4 1/2

What reasons do you have for wanting to be a member of this Board? I am excited to find outlets to serve my community. I've benefited as a member of the Redmond community since 2002 and I believe that I owe it to my city to give back. Of all the committee options presented, this one simply grabbed my attention more than the others and I'll do my best to support that statement in the remainder of my responses.

Do you have experience in group processes and decision making? Please describe: I have an understanding of this process as group of individuals working together to listen, analyze, and consider alternative courses of action and decide among those a solution or solutions. As a wife, mother, volunteer, and executive director of my own non-profit, I believe I hold a unique skill set that will serve this committee well.

What other City Boards/Committees/Commissions do you currently serve on? None with City of Redmond, currently. I am currently a member of the Redmond Housing Selection Comittee for Habitat for Humanity.

Have you had past code enforcement interactions? Please describe: I don't recall interactions with code enforcement in my personal experience but I can easily access city codes online and have done so to assist personal friends who have had interactions or questions in order to provide them with the information they need.

What contributions do you feel you can make to the Board: I am someone who stays organized and I find value in being efficient and on time. I am a good communicator both verbally and in writing. I find it easy to listen and I have the ability to see multiple sides while withholding opinion or judgment until asked. I am an open and friendly person who finds it easy to develop relationships and maintain professionalism. I am a fast learner and I will be a great addition to your committee.

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this commission is subject to public records disclosure.

[redacted] 10/6/2020

(Signature) (Date)

CITY OF REDMOND
PARKS COMMITTEE APPLICATION

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at 541-923-7751. Thank you for your time and interest in the City of Redmond. Attach additional sheets if necessary.

I, Alysa Martinez, respectfully request to be considered
(Please print first and last name)
as an applicant for a position on the Redmond Parks Committee.

[redacted]
(Address)

Redmond OR

[redacted]
(Phone)

[redacted]
(Email)

Qualified Committee applicant shall reside within the Redmond School District 2J.

How long have you been a resident, owned property or operated a business? Years: 2 Months: 5

What reasons do you have for wanting to be a member of this committee? I moved to Redmond to build a better life for my family, and have since been welcomed by a great community. I have a small child who takes full advantages of the parks in our community, and i would love to help continue to grow our parks for generations to come.

Brief outline of experience and occupations. Please see attached.

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this committee is subject to public records disclosure.

[redacted]

10/29/20
(Date)

As a professional I am a Certified Medical Assistant and have worked in the medical field for 10 years. While this professional experience may not directly translate to experience working with the city, I am passionate about the city of Redmond. I am passionate about making this city my home for years to come, and the children of our community deserve safe and clean places to play and grow their curiosity.

I have been on advisory committee's within my professional career, the most relevant was a patient satisfaction panel. I spearheaded this committee where we brought in patients from our community, and over the course of a year took their recommendations, and concerns, and turned them into actions within our practice to better their experiences.

Thank you for the opportunity to be considered for a position on the Parks Committee.

CITY OF REDMOND
STUDENT PARTICIPATION IN CITY COMMISSIONS

Did you realize that you can have an impact on the future of your community? How it is built, how it is planned, what types of park amenities are provided, etc. Every month over 100 city volunteers meet and work with city staff on recommendations for the Redmond City Council regarding the future of the City of Redmond. However, most of the volunteers are adults and we are interested in hearing from you too – the youth of our community. The City of Redmond is interested in having a student participate on the City's commissions and committees who can provide the perspective of how these decisions impact the youth of our community and what living in Redmond feels like for the youth. You are our future and we are planning our future so it is vital that your voice is heard in this process. The appointment is for one school year. This is a great opportunity to do something for your community and gain "real-world" experience in planning and government.

If you are interested, please fill out the application below and return to the City Recorder at the City of Redmond, 411 SW 9th St, Redmond, OR 97756, or kelly.morse@ci.redmond.or.us.

WHAT COMMISSION/COMMITTEE ARE YOU APPLYING FOR: Redmond Committee For Art in Public Places

NAME: Juniper Maurer

SCHOOL YOU ATTEND: Redmond Proficiency Academy **GRADE:** 9th

ADDRESS: [redacted] Redmond, OR 97756

EMAIL: [redacted] **PHONE NUMBER:** [redacted]

How long have you lived in the City of Redmond? 10 Years 6 Months

Why are you interested in this commission? This commission would give me an ~~opportunity~~ opportunity to gain experience in a leadership role as well as having influence in my local government. I am invested in all forms of art; I am also an arts student at RPA. Thank you for considering me.

'20 AUG 11 PM2:58:31

CITY OF REDMOND
URBAN AREA PLANNING COMMISSION APPLICATION

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at (541) 923-7751. Thank you for your time and interest in the City of Redmond. Attach additional sheets if necessary.

I, Laura Garcia, respectfully request to be considered
(Please print first and last name)
as an applicant for a position on the City of Redmond Urban Area Planning Commission.

[redacted]
(Address) Redmond OR 97756

[redacted]
(Phone) (Email)

All new Redmond Urban Area Planning Commission applicants must reside within the Redmond Urban Growth Boundary.

Do you reside within the Urban Growth Boundary? _____
How long have you been a resident? Years: 16 Months: _____

What reasons do you have for wanting to be a member of this Commission? I wanted to be able to be a part of the decision Making process for how Redmond grows and be a productive member of the community.

Brief outline of experience and occupations. Past Preesident of The Redmond Chamber of Commerce, Leadership Redmond Sisters city Redmond Ambassador. owner of Mazatlan Mexican Restaurant.

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this [redacted]e.

[redacted] 07/10/2020
(Date)

CITY OF REDMOND
URBAN AREA PLANNING COMMISSION APPLICATION

Please type or print answers to the following questions and submit to the City Recorder at City Hall, 411 SW 9th St, Redmond, OR 97756. If you have any questions, please feel free to contact the City Recorder at (541) 923-7751. Thank you for your time and interest in the City of Redmond. Attach additional sheets if necessary.

I, Ron Osmundson, respectfully request to be considered
(Please print first and last name)
as an applicant for a position on the City of Redmond Urban Area Planning Commission.

[redacted]
(Address)
Redmond, OR 97756

[redacted] [redacted]
(Phone) (Email)

All new Redmond Urban Area Planning Commission applicants must reside within the Redmond Urban Growth Boundary.

Do you reside within the Urban Growth Boundary? Yes
How long have you been a resident? Years: 15 Months:

What reasons do you have for wanting to be a member of this Commission?

I ran as a candidate for city council and lost but would like to offer my set skills to the City of Redmond serving on the Planning Commission.

Brief outline of experience and occupations. Daycare Co-Owner and Operator, Redmond Child Care Taskforce - Neighborhood Impact, Volunteer Football Coach

My signature affirms that the information in this application is true to the best of my knowledge. I understand that misrepresentations of facts are cause for removal from any advisory committee, board or commission I may be appointed to. I also understand that City policy requires disclosure of actual or potential conflicts of interest by persons appointed by the Mayor and Council. All information and documentation related to service on this
re.

[redacted]

11/4/20
(Date)