The Dalles Transportation System Plan

The Dalles, Oregon

December 2016

Transportation System Plan

The Dalles Transportation System Plan

The Dalles, Oregon

Prepared For:
The Dalles, Oregon
1215 W 1st Street
The Dalles, Oregon 97058
(541) 506-2021

Prepared By:
Kittelson & Associates, Inc.
354 SW Upper Terrace Drive Suite 101
Bend, Oregon 97702
(541) 312-8300

In Association With:
Angelo Planning Group

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PREFACE

The progress of this plan was guided by the Project Management Team (PMT), the Technical Advisory Committee (TAC), and the Public Advisory Committee (PAC). The PMT, TAC, and PAC members are identified below, along with members of the consultant team. The TAC and PAC members devoted a substantial amount of time and effort to the development of The Dalles' Transportation System Plan (TSP), and their participation was instrumental in the development of this document. The Consultant Team and PMT believe that The Dalles' future transportation system will be better because of their commitment.

PROJECT MANAGEMENT TEAM

Dave Anderson
Jim Bryant
Dale McCabe
Ryan McKinnis
Richard Gassman

TECHNICAL ADVISORY COMMITTEE

Dawn Hert
Arthur Smith
Angie Brewer
Andrea Klaas
Dustin Nilsen
Jay Waterbury
Steve Baska
Bob Palmer
Patricia Neighbor
Scott Edelman
Brad DeHart
Dan Schwanz
Michael Held

PUBLIC ADVISORY COMMITTEE

Russ Brown
Jim Wilcox
Mimi McDonell
Dan Erickson
Matthew Klebes
Dave Peters
Phil Lewis
Dennis Whitehouse
Michele Spatz
Jim Austin
Joe Abbas
Chuck Covert
Sherry Dufault
John Newcomer
Donna Lawrence
Megan Thompson

CONSULTANT TEAM

Kittelson & Associates, Inc.
Chris Brehmer, PE
Susan Wright, PE
Ashleigh Griffin

Angelo Planning Group
Darci Rudzinski
Clinton "CJ" Doxsee

Chapter 1 Introduction and Policy Context

1. INTRODUCTION AND POLICY CONTEXT

The City of The Dalles 2016 Transportation System Plan (TSP) is designed to guide investments in the transportation system over the next 20 years in order to serve existing and anticipated future transportation needs. This TSP is a community-driven document that has been developed in alignment with federal and state requirements for long-range planning. This document is organized as follows:

Chapter 1: Introduction and Policy Context describes The Dalles study area, the planning process of the transportation system plan, and the context of other policies and plans that relate to the TSP. This chapter describes how the TSP meets the requirements of federal and local regulations.

Chapter 2: Goals and Objectives contains the overarching goals that drove the development of this plan and includes more specific objectives that will lead to the implementation of the plan and fulfillment of the goals.

Chapter 3: Existing Conditions documents the existing transportation system including an inventory of facilities as of 2015 and a summary of operational characteristics.

Chapter 4: Future Travel Demand describes the expected change in travel demand based on population and employment projections for the City.

Chapter 5: Future Alternatives Analysis describes the alternatives that were considered and evaluated during the development of the Plan.

Chapter 6: Transportation System Plan describes the Modal Plans that make up the Transportation System Plan, including the Roadway Plan, Safety Plan, Bicycle Plan, Pedestrian Plan, Transit Plan, Rail Plan, Marine Transportation Plan, Air Plan, and Pipeline Plan.

Chapter 7: Funding the Plan provides an overview of funding sources to complete the elements identified in the Plan.

TSP DEVELOPMENT PROCESS

The TSP was developed through a process that identified transportation needs, developed and analyzed potential alternative approaches for addressing those needs, and developed projects, programs, pilot projects, policies, and future studies as well as a finance plan that best address The Dalles' forecasted needs. The following steps were involved in the process:

- Reviewing state, regional, and local transportation plans and policies that The Dalles TSP must either comply with or be consistent with.
- Providing public open houses to provide project information to, and gather feedback from, the public at key points during the TSP development process, establishing project advisory committees, and developing transportation plan goals and objectives.

- Identifying a detailed inventory of existing transportation facilities and services.
- Evaluating current transportation operations and deficiencies.
- Evaluating transportation needs in the 2035 forecast year with expected growth and without any additional transportation improvements beyond those already funded.
- Identifying and evaluating improvement alternatives intended to address The Dalles' future transportation needs.
- Developing a prioritized set of projects, programs, pilot projects, policies, and future studies that meet the plan goals and objectives.
- Estimating the revenue available for transportation projects through the year 2035.
- Compiling the results of this work into this TSP document.
- Reviewing and adopting the TSP by the Planning Commission and City Council.

PUBLIC INVOLVEMENT

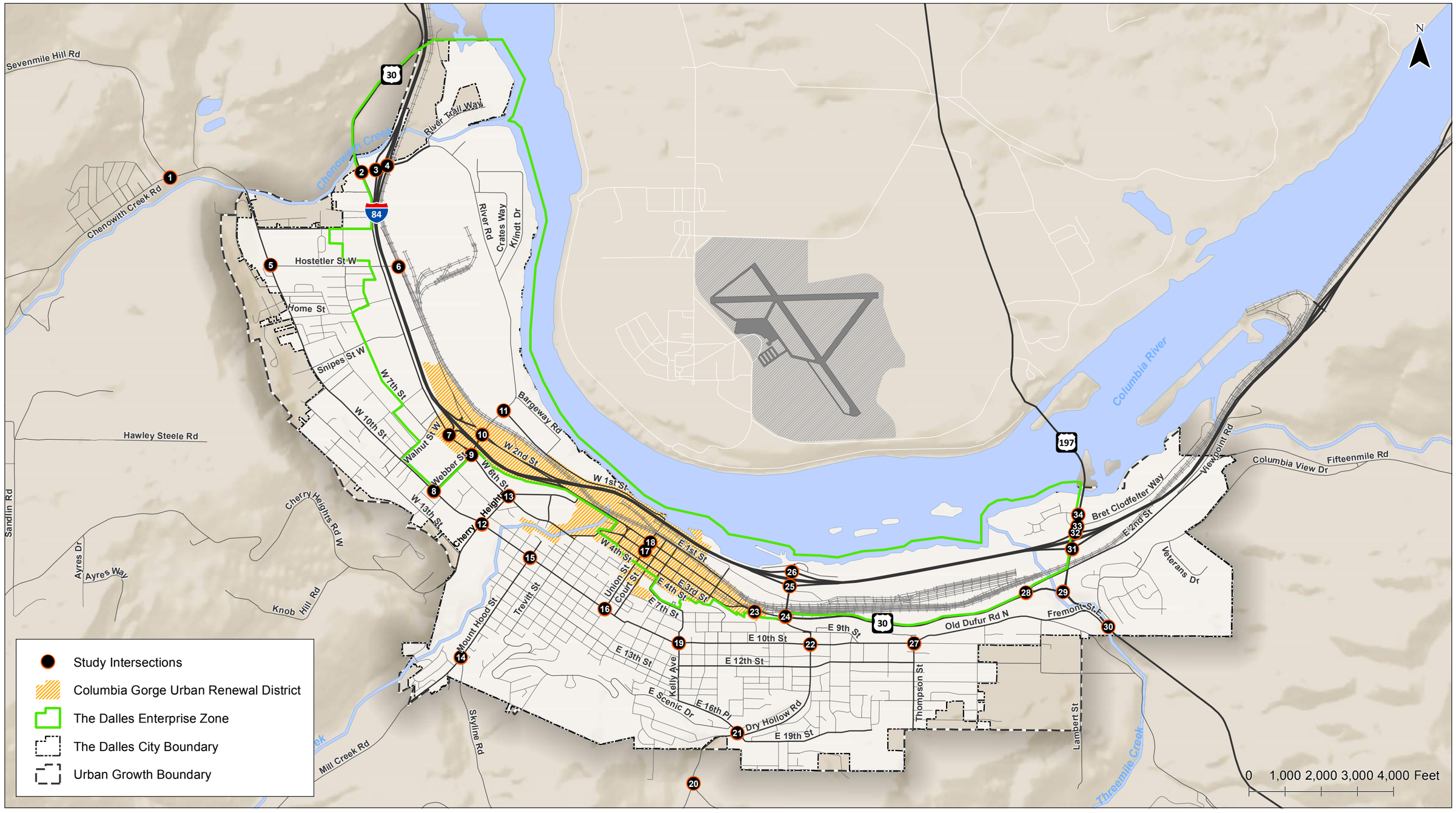
The planning process was guided by a Technical Advisory Committee (TAC) and a Project Advisory Committee (PAC) comprised of key stakeholder agencies and other community representatives. The TAC and PAC were responsible for reviewing the technical aspects of the TSP and providing input to represent various organizations and community groups. The TAC and PAC reviewed several memoranda and convened at a total of five TAC/PAC meetings during the process of developing the TSP. The TAC and PAC meetings focused on all aspects of the TSP development including the review and presentation of existing deficiencies and forecast needs; alternative development; a preferred transportation and funding plan; and, recommended code amendments.

In addition to the established advisory committees, two public meetings were held at key junctures in the process to obtain public comment regarding transportation concerns, future transportation improvement projects, programs, pilot projects, policies, and future studies, and respective priorities of these plan elements. Comments were addressed in the alternatives analysis and final plan development. Finally, the draft plans were presented and discussed with the City Planning Commission and Council at a joint work session and at public hearings.

STUDY AREA

Figure 1-1 illustrates The Dalles TSP study area and study intersections. The study area includes all roadways within The Dalles Urban Growth Boundary (UGB). The study intersections were identified by City and ODOT staff as representing key intersections within the study area.

Based on the requirements of the *Oregon Transportation Planning Rule* (TPR), the study of roadways and intersections is generally limited to those with the highest classifications – collectors and arterials – as well as the Interstate. However, local street issues, such as street connectivity and safety are also discussed where appropriate.



Study Area and Intersections
The Dalles, Oregon

Figure
1-1

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

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TRANSPORTATION ENGINEERING/PLANNING

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POLICY CONTEXT

This section presents a review of existing plans, regulations, and policies that affect transportation planning in the TSP update study area. The review explains the relationship between the documents and planning in this area, discussing key issues that guided the TSP development process.

Some documents included in this review establish transportation-related standards, targets, and guidelines with which the TSP update shall coordinate and be consistent; others contain transportation improvements that were factored into the future demand modeling and are otherwise reflected in the TSP.

Table 1-1 provides a list of the documents reviewed in this memorandum and their project relevance. See Technical Appendix 1 in Volume II of the TSP for a summary of each document.

Table 1-1. Summary of Documents Reviewed

Document	Project Relevance
State Documents	
Oregon Transportation Plan (2006)	Projects, policies, and regulations proposed as part of the updated TSP will reflect the policies of the Oregon Transportation Plan and will comply with or move in the direction of meeting the standards and targets established in the OHP related to safety, access, and mobility. State modal plans will inform recommended improvements in the updated TSP; TSP recommendations will be consistent with state policy and requirements.
Oregon Highway Plan (2011)	
Oregon Freight Plan (2011)	
Oregon Public Transportation Plan (1997)	
Oregon Rail Plan (2014)	
Oregon Aviation Plan (2007)	
Oregon Bicycle/Pedestrian Plan (2011)	
Oregon Transportation Safety Action Plan (2011)	
Transportation Planning Rule (OAR 660-012) (2011)	

Document	Project Relevance
Access Management Rule (OAR 734-051) (2014)	
Statewide Transportation Improvement Program (STIP)	The TSP update analysis will take into account projects that are programmed in the STIP. An expected outcome of this planning process is proposed recommendations to update the STIP to include projects from the updated TSP.
ODOT Highway Design Manual (2012)	The ODOT Highway Design Manual provides design standards on state roadways; analysis for the TSP update and final project recommendations will need to reflect state requirements for state facilities. Standards and guidelines adopted by The Dalles should be considered for additional guidance, concepts, and strategies for design.
Oregon Resilience Plan (2013)	The Oregon Resilience Plan provides guidance on and sets priorities for Oregon's multi-modal transportation system, as related to its role in rescue and economic recovery after a major seismic event. Transportation policies and standards adopted by The Dalles should be consistent with and supportive of the objectives and recommendations of this plan.
Sustainability Executive Orders (EO-00-07, EO-03-03,and EO-06-02)	The TSP planning process will consider ODOT's overall vision for sustainability efforts and consider strategies to create sustainable transportation operations.
Governor's Climate Change Initiative	The TSP planning process will consider strategies identified in ODOT's Greenhouse Gas Emissions Reduction Toolkit.
Regional/County Documents	
Wasco County Coordinated Transportation Plan (2009-2012)	The TSP planning process will consider the priorities identified in the Wasco County Coordinated Transportation Plan in the development of the transit element of the updated TSP. The TSP transit element will summarize available services in the City and will include recommendations for enhanced transit service.
Wasco County Transportation System Plan (2009)	The TSP update process will review goals, objectives, standards, and recommended projects from the Wasco County TSP and incorporate it into The Dalles TSP update.
The Columbia Gorge Regional Airport Master Plan (2010)	The TSP update process will consider the needs and potential expansion and growth of commercial and recreational uses around the Columbia Gorge Regional Airport and will reflect related capacity and access-related improvements to the City's transportation system, as necessary.

Document	Project Relevance
Columbia River Gorge National Scenic Area Management Plan (2011)	Transportation needs identified for the GMA will be consistent with the Columbia River Gorge National Scenic Area Management Plan
City Documents	
The Dalles Comprehensive Plan (2011)	The updated TSP is intended to be adopted as the transportation element of the City's Comprehensive Plan, replacing the 2005 TSP. Recommendations resulting from the TSP update process must either be consistent with existing policies, including those identified above, or the TSP process should include proposed amendments to adopted policies. Amendments to the Zoning and Land Use Development Ordinance will also likely be needed in order to implement the updated TSP; proposed amendments will be based on existing, revised, or new policies related to land use designations, plan and code amendment procedures, land use review coordination, and/or protection of transportation facilities.
The Dalles Transportation System Plan (2005)	The TSP update process will review goals, objectives, standards, and recommended projects from the current plan and will determine what to retain or change in the updated TSP. This project will update transportation improvement projects for all modes, based on current and projected needs. Updated data, stakeholder and community involvement, and evaluation criteria will be used in making these determinations.
Land Use and Development Ordinance (2015)	Amendment to LUDO provisions related to transportation improvements such as pedestrian and bicycle access and connectivity, transit access, traffic impact analyses, and agency coordination may be recommended as part of this planning process in order to implement the updated TSP, provide consistency between the LUDO, TSP, and local road standards, and strengthen compliance with the TPR.
I-84 Chenoweth Interchange Area Management Plan (2009)	Recommended IAMP amendments to the TSP will be considered during the policy amendment, implementing ordinances and findings phase of the TSP update and, where appropriate, incorporated into the TSP.
The Dalles Growth Management Report (2013)	The TSP update process will consider the UGB findings and recommendations from The Dalles Growth Management Report. The proposed UGB expansion has not been adopted and therefore will not be reflected in the TSP update analysis. To the extent possible, the updated TSP recommendations will reflect the relative scale and location of proposed UGB expansion in order to limit constraints on future growth in those areas.

Document	Project Relevance
The Dalles' Economic Opportunities Analysis Report (2011)	The TSP update process will reflect the findings of The Dalles' Economic Opportunity Analysis Report, as it relates to improved multi-modal transportation service and connections to existing employment areas.
The Dalles' Current and Past Transportation Budget and Funding Sources	The TSP update process will review and take into consideration the current and past transportation budget and funding sources.

Chapter 2 Goals and Objectives

2. GOALS AND OBJECTIVES

The 2016 Transportation System Plan Goals and Objectives are based on an evaluation of the goals in the 1999 City of The Dalles TSP, the transportation element of the current Comprehensive Plan, direction provided by the City and ODOT staff, and input from the Advisory Committees. The goals and objectives were used to evaluate alternatives, develop priorities and guide transportation investments in The Dalles. 2016 TSP Goals and Objectives were also used to update City transportation policies, which reside in the Comprehensive Plan document under Goal 12: Transportation.[1] Additional information on how these were used to evaluate alternatives is included in Chapter 5 and Technical Appendix 2.

Goal 1. Safety and Mobility

The Safety and Mobility goal recognizes the importance of a safe transportation system that is reliable and in a state of good repair.

Objectives

1A. Eliminate the number of fatal and serious crashes in the plan area.

1B. Develop a multi-modal transportation system that incorporates safety and operational improvements for bicyclists and pedestrians.

1C. Satisfy applicable City and/or State operational performance measures.

1D. Preserve and maintain the existing transportation system in a state of good repair.

1E. Improve safety and operational components of existing transportation facilities not meeting agency standards or industry best practices.

Goal 2. Accessibility and Connectivity

The Accessibility and Connectivity goal focuses on providing a transportation system available to all users, regardless of mode of choice, ability, or economic status. It also works to improve the local circulation system to reduce the community's reliance on State Highways to travel to local destinations.

Objectives

2A. Plan and design an integrated transportation system that includes additional local, collector, and arterial roads, based on future land use needs, that accommodate all users of the transportation system.

[1] Amendments to Comprehensive Plan Goal 12 that resulted from the TSP update are included in Technical Appendix 8.

2B. Plan and design transportation facilities that complete a route by connecting other existing routes, filling a gap in an existing route, or providing connectivity between modes.

2C. Support transit service to target populations and encourage transit service for The Dalles urban area.

2D. Consider impacts and transportation affordability to low income or minority populations when assessing the impacts of transportation infrastructure projects.

Goal 3. Integration

The Integration goal ensures compatibility with local and regional land use plans or programs while promoting environmental stewardship and financial responsibility.

Objectives

3A. Develop transportation investments in coordination with local land use, comprehensive and regional plans.

3B. Incorporate Transportation Demand Management (TDM) strategies to reduce the number of single occupancy vehicles, maximize the use of existing infrastructure and reduce parking demands.

3C. Prioritize transportation projects that provide the most benefit for the cost.

3D. Maintain and develop an environmentally sensitive transportation system.

3E. Incorporate new technologies to enhance the transportation system and extend the useful life of the existing facilities.

Goal 4. Economic Development

The Economic Development goal seeks to leverage the transportation system as a catalyst for economic vitality in the City.

4A. Improve the movement of goods and delivery of services throughout the City while balancing the needs of all users with a variety of travel modes.

4B. Prioritize efficient freight movement on identified freight routes.

4C. Develop a transportation system that supports connections to air, rail, marine, or freight transportation, including services provided by the Columbia Gorge Regional Airport, the Port of The Dalles, and The Dalles Marine Terminal.

4D. Identify lower-cost alternatives, phasing opportunities, and/or funding mechanisms for transportation improvements that serve planned development.

4E. Program transportation improvements to facilitate the orderly development of planned land uses.

Chapter 3 Existing Conditions

3. EXISTING CONDITIONS

The existing conditions chapter documents the type, condition, and performance of facilities that provide transportation of people, goods, and services to and through The Dalles in 2015. The existing conditions were analyzed with respect to the transportation goals, including: mobility, safety, economic development, accessibility and connectivity. The following questions represent a few of the focus areas explored through the analysis:

- How have travel patterns changed since the 1999 Transportation System Plan (TSP) was adopted, and can the existing transportation facilities accommodate those changes?
- Are any existing facilities in need of maintenance or replacement?
- Is economic development being limited by existing transportation facilities?
- Where have the most frequent and severe crashes been reported? What factors are contributing to crashes?

The findings of this inventory and analysis include a list of existing needs that reflect opportunities to improve the system, based on the goals and objectives outlined in Chapter 2. Detailed findings are included in this chapter; a summary of the key findings includes:

- The City has annexed 850-acres of residential and industrial land since 2005 and taken jurisdiction of several miles of roadways (W 6th Street and W 2nd Street). These roadways are not designed to current City and ADA standards, including provision for pedestrian and bicycle facilities.
- Vacant land is available within the Port of The Dalles and the Columbia Gorge Industrial Center that represents a significant opportunity for economic development and growth in traffic near the Chenoweth Interchange. The I-84 Chenoweth Interchange Area Management Plan (IAMP) was adopted in July 2010 to protect the function of the interchange to provide safe and efficient connections with the interstate to and from the city's industrial port area.
- Operational analysis of vehicle delay and capacity indicates that one intersection (US 197/I-84 EB Ramp) does not meet City delay standards. Other intersections are approaching City standards for delay and ODOT standards for capacity; these include: Thompson Street/E 10th Street/Old Dufur Rd, I-84 EB Ramps/W 6th Street, and US 197/Lone Pine Boulevard.
- A review of 5-year crash history at the study intersections identified several intersections with potential for crash reduction. More frequent and severe crashes were reported at these intersections than were reported at similar intersections in The Dalles or throughout Oregon. Countermeasures were evaluated as part of the alternatives analysis element of the TSP.
- Several roadway segments were reported with poor pavement conditions, per recent City and ODOT inventory. City and ODOT maintenance schedules were reviewed and new pavement preservation projects were included in the alternatives analysis element of the TSP.
- Bicycle and pedestrian facilities are provided on many roadways, but improvements to the existing facilities and construction of new facilities are needed to encourage more use of these modes of travel.

- A new transit center was constructed at Chenoweth Loop Road and W 7th Street that serves as a stop location for Columbia Area Transit (CAT) and Greyhound. It creates new opportunities for use of transit for local and regional trips.
- Bridge inventory conducted by ODOT identified a couple bridges that are weight restricted and/or have functional or structural issues. These include the W 6th Street Bridge over Mill Creek, the US 30 (Hwy 100) Bridge over Chenowith Creek, and the US 197 Bridge over the Columbia River.

EXISTING TRANSPORTATION FACILITY INVENTORY

The transportation facility inventory discussion that follows describes the existing system inventories for transportation networks for all modes, including roadway, freight, bicycle, pedestrian, transit, bridge, rail, air, water, and pipeline. The land and population inventory describes the population and land use characteristics and sets the state for the future potential changes in the transportation system.

Lands and Population Inventory

The inventory of existing lands and population identifies factors that may influence existing travel patterns and growth patterns within The City of The Dalles over the next 20 years. The following sections describe: Zoning, Columbia River Gorge National Scenic Area, Developed and Vacant Land, Natural Resources and Hazards, Activity Centers, and Historic and Projected Population Growth.

Zoning

Figure 3-1 provides the location of zoning districts within the City's Urban Growth Boundary (UGB). There are eleven zones shown on the map, depicting commercial, industrial, residential, open space, parks, and right-of-way zone districts. The zoning map also includes a Neighborhood Center overlay zone wherein a mix of uses is allowed. Generally, industrial, open space, and recreational commercial zones are located between I-84 and the Columbia River. Commercial and residential zones, as well as Neighborhood Center overlay zones, are all located south of I-84.

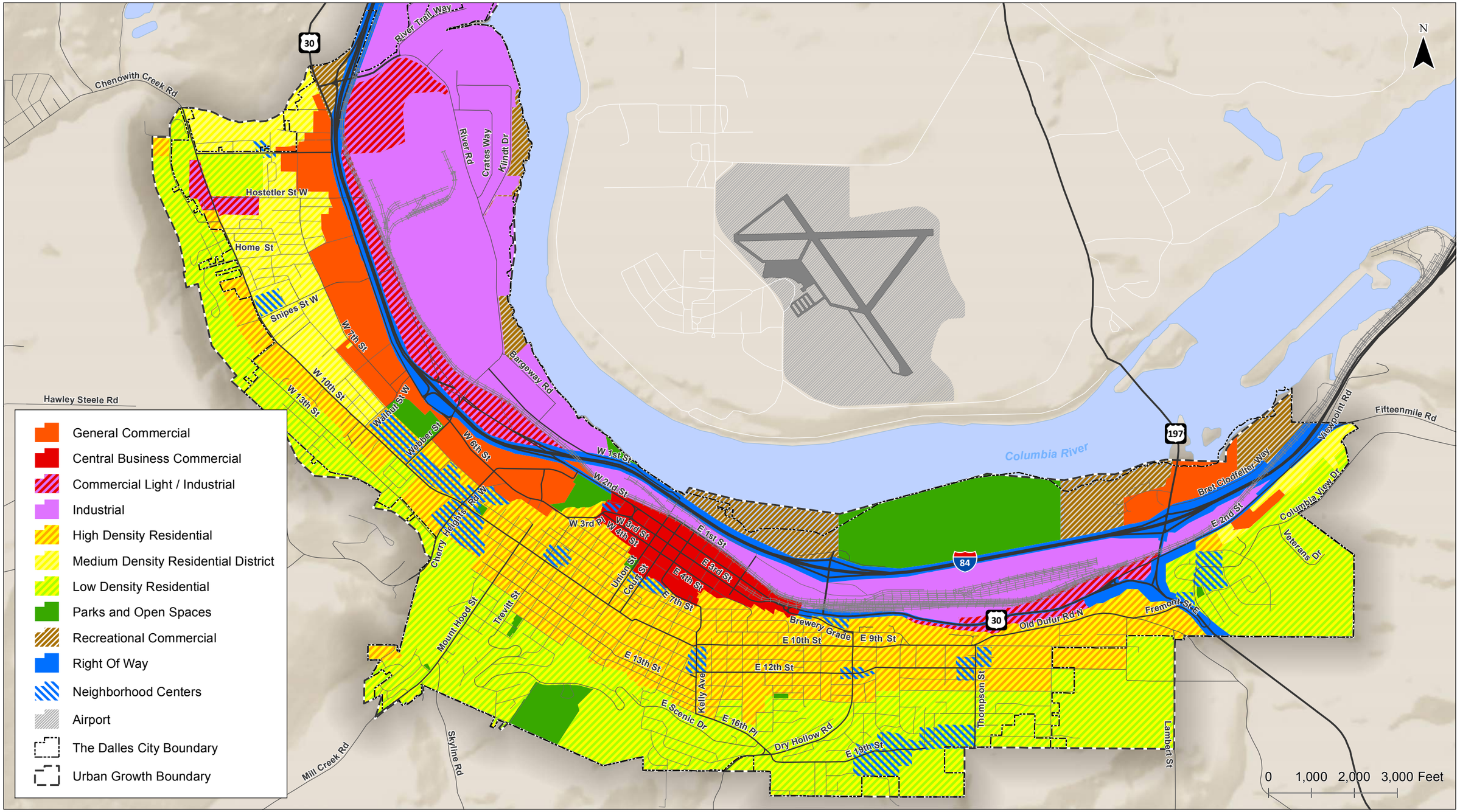
Development regulations for each of the City's zones are provided for in Chapter 5 of the Land Use Development Ordinance (LUDO). Table 3-1 includes a list of the zones and a summary of the types of development permitted in each.

Table 3-1. Zoning Districts

Zoning District	Zoning District Purpose
Residential	
RL – Low Density Residential	Allows for 0-6 single family dwelling units per gross acre
RM – Medium Density Residential	Allows for 7-17 single family and multi-family dwelling units per gross acre
RH – High Density Residential	Allows for 7-25 single family and multi-family dwelling units per gross acre
Commercial	
Central Business Commercial	Allows for commercial, civic, and residential uses subject to additional sub-district design standards
General Commercial	Allows for a wide range of retail, wholesale, and service business
Industrial	
Commercial Light/Industrial	Allows for commercial uses and certain light industrial uses
Industrial	Allows for a variety of commercial and industrial uses
Open Space	
Parks and Open Spaces	Insures sufficient open areas throughout the community to safeguard public needs and provide recreational activities
Recreational Commercial	Allows for mixed business, commercial, service, recreational, and light industrial uses
Overlay	
Neighborhood Centers	Allow for a mix of certain commercial, residential, civic, and light manufacturing within a single building or tax lot

Columbia River Gorge National Scenic Area

The Columbia River Gorge National Scenic Area Management Plan (Management Plan) provides regulations and standards to preserve land for rural and natural uses within the Columbia River Gorge corridor and focus future growth and economic development within urban areas. The Management Plan is divided into three categories of land: Urban Areas, Special Management Areas (SMAs), and General Management Areas (GMAs). A summary of GMA acreage within The Dalles TSP is provided in Table 3-2.



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Zoning
The Dalles, Oregon

Figure
3-1

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Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

Table 3-2. **Columbia River Gorge National Scenic Area Management Areas**

Management Area	Acres Within The Dalles UGB	Acres within The Dalles City Limits
General Management Areas (GMAs)		
Residential (R-1, R-5)	70.6	18.0
Agricultural (A-1(40), A-1(160), A-2(40))	53.6	19.8
Open Space	3.9	-
Public Recreation	8.4	8.4
Special Management Areas (SMAs)		
Agriculture*	0.1	-
Open Space	9.9	9.9

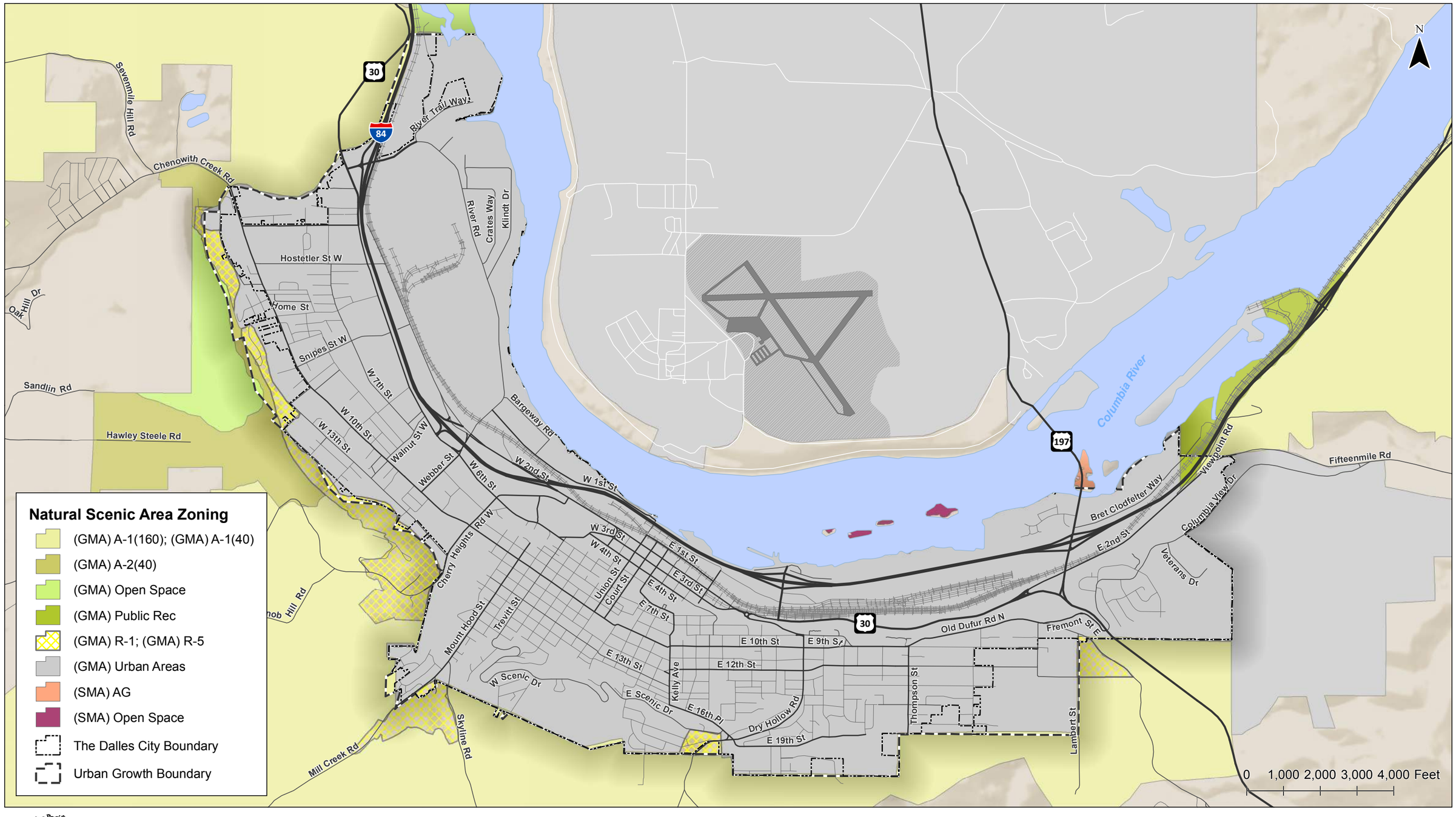
*also designated as a special agricultural area in the GMA.

The majority of the City of The Dalles is designated as an Urban Area and is exempt from the requirements of the management plan. However, as shown in Figure 3-2, there are limited areas within both the UGB and The Dalles city limits that are included in the management areas governed by the Management Plan. Relevant to land use and transportation planning, areas within the Residential GMA are subject to a review process and have additional criteria for the protection of scenic, cultural, natural, and recreation resources.

Developed & Vacant Land

An inventory of developed and vacant land was produced using assessor property classification data for tax lots within the UGB. Each parcel of property is classified in accordance with ORS 308.215 and, with the exception of specially-assessed properties, the classification is based upon the highest and best use of the property. Tax assessor information for parcels within The Dalles UGB provides a basic inventory of developed and vacant land, which is mapped in Figure 3-3.

A majority of vacant land available is zoned as Low Density Residential or Industrial, while a smaller portion of vacant land is zoned Recreational Commercial or General Commercial. Vacant Low Density Residential lands are generally characterized as small parcels and are located near the southern and western portion of the UGB. One notable exception to the size and locations of vacant Low Density Residential lands is located near the eastern portion of the UGB, which features large vacant parcels owned by the North Wasco County School District.



Natural Scenic Area Zoning

- (GMA) A-1(160); (GMA) A-1(40)
- (GMA) A-2(40)
- (GMA) Open Space
- (GMA) Public Rec
- (GMA) R-1; (GMA) R-5
- (GMA) Urban Areas
- (SMA) AG
- (SMA) Open Space
- The Dalles City Boundary
- Urban Growth Boundary

Columbia Gorge Natural Scenic Area Zoning
The Dalles, Oregon

Figure **3-2**

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

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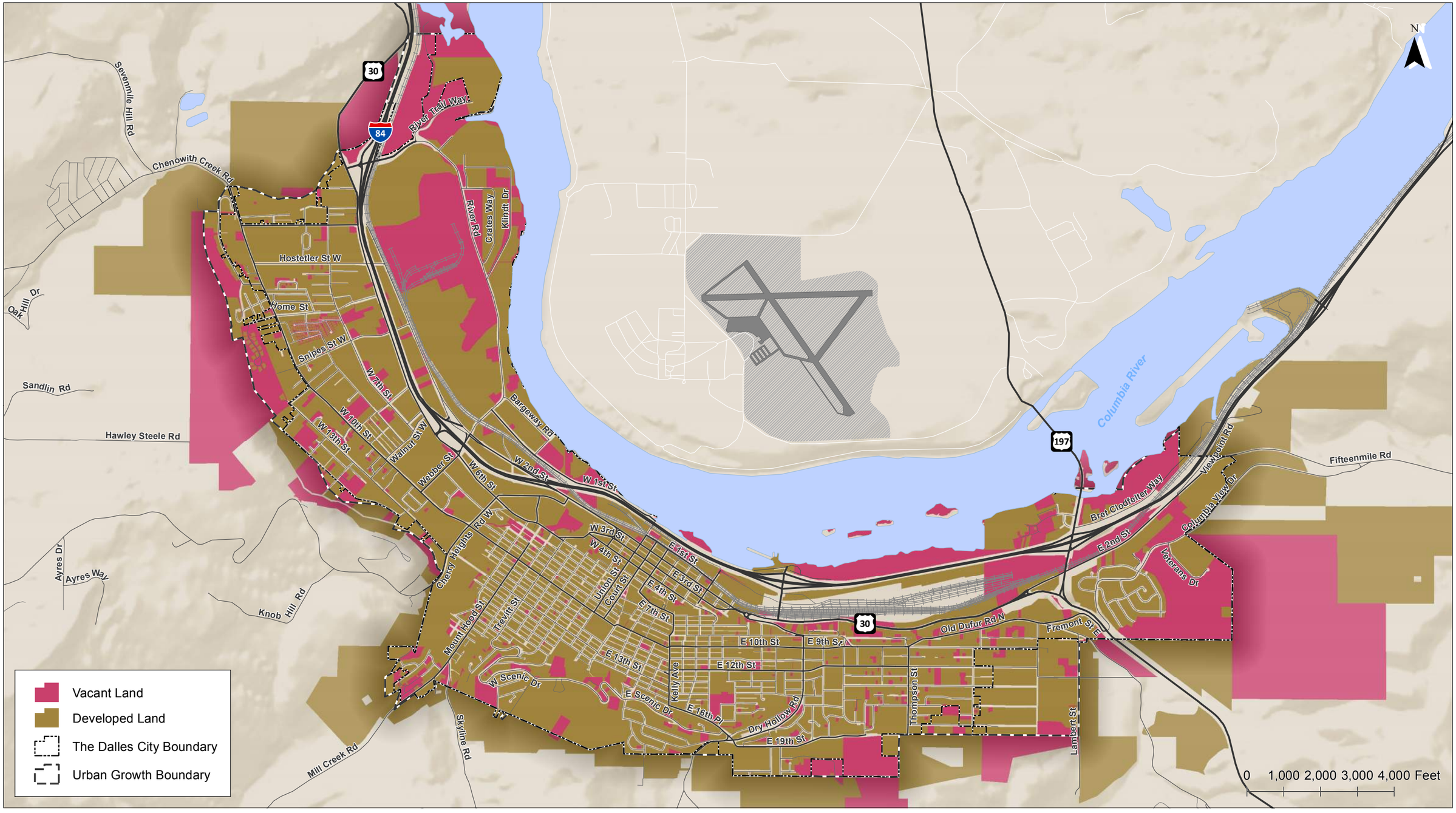

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Vacant & Developed Land
The Dalles, Oregon

Figure
3-3

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

Vacant industrial land is predominantly located in the Chenoweth Industrial area, to the northwest. The Port of The Dalles is developing infrastructure to serve vacant industrial land in the Chenoweth industrial area, creating "shovel-ready" sites for future tenants in the Columbia Gorge Industrial Center (refer to Exhibit 3-1 and Exhibit 3-2). As of fall 2015, 26 shovel-ready sites were available in The Columbia Gorge Industrial Center. The vacant Recreational Commercial and General Commercial zoned land is located in the northeastern area of the UGB, concentrated near The Dalles Bridge.

Exhibit 3-1. Roadway Infrastructure Within the Columbia Gorge Industrial Center (as of 9/17/15)

Exhibit 3-2. Aerial Photo of the Columbia Gorge Industrial Center (Source: John Fulton)

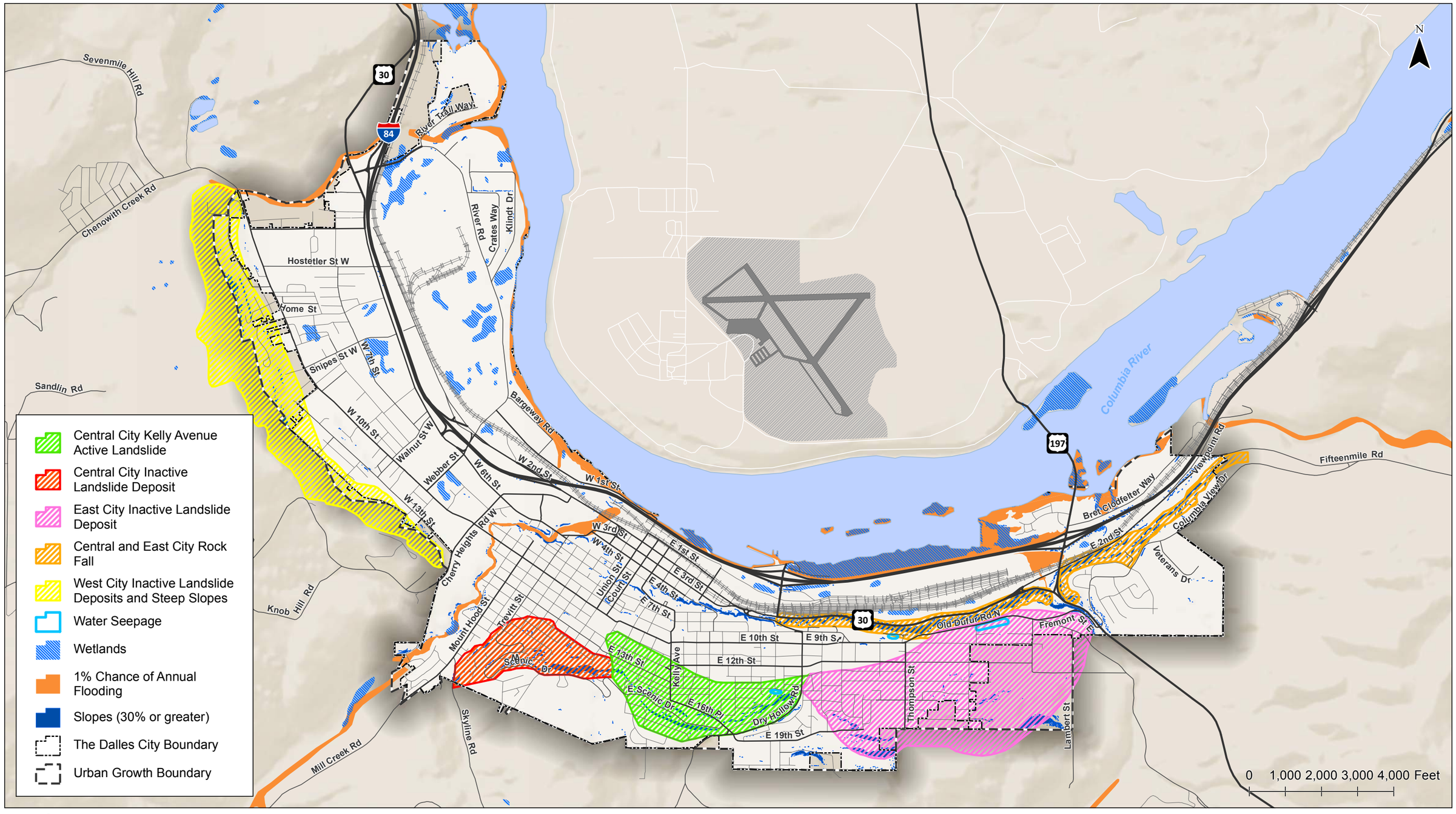
Natural Resources & Hazards

Figure 3-4 provides the general location of geologic hazards, steep slopes, wetlands and floodplains within The Dalles UGB that will limit development opportunities.

Wetlands

Wetlands identified in Figure 3-4 are based on data provided by the City of The Dalles. Wetlands are typically small and not concentrated in specific locations within the UGB. The exception is the largest wetland area, which is located between I-84 and the Columbia River on vacant land and zoned as Parks and Open Space. Detailed delineation reports for this area have been prepared by private property owners and The Port. These reports delineate areas that could be designated to mitigate wetland impacts associated with development of larger contiguous parcels.

The City of The Dalles shares a significant portion of its boundary with the Columbia River, an area that is subject to a 1% chance of annual flooding. Areas within floodplains zones, as identified in the Flood Insurance Rate Maps (FIRMS) by FEMA, are subject to LUDO Chapter 8.030 – Flood Control Provision, which contains specific development criteria for physical improvements in the overlay. Underlying land use zones adjacent to the river are primarily Industrial, with General and Recreational Commercial zones near The Dalles Bridge. All of the land zoned Parks and Open Space and adjacent to the river is identified as being within the Floodway zones.



Environmental Constraints: Geologic Hazards, Steep Slopes, Wetlands, & Floodplains
The Dalles, Oregon

Figure **3-4**

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APG

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

Three smaller river bodies travel through the City before connecting with the Columbia River, providing additional areas subject to 1-percent chance of annual flooding. Chenoweth Creek is located near the northern portion of The Dalles, travelling primarily near or through properties zoned Medium Density Residential, Recreational Commercial, and Industrial. Mill Creek is centrally located within the City, travelling primarily near properties zoned Low and Medium Residential, General Commercial, Central Business Commercial, and Parks and Open Space. Three Mile Creek is in the eastern portion of The Dalles and parallels US 197 until the US 30 junction, at which point it travels west of the Lone Pine development.

Hazards

The City of The Dalles identifies six geologic hazard zones within the UGB that make the ground potentially unstable, as depicted in Figure 3-4. Provisions for geologic hazard areas, found in LUDO Chapter 8.040, apply to all new development including, but not limited to, transportation facilities. All geologic hazard areas feature lands with slopes of 30 degrees or more. The majority of geologic hazard areas are located near the southern portion of the UGB in Medium and Low Density Residential areas. The exception is a geologic hazard area that exists on US 30 (Mosier-The Dalles Hwy/E. 2nd Street), generally located between Brewery Overpass Rd and US 197.

Activity Centers

It is important to provide safe and efficient multimodal connections to and between major activity centers in the community. The activity centers found in The Dalles include a variety of civic, educational, health, and recreational uses. As seen in Figure 3-5, activity centers are generally clustered around downtown and near arterials. Some prominent destinations outside of downtown include the community college and hospital, located near the southern portion of the UGB and outside of the geologic hazard areas. Key attractors in The Dalles are shown in Figure 3-5 and include:

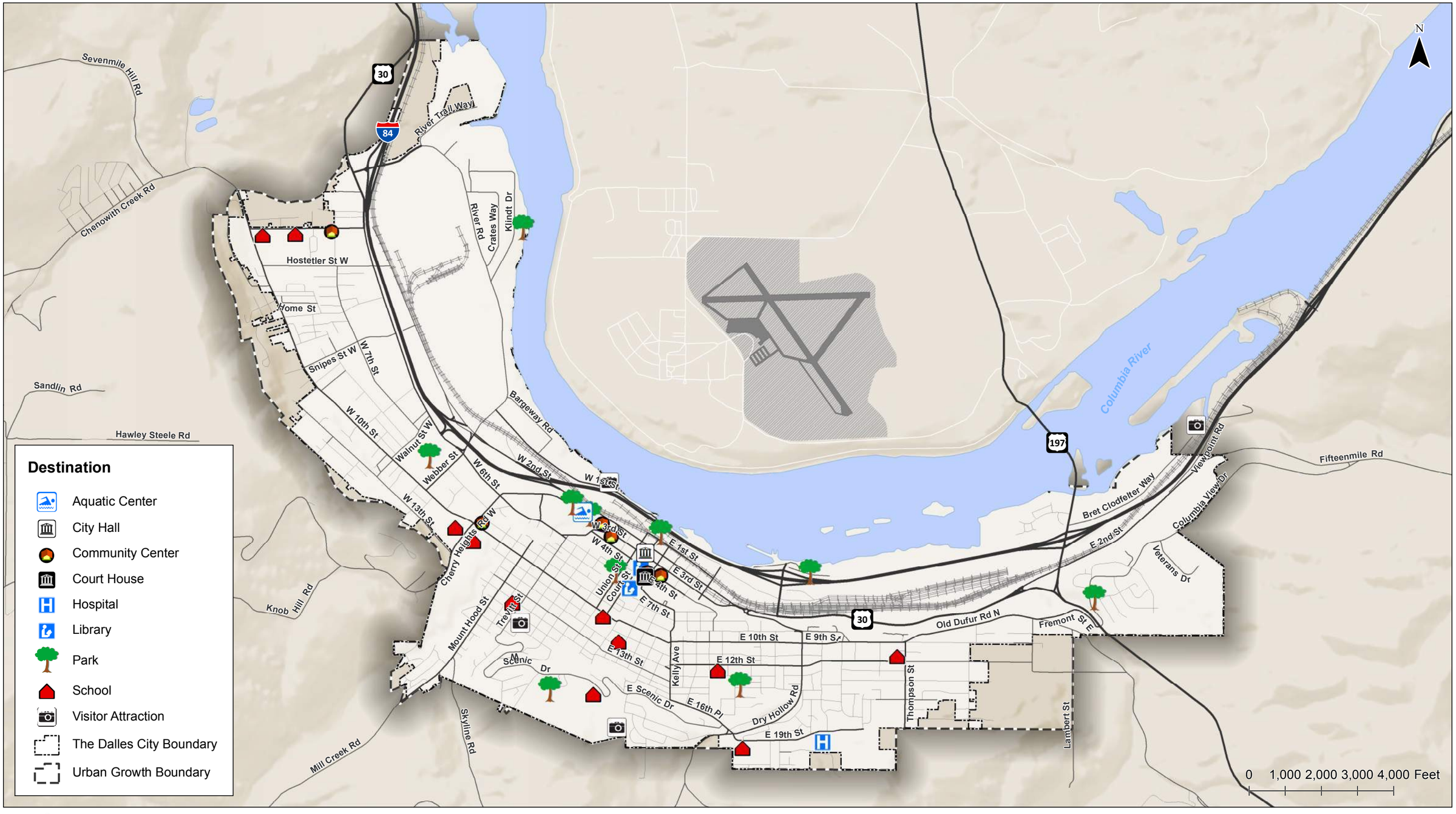
Exhibit 3-3. The Columbia Gorge Discovery Center and Museum (Source: www.gorgediscovery.org)

- Schools –North Wasco County School District operates three elementary, one middle-school, one high-school, and one community school in The Dalles. There are also three private academies and Columbia Gorge Community College.
- Parks and Recreation – Developed and undeveloped parks within The Dalles include an aquatic center, Sorosis Park, and two riverfront parks (Kiwanis Park and Riverfront Park).

- Downtown – The Dalles' downtown area includes most of the civic uses within the City, including the Wasco County Court House, The Dalles City Hall, Civic Auditorium, and Art Center, two libraries, and a museum.
- Shopping – In addition to Downtown, shopping centers such as Safeway, Fred Meyer, Grocery Outlet, Cascade Square, BiMart, and Kmart were identified as high-interest areas. Most of these are located along W. 6th Street.
- Mid-Columbia Medical Center – The Mid-Columbia Medical Center is located away from the downtown area and major highways. Primary access is provided via a single arterial, E. 19th Street.
- Lone Pine – The Lone Pine region is located on the eastern end of The Dalles, to the north of the I-84 and SR 197 interchange. Lone Pine contains shopping, residential development, medical areas, and hotels.
- Columbia Gorge Discovery Center & Museum - The official interpretive center for the Columbia River Gorge National Scenic Area is located in the northwest corner of The Dalles. Access is provided via US 30. (See Exhibit 3-3)
- The Dalles Dam Visitor Center – The U.S. Army Corps of Engineers operates a visitor center and offers tours of The Dalles Dam daily from Memorial Day through Labor Day. Access is provided via Bret Clodfelter Way.

Exhibit 3-4. The Fort Dalles Museum (Source: Google Maps user Mahalofreddy)

- Fort Dalles Readiness Center is located adjacent to the Columbia Gorge Community College campus and provides a venue for various public events.
- Fort Dalles Museum is located on Garrison Street, between W 15th and 16th Streets. (See Exhibit 3-4)
- The Dalles Marina and Columbia River Commercial Dock – two cruise ships regularly dock at the Columbia River Commercial dock, located on W 1st Street near Downtown. On days where both ships service The Dalles simultaneously, the smaller ship docks at The Dalles Marina. The smaller ship provides transportation options for the Gorge Discovery Center and Maryhill Museum, but passengers are otherwise left to walk from the Marina to downtown, which is one mile away along an unlit trail.



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Destinations
The Dalles, Oregon

Figure
3-5

Oregon Department of Transportation

KITTELSON & ASSOCIATES, INC. TRANSPORTATION ENGINEERING/PLANNING

APG

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

Street Network

The street network is the backbone of the transportation system in the City of The Dalles. Motor vehicle, bicycle, pedestrian, transit, and freight transportation all rely on the street network to some degree. The street network also provides motor vehicle, bicycle, pedestrian, and transit access to air and rail facilities. The following section describes the street network's jurisdiction and characteristics.

Jurisdiction

Streets within The Dalles are owned and maintained by three separate jurisdictions, including the Oregon Department of Transportation (ODOT), Wasco County and the City of The Dalles. All Wasco County roads within The Dalles City Limits are expected to be transferred to The City of The Dalles in 2016. Each jurisdiction is responsible for determining the street's functional classifications, defining its major design and multimodal features, and approving construction and access permits. Coordination is required among the jurisdictions to ensure that the streets are planned, operated, maintained, and improved to safely meet public needs.

State Highways

ODOT owns the following highways within The Dalles:

- Interstate 84 (I-84) is a four-lane, limited access facility that connects The Dalles to Portland, located 85 miles to the west, and then passes through Idaho and Utah to the east. There are currently six interchanges with I-84 in The Dalles. These interchanges connect at several points along old US 30 and at US 197 where it crosses into Washington.
- US 197 (Highway 197) is a two-lane highway that connects to US 97 and Bend located 132 miles to the south. It extends northward into Washington, terminating at State Route 14.
- US 30 (Historic Columbia River Highway) is a two-lane scenic highway connecting Troutdale and The Dalles.
- US 30 (The Dalles-Mosier Highway) is a two- lane highway that connects US 197 to Brewery Overpass Road within The Dalles.

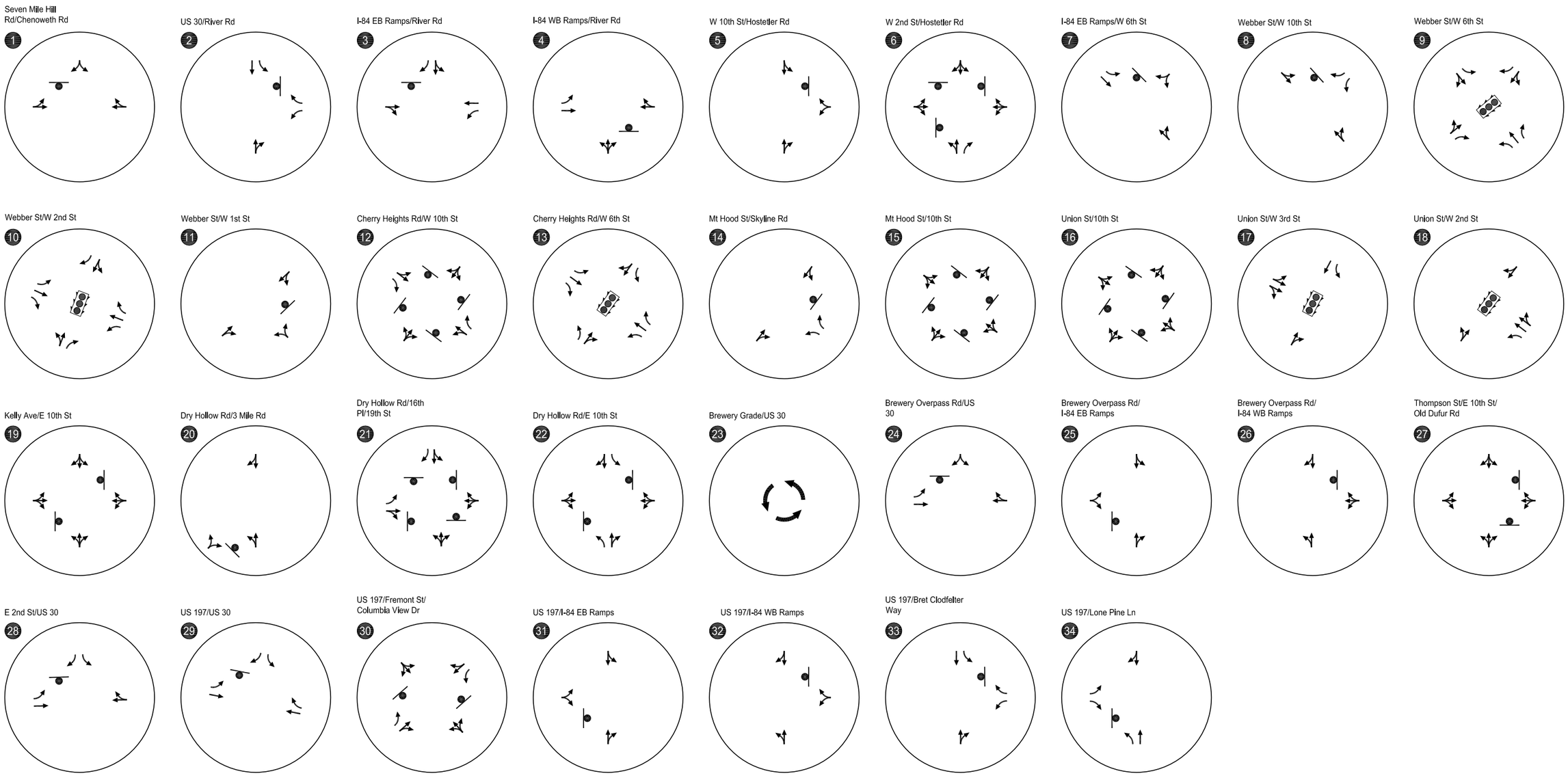
Non-State Roads

Non-state streets are maintained by the City, County, or private property owners. Local residential roads are maintained and operated by the City. Public access roads are under the City's jurisdiction but maintained by adjacent property owners. Roadway names and lengths obtained from the City and Wasco County GIS are summarized in Technical Appendix 3.

Roadway Characteristics

Existing Intersection Traffic Control and Lane Configurations

Of the 34 study intersections, four are signalized, five are two-way stop controlled, and four are all-way stop controlled. Figure 3-6 illustrates existing traffic control devices and lane configurations at the study intersections.



- Study Intersections

- STOP SIGN
- TRAFFIC SIGNAL
- ROUNDABOUT

Existing Lane Configurations & Traffic Control Devices The Dalles, Oregon

Figure 3-6

National Highway System Facilities

The National Highway System (NHS) consists of roadways that provide important connections for the nation's economy, defense, and mobility. NHS roadways can be interstates, other principal arterials, highways that are a part of the Strategic Highway Network (STRAHNET[2]), major connectors of the STRAHNET, and intermodal connectors. Interstate-84 is the only designated NHS Highway in The Dalles.

On-Street Parking Locations

On-street parking is provided on the majority of the streets within the downtown area and the residential areas south of downtown. Within downtown, parallel on-street parking is provided on the E 2nd Street and E 3rd Street couplet. In addition, a mix of parallel and angle parking is available on cross streets.

The local business community has experimented with a parklet on E 2nd Street between Laughlin and Federal Street. The parklet expands the sidewalk into one or more on-street parking spaces to create people-oriented places, as shown in Exhibit 3-5.

Exhibit 3-5. Existing Parklet on E 2nd Street between Laughlin and Federal Street

Pavement Type and Conditions

The majority of public roads in The Dalles are paved. The City implements a Pavement Condition Rating program utilizing the subjective Good-Fair-Poor (GFP) Rating Method. Existing pavement conditions for City roadways, based on 2013 inventory data, are shown in Figure 3-7.

[2] This is a network of highways which are important to the United States' strategic defense policy and which provide defense access, continuity and emergency capabilities for defense purposes.

ODOT conducts pavement condition surveys biennially on state-maintained roadways. It employs two separate and distinct pavement rating procedures. For I-84, the only NHS road in The Dalles, ODOT collects detailed data on pavement surface distress types, severity, and quantities. For non-NHS highways, the subjective Good-Fair-Poor (GFP) Rating Method is used, which relies on visual inspection of pavement surface and is rated from 1.0 to 5.0 based on the ride quality and surface distresses. The indexes resulting from both methodologies are then categorized into five conditions: "Very Good", "Good", "Fair", "Poor" and "Very Poor." Existing pavement conditions for ODOT roadways, based on 2014 ODOT inventory data, are shown in Figure 3-7.

ODOT monitors pavement conditions through its Pavement Management System. The Pavement Management System is a set of tools or methods that can assist decision makers in finding cost-effective strategies for providing, evaluating, and maintaining pavements in a serviceable condition.

As shown in Exhibit 3-6, ODOT applies preventative maintenance to roadways with fair or better ratings, but roadways with poor ratings require major rehab or reconstruction.

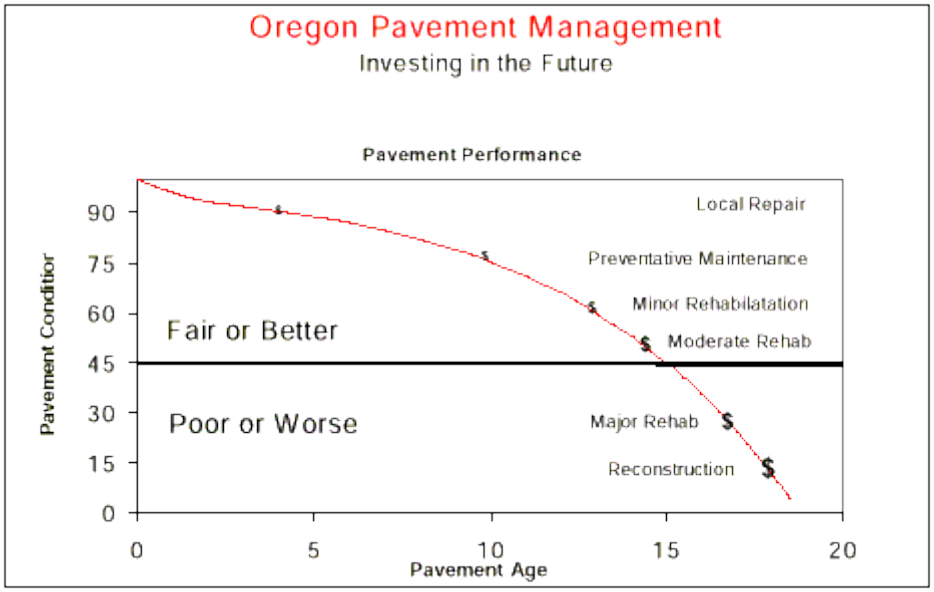
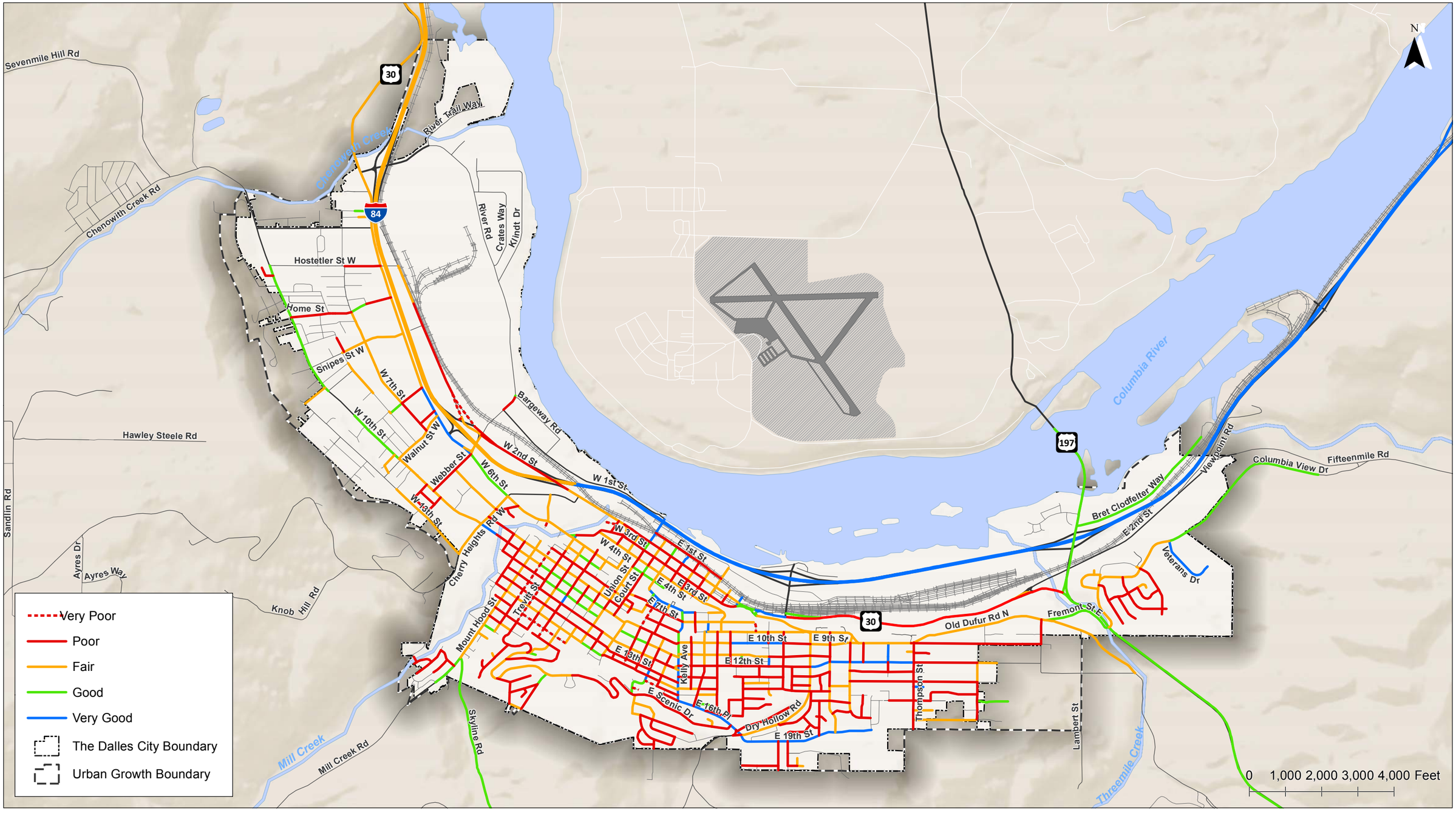


Exhibit 3-6. Oregon Pavement Management Strategy (Source: http://www.oregon.gov/odot/)

Based on the most recent survey data, US 30 from the Brewery Grade Overpass to US 197 and I-84 received a rating of "poor" within The Dalles. In 2015, ODOT repaved 3.8 miles of Interstate 84 from MP 84.3 (near the Union Pacific railroad overcrossing) to MP 88.1 (Fifteenmile Creek Bridge), to improve a section of pavement. The 2015-2018 Statewide Transportation Improvement Program (STIP) includes a project scheduled for 2016 to provide pavement overlay and median barrier replacement from I-84 milepoint 70.46 to 84.31.



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Existing Roadway Pavement Conditions
The Dalles, Oregon

Figure
3-7

Oregon Department of Transportation

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TRANSPORTATION ENGINEERING/PLANNING

APG

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County, The City of The Dalles, Oregon Department of Transportation
Sources: Esri, USGS, NOAA

Bicycle/Pedestrian Network

Provision of comprehensive pedestrian and bicycle facilities can enable people to walk and bike safely and efficiently between land uses. Within The Dalles, pedestrian and bicycle facilities primarily serve short trips to major attractors, such as schools, parks, and transit stops. However, bicycle travel can be a viable commuting option for The Dalles residents when supported by facilities such as bicycle lanes or paved shoulders, secure bicycle parking, work-place showers, and bus-mounted bicycle racks.

ODOT is currently in the process of updating the *Oregon Bicycle and Pedestrian Plan.* The Plan will provide a vision for the entire state system, including locally owned facilities, while defining the role of the State and ODOT. The Plan will inform decision making and guide investments strategies made through Transportation System Plans, Facility Plans, the Statewide Transportation Improvement Program and other programs, but will not include the identification of projects.

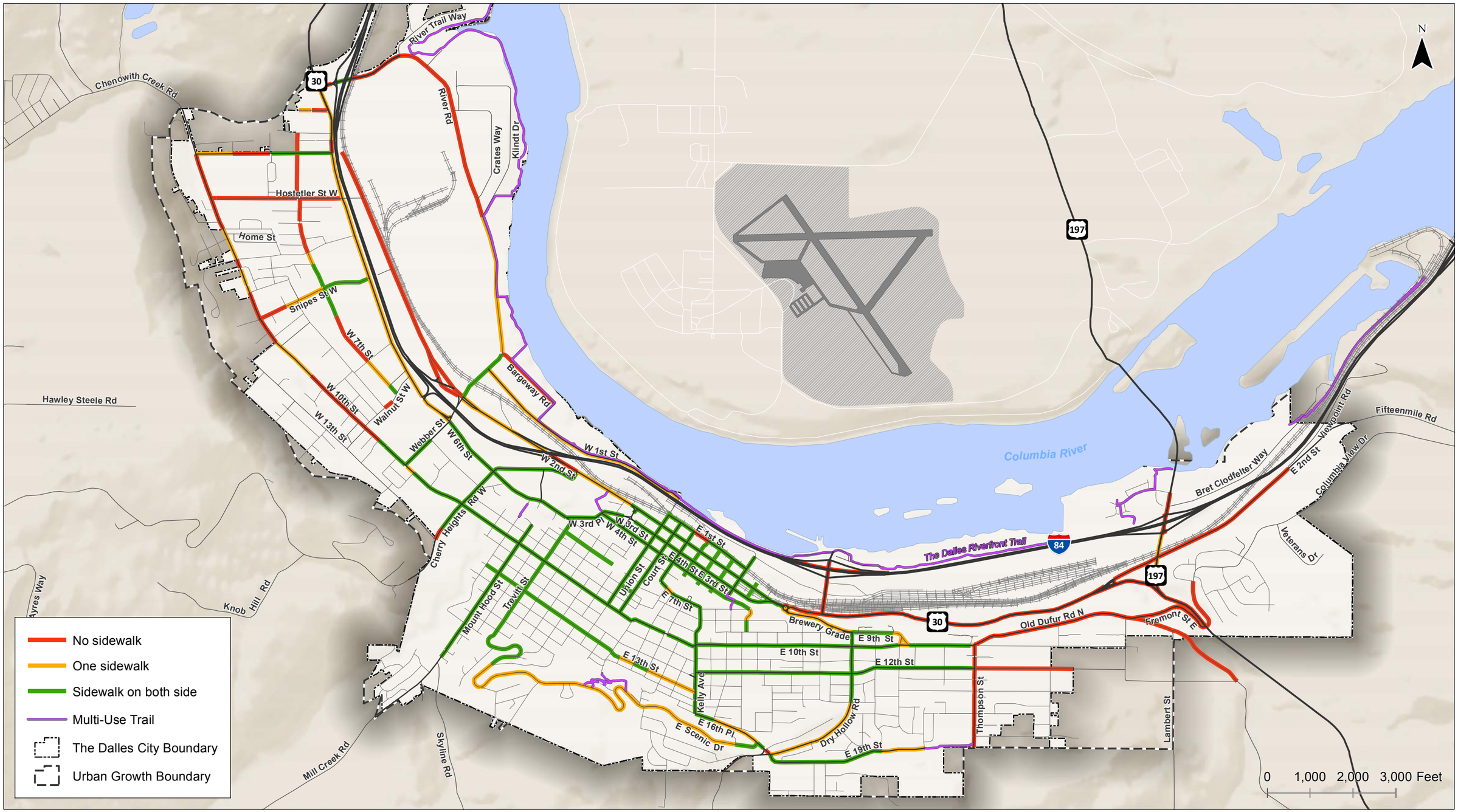
Pedestrian Facilities

Walking can also be a viable commuting option when supported by facilities such as sidewalks, shared-use paths, and trails - or when mixed-use developments give people the option to live near their work.

The *Oregon Bicycle and Pedestrian Design Guide* identifies two design treatments for accommodating pedestrians on roadways. These include:

> **Sidewalks** — Sidewalks are typically located along roadways, separated with a curb and/or planting strip or swale, and have a hard, smooth surface.
>
> **Shared-use Paths** — Paths are typically used by pedestrians, cyclists, skaters and joggers. Paths can be constructed with a variety of surface types, though materials that provide a relatively smooth and firm surface are typically required to comply with Americans with Disability Act (ADA) requirements.

Figure 3-8 illustrates the location and type of pedestrian facilities on The Dalles roadways. Generally, sidewalks are provided on both sides of the street throughout The Dalles Historic Downtown and the residential areas south of downtown. Areas to the northwest of Webber Street (south of I-84) and areas east of Thompson Street generally have the fewest pedestrian facilities. As shown in Figure 3-8, pedestrian facilities are particularly lacking along the 10th Street east-west arterial route.



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The Hub of the Pacific Northwest CITY OF THE DALLES OREGON

Existing Sidewalks and Shared-use Paths
The Dalles, Oregon

Figure **3-8**

Oregon Department of Transportation

KITTELSON & ASSOCIATES, INC. TRANSPORTATION ENGINEERING/PLANNING

APG

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

Bicycle Facilities

The *Oregon Bicycle and Pedestrian Design Guide* identifies four design treatments used to accommodate bicycle travel on roadways and one design treatment used to accommodate bicycle travel that is separated from the roadway. These design treatments are described below.

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). Generally, most collectors and some arterials in The Dalles carry less than 3,000 vehicles per day. Per the *Oregon Bicycle and Pedestrian Design Guide,* these roads could allow bicycle traffic to mix with automobile traffic.

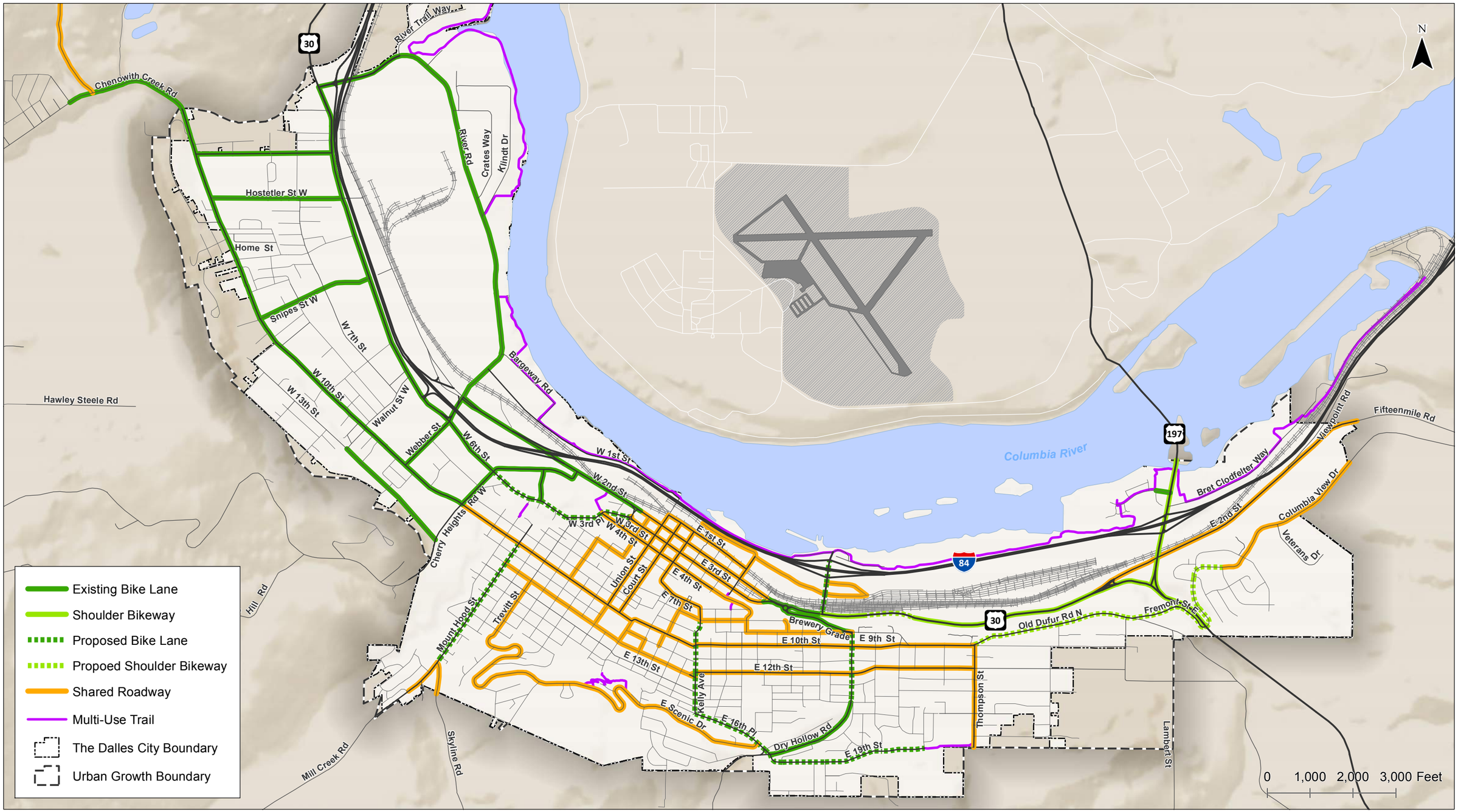
Bicycle Boulevard – The bicycle boulevard is a refinement of the shared roadway treatment. On bicycle boulevards, the typical operation of a local street is modified to function as a through street for bicyclist while maintaining local access for motor vehicles. Traffic calming devices reduce motor vehicle speeds and through trips and traffic controls limit the potential for conflicts between bicyclists and motorists.

Shoulder Bikeway — A shoulder bikeway is a paved shoulder that provides a suitable area for bicycling, reducing the potential for conflicts with motor vehicles. In The Dalles, this includes the roadways transitioning from urban to rural at the southern city limits.

Bike Lane — Some roadways dedicate a portion of the roadway for preferential use by bicyclists. Bike lanes are generally considered appropriate on urban arterials and major collectors where motor vehicle speeds are significantly higher than bicycle speeds. Bike lanes on local streets are appropriate where bicycle volumes are high, vehicle speeds are higher than 25 miles per hour, and/or poor sight distance exists. Bike lanes must always be well-marked to call attention to their preferential use by bicyclists.

Shared-Use Path — Shared-use paths are separated from the roadway by an open space or barrier. Shared-use paths are typically used by pedestrians and bicyclists as two-way facilities. Shared-use paths are appropriate in corridors with high traffic volumes not well served by the street system. Such paths can also be used to create pedestrian and bicycle short cuts and can serve as elements of a community recreational trail system.

The Dalles' bicycle facilities were inventoried using data from Wasco County's Geographic Information System (GIS) database, the current TSP, and visual inspection of facilities using Google Earth imagery. Figure 3-9 illustrates the location and type of bicycle facilities on City arterial and collector roadways.



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The Hub of the Pacific Northwest
CITY OF THE DALLES
OREGON

Oregon Department of Transportation

KITTELSON & ASSOCIATES, INC.
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Existing Bike Facilities
The Dalles, Oregon

Figure
3-9

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

Riverfront Trail

The Riverfront Trail is a shared-use, paved trail that parallels the south bank of the Columbia River. Much of the Trail is ADA-accessible. When complete, the Riverfront Trail will span ten miles between The Discovery Center to the northwest and The Dalles Dam Visitor Center at the eastern terminus. Currently, there are missing segments of the trail just west of the Lone Pine Development, and east of US 197 to The Dalles Dam. The asphalt-paved trail is 8- to 12-feet wide, offering an attraction for bicyclists, walkers with dogs or strollers, joggers, and many others. The majority of the Riverfront Trail is ADA accessible.

Restrooms are available along the trail (the Pocket Park and The Dalles Dam Visitor Center) and the trail provides easy access to downtown and numerous benches. In the summer, kayak and bike rentals are available at The Kayak Shack in Riverfront Park, at the 6.5-mile point.

The Riverfront Trail has multiple access points within the first six miles between The Discovery Center and Riverfront Park. There are no access points between the Riverfront Park and the Lone Pine residential development, as the trail runs between I-84 and the Columbia River.

Other Shared-use Paths and Trails

Additional shared-use paths running north-south could provide a comprehensive (off-street) network for recreational and commuter use.

The 2005 TSP proposed two shared-use paths that follow Mill Creek and Chenoweth Creek. The path along the west bank of Mill Creek would connect with the street system at the Cherry Heights Road/13th Street intersection. The path along Chenowith Creek would run along the creek from W 10th Street to the Riverfront Trail, including an at-grade crossing of US 30 (Historic Columbia River Highway) and an undercrossing of I-84. Neither of these paths is currently available or funded for construction.

Public Transit Services Inventory

A new transit center, operated by the Mid-Columbia Council of Governments (MCCOG), was constructed at West 7th Street, near the Chenoweth interchange. The transit center hosts service provided by Columbia Area Transit, MCCOG's Link, and Greyhound.

The Dalles is currently served by several transit services providing inter-city service. There is also currently demand-responsive service available in The Dalles, but there is no fixed-route transit service within The Dalles. The following transit services are available in The Dalles or nearby communities:

- CAT: Hood River/The Dalles Fixed-Route Service
- CAT/LINK: Hood River/The Dalles/Portland Fixed-Route Service
- LINK Dial-A-Ride & Shopping Bus

- Greyhound
- Amtrak

The following provides an overview of each of the available transit services.

Columbia Area Transit – Hood River/The Dalles

The Hood River County Transportation District operates CAT, the fixed-route service connecting Hood River and The Dalles. The bus runs three trips daily, Monday through Friday, in each direction. Buses serve the Columbia Gorge Community College and the transit center in The Dalles. In Hood River, buses serve Rosauer's Market, Providence Hood River Memorial Hospital, Wal-Mart, and the Hood River Hotel. Fares are currently $3.00 each way, with discounted rates for seniors and persons with disabilities and free rides for children aged 0-6 years old.

It should be noted that the feasibility of "Upper Valley" transit service between Hood River, Odell, and Parkdale is being assessed and may increase demand for travel from The Dalles to Hood River as it would provide access to additional destinations. Federal Lands Access Program (FLAP) grant applications are also pending for a Portland-Hood River-Timberline connection. This service would also serve Mount Hood Meadows and connect with the Mount Hood Express transit service that operates between Timberline and Portland four times per day, seven days per week. The availability of this service is also likely to greatly increase demand between The Dalles and Hood River.

Columbia Area Transit & LINK – Hood River/The Dalles/Portland

CAT and LINK provide fixed-route service connecting Hood River, The Dalles, and Portland on Tuesday and Thursday each week. The feasibility of a third day of service is being assessed. The bus departs the transit center in The Dalles in the morning and returns from TriMet's Gateway MAX light rail/bus transit station in Portland during the afternoon, with a stop in Hood River each way. Fares are $8.00 each way, with discounted rates for seniors and persons with disabilities and free rides for children aged 0-6 years old.

LINK Dial-a-Ride

The Mid-Columbia Council of Governments (MCCOG) provides door-to-door transportation services throughout Wasco County. The trips are scheduled in advance and may serve several passengers with different destinations at once. LINK offers lift-equipped buses. LINK service operating hours are 8:00 AM to 5:00 PM, Monday through Friday, closed on federal holidays. Fares range from $1.50 (within the City of The Dalles) up to $5.00 (originating or ending outside of The Dalles) per trip.

LINK also provides a "Shopper Shuttle" bus on Mondays and Wednesdays, 10 AM to 12 PM. The $3.00 fare provides unlimited stops to access Bi-Mart, K-Mart, Grocery Outlet, St. Vincent Thrift Store, Downtown, Safeway, and Fred Meyer. LINK drivers are available to help load and unload bags. Reservations are required.

A new transit center operated by the MCCOG opened this year on West 7th Street, near the Chenoweth interchange. The transit center serves as a stop location for CAT's service to Hood River and Portland, LINK resources, and Greyhound operations.

Greyhound

Greyhound service provides three trips daily between The Dalles, Hood River, and Portland. However, a day trip to Portland would require a trip from The Dalles to depart at 3:30 AM, 2:40 PM, or 4:25 PM, and depart Portland at 10:00 AM, 12:10 PM, or 11:00 PM. Roundtrip fare prices range from $48 to $75, posing a barrier for low-income populations.

Amtrak

Although a ticket office is not provided in The Dalles, Amtrak Thruway provides bus transportation from The Dalles (201 E Federal Street) to the nearest full service station (Portland). This service operates seven days a week, one bus in the morning, one in the afternoon and one in the evening. The nearest Amtrak station is in Wishram, Washington. This station is served by Amtrak's Empire Builder route, connecting Seattle and Portland to cities across the northern United States and ending in Chicago. The Portland-bound train departs at 7:30 AM daily and arrives in Portland at 10:10 AM, with lowest amenity roundtrip fares near $46. The Spokane-bound train departs at 6:55 PM daily and arrives in Spokane at 12:13 AM, with lowest amenity roundtrip fares near $82. The Wishram station is located approximately 16 miles from The Dalles. Currently, there are no fixed-route transit connections nor does LINK dial-a-ride provide service between the station and The Dalles.

Bridges

ODOT maintains an inventory of bridge conditions within The Dalles. State, County, and City owned facilities are assigned a sufficiency rating based on inspections conducted at regular intervals, usually every two years. The sufficiency rating is a measure between 0 and 100 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 are given priority. The sufficiency rating is used to identify deficiencies, which may include structural issues or functional issues. For example, older bridges may be narrow and not designed to the same width or height clearance of today's standards. Therefore, a sufficiency rating does not necessarily indicate a structural issue as summarized below.

One bridge within The Dalles city limits and two within the Federal Aid Urban Boundary (outside of the city limits) have sufficiency ratings below 50.

- The Dalles City Limits
    - Structure 00464 - W 6th Street Bridge over Mill Creek (sufficiency rating 48.9). The bridge is open with posted weight restrictions. The bridge inspection report notes

that there is "very heavy truck traffic on this bridge and there is a need for additional load posting signs outside of this bridge to limit heavy trucks at this location."

- Federal Aid Urban Boundary
    - Structure 00506 – US 30 (Hwy 100) Bridge over Chenoweth Creek (sufficiency rating 38.2).
    - Structure 06635Q – US 197 Bridge over the Columbia River (sufficiency rating 33.4).

Technical Appendix 3 includes bridge ratings for 26 bridges and culverts within The Dalles from the ODOT Bridge Working Database, and 4 bridges within the Federal Aid Urban Boundary. All bridges, except those noted above, received acceptable ratings.

Rail Inventory

The Union Pacific Railroad (UP) provides freight service along the I-84 corridor, known as the east-west transcontinental route linking Oregon with the mid-west and beyond. Locally, the transcontinental route operates between Portland and Hinkle Rail Yard (near Hermiston, OR) along the southern bank of the Columbia River. Hinkle Rail Yard is a junction point, and the location of UP's primary carload classification yard in the Pacific Northwest. The route continues southeast from Hinkle to Granger, Wyoming and Ogden, Utah, connecting to UP's historic Central Corridor that links the San Francisco Bay Area of California with Salt Lake City, Utah; Omaha, Nebraska; and, Chicago, Illinois.

UP's network in Oregon is predominantly single track with passing sidings. Top inbound commodities include mixed freight handled in containers and trailers, recyclables/waste, fertilizers, soda ash and coal. Top outbound commodities were dominated by mixed freight handled in intermodal service, and lumber/building materials.

According to the *Oregon Rail Plan*, the Federal Railroad Administration (FRA) has established nine track classes, which set maximum speeds for freight and passenger trains, based on the track condition. UP track is maintained to FRA Class 1 conditions with no weight or dimensional restriction through The Dalles. In Oregon, Class 1 railroads have freight train speeds up to 60 mph and passenger speeds up to 79 mph. Within The Dalles, trains are restricted to 40 mph.

There are three at-grade crossings on major roads within the City, including: Webber Street, Union Street (See Exhibit 3-7), and Madison Street. At-grade crossings result in interaction between fixed-rail and other transportation system users. ODOT Rail regulates all public at-grade highway-railroad grade crossings in Oregon.

Exhibit 3-7. Existing At-Grade Rail Crossing of Union Street

All three crossings feature "Active Control" crossings that communicate the presence or approach of a train using measures such as flashing lights, bells, and/or a gate system. However, due to geometry and limited spacing between the railroad tracks and 1st Street, the City and ODOT have noted a few potential conflicts. At the rail crossing on Madison Street, ODOT rail has expressed concern that eastbound left-turn traffic from 1st Street do not have a physical crossing barrier in place. This is due to the fact that 1st Street parallels the railroad tracks and 1st Street intersects with Madison Street at the crossing. At the Union Street rail crossing, southbound traffic turning left onto 1st Street may create a queue across the railroad tracks during peak periods of vehicular traffic.

Air, Water, and Pipeline Inventories

Air

The Dalles is served by the Columbia Gorge Regional Airport, also known as The Dalles Airport. Table 3-3 summarizes the Columbia Gorge Regional Airport as described by the AirNav Airport Information Website.

Table 3-3. **Air Transportation Inventory**

Name	Use	Runway Dimension	Surface	# of Based Aircraft	Federal Aviation Administration (FAA) ID
Columbia Gorge Regional Airport	Public	5,097' x 100'	Asphalt	61	KDLS
		4,647' x 100'	Asphalt		

The *Oregon Aviation Plan* assigns all statewide public use airports to the following five categories:

- **Category 1: Commercial Service Airports** – Scheduled commercial service.
- **Category 2: Business or High Activity General Aviation Airports** – 30,000 or more annual operations (i.e., take-offs and landings), of which a minimum of 500 are business-related (turbine) aircraft. Business-use heliports are also included in this category.

- **Category 3 – Regional General Aviation Airports** – Generally less than 30,000 annual operations and geographically significant location with multiple communities in the service area.
- **Category 4: Community General Aviation Airports** – 2,500 or more annual operations, or more than ten based aircraft.
- **Category 5: Low Activity General Aviation Airports** – Less than 2,500 annual operations and no more than ten based aircraft.

The Columbia Gorge Regional Airport is a Category 3 airport with two active runways on the airfield. The primary Runway 13-31 is 5,097 feet long and 100 feet wide and the secondary Runway 7-25 is 4,647 feet long by 100 feet wide.

The airport served 45 operations per day on average, with 59-percent of the operations transient general aviation, 29-percent local general aviation, 11-percent air taxi, and 5-percent military. Of the 61 aircraft based on the field, 60 are single-engine airplanes and 1 is a helicopter.

Water

The Columbia River serves as the northern boundary of The Dalles and provides a valuable resource to the City and the surrounding area. The river provides recreational opportunities and economic development opportunities such as the four private cruise lines that port at The Dalles Marine Terminal near the intersection of W 1st Street and Union Street. Cruises run from March to November each year and result in many passengers connecting to the pedestrian facilities in The Dalles or transferring to buses to visit local tourist destinations.

The Port of The Dalles Marina is located on the Columbia River at River Mile Post 190. The Marina provides space for 62 boathouses and approximately 30 open moorage positions that are leased on a monthly, 6-month or annual basis. A boat launch is located adjacent to the Marina to accommodate boat haul outs with trailers.

Pipeline and Transmission System

Northwest Natural Gas operates a major natural gas distribution line serving The Dalles. This distribution line extends southward from the main transmission line, which runs along the Washington side of the Columbia River Gorge. Northwest Pipeline Corporation operates the main transmission line.

Environmental Justice

Environmental Justice (EJ) populations are a special focus in transportation planning and project development. Identifying EJ populations early on is intended to make participation in transportation planning and project development more inclusive of diverse communities. The analysis is also valuable in identifying the transportation needs that will provide the most benefits to EJ populations. Five

population groups are considered for transportation impact susceptibility, representing those who may rely more heavily on public infrastructure or transit for access to day-to-day needs and jobs. They include minority groups, populations under 17 or over 64 years of age, low-income households, low-English proficiency households, and people with disabilities.

Demographic Summary

For EJ evaluation purposes, The Dalles has approximately 14,730 people living within the City limits according to 2013 American Community Survey (ACS) 5-Year Estimates.[4] The highest concentration of people is located in census block groups close together near the downtown area, with the highest density being close to 13 people per acre. Most of the population density outside of the central area of the City is relatively low, ranging between 2-3 people per acre, with a notable exception in the northwest area of the City of 4-5 people per acre. Population and population density are important considerations when evaluating and comparing EJ populations. For example, a census block group may have high percentage of a specific population, but there are relatively fewer people in the area altogether. Conversely, a census block group may have a large concentration of a specific population that may not be as prominently featured in EJ maps relative to the overall population in that area.

The make-up of specific EJ populations of The Dalles is shown in Exhibit 3-8.[5] Compared to the whole state of Oregon, The Dalles has a greater portion of people who are 65 or older (19%), 17 or younger (25%), or who are considered to be in poverty (43%). The Dalles has approximately 1% of low-English proficiency households, comparable to the State's figure of 3 percent.[6] The portion of population within The Dalles with disabilities is similar to State of Oregon (approximately 13% and 12% respectively).

[4] The US census is conducted once every 10 years to provide an official count of the entire U.S. population to Congress; the American Community Survey (ACS) is conducted every year to provide up-to-date information about the social and economic needs.

[5] EJ population analysis for The Dalles consists entirely of 2013 ACS 5-Year Estimates data. This is the most recent data available to perform analysis at the smallest possible geography (census block group).

[6] Care should be taken when evaluating available data for low-English households within The Dalles due to the small sample size and large margin of error. See the "Limited-English Proficiency" section in Appendix D for more details.

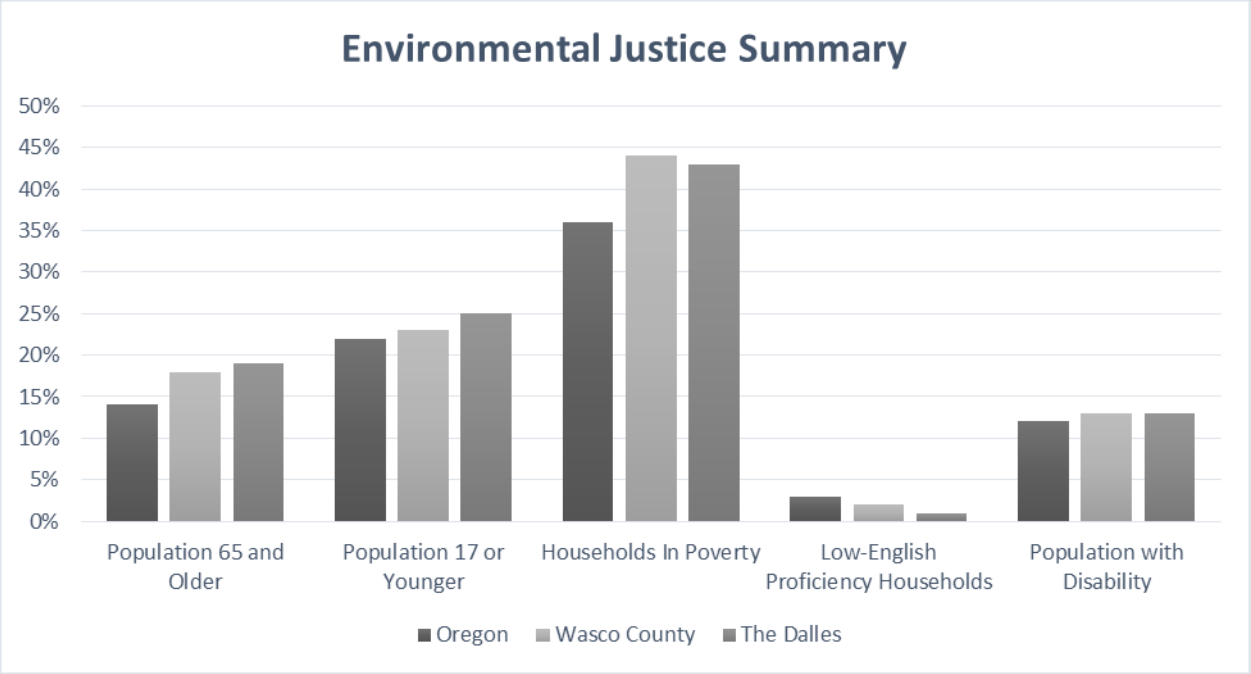


Exhibit 3-8. Environmental Justice Summary

Technical Appendix 3 includes maps and statistics summarizing minority populations, low-income populations, persons 65 years and older, persons 17 years and younger, limited-English proficiency, and persons with disabilities within The Dalles relative to Wasco County and Oregon.

EXISTING TRANSPORTATION SYSTEM OPERATIONS ANALYSIS

The existing transportation system operations analysis identifies how the study area's transportation system currently operates based on year 2015 traffic volumes. This analysis includes an evaluation of traffic operations at the study intersections, including non-motorized (pedestrian and bicycle) operations.

Kittelson & Associates, Inc. (KAI) staff visited and inventoried the study area in October 2015. At that time, KAI collected information on existing transportation system conditions along key roadway corridors and at the study intersections.

Traffic Counts

Traffic counts were conducted at the study intersections in April and June 2015. Counts were conducted on typical mid-week days over various time periods (24-hour, 16-hour, or 3-hour). All counts include the total number of pedestrians, bicyclists, and motor vehicles that entered the respective intersections in 15-minute intervals during the evening (2:00 to 6:00 p.m.) peak time period. The traffic counts were reviewed to determine the system-wide peak hour for the operational analysis. The counts were also seasonally adjusted to reflect 30th highest hour traffic volumes and balanced consistent with

the methodology provided in the ODOT Analysis Procedures Manual (APM). Figure 3-10 summarizes the traffic counts at the study intersections during the weekday p.m. peak hour. *The traffic count worksheets are included in Technical Appendix 3.*

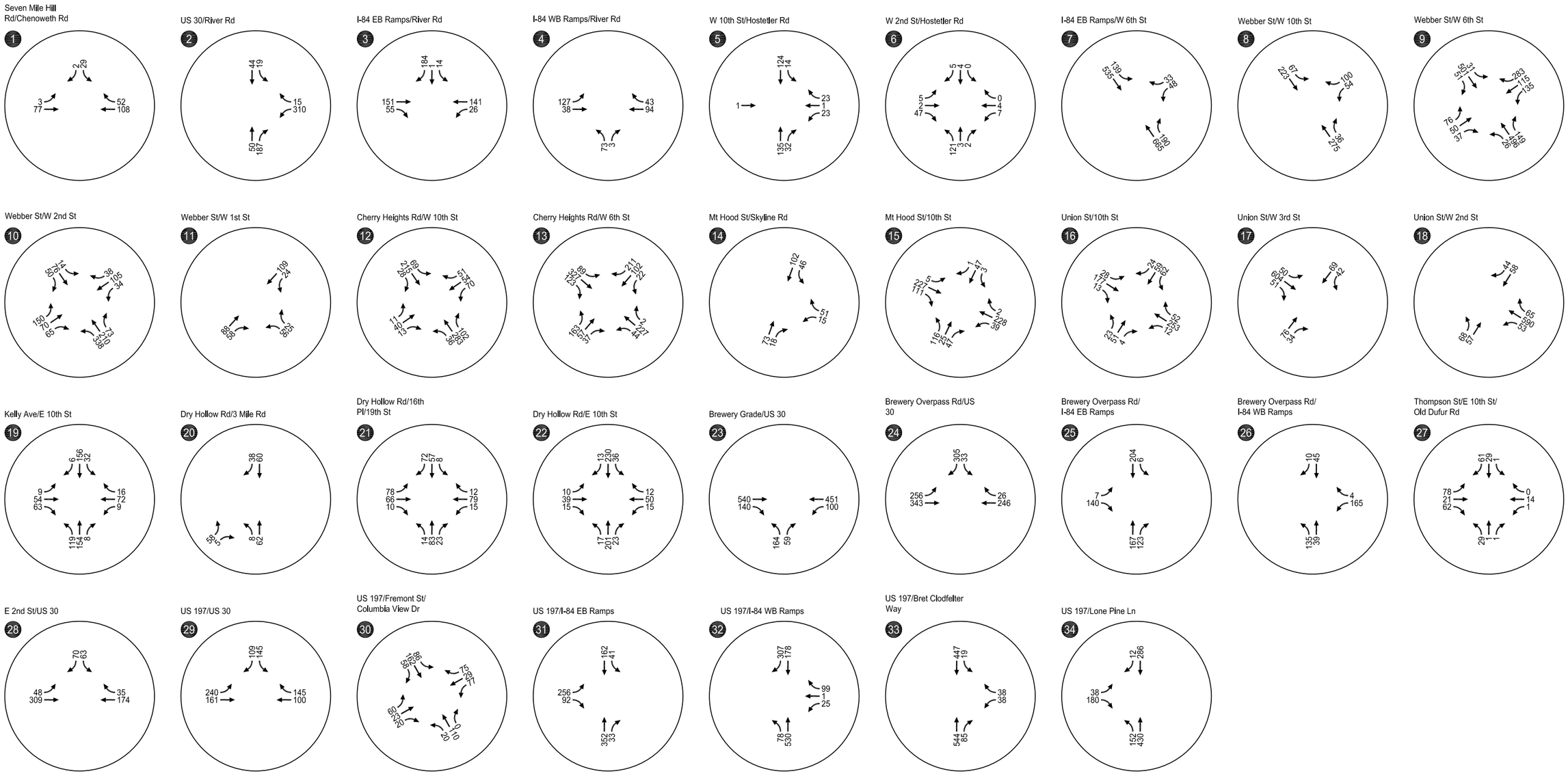
Analysis Methodology and Operational Standards

The intersection operations analysis was conducted using Synchro 8 software, which implements the methodologies outlined in the Highway Capacity Manual (HCM). Based on direction provided by the ODOT Transportation Planning and Analysis Unit (TPAU), the HCM 2000 methodology was used to analyze traffic operations at the signalized intersections while the HCM 2010 methodology was used to analyze traffic operations at the unsignalized intersections.

The intersection operations analysis results were compared to City of The Dalles and ODOT performance standards to identify potential areas for improvement. Performance standards from each agency apply at intersections where the agency has jurisdiction over at least one approaching roadway. The City defines intersection performance based on Level of Service, which correlates with delay. ODOT performance targets are based on volume/capacity (v/c) ratios, a comparative measure of the volume of traffic entering an intersection to the theoretical intersection capacity. By way of example, a v/c ratio of 1.0 indicates that an intersection is operating at capacity while a v/c ratio over 1.0 indicates that the intersection's capacity is exceeded.

The City and ODOT performance thresholds are summarized below.

- The City's current TSP establishes a Level-of-Service D standard, which correlates to a maximum delay of 55 seconds/vehicle at signalized intersections and 35 seconds/vehicle on the minor street approach at unsignalized intersections.
- Table 6 of the *Oregon Highway Plan* (OHP) provides maximum v/c ratios for all signalized and unsignalized intersections located outside the Portland Metro area. The standards vary based on the classification of the roadway (Statewide Highway, Districts Highway, etc.), designation (Freight Route, Expressway, etc.), and posted speed. The intersections subject to ODOT v/c targets within the study area are located along I-84, US 197 and US 30.



- Study Intersections

Existing Traffic Volumes Weekday PM Peak Hour The Dalles, Oregon

Figure 3-10

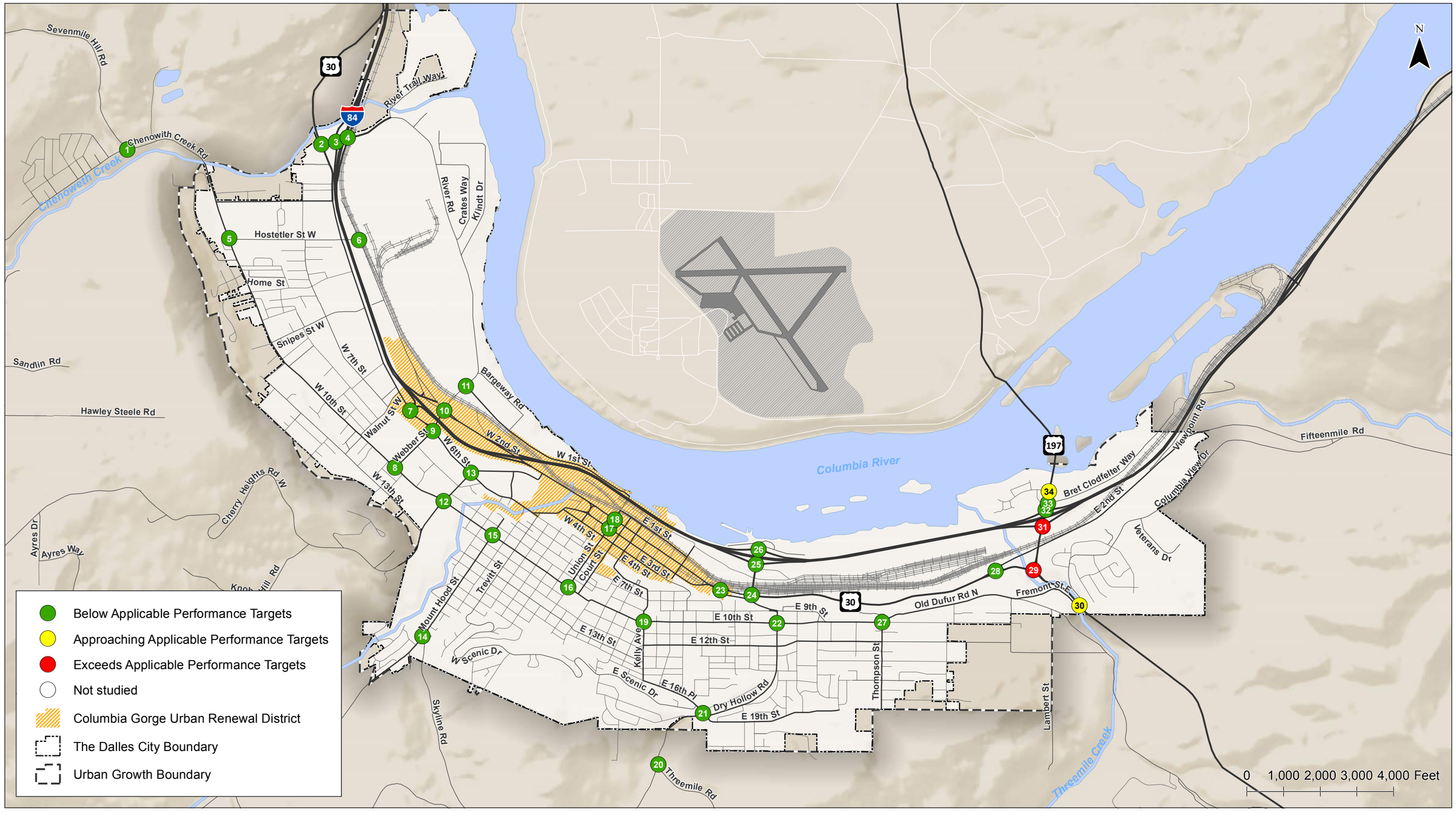
Intersection Operations

The City of The Dalles intersection operation standards are LOS of D for signalized and unsignalized intersections. ODOT operation standards were found according to Table 6 of the Oregon Highway Plan. The traffic volumes shown in Figure 3-10 were used to analyze traffic operations at the study intersections. Figure 3-11 and Table 3-4 summarize the results of the traffic operations analysis at the study intersections for the weekday p.m. peak hour. Figure 3-11 illustrates study intersections with yellow circles that are nearing the applicable performance thresholds (within 0.05 of the V/C target or LOS D). All other intersections are shown by green circles, indicating they are operating well below the applicable performance thresholds. *HCM Existing Traffic Condition worksheets are included in Technical Appendix 3.* Key findings include:

- All study intersections currently operate acceptably according to their respective performance thresholds.
- The US 197/I-84 EB Ramp intersection currently satisfies applicable ODOT v/c targets during the weekday p.m. peak hour. The intersection has a v/c ratio of 0.79 and is approaching the 0.80 v/c target.
- Two other intersections, I-84 EB Ramps/W 6th Street and US 197/Lone Pine Lane operate at LOS D under existing conditions, which indicates that as volumes grow they will likely exceed the City's performance thresholds.

Intersection Queues

A queuing analysis was conducted at the five signalized study intersections using Synchro 8 software. Table 3-5 summarizes the 95th percentile queues for turning movements with exclusive lanes during the weekday p.m. peak hour, rounded to the nearest 25 feet (approximately 1 vehicle length). The available storage lengths reflect the striped storage for each movement at the intersections.



\\kittelson.com\SH_Portland\proj\file\18495 - The Dalles TSP\gis\Draft TSP\3-11 Existing Traffic Conditions, Weekday PM Peak Hour.mxd - agriffin - 7:06 PM 6/8/2016

Existing Traffic Conditions
Weekday PM Peak Hour
The Dalles, Oregon

Figure **3-11**

Oregon Department of Transportation

Kittelson & Associates, Inc. Transportation Engineering/Planning

APG

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

Table 3-4. **Existing Intersection Operations – Weekday PM Peak Hour**

Map ID	Intersection	Level of Service (LOS)	Delay (Sec)	Volume/ Capacity (V/C)	Unsignalized Critical Movement	ODOT V/C Target	Meets Applicable Performance Thresholds?
1	Seven Mile Hill Rd/ Chenoweth Rd	B	10.1	0.05	SB	N/A	Yes
2	US 30/River Rd	B	12.7	0.43	WB	0.90	Yes
3	I-84 EB Ramps/River Rd	B	12.1	0.26	WBR/ SB	0.80	Yes
4	I-84 WB Ramps/River Rd	B	14.7	0.21	NB	0.80	Yes
5	W 10th St/Hostetler Rd	B	10.4	0.08	WB	N/A	Yes
6	W 2nd St/Hostetler Rd	B	11.6	0.02	WB	N/A	Yes
7	I-84 EB Ramps/W 6th St	D	25.2	0.33	WB	0.80	Yes
8	Webber St/W 10th St	C	16.0	0.15	WB	N/A	Yes
9	Webber St/W 6th St	B	15.7	0.77	Signalized	N/A	Yes
10	Webber St/W 2nd St	B	14.8	0.69	Signalized	N/A	Yes
11	Webber St/W 1st St	B	10.5	0.11	WB	N/A	Yes
12	Cherry Heights Rd/W 10th St	C	16.1	N/A	AWSC	N/A	Yes
13	Cherry Heights Rd/W 6th St	C	22.7	0.58	Signalized	N/A	Yes
14	Mt Hood St/Skyline Rd	B	10.5	0.06	NBR/ WB	N/A	Yes
15	Mt Hood St/10th Street	C	18.0	N/A	AWSC	N/A	Yes
16	Union St/10th	B	10.7	N/A	AWSC	N/A	Yes
17	Union St/W 3rd St	C	37.5	0.40	Signalized	N/A	Yes
18	Union St/W 2nd St	B	13.0	0.36	Signalized	N/A	Yes
19	Kelly Ave/E 10th St	C	19.7	0.27	WB/NB	N/A	Yes
20	Dry Hollow Rd/3 Mile Rd	A	9.8	0.08	NE	N/A	Yes
21	Dry Hollow Rd/16th Pl/19th St	A	8.5	N/A	AWSC	N/A	Yes
22	Dry Hollow Rd/E 10th St	C	15.3	0.19	WB	N/A	Yes
23	Brewery Grade/US 30	C	20.0	0.80	EB	0.90	Yes
24	Brewery Overpass Rd/US 30	B	13.5	0.49	SB	0.90	Yes
25	Brewery Overpass Rd/ I-84 EB Ramps	B	10.9	0.22	EB	0.80	Yes
26	Brewery Overpass Rd/ I-84 WB Ramps	B	13.3	0.31	WB	0.80	Yes
27	Thompson St/E 10th St/ Old Dufur Rd	B	10.3	0.81	NB	N/A	Yes
28	E 2nd St/US 30	B	10.1	0.09	WBL	0.90	Yes
29	US 197/US 30	D	33.7	0.57	SBL	0.85	Yes
30	US 197/Fremont St/Columbia View Dr	C	19.2	0.43	EBL/ WBL	0.85	Yes
31	US 197/I-84 EB Ramps	E	36.0	0.79	EB	0.80	Yes
32	US 197/I-84 WB Ramps	B	12.1	0.21	WB	0.80	Yes
33	US 197/Bret Clodfelter Wy	C	15.3	0.19	WB	0.85	Yes
34	US 197/Lone Pine Ln	D	27.5	0.27	EB	0.85	Yes

AWSC = All-way stop control, N/A = Not applicable

Table 3-5. **Existing Signalized 95th Percentile Queues – Weekday PM Peak Hour**

Map ID	Intersection	Movement	Weekday PM Queue (feet)	Available Storage (feet)	Adequate?
9	Webber St/W 6th St	EBL	25	250	Yes
		EBT	350	705	Yes
		WBL	25	150	Yes
		WBT	300	> 500	Yes
		WBR	50	175	Yes
		NBT	125	495	Yes
		NBR	25	175	Yes
		SBT	225	585	Yes
		SBR	100	60	No
10	Webber St/W 2nd St	EBL	25	125	Yes
		EBT	125	430	Yes
		WBL	200	425	Yes
		WBT	150	635	Yes
		WBR	25	425	Yes
		NBT	225	585	Yes
		NBR	50	25	No
		SBT	150	810	Yes
13	Cherry Heights Rd/W 6th St	EBL	100	100	Yes
		EBT	350	> 500	Yes
		EBR	50	> 500	Yes
		WBL	50	965	Yes
		WBT	250	965	Yes
		WBR	0	75	Yes
		NBL	150	100	No
		NBT	100	360	Yes
		SBL	50	225	Yes
		SBT*	325	> 500	No*
17	Union St/W 3rd St	EBT	275	365	Yes
		NBT	100	> 500	Yes
		SBL	75	45	No
		SBT	50	205	Yes
18	Union St/W 2nd St	WBL	50	40	No
		WBT	150	390	Yes
		NBT	75	205	Yes
		SBT	50	385	Yes

*The queues for the southbound through/right movement extend beyond the end of left-turn lane. The right-turn movement is higher than the through and left-turn movements combined.

As shown in Table 3-5, all of the signalized study intersections currently have one or more movements where the 95th percentile queues exceed the available storage for that movement. These intersections have the potential for queues to extend into the adjacent through lane and block traffic, with the exception of the southbound left-turn at the Union St/W 3rd St and westbound left-turn at the Union St/ W 2nd St intersections which have queues that can be accommodated, but extend beyond

the striped storage. The queues do not block the adjacent intersections. *The worksheets used to evaluate existing queuing at the signalized study intersections are included in Technical Appendix 3.*

Freeway Operations

Freeway operations analysis was conducted for the weekday p.m. peak hour at each merge and diverge location (on- and off-ramps) and each mainline segment of I-84 (no ramps). The analysis was based on HCM 2010 methodologies using HCS 2010 software. The analysis indicates that all segments of I-84 within The Dalles are operating at Level-of-Service A or B. The highest density of vehicles per mile per lane occurs in the eastbound direction at the 6th Street on-ramp and the mainline segment after the on-ramp.

A summary table of results and *worksheets used to evaluate existing freeway operations are included in Technical Appendix 3.*

Traffic Safety

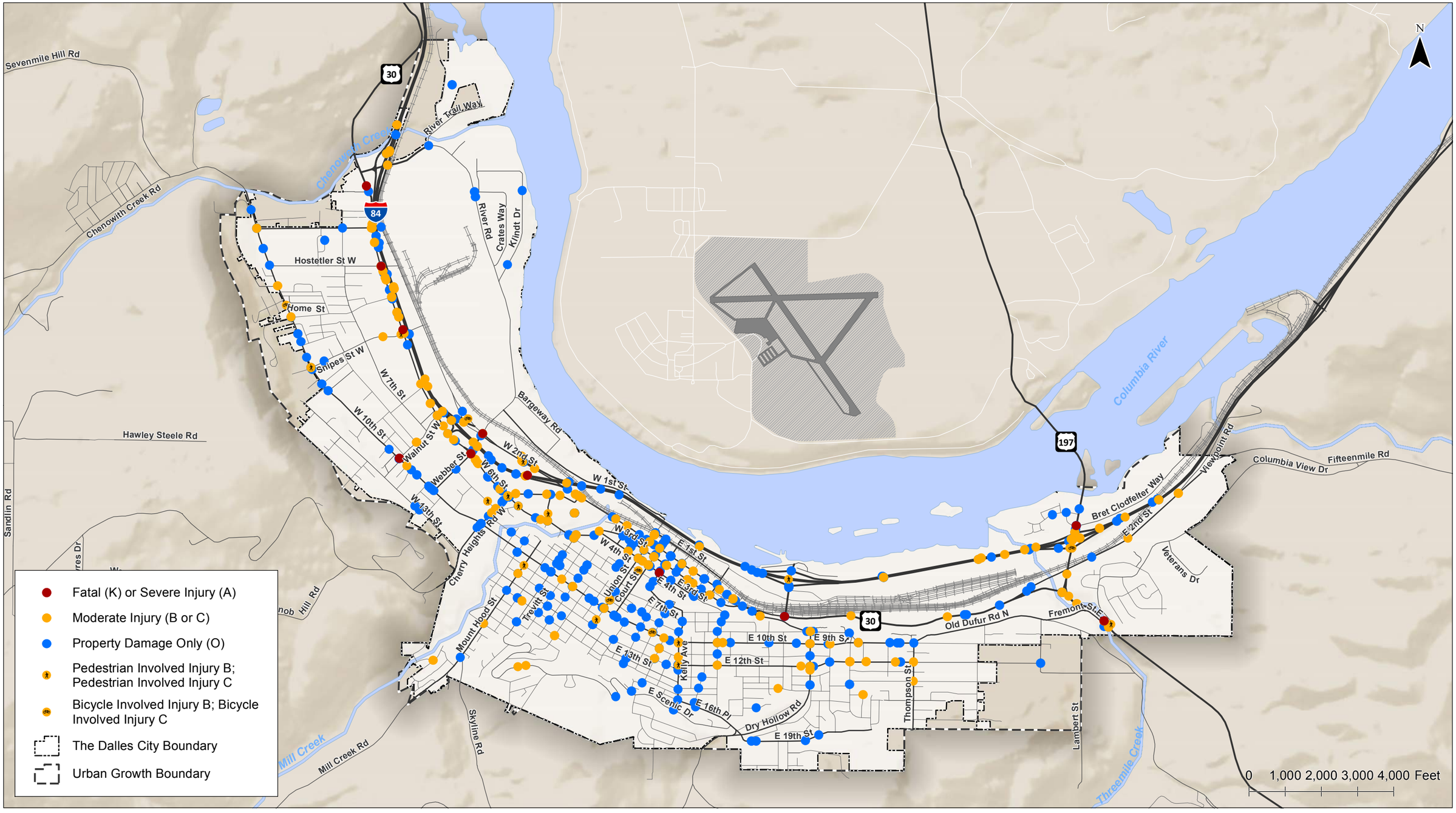
Reported crash data was analyzed at all study intersections in an effort to identify patterns and trends that may indicate an opportunity to reduce crash potential. The data was obtained from ODOT for the five-year period from January 1, 2010 through December 31, 2014. The data includes information about crash location, type, weather, roadway surface conditions, traffic control, and vehicle information. *A summary of the reported crashes by study intersection is provided in Technical Appendix 3.*

Figure 3-12 illustrates the location and severity of 709 reported crashes within the City over the five-year study period. The figure classifies crashes by severity and indicates whether a pedestrian or bicyclist was involved. Crash severity is defined using the KABCO injury-severity scale in the ODOT database. This scale was developed by the National Safety Council (NSC) and is frequently used by law enforcement for classifying injuries as:

- K – Fatal;
- A – Incapacitating injury;
- B – Non-incapacitating injury;
- C – Possible injury; and,
- O – No injury.

Current Federal legislation, Moving Ahead for Progress in the 21st Century Act (MAP-21), prioritizes funding for Fatal and Injury A crashes, shown in red, in Figure 3-12.

A fatal crash involving a train and a pedestrian was reported at the Union Street/1st Street intersection in 2015. Although outside of the study period, as defined above, this event will be reviewed to identify opportunities to reduce potential for similar events in the future.



\\kittelson.com\SH_Portland\proj\file\18495 - The Dalles TSP\gis\Draft\TSP\3-12 Reported Crash History, November 1, 2009 to October 31, 2014.mxd - agriffin - 7:09 PM 6/8/2016

Reported Crash History
January 1, 2010 to December 31, 2014
The Dalles, Oregon

Figure **3-12**

Oregon Department of Transportation

Kittelson & Associates, Inc. Transportation Engineering/Planning

APG

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA, Oregon Department of Transportation

Crash Type and Severity

Analysis of crash patterns is focused at study intersections, where the highest density of crashes exists. Figure 3-13 illustrates the frequency of crashes by study intersection. Table 3-6 summarizes the location, type, severity, and number of crashes that were reported at the study intersections.

Table 3-6 shows there are more angle and turning crashes than rear-end crashes at multiple intersections. Statewide ODOT research has shown that on average less than 45-percent of multiple vehicle crashes at 4-leg stop-controlled intersections or signals involve angle or turning movements.

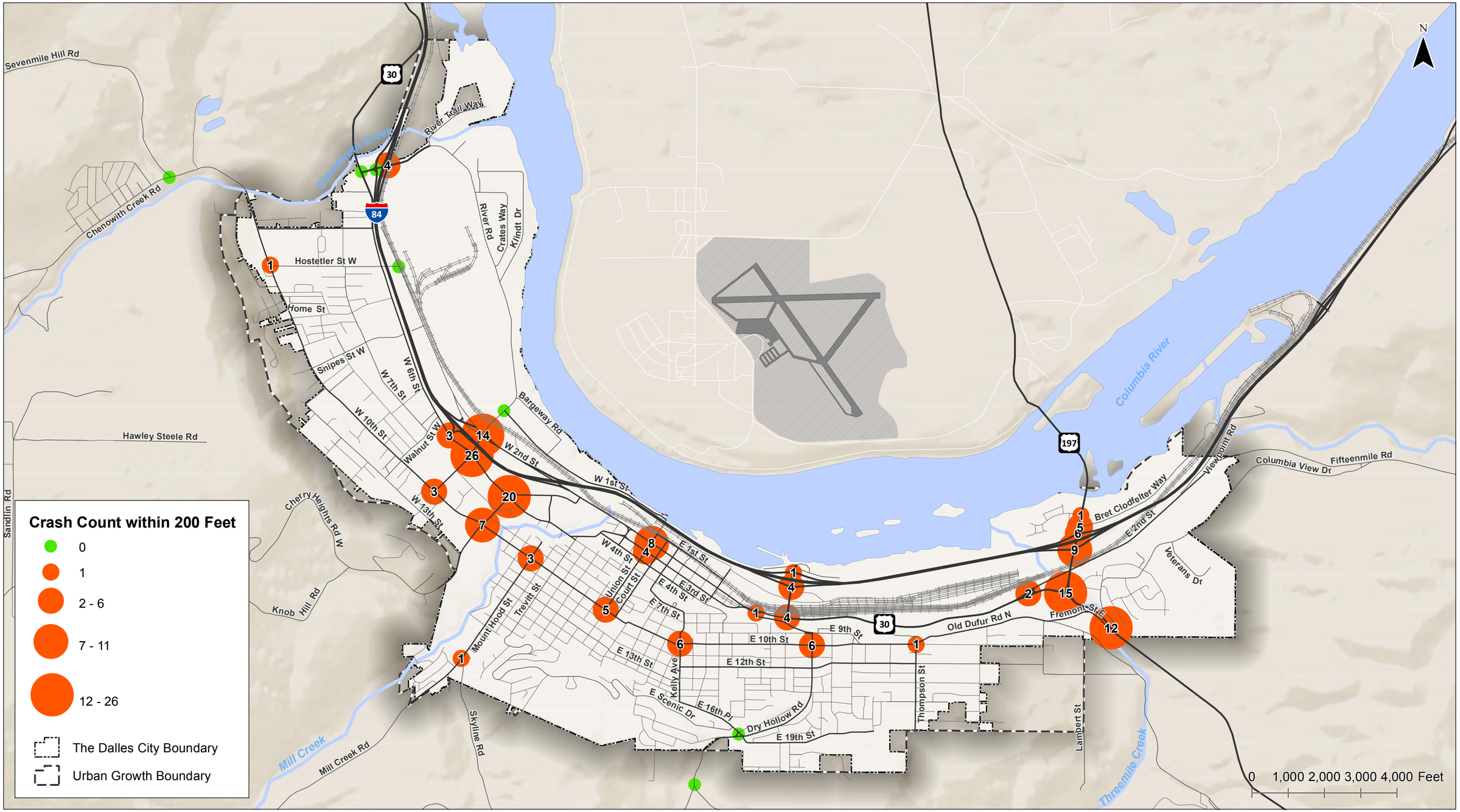
One signalized intersection and four stop-controlled intersections were identified as having over 50 percent of crashes from turning or angle collisions, including:

- #10 - Webber St/W 2nd St - A total of 14 crashes were reported at the intersection over the 5-year period, including 10 crashes caused by angle or turning movement. A majority of these crashes involve a northbound left-turn vehicle.
- #22 - Dry Hollow Road/E 10th Street - A total of 6 crashes were reported at the intersection over the 5-year period, all of them caused by angle or turning movement.
- #31 - US 197/I-84 EB Ramps - A total of 9 crashes were reported at the intersection over the 5-year period, including 6 caused by angle or turning movement. A majority of these crashes involve an eastbound left-turn from the I-84 ramp.
- #32 - US 197/I-84 WB Ramps - A total of 6 crashes were reported at this intersection over the study period, including 3 angle or turning movement collisions. In all three of the angle/turning crashes the driver was cited as not yielding right-of-way or driving recklessly.
- #33 - US 197/Bret Clodfelter Way - A total of 5 crashes were reported at this intersection over the study period, all of them including angle or turning movement collisions where the driver was cited as not yielding right-of-way.

Critical Crash Rate Comparisons

The critical crash rate method was used to identify study intersections that warrant further investigation and may represent opportunities to reduce crash frequency and severity. The Critical Crash Rate method is recommended by ODOT and is consistent with guidance in Part B of the Highway Safety Manual (HSM). The critical rate method establishes a threshold for comparison among intersections with similar numbers of approaches and similar traffic control.

Table 3-7 summarizes the study intersection crash rates calculated as the number of reported crashes relative to the amount of traffic at the intersection (measured per million entering vehicles). Other intersections were also studied, as requested by the Technical Advisory Committee. The critical crash rates are calculated based on the weighted average crash rate for all similar intersections in The Dalles. *Worksheets from the ODOT critical rate calculator used in this analysis are provided in Technical Appendix 3.*



\\kittelson.com\fs\H_Portland\proj\file\18495 - The Dalles TSP\gis\Draft\TSP\3-13 Crash Frequency by Study Intersection.mxd - agriffin - 7:13 PM 6/8/2016

Crash Frequency by Study Intersection
The Dalles, Oregon

Figure **3-13**

Oregon Department of Transportation

Kittelson & Associates, Inc. Transportation Engineering/Planning

APG

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA, Oregon Department of Transportation

Table 3-6. **Reported Crashes by Study Intersection (1/1/2010 to 12/31/14)**

Map ID	Intersection	Collision Type							Severity			Total
		Rear-End	Turning	Angle	Fixed-Object	Pedestrian/ Bicycle	Sideswipe-meeting	Other	Fatal & Severe Injury (K+A)	Moderate & Minor Injury (B+C)	PDO[1] (O)	
4	I-84 WB Ramps/River Rd	1	2		1					2	2	4
5	W 10th St/Hostetler Rd		1								1	1
7	I-84 EB Ramps/W 6th St		1					1		1	1	2
8	Webber St/W 10th St	1	2								3	3
9	Webber St/W 6th St	19	3	4					1	5	20	26
10	Webber St/W 2nd St	4	6	4					1	4	9	14
12	Cherry Heights Rd/W 10th St	1	1	2	1			2			7	7
13	Cherry Heights Rd/W 6th St	15	2		2	1				6	14	20
14	Mt Hood St/Skyline Rd							1			1	1
16	Union St/10th	2	1	2						1	4	5
17	Union St/W 3rd St		1	2	1					1	3	4
18	Union St/W 2nd St	1	2	2				3		1	7	8
19	Kelly Ave/E 10th St			4	1	1				4	2	6
22	Dry Hollow Rd/E 10th St		2	4						2	4	6
23	Brewery Grade/US 30	1					1			1	1	2
24	Brewery Overpass Rd/US 30	1	2	1					1		3	4
25	Brewery Overpass Rd/I-84 EB Ramps		1		2						3	3
26	Brewery Overpass Rd/I-84 WB Ramps			1							1	1
27	Thompson St/E 10th St/Old Dufur Rd				1						1	1
28	E 2nd St/US 30		1	1							2	2
29	US 197/US 30		14					1		4	11	15
30	US 197/Fremont St/Columbia View Dr		2	6	3	1			1	6	5	12
31	US 197/I-84 EB Ramps	3	3	2		1				7	2	9
32	US 197/I-84 WB Ramps	3	1	2						3	3	6
33	US 197/Bret Clodfelter Wy		3	2					1		4	5
34	US 197/Lone Pine Ln	1									1	1

[1] PDO = Property Damage Only; Note: There were no reported crashes at the following intersections during the 2010 – 2014 study period: Seven Mile Hill Rd/Chenoweth Rd (#1), US 30/River Rd (#2), I-84 EB Ramps/River Rd (#3), Mt Hood St/10th Street (#15)

Table 3-7. **Intersection Critical Crash Rate Comparison**

Map ID	Intersection	AADT Entering Intersection	Total Crashes	Number of Legs at Intersection	Intersection Control Type	Intersection Crash Rate*	Reference Population Crash Rate	Critical Rate	Exceeds Critical Rate?
4	I-84 WB Ramps/River Rd	3,780	4	4-leg	Stop-Controlled	0.58	0.41	0.88	No
5	W 10th St/Hostetler Rd	3,530	1	3-leg	Stop-Controlled	0.16	0.25	0.65	No
7	I-84 EB Ramps/W 6th St	16,100	2	3-leg	Stop-Controlled	0.07	0.25	0.41	No
8	Webber St/W 10th St	7,550	3	3-leg	Stop-Controlled	0.22	0.25	0.50	No
9	Webber St/W 6th St	19,500	26	4-leg	Signal	0.73	0.57	0.79	No
10	Webber St/W 2nd St	12,230	14	4-leg	Signal	0.63	0.57	0.85	No
12	Cherry Heights Rd/W 10th St	9,720	7	4-leg	Stop-Controlled	0.39	0.41	0.69	No
13	Cherry Heights Rd/W 6th St	19,420	20	4-leg	Signal	0.56	0.57	0.79	No
14	Mt Hood St/Skyline Rd	3,380	1	3-leg	Stop-Controlled	0.16	0.25	0.66	No
16	Union St/10th	7,580	5	4-leg	Stop-Controlled	0.36	0.41	0.73	No
17	Union St/W 3rd St	9,260	4	4-leg	Signal	0.24	0.57	0.90	No
18	Union St/W 2nd St	9,360	8	4-leg	Signal	0.47	0.57	0.89	No
19	Kelly Ave/E 10th St	6,980	6	4-leg	Stop-Controlled	0.47	0.41	0.74	No
22	Dry Hollow Rd/E 10th St	6,610	6	4-leg	Stop-Controlled	0.50	0.41	0.75	No
24	Brewery Overpass Rd/US 30	6,470	4	4-leg	Stop-Controlled	0.34	0.41	0.76	No
25	Brewery Overpass Rd/I-84 EB Ramps	6,470	3	4-leg	Stop-Controlled	0.25	0.41	0.76	No
26	Brewery Overpass Rd/I-84 WB Ramps	3,430	1	4-leg	Stop-Controlled	0.16	0.41	0.91	No
27	Thompson St/E 10th St/Old Dufur Rd	3,260	1	4-leg	Stop-Controlled	0.17	0.41	0.92	No
28	E 2nd St/US 30	6,990	2	4-leg	Stop-Controlled	0.16	0.41	0.74	No
29	US 197/US 30	9,000	15	3-leg	Stop-Controlled	0.91	0.25	0.48	**Yes**
30	US 197/Fremont St/Columbia View Dr	7,200	12	4-leg	Stop-Controlled	0.91	0.41	0.74	**Yes**
31	US 197/I-84 EB Ramps	8,050	9	4-leg	Stop-Controlled	0.61	0.41	0.72	No
32	US 197/I-84 WB Ramps	12,180	6	4-leg	Stop-Controlled	0.27	0.41	0.65	No
33	US 197/Bret Clodfelter Wy	11,710	5	3-leg	Stop-Controlled	0.23	0.25	0.45	No
34	US 197/Lone Pine Ln	10,980	1	3-leg	Stop-Controlled	0.05	0.25	0.45	No

* Crash rates are reported as the number of crashes per million entering vehicles. Note: There were no reported crashes at the following intersections during the 2010 – 2014 study period: Seven Mile Hill Rd/Chenoweth Rd (#1), US 30/River Rd (#2), I-84 EB Ramps/River Rd (#3), Mt Hood St/10th Street (#15)

As shown in Table 3-7, two intersections exceed critical crash rates. One element that makes these two intersections unique compared to other study intersections in The Dalles is the speed of traffic on US 197 through these intersections. The following provides more detail on the reported crash history at these intersections:

- #29 - US 197/US 30 – A total of 15 crashes were reported at the intersection over the study period. Of the 15 crashes, 4 resulted in an injury B or C, and 11 resulted in PDO. 14 of the 15 reported crashes involved left-turns (primarily southbound left turns and eastbound left-turns). 11 crash reports involving a left-turn crash indicate that the driver did not yield right-of-away. Dedicated left-turn lanes are provided for the southbound and eastbound approaches at the intersection.
- #30 - US 197/Fremont St/Columbia View Drive - A total of 12 crashes were reported at the intersection over the study period. Of the 10 crashes, 1 resulted in an injury A, 6 resulted in an injury B or C, and 5 resulted in PDO. A majority of the crashes were reported as fixed object and turning movement crashes. Three fixed-object and four angle crashes resulted on snow or ice in October, November, and December; these were associated with one Injury A and four Injury C crashes. One crash involved a work zone collision with a worker.

90th Percentile Crash Rate Comparisons

A second method used to identify intersections with more crashes than should be 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.

Three of the study intersections currently exceed the 90th percentile crash rates for similar intersections:

- #4 - I-84 EB Ramps/River Road – A total of 4 crashes were reported at the intersection over the 5-year period. Of the 4 crashes, 2 resulted in an injury B or C, and 2 resulted in property damage only. Two of the crashes were reported as turning movement, and crash reports indicate the driver didn't yield right-of-away.
- #19 - Kelly Avenue/E 10th Street - A total of 6 crashes were reported at the intersection over the 5-year period. Of the 6 crashes, 4 resulted in an injury B or C, and 2 resulted in property damage only. Four of the crashes were reported as angle and reported crash cause indicates "the driver passed the stop sign."
- #22 - Dry Hollow Road/E 10th Street - A total of 6 crashes were reported at the intersection over the 5-year period. Of the 6 crashes, 2 resulted in an injury B or C, and 4 resulted in property damage only. Four of the crashes resulted in angle collisions, and crash reports indicate the driver didn't yield right-of-away.

Statewide Safety Priority Index System

The ODOT Statewide 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. There are no SPIS sites identified by ODOT within the top ten percent for 2014 (based on 2010-2013 crash data).

The ODOT All Roads Transportation Safety (ARTS) program has programmed three improvement projects within the City of The Dalles, including:

- 6th Street at Hostetler Way
  - Systemic Sign Upgrades
- US 197 (The Dalles-California Hwy) at the I-84 ramps, US 30, and Fremont Street
  - Systemic Sign Upgrades
- US 197 (The Dalles-California Hwy) at Bret Clodfelter Way
  - Illumination,
  - Systemic Sign Upgrades,
  - Provide a raised Median

These planned ARTS projects will be funded through the 2017-2019 Statewide Transportation Improvement Program (STIP). Additionally, minor signage and striping improvements may be implemented at the following intersections as part of the ARTS transition project:

- 6th Street at Webber Street
- 6th Street at Cherry Heights Road
- 2nd Street at Webber Street

Special Considerations

Based on discussions with City staff, the following issues were identified that may be contributing to crashes:

- Skewed intersection geometry at E 10th Street/Thompson Street
- Skewed intersection geometry and multiple points of conflict at E 2nd Street/US 30

Transit Operations

The following summarizes information on existing ridership and survey data from CAT and LINK services.

CAT Ridership and On-Board Survey

CAT provided monthly ridership, on-off data, and on-board survey results for their Hood River – The Dalles and Hood River – The Dalles – Portland services. Ridership indicated 2,998 annual rides to and from The Dalles on CAT's service ending in Hood River and 697 annual rides to and from The Dalles on CAT's service to Portland. Both services have annual average rides per service hour of approximately 3.5, indicating high interest in fixed-route transit service. On-off data showed consistent trips to CGCC throughout the day and a strong commute pattern from The Dalles to Hood River in the morning and returning in the evening. On-board survey results indicated the CAT service was used by both choice and captive riders, a majority of whom walked or relied on rides to get to and from the bus station.

LINK Ridership and Origin-Destination Data

Monthly ridership data for LINK dial-a-ride was provided by MCCOG for financial year 2015-2016. LINK dial-a-ride service includes Medicaid and Shopper Shuttle riders. The data shows 18,999 annual rides on the LINK dial-a-ride service, resulting in annual average rides per service hour of approximately 3.5. This is a very productive rate for dial-a-ride service with most small transit agencies striving to reach 2.0 rides per hour. The LINK's high rate could be attributable to the lack of fixed-route service, the relatively compact size of The Dalles, and very efficient trip scheduling and routing.

LINK origin-destination data showed relatively equal ridership from all residential areas of The Dalles, as well as high ridership at the transit center, CGCC, and Mid-Columbia Medical Center. Trip purpose showed approximately 25% of trips for education, 25% for medical, 26% for work, and the remaining 24% for social/senior center, banking, personal/miscellaneous, recreation, meal site, special events, or shopping.

Bicycle Level of Traffic Stress

The ODOT APM provides a methodology for evaluating bicycle facilities within urban and rural environments that quantifies the perceived safety issue of being in close proximity to vehicles. This methodology, Bicycle Level of Traffic Stress (LTS), is based on the premise that as much as 60 percent of the population of a given City is "interested, but concerned" about cycling as a mode of transportation. The Bicycle LTS methodology seeks to identify road segments and routes that could be improved to remove the "concern" and encourage more bicycling as a mode of transportation.

Existing Collector and Arterial streets were evaluated based on the Bicycle LTS methodology. As applied by ODOT, this methodology classifies four levels of traffic stress that a cyclist can experience on the roadway, ranging from LTS 1 (little traffic stress) to LTS 4 (high traffic stress). A road segment with a Bicycle LTS 1 rating generally has low traffic speeds and low volumes and is suitable for all cyclists, including children. A road segment with a Bicycle LTS 4 generally has high speeds, high volumes and is

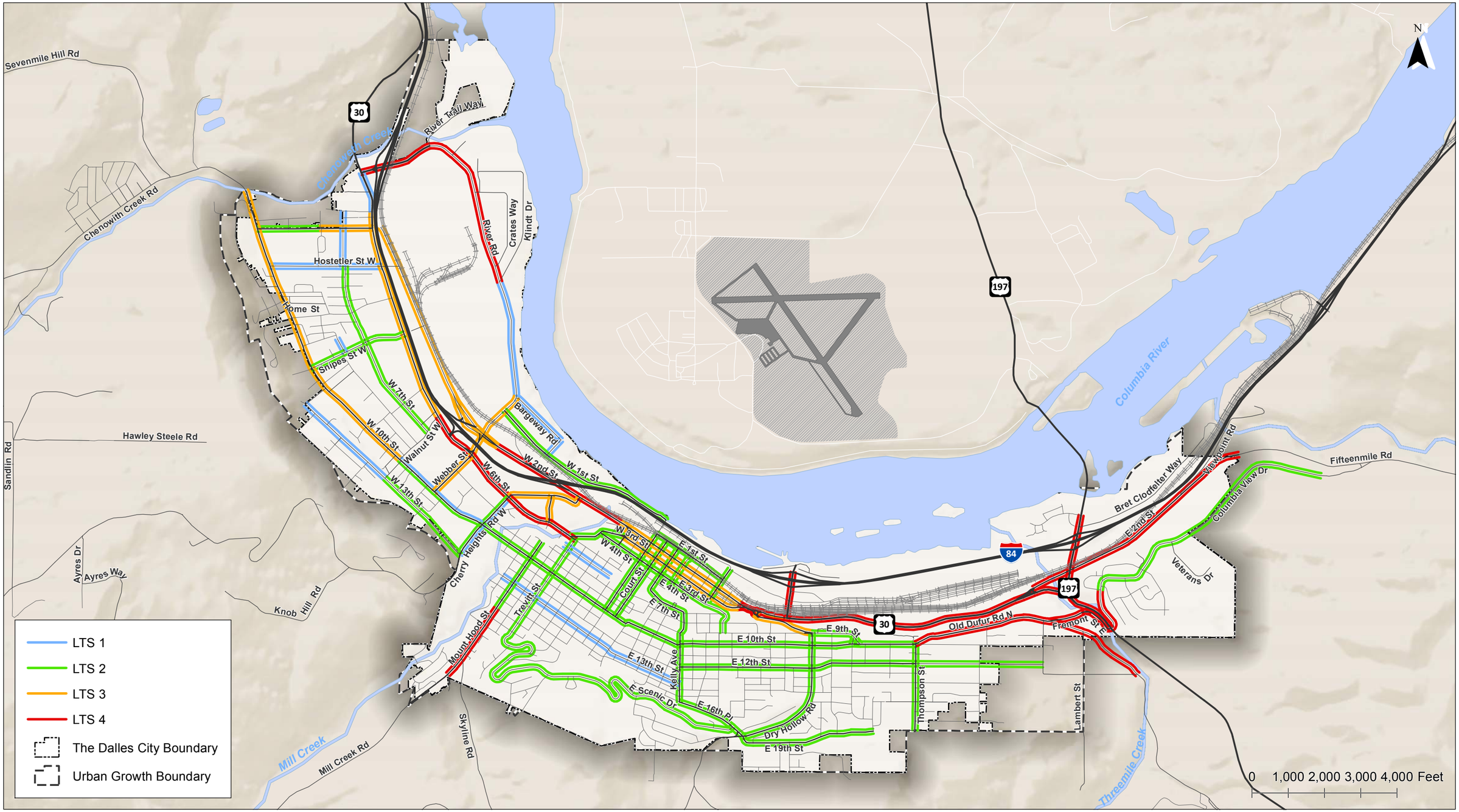
perceived as unsafe by most adults. Bicycle LTS 2 is considered appealing to a majority of the bike-riding population and therefore, is the desired target on most roadways.

Key characteristics that influence the bicycle LTS include:

- Number of lanes per direction
- Width of bike lane
- Separation between travel lane and bike lane (i.e., striped buffer zone or physical barrier such as on-street parking)
- On-street parking
- Posted or prevailing travel speed
- Intersection approach design of turn lanes
- Unsignalized intersection crossings

It is important to note the LTS of the whole segment is based on the worst LTS at any point along the segment because it is what will discourage ridership on the segment; therefore, LTS 3 or 4 segments may reflect the score of only a small portion of a given segment.

Figure 3-14 illustrates the results of the LTS analysis for The Dalles. Table 3-8 summarizes the segments with LTS 3 and 4 and provides a brief summary of the primary characteristics that informed the ratings.



Existing Bicycle Level of Traffic Stress
Arterial and Collector Streets
The Dalles, Oregon

Figure **3-14**

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

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Table 3-8. **Segments with Bicycle LTS 3 or 4 Rating**

Roadway	LTS Rating	Segment Start-End	Posted Speed (mph)	Presence of Bike Lane
Brewery Overpass Road	4	I-84 WB Ramp to E 2nd Street/US 30	Not posted	Yes
E 2nd Street	4	Brewery Overpass to 700 feet East	30	None
	4	Taylor Street to Brewery Overpass Road	25	None
US 30	4	700 feet East of Brewery Overpass to US 197	40	None
US 197	4	Lone Pine Drive to Fremont Street	45	None
River Road*	4	I-84 to Klindt Drive	40	Yes
	3	Klindt Drive to Bargeway Road	40	Yes
W 6th Street	3	Irvin St to Walnut Street	40	Yes
	4	Walnut Street to W 3rd Place/Trevitt Street	40	Yes
Mount Hood Street	4	Mill Creek Road to 16th Street	25	None**
Dry Hollow Road	4	E 16th Street to E 14th Street	35	Yes
Old Dufur Road	4	Thompson Street to Fremont Street	35	None
Fremont Street E	4	Old Dufur Road to US 197	35	None
W 2nd Street	4	Webber St to north end	30	None
Webber Street	3	Bargeway to 10th Street	30	>7 ft
Cherry Heights Road	3	US 30 to 6th Street	30	Yes
Mountain Hood	3	Entire Roadway	30	Yes
W 6th Street	3	Webber St to Lincoln Street	35	Yes
Brewery Grade	3	US 30 to 9th Street	30	None
Chenowith Loop Road	3	6th Street to 7th Street	25	<5 ft

* The Riverfront Trail could serve as a parallel route, providing a lower level of traffic stress for this segment.
** Pavement width exists, but no bike lane striping is provided

The majority of segments with LTS 3 or 4 have a paved shoulder; however, according to the Bicycle LTS methodology, the bike lane widths are too narrow relative to the posted speeds. The Bicycle LTS methodology indicates that for these segments to be rated LTS 2 or 3 one of the following must occur:

- Provide a 7-foot wide buffered bike lane to give bicyclists a buffer distance between the bike lane and adjacent travel lane,
- Reduce the posted speed limits to 30 miles per hour (mph) or less,
- Provide a paved bike lane where one does not exist today, and/or
- Improve intersection approach design of turn lanes to reduce difficulty for a bicyclist to traverse the intersection without having to change multiple lanes on the approach.

Enhanced facilities, such as separated multi-use paths, may also be considered in some areas where traffic volumes and/or travel speeds are high. *Bicycle LTS analysis worksheets are included in Technical Appendix 3.*

SUMMARY OF FINDINGS

The information provided in this chapter summarizes the existing transportation facilities provided in The Dalles in terms of characteristics, connections, and function. Based on the information summarized above, the following key findings are highlighted as opportunities to advance the transportation goals and objectives in Chapter 2.

Lands and Population Inventory

- Vacant land is available within the Port of The Dalles and the Columbia Gorge Industrial Center.
- Natural resources (floodplains and wetlands) and geologic hazards will influence where growth can occur.
- The Dalles experienced 34.2 percent growth from 1980 to 2015. Historic population growth will inform future population forecasts, which will be integrated with projected employment to estimate future traffic volume.

Street Network Inventory

- *Roadway Ownership:* ODOT, Wasco County, and The City of The Dalles own and maintain the roadways within the study area. The state-owned roadways are intended to serve regional, statewide, and interstate trips. The local roadways should provide off-highway connections for local trips (home-to-work, work-to-retail, retail-to-home, etc.)
- *Roadway Ownership:* All Wasco County roads within The Dalles City Limits are expected to be transferred to The City of The Dalles in 2016, increasing the number of miles of roadway maintained by the City.
- *Freight Routes:* I-84 and US 197 are the primary freight routes through The Dalles. US 197 restricts certain oversize and overweight loads. US 30 has high restrictions for freight and should not be considered for use as a detour route for any trucks.
- *On-street Parking:* The City has on-street parking in the downtown and on many residential streets. Downtown, the City has experimented with parklets, expanding the sidewalk into one or more on-street parking spaces to create people-oriented places.
- *Pavement:* Based on the most recent survey data, many miles of roadway in The Dalles are in need of pavement rehabilitation. City and ODOT maintenance schedules will be reviewed and new pavement preservation projects will be included in the alternatives analysis element of the TSP.
- *Pavement*: Several miles of pavement on I-84 were identified in “poor” condition in the 2014 inventory. In 2015, ODOT repaved 3.8 miles of Interstate 84 from MP 84.3 (near the Union Pacific railroad overcrossing) to MP 88.1 (Fifteenmile Creek Bridge), to improve a

section of pavement. The 2015-2018 Statewide Transportation Improvement Program (STIP) includes a project scheduled for 2016 to provide pavement overlay and median barrier replacement from MP 70.46 to 84.31.

- *Pedestrian Facilities*: Generally, sidewalks are provided on both sides of streets throughout The Dalles Historic Downtown and the residential areas south of downtown. Areas to the northwest of Webber Street (south of I-84) and areas east of Thompson Street are in greatest need of pedestrian facilities.
- *Pedestrian Facilities*: Given it is one of a few east-west arterials in The Dalles, pedestrian improvements to 10th Street may be prioritized to provide an east-west pedestrian route.
- *Bicycle Facilities*: Bicycle facilities in The Dalles include neighborhood streets where bicycles and vehicles can share the road, arterials and collectors with five-foot bicycle lanes, and paved shoulders near the edges of the UGB.
- *Shared-Use Paths*: The majority of The Dalles Riverfront Trail is completed, but a workgroup is tasked with identifying options to complete two short missing segments. Additional shared-use paths along Chenowith Creek and Mill Creek, were identified in the 2006 TSP, but have not been completed.
- *Transit*: A new transit center was constructed at West 7th Street at Chenoweth Loop Road. The transit center is served by bus service provided by Columbia Area Transit, MCCOG's Link, and Greyhound.
- *Bridges:* W 6th Street Bridge over Mill Creek is open with weight restrictions. The bridge inspection report notes that there is "very heavy truck traffic on this bridge and there is a need for additional load posting signs outside of this bridge to limit heavy trucks at this location."
- *Bridges*: The US 30 (Hwy 100) Bridge over Chenowith Creek and the US 197 Bridge over the Columbia River have sufficiency ratings below 50, indicating a functional or structural issue.
- Rail: Concerns associated with specific vehicular movements have been identified at two rail crossings (Union Street and Madison Street). Options to improve the crossings as a proactive means to avoid conflicts will be considered.
- *Environmental Justice*: Compared to the whole state of Oregon, The Dalles has a greater portion of people who are 65 or older (19%), 17 or younger (25%), or who are considered to be in poverty (43%).
- *Environmental Justice:* The TSP will be take into account the areas in The Dalles with the highest proportion of minority groups, populations under 17 or over 64 years of age, low-income households, low-English proficiency households, and people with disabilities. The public involvement efforts will attempt to obtain input from these populations and alternatives developed as part of the TSP will attempt to minimize adverse impacts and maximize positive impacts to these populations.

Existing Transportation System Operations

- *Intersection Operations*: All of the study intersections currently, satisfy applicable level-of-service and volume-to-capacity performance thresholds.
- *Intersection Operations:* The US 197/I-84 EB Ramp intersection currently operates at a LOS "E", but satisfies applicable ODOT v/c targets during the weekday p.m. peak hour. The intersection has a v/c ratio of 0.79 and is approaching the 0.80 v/c target during the weekday PM peak hour.
- *Intersection Operations:* While it does not exceed the City's LOS standard, the northbound approach at the Thompson Street/E 10th Street/Old Dufur Rd intersection has a volume-to-capacity ratio of 0.81. This represents a condition where the northbound approach delay is likely to vary significantly and may exceed LOS D delay thresholds during portions of a typical day.
- *Intersection Operations:* Two other intersections, I-84 EB Ramps/W 6th Street and US 197/Lone Pine Lane operate at LOS D under existing conditions, indicating that as volumes grow they will likely exceed the City's performance thresholds.
- *Intersection Operations*: One or more movements at all of the signalized study intersections have potential for queues to extend into the adjacent through lane and block traffic. Improvements to address the queue storage will take into account future forecast volumes and other intersection operational improvements.
- *Safety*: Several intersections have a greater proportion of angle and left-turn crashes than rear-end crashes, which can indicate an opportunity to reduce injury or fatal crashes by implementing engineering countermeasures. Countermeasures could include improving sight distance, modifying traffic control, or restricting turn movements.
- *Safety*: The crash rates at two intersections (US 197/US 30 and US 197/Fremont St/ Columbia View Drive) exceed critical crash rate thresholds. Crash patterns at these intersections have been evaluated and additional evaluation will be conducted to identify potential countermeasures. Both intersections are unsignalized and have high-speed approaches (relative to other intersections in The Dalles).
- *Safety*: Three study intersections exceed the statewide 90th percentile crash rates for similar types of intersections. Countermeasures will be evaluated as part of the alternatives analysis element of the TSP.
- *Safety*: ODOT has programmed systemic safety improvement projects within the 2017-2019 STIP at:
    - 6th Street/Hostetler Way and
    - US 197 at Bret Clodfelter Way, I-84 ramps, US 30, and Fremont Street.
- *Safety*: The following locations have unique geometry and/or traffic control that may be contributing to crashes:

  - Skewed intersection geometry at E 10th Street/Thompson Street
  - Skewed intersection geometry and multiple points of conflict at E 2nd Street/US 30
  - E 16th Place and Dry Hollow Road

- *Transit:* Ridership on CAT's Hood River – The Dalles and Hood River – The Dalles – Portland services is approximately 3,000 annual rides to and from The Dalles and Hood River and approximately 700 annual rides to and from The Dalles and Portland. Both services have annual average rides per service hour of approximately 3.5 rides per service hour.
- *Transit:* CAT's ridership on-off data shows consistent trips to CGCC throughout the day and a strong commute pattern from The Dalles to Hood River in the morning and returning in the evening.
- *Transit:* CAT's on-board survey results indicate that CAT's service is used by both choice and captive riders, a majority of whom walk or rely on rides to get to and from the bus station.
- *Transit:* LINK provides approximately 19,000 annual rides, resulting in annual average rides per service hour of approximately 3.5 rides per hour.
- *Transit:* LINK origin-destination data show relatively equal ridership from all residential areas of The Dalles, as well as high ridership at the transit center, CGCC, and Mid-Columbia Medical Center. LINK rider's trip purpose is approximately 25% of trips for education, 25% for medical, 26% for work, and the remaining 24% for social/senior center, banking, personal/miscellaneous, recreation, meal site, special events, or shopping.

Chapter 4 Future Travel Demand

4. FUTURE TRAVEL DEMAND

Chapter 3 identified *existing* deficiencies and needs in the transportation system of The Dalles. Chapter 4 examines the anticipated *future* transportation system needs in The Dalles over a 20-year period from 2015 through 2035. These needs include

- Existing deficiencies identified in Chapter 3
- Needs identified from feedback from citizens and residents
- System improvements needed to achieve goals identified in Chapter 2
- Forecast needs associated with growth in travel demand through 2035.

Chapter 4 describes the future anticipated growth in the City of The Dalles, discusses the methods used in the technical analysis, and describes the future "base conditions." The base condition or "no-build" analysis assumes that The Dalles will continue to see growth in employment and population between 2016 and 2035 within the existing Urban Growth Boundary (UGB). At the same time, the base analysis assumes all modal transportation systems will remain as they exist today, except where planned improvement projects are considered funded and certain to be implemented. This "do nothing" or "no-build" scenario is commonly used as a foundation that communities can compare to alternatives that include various projects, policies, pilot studies, and programs.

Chapter 5 discusses a variety of transportation alternatives that were developed to address the transportation system needs and discusses how each alternative fulfills the goals and objectives of the Transportation System Plan.

DEVELOPMENT OF YEAR 2035 TRAFFIC FORECASTS

Estimates of future traffic demand are based on population and employment forecasts in the year 2035, existing travel patterns, and transportation infrastructure (existing system and planned/funded improvements). The following section summarizes key aspects of The Dalles 2035 traffic volume estimate.

Land Use and Population Projections

Land use plays an important role in developing a comprehensive transportation system. The amount of land that is planned to be developed, the type of land uses, and how the land uses are mixed together will have a direct impact on how the transportation system will be used in the future. Understanding land use is critical to taking actions to maintain or enhance the transportation system.

Travel Demand Modeling Tool

Based on a variety of data sources, ODOT's Transportation Planning Analysis Unit (TPAU) has created a travel demand model specific to The Dalles to help inform future demand and travel patterns. The

travel demand model is comprised of multiple Transportation Analysis Zones (TAZs) that encompass defined geographic areas and the land uses within them. The arterial and collector roadway network is integrated with the TAZs to reflect the existing motor vehicle transportation system.

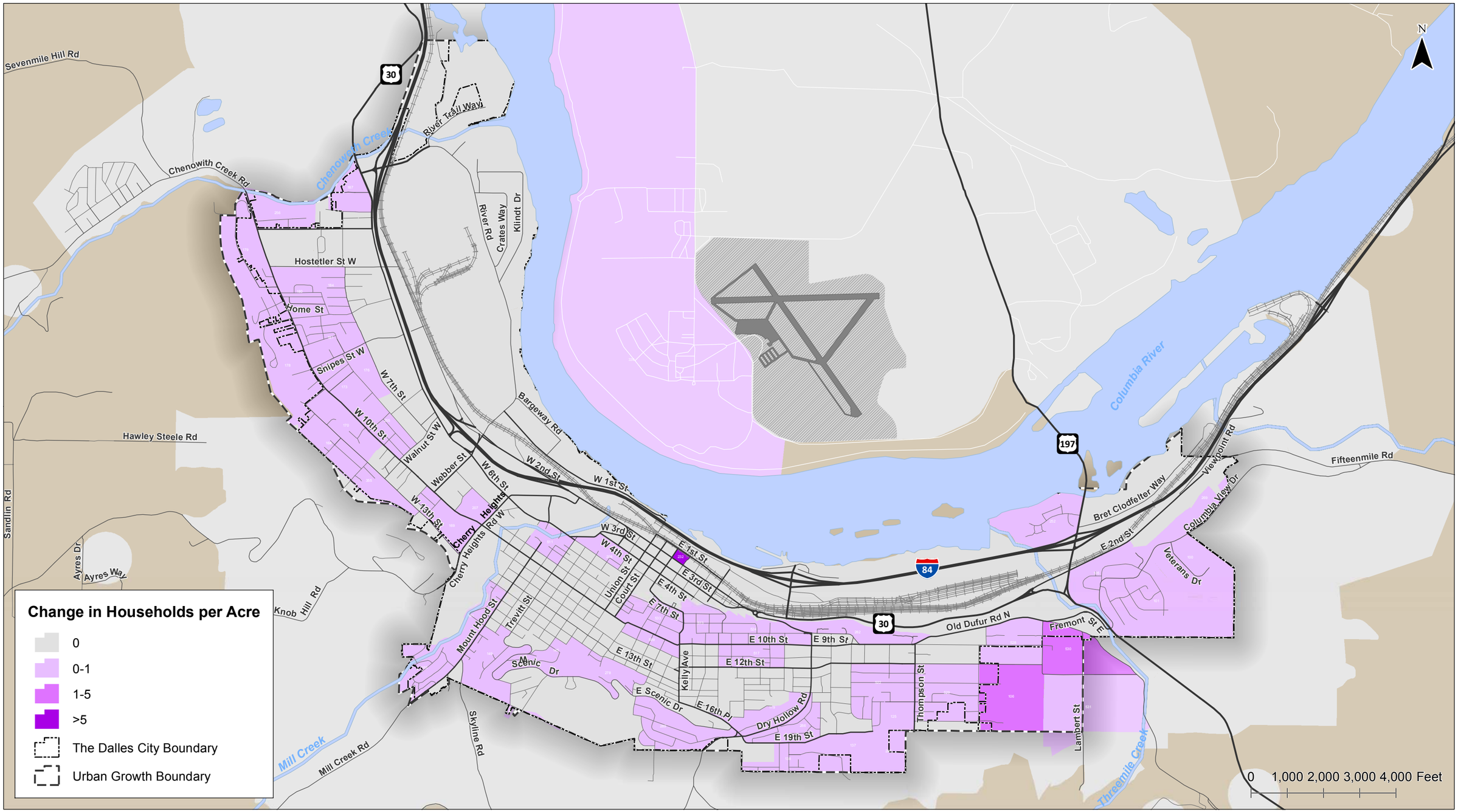
Travel patterns between land uses in each TAZ and to and from the broader region have been estimated by City staff for both existing and long-term future conditions and integrated into the TPAU modeling effort. Each TAZ has been coded with a unique set of characteristics for land use, population, employment and households in the geographic area represented by the TAZ. The travel demand model in turn uses the coded information to predict future travel patterns between TAZs and the regional roadway network. The inputs into the model and TAZs are coded to represent the existing transportation system and anticipated future changes as accurately as possible. Each TAZ area is individually coded to reflect anticipated changes in population, businesses/employment opportunities and/or households.

Growth Projections

The Dalles travel demand model is coded to assess travel patterns for base year 2010 and forecast year 2036 population, household, and employment (retail, service, and other) estimates for The Dalles by TAZ. Figure 4-1 and Figure 4-2 illustrate the percent change in households and employment expected per acre between base year 2010 and forecast year 2036. Table 4-1 summarizes the collective changes in population, households, employment community-wide. As shown in Table 4-1, the change in population is projected to be 11.8 percent over the 26-year period while the corresponding percent change in households is projected to be 13.4 percent and the change in employment is projected to be 15.2 percent.

Table 4-1. The Dalles Land Use Summary

Land Use	2010	2036	Change	Percent Change
Population	18,479	20,660	2,181	11.8%
Households	7,378	8,369	991	13.4%
Employment	8,435	9,714	1,279	15.2%



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Change in Households from 2010 to 2036
The Dalles, Oregon

Figure
4-1

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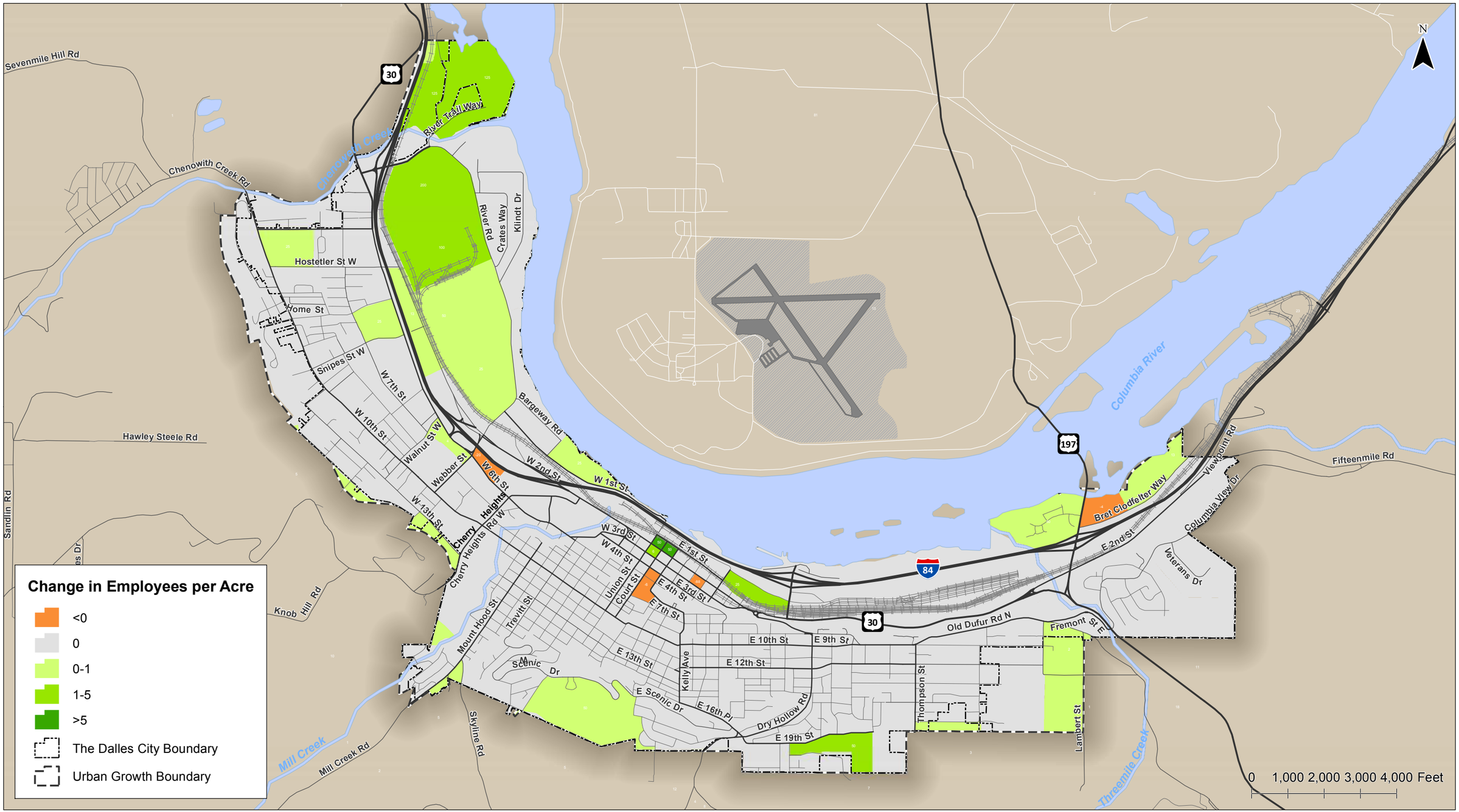
Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County



Change in Employees per Acre

- <0
- 0
- 0-1
- 1-5
- >5
- The Dalles City Boundary
- Urban Growth Boundary

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Change in Employment from 2010 to 2036
The Dalles, Oregon

Figure
4-2

Oregon Department of Transportation

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APG

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County

Travel Trends and Modeling Observations

In reviewing the future traffic volume projections, several trends and relationships should be considered as follows.

- The greatest increase in housing and employees per acre (density) is projected within several blocks of The Dalles Downtown where redevelopment is anticipated.
- While the downtown TAZs have the highest increase in density of anticipated housing and employees, these areas are relatively small.
- The total increase in employment projected by the travel demand model is highest in the industrial areas.
- As land uses change in proportion to each other (i.e., a more significant increase in employment relative to population and household growth), there will be a shift in the overall operation of the transportation system.
    - By way of illustration, retail land uses typically generate a higher number of trips per acre of land than residential, industrial, or other land uses. As a result, the location and design of retail land uses in The Dalles has the potential to substantially affect localized transportation system operations (for example, at a traffic signal or driveway serving as a gateway to a retail development). Even within retail uses, the trip impact can vary between destination retail (businesses whose customers drive significant distances to reach the site – for example, a large home improvement store) vs. convenience retail (business who rely largely on traffic passing by the site to shop as a function of convenience – for example, a gas station or convenience market)
- Areas of The Dalles that are homogeneous in land use character can also affect transportation system design and operations.
    - For example, the Port area primarily has employment-based land uses and, as a result, the local transportation system must support significant trips coming to or from that area during peak commuter periods (especially if shift changes coincide among employers).
    - Similarly, residential subdivisions tend to have a relatively heavy egress travel pattern during the morning peak hour and a relatively heavy return-to-home travel pattern during the p.m. peak hour.
    - Promoting a mix of residential, commercial, and employment land uses so that some residents may work and shop locally reduces the need for residents to travel longer distances (for example, as is being developed within the Lone Pine area).
    - Parking demand is also heavily impacted by land use – mixed-use areas have the potential to make better use of shared parking arrangements (for example, office

space may use parking during the day that is shared with local residents overnight and on weekends when residential is highest and office demand lowest).

- Areas with significant future development potential may substantially impact the transportation system and should be thoughtfully considered. ODOT's travel demand model specifically considered the following local high-growth potential areas:
    - Lands north of I-84, at the far west and east ends of the city, at the boundaries of the UGB;
    - Vacant industrial land located near the I-84/ Chenoweth interchange;
    - Land zoned for industrial/commercial uses at the Columbia Gorge Regional Airport; and,
    - Future mixed-use development within the Lone Pine area.

Planned and Funded Projects Assumed in the Travel Demand Model

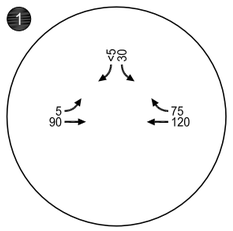
The initial year 2035 modeling presented in this section assumes that only new transportation projects that are both developed and funded will be available for use in 2035. Typically, such future projects could be part of the ODOT Statewide Transportation Improvement Program (STIP), or City/County projects. While ODOT's 2015-2018 STIP includes several projects within The Dalles, such as improvements to the Riverfront Trail, sign upgrades, signalization upgrades, and safety improvements, no capacity or operational projects are planned and funded at the study intersections. Accordingly, the Year 2035 modeling presented in this report reflects operations of the existing transportation system with year 2035 traffic volumes.

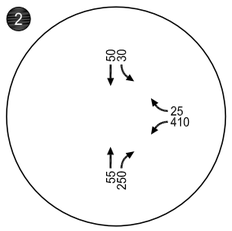
FUTURE TRAFFIC CONDITIONS AND NEEDS

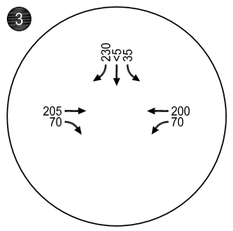
Year 2035 Forecast Traffic Volumes

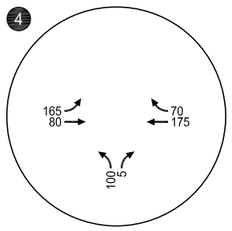
Year 2035 forecast traffic volumes on the arterial and collector street system were projected using the travel demand model to reflect anticipated land use changes assuming continued use of the existing transportation network. Turning and through movement volumes at the study intersections were derived from the travel demand model projections using the post-processing methodology presented in the National Cooperative Highway Research Program (NCHRP) Report 255 *Highway Traffic Data for Urbanized Area Project Planning and Design*, in conjunction with engineering judgment and knowledge of the study area.

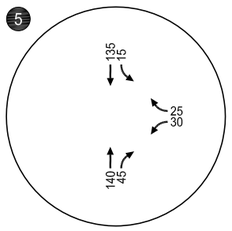
Figure 4-3 illustrates the year 2035 traffic volumes at the study intersections located within The Dalles UGB during the weekday p.m. peak hour while Figure 4-4 illustrates the corresponding intersection locations.

1 Seven Mile Hill Rd/Chenoweth Rd


2 US 30/River Rd


3 I-84 EB Ramps/River Rd


4 I-84 WB Ramps/River Rd


5 W 10th St/Hostetler Rd


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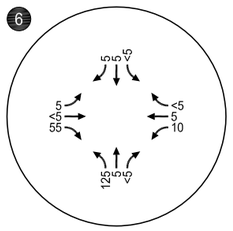
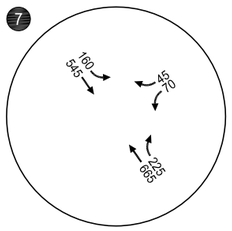


7 I-84 EB Ramps/W 6th St


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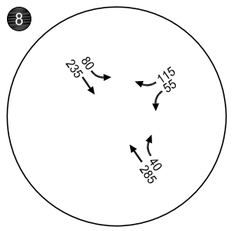

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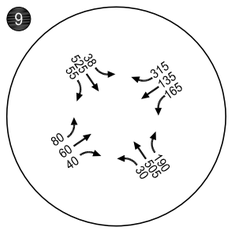

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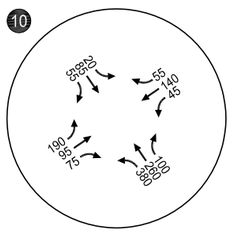

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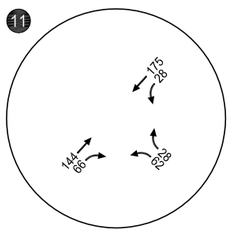

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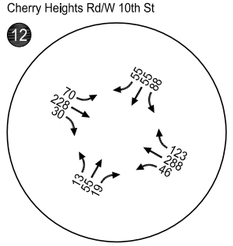

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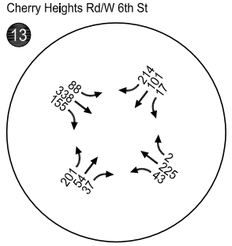

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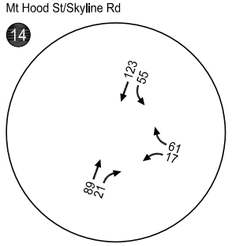
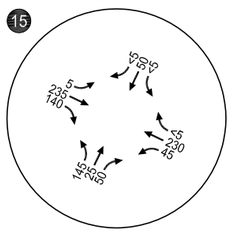


15 Mt Hood St/10th St


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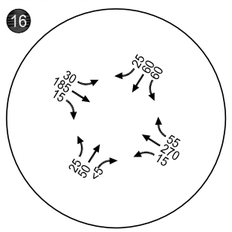
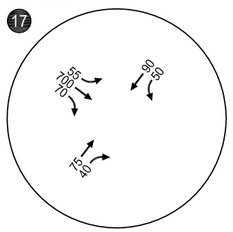


17 Union St/W 3rd St


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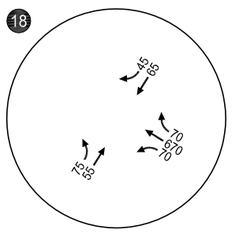
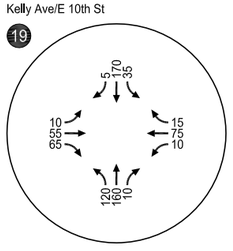
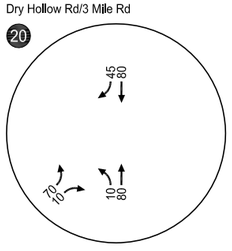
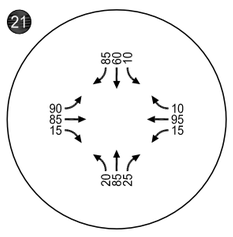


19 Kelly Ave/E 10th St


20 Dry Hollow Rd/3 Mile Rd


21 Dry Hollow Rd/16th Pl/19th St


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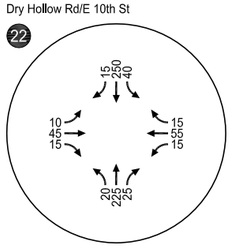
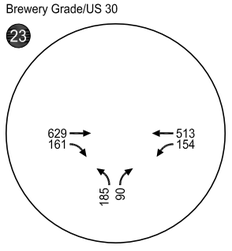


23 Brewery Grade/US 30


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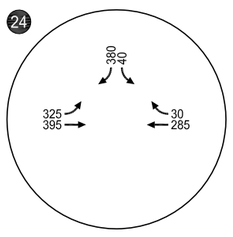

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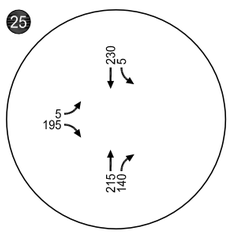

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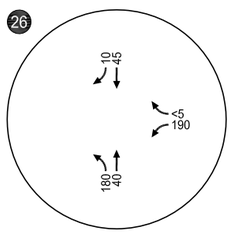
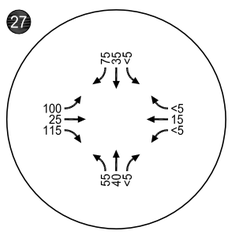
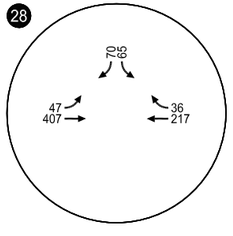
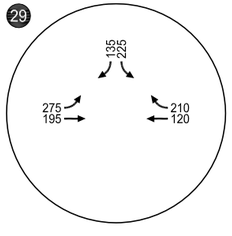
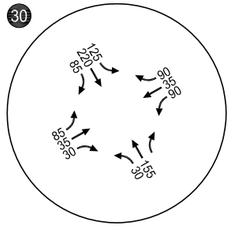
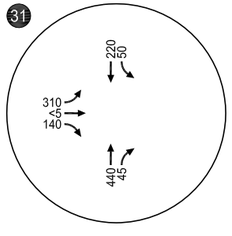


27 Thompson St/E 10th St/ Old Dufur Rd


28 E 2nd St/US 30


29 US 197/US 30


30 US 197/Fremont St/ Columbia View Dr


31 US 197/I-84 EB Ramps


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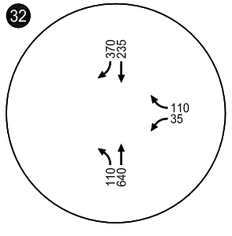
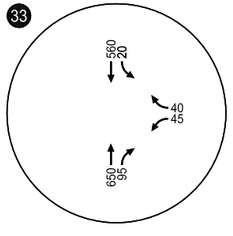
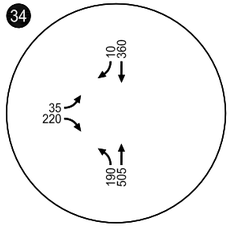


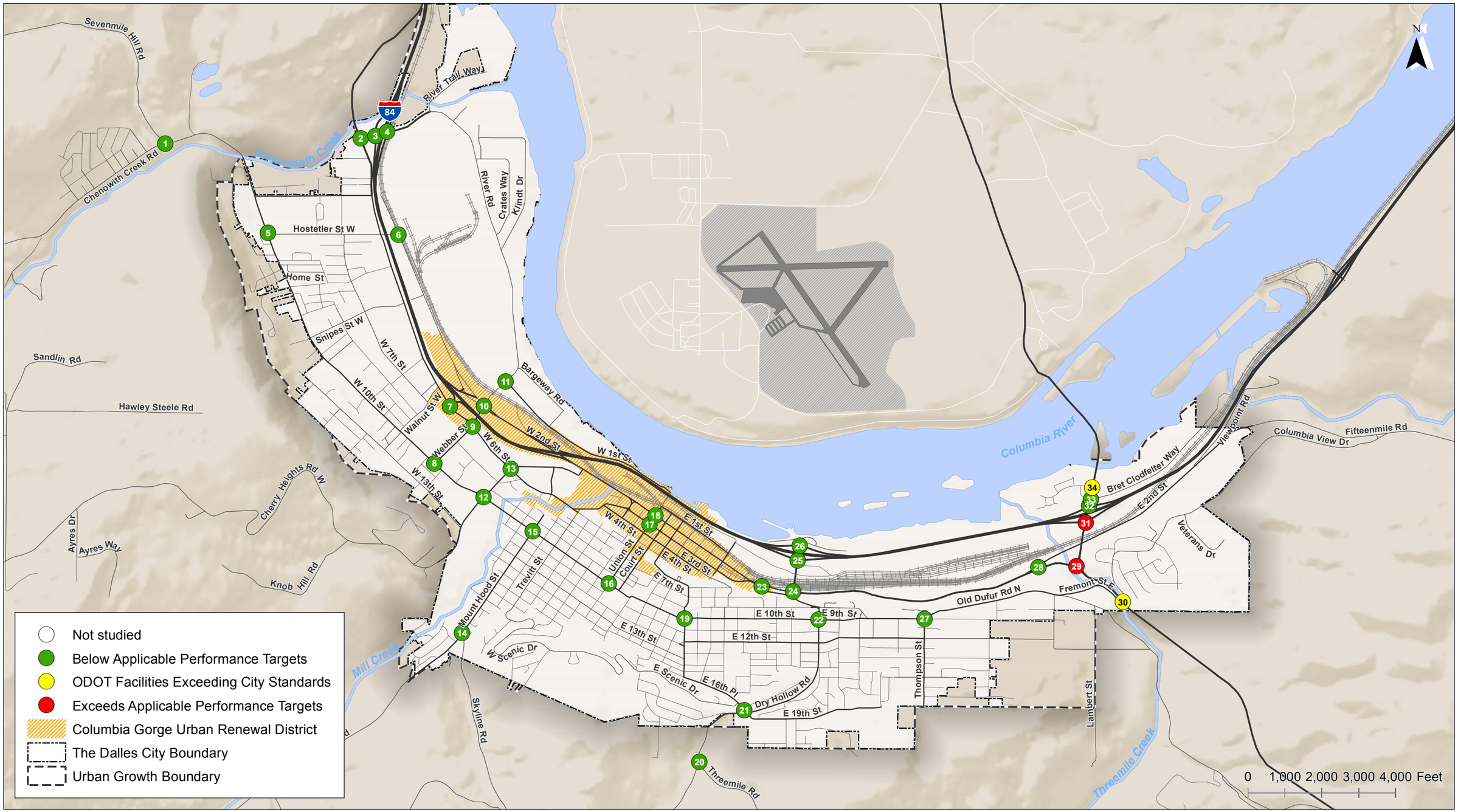
33 US 197/Bret Clodfelter Way


34 US 197/Lone Pine Ln


- Study Intersections

Future 2035 Traffic Volumes
Weekday PM Peak Hour
The Dalles, Oregon

Figure
4-3



2035 Traffic Conditions
Weekday PM Peak Hour
The Dalles, Oregon

Figure **4-4**

Oregon Department of Transportation

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

K:\H_Portland\proj\le\18495 - The Dalles TSP\gis\4-4 Future Traffic Conditions.mxd - aludwig - 12:24 AM 12/10/2016

Year 2035 Forecast Operations

The City of The Dalles seeks to maintain LOS D or better at signalized and unsignalized intersections. ODOT operation standards for existing and no-build future scenarios were previously documented in Technical Memorandum #3 and are defined in Table 6 of the *Oregon Highway Plan*.

The traffic volumes shown in Figure 4-3 were used to analyze traffic operations at the study intersections. Figure 4-4 and Table 4-2 summarize the results of the traffic operations analysis at the study intersections for the weekday p.m. peak hour. Figure 4-4 illustrates study intersections that exceed the applicable operational standards with red circles. Those intersections shown with yellow circles satisfy ODOT performance targets, but do not meet City standards. All other intersections are shown by green circles, indicating they are operating below the applicable performance thresholds. Note that the color-coding shown in Figure 4-4 only represents delay- and capacity-based performance measures. Additional performance measures and considerations including queuing and safety are addressed later in this chapter. *Year 2035 Future Traffic Condition operations analysis worksheets are included in Technical Appendix 4.*

Key findings from the forecast weekday p.m. peak hour operational analysis includes:

- Compared to existing conditions, the forecast traffic conditions do not indicate a substantial increase in traffic demand and congestion, except along the US 197 corridor.
- The unsignalized US 197/I-84 EB Ramp intersection (Intersection #31) has a volume-to-capacity (v/c) ratio of greater than 1.0 on the eastbound approach. This finding indicates eastbound I-84 off-ramp volumes are projected to exceed both the intersection's capacity and the intersection's 0.85 v/c target.
- The unsignalized US 197/US 30 intersection (Intersection #29) has a v/c ratio of greater than 1.0 on the southbound left-turn approach lane. This finding indicates southbound volumes turning left to continue on US 197 are projected to exceed both the intersection's capacity and the intersection's 0.85 v/c target.
- While satisfying ODOT's mobility standard, the Lone Pine Boulevard eastbound left-turn movement at US 197 (Intersection #34) is forecast to exceed the City's LOS D threshold. The projected delay impacts less than 50 vehicles during the weekday p.m. peak hour.
- The minor-street approaches to US 197 at Fremont Street/Columbia View Drive (Intersection #30) are forecast to exceed the City's LOS D threshold but satisfy ODOT's mobility standard.
- The signals at the Webber Street interchange (at 6th Street and 2nd Street) operate with permitted left-turn phasing on the north and south approaches. This signal phasing does not provide for the most efficient signal operations resulting in excess delay and queuing on the north and south approaches at both signals.

Table 4-2. Forecast 2035 Intersection Operations – Weekday PM Peak Hour

Map ID	Intersection	Level of Service (LOS)	Delay (Sec)	Volume/ Capacity (V/C)	Unsignalized Critical Movement	ODOT V/C Target*	Meets Applicable Performance Thresholds?
1	Seven Mile Hill Rd/ Chenoweth Rd	B	10.5	0.05	SB	N/A	Yes
2	US 30/River Rd	C	16.5	0.61	WB	0.90	Yes
3	I-84 EB Ramps/River Rd	C	16.6	0.13	SB	0.85	Yes
4	I-84 WB Ramps/River Rd	D	25.2	0.43	NB	0.85	Yes
5	W 10th St/Hostetler Rd	B	10.8	0.09	WB	N/A	Yes
6	W 2nd St/Hostetler Rd	B	11.9	0.03	WB	N/A	Yes
7	I-84 EB Ramps/W 6th St	D	33.2	0.49	WB	0.85	Yes
8	Webber St/W 10th St	C	17.1	0.17	WB	N/A	Yes
9	Webber St/W 6th St	C	20.4	0.76	Signalized	N/A	Yes
10	Webber St/W 2nd St	C	22.2	0.87	Signalized	N/A	Yes
11	Webber St/W 1st St	B	11.7	0.15	WB	N/A	Yes
12	Cherry Heights Rd/W 10th St	C	19.8	N/A	AWSC	N/A	Yes
13	Cherry Heights Rd/W 6th St	C	25.5	0.65	Signalized	N/A	Yes
14	Mt Hood St/Skyline Rd	B	11.1	0.03	WB	N/A	Yes
15	Mt Hood St/10th St	C	23.4	N/A	AWSC	N/A	Yes
16	Union St/10th	B	11	N/A	AWSC	N/A	Yes
17	Union St/W 3rd St	C	31.8	0.46	Signalized	N/A	Yes
18	Union St/W 2nd St	B	13.5	0.4	Signalized	N/A	Yes
19	Kelly Ave/E 10th St	C	18.9	0.29	WB	N/A	Yes
20	Dry Hollow Rd/3 Mile Rd	B	10	0.1	EB	N/A	Yes
21	Dry Hollow Rd/16th Pl/19th St	A	8.7	N/A	AWSC	N/A	Yes
22	Dry Hollow Rd/E 10th St	C	16.7	0.22	WB	N/A	Yes
24	Brewery Overpass Rd/US 30	B	11.8	0.30	EB	0.90	Yes
25	Brewery Overpass Rd/ I-84 EB Ramps	C	15.9	0.40	WB	0.85	Yes
26	Brewery Overpass Rd/ I-84 WB Ramps	C	16.2	0.25	NB	0.85	Yes
27	Thompson St/E 10th St/ Old Dufur Rd	B	10.4	0.10	SB	N/A	Yes
28	E 2nd St/US 30	B	10.4	0.10	SBL	0.90	Yes
29	US 197/US 30	**F**	**>50**	**1.13**	SBL	0.85	**No**
30	US 197/Fremont St/Columbia View Dr	**F**	**50.3**	0.71	EB	0.90	**City No, ODOT Yes**
31	US 197/I-84 EB Ramps	**F**	**>50**	**1.08**	EB	0.85	**No**
32	US 197/I-84 WB Ramps	A	9.6	0.14	WB	0.85	Yes
33	US 197/Bret Clodfelter Wy	C	22.8	0.31	WB	0.90	Yes
34	US 197/Lone Pine Blvd	**E**	**40.4**	0.26	EB	0.90	**City No, ODOT Yes**

AWSC = All-way stop control, N/A = Not applicable, EB=Eastbound, WB=Westbound, SB=Southbound, NB=Northbound

* For critical movement at unsignalized intersections

As shown in Table 4-2, there is a need to increase capacity at two intersections that exceed their applicable v/c targets. At two other intersections on ODOT facilities, the delay exceeds City thresholds, but not ODOT's v/c target.

Congestion has been reported at several other intersections within The Dalles, although the forecast conditions do not indicate the delay and capacity will exceed applicable performance thresholds. Pedestrian and bicycle facilities and safety projects may be identified at these locations, as described below.

Intersection Queues

A queuing analysis was conducted at the five signalized study intersections using Synchro 8 software. Table 4-3 summarizes the 95th percentile queues for movements with exclusive lanes during the weekday p.m. peak hour, rounded to the nearest 25 feet (approximately 1 vehicle length). The available storage lengths reflect the striped storage for each movement at the intersections.

Table 4-3. Forecast 2035 Signalized 95th Percentile Queues – Weekday PM Peak Hour

Map ID	Intersection	Movement	Weekday PM Queue (feet)	Available Storage (feet)	Adequate?
9	Webber St/W 6th St	EBL	25	250	Yes
		EBT/R	<400	705	Yes
		WBL	25	150	Yes
		WBT	300	> 500	Yes
		WBR	50	175	Yes
		NBL/T	100	495	Yes
		NBR	5	175	Yes
		SBL/T	250	585	Yes
		SBR	125	50	**No**
10	Webber St/W 2nd St	EBL	25	125	Yes
		EBT	100	430	Yes
		WBL	275	425	Yes
		WBT	200	635	Yes
		WBR	50	425	Yes
		NBL/T	275	585	Yes
		NBR	50	25	No
		SBL/T	150	810	Yes
13	Cherry Heights Rd/W 6th St	EBL	100	100	Yes
		EBT	375	> 500	Yes
		EBR	50	> 500	Yes
		WBL	50	965	Yes
		WBT	250	965	Yes
		WBR	0	75	Yes
		NBL	150	100	**No**
		NBT/R	75	360	Yes
		SBL	25	200	Yes
		SBT/R	300	200	**No**
17	Union St/W 3rd St	EBT	350	365	Yes
		NBT	100	> 500	Yes
		SBL	75	75	Yes
		SBT	50	205	Yes
18	Union St/W 2nd St	WBL	50	50	Yes
		WBT	175	390	Yes
		NBT	100	205	Yes
		SBT	50	385	Yes

EB=Eastbound, WB=Westbound, SB=Southbound, NB=Northbound, L=Left-turn Lane, T=Through Lane, R=Right-turn Lane, L/T=Shared Left-Through Lane, T/R= Shared Through-Right Lane L/R=Shared Left and Right-turn Lane

As shown in Table 4-3, all of the signalized study intersections are forecasted to have one or more movements where the 95th percentile queues exceed the available storage for that movement. *The*

worksheets used to evaluate future queuing at the signalized study intersections are included in Technical Appendix 4.

Based on the forecast queuing analysis, the following signalized intersection improvement needs were identified:

- *Webber Street Interchange (Intersections #9 and #10)* - Queue storage to accommodate forecast demand queues at the Webber/6th Street and Webber/2nd Street intersections would require extending the right-turn lane beyond the queue in the shared through/left lanes. Due to restrictions in width under the I-84 overpass, extending these turn lanes beyond 100 feet is not feasible within the constraints of the existing structure.
- *Cherry Heights Road/W 6th Street (Intersection #13)* – Observations and analysis indicate the southbound queue extends beyond the left-turn lane storage length, reducing the approach capacity. Review of approach volumes indicates an imbalance in lane utilization between the left lane (20 vehicles/hour) and shared through/right lanes (346 vehicles/hour). The northbound and southbound left-turn lanes need to be converted to a shared through/left-turn lane to provide a dedicated right-turn lane for the approaches.

Unsignalized Intersection Queues

The operational analysis of unsignalized intersections estimates queuing at unsignalized intersections. Based on review of the analysis results, we did not identify any unsignalized queues that exceed available storage. Additional consideration of storage lengths and turn lane needs at unsignalized intersections are identified as safety needs.

Roadway Connectivity

Within most of the City, the existing grid network generally provides users with a variety of travel options and serves as emergency access routes during incidents. A review of the existing street connectivity needs and constraints revealed the following:

- There is an established grid system within and adjacent to the downtown core. Outside of the downtown area, connectivity is limited by topography, the I-84 corridor, the US 197 corridor, and the Union Pacific Railroad corridor and undeveloped properties. Specific constraints include:
    - Access to/from residential areas off of Columbia View Drive is limited to a single unsignalized intersection at US 197.
    - Access to the mixed-use development off of Lone Pine Boulevard is limited to a single point of access on US 197.
    - Connections from The Dalles to The Dalles Municipal Airport and the surrounding industrial areas are limited to US 197.

  - Railroad crossings and I-84 concentrate north-south travel to/from The Port industrial area to River Road (Chenoweth Interchange) and Webber Street.
- Despite the grid system in the downtown area and to the south, there are limited east-west connections from the west side of the City to the east side, with the exception of I-84.
- Significant grade changes limit connections across the southern UGB boundary, although current connections provide adequate capacity.
- The Mid-Columbia Medical Center (MCMC) has limited collector or arterial connection options to the east to Thompson Street (refer to Figure 4-5). Completing a connection to Thompson Street could improve emergency response time by providing alternative routes to the hospital and could alleviate other north/south routes currently in use. Examples of connections that could be considered for completion are:
  - Extend E 19th Street from Oakwood Drive to Thompson Street
  - Extend Oakwood Drive from E 16th Street to E 14th Street
  - Complete E 16th Street from Golden Way to Thompson Street
- The downtown core of The Dalles includes a one-way couplet (East 2nd Street and East 3rd Street). There have been requests to evaluate the impacts to the downtown area if the one-way couplet was converted into two-way streets. Consideration will need to be given to the roundabout at East 2nd Street and Brewery Grade as the west leg of the roundabout currently accommodates the one-way couplet configuration. Consideration will also need to be given to the costs of upgrading the signalized intersections along both streets to allow for two-way travel. The evaluation of this concept is provided in Chapter 5 of the TSP.
  - Traffic volume
  - Roundabout
  - Signal modifications
  - Loading/unloading, freight.

Roadway Safety Needs & Considerations

Several study intersections were identified in Technical Memorandum #3 as exceeding the critical crash rate, the 90th percentile crash rate, or having more than 50-percent left-turn or angle crash type proportion. These include:

- US 197/Fremont Street/Columbia View Drive (Intersection #30)
  - Exceeds Critical Crash Rate during the study period. The posted speed on the uncontrolled US 197 approaches is 45 miles per hour (MPH). Fourteen of the 15 reported crashes (93 percent) were left-turn crashes. Safety improvement needs may include changes to traffic control or speed reduction on US 197.
- US 197/US 30 (Intersection #29)
  - Exceeds Critical Crash Rate during the study period. The posted speed on the uncontrolled US 197 approaches is 45 miles per hour (MPH). Speed and weather factors have been indicated in the 12 reported crashes at this intersection. Safety improvement needs may include changes to traffic control or speed reduction measures.

- I-84 EB Ramps/River Road (Intersection #3)
    - This intersection exceeded the 90th percentile crash rates for similar intersections throughout the state. Two of the four crashes at this location were injury B and C. Two of the four crashes were turning movement related; indicating that sight distance may need to be evaluated.
- Kelly Avenue/East 10th Street (Intersection #19)
    - This intersection exceeded the 90th percentile crash rates for similar intersections throughout the state. Four of the six reported crashes resulted in injury B or C. Four crashes were angle collisions with reports that the driver failed to obey the stop sign. Advanced stop-ahead warning signage or larger stop signs may be needed to reduce potential for running the stop sign.
- Dry Hollow Road/East 10th Street (Intersection #22)
    - This intersection exceeded the 90th percentile crash rates for similar intersections throughout the state with a total of six crashes. Four crashes were angle collisions and two crashes resulted in injuries. Advanced stop-ahead warning signage may be needed to reduce potential for running the stop sign.
- US 197/I-84 Eastbound Ramps (Intersection #31)
    - Six of the nine reported crashes were either angle or turning movement related. The majority of these involved an eastbound vehicle making a left-turn from the ramp. Turn lanes or changes in traffic control may be needed to address the reported crash types.
- US 197/I-84 Westbound Ramps (Intersection #32)
    - Three of the six reported crashes were angle or turning movement related. No exclusive left-turn or right-turn lanes are provided along any approach to the intersection. Turn lanes or changes in traffic control may be needed to address the reported crash types.
- Webber St/W 2nd Street (Intersection #10)
    - 14 crashes were reported at the intersection over the 5-year period, including 10 crashes caused by angle or turning movement. A majority of these crashes involve a northbound left-turn vehicle. Converting the northbound left-turn phase to protected only phasing may be needed to address reported crash types.
- US 197/Bret Clodfelter Way (Intersection #33)
    - 5 crashes were reported at this intersection over the study period, all of them including angle or turning movement collisions where the driver was cited as not yielding right-of-way. Turn lanes or changes in traffic control may be needed to address the reported crash types.

Increases in congestion associated with the forecast employment and population growth could affect crash patterns observed at the aforementioned intersections and throughout the City. Based on input from the Technical and Public Advisory Committee members, additional safety improvement needs identified for mitigation include:

- W 6th Street from River Road to Chenoweth Loop Road and from Hostetler Street to Snipes Street

- A two-way left-turn lane is provided on W 6th Street from Snipes to Webber Street, but is not provided along this segment of W 6th Street. A TWLTL is expected to reduce left-turn and rear-end crashes related to traffic turning at public and private accesses.

- As shown in Figure 4-5, there were 27 crashes along the segments of W 6th Street where no TWLTL or left-turn lane exists today. Of these 27 crashes, the majority were rear-end crashes (14) or angle/left-turn crashes (12). Of the 14 rear-end crashes, 10 occurred in the northbound direction.

- 1st Street/Union Street
  - At this rail crossing, southbound traffic turning left onto 1st Street has the potential to create a queue across the railroad tracks during peak periods of vehicular traffic. (See Exhibit 4-1)

- 1st Street/Madison Street
  - 1st Street parallels the railroad and intersects with Madison Street at the railroad crossing. Because the existing traffic gate blocks the northbound lane along Madison Street, the geometry of the intersection allows vehicles attempting an eastbound left-turn movement from 1st Street to avoid the traffic gate when a train is present. (See Exhibit 4-2)

Exhibit 4-1. UPRR Railroad Crossing at Union Street

Exhibit 4-2. UPRR Railroad Crossing at Madison Street

Reported Crash History along W 6th Street
January 1, 2010 to December 31, 2014
The Dalles, Oregon

Figure
4-5

Oregon Department of Transportation

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TRANSPORTATION ENGINEERING/PLANNING

APG

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Data Source: Wasco County
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Oregon Department of Transportation

\\kittelson.com\lsi\H_Portland\proj\lie\18495 - The Dalles TSP\gis\F4-5 crash along 6th St.mxd - mludat - 8:37 AM 1/19/2016

- E 10th Street/Thompson Street
    - While projected to satisfy the City and ODOT's intersection capacity standard, stakeholder comments indicate the Old Dufur Road skewed approach and the undefined nature of the intersection contribute to driver confusion and influence the perceived safety of pedestrians and bicyclists (see Exhibit 4-3). The existing configuration includes stop sign control on the northbound Thompson Street and westbound East 10th Street approaches.
- E 2nd Street/US 30
    - The intersection has eastbound and westbound free-flow through movements; however, the eastbound left-turn, westbound right-turn, and southbound movements are all stop-controlled. Westbound vehicles along US 30 are shifted to the north to allow for an easier eastbound left-turn movement onto East 2nd Street. Exhibit 4-4 illustrates the existing intersection configuration.
    - The current intersection has drainage issues and lacks storm inlets.

Exhibit 4-3. Existing Alignment at E 10th Street/Old Dufur Road/Thompson Street Source: Google Maps

Exhibit 4-4. Existing Alignment of US 30/State Road (E 2nd Street) Source: Google Maps

ODOT ARTS Program

In addition to the projects listed above, the ODOT All Roads Transportation Safety (ARTS) program has programmed systemic sign upgrades and illumination along US 197 and West 6th Street.

Bicycle Needs

Bicycle needs were evaluated at a qualitative level in the context of future system needs.[7] The Dalles Bicycle Advisory Committee provided extensive feedback and guidance related to bicycle system needs. The Advisory Committee feedback was reviewed along with those bicycle facilities identified in Chapter 3 as having a bicycle level of traffic stress (LTS) rating of 3 or 4[8].

Downtown Bicycle Considerations

Bicycle corridor needs through the downtown area were noted in light of the lack of existing facilities on the East 2nd Street and East 3rd Street corridors. Given current right-of-way and building constraints in the downtown area, opportunities to widen East 2nd Street or East 3rd Street to provide dedicated bicycle facilities are limited. While many cyclists share the roadway with motor vehicles, there is a need to accommodate bicycle travel for a wider range of users through downtown.

East-West Bicycle Connectivity Considerations

The existing conditions analysis documented that there are limited east-west bicycle connections through The Dalles. The northwest side of the City has several schools, a new transit center (under construction on West 7th Street), a new aquatic center, and may be home to the Gorge Youth Center in the future. A high priority has been placed on providing safe and efficient bicycle facilities between these locations and to residential areas.

Input from The Dalles Ad-Hoc Bicycle Advisory Committee identified several specific needs, including new bicycle routes and right-of-way for multi-use paths based on their discussion during a November 18, 2015 meeting. The needs are generally illustrated in Figure 4-6.

Pedestrian Needs

Within The Dalles, sidewalks are provided on one or both sides of some of the arterials and collectors, as summarized in Chapter 3. Generally, sidewalks are provided on both sides of the street throughout The Dalles Historic Downtown and on at least one side of residential streets south of downtown. Ideally, future plans for improvements to the pedestrian system should focus on strategic improvements to improve east-west connectivity throughout The Dalles and connectivity between

[7] Future forecast volumes are not expected to increase to a great enough degree on a typical weekday to warrant a future conditions evaluation of bicycle level of traffic stress.

[8] Bicycle needs aim to reduce the LTS to a rating of 2, which is considered appealing to a majority of the bike-riding population and therefore, is the desired target on most arterials and collectors.

residential areas and schools as identified in the Safe Routes to School (SRTS) Action Plans, and trail improvements to complete The Dalles Riverfront Trail.

Pedestrian needs identified to date include:

- Areas to the west of Webber Street (and south of I-84) and areas east of Thompson Street generally have the fewest pedestrian facilities. The areas to the west of Webber Street in need of pedestrian facilities have some key attractors and generators (school, transit center, and planned youth center).
- Given it is one of a few east-west arterials in The Dalles, pedestrian improvements to 10th Street and/or 7th Street (West of Cherry Heights Rd) would provide an east-west pedestrian route and align with future bicycle route needs.
- Improvements to the shared-use paths within The Dalles are needed.
    - The majority of The Dalles Riverfront Trail is completed, but a workgroup is tasked with identifying options to complete two short missing segments.
    - Additional shared-use paths along Chenowith Creek and Mill Creek, were identified in the 2006 TSP, but have not been completed. Constructing new accesses is needed in the future.
- Needs previously identified through SRTS plans include:
    - Sidewalk and sidewalk connections around Chenoweth Elementary on W 10th Street, W 7th Street, Hostetler Street, and Chenowith Loop Road
    - Sidewalk and sidewalk connections around Dry Hollow Elementary on E 16th Place and E 19th Street – add sidewalk on side with gravel up Dry Hollow
    - Intersection signage and pavement markings, including crossing warning signs and markings at:
        - West 10th Street/Hostetler Street (Chenowith Elementary)
        - East 16th Place/East 19th Street/Dry Hollow Road (Dry Hollow Elementary)
        - West 14th Street/Bridge Street (Colonel Wright Elementary)
        - West 14th Street/Trevitt Street (Colonel Wright Elementary)
        - West 16th Street/Bridge Street (Colonel Wright Elementary)
        - West 16th Street/Trevitt Street (Colonel Wright Elementary)

Transit Forecast and Needs

To assess the potential need for fixed-route transit in The Dalles, population and employment densities, Wasco County CTP findings, CAT Hood River-The Dalles-Portland ridership and on-off data and on-board surveys, and LINK dial-a-ride ridership and origin-destination data were analyzed.

Transit Supportive Densities

An area is generally considered transit supportive if one of the following thresholds is met:

- population density of 3 households/gross acre or more; or,
- job density of 4 employees/gross acre.

High employment density areas include Downtown, CGCC, and Mid-Columbia Medical Center. Future high employment density is anticipated along River Road and the Lone Pine region; however, the densities are anticipated to be very low due to the large parcel areas. Population densities are highest in the northwestern region and central areas of the City. Increases are expected in the central and eastern area of the City. Most areas of town are considered transit supportive, with the exception of several residential parcels along W 10th Street and Scenic Drive.

Wasco County CTP Findings

The Mid-Columbia Economic Development District (MCEDD) prepared the 2016-2019 Wasco County Coordinated Transportation Plan (CTP) to meet state and federal requirements for Special Transportation Fund (STF) agencies. The CTP looks for service needs and prioritizes improvements to provide a strategy for financial resource investment, to improve transportation services for certain populations, and to guide acquisition of funds and grants. While the CTP analyzed countywide CTP transportation services, it offers useful insights to the needs of The Dalles. This section summarizes needs and proposed strategies and key destinations in The Dalles.

Needs and Proposed Strategies

The CTP identified transit needs and proposed strategies to address these needs for target populations including seniors, persons with disabilities, low income individuals, and limited English proficiency individuals. The complete needs and strategies assessment can be found in Attachment B. Key needs that can be addressed with fixed-route service or should be considered in planning for fixed-route service include the following:

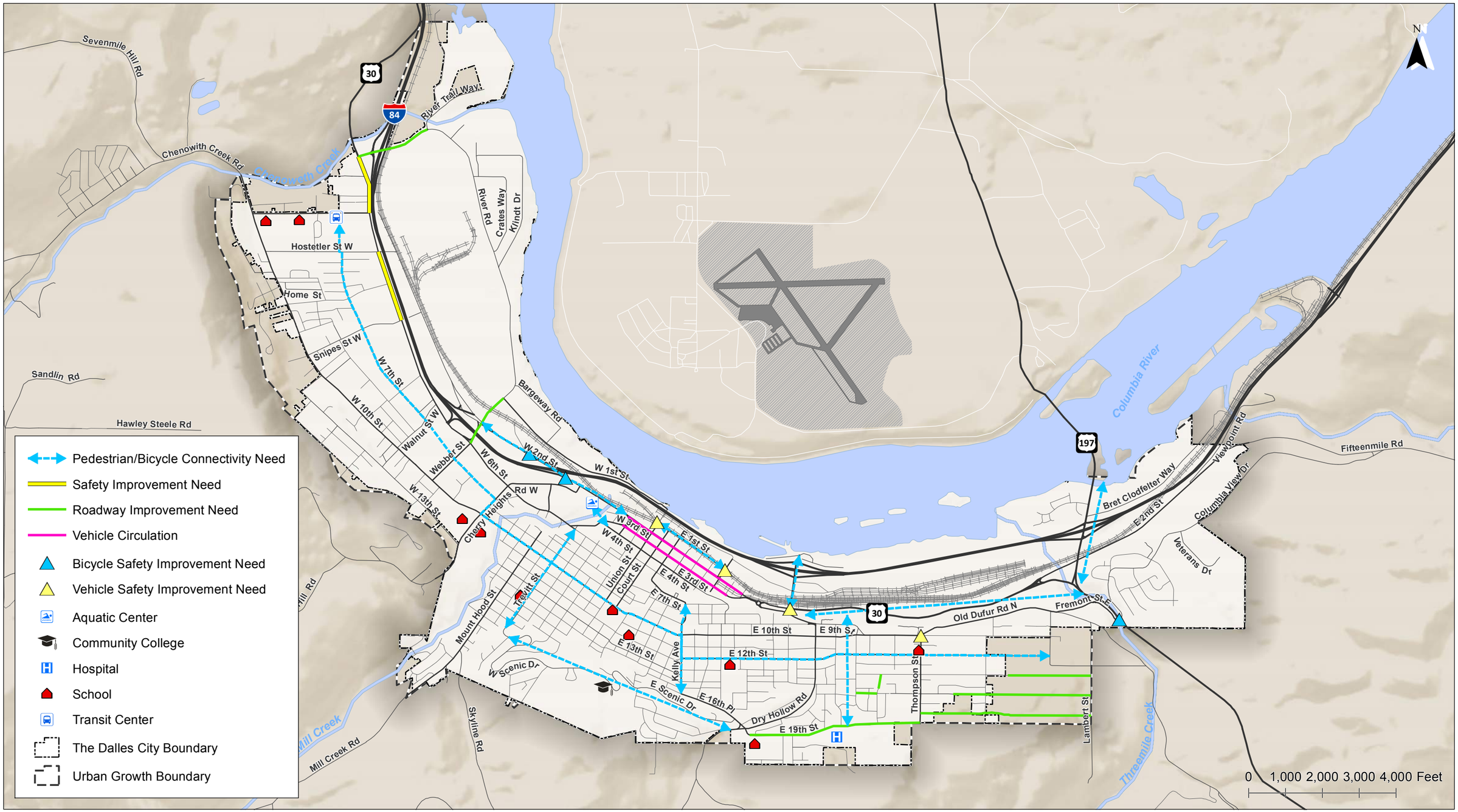
- Access to shopping – Serving shopping destinations with fixed-route service would address this need and increase likelihood of ridership.
- Address employment transportation – Ensure fixed-route service connects to areas of dense populations and jobs.
- Provide access to affordable public transportation during early morning and evening peaks, as well as weekends – Assess service hours for fixed-route service.
- Address scheduling difficulties presented by need for LINK's 24-hour notice and 30-minute pick-up window – Plan stops near major LINK origins to provide regular, predictable service.
- Other considerations
    - Collaborate with Human Services providers – Ensure Human Services Agency is involved in fixed-route development.

- Funding – Leverage state and Federal grants in establishing fixed-route service, as local funding is limited.
- Affordable fares – Maintain low fares for fixed-route service.
- Address cash/exact change only system – Explore new fare payment system and monthly pass options.
- Improve bilingual marketing – Provide information, materials, and outreach in several languages to ensure limited English proficiency populations' needs are addressed.
- Address safety and security concerns – Extend Travel Ambassador program to fixed-route service. The Travel Ambassador program provides one-on-one assistance to travelers in determining services and routing information; allowing bus drivers to focus on operating the bus and providing extra attention to onboard safety concerns.

SUMMARY OF NEEDS

Overall, findings indicated interest from all geographic regions of the city and from community members of varying demographics. High ridership on existing services, expressed interest from survey respondents, and high-priority destinations indicate a demand for fixed-route transit service in The Dalles.

The preliminary needs identified include improvements to pedestrian and bicycle facilities to enhance east-west connectivity throughout the City and between key attractors and destinations. The needs also consider intersection capacity improvements, vehicular connectivity, and safety improvements. Alternatives to address the identified needs are discussed in Chapter 5, with additional information on the evaluation of the alternatives.



Future Needs
The Dalles, Oregon

Figure
4-6

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

Oregon Department of Transportation

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Chapter 5 Alternatives Analysis

5. ALTERNATIVES ANALYSIS

As summarized in Chapter 3 and Chapter 4, the greatest transportation needs within The Dalles relate to traffic operations, safety, and multimodal facilities. Chapter 5 describes how projects were identified to address existing and future needs and identifies alternatives, where applicable, to address these needs. The alternatives are grouped by project type to allow for evaluation and prioritization of projects that address each of the key areas of need. Only project locations with multiple alternatives are presented in this Chapter. The full list of projects is provided in Chapter 6.

EVALUATION CRITERIA

Evaluation criteria were developed to provide a qualitative process to evaluate alternatives relative to the TSP goals and objectives outlined in Chapter 2. The rating method used to evaluate the alternatives is described below.

- Most Desirable: The concept addresses the criterion and/or makes substantial improvements in the criteria category. (+2)
- Moderately Desirable: The concept partially addresses the criterion and/or makes some improvements in the criteria category. (+1)
- No Effect: The criterion does not apply to the concept or the concept has no influence on the criteria. (0)
- Least Desirable: The concept does not support the intent of and/or negatively impacts the criteria category. (-1)

In the alternatives screening, the criteria were not weighted; instead, the ratings were used to inform discussions about the benefits and tradeoffs of each alternative.

Table 5-1 presents the evaluation matrix that was used to qualitatively evaluate the recommendations and alternatives described in this chapter.

Table 5-1. Evaluation Matrix

Criteria Number	Evaluation Criteria	Evaluation Measures
Goal 1: Safety and Mobility - Ensure a safe and efficient transportation system for all users in a state of good repair.		
1A1	Estimated number of fatal or serious injury crashes.	To what extent does the alternative reduce the estimated frequency of fatal and serious injury crashes? Whenever possible, estimate the change in predicted crash frequency using Safety Performance Functions from the Highway Safety Manual calibrated for Oregon and/or crash modification factors (CMFs) approved by ODOT for use in the All Roads Transportation Safety (ARTS) program
1A2	Estimated number of bicycle and pedestrian related crashes.	To what extent does the alternative reduce the estimated frequency of pedestrian and bicycle related crashes? Whenever possible, measure using reliable crash modification factors (CMFs) for estimating relative change in predicted crash frequency.
1B1	Number of conflict points between all modes of travel including crossing points for pedestrians and bicyclists along major arterials and vehicular at-grade rail crossings.	To what extent does the alternative increase safety by reducing vehicle to vehicle, vehicle to rail, vehicle to pedestrian/bicycle, or pedestrian/bicycle to pedestrian/bicycle conflict points? Measured as relative impact between alternatives in regards to reducing the number of conflict between modes and speed differential. For example, installing raised medians to provide a physical barrier between modes at intersections.
1B2	Intersection visibility and sight distances available to motorists, pedestrians, and bicyclists at intersections and key decision points.	To what extent does the alternative improve sight distance for all system users, increasing available time to identify and react to potential conflicts? Measured as relative impact between alternatives for providing adequate sight distance based on desired operating speeds.
1C1	Percent of study intersections meeting applicable operational performance measures.	To what extent does the alternative mitigate or improve operational performance relative to applicable targets and standards? Measured by the degree to which an alternative mitigates a failing condition or improves operations.
1D1	Percentage of acceptable pavement conditions based on roadway classification or extended lifespan of pavement.	To what extent will the project preserve or extend the life of the existing pavement condition? Measured by whether or not the project improves the pavement condition index.
1E1	Compliance with agency standards or implementation of industry best practices.	To what extent does the alternative improve the transportation facility to meet or comply with agency design standards or implement an industry best practice? Measured by whether or not an alternative improves the transportation facility to meet or comply with agency design standards or implements an industry best practice.

Criteria Number	Evaluation Criteria	Evaluation Measures
Goal 2: Expand affordable, accessible and multimodal options to improve connections for all users of the transportation system to jobs, services and activity centers		
2A1	Potential impact on bicycle and pedestrian volumes.	To what degree may the alternative increase pedestrian and bicyclist travel on appropriately-designed facilities? Measured by potential increase in pedestrian and bicyclist volume relative to baseline conditions.
2A2	Compliance with "Complete Streets" concept within urban areas, and appropriate locations within the urban fringe.	To what extent does the alternative provide a "Complete Street" within urban areas, and appropriate locations within the urban fringe? Measured by whether or not an alternative adopts a "Complete Street" approach or incorporates "Complete Street" components within urban areas, and appropriate locations within the urban fringe?
2B1	Impact on system-wide connectivity and availability of more direct routes for each mode of transportation.	To what extent does the alternative improve the connectivity of the existing transportation system or provide a more direct route? Measured by the extent each alternative increases connectivity and provides facilities for each mode. Connectivity includes filling a gap in an existing route and designing new facilities that provide continuous routes between key destinations.
2B1	Miles of designated facilities for bicyclists and pedestrians provided.	To what extent does the alternative increase the number of miles of pedestrian and bicycle facilities (on-street and off-street)? Measured by potential expansions of the pedestrian and bicycle systems.
2C1	Impact on transit ridership.	To what degree does the alternative promote transit ridership or make transit a more viable option for all users? Measured by whether or not an alternative is able to increase transit ridership.
2D1	Impact of transportation project on low income and minority populations.	To what extent does the alternative affect low income and minority populations? Measured as relative ability of each alternative to spread the impacts and benefits of transportation improvements equitably to all populations.
2D2	Viability of non-auto travel.	To what degree are transportation facilities (transit service, sidewalks, bicycle lanes, separated mixed-use paths, parks) for non-auto travelers integrated into the alternative? Measured relative to facilities and integration present in baseline conditions.

Criteria Number	Evaluation Criteria	Evaluation Measures
Goal 3: Integration - Integrate land use, financial, and environmental planning to prioritize strategic transportation investments and preserve The Dalles' identity.		
3A1	Compliance with local land use plans, comprehensive plans, and regional transportation plans.	To what extent does the alternative comply with local or regional land use, comprehensive, and transportation plans? Measured by whether or not an alternative is identified or compatible with an adopted plan.
3B1	Incorporation of Transportation Demand Management (TDM) Strategies.	To what extent are TDM strategies being implemented to improve the transportation system? Measured by the use of TDM strategies incorporated into the alternative.
3C1	Cost/benefit analysis and potential impact on forecasted expenditures.	To what degree does the alternative leverage a positive return on investment? Measured by the calculated cost/benefit analysis and alignment with current funding projections.
3D1	Impacts on air quality, environmentally sensitive areas, and water and soil quality.	To what degree does the alternative impact environmentally sensitive areas? Measured by the potential adverse impacts of the alternative to the environment.
3E1	Incorporation of ITS technology.	To what extent is ITS technology being implemented for system improvements? Measured by the use of ITS devices relative to Baseline.
Goal 4: Economic Development - Build and maintain the transportation system to support economic vitality in the City.		
4A1	Roadway geometry accommodates freight movement where it is warranted.	To what extent does the alternative accommodate the design vehicle for designated freight routes? Measured by whether or not an alternative is able to accommodate the design vehicle without potential adverse impacts to other modes.
4B1	Traffic operations performance on designated freight routes.	To what extent does the alternative provide acceptable performance along designated freight routes? Measured by operational performance along freight routes.
4B2	System-wide congestion and travel time.	To what extent does the alternative relieve congestion or reduce travel times on the transportation system? Measured by whether or not an alternative relieves congestion or reduces travel time.

Criteria Number	Evaluation Criteria	Evaluation Measures
4C1	Impact on intermodal connectivity and availability of air, rail, barge and freight facilities.	To what extent does the alternative improve the intermodal connectivity of the existing transportation system or provide better access to air, rail, barge or freight facilities? Measured by the extent to which each alternative increases intermodal connectivity and provides better connections to air, rail, barge and freight facilities.
4D1	External funding opportunities leveraged and financially responsible development proposals.	To what extent does the alternative leverage other private funding sources or include transportation improvements as part of a development proposal? Measured by whether or not an alternative leverages additional funding sources or is included as part of a development proposal.
4E1	Potential increased attraction to desired businesses and developers.	To what extent does the alternative eliminate roadblocks to development caused by the transportation system? Measured by the critical transportation improvements funded relative to Baseline.

ALTERNATIVES ANALYSIS

Roadway Improvements

Roadway improvements were identified for the major roadways with proposed functional classification changes and new connections identified in the functional classification map. These roads may be serving or expected to serve higher traffic volumes than they were originally intended to serve. These upgrades cannot be conducted as part of regular maintenance activities and may include activities such as widening or full reconstruction of a roadway. As multiple projects were not considered at each location, the Roadway Improvements are presented in Chapter 6.

Operational Improvements

Preliminary intersection improvement alternatives were identified throughout the City, based upon operational, safety, or geometric needs. The alternatives have been evaluated to confirm they will meet City and ODOT operational performance thresholds based on forecast 2036 traffic conditions.[9]

[9] Although future deficiencies were identified in Technical Memorandum #4 using the 2035 forecast traffic conditions (the 20-year horizon from the existing conditions analysis conducted with 2015 traffic counts), future alternatives were evaluated using 2036 forecast volumes to result in a Plan that serves the 20-year horizon from the expected adoption year of 2016.

The City's level of service (LOS) standard of "D" correlates to a maximum delay of 55 seconds/vehicle for signalized intersections and 35 seconds/vehicle on the minor street approach at unsignalized intersections.

Table 10-1 of the ODOT *2012 Highway Design Manual* (HDM) provides volume-to-capacity (v/c) ratios used to assist in evaluating future alternatives on state highways. Oregon Highway Plan (OHP) mobility targets were used to determine future deficiencies, as summarized in Chapter 4. However, HDM standards should be considered when potentially investing significant funds to enhance the capacity of the roadway system. HDM standards are not applicable when addressing safety issues as they are not significant capacity enhancements. Table 5-2 summarizes the respective ODOT performance requirements applicable to the study intersections.

Table 5-2. Summary of ODOT Intersection Performance Standards

ID Number	Street 1	Street 2	Traffic Control[1]	ODOT V/C Target*	HDM 20-year Design Mobility Standards
2	US 30	River Road	TWSC	0.90	0.80
3	I-84 EB Ramps	River Road	TWSC	0.85	0.65
4	I-84 WB Ramps	River Road	TWSC	0.85	0.65
7	I-84 EB Ramps	W 6th Street	TWSC	0.85	0.65
24	Brewery Overpass Road	US 30	TWSC	0.90	0.80
25	Brewery Overpass Road	I-84 EB Ramps	TWSC	0.85	0.65
26	Brewery Overpass Road	I-84 WB Ramps	TWSC	0.85	0.65
28	East 2nd Street	US 30	TWSC	0.90	0.80
29	US 197	US 30	TWSC	0.85	0.75
30	US 197	Fremont Street/ Columbia View Drive	TWSC	0.90	0.75
31	US 197	I-84 EB Ramps	TWSC	0.85	0.65
32	US 197	I-84 WB Ramps	TWSC	0.85	0.65
33	US 197	Bret Clodfelter Way	TWSC	0.90	0.75
34	US 197	Lone Pine Blvd	TWSC	0.90	0.75

[1]TWSC: Two-way stop-controlled (unsignalized)
*From the Oregon Highway Plan (For the critical movement at unsignalized intersections)

Intersection projects are summarized in Table 5-3 and their locations are illustrated in Figure 5-1. A description of the need for individual projects and improvement elements is presented after the referenced tables and figures. The table also includes a column indicating whether the project is related to other projects in this Plan. For example, US 197/US 30 was identified for an intersection improvement based on both operational and safety needs. It is included in both sections but will only result in one project.

Several intersection projects should be coordinated with one another. For example, the J-turn at US 197/Fremont Street may only be successful if it is coordinated with a roundabout to the north to allow

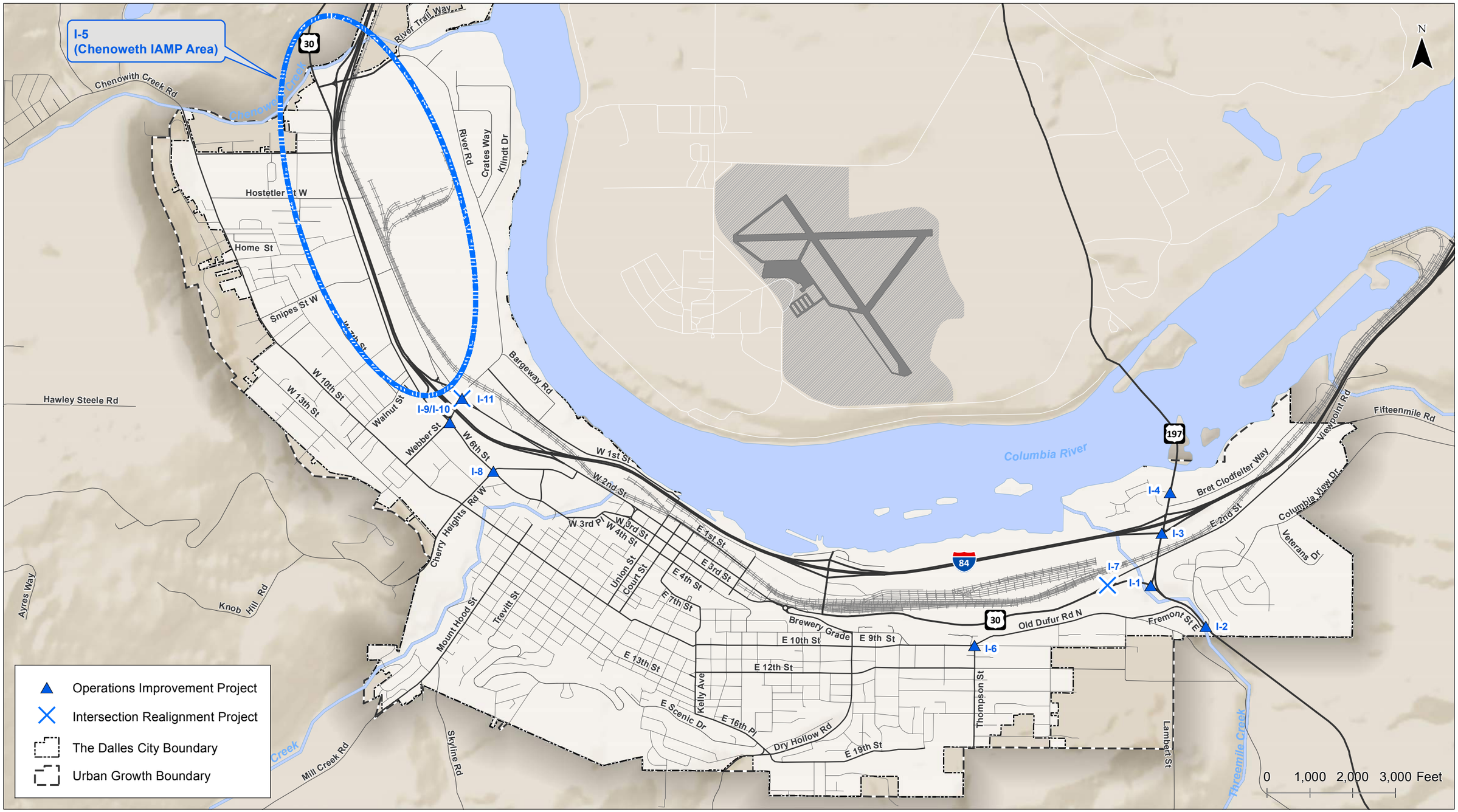
full access throughout the US 197 corridor. Recommended coordination is also indicated below each project description.

When multiple alternatives are available for a specific location, the evaluation criteria described earlier in this chapter are used to evaluate each alternative. The full evaluation criteria are provided in *Technical Appendix 5,* and a summary of the results by each project goal is provided at the end of each section below when relevant. The evaluation criteria and the input received from the advisory committee and public were used to determine a preferred alternative, which is described in *italic text*.

Table 5-3. Intersection Alternatives

Project No.	Project Name	Project Description	Related Projects	Cost Estimate[1]	Source	Potential Funding Source			
						ODOT	City	Private	County
I-1a	Intersection Traffic Control Improvements at US 197/US 30	Install a traffic signal to increase capacity.	S-1	$1.5 to $2.0 million	KAI	✓			
I-1b	Intersection Traffic Control Improvements at US 197/US 30	Install a single-lane roundabout to increase capacity.	S-1	$2.0 to $2.5 million	KAI	✓			
I-2a	Intersection Traffic Control Improvements at US 197/Fremont Street/ Columbia View Drive	Restrict left-turns from minor-street approaches with raised median and construct median U-turn to south on US 197 (install a J-turn) to improve safety.	S-2	See Project S-2	KAI	✓	✓		
I-2b	Intersection Traffic Control Improvements at US 197/Fremont Street/ Columbia View Drive	Install a single-lane roundabout to increase capacity and improve safety.	S-2	>$2 million	KAI	✓	✓		
I-2c	Intersection Traffic Control Improvements at US 197/Fremont Street/ Columbia View Drive	Install an overpass/interchange over US 197 and improve safety.	S-2	$10 million	Previous TSP	✓	✓		
I-3	Intersection Traffic Control Improvements at US 197/ I-84 EB Ramps	Install a traffic signal to increase capacity.	S-8 S-9	$1.25 to $1.5 million	KAI	✓		✓	
I-4	Intersection Traffic Control Improvements at US 197/ Lone Pine Boulevard	Construct single-lane roundabout.	None	$1.5 to $2.0 million	Lone Pine TIA	✓		✓	
I-5	I-84 Chenoweth Interchange Area Management Plan (IAMP)	Implement projects from the I-84 Chenoweth Interchange Area Management Plan.	None	--	IAMP	✓	✓	✓	
I-6a	Intersection Improvements at Thompson St/E 10th St/ Old Dufur Road	Convert the existing two-way stop controlled configuration to two offset "T" intersections.	None	$85,000	KAI		✓		
I-6b	Intersection Improvements at Thompson St/E 10th St/ Old Dufur Road	Convert the existing two-way stop controlled configuration to two mini roundabouts.	None	$175,000	KAI		✓		
I-6c	Hybrid of Alternatives I-6a and I-6b	Convert the existing intersection to an off-set "T" and a mini-roundabout.	None	$130,000	KAI		✓		
I-6d	Intersection Improvements at Thompson St/E 10th St/ Old Dufur Road	Convert the existing two-way stop controlled configuration to all-way stop and provide curb and sidewalks on all approaches.	None	$40,000	KAI		✓		
I-7	Intersection Realignment at E 2nd St/US 30	Realign this intersection into a more traditional T-intersection.	None	$100,000	Previous TSP	✓			✓
I-8	Signal Modifications and Lane Reallocation at Cherry Heights Rd/W 6th Street	Convert the southbound approach to a shared left-through lane and an exclusive right-turn lane and modify the signal to provide permitted left-turn phasing. Extend the northbound left-turn lane on Cherry Heights Rd to accommodate future queue lengths.	None	$20,000	KAI		✓		
I-9	Signal Timing Modifications at W 2nd St/ Webber Road and W 6th St/Webber Road	Modify signal phasing to provide split phasing in combination with signal coordination for northbound and southbound movements.	None	$20,000	KAI	✓	✓		
I-10	Increase Queue Storage at W 2nd St/ Webber Road and W 6th Street/ Webber Road	Extend the northbound right-turn lane at W 2nd Street and the southbound right-turn at W 6th Street as far as possible without impacting the I-84 overpass structure.	None	$100,000	KAI	✓	✓		
I-11a	Realign Webber Street approaches at W 2nd Street and W 6th Street (Phase 1)	Realign north and south approaches to provide dedicated left-turn lanes. Modify signal timing to provide protected/permitted left-turn phasing with Flashing Yellow Arrow display.	S-5	$500,000	KAI	✓	✓		
I-11b	Realign Northbound Webber Street approach at W 2nd Street (Phase 2)	Extend northbound left-turn storage lane by widening intersection to the west	S-5	$200,000	KAI	✓	✓		

[1] Preliminary cost estimates do not include Right-of-Way and include 30% contingency.



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Intersection Alternatives
The Dalles, Oregon

Figure
5-1

Oregon Department of Transportation

Kittelson & Associates, Inc.
Transportation Engineering/Planning

APG

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

Project I-1: Intersection Traffic Control Improvements at US 197/US 30 (Intersection #29)

The southbound left-turn movement is forecast to exceed ODOT's v/c ratio targets in 2035 and exceed capacity on the southbound US 197 approach. In addition, the intersection exceeded the statewide critical crash rate. Capacity could be increased by installing a signal or by constructing a roundabout. Each would have a varying level of costs and impacts on operations and safety. The relative difference in cost between the two alternatives generally reflects the size of the intersection and the amount of pavement required.

Forecast 2036 operations for the no-build condition were compared to a signalized control alternative and a roundabout improvement alternative. The results are summarized in Table 5-4. The roundabout was analyzed with single lanes on all approaches and the signal was analyzed assuming existing lane configurations.

Table 5-4. US 197 at US 30 – 2036 Operational Summary

Intersection Scenario	Eastbound			Westbound			Southbound		
	Delay (sec/veh)	v/c ratio	Queue (ft)	Delay (sec/veh)	v/c ratio	Queue (ft)	Delay (sec/veh)	v/c ratio	Queue (ft)
No Build	8.1 (A)	0.21	25	-	-	-	>50 (F)	>1.0	310
Signal Control Alternative	15.1 (B)	0.70	200	16.9 (B)	0.33	75	18.2 (B)	0.63	150
Roundabout Alternative	13.9 (B)	0.62	100	10.9 (B)	0.47	75	8.5 (A)	0.42	50

*Note: Performance measures (delay, LOS, v/c ratio, 95th percentile queue) reported for the critical lane group on each approach

As shown in Table 5-4, both alternatives are expected to meet City and ODOT performance thresholds. The signalized alternative and roundabout are both projected to operate at LOS B or better during the 2036 PM peak hour. Queue lengths are expected to be less for the roundabout configuration compared to the signalized configuration. Operational Analysis worksheets are provided in *Technical Appendix 5*.

Consistent with the ODOT roundabout policy, further discussion of a roundabout would need to include a range of stakeholders given US 197 serves as a critical freight route, particularly for over-dimensional loads. As discussed as part of roundabout evaluations on other state highways in Oregon, consideration of a gated central "pass-through" lane could be useful in accommodating these over-dimensional users, while still maintaining the safety a roundabout provides for other highway users.

If a traffic signal were to be installed at this intersection the design would need to provide special accommodation of the rural nature of the highway and the expectancy of drivers to encounter a traffic signal. Similar to the roundabout, the design of the traffic signal would need to include a high degree of roadside context to help inform approaching drivers of the potential need to stop, which could include dynamic feedback signs, advance warning signs, longer all-red and yellow signal clearance intervals, and changes to the physical approach geometry and aesthetics. Installation of a traffic signal requires that the signal meet warrants outlined in the Manual on Uniform Traffic Control Devices (MUTCD) and is subject to State Traffic Engineer review and approval.

Alternatives Evaluation and Recommendation

Alternatives 1a (traffic signal) and 1b (roundabout) were evaluated against the evaluation criteria based on the project goals and objectives. The results are summarized in Table 5-5; the full evaluation criteria results are provided in *Technical Appendix 5.*

Table 5-5. US 197 at US 30 - Project I-1 Evaluation Criteria Summary

	Evaluation Criteria Score by Goal				
Project ID	**Goal 1: Safety and Mobility**	**Goal 2: Multimodal Options**	**Goal 3: Integration**	**Goal 4: Economic Development**	**Total Score**
Alternative I-1a (Signal)	8	1	3	6	18
Alternative I-1b (Roundabout)	12	1	2	7	22

The roundabout received positive feedback during discussions with the Public Advisory Committee (PAC) and Technical Advisory Committee (TAC) as an alternative to improve both operations and safety. In addition, the roundabout was discussed to potentially help reduce the speeds and acceleration taking place heading southbound up the grade along US 197. The roundabout could also serve as a gateway feature into the City.

Recommendation: Based on the alternatives evaluation and the public input, a roundabout is recommended as the preferred alternative at this location. The intersection is expected to continue functioning within ODOT's mobility standards during the PM peak hour for approximately 10 years under the existing two-way stop-controlled (TWSC) configuration. This project could be considered as a short-term to medium-term project based on operations, but a short-term need has been identified since it was also identified as a safety need. The design of this project should consider the fact that trucks currently use this route to gain momentum when traveling uphill on US 197 towards the landfill.

Coordination: Construction of this project should be coordinated with the recommended J-turn alternative at the intersection of US 197 at Fremont Street/Columbia View Drive because the roundabout will operate in conjunction with the J-turn to provide access to side streets and properties along the US 197 corridor.

Project I-2: Intersection Traffic Control Improvements at US 197/Fremont Street/Columbia View Drive

The eastbound and westbound approaches along Fremont Street and Columbia View Drive (Intersection #30) are forecast to exceed the City's LOS "D" standard in 2035. The eastbound approach is estimated to operate at LOS F during the future PM peak hour with the westbound approach expected to operate at LOS E. However, the intersection is expected to satisfy ODOT's v/c target.

Vehicles attempting through or left-turn movements from the side street are projected to experience the majority of the delay on the approach.

This intersection was also identified as a key intersection to improve due to safety (the intersection exceeded the statewide critical crash rate) and is a potential connection for a new school along Columbia View Drive. Project S-2 further describes the safety issue.

A J-Turn intersection provides an at-grade alternative that could effectively reduce left-turn and angle conflicts at the intersection. This project would be implemented in conjunction with a roundabout at the US 197/US 30 intersection (Project I-1). The alternative would allow right-in, right-out movements from Fremont Street and right-in, left-in, right-out movements at Columbia View Drive. The restricted turn movements would be enforced with a directional raised median. All drivers approaching the highway from Fremont Street or Columbia View Drive would make a right-turn at US 197. Traffic from Columbia View Drive could use the proposed roundabout at US 197/US 30 to make a U-turn to go south on US 197. Traffic from Fremont Street could make a U-Turn at a median opening proposed south of the intersection to return north on US 197. The U-turning traffic would be accommodated by using a bulb-out or loon at the U-turn crossover location. The loon can be sized accordingly to accommodate the selected design vehicle.

Figure 5-2 provides a conceptual sketch of a J-Turn intersection at US 197/Fremont Street/Columbia View Drive. This treatment has proven effective at reducing high-speed angle and turning-related crashes and will be discussed in further detail as part of Project S-2 in the Safety Alternatives section.

A single lane roundabout was also considered at this location. However, there are geometric constraints due to elevation that would add significant costs to the roundabout. There is a large cut area on the northeast corner of the intersection between US 197 and Columbia View Drive that would need to be filled in order to accommodate a roundabout. There are also constraints limiting the approach alignments of Fremont Street and Columbia View Drive, as illustrated by the concept sketch in Figure 5-3.

Another alternative is an overpass/interchange at this location. There are several options for the design of the overpass. One option would include maintaining the existing intersection as it is today to provide full access to US 197, while another would combine the J-turn with the overpass to reduce left-turn conflicts at the intersection of US 197/Fremont Street. For the purpose of this analysis, the overpass was analyzed without the J-turn and it was assumed that only the eastbound and westbound through movements along Fremont Street and Columbia View Drive would utilize the overpass.

The future 2036 PM peak hour operational results for the no-build scenario, J-turn, single-lane roundabout, and overpass are summarized in Table 5-6. All three alternatives are expected to improve operations over the existing stop-controlled approaches along Fremont Street and Columbia View Drive. The alternatives are also expected to meet the 20-year design-mobility standards established in the *Highway Design Manual.*

Table 5-6. US 197 at Fremont Street/Columbia View Drive – 2036 Operational Summary

Intersection Scenario	Eastbound			Northbound			Westbound			Southbound		
	Delay (sec/veh)	v/c ratio	Queue (ft)	Delay (sec/veh)	v/c ratio	Queue (ft)	Delay (sec/veh)	v/c ratio	Queue (ft)	Delay (sec/veh)	v/c ratio	Queue (ft)
No Build	55.2 (F)	0.74	125	8.0 (A)	0.03	<25	46.1 (E)	0.78	155	7.8 (A)	0.10	<25
J-Turn	11.3 (B)	0.22	25	8.0 (A)[1]	0.10[1]	<25[1]	11.2 (B)	0.30	35	7.9 (A)	0.10	<25
Roundabout	8.4 (A)	0.25	25	7.5 (A)	0.27	25	8.0 (A)	0.31	25	10.8 (B)	0.53	75
Overpass	20.1 (C)	0.35	40	8.0 (A)	0.03	<25	18.4 (C)	0.44	55	7.8 (A)	0.10	<25

*Note: Performance measures (delay, LOS, v/c ratio, 95th percentile queue) reported for the critical lane group on each approach

[1] These operations are for the northbound U-turn movement associated with the J-Turn. U-turns are not analyzed as part of the HCM; therefore, this movement was analyzed as a left-turn movement as vehicles could utilize the loon as a staging area to perform a two-stage maneuver.

Alternatives Evaluation and Recommendation

Alternatives 2a (J-turn), 2b (roundabout), and 2c (overpass) were evaluated against the evaluation criteria based on the project goals and objectives. The results are summarized in Table 5-7; the full evaluation criteria results are provided in *Technical Appendix 5.*

Table 5-7. Project I-2 Evaluation Criteria Summary

	Evaluation Criteria Score by Goal				Total Score
Project ID	Goal 1: Safety and Mobility	Goal 2: Multimodal Options	Goal 3: Integration	Goal 4: Economic Development	
Alternative I-2a (J-Turn)	7	1	1	5	14
Alternative I-2b (Roundabout)	10	2	0	5	17
Alternative 1-2c (Overpass)	8	3	0	6	17

Initially, the J-turn was well received during the discussions with the PAC/TAC members based on the ability to improve safety. However, further discussions indicated some hesitation due to the fact that the J-turn would need to be constructed in conjunction with the roundabout at US 30/US 197, increasing the total cost of the project, and it would eliminate the ability for vehicles to cross US 197 (they would need to turn right onto US 197, u-turn at the J-turn and the US 30/US 197 roundabout and turn right again). Community members felt that the overpass was the preferred solution and should be pursued if costs of the overpass are not substantially greater than that of the J-turn and downstream roundabout combined. In the near-term, safety could be increased through speed reduction techniques such as speed radar signs in combination with striping and pavement markers.

Recommendation: Based on the evaluation criteria, relative cost, and public input, an overpass is recommended in the long-term; however, a feasibility study is recommended to develop a more detailed cost estimate for the overpass that considers the amount of fill or structures needed in this location.

If cost differences between the overpass and J-turn/roundabout option are substantial, the intersection improvements at this location could be phased. The J-turn should be considered as a short-term priority project due to the safety benefits this at-grade, lower cost configuration could provide, and an overpass should be considered as a long-term solution. If the overpass were to be constructed, the J-turn could remain in place to provide access to and from US 197 while the overpass served as a connection between the City and the Columbia View Drive area. In the near-term, safety could also be increased through speed reduction techniques.

Coordination: The J-turn should be coordinated with Project I-1, the roundabout at the intersection of US 197 and US 30, which would provide an opportunity for U-turn maneuvers from Columbia View Drive. The proposed roundabout at US 197 and US 30 was also analyzed to include the new traffic distribution from the turn restrictions at the J-turn. A single-lane roundabout is still expected to provide adequate operations and meet the 20-year design-mobility standards established in the Highway Design Manual. Ideally, the roundabout and J-turn intersection improvements at US 30 and Fremont Street/Columbia View Drive, respectively, would be programmed as one project.

PROJECT I-2: CONCEPTUAL J-TURN ALTERNATIVE
US 197/FREMONT ST/COLUMBIA VIEW DR
THE DALLES, OR

Figure **5-2**

PROJECT I-2: CONCEPTUAL ROUNDABOUT ALTERNATIVE
THE DALLES, OR

Figure
5-3

Project I-3: Intersection Traffic Control Improvements at US 197/I-84 EB

- The 2035 no-build analysis projects the eastbound I-84 off-ramp volumes will exceed both the intersection's capacity and the intersection's v/c target. This intersection was also identified as a safety project and is further discussed in projects S-8 and S-9.

- This intersection is located between two bridges so any widening of US 197 would require reconstructing the 275-foot long I-84 overpass structure. An option for increasing capacity on the eastbound approach is the installation of a signal. Installation of a traffic signal requires that the signal meet warrants outlined in the Manual on Uniform Traffic Control Devices (MUTCD) and is subject to State Traffic Engineer review and approval. Roundabouts were considered at the US 197/I-84 ramp intersections, but are not recommended to move forward due to the extensive fill, reconstruction of the ramps, and widening of the two nearby overcrossings likely required.

- Intersection operations were analyzed under no-build and signalized alternatives, as summarized in Table 5-8. The signal was analyzed assuming the existing lane configurations.

Table 5-8. US 197 at I-84 EB Ramps – 2036 Operational Summary

Intersection Scenario	Eastbound			Northbound			Southbound		
	Delay (sec/veh)	v/c ratio	Queue (ft)	Delay (sec/veh)	v/c ratio	Queue (ft)	Delay (sec/veh)	v/c ratio	Queue (ft)
No Build	>50 (F)	>1.0	350	-	-	-	8.9 (A)	0.06	<25
Signal Control Alternative	12.8 (B)	0.61	175	11.0 (B)	0.65	200	8.0 (A)	0.35	100

*Note: Performance measures (delay, LOS, v/c ratio, 95th percentile queue) reported for the critical lane group on each approach

As shown in Table 5-8, the signalized alternative is expected to provide adequate operations, and the 95th percentile queue length for the southbound approach is projected to be accommodated within the length of the existing bridge. Operational Analysis worksheets are provided in Technical Appendix 5.

Alternatives Evaluation and Recommendation

The summary of the evaluation for the traffic signal alternative is provided in Table 5-9.

Table 5-9. US 197 at I-84 EB Ramps - Project I-3 Evaluation Criteria Summary

	Evaluation Criteria Score by Goal				Total Score
Project ID	Goal 1: Safety and Mobility	Goal 2: Multimodal Options	Goal 3: Integration	Goal 4: Economic Development	
Alternative I-3 (Signal)	8	2	1	7	18

Recommendation: The traffic signal alternative for project I-3 is the preferred alternative for project I-3. The eastbound left-turn movement at this intersection is expected to exceed ODOT's v/c mobility target near year 2022.

The timing and need for this improvement will likely be heavily dependent upon the build-out of the development in the Lone Pine Village area. This location was briefly discussed with the PAC/TAC members; however, a clear alternative (roundabout vs. signal) was not decided on. Due to the constraints associated with installing a roundabout at this location, a traffic signal was determined to be the preferred solution for this location.

Coordination: The improvements at this location will likely need to occur at the WB off-ramp intersection to provide consistency within the interchange area. The improvements should also consider any potential improvements along the US 197 corridor (US 30 and Lone Pine Blvd).This location should be considered as a short-term to medium-term priority project.

Project I-4: Intersection Traffic Control Improvements at US 197/Lone Pine Boulevard

While satisfying ODOT's mobility target, the Lone Pine Boulevard eastbound left-turn movement at US 197 (Intersection #34) is forecast to exceed the City's LOS D threshold. The projected delay impacts less than 50 vehicles during the weekday PM peak hour.

ODOT and the developer of the Lone Pine project have an agreement which identifies a roundabout as the appropriate solution at this intersection and to be funded by Lone Pine. The timing of the improvement is dependent on the build-out of the project and future traffic conditions.

Alternatives Evaluation and Recommendation

Table 5-10 provides a summary of the evaluation criteria scores for project I-4.

Table 5-10. US 197/Lone Pine Boulevard - Project I-4 Evaluation Criteria Summary

	Evaluation Criteria Score by Goal				Total Score
Project ID	Goal 1: Safety and Mobility	Goal 2: Multimodal Options	Goal 3: Integration	Goal 4: Economic Development	
Alternative I-4 (Roundabout)	8	2	3	5	18

Recommendation: The appropriate solution identified for this location is a roundabout. The PAC/TAC members identified that development will drive the need for an intersection improvement at this location. This location is not expected to exceed ODOT's mobility target over the 20-year period. This project should be considered as a long-term priority or Vision Project.

Considerations: Consideration should be given to the potential for queue spillback into the upstream intersections of Bret Clodfelter Way and the westbound I-84 off ramp in the near- and mid-term. Currently, there is approximately 300 feet and 500 feet between the intersections, respectively.

Intersection Realignment

Several intersections within The Dalles have skewed approach geometry, which has been correlated to increased crash potential. The following locations have unique geometry that could be considered for realignment.

Project I-6: Intersection Improvements at Thompson Street/East 10th Street/Old Dufur Road

This intersection (Intersection #27) does not exceed the City or ODOT's operational standard but was identified as an issue via community feedback. The skew at this intersection creates sight distance issues for drivers facing westbound when approaching the intersection from East 10th Street or Old Dufur Road. The existing configuration includes stop sign control on the northbound Thompson Street and westbound East 10th Street approaches.

The following alternatives could improve operations and safety at this intersection:

a) Realign the westbound Old Dufur Road approach to intersect E 10th Street at a 90-degree angle, creating two off-set "T" intersections, as shown in Figure 5-4.
b) Construct two mini roundabouts, as shown in Figure 5-5.
c) Construct an off-set "T" intersection and a mini-roundabout, as shown in Figure 5-6.
d) Conversion of the TWSC variation to an all-way stop-control (AWSC) configuration with new sidewalks and crossing treatments.

Alternatives Evaluation and Recommendation

This intersection was identified to be an issue for all roadway users (vehicles, pedestrians, and bicyclists) due to a lack of sidewalks, crosswalks, and sight distance. Two alternatives were initially discussed at this location with the TAC/PAC. The first included two offset T-intersections. The second included two roundabouts. Based on PAC/TAC feedback, it was suggested to create an additional concept that is a hybrid of the two concepts. This would include an offset T-intersection along the Thompson Street approach with Old Dufur Road and the east leg of East 10th Street tying into a roundabout, as illustrated in Figure 5-6. Table 5-11 summarizes the evaluation criteria for each alternative.

Table 5-11. Project I-6 Evaluation Criteria Summary

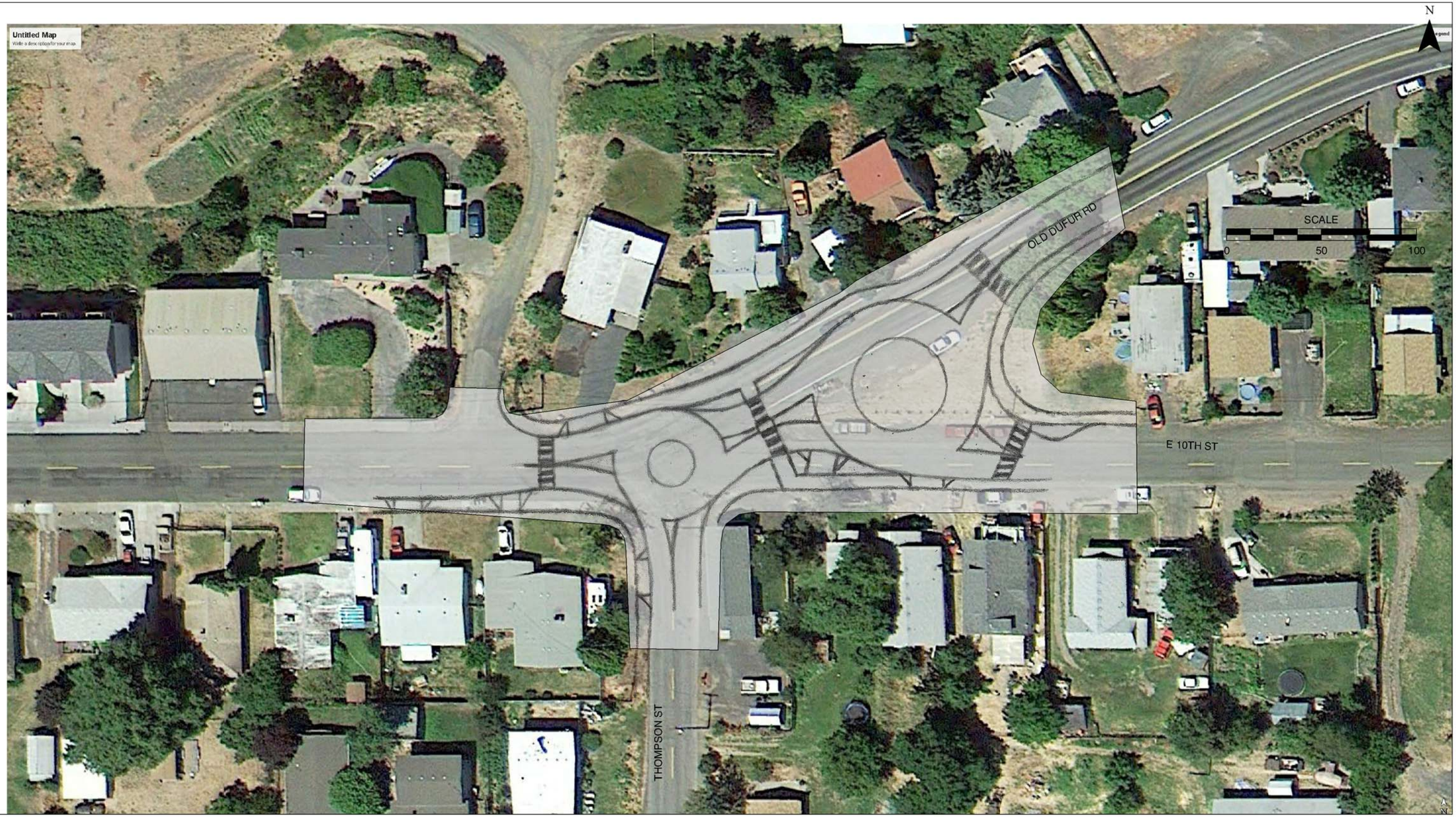
	Evaluation Criteria Score by Goal				
Project ID	**Goal 1: Safety and Mobility**	**Goal 2: Multimodal Options**	**Goal 3: Integration**	**Goal 4: Economic Development**	**Total Score**
Alternative I-6a (two off-set "T" intersections)	4	1	1	0	6
Alternative I-6b (two mini roundabouts)	10	4	1	1	16
Alternative I-6c (Hybrid of Alternatives I-6a and I-6b)	8	4	1	1	14
Alternative I-d (AWSC)	4	3	1	0	8

Recommendation: Based on the evaluation criteria and public input, the hybrid concept that includes an offset T-intersection and a roundabout is the preferred alternative.

The concept provides sidewalks, defined crossings for pedestrians, improves sight distance, and will help slow speeds making it more comfortable for bicyclists. This refined concept should be considered as a short-term to medium-term priority project.

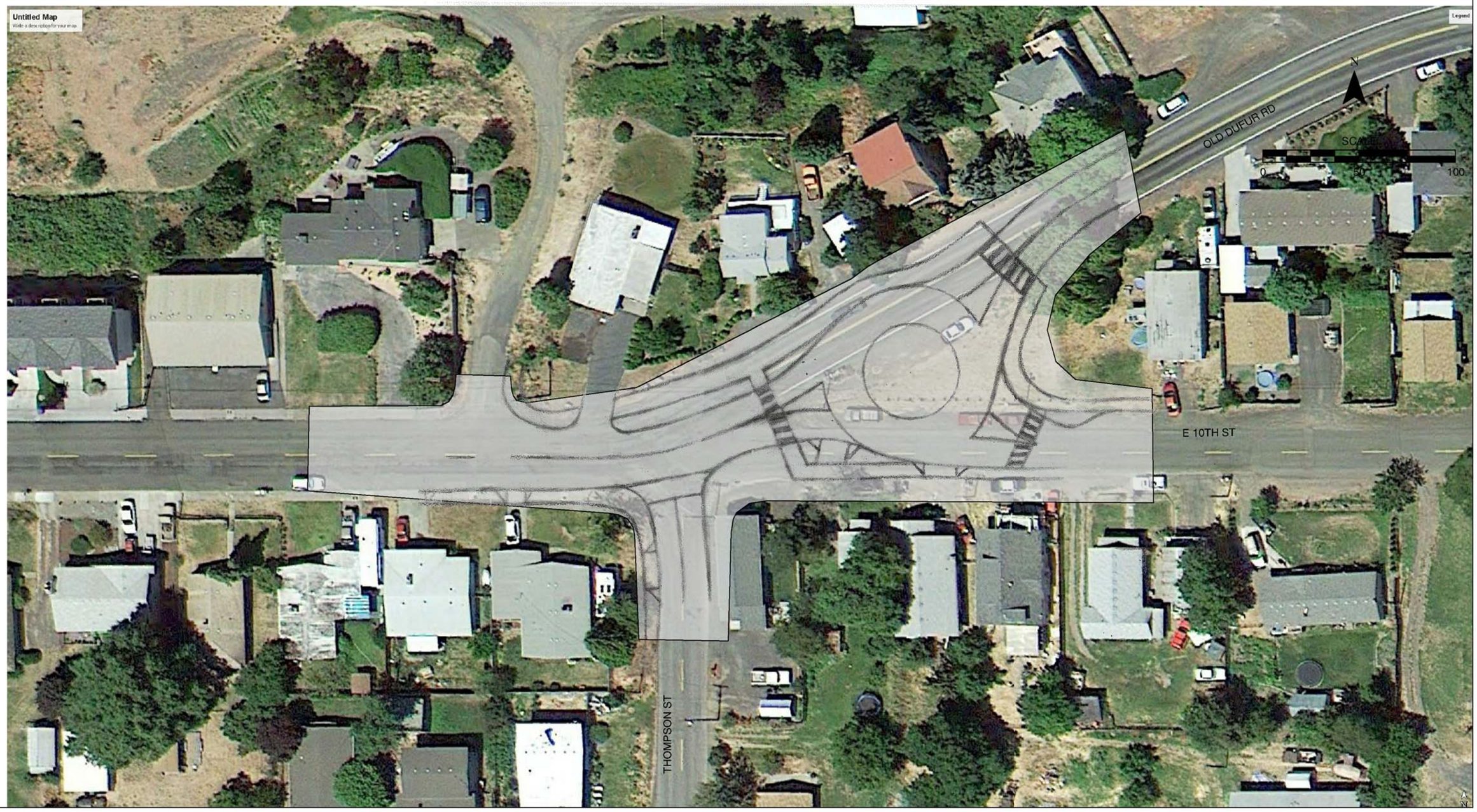
PROJECT I-6a: CONCEPTUAL OFFSET "T" INTERSECTION
THOMPSON ST/E 10TH ST/OLD DUFUR RD
THE DALLES, OR

Figure **5-4**



PROJECT I-6b: CONCEPTUAL MINI ROUNDABOUT INTERSECTION
THOMPSON ST/E 10TH ST/OLD DUFUR RD
THE DALLES, OR

Figure **5-5**



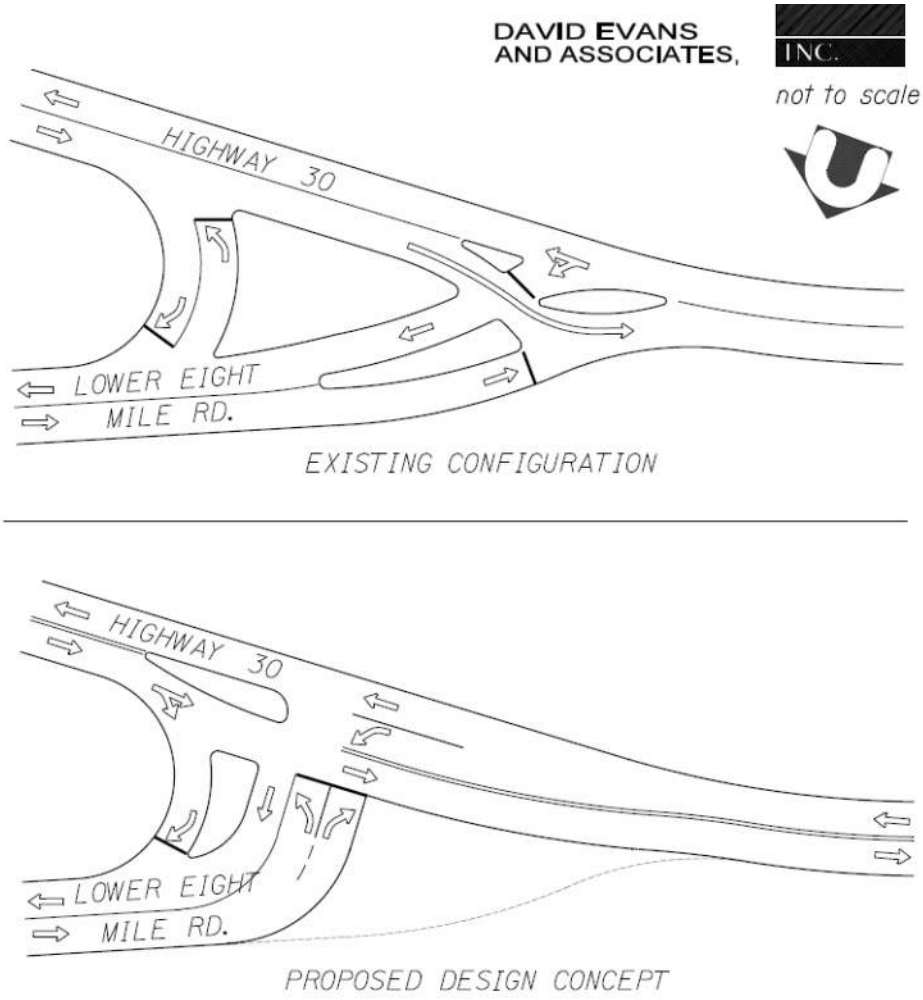
PROJECT I-6c: CONCEPTUAL ROUNDABOUT & T-INTERSECTION
THOMPSON ST/E 10TH ST/OLD DUFUR RD
THE DALLES, OR

Figure **5-6**

Project I-7: Intersection Realignment at East 2nd Street/US 30

The intersection of East 2nd Street and US 30 (Intersection #28) has a unique TWSC configuration. The eastbound and westbound through movements are free-flow; however, the eastbound left-turn, westbound right-turn, and southbound movements are all stop-controlled. Westbound vehicles along US 30 are shifted to the north to accommodate the eastbound left-turn movement onto East 2nd Street.

As shown in Exhibit 5-1 realignment of the intersection was proposed in the 1999 The Dalles TSP. Realignment would eliminate the shift in alignment experienced by westbound vehicles.



Source: 1999 The Dalles TSP

Exhibit 5-1. East 2nd Street/US 30 Intersection Geometry

Alternatives Evaluation and Recommendation

Table 5-12 summarizes the evaluation criteria for this project.

Table 5-12. East 2nd Street/US 30 - Project I-7 Evaluation Criteria Summary

	Evaluation Criteria Score by Goal				
Project ID	**Goal 1: Safety and Mobility**	**Goal 2: Multimodal Options**	**Goal 3: Integration**	**Goal 4: Economic Development**	**Total Score**
Alternative I-7 (Realignment)	5	0	2	1	8

Recommendation: This intersection realignment project was carried forward from the previous TSP through this update since it has not been constructed and is still needed. Based upon feedback from the PAC/TAC members, this intersection is not a high priority. The realignment to a traditional T-intersection was proposed in the City's previous TSP, but was not constructed. Operations are not anticipated to be a factor in the next 20 years and a safety need has not been identified based upon the historical crash data. This project should be considered as a long-term project.

Intersection Queue Length

Based upon the future operational analysis summarized in Chapter 4, there were three signalized intersections identified with 95th percentile queue lengths expected to exceed the existing available queue storage lengths during the 2035 PM peak hour. No unsignalized queues are expected to exceed the available queue storage.

As shown in Table 5-13, the future 95th percentile queues lengths exceed storage at three study intersections. The following projects were identified to address these queue spillover issues.

Table 5-13. Comparison between 95th Percentile Queue Length and Available Storage

Intersection	Movement Exceeding the Existing Available Queue Storage	Weekday PM 95th Percentile Queue Length (feet)	Available Queue Storage (feet)	Length Exceeding Available Storage (feet)
Cherry Heights Road/West 6th Street	Northbound left	150	100	50
Webber Street/W 6th Street	Southbound right	125	50	75
Webber Street/W 2nd Street	Northbound right	50	25	25

Project I-8: Signal Modifications and Lane Reallocation at Cherry Heights Rd/W 6th Street

The southbound right-turn volume exceeds the total volume of the through and left-turns, indicating that an exclusive right-turn lane is needed. A near-term alternative is to reallocate the southbound approach to provide a shared left-through lane and an exclusive right-turn lane. The southbound left-turn phasing at the signal will need to be modified to accommodate this change.

The existing northbound shared through/right lane has a storage length of approximately 150 feet. If the northbound left-turn queue extends past 150 feet, through and right-turning vehicles are prevented from entering the lane. In order to provide intersection continuity consistent with the proposed lane configurations on the southbound approach, the existing shared through/right lane should be converted to an exclusive right-turn lane. Northbound through vehicles and left-turning vehicles will be able to utilize the 400 feet of available distance between West 6th Street and West 8th Street. The northbound left-turn phasing will also need to be modified to accommodate the proposed change.

This intersection was analyzed with the proposed lane configurations, as shown in Figure 5-7, and with split signal timing phasing for the northbound and southbound approaches. The results showed similar intersection operations and all queue lengths are expected to be accommodated at the intersection. It is anticipated that the City's Maintenance Department could complete this project as part of routine restriping.

Alternatives Evaluation and Recommendation

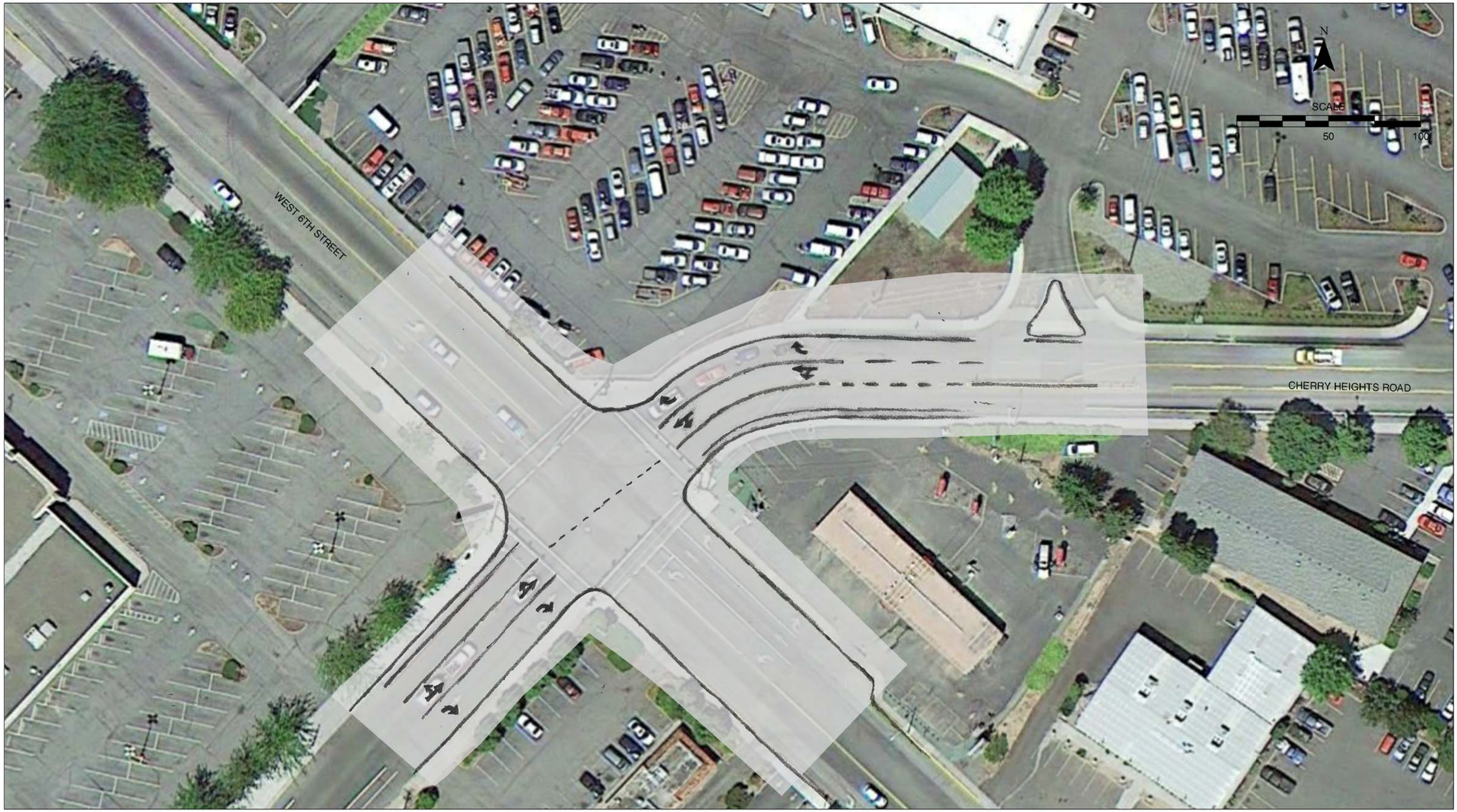
Table 5-14 summarizes the evaluation criteria for Project I-8.

Table 5-14. Cherry Heights Rd/W 6th Street - Project I-8 Evaluation Criteria Summary

	Evaluation Criteria Score by Goal				
Project ID	**Goal 1: Safety and Mobility**	**Goal 2: Multimodal Options**	**Goal 3: Integration**	**Goal 4: Economic Development**	**Total Score**
Alternative I-8 (Lane Reallocation)	3	0	1	1	5

This project was not discussed during the PAC/TAC meeting. However, feedback received indicated that they would like to see this improvement implemented. It is expected that this project could be completed in the short-term at a relatively low cost to the City.

Recommendation: Modifications to the lane configurations and signal timing phasing for the northbound and southbound approaches are recommended at this location.



PROJECT I-8: CONCEPTUAL LANE RESTRIPING
CHERRY HEIGHTS ROAD/W 6TH STREET
THE DALLES, OR

Figure **5-7**

Projects I-9 through I-11: Lane Alignment and Signal Optimization at Webber Street Signals

City staff has observed southbound queues from W 6th Street backing through the W 2nd Street intersection during midday peak periods due to the delay associated with permitted southbound left-turns. Ideally, the existing right-turn lanes would be extended beyond the queue in the shared through/left lanes to accommodate forecast demand queues at the Webber/6th Street (Intersection #9) and Webber/2nd Street (Intersection #10) intersections. Due to restrictions in width under the I-84 overpass, extending these turn lanes beyond 100 feet may not be feasible within the constraints of the existing structure.

To increase capacity at the intersections, the north and south approaches should be realigned to provide exclusive left-turn lanes, as shown in Figure 5-8 and Figure 5-9. Providing left-turn lanes would facilitate running concurrent left-turn phases and provide a protected left-turn phase. Additional alternatives include signal coordination of the north and southbound through traffic to minimize queueing between the signals.

Alternatives Evaluation and Recommendation

Table 5-15 summarizes the evaluation criteria for projects associated with the queues at Webber Street/2nd Street and Webber Street/6th Street.

Table 5-15. Webber Street Signals - Projects I-9 through I-11 Evaluation Criteria Summary

	Evaluation Criteria Score by Goal				
Project ID	**Goal 1: Safety and Mobility**	**Goal 2: Multimodal Options**	**Goal 3: Integration**	**Goal 4: Economic Development**	**Total Score**
Alternative I-9 (Signal Timing Modifications)	2	0	1	2	5
Alternative I-10 (Extend right-turn lanes for queue storage)	2	0	1	2	5
Alternative I-11a (Realign Webber Street approaches to provide dedicated north and southbound left-turn lanes)	2	0	1	2	5
Alternative I-11b (Realign northbound Webber Street approach to extend northbound left-turn storage lane))	2	0	1	2	5

The TAC/PAC discussion and the feedback received about these locations was positive.

Recommendation: This project could be a phased project as follows:

Short-Term

- *Extend the northbound right-turn lane at the Webber and 2nd Street intersection and the southbound right-turn lane at the Webber and 6th Street intersection.*

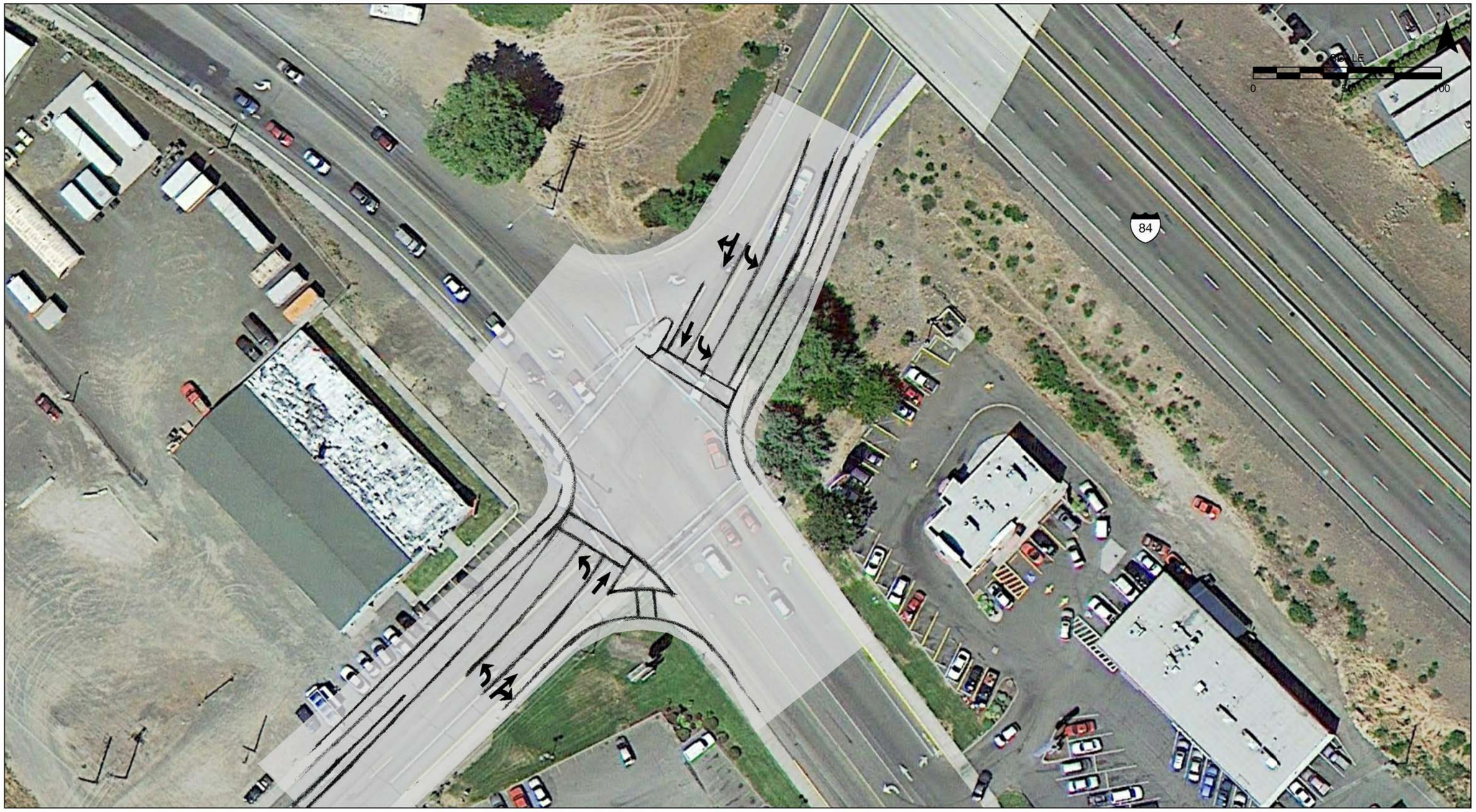
Medium-Term to Long-Term

- *Add an exclusive northbound and southbound left-turn lane at the 2nd and 6th Street intersections, respectively.*
- *Alter the signal timings to accommodate the new lane configurations.*
- *Coordinate the signals.*

The medium-term to long-term improvements at these intersections will require some right-of-way to accommodate the additional lanes.

PROJECT I-11a: CONCEPTUAL REALIGNMENT
WEBBER STREET/W 2ND STREET
THE DALLES, OR

Figure
5-8



PROJECT I-11b: CONCEPTUAL REALIGNMENT
WEBBER STREET/W 6TH STREET
THE DALLES, OR

Figure **5-9**

DOWNTOWN COUPLET CIRCULATION

Within The Dalles downtown, the roadway system operates as a one-way couplet with westbound traffic on 2nd Street and eastbound traffic on 3rd Street. While there are few issues with the couplet today, the City is making efforts to revitalize downtown and attract new businesses that could be supported by a conversion.

Successful one-way to two-way conversions have been documented in several Oregon cities, one of the most notable being downtown Oregon City. Oregon City's conversion resulted in a complete street project that filled gaps in transportation infrastructure by linking transit, pedestrian, and bicycle networks. The project has been credited as "bolstering Oregon City's downtown, with 37 new downtown businesses opening in…32 months."

The advantages and disadvantages of a one-way to two-way conversion in The Dalles have been qualitatively evaluated relative to economic development, and motorized and non-motorized travel. Table 5-16 provides a general summary of the factors to be considered by the City and its stakeholders. If the City decided to move forward with further consideration of a couplet conversion, additional quantitative evaluations of projects and costs could be completed to further inform decisions. An operational analysis of a two-way street couplet would require a new model run by ODOT's Transportation Planning Analysis Unit (TPAU) to understand how changes in traffic patterns would influence operations.

Table 5-16. Qualitative Evaluation of a One-Way to Two-Way Street Conversion in Downtown

Evaluation Category	Advantages of Conversion	Disadvantages of Conversion

Motor Vehicles	• Easy-to-navigate network	• Impacts to existing local circulation downtown, potentially reducing traffic on 3rd Street while increasing through traffic on 2nd Street.
		• Increases congestion by introducing more conflicting movements at every intersection
		• Restriping and other signage upgrades (approximately $5,000 per block)
		• Upgrades required to existing signals and intersections, including:
		  ○ Westbound left-turn lane at 2nd Street/Lincoln Street ($100,000)
		  ○ New signals ($225,000 at each of the 6 signals)
		• New signals may be required to accommodate increased left-turn demand on 2nd Street at Taylor Street and Lincoln Street ($400,000)

Economic Development	• Supports other ongoing economic development efforts • Increases the visibility and accessibility of retail offerings • Slower speeds and congestion may make downtown appear busy, which could attract more retail customers	• Not a stand-alone catalyst for economic development.
Pedestrian/Bicycle	• Reduced speeds due to congestion may encourage more bicyclists to share the road with motor vehicles • Reduced potential for multi-threat crossing conflicts	• Additional delay at intersections.

Economic Development

Economic development is often cited as a primary benefit of a conversion and is associated with making the streets more "customer friendly" and "easier to navigate" – especially for tourist and infrequent customers. The level of these benefits is difficult to estimate, but given that The Dalles downtown is only 10 blocks long within the couplet, these benefits to potential customers appear minimal.

The conversion of one-way to two-way streets should not be considered a catalyst for economic development, but it could support other downtown revitalization efforts currently underway by The Dalles Main Street organization. According to the National Trust for Historic Preservation (www.preservationnation.org) the retail area affected by the conversion should be "experiencing a comeback" before a conversion can be effective.

Pedestrian and Bicycles

Experts from the Pedestrian and Bicycle Information Center within the University of North Carolina Highway Safety Research Center (www.pedbikeinfo.org) suggest one-way to two-way street conversions can "also help reduce motor vehicle speeds and vehicle miles traveled and provide improved conditions and access for bicyclists."

For pedestrians the potential for a multiple-threat crossing conflict is reduced by providing two-way traffic. This conflict occurs when a pedestrian is crossing a two-lane roadway and the vehicle in the lane nearest to the pedestrian stops for the pedestrian and a vehicle in the second lane does not stop. A two-way traffic flow eliminates this conflict since both drivers theoretically have an unobstructed view of the crosswalk on the approach.

Other pedestrian and bicycle enhancements, such as bulb-outs at intersections to reduce crossing distance, can be implemented without a conversion to two-way traffic.

Public Input and Recommendation

The Downtown Couplet conversion was discussed with the PAC/TAC members. The majority of the PAC/TAC recommended not to pursue a couplet conversion due to the cost required to complete the conversion. If a couplet is pursued in the future, a detailed economic analysis to estimate the benefit would be needed. Feedback from the general public supported the recommendation not to pursue evaluation of a couplet conversion.

Recommendation: The couplet conversion is not recommended for further analysis.

SAFETY ALTERNATIVES

The TSP Safety goal recognizes the importance of a safe transportation system that is reliable and in a state of good repair. Objectives include:

1A. Reduce the number of fatal and serious crashes in the plan area.

1B. Develop a multi-modal transportation system that incorporates safety and operational improvements for bicyclists and pedestrians.

1C. Satisfy applicable City and/or State operational performance measures.

1D. Preserve and maintain the existing transportation system in a state of good repair.

1E. Improve safety and operational components of existing transportation facilities not meeting agency standards or industry best practices.

Based upon the crash trends and safety needs documented in Chapter 4, a range of safety alternatives were identified to address the crash patterns and trends observed during the five-year historical crash review period. Suggested countermeasures are provided in the Safety Plan in Chapter 6. The sections below provide discussion where multiple safety alternatives are considered in a location.

Project S-1: US 197/US 30

This intersection is a potential candidate for systematic sign upgrades as part of the ODOT All Roads Transportation Safety (ARTS) program. Some other mitigation options in addition to sign upgrades to consider could include the following:

- Install retroreflective tape on the sign post to increase sign visibility.
- Install transverse rumble strips to alert drivers of the intersection ahead.
- Convert the painted medians and channelizing right-turn bypass island into raised curb to reduce speeds and create an urban-like environment at the intersection.
- Reduce lane widths within the intersection influence area.
- Change in traffic control to alternative form such as:
    - Traffic signal
    - Roundabout

Roundabouts have proven to be an effective intersection treatment for improving safety – particularly for reducing severe and fatal crashes. NCHRP Report 572 found that converting a minor-road stop controlled intersection to a modern roundabout can reduce total crash frequency by 44 percent and injury crashes by 82 percent.

Project S-2: US 197/Fremont Street/Columbia View Drive

The majority of crashes occurring at unsignalized intersections on high-speed rural highways are right-angle crashes resulting from turning movements. The proportion of reported angle and turning crashes suggests that drivers may be accepting inadequate gaps when turning onto US 197 from Fremont Street or Columbia View Drive. The 6-percent grade on US 197 is expected to influence vehicle speed on uncontrolled approaches.

As described by Project I-2, a J-turn provides one at-grade alternative to reduce crash potential at this intersection. The J-Turn has been proven effective in reducing total crash frequency in other states, including Maryland (44% reduction) and North Carolina (27.2% reduction).

This intersection is also a potential candidate for systematic sign upgrades as part of the ODOT ARTS program. The following alternative mitigation options could be considered in addition to the J-Turn intersection:

- Install retroreflective tape on the sign post to increase sign visibility.
- Install dynamic message signs that indicate when the roadway is icy or snowy.

- Install variable speed signs that display a lower advisory speed when the roadway is icy or snowy.
- Install transverse rumble strips to alert drivers of the intersection ahead.
- Reduce uncontrolled-approach lane widths and install rumble strips within the lane lines. This option has been effective in reducing crashes at rural two-lane stop-controlled intersections.
- As described in Project I-2, an overpass or roundabout may be a potential long-term solution.

Project S-3: West 6th Street from Snipes Street to Hostetler Street

There are 11 driveways along W 6th Street between Snipes Street and Hostetler Street (a 1,900 foot segment). Within this same segment 27 crashes were reported over the 5-year crash data review period. Restriping the existing pavement and widening the pavement, as needed, to provide a two-way left-turn lane (TWLTL) could reduce conflicts between northbound through and northbound left-turning vehicles.

The addition of a center TWLTL would also provide a refuge for vehicles exiting a driveway to travel northbound on West 6th Street. Vehicles attempting an eastbound left-turn would be able to perform a two-stage crossing, meaning they would look for a gap in southbound traffic and then a gap in northbound traffic rather than waiting to find a simultaneous gap in both directions. Creating a two-stage crossing could help reduce the number of angle crashes along the corridor and would also provide an operational benefit by reducing the delay for the vehicles exiting the driveways. Providing a center TWLTL in this section would also provide overall corridor continuity given West 6th Street includes a center TWLTL from Walnut Street to a point south of the Snipes Street intersection.

As parcels with access to 6th Street redevelop, the City should also pursue access consolidation, restrictions, and other access management strategies to reduce the number of vehicle-vehicle and vehicle-pedestrian conflicts.

As illustrated by the photos in Exhibit 5-2 and Exhibit 5-3, the existing cross section of 6th Street could allow for the addition of a center TWLTL. Where sidewalk has been constructed on W 6th Street there is approximately 75 feet from the edge of the sidewalk to the edge of pavement. Right-of-way dedication will be required on two parcels to obtain width for the TWLTL. Filling sidewalk gaps on these two parcels is identified as Project P-14.

Exhibit 5-2. 6th Street 700 feet north of 6th Street/Snipes Street intersection

Exhibit 5-3. 6th Street in front of Bi-Mart

There are several options for how to assign the available pavement width to include a TWLTL while maintaining on-street parking and enhancing bicycle facilities. One alternative cross-section is shown in Exhibit 5-4. A conceptual view of this cross-section on W 6th Street is illustrated in Figure 5-10.

PROJECT S-3: CONCEPTUAL CROSS-SECTION ON W 6TH STREET
SNIPES ST TO HOSTETLER ST
THE DALLES, OR

Figure
5-10

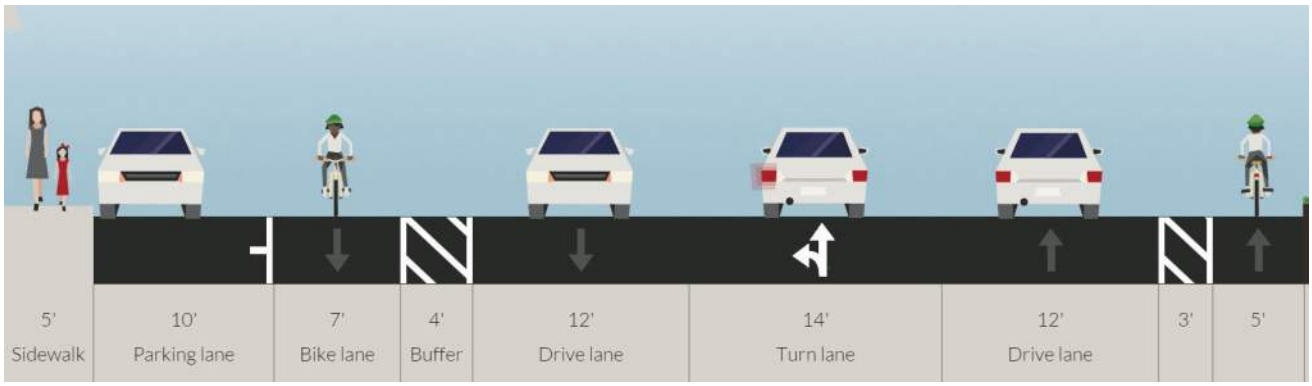


Exhibit 5-4. Example Cross-section Looking North on W 6th Street Between Snipes Street and Hostetler Street (Source: www.streetmix.net)

Public Input and Recommendation

The PAC/TAC members were positive to the idea of making changes to the existing cross section. The members indicated that in addition to the rear-end crashes, they have observed near misses involving northbound drivers using the southbound travel lane as a left-turn lane. The section of 6th Street to the south includes a center TWLTL. The members of the PAC/TAC were supportive including a center TWLTL and bike lanes along this section.

There were also discussions of including a buffered two-way cycle track on the west side of the road since there are no destinations on the east side of 6th Street. Due to the existing right-of-way and pavement width, there are many options to consider. One potential cross section that includes a center TWLTL and a buffered two way bicycle area is shown in Exhibit 5-5. This project should be further evaluated as a feasibility study and considered as a medium-term priority project.

Exhibit 5-5. 6th Street 700 feet north of 6th Street/Snipes Street intersection

ACTIVE TRANSPORTATION ALTERNATIVES

Active transportation options, including walking and bicycling, are transportation alternatives that not only provide physical benefits to people but also reduce traffic and congestion on roadways. In order for people to choose walking and bicycling as viable modes of transportation, adequate facilities are needed to provide separation from motor vehicles and connectivity throughout the City. This section describes several key bicycle project alternatives.

The full list of pedestrian, bicycle, and transit projects is presented in the Plan in Chapter 6.

East-West Connectivity

An emphasis has been placed on east-west connectivity through The Dalles. There are schools on the northwest side of the City as well as a new transit center currently under construction and a planned youth center. A high priority has been placed on providing safe and efficient bicycle facilities to connect these locations and to provide connection to the Downtown area.

West 7th Street (Project B-1)

West 7th Street was also identified as a high priority segment as it provides an alternative east-west roadway to West 10th Street and W 6th Street. With the recently completed connection to Chenowith Loop Road, this would provide a direct east-west connection from the new transit center. Currently there are no marked bicycle lanes along West 7th Street from Chenowith Loop Road to Walnut Street.

The existing pavement width along the segment of West 7th Street varies from approximately 30 feet to 55 feet. Approximately 36 to 38 feet of pavement would be needed to provide two 11- or 12-foot travel lanes and two 7-foot buffered bike lanes. Lane widths could be narrowed to encourage lower speeds and on-street parking could be removed to provide for bike lanes. In the locations where only 30 feet of pavement exists, an additional 6 to 8 feet of pavement could be added to provide for bike lanes. Right-of-way would need to be assessed in these locations; however, based on aerial imagery, it appears that the right-of-way on the south side of the roadway is approximately 10 feet off of the existing edge of pavement.

Downtown Historic Area (Project B-7)

The Downtown Historic Area currently does not provide bicycle lanes. Some bicyclists traveling in this area along 2nd Street or 3rd Street have indicated they do not feel comfortable sharing the lanes with vehicular traffic. One alternative to provide bicycle lanes along the east-west segments of Downtown would remove on-street parking on one side of 2nd Street and 3rd Street to provide a 7-foot buffered bike lane. Based on feedback from the City, this option is not feasible due to the value of on-street parking for local businesses.

A second option would use a parallel route on E 1st Street to provide a two-way bicycle boulevard. As shown in Exhibit 5-6, E 1st Street currently is a one-way street with a wide lane and on-street parking. The existing cross-section and one option to be considered are shown in Exhibit 5-7 and Exhibit 5-8. Given the current use of E 1st Street for industrial purposes, a 14-foot minimum lane width is assumed.

Exhibit 5-6. Looking West on E 1st Street at Court Street (Source: Google Streetview)

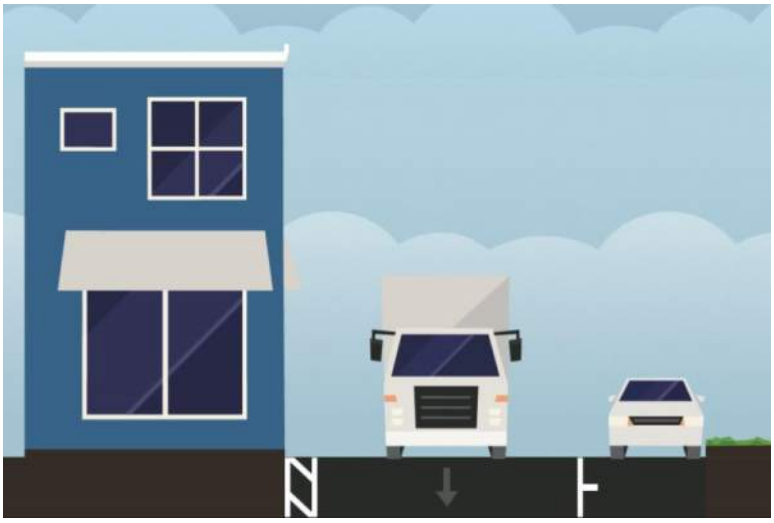


Exhibit 5-7. Existing Cross-section Looking West on E 1st Street (Source: www.streetmix.net)

Exhibit 5-8. Alternative #1: Protected Bike Lane on E 1st Street (Source: www.streetmix.net)

Transit Alternatives

To enhance transit service within The Dalles, the feasibility of implementing a fixed-route service was evaluated. A fixed route system could help reduce single-occupant motor vehicle trips and provide accessibility and connectivity, consistent with TSP Goal #2C. The following summarizes assumptions utilized in the feasibility analysis including operations guidance and cost assumptions. The detailed feasibility analysis is provided in Technical Appendix 6.

Key destinations identified in the Wasco County CTP included medical care, high employment regions, shopping, recreational areas, and educational facilities. These locations and discussion with the Transit Plan Advisory Committee (TPAC) led to six high priority stops for potential fixed-route transit service:

- Transit Center
- 6th Street Shopping (Cascade Square, Safeway, Fred Meyer, etc.)
- Downtown
- Lone Pine Shopping, Residential, Medical Area, and nearby hotels
- Mid-Columbia Medical Center
- Columbia Gorge Community College – The Dalles (CGCC)

Operations Guidance

Running buses on one hour headways would allow for ease of scheduling and predictability. In order to run routes on one hour headways, a maximum of 50 minutes per hour of operating time should be used to account for bus driver breaks, bus driver changes, and late bus catch-ups. Buses operate on an average speed of 10-15 mph. Given these assumptions, routes should be about 10 miles long. Routes

longer than 10 miles would result in headways greater than one hour or the need for additional buses to maintain 60 minute headways.

Routing and scheduling should keep future CAT schedules in mind in order to allow for easy transfers between routes. For example, the Hood River – The Dalles schedule lists bus arrivals at the Transportation Center at 6:46 AM, 12:44 PM, and 5:48 PM. With one hour headways, a fixed-route service could operate for 50 minutes, arrive at the new transit center on the 0:40 of the hour and then depart at the 0:50 of the hour. This would allow transfer to and from the fixed-route service.

For route configuration, loops provide the benefit of increasing the service area compared to a line route that travels both directions on the same route. The disadvantages of loops are the increased travel time associated with out of direction travel on a one-way loop as well as the ease of understanding of where the bus will take you and how to ride the bus. Loops should be designed to be less than 30 minutes and to operate on parallel streets so as riders could walk, for example, between 1st Street and 10th Street to avoid out-of-direction travel on the bus. Opportunities to transfer between routes should occur at the new transit center at 7th street, downtown, or at CGCC, increasing potential to overlap with CAT schedules.

Cost Assumptions

The Federal Transit Administration requires recipients of Urbanized Area Formula Program (5307) or Rural Formula Program (5311) to report operating cost, revenue hour, and revenue mile data to the National Transit Database (NTD). This data, which includes fixed-route and demand-responsive, was used to estimate operational costs of a fixed-route system in The Dalles. The Dalles is approximately 85 miles from Portland, similar to Hood River County Transportation District (65 miles, $70.20/hour), Mid-Columbia Council of Governments Link (85 miles, $69.03/hour), and Tillamook County Transportation District (75 miles, $69.70/hour). Based on this assessment, planning level operational costs for a fixed-route transit system in The Dalles are assumed to be approximately $70/hour.

Capital costs are expected to be $500,000 per 40-foot bus, based on the American Public Transportation Association (APTA)'s *2016 Public Transportation Vehicle Database*. The *2015-2018 STIP* shows the average STIP funding for bus purchases to be near $350,000 which typically does not include local match.

Routing Alternatives

Remix, a transit planning software, was used to develop routing alternatives under the transit feasibility study. Remix provides estimated run times, population and employment within ¼ mile of the route, and annual operating cost based on the input cost per revenue hour ($70) and hours of service for alternative routes. Three of these routing alternatives are shown below, indicating a rough order-of-magnitude for one route, two route, and three route alternatives. Operating cost and estimated ridership were calculated for each routing alternative given the following service hours:

- 5 days per week: 6:00 a.m. to 7:00 p.m. on weekdays, or 3,315 service hours per route
- 6 days per week: 6:00 a.m. to 7:00 p.m. on weekdays and 8:00 a.m. to 6:00 p.m. on Saturday, or 3,865 service hours per route
- 7 days per week: 6:00 a.m. to 7:00 p.m. on weekdays and 8:00 a.m. to 6:00 p.m. on weekends, or 4,415 service hours per route

Potential transit demand was estimated using TCRP Report 161. TCRP Report 161 is a workbook providing step-by-step procedures for quantifying the need for passenger transportation services and quantifies the demand that is likely to be generated given the service hours provided. While TCRP 161 provides a rough estimate for ridership, the methodology doesn't take population or job densities into account, though those factors may vastly influence ridership. Table 5-17 provides the alternatives summary for a one-route, two-route, and three-route options assessed in the feasibility study, with descriptions of each alternative shown below.

Table 5-17. Alternatives Summary

Alternative	Number of Routes	Headways (minutes)	Number of Buses	Capital Cost	# of Priority Stops Served	Pop/Job Coverage[10]	Days per Week	Annual Revenue-Hours per Route	TCRP 161 Estimated Ridership	Annual Operating Cost
1	1	60	1	$500,000	5 of 6 (No Lone Pine)	7.6k/5.1k	5	3,315	35,300	$230,000
							6	3,865	38,400	$270,000
							7	4,415	41,600	$310,000
2	2	60	2	$1,000,000	6 of 6 + VA	9.4k/5.7k	5	6,630	54,400	$460,000
							6	7,730	60,700	$540,000
							7	8,830	67,100	$610,400
3	3	60	3	$1,500,000	6 of 6	8.8k/5.5k	5	9,945	73,500	$660,000
							6	11,595	83,000	$780,000
							7	13,220	92,400	$890,000

Alternative 1

Alternative 1 covers all priority destinations except for the Lone Pine area with one route. One bus runs on 1 hour headways, servicing the transit center, 6th Street shopping center, Downtown, CGCC, and the Mid-Columbia Medical Center. The Lone Pine area is not serviced. Alternative 1 is shown in Exhibit 5-9.

Statistics for this alternative include:

- Buses Required – 1
- Revenue Hours – 4,415
- Estimated demand - 41,600 annual rides
- Cost - $309,100 per year to operate, $500,000 capital cost
- ¼ Mile Capture area – 7,600 people, 5,100 jobs

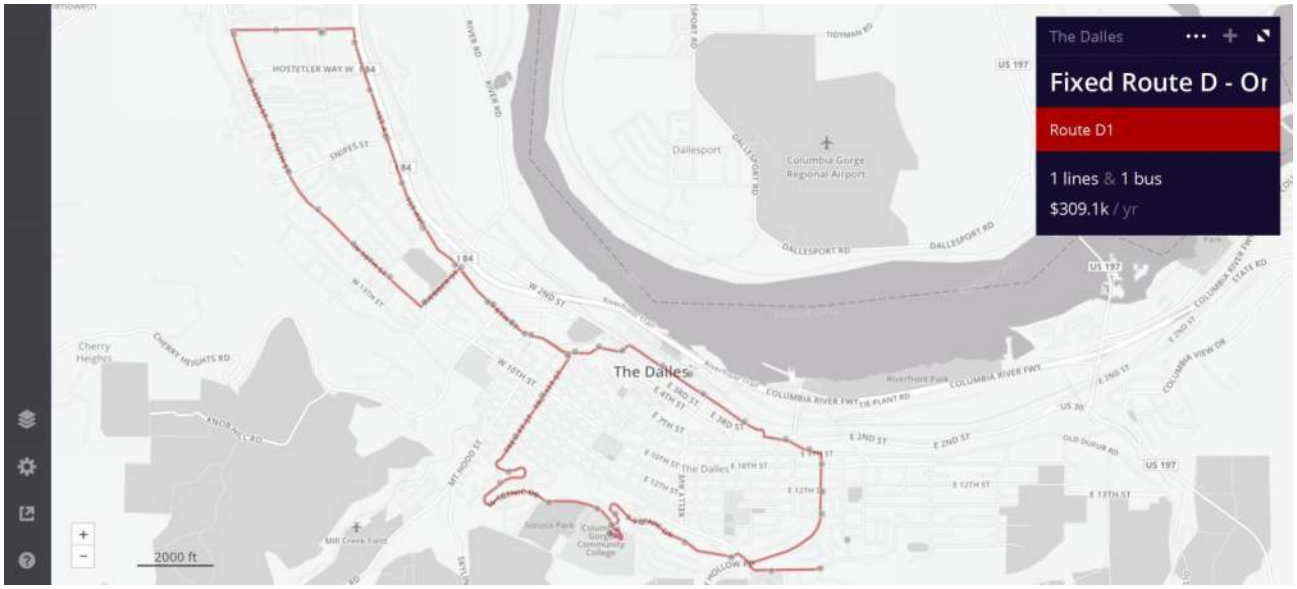


Exhibit 5-9. Alternative 1

Alternative 2

Alternative 2 covers all priority destinations between two different routes. Two buses run on 1 hour headways. A west loop services the transit center, 6th Street shopping center, Downtown, CGCC, and Mid-Columbia Medical Center. An east loop services Downtown, CGCC, Mid-Columbia Medical Center, Lone Pine, and the Veteran's Affairs area. Riders would need to transfer at stops Downtown, at CGCC, or Mid-Columbia Medical Center. Alternative 2 is shown in Exhibit 5-10.

Statistics for this alternative include:

- Buses Required – 2
- Revenue Hours – 8,830
- Estimated demand - 41,600 annual rides
- Cost - $610,400 per year to operate, $1,000,000 capital cost
- ¼ Mile Capture area – 9,400 people, 5,700 jobs

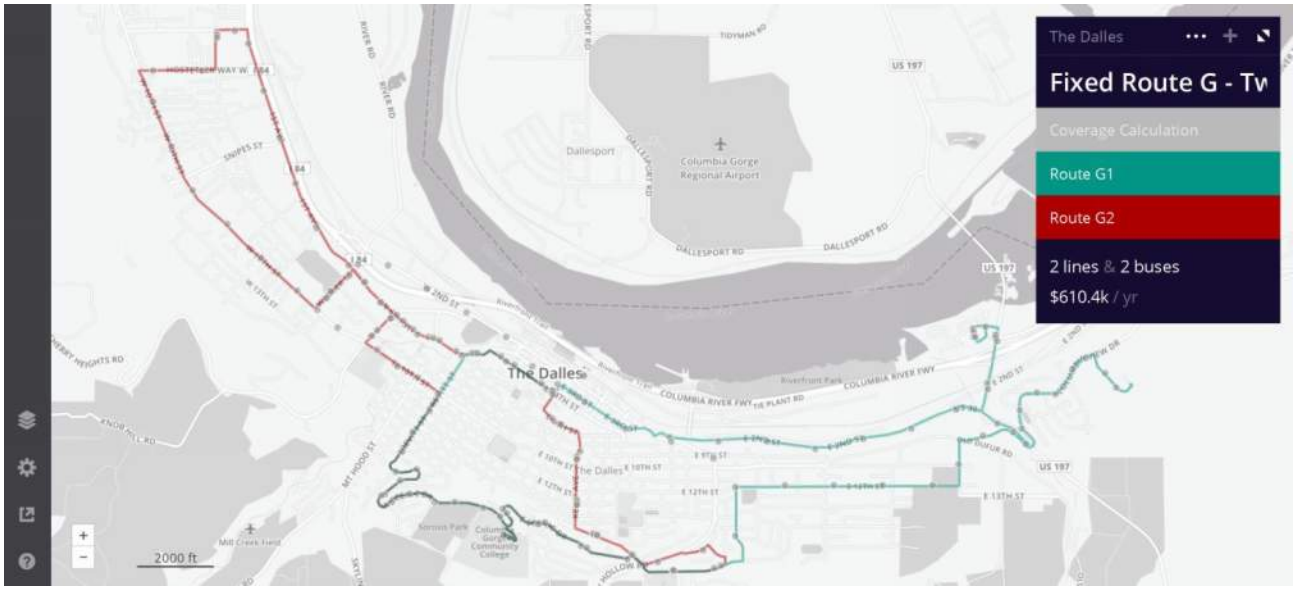


Exhibit 5-10. Alternative 2

Alternative 3

Alternative 3 covers all priority destinations between three different out-and-back routes. Three buses run on 1 hour headways. One route operates along West 10th Street, servicing the transit center, 6th Street shopping center, Downtown, CGCC, and Mid-Columbia Medical Center. Another route operates along West 7th Street, servicing the transit center, 6th Street shopping center, Downtown, and CGCC. One route serves the east side of town, serving the Lone Pine area, Downtown, and CGCC. Alternative 3 is shown in Exhibit 5-11.

Statistics for this alternative include:

- Buses Required – 3
- Revenue Hours – 13,220
- Estimated demand – 92,400 annual rides
- Cost - $891,500 per year to operate, $1,500,000 capital cost
- ¼ Mile Capture area – 8,800 people, 5,500 jobs

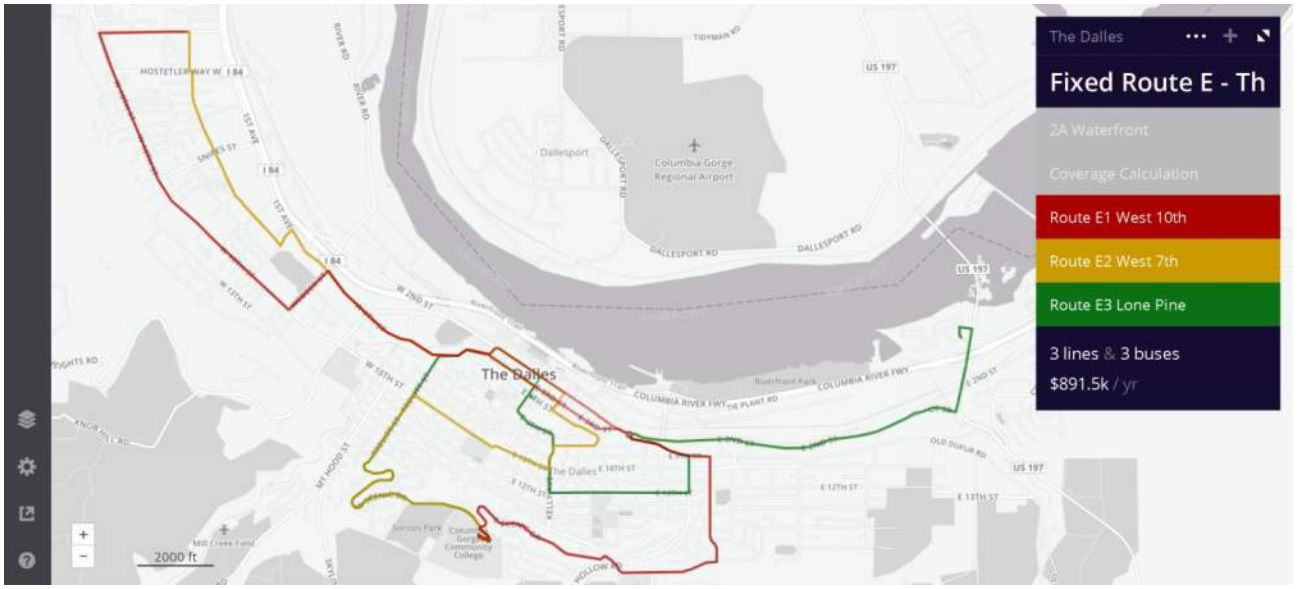


Exhibit 5-11. Alternative 3

Effect on CAT and LINK Ridership

The LINK dial-a-ride service currently serves 18,999 rides annually and approximately 3.5 rides per service hour. Fixed-route demand is forecasted to be near 7.0-9.4 riders per hour, depending on annual revenue hours. Each service hour of fixed-route service is expected to be near 2-2.5 times more productive than dial-a-ride service. As fixed-route service is expected to capture many LINK riders, the LINK may be able to decrease the number of buses running simultaneously while maintaining service for its riders. In addition, ridership on a fixed-route service may increase ridership on the CAT Hood River-The Dalles route and the CAT/LINK Hood River-The Dalles-Portland route.

Oregon Small City Transit Ridership Comparison

In order to assess ridership estimates in the local context, TCRP Report 161 ridership estimates were calculated for Sandy, Oregon and Canby, Oregon's transit services and compared to their actual ridership. Revenue service hour and ridership data was provided by the Florida Transit Information System (FTIS) Rural Integrated National Transit Database. This data includes both dial-a-ride and fixed-route services. Sandy, Canby, and The Dalles have similar populations and no college enrollment. The comparison assumes LINK dial-a-ride maintains 5,153 annual revenue hours and 19,000 annual ridership, and two fixed routes (Alternative 2) operating 7 days per week – 8,830 annual revenue hours and 67,100 estimated annual ridership- for a total of 13,983 annual revenue hours and 86,100 annual ridership. These comparisons were made to compare potential future transit revenue hours in The Dalles' compared to Sandy and Canby. Estimated and actual ridership for these cities is shown in Table 5-18 and Exhibit 5-12.

Table 5-18. Ridership Comparison

City	Population	Revenue Hours	College Enrollment[11]	Method	Ridership
Sandy	10,014	14,682	0	TCRP 161	95,400
				Actual	169,863
The Dalles	13,630	13,983	0	TCRP 161	86,100
				Actual	-
Canby	16,866	17,815	0	TCRP 161	120,800
				Actual	112,648

[11]College enrollment includes only four-year universities, not community college.

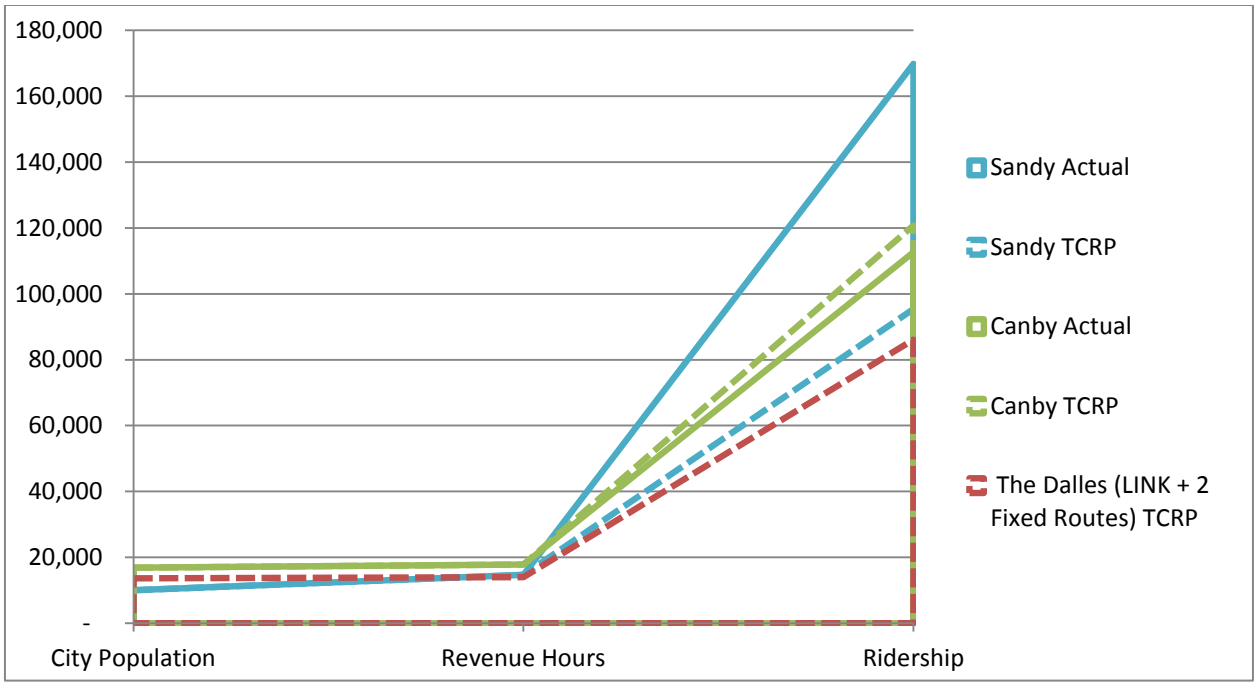


Exhibit 5-12. Estimated and Actual Transit Ridership in Oregon Small Cities

The estimated and actual ridership in Canby and Sandy suggest the TCRP ridership estimate for The Dalles to be a reasonable to conservative estimate of potential future ridership for transit in The Dalles.

Chapter 6 Transportation System Plan

6. TRANSPORTATION SYSTEM PLAN

Chapter 6, the Transportation System Plan, describes the 20-year plan for the transportation system, developed based on the work described in previous chapters: the existing conditions of the system, the anticipated future conditions, the goals and objectives of the system development, and the performance of various investment alternatives in alignment with those goals and objectives. Chapter 6 includes the following sections:

- **Roadway Plan** – This element presents the City's updated functional classification plan, the updated Roadway Design Standards, and the preferred alternatives for Roadway, Freight, Bridge and Culvert, Intersection, Interchange, Corridor, and Safety Improvements.
- **Bicycle and Pedestrian Plan** – This element presents the City's proposed Pedestrian and Bicycle Plans and the items to accomplish the plans.
- **Public Transportation Plan** – This element presents the Plan for Public Transportation Improvements.
- **Air, Water, Rail, and Pipeline Plans** – This element presents the Plan for Air, Water, Rail, and Pipeline Improvements.

ROADWAY PLAN

This section presents the City's functional classification plan and roadway design standards as well as the Plan elements for Roadway, Freight, Bridge and Culvert, Intersection, Interchange, Corridor, and Safety Improvements.

Functional Classification Plan

A roadway's functional classification is determined by several factors, including how the facility connects with the rest of the system, the volume of traffic (local or through) it is expected to carry, and the types of trips it is expected to carry. The functional classification considers the adjacent land uses and the kinds of transportation modes that should be accommodated. The public right-of-way should also provide sufficient space for utilities to serve adjacent land uses.

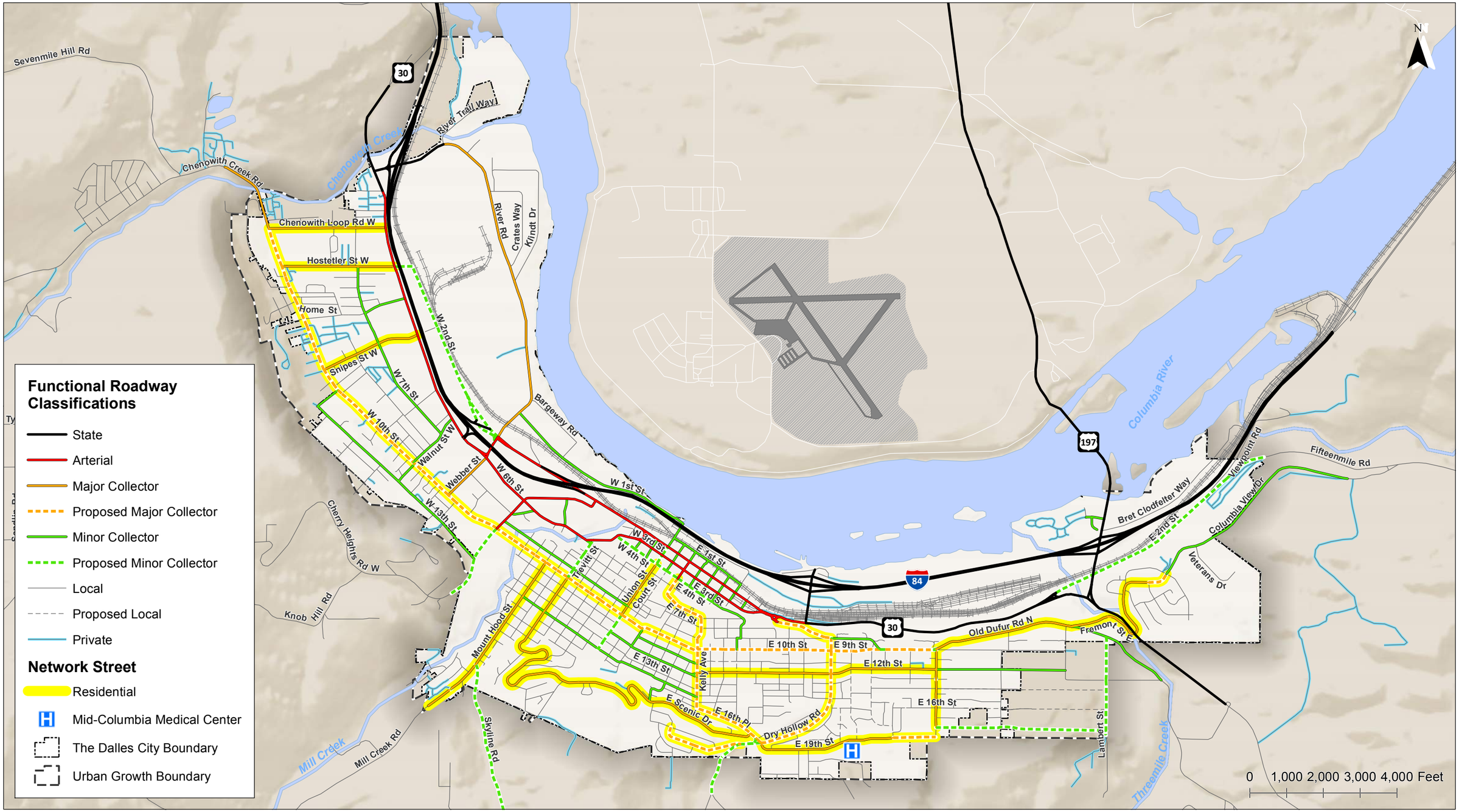
Roadways within the Study Area are categorized as Highways, Arterials, Collectors, Unassigned, or Local Streets or Roads. The following functional classifications are defined as follows:

- Highways: Highways generally carry long-distance traffic through a region. Some of the traffic on interstate freeways may exit/enter to travel to/from the regional street system. Because of the access restriction, however, short-distance local trips are discouraged. Interstate 84 is the only freeway serving the City of The Dalles.
- Arterial: Arterial streets form the primary roadway network within and through a region. They provide a continuous road system that distributes traffic between neighborhoods

and districts. Generally, arterial streets are high capacity roadways that carry high traffic volumes with minimal localized activity.

- Collector: The function of collector streets is equally divided between mobility and access. Collector streets connect local neighborhoods or district traffic to the arterial network. Generally, they do not connect together to form a continuous network because they are not designed to provide alternative routes to the arterial street system. "Residential Network Streets" are classified as either Major or Minor Collectors, providing new east-west routes to improve access and circulation for new residential areas as well as the Mid-Columbia Medical Center (MCMC).
- Local Street: The function of local streets is to provide direct access to adjacent land uses; characterized by short roadway distances, slow speeds, and low volumes. Local streets typically offer a high level of accessibility; generally serving passenger cars, pedestrians, and bicycles, but not through trucks. Separate pedestrian sidewalk facilities are often provided in urban areas. Local streets generally convey low volumes of freight traffic.

The functional classification plan is shown in Figure 6-1. This plan reflects changes in traffic volumes and travel patterns throughout the City, recommendations from local planning documents, and improvements to the existing functional classification plan. The functional classification plan corresponds to the roadway design standards summarized in the next section.



Functional Roadway Classifications

- State
- Arterial
- Major Collector
- Proposed Major Collector
- Minor Collector
- Proposed Minor Collector
- Local
- Proposed Local
- Private

Network Street

- Residential

- Mid-Columbia Medical Center
- The Dalles City Boundary
- Urban Growth Boundary

Functional Classification Plan
The Dalles, Oregon

Figure **6-1**

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

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Roadway Design Standards

The City's roadway design standards are summarized in Table 6-1. The cross-sections include additional information on right-of-way width, number of travel lanes, bicycle and pedestrian facilities, and other amenities such as landscape strips and on-street parking. These cross-sections are intended for planning and designing new roadways, as well as for improving existing roadways where it is physically and economically feasible. In some locations within the City, constraints such as steep grades and limited right-of-way may prevent the full cross-section from being constructed. The landscape buffer may be waived if justification is provided.

Table 6-1. Roadway Design Standards for City Streets

	Arterial/State	Major Collector[12]	Minor Collector[10]	Local Street
Number of Vehicle Lanes	3	2	2	2
Lane Width	12' *Note: On freight routes, lanes should be 14' wide or include a 2' striped buffer between the travel lane and the bicycle lane.*	12'	12'	8'
Center Turn Lane Width	14'	N/A	N/A	N/A
Landscape Buffer Width	5'	5'	5'	4'
Shoulder, Bike Lane, and/or On-Street Parking Width	6' Bike Lane *Note: Provide a buffer between the travel lane and bike lane whenever possible.*	6' Bike Lane *Note: Replace the bicycle lane with 8' parking lane when adjacent to residential properties with primary access to the Major Collector. Consider curb bulb-outs at intersection corners with on-street parking areas to improve pedestrian visibility, and reduce roadway crossing widths.*	6' Bike Lane *Note: Exceptions are allowed to replace the bicycle lane with 8' on-street parking lane when adjacent to residential properties with primary access to Minor Collector.*	8' On-Street Parking *Note: The removal of the on-street parking lanes is allowed in industrial areas to accommodate two 16-foot travel lanes for heavy vehicles.*
Shoulder Surface	Paved	Paved	Paved	Paved
Pavement Width	50'	36'	36'	32'
Minimum Sidewalk Width	5' *Note: 6' on State highways*	5'	5' *Note: Consider curb bulb-outs at intersection corners where on-street parking to improve pedestrian visibility, and reduce roadway crossing widths.*	5' *Note: Consider curb bulb-outs at intersection corners to define parking areas, improve pedestrian visibility, and reduce roadway crossing widths, except in industrial areas.*
Surface Type	Paved	Paved	Paved	Paved
Minimum ROW Width	90'	60'	60'	50'
Additional Notes:	*Provide on-street parking on the West side of 6th Street.* *Roadways that may require deviation from this standard are limited to US 30 and 2nd and 3rd Streets within the downtown couplet.*	*All major collectors, except for Webber Street and River Road are identified as Residential Network Streets and have specified cross-sectional standards.* *Widening for turn lanes at major intersections with other collector and arterial facilities should have a minimum of 12' lane width.*		

[12] *These cross-sections apply to all roadways except streets designated by The Dalles as "Residential Network Streets." Each Residential Network Street is shown in Figure 6-1 and the adopted cross-sections are provided in Technical Appendix 7.*

Engineering Options Assessments

An engineering option assessment is recommended that will allow the City to review proposed cross-sections that deviate from the standards. This system is intended to adapt to the surrounding context, and allow the City to consider deviations based on adjacent land use, topographical, environmental (natural and man-made), historical, or other contextual opportunities and constraints. Options should not be allowed for self-imposed hardships, but to provide alternative ways to meet the functional purpose. The deviation process should specifically address the code standard, the proposed option, and how the functional intent will continue to be met or why it would be unreasonable to do so. The options evaluated should include the longitudinal considerations. For example, if an eight-foot wide shared-use path were proposed on one side of the roadway in lieu of sidewalks on both side, the process should consider how and where pedestrian crossings would be accommodated.

Access Management

Access management is a set of measures regulating vehicular access to streets, roads, and highways from public roads and private driveways. Access management is a policy tool which seeks to balance mobility, the need to provide efficient, safe, and timely travel with access to individual properties. Proper implementation of access management techniques should contribute to reduced congestion, reduced accident rates, less need for roadway widening, energy conservation, and reduced air pollution. Measures may include, but are not limited to, restrictions on the type and amount of access to roadways, and use of physical controls, such as signals and channelization including raised medians, to reduce impacts of approach road traffic on the main facility.

The City's access management policy maintains and enhances the integrity (capacity, safety, and level of service) of city streets. Numerous driveways or street intersections increase the number of conflicts and potential for collisions and decrease mobility and traffic flow. The city of The Dalles, as with every city, seeks a balance of streets that provide access with streets that serve mobility. The following access management strategies would improve local access and mobility in the city of The Dalles:

- Maintain city-wide access spacing standards according to a roadway's jurisdiction and functional classification.
- Establish an approach for access consolidation over time to move in the direction of the standards at each opportunity.
- Work with land use development applications to consolidate driveways where feasible.
- Identify potential transportation improvement projects that provide left turn lanes where warranted for access onto cross streets.
- Construct raised medians to provide for right-in/right-out driveways as appropriate.

Access Spacing Standards

The following describes ODOT and city of The Dalles access spacing standards.

ODOT Standards

Oregon Administrative Rule 734, Division 51 establishes procedures, standards, and approval criteria used by ODOT to govern highway approach permitting and access management consistent with Oregon Revised Statutes (ORS), Oregon Administrative Rules (OAR), statewide planning goals, acknowledged comprehensive plans, and the Oregon Highway Plan (OHP). The OHP serves as the policy basis for implementing Division 51 and guides access management rules and administration, including mitigation and public investment, when required, to ensure highway safety and operations pursuant to this division.

Access management standards for approaches to state highways vary based on the classification of the highway and highway designation, type of area, and posted speed.

The OHP classifies Highway 004 (US 197) as a Regional Highway through The Dalles and Highway 292 (US 30) as a District Highway through The Dalles. Future development along these highways (new development, redevelopment, zone changes, and/or comprehensive plan amendments) will be required to meet the OHP access management policies and standards. Table 6-2 summarizes ODOT's current access management standards for private driveways on these highways.

Table 6-2. ODOT Highway Access Spacing Standards

Location	Highway Classification	Posted Speed (MPH)	Spacing Standards (Feet) [1]
US 197 (Hwy 004), north of Fremont Street	Regional	45 mph	500'
US 197 (Hwy 004), south of Fremont Street	Regional	65 mph	990'
US 30 (Hwy 292)	District	40 mph	360'

[1] These access management spacing standards do not apply to approaches in existence prior to April 1, 2000 except as provided in OAR 734-051-5120(9).

City Standards

Access management standards for approaches to city streets are also based on roadway functional classification. Table 6-3 identifies the City's standards as they relate to new development and redevelopment. In addition to the spacing standards below, access should be taken from lower classification streets whenever possible.

Table 6-3. Access Spacing Standards for City Roadways

Functional Classification	Minimum Posted Speed	Minimum Spacing between Driveways and/or Streets
Arterial Street (2-Way)	25 – 40 mph	300 – 400 feet
Arterial Street (1-Way)	25 – 35 mph	150 – 300 feet
Major Collector Street	25 – 35 mph	150 – 300 feet
Minor Collector Street	25 – 35 mph	75 – 150 feet
Major/Minor Collector Street in Industrial Area	25 – 35 mph	150 – 300 feet

Driveway Access Spacing Adjustments

Driveway access spacing adjustments may be provided to parcels whose highway/street frontage, topography, natural resources or physical barriers would otherwise preclude access that meets access spacing standards. Approval of an adjustment could impose conditions that: 1) the access may be closed at such time that reasonable access becomes available to a local public street and 2) the establishment of joint/cross access easements. The review authority may also require a given land owner to work in cooperation with adjacent land owners to provide either joint access points, front and rear cross-over easements, or a rear access upon future redevelopment to the extent allowed by City code and the Oregon Administrate Rules.

The requirements for obtaining an adjustment from ODOT's minimum spacing standards are documented in OAR 734-051-3050. The City Engineer may adjust the access spacing standards for streets under the City's jurisdiction where the physical site characteristics or layout of abutting properties precludes access that would meet access spacing standards. The City's approval criteria can be found in the Land Use Development Ordinance (LUDO).

Access Consolidation through Management

From an operational perspective, access management measures seek to limit the number of redundant access points along roadways. This enhances roadway capacity, improves safety, and benefits circulation. The City should complement access spacing enforcement with provision of alternative access points where appropriate. Purchasing right-of-way and closing driveways without a parallel road system and/or other local access could seriously affect the viability of the impacted properties. Thus, if the City takes an access management approach, alternative access could be developed to avoid "land-locking" a given property.

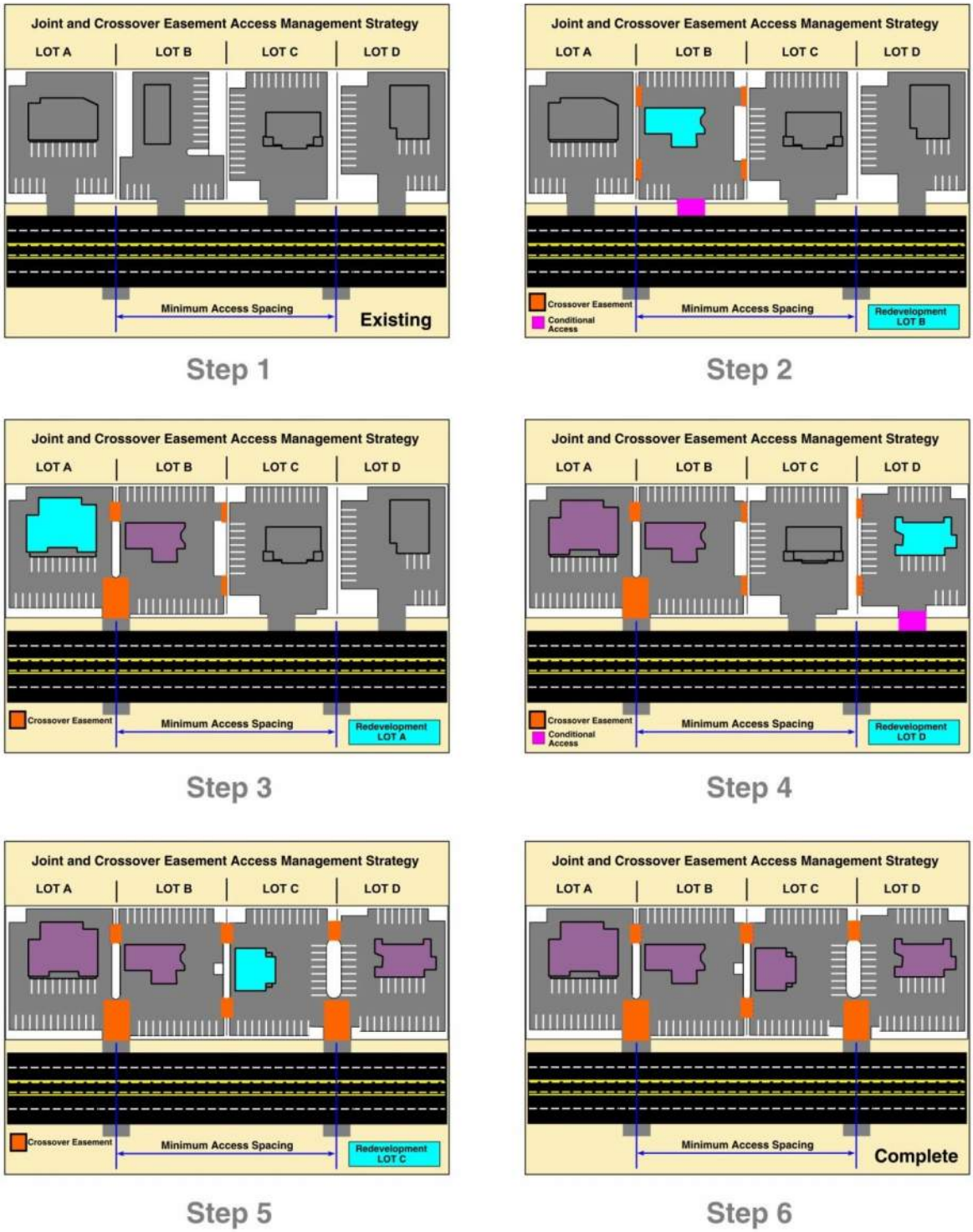
As part of every land use action, the City should evaluate the potential need for conditioning a given development proposal with the following guidelines in order to maintain and/or improve traffic operations and safety along the arterial and collector roadways.

- Developments with frontage on two roadways should locate their driveways on the lower functional classified roadway.

- Access driveways should align with opposing driveways.
- The City may permit multiple driveways so long as they meet the driveway access spacing standards.
- If spacing standards cannot be met, the City should try to consolidate access points with neighboring properties.
- Where standards cannot be met and joint access is not feasible, the City should grant temporary conditional access by providing crossover easements on compatible parcels (considering topography, access, and land use) to facilitate future access between adjoining parcels.

Exhibit 6-1 illustrates the potential application of cross-over easements and access consolidation over time to achieve access management objectives. As illustrated in the exhibit, by using these guidelines, all driveways can eventually move in the overall direction of meeting driveway access spacing standards as development and redevelopment occur along a given street.

Exhibit 6-1. Application of an Example of Potential Driveway Consolidation

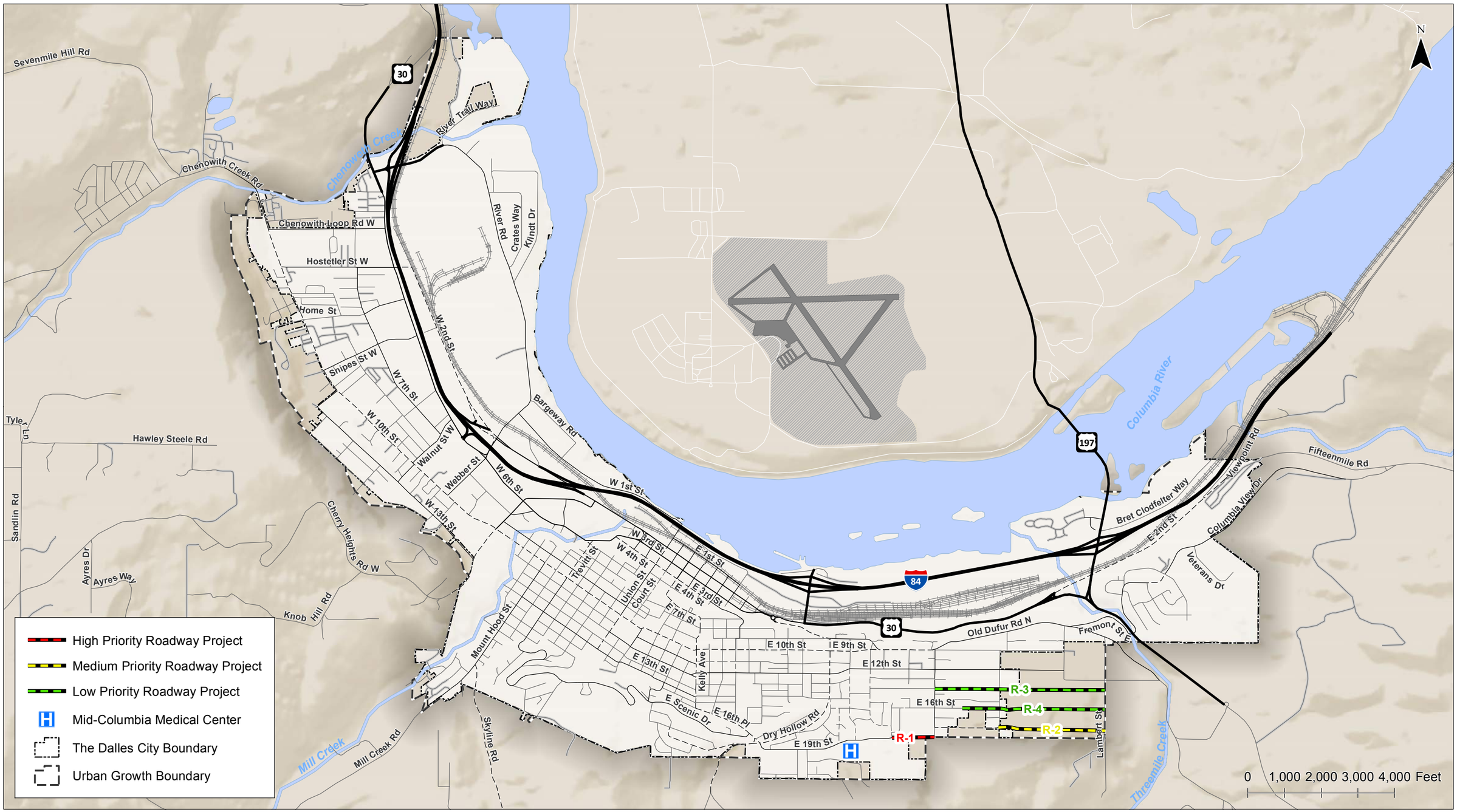


New Roadways

The plan for new roadways is summarized in Table 6-4 and shown in Figure 6-2 and is consistent with the new roadways shown on the functional classification map. Because these are all City roadways, the TSP assumes the City will be responsible for the costs of these roads for a conservative analysis. The private partnership may include contributions through funding mechanisms such as system development charges (SDCs).

Table 6-4. New Roadways

Map ID	Location	Project Type	Project Description	Cost Estimate	Priority	Potential Funding Source		
						ODOT	City	Private
R-1	E 19th Street Extension	New Connection	Construct new Major Collector between Thompson Street and Oakwood Drive	$900,000	High		✓	
R-2	E 18th Street Connection	New Connection	Construct new Minor Collector between Lambert Street and Morton Street, as development occurs	$1.9 million	Medium		✓	✓
R-3	E 14th Street Connection	New Connection	Construct new local street between Morton Street and Lambert Street	$2.0 million	Low/Development Driven		✓	✓
R-4	E 16th Street Connection	New Connection	Construct new local street between Morton Street and Lambert Street	$1.3 million	Low/Development Driven		✓	✓
Total Cost of High Priority New Roadway Projects				**$900,000**				
Total Cost of Medium Priority New Roadway Projects				**$1,900,000**				
Total Cost of Low Priority/ Development-Driven New Roadway Projects				**$3,300,000**				
Total Cost of New Roadway Projects				***$6,100,000***				



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Roadway Plan
The Dalles, Oregon

Figure
6-2

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Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

Freight Route Designations

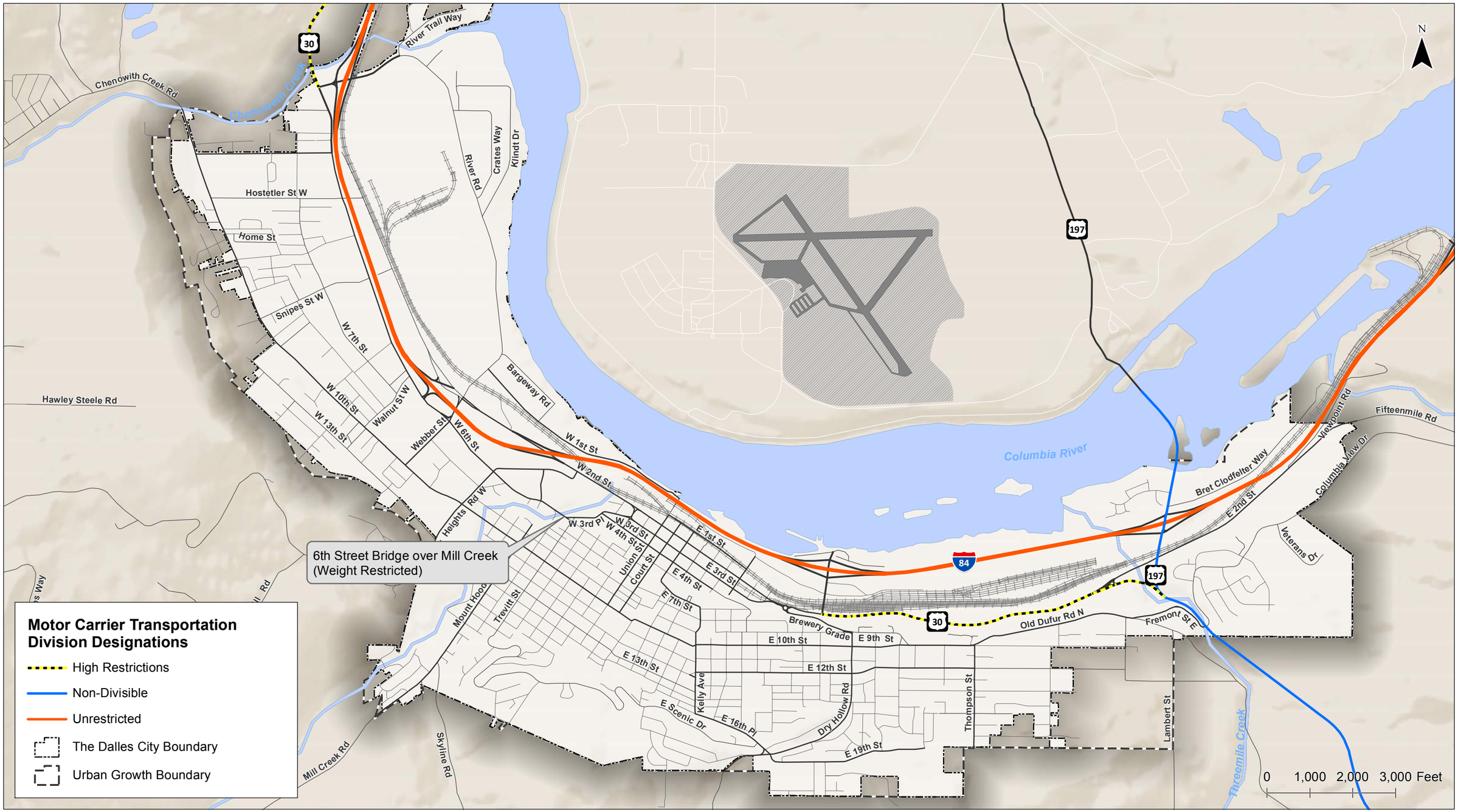
The City's designated freight routes are shown in Figure 6-3 along with ODOT's Motor Carrier Transportation Division (MCTD) freight routes. Access to the major freight areas within The Dalles is generally provided via River Road and connects to I-84 at the Chenoweth Interchange and the Webber Street Interchange. Additional freight generators between I-84 and the railroad near Brewery Overpass Road have convenient access to I-84 via Brewery Overpass interchange terminals.

The MCTD-designated freight routes shown in Figure 6-3 are assigned a description ranging from most restrictive to the most accessible routes for the movement of freight. These descriptions are provided below.

- Routes colored black and yellow are highly restricted to truck and oversize load traffic. These routes may be important for local freight access by permit but not for general use. These routes should not be considered for use as a viable detour route for trucks.
- Routes colored blue are unrestricted to standard freight truck traffic but are either weight or width restricted for non-divisible and/or heavy haul loads. These routes are viable detour routes for general freight trucks only but will not accommodate certain oversize and overweight loads.
- Routes colored orange are generally available for use by unrestricted freight and oversize/overweight routes. These are typically the most heavily used truck routes in the state and also usually offer the most viable unrestricted detour route.

The existing W 6th Street bridge over Mill Creek is currently posted with weight restrictions (refer to Figure 6-3). However, trucks do use the route. Project BR-4 in the Bridge and Culvert Plan identifies a project to improve signage throughout the City to inform trucks of alternate routes in advance of the bridge to provide adequate opportunity to avoid the bridge.

Several of the intersection improvements identified in this Plan are located on freight routes. The design of these improvements must consider the impacts to freight traffic.



Motor Carrier Transportation Division Designations

- High Restrictions
- Non-Divisible
- Unrestricted
- The Dalles City Boundary
- Urban Growth Boundary

MCTD Freight Mobility Map
The Dalles, Oregon

Figure **6-3**

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

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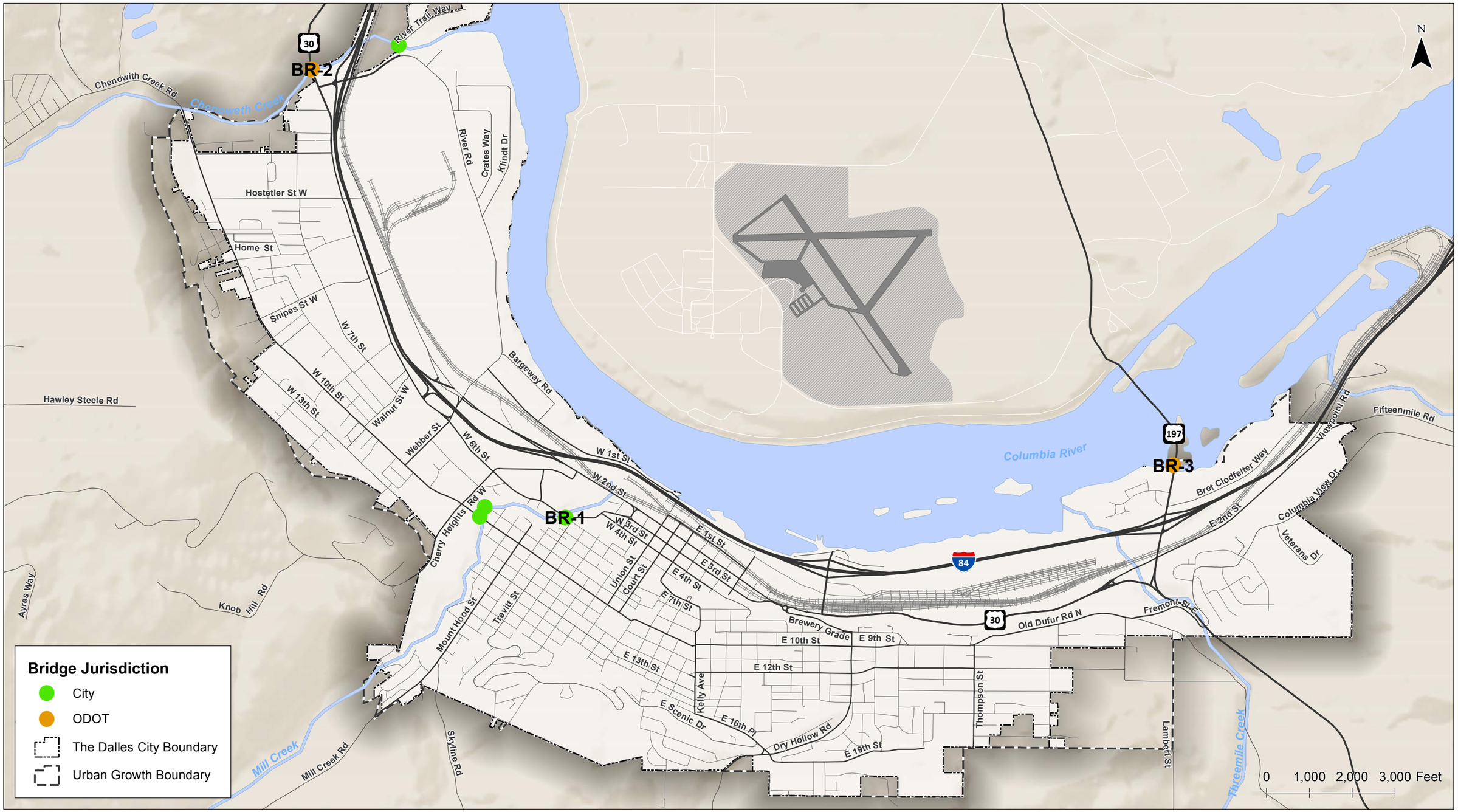
Bridge and Culvert Improvements

The Bridge and Culvert Plan improvements are summarized in Table 6-5 and shown in Figure 6-4. The projects identified as part of the TSP update were combined with other projects identified in the City's current TSP. The plan for bridge and culvert improvements includes replacing existing bridge structures and widening existing bridge structures.

Table 6-5 summarizes the planned bridge and culvert improvements.

Table 6-5. Bridge and Culvert Projects

Map ID	Location	Project Type	Project Description	Cost Estimate	Priority	Potential Funding Source		
						ODOT	City	Private
BR-1	W 6th Street at Mill Creek	Bridge	Conduct feasibility study to determine the cost of repairing this historic bridge	$20,000	Medium		✓	
BR-2	Structure 00506 – US 30 (Hwy 100) bridge over Chenoweth Creek	Bridge	Replace bridge with a new, longer and wider structure (project includes surface rehabilitation for the Mosier Creek and Dry Canyon Creek bridges to extend the life of the bridges)	$3,800,000	High	✓		
BR-3	Structure 06635Q – US 197 Bridge over the Columbia River	Bridge	Replace the concrete bridge deck and railing (cost to be split between Washington and Oregon state DOTs)	$24 - $36 million	Medium	✓		
BR-4	Signage to Redirect Trucks around 6th Street Bridge	Bridge	Install signage to provide advance warning to trucks to allow them to redirect and avoid the 6th Street, weight restricted, bridge over Mill Creek	$5,000	High		✓	



Bridge and Culvert Plan
The Dalles, Oregon

Figure
6-4

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

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Intersection Improvements

The Intersection elements are summarized in Table 6-6 and shown in Figure 6-5. The improvements include:

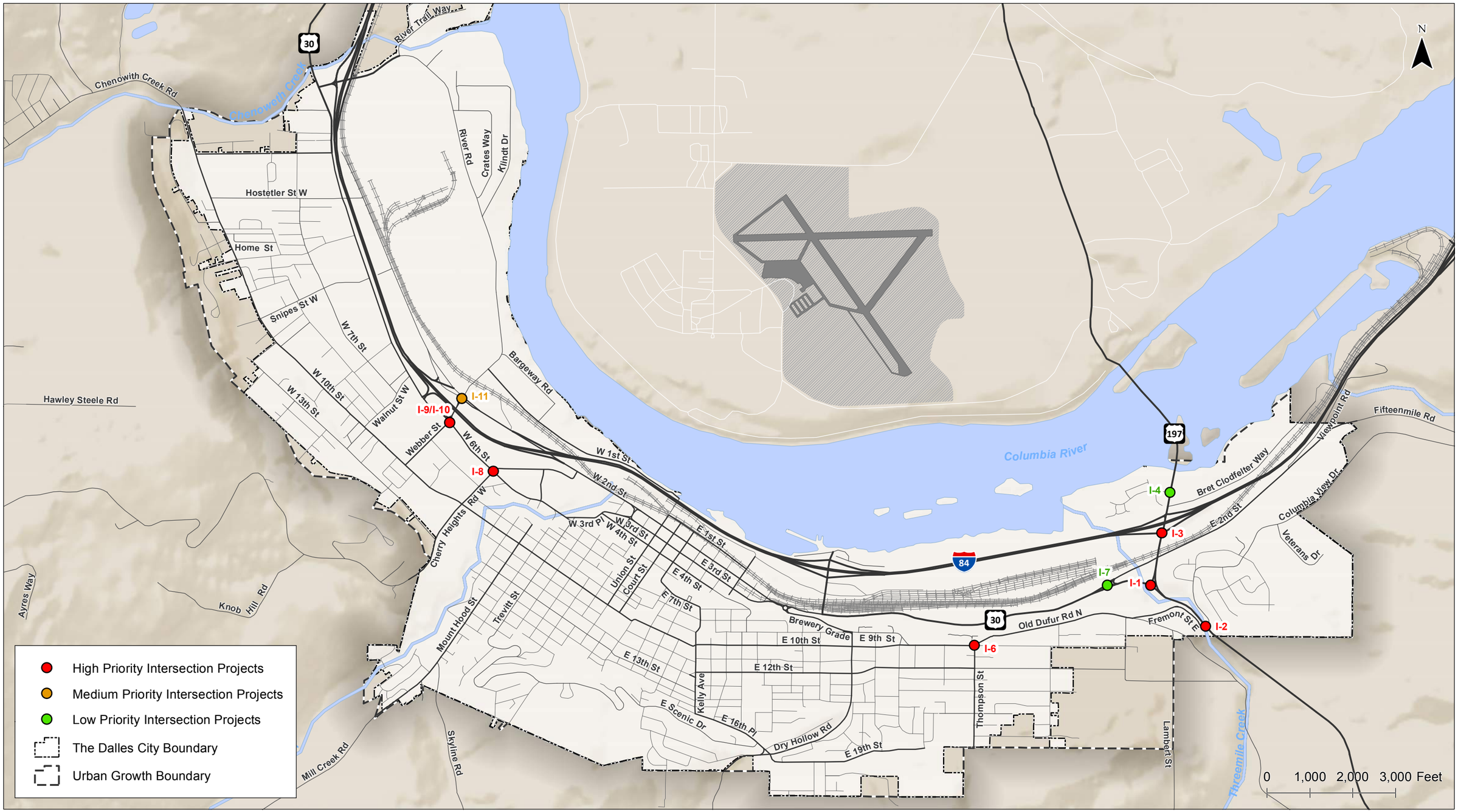
- Reconfigure the intersection to improve operations with treatments such as roundabouts;
- Optimize the signal timing/phasing;
- Reconfigure or add additional left- and/or right-lanes; and
- Conduct corridor studies to further evaluate perceived issues to determine if deficiencies are present that may be mitigated by improvements.

Note that the improvements in Table 6-6 are capacity or queuing-based. Additional improvements related to safety are presented in the Safety Plan.

Table 6-6. Intersection Improvements

Map ID	Location	Project Type	Project Description	Cost Estimate	Estimated City Contribution*	Priority	Potential Funding Source			
							ODOT	City	Private	County
I-1	US 197/US 30	Intersection, Operations	Install a roundabout to address both safety and operational issues. The selection and design of the roundabout should consider the truck traffic that currently uses this route to gain momentum when traveling uphill on US 197 towards the landfill. A right-turn bypass lane from the west to south leg may assist trucks in maintaining momentum. *(Also shown as project S-1.)*	$2.0 to $2.5 million	$250,000	High	✓			
I-2	US 197/Fremont Street/ Columbia View Drive	Intersection, Operations	Install sign upgrades, rumble strips, and dynamic message signage to manage speeds and provide advance warning of the intersection.	$20,000	$5,000	High	✓	✓		
			In the longer term, install an overpass while converting existing intersections to right-in, right-out or maintaining the J-turn. *(Also shown as S-2.)*	$9,955,000	$1,100,000	High	✓	✓		
I-3	US 197/ I-84 EB Ramps	Intersection, Operations	Install a traffic signal to increase capacity. *(Also related to Safety projects S-8 and S-9.)*	$1.25 to $1.5 million	$150,000	High	✓		✓	
I-4	US 197/ Lone Pine Boulevard	Intersection, Operations	Construct single-lane roundabout.	$1.5 to $2.0 million	$190,000	Low/Development Driven	✓	✓	✓	
I-6	Thompson St/E 10th St/ Old Dufur Road	Intersection, Realignment	Convert the existing intersection to an off-set "T" and a mini-roundabout.	$130,000	$130,000	High		✓		
I-7	E 2nd St/US 30	Intersection, Realignment	Realign this intersection into a more traditional T-intersection.	$100,000	$25,000	Low	✓			✓
I-8	Cherry Heights Rd/W 6th Street	Intersection, Realignment	Convert the southbound approach to a shared left-through lane and an exclusive right-turn lane and modify the signal to provide permitted left-turn phasing. Extend the northbound left-turn lane on Cherry Heights Rd to accommodate future queue lengths.	$20,000	$20,000	High		✓		
I-9 & I-10	W 2nd St / Webber Road and W 6th St/Webber Road	Intersection, Realignment	Extend the northbound right-turn lane at the Webber and 2nd Street intersection and the southbound right-turn lane at the Webber and 6th Street intersection.	$100,000	$100,000	High		✓		
I-11	W 2nd Street and W 6th Street	Intersection, Realignment	Add an exclusive northbound and southbound left-turn lane at the 2nd and 6th Street intersections, respectively, by realigning the approaches. Alter the signal timings to accommodate the new lane configurations. Coordinate the signals.	$500,000	$500,000	Medium		✓		
			Total Cost of High Priority Intersection Projects	**$13,855,000**	**$1,755,000**					
			Total Cost of Medium Priority Intersection Projects	**$500,000**	**$500,000**					
			Total Cost of Low/Vision Priority Intersection Projects	**$1,850,000**	**$215,000**					
			Total Cost of Intersection Projects	***$16,205,000***	***$2,470,000***					

*For projects in which the City will be a funding partner with multiple agencies, a 25% match is assumed to be the City's contribution and is used for the funding evaluation.



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Intersection Alternatives
The Dalles, Oregon

Figure
6-5

Oregon Department of Transportation

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Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

Interchange Improvements

ODOT completed an Interchange Area Management Plan (IAMP) at the I-84 Chenoweth Interchange in 2009. Table 6-7 and Figure 6-6 include projects from the IAMP that are proposed to be included in the TSP update. Additional information on land use, system, travel demand, and access management strategies is documented in the IAMP.

The IAMP identified four roadway improvement phases (near-term, mid-term, long-term, and vision beyond planning horizon). These were developed to estimate the amount of new development that could occur within the study area before implementation of various components of the local access and circulation plan are required. These phases were developed as planning milestones, since improvements will likely be needed incrementally as development occurs. The phases are intended to show the increments of development that can occur before major improvements are needed. The Vision projects and many of the long-term projects are not expected to be needed due to the revisions in growth estimates for the area. The presence of wetlands and development of low trip-generating uses have resulted in lower impacts than expected during the IAMP development. Project W1 (providing a 5-lane section on W 6th Street) is an example of a project that is not likely to be needed in the future. Table 6-7 identifies the proposed phasing of projects in the IAMP.

Table 6-7. IAMP Projects and Phasing Plan

Map Reference	Improvement Type	Description	Cost Estimate*
Phase 1 – Near-Term Improvements			
I1	Restripe Bridge Lanes	Restripe lanes on bridge to accommodate four lanes (two in each direction, including side-by-side left-turn lanes)	Funded by Development
W4	Intersection Improvement (Signal)	Intersection control at West 6th Street/Hostetler Street to accommodate future traffic	Funded by Development
Phase 2 – Mid-Term Improvements and Actions			
E10	Intersection Improvement (Roundabout)	Intersection control to accommodate future traffic at reconstructed River Trail Way/River Road	$710,000
I2	Signalize Intersection	Accommodate weekday a.m. and p.m. peak hour travel demand at Westbound I-84 Ramp Terminal	$760,000
I3	Signalize Intersection	Accommodate weekday a.m. and p.m. peak hour travel demand at Eastbound I-84 Ramp Terminal	
W2	Intersection Improvement (Roundabout or Signal)	Intersection control at West 6th Street (US 30)/River Road to accommodate future traffic and provide for u-turns created by the median	Funded by Development
W3	Intersection Improvement (Roundabout or Signal)	Intersection control at W 6th Street/Chenoweth Loop to accommodate future traffic and provide for u-turns created by the median	Funded by Development
Phase 3 – Long-Term Improvements			
E2B	UP Railroad At-Grade Crossing and Signal (Short-term)	Provides Hostetler Street connection to River Road and intersection control to accommodate traffic at Hostetler Street and 2nd Street (requires approval by ODOT Rail and UPRR)	Funded by Development
E3	New Collector Roadway	Extend Hostetler Street from West 2nd Street to River Road	$4,210,000
E1	New Collector Roadway	Extend River Trail Way from River Road to Hostetler Street Extension	$12,430,000
W2	Provide Left-Turns	Provide dual westbound left-turns at River Road/West 6th Street (US 30) roundabout or signal	Funded by Development
W1	W 6th Street Median	Construct raised median and provide 5-lane section on W 6th Street from River Road to Chenoweth Loop	Funded by Development
W5	Widen West 6th Street to 5 Lanes	Widen West 6th Street from River Road to south of Hostetler Street to accommodate weekday a.m. and p.m. peak hour travel demand	Funded by Development
W4	Dual Westbound Left-Turns	Provide dual westbound left-turns at W 6th Street/Hostetler Street intersection	Funded by Development
E2	Traffic Signal	Traffic signal installed at 2nd Street/Hostetler Street	$13,410,000
E11	Intersection Improvement (Signals)	Intersection control to accommodate future traffic at connection of River Road/Crates Way (North)/Columbia Road	$300,000
E9	Intersection Improvement (Roundabout)	Intersection control to accommodate future traffic at Hostetler Street/River Way Trail Extension	$830,000
E12	Intersection Improvement (Roundabout or Signal)	Intersection control to accommodate traffic at future connection of River Road and Hostetler Street	$500,000
Phase 4 – Long-Term Vision			
I4	Widen Bridge to 6 Lanes (Long-term)	Accommodate weekday peak hour travel demand beyond the 85-percent development threshold (NOT PART OF 20-YEAR PLAN)	Funded by Development
Ongoing Phase – Improvements Implemented in any Phase			
E1	New Local Roadway	Extend River Trail Way from River Road to the Hostetler Street Extension	Funded by Development
E4	New Local Roadway (Long-term)	Provides local business access	Funded by Development
E4B	New Local Roadway (Short-term)	Provides temporary local business access until environmental concerns can be mitigated and project E4 can be constructed	Funded by Development
E5	New Local Roadway	Provides local business access	Funded by Development
E6	New Local Roadway	Provides local business access. Alignment is variable depending on parcel access and circulation.	Funded by Development
N1	New Local Roadways	Provide a network of local streets	Funded by Development
W7	New Local Roadway	Provides local connection between Division Street and Irvine Street	Funded by Development
W8	New Local Roadway	Provides paved local connection between 6th Street and 7th Street	Funded by Development
W9	Cul-de-sac	Supports consolidation of accesses on West 6th Street	Funded by Development
W4 & W5	Left-turn Lanes	Construct exclusive left-turn lanes on northbound, eastbound, and southbound approaches and an exclusive right-turn lane on the northbound approach to the West 6th Street/Hostetler Street intersection (elements of projects W4 and W5)	Funded by Development
N2^	ROW Preservation	Preserve ROW for a potential future overpass of I-84	Funded by Development
N3^	ROW Preservation	Preserve ROW for a potential future overpass of I-84	Funded by Development
W6	Relocate Driveway/New Local Roadway	Relocated driveway further from interchange and River Road/West 6th Street intersection to meet access spacing standards	Funded by Development
E13	Intersection Improvement (Signal)	Intersection control to accommodate future traffic at River Road/Klindt Drive	$500,000
Summary of Total Cost for Non-Development Funded IAMP Projects			
		Phase 1 Projects	**--**
		Phase 2 Projects	**$1,470,000**
		Phase 3 Projects	**$31,680,000**
		Phase 4 Projects	**--**
		Ongoing Projects	**$500,000**
		Total IAMP Projects	***$33,650,000***

*Cost estimates were developed during IAMP project and are only shown for the projects that are not intended to be funded by development. Projects that include a cost estimate were included in the methodology used to develop System Development Charges (SDCs).
^The alignment for N2 and N3 bisects land that is now owned by a developer. If future construction of this connection is pursued, realignment may be needed.

The IAMP further identified the percent of development that is expected to be accommodated under each improvement phase, as summarized in Table 6-8. For example, if all improvements identified in Phase 2 are in operation, between 11 and 55 percent of full build-out under the land use scenario could occur before queuing and intersection operations exceed capacity.

As shown in Table 6-8, the Long-Term Improvements are expected to provide capacity for up to 75-percent of full build-out of all vacant and redevelopable land within the study area. However, the amount of reasonable development that may occur in this area needs to be reevaluated based on the most current information related to developable areas. The potential for development is anticipated to be lower than previously estimated due to wetlands and other issues. It is likely that only the near-term and mid-term improvements may be needed in this area.

Table 6-8. Transportation Improvement Thresholds

Improvement Phase	Development Threshold (Percent of Full Build-Out)
0 – No-Build	--
1 – Near-Term Improvements	<10%
2 – Mid-Term Improvements	11-55%
3 – Long-Term Improvements	56-75%
4 – Long-Term Vision Improvements	76-85%

N3
N2
N1
I-84
RIVER RD
W6
E10
I1
I2
I3
RIVER RD
COLUMBIA RD
E8
STEELHEAD WAY
E4B
E7
W2
W 6TH ST
E1
E4
CRATES WAY
W7
W1
E11
W3
E12
W 2ND ST
E3
CRATES WAY
W5
HOSTETLER ST W
E2
E9
KEINDT DR
W4
E6
E5
E13
POMONA ST
RIVER RD
SNIPES ST

LEGEND

- ALIGNMENT VARIABLE
- CLOSE ACCESS
- MEDIAN
- LOCAL ROADWAY
- COLLECTOR ROADWAY
- SIGNAL
- ROUNDABOUT
- ROUNDABOUT OR SIGNAL
- OVERPASS / UNDERPASS

IAMP PROJECTS
THE DALLES, OREGON

FIGURE
6-6

H:\projfile\18495 - The Dalles TSP\dwgs\figs\9600Figs-Final-Concept-fig 6-6.dwg Dec 26, 2016 - 4:39pm - openbnd Layout Tab: Fig-8-1

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Note: The alignment for N2 and N3 bisects land that is now owned by a developer. If future construction of this connection is pursued, realignment may be needed.

Safety Improvements

The safety improvements within the Roadway Plan are summarized in Table 6-9 and shown in Figure 6-7. It should be noted that many of the roadway, pedestrian, and bicycle improvement projects identified in other sections of this Plan will improve safety along City roads.

The projects for safety improvements include:

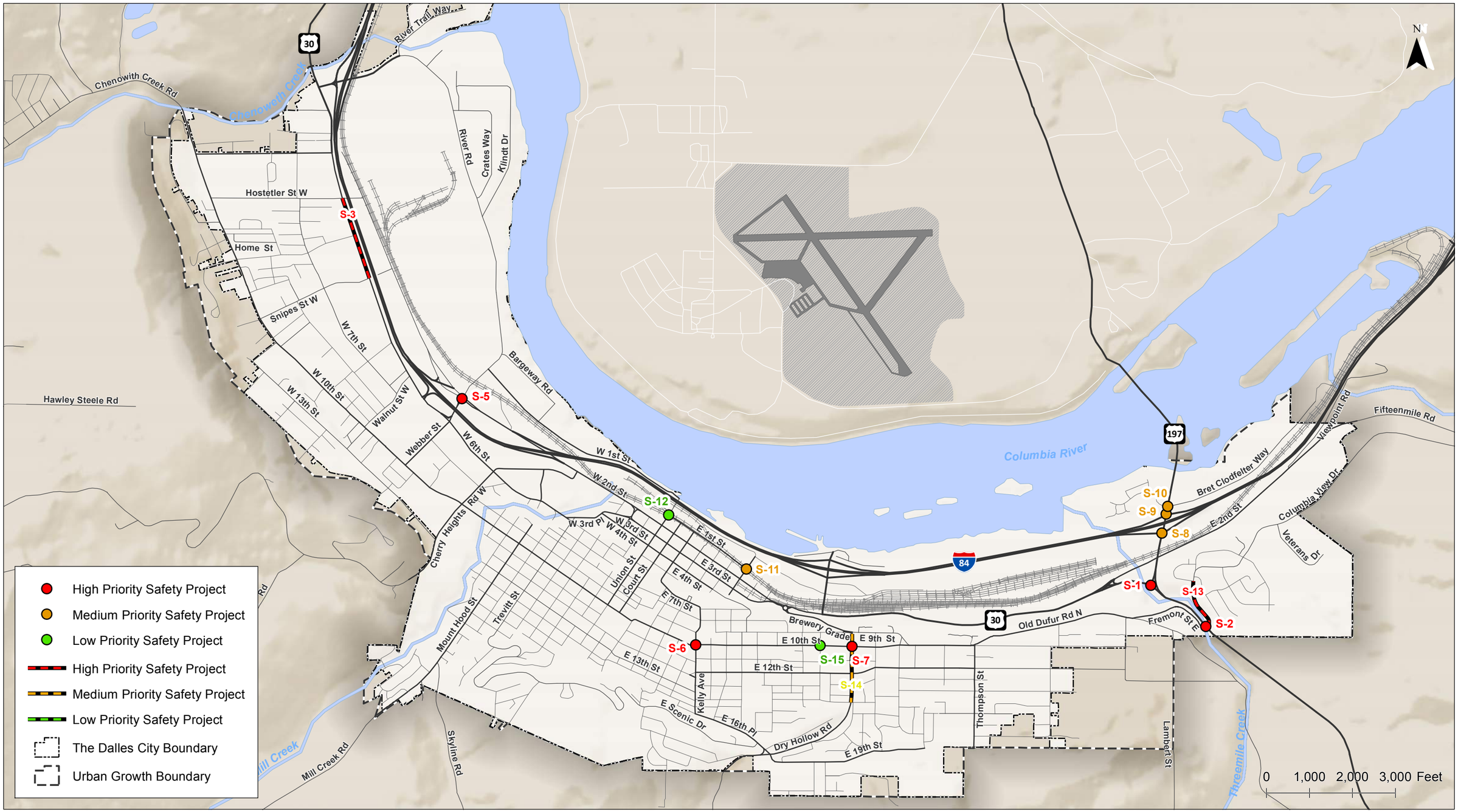
- Realigning intersection approaches;
- Installing signage and pavement markings;
- Reconfiguring turn lanes at intersections;
- Installing a J-turn intersection treatment; and
- Installing guardrail.

Table 6-9. Safety Improvements

Map ID	Location	Project Type	Project Description	Cost Estimate	Expected City Contribution*	Priority	Potential Funding Source		
							ODOT	City	Private
S-1	US 197/US 30	Safety	Install systemic safety improvements (signing and markings), and install a roundabout to address both safety and operational issues. The design of the roundabout should consider that trucks currently use this route to gain momentum when traveling uphill on US 197 towards the landfill. *(This project is also shown on the Intersection map as project I-1.)*	$2,000 for Systemic Safety Improvements; See Project S-1 for total cost estimate.	$500	High	✓		
S-2	US 197/Fremont Street/Columbia View Drive	Safety	Safety improvements including sign upgrades, rumble strips, and dynamic message signage.	$20,000	$5,000	High	✓	✓	
			Install an overpass in the long-term.	See Project I-2	See Project I-2	High	✓	✓	
S-3	West 6th Street from Snipes Street to Hostetler Street	Safety	Restripe roadway and widen, as necessary, to provide a consistent 3-lane section with center two-way, left-turn lane. Further study is needed to determine the preferred solution. Note: this project should be completed in conjunction with P-14.	$250,000	$250,000	High		✓	
S-5	Webber Street at W 2nd Street and W 6th Street	Safety	Realign approaches to provide protected left-turn phasing to reduce left-turn crashes on the Webber Street approaches.	See Project I-11	See Project I-11	High		✓	
S-6	Kelly Avenue/East 10th Street	Safety	Potential safety improvements include installing Stop Ahead signage (W3-1) on the East 10th Street approaches, use of a larger stop sign size, use of retroreflective tape on the sign post, and/or addition of Light Emitting Diode (LED) lights on the STOP sign border.	$5,000	$5,000	High		✓	
S-7	Dry Hollow Road/East 10th Street	Safety	Potential safety improvements include the use of a larger stop sign size, use of retroreflective tape on the sign post, or addition of LED lights on the STOP sign border.	$5,000	$5,000	High		✓	
S-8	US 197/I-84 EB Ramps	Safety	Systemic sign upgrades as potential candidates for the ODOT All Roads Transportation Safety (ARTS) Program. *(Project I-3 identifies a project to install a traffic signal to increase capacity here.)*	$1,000	$250	Medium	✓		
S-9	US 197/I-84 WB Ramps	Safety	Systematic sign upgrades as potential candidates for the ODOT ARTS program.	$1,000	$250	Medium	✓		
S-10	US 197/Bret Clodfelter Way	Safety	Illumination and systemic sign upgrades as potential candidates for the ODOT ARTS program.	$14,000	$3,500	Medium	✓		
S-11	1st St/Madison Street	Safety	Install part time restriction sign (sign that illuminates with railroad crossing activation) restricting eastbound left-turns during the approach and passage of trains (subject to ODOT Rail and Union	$20,000	$20,000	Medium		✓	

Map ID	Location	Project Type	Project Description	Cost Estimate	Expected City Contribution*	Priority	Potential Funding Source		
							ODOT	City	Private
			Pacific Railroad approval).						
S-12	1st St/Union Street	Safety	Install signage prohibiting drivers from stopping on the railroad tracks similar to Do Not Block Intersection signage. (subject to ODOT Rail and Union Pacific Railroad approval).	$1,000	$1,000	Low		✓	
S-13	Columbia View Drive Guardrail	Safety	Install guardrail along Columbia View Drive as it ascends the hill east of Highway 197.	$60,000	$60,000	High		✓	
S-14	Dry Hollow Road Corridor Study	Safety	Conduct a corridor study of Dry Hollow Road between E 9th Street and E 14th Street to evaluate speeds and determine whether corridor and/or intersection treatments such as mini-roundabouts or low-cost treatments such as signing and striping enhancements are needed.	$10,000	$10,000	Medium		✓	
S-15	Lewis Street/10th Street Intersection Enhancements	Safety	Stripe stop bars on Lewis Street at the approaches to 10th Street; Install advanced warning signage for the Lewis Street approaches.	$5,000	$5,000	Low		✓	
			Total Cost of High Priority Safety Projects	**$342,000**	**$325,500**				
			Total Cost of Medium Priority Safety Projects	**$46,000**	**$34,000**				
			Total Cost of Low Priority Safety Projects	**$6,000**	**$6,000**				
			Total Cost of Safety Projects	***$394,000***	***$365,500***				
	Note: The cost for projects S-2 and S-5 are excluded from the total because they are included in the cost for intersection projects.								

*For projects in which the City will be a funding partner with multiple agencies, a 25% match is assumed to be the City's contribution and is used for the funding evaluation.



K:\H_Portland\proj\file118495 - The Dalles TSP\gis\Draft\TSP\6-7 Safety Improvement.mxd - aludwig - 11:00 PM 12/9/2016

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OREGON

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Safety Plan
The Dalles, Oregon

Figure
6-7

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

BICYCLE AND PEDESTRIAN PLAN

The pedestrian and bicycle plan identifies the complete network of facilities for pedestrians and bicyclists. These networks include sidewalks and bike lanes or alternative treatments to provide connectivity on the major roads in the City. Sidewalk improvements have also been identified on some local streets and neighborhood streets that are located along routes near schools, provide access to local attractions, and in other high priority locations identified by the Public.

Projects within these plans were prioritized based on several factors:

- Inclusion in the Pedestrian and Bicycle Advisory Committee's Priority Network;
- Increasing north-south connectivity between downtown and areas south of downtown;
- Increasing east-west connectivity connecting to downtown;
- Providing connectivity to key destinations; and
- Providing parallel routes to high-volume roadways.

Bicycle Plan

The Bicycle Plan is shown in Figure 6-8. The map illustrates the planned bicycle routes throughout the City and indicates whether an on-street bicycle lane or a shared-roadway is recommended.

In some cases, buffered bike lanes or shared-use trails are recommended. Buffered bike lanes are on-street bike lanes that include a physical separation ("buffer") between the bike lane and the vehicle traffic lane and/or the vehicle parking lane. Buffered bike lanes can be particularly helpful on streets with comparatively high vehicle speeds, high vehicle volumes, or relatively frequent parking turnover. Shared-use paths are separated from the roadway by an open space or barrier. Shared-use paths are typically used by pedestrians and bicyclists as two-way facilities. Such paths can also be constructed on alignments separate from roadways to create more direct routes between destinations and also serve as elements of a recreational trail system.

Projects to complete the bicycle Plan in The Dalles are identified in Table 6-10.

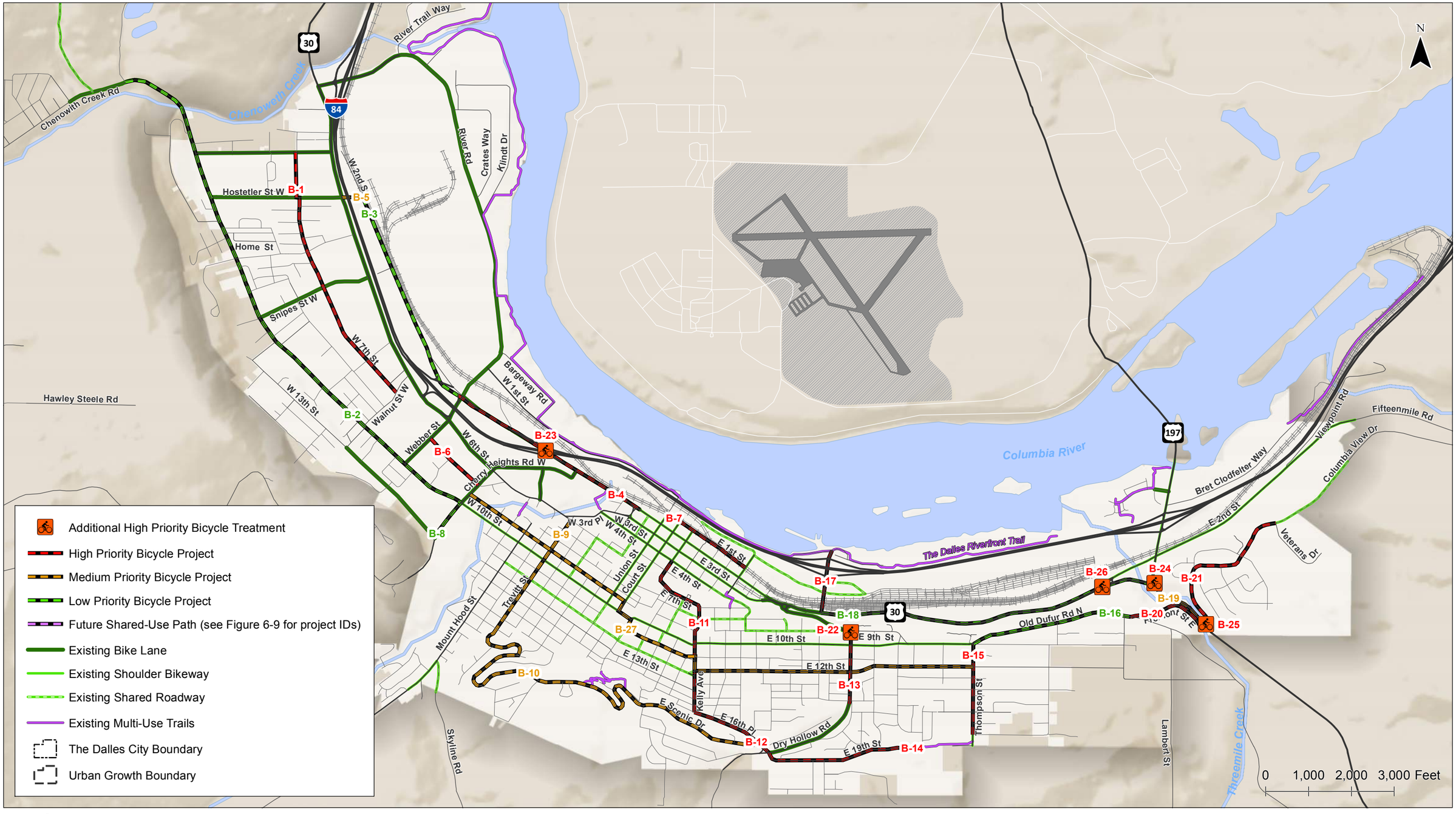
Table 6-10. Bicycle Projects

Map ID	Location	Project Description	Project Type	Cost Estimate	Expected City Contribution*	Priority	Potential Funding Source		
							ODOT	City	Private
B-1	West 7th Street from the new Transit center to Walnut Street	Add a bicycle lane(s) along West 7th Street from Chenowith Loop Road to Hostetler Street	Bicycle Lane without Pavement Widening	$2,000	$2,000	High		✓	
		Install sharrow markings along West 7th Street from Hostetler Street to Pomona Street	Shared Roadway	$1,000	$1,000			✓	
		Add a bicycle lane(s) along West 7th Street from Pomona Street to Walnut Street	Bicycle Lane without Pavement Widening	$10,000	$10,000			✓	
B-2	West 10th Street from Foley Lakes to Cherry Heights Road	Widen the existing bicycle lane to a 7-ft buffered bicycle lane from Foley Lakes to Cherry Heights Road	Bicycle Lane without Pavement Widening	$7,000	$7,000	Low		✓	
B-3	West 2nd Street from Hostetler Street to Webber Street	Add a bicycle lane(s) along West 2nd Street from Hostetler Street to Webber Street	Bicycle Lane with Pavement Widening	$800,000	$800,000	Low		✓	
B-4	West 2nd Street from Webber Street to Lincoln Street	Conduct a refinement plan for West 2nd Street from Webber Street to Lincoln Street that develops the preferred streetscape for this gateway section of the corridor and considers treatments at the key intersections, including Cherry Heights Road and W 2nd Street. Add a bicycle lane(s) along West 2nd Street from Webber Street to Lincoln Street	Bicycle Lane with Pavement Widening	$1,280,000	$1,150,000	High	✓	✓	
B-5	Hostetler Street from West 2nd Street to West 6th Street	Add a bicycle lane(s) along Hostetler Street from West 2nd Street to West 6th Street	Bicycle Lane with Pavement Widening	$1,000	$1,000	Medium		✓	
B-6	West 8th Street from Webber Street to Cherry Height Road	Install sharrow markings and signage along West 8th Street from Webber Street to Cherry Height Road	Shared Roadway	$2,000	$2,000	High		✓	
B-7	East 1st Street from Union Street to Madison Street	Add a bicycle lane(s) along East 1st Street from Union Street to Madison Street. Consider a 2-way bike lane along this route.	Bicycle Lane without Pavement Widening	$5,000	$5,000	High		✓	
B-8	Cherry Heights Road from West 13th Street to West 10th Street	Add a bicycle route Cherry Heights Road from West 13th Street to 525ft north	Bicycle Lane with Pavement Widening	$111,000	$111,000	Low		✓	
		Add a bicycle route Cherry Heights Road from 525ft north of West 13th Street to W 10th Street	Bicycle Lane without Pavement Widening	$1,000	$1,000				

B-9	Trevitt Street from West 6th Street to West 17th Street	Install sharrow markings and signage along Trevitt Street from West 6th Street to W 17th Street	Shared Roadway	$3,000	$3,000	Medium		✓	
B-10	Scenic Drive from West 17th Street to E16th Street	Add a bicycle route on Scenic Drive from West 17th Street to E 19th Street	Bicycle Lane without Pavement Widening	$14,000	$14,000	Medium		✓	
B-11	Kelly Avenue from East 5th Street to E 16th Place	Add a bicycle route along Kelly Avenue from East 5th Street to E 7th Street	Shared Roadway	$4,000	$4,000	High		✓	
		Add a bicycle route along Kelly Avenue from East 7th Street to E 10th Street	Shared Roadway	$1,000	$1,000			✓	
		Add a bicycle route along Kelly Avenue from E 10th Street to East 14th St	Shared Roadway	$4,000	$4,000			✓	
		Add a bicycle route along Kelly Avenue from East 16th Street to East 14th St	Shared Roadway	$1,000	$1,000			✓	
B-12	E 16th Place from Kelly Avenue to Dry Hollow Road	Add a bicycle route uphill along East 16th Street from Kelly Avenue to East 17 Street. This project would impact the existing on-street parking and may require a shared-lane treatment or widening the sidewalks to create a shared-use path for a portion of it to minimize impacts to on-street parking.	Uphill Bicycle Lane with Pavement Widening	$39,000	$39,000	High		✓	
		Add a bicycle route along East 16th Street from East 17 Street to Dry Hollow Road	Bicycle Lane without Pavement Widening	$3,000	$3,000				
B-13	Dry Hollow Road from East 14th Street to Brewery Grade	Add a bicycle route along Dry Hollow Road from East 14th Street to Brewery Grade	Shared Roadway	$1,000	$1,000	High		✓	
B-14	East 19th Street from Dry Hollow Road to Oakwood Drive	Install sharrow markings and signage along East 19th Street from Dry Hollow Road to Oakwood Drive	Shared Roadway	$3,000	$3,000	High		✓	
B-15	Thompson Street from East 18th Street to East 10th Street	Add a bicycle route along Thompson Street from East 18th Street to East 10th Street	Bicycle Lane with Pavement Widening	$140,000	$140,000	High		✓	
B-16	Old Dufur Road from Fremont Street to East 10th Street	Add a bicycle route along Old Dufur Road from Fremont Street to East 10th Street	Bicycle Lane with Pavement Widening	$400,000	$400,000	Low		✓	
B-17	Brewery Overpass	Add a bicycle route along Brewery Overpass	Shared Roadway	$1,000	$1,000	High		✓	
B-18	US 30 from US 197 to Brewery Overpass	Add a bicycle route along East 2nd Street from US 197 to Brewery Overpass	Bicycle Lane with Pavement Widening	$980,000	$240,000	Low	✓		

B-19	US 197 from Fremont Street/Columbia View Drive to Lone Pine Boulevard	Add a bicycle route along US 197 from Fremont Street/Columbia View Drive to US30	Bicycle Lane without Pavement Widening	$5,000	$1,300	Medium	✓		
B-20	Fremont Street	Add a bicycle route along Fremont Street	Shared Roadway	$1,000	$1,000	High		✓	
B-21	Columbia View Drive	Install sharrow markings and signage along Columbia View Drive from US197 to Veterans Drive	Shared Roadway	$3,000	$3,000	High		✓	
B-22	Dry Hollow at Brewery Grade	Additional bike treatment to improve bicycle safety	Bicycle	$3,000	$3,000	High		✓	
B-23	I-84 and 2nd Street	Additional bike treatment to improve bicycle safety	Bicycle	$3,000	$1,000	High	✓		
B-24	US 197 at US 30	Additional bike treatment to improve bicycle safety	Bicycle	$2,000	$500	High	✓		
B-25	US 197 at Fremont Street/Columbia View Drive	Additional bike treatment to improve bicycle safety	Bicycle	$3,000	$1,000	High	✓		
B-26	US 30 and E 2nd Street	Additional bike treatment to improve bicycle safety	Bicycle	$2,000	$500	High	✓		
B-27	W 9th Street Bike Lanes	Install bike lanes on W 9th Street from Cherry Heights to Court Street to E 10th Street to Washington Street to 11th Street to Kelly Avenue to E 12th Street to Thompson Street to create a complete east-west connection. This project should include treatment at the intersection of Dry Hollow Road/E 12th Street to guide bicyclists in appropriate crossings. Colored pavement markings and signage may be used to direct left-turning bicyclists to use two-stage left-turns with the crosswalks. This project may require removal of on-street parking in some locations to accommodate a bike lane.	Bicycle Lane without Pavement Widening	$30,000	$30,000	Medium		✓	
B-28	Bike Hub	Install bike hub.	Bike Hub	$70,000	$18,000	High	✓	✓	✓
			Total Cost of High Priority Bicycle Projects	**$1,585,000**	**$1,527,000**				
			Total Cost of Medium Priority Bicycle Projects	**$53,000**	**$49,300**				
			Total Cost of Low Priority Bicycle Projects	**$2,298,000**	**$1,559,000**				
			Total Cost of Bicycle Projects	***$3,936,000***	***$3,135,300***				

*For projects in which the City will be a funding partner with multiple agencies, a match of 11% to 25% is assumed to be the City's contribution and is used for the funding evaluation. In general, larger ticket items are assumed to have an 11% match, and all other projects are assumed to have a 25% local match.



Bicycle Plan
The Dalles, Oregon

Figure
6-8

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Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

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Pedestrian Plan

The Pedestrian Plan is shown in Figure 6-9. The map illustrates the key pedestrian routes throughout the City and identifies where improvements are needed to complete sidewalk gaps or improve crossings on these networks. Pedestrian needs within The Dalles are primarily addressed through sidewalks or multi-use paths.

Projects to complete the Pedestrian Plan in The Dalles are identified in Table 6-11.

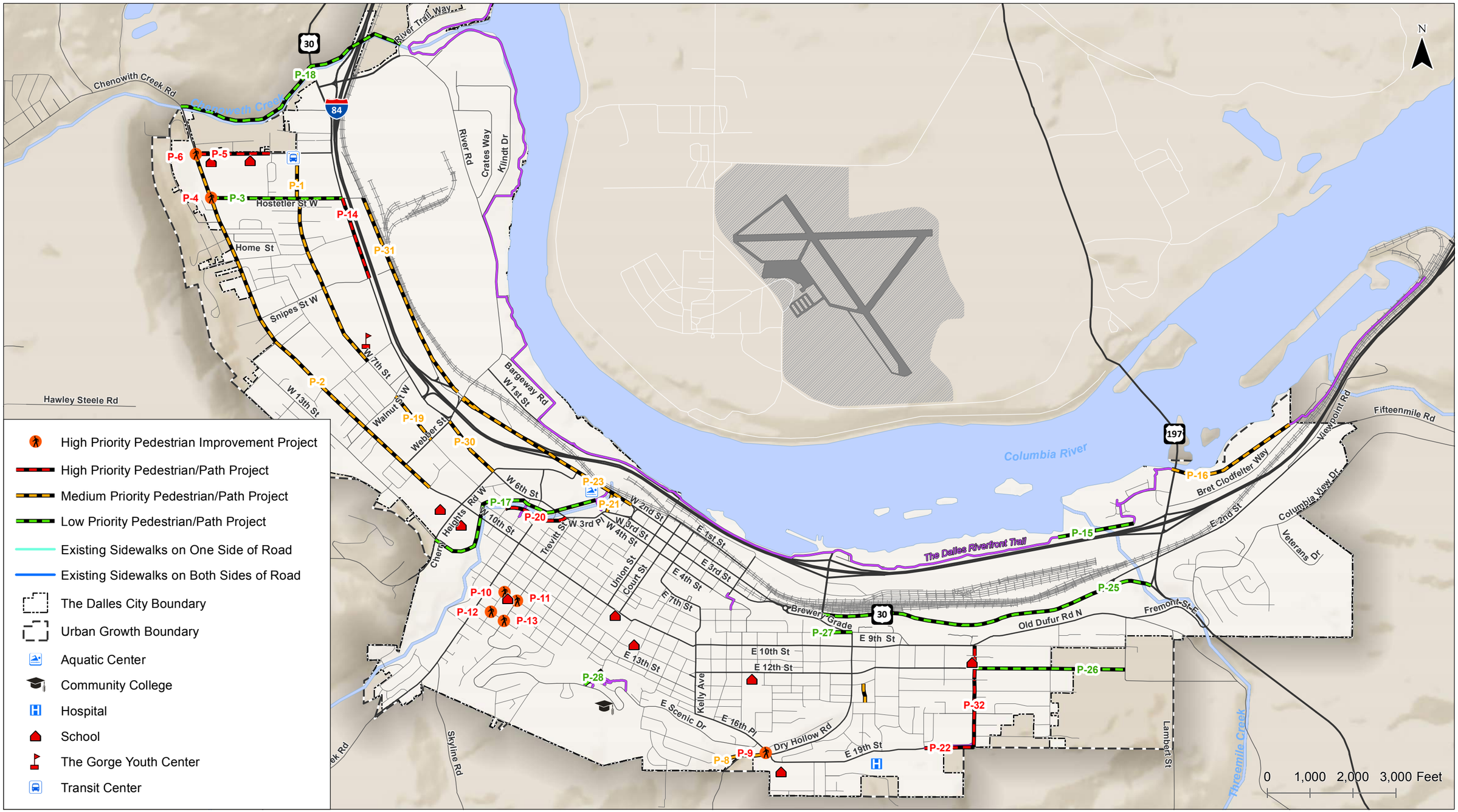
Table 6-11. Pedestrian Projects

Map ID	Location	Project Description	Project Type	Cost Estimate	Expected City Contribution**	Priority	Potential Funding Source		
							ODOT	City	Private
P-1	W 7th Street Sidewalk	Add a sidewalk on both sides of the street to fill sidewalk gaps from Chenowith Loop Road to Walnut Street. (Note: Sidewalk is only desired for the west side of W 7th Street between Chenoweth Loop Road and Hostetler.)	Sidewalk	$ 560,000	$ 560,000	Medium		✓	
P-2	W 10th Street Sidewalk	Add a sidewalk on both sides of the street to fill sidewalk gaps from Chenowith Loop Road to Vey Way	Sidewalk	$ 610,000	$ 610,000	Medium		✓	
P-3	Hostetler Street Sidewalk	Add a sidewalk on both sides of the street from West 10th Street to West 6th Street	Sidewalk	$ 200,000	$ 200,000	Low		✓	
P-4	W 10th Street/Hostetler Street intersection	Stripe high emphasis crosswalk markings and install appropriate school crossing signal	Crossing	$ 2,000	$ 2,000	High		✓	
P-5	Chenowith Loop Road Sidewalk	Add sidewalk on the south side of the street from Chenowith Elementary School to W 10th Street	Sidewalk	$ 46,000	$ 46,000	High		✓	
P-6	W 10th Street/Chenowith Loop Road Crosswalk	Stripe crosswalk markings and install appropriate school crossing signage	Crossing	$ 2,400	$ 2,400	High		✓	
P-8	E 19th Street Sidewalk	Add sidewalk on the north side of the street from East 18th Street to Dry Hollow Road	Sidewalk	$ 30,000	$ 30,000	Medium		✓	
P-9	E 16th Place/E 19th Street/Dry Hollow Road Crosswalk	Stripe crosswalk markings and install upgraded school crossing signage	Crossing	$ 2,500	$ 2,500	High		✓	
P-10	W 14th Street/Bridge Street Crosswalk	Stripe crosswalk markings and install upgraded school crossing signage	Crossing	$ 2,200	$ 2,200	High		✓	
P-11	W 14th Street/Trevitt Street Crosswalk	Stripe crosswalk markings and install upgraded school crossing signage	Crossing	$ 2,200	$ 2,200	High		✓	
P-12	W 16th Street/Bridge Street Crosswalk	Stripe crosswalk markings and install upgraded school crossing signage	Crossing	$ 2,200	$ 2,200	High		✓	
P-13	W 16th Street/Trevitt Street Crosswalk	Stripe crosswalk markings and install upgraded school crossing signage	Crossing	$ 2,200	$ 2,200	High		✓	
P-14	W 6th Street Sidewalk	Fill gaps between Snipes Street and Hostetler Street. Note: this should be conducted in conjunction with project S-3.	Sidewalk	$34,000	$34,000	High		✓	
P-15*	The Dalles Riverfront Trail	Fill gap in Riverfront Trail from Lone Pine to existing trail. *Note that this project has been opposed by one of the tribes and is unlikely to be developed.*	Shared-Use Path	Unknown	Unknown	Vision		✓	
P-16*	The Dalles Riverfront Trail	Complete Riverfront Trail from US 197 to The Dalles Dam	Shared-Use Path	Unknown	Unknown	Medium		✓	

Map ID	Location	Project Description	Project Type	Cost Estimate	Expected City Contribution**	Priority	Potential Funding Source		
							ODOT	City	Private
P-17	Mill Creek Trail^	Construct path on the west bank of Mill Creek from Cherry Heights Road/13th Street intersection to The Dalles Riverfront Trail	Shared-Use Path	Unknown	Unknown	Low		✓	
P-18	Chenoweth Creek Trail^	Construct trail along the creek from W 10th Street to the Riverfront Trail, including an at-grade crossing of US 30 (Historic Columbia River Highway) and an undercrossing of I-84.	Shared-Use Path	Unknown	Unknown	Low		✓	
P-19	Shared Use Path between West 7th Street and West 8th Street	Construct a shared-use path between West 7th Street and West 8th Street (from Walnut to Webber)	Shared-Use Path	$30,000	$30,000	Medium		✓	
P-20	Shared-Use Path along between W 8th Street and West 6th Street	Construct a shared-use path between W 8th Street and West 6th Street. Pre-engineering for part of this trail has begun. Further plans should be coordinated with The Dalles Watershed Council and the Riverfront Trail Committee.	Shared-Use Path	$37,000	$37,000	High		✓	
P-21	Shared-Use Path to the Aquatic Center	Construct a shared-use path between the intersection of West 3rd Place and West 4th Street to connect to the Aquatic Center and the Thompson City Park. This path should use the existing bridge. Much of this path will be constructed on private property.	Shared-Use Path	$7,000	$7,000	Medium		✓	
P-22	Sidewalks and Bicycle Lanes on East 19th Street and Thompson Street	Install sidewalks and bicycle lanes on the future East 19th Street connection to Thompson Street. This will be accomplished through roadway project R-1 and is included in the cost estimate for that project.	Sidewalk	--	--	High		✓	
P-23	W 2nd Street: Lincoln Street to Webber Street	Add a sidewalk on both sides of the street from Lincoln Street to Webber Street, based on result of streetscape study.	Sidewalk	$250,000	$250,000	Medium		✓	
P-25	E 2nd Street Sidewalks	Construct sidewalks on one side of East Second Street between Brewery Overpass Road and Highway 197	Sidewalk	$380,000	$95,000	Low	✓	✓	
P-26	E 12th Street Sidewalks	Construct sidewalks on E 12th Street between Thompson and Richmond	Sidewalk	$170,000	$170,000	Low		✓	
P-27	E 9th Street Sidewalk Infill	Construct sidewalks on E 9th Street from Lewis Street to Brewery Grade to provide a complete connection.	Sidewalk	$13,000	$13,000	Low		✓	
P-28	Sorosis Park Trail Connection Study	Study the feasibility of improving the trail connections between Sorosis Park and Washington Street.	Study	$20,000	$20,000	Low		✓	
P-29	Pedestrian Access Study	Evaluate the best locations for pedestrian/bicycle connections across the interstate and railroad to access the river, Riverfront trail, and Lone pine.	Study	$20,000	$20,000	High	✓	✓	
P-30	6th Street/Cherry Heights Road Pedestrian Access Study	Complete a study to examine pedestrian access in the area and determine the appropriate location and design for a mid-block crossing(s) of 6th Street between Cherry Heights Road and Webber Street.	Study	$5,000	$1,000	Medium	✓	✓	

Map ID	Location	Project Description	Project Type	Cost Estimate	Expected City Contribution**	Priority	Potential Funding Source		
							ODOT	City	Private
P-31	W 2nd Street Sidewalks from Webber to Hostetler	Install sidewalks on the west side of W 2nd Street.	Sidewalk	$510,000	$510,000	Medium		✓	
P-32	Thompson Street Sidewalks	Install sidewalks on both sides of Thompson Street between E 19th Street and E 10th Street. (Should be completed in conjunction with the E 19th Street extension)	Sidewalk	$228,000	$228,000	High		✓	
Total Cost of High Priority Pedestrian Projects				**$382,700**	**$382,700**				
Total Cost of Medium Priority Pedestrian Projects				**$2,003,000**	**$1,998,000**				
Total Cost of Low Priority Pedestrian Projects				**$783,000**	**$498,000**				
Total Cost of Pedestrian Projects				***$3,168,700***	***$2,878,700***				

*The alignment of these path projects is uncertain at this point and may change prior to implementation.
**For projects in which the City will be a funding partner with multiple agencies, a 25% match is assumed to be the City's contribution and is used for the funding evaluation.



Pedestrian Plan
The Dalles, Oregon

Figure
6-9

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

\\kittelson.com\fs\H_Portland\proj\file\18495 - The Dalles TSP\gis\Draft\TSP\6-9 Pedestrian Plan.mxd - aludwig - 4:34 PM 12/26/2016

PUBLIC TRANSPORTATION PLAN

To enhance transit service within The Dalles, the feasibility of implementing a fixed-route service was evaluated. Routing alternatives are provided in Chapter 5. The implementation and phasing plan and potential funding options are described below.

Implementation & Phasing Plan

A phased implementation will increase the feasibility of fixed-route transit in The Dalles as capital and operating costs can impede transit implementation.

As a first-step in fixed-route transit, a LINK dial-a-ride bus could be assigned to provide fixed-route service before and after CAT's Hood River – The Dalles – Portland service arrives and departs The Dalles, so as to allow transfer to and from the CAT bus. As the buses are already purchased, capital costs would only include bus stop amenities (signage, benches, etc.). Should fixed-route demand continue to rise, the dial-a-ride bus could provide one-hour headway service throughout the day. This option is not expected to significantly increase operating costs, as the dial-a-ride buses are already operating. In addition, fixed-route service typically produces 10 riders per service hours, compared to LINK dial-a-ride's current 3.5 riders per service hour on 3 buses. Therefore, fixed-route service would likely offset and alleviate demand on dial-a-ride, allowing LINK to continue to serve its passengers with 2 buses.

As demand increases, a separate and designated fixed-route service could be established as described in Chapter 5 with a one bus route system (Alternative 1) and expanding over time to two and three routes (Alternatives 2 and 3, respectively). Expansion of a fixed-route transit system will require increased and dedicated funding.

Potential Funding Options

To fund a fixed-route system in The Dalles, potential funding sources must be identified. The list below identifies the state and federal grant programs that could be applied for. That is followed by a list of sources that could be generated locally to fund transit. The list includes a variety of sources used by other transit providers.

State and Federal Transit Grant Programs

A number of state and federal transit grant programs are available that provide funding sources to local transit agencies. Transit agencies in Wasco County receive funds from some of these sources, namely Special Transportation Funds (STF), 5310, and 5311. Many of these funds are fixed amounts based on a formula for Wasco County, so utilizing them for fixed-route transit service in The Dalles would require they be used in lieu of other services. Federal grant programs regularly are added and removed with

each renewal of the federal transportation bill. A sampling of current known grant programs is included below[13]:

- State Special Transportation Funds (STF)
- Federal Transit Administration (FTA)
    - Section 5310 - Special Needs for Elderly Individuals and Individuals with Disabilities
    - Section 5311 - Small Cities and Rural Areas programs
    - Section 5314 – Technical Assistance and Workforce Development
    - Section 5339 – Buses and Bus Facilities

The grant programs are described in more detail below.

STF Program

The STF was created in 1985 by the Oregon Legislature. STF is allocated (based on population) by the Oregon Legislature every two years to 42 jurisdictions around the state including MCCOG. It is funded by cigarette tax revenue, excess revenue earned from sales of photo ID Cards, and other funds from the Oregon Department of Transportation. The STF Program provides a flexible, coordinated, reliable and continuing source of revenue in support of transportation services for seniors and people with disabilities of any age. The Oregon Legislature intended that STF funds be used to provide transportation services needed to access health, education, work, and social/recreational opportunities so that seniors and people with disabilities may live as independently and productively as possible. The funds may be used for any purpose directly related to transportation services, including transit operations, capital equipment, planning, travel training and other transit-related purposes.

Section 5310 Funds

The 49 U.S.C 5310 program (§5310) provides formula funding to states and metropolitan regions for the purpose of meeting the transportation needs of seniors and people with disabilities. Funds are apportioned based on each state's share of the population for these two groups. The purpose of the program is to improve mobility for seniors and people with disabilities by removing barriers to transportation service and expanding transportation mobility options. Eligible projects include both "traditional" capital investment and "nontraditional" investment beyond the Americans with Disabilities Act (ADA) complementary paratransit services.

[13] The level of funding available from these federal programs and the eligibility of projects to receive continued support vary by program. In general, however, these grant programs are not considered stable sources of annual funding. Rather, these programs can help fund the purchase of vehicles, capital investments, or fund temporary operations of a new services or special programs.

Traditional Section 5310 project examples include:

- Purchasing buses and vans for providing service to seniors and/or people with disabilities
- Preventative Maintenance
- Wheelchair lifts, ramps, and securement devices for such vehicles
- Transit-related information technology systems, including scheduling/routing/one-call systems
- Acquisition of transportation services for seniors and/or people with disabilities under a contract, lease, or other arrangement

Section 5311 Funds

The 49 U.S.C 5311 program (§5311) provides funding for transit capital, planning, and operations in rural areas (population less than 50,000), including job access and reverse commute projects.

Section 5314 Funds

The 49 U.S.C 5314 program (§5314) supports technical assistance activities that enable more effective and efficient delivery of transportation services, foster compliance with federal laws (including the ADA), meet the transportation needs of the elderly, and more. The funding can provide training opportunities for transit staff, allowing for effective outreach and operations of a fixed-route transit system.

Section 5339 Funds

The 49 U.S.C 5339 program (§5339) provides funding through a competitive allocation process to states and transit agencies to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities. The competitive allocation provides funding for major improvements to bus transit systems that would not be achievable through formula allocations.

ConnectOregon Funds

*Connect*Oregon projects are eligible for up to 70% of project costs for grants. A minimum 30% cash match is required from the recipient for all grant funded projects. Projects eligible for funding from state fuel tax revenues (section 3a, Article IX of the Oregon Constitution, the Highway Trust Fund), are not eligible for *Connect*Oregon funding. If a highway or public road element is essential to the complete functioning of the proposed project, applicants are encouraged to work with their ODOT region, city, or county to identify the necessary funding sources.

Local Funding Options

The following is a list of potential local funding sources that could be implemented to fund transit. Property taxes or business taxes will likely be the primary and necessary methods of match for federal

and state funds, making fixed-route transit feasible in The Dalles. The list includes a variety of sources used by other transit providers; however they have varying levels of feasibility in The Dalles.

- **Property Taxes** could provide consistent revenue to support a fixed-route system in The Dalles. Most municipalities collect property taxes, tax assessed on the value of an owned property, a portion of which can be used to fund transit.
- **Business Taxes** could also provide consistent revenue, taxing the net income of nearby businesses. Businesses benefit from their employees receiving consistent and reliable transportation and their customers receiving viable means to travel to the establishment.
- **Gas Tax** increase could fund road projects that are currently funded with flex funds, allowing a shift of flex funds for transit.
- **Farebox** revenue typically funds 5-10% of rural transit operations in Oregon.
- **Tax Increment Financing** can be used to capture additional property taxes generated in the vicinity of transit specific improvements or areas. This type of funding can also be used to capture a portion of property value caused by a particular investment.
- **Tax Incentive Zones** provide an indirect avenue for transit funding by potentially increasing fare revenue, sponsorship revenue, etc. by providing tax incentives for businesses and residents residing near transit oriented or transit friendly developments.
- **Multimodal Impact Fees** are similar to Transportation Impact Fees (TIFs) but focused on improvements to multimodal transportation options. In the event that a TIF is established, the fixed-route service could work to allocate a portion of the funds towards transit enhancing improvements.
- **Advertising/Sponsorship** opportunities could provide small amounts of consistent revenue. Some transit providers sell sponsorship for facility names, individual transit vehicles, within brochures, transit corridor guide books, etc.
- **Parking Fees/Fines** have the ability to provide incentives for users to use transit to reach desirable areas of the city, such as downtown The Dalles. The implementation of a parking strategy could increase transit ridership and thus fare box recovery as well as increase parking revenue.

AIR, WATER, RAIL, AND PIPELINE PLANS

The following describes identified needs and planned improvements related to the air, water, rail, and pipeline modes.

Air System

The Dalles is served by the Columbia Gorge Regional Airport, also known as The Dalles Airport. The *Oregon Aviation Plan* assigns the Columbia Gorge Regional Airport as a Category 3 (Regional General Aviation) airport. It has two runways and serves 45 operations per day on average.

The Columbia Gorge Regional Airport – Airport Master Plan, completed in August 2010, includes plans to construct new hangars, replace the existing terminal building, expand the runway ramps, install a new fuel farm, and utilize excess airport property for revenue generation. A plan to generate revenue includes a planned business park area located in the southwest corner of the airport property. The Master Plan also identified a unique opportunity to utilize the excess airport property for a golf course and resort.

Thirty-five acres in the business park have been developed into 17 lots that are shovel-ready for construction with the completed roadway infrastructure and utilities (water, sewer, electricity, cable, and high speed internet). Development is expected to continue at the business park.

Water System

The Columbia River serves as the northern boundary of The Dalles and provides a valuable resource to the City and the surrounding area. The river provides recreational opportunities and economic development opportunities such as the four private cruise lines that port at The Dalles Marine Terminal near the intersection of W 1st Street and Union Street. Cruises run from March to November each year and result in many passengers connecting to the pedestrian facilities in The Dalles or transferring to buses to visit local tourist destinations. This further emphasizes the need for improved pedestrian connections between the river and the areas near downtown and the transit center.

The Port of The Dalles Marina is located on the Columbia River at River Mile Post 190. The Marina provides space for 62 boathouses and approximately 30 open moorage positions that are leased on a monthly, 6-month or annual basis. A boat launch is located adjacent to the Marina to accommodate boat haul outs with trailers.

Rail System

The Union Pacific Railroad (UP) provides freight service along the I-84 corridor, known as the east-west transcontinental route linking Oregon with the mid-west and beyond. Locally, the transcontinental route operates between Portland and Hinkle Rail Yard (near Hermiston, Oregon) along the southern bank of the Columbia River. Hinkle Rail Yard is a junction point, and the location of UP's primary carload classification yard in the Pacific Northwest. The route continues southeast from Hinkle to Granger, Wyoming and Ogden, Utah, connecting to UP's historic Central Corridor that links the San Francisco Bay Area of California with Salt Lake City, Utah; Omaha, Nebraska; and Chicago, Illinois.

UP's network in Oregon is predominantly single track with passing sidings. Top inbound commodities include mixed freight handled in containers and trailers, recyclables/waste, fertilizers, soda ash and coal. Top outbound commodities were dominated by mixed freight handled in intermodal service, and lumber/building materials.

According to the *Oregon Rail Plan*, the Federal Railroad Administration (FRA) has established nine track classes, which set maximum speeds for freight and passenger trains, based on the track condition. UP track is maintained to FRA Class 1 conditions with no weight or dimensional restriction through The Dalles. In Oregon, Class 1 railroads have freight train speeds up to 60 mph and passenger train speeds up to 79 mph. Within The Dalles, trains are restricted to 40 mph.

There are three at-grade crossings on major roads within the City, including: Webber Street, Union Street, and Madison Street. In addition, a private at-grade crossing is located on Hostetler Road at the entrance to an industrial area. At-grade crossings result in interaction between fixed-rail and other transportation system users. ODOT Rail regulates all public at-grade highway-railroad grade crossings in Oregon.

All three crossings feature "Active Control" crossings that communicate the presence or approach of a train using measures such as flashing lights, bells, and/or a gate system. However, due to geometry and limited spacing between the railroad tracks and 1st Street, the City and ODOT have noted a few potential conflicts. At the rail crossing on Madison Street, eastbound left-turn traffic from 1st Street does not have a physical crossing barrier in place. This is due to the fact that 1st Street parallels the railroad tracks and 1st Street intersects with Madison Street at the crossing. Additional warning or other devices may be needed to enforce the crossing warning system.

At the Union Street rail crossing, southbound traffic turning left onto 1st Street may create a queue across the railroad tracks during peak periods of vehicular traffic. Signage should be installed to encourage queued vehicles to stop in advance of the railroad crossing. Safety projects S-11 and S-12 are intended to address rail crossing issues.

Pipeline and Transmission System

Northwest Natural Gas operates a major natural gas distribution line serving The Dalles. This distribution line extends southward from the main transmission line, which runs along the Washington side of the Columbia River Gorge. Northwest Pipeline Corporation operates the main transmission line.

Chapter 7 Funding Plan

7. FUNDING PLAN

Funding for the implementation of the projects identified in the Transportation System Plan will be shared between the City of The Dalles, ODOT, and private development. The proportional contributions are to be determined at the time that development occurs or some land use change triggers the need for implementation. Contributions of each agency, if any, should reflect facility usage by local, regional, or statewide trips.

To assist with the future implementation efforts, Chapter 7 outlines the existing revenue stream for transportation funding in the City of The Dalles, summarizes project costs by type for the recommended projects, and discusses potential funding sources.

For the City of The Dalles, there are two strategic considerations related to transportation funding:

- The City's existing transportation System Development Charge (SDC) program should be updated following adoption of the TSP. The City Council needs to consider the implications on the future rate assessed on both economic development potential and the percentage of future transportation revenue needs that can be reasonably relied upon for funding by SDCs.
- Due to declining revenue, both traditional and non-traditional partnerships and funding sources should actively be pursued by the City of The Dalles. This can include volunteer efforts to initiate trail construction, staff pursuit of grants, public/private partnerships, and coordination with State and County interests to help fund transportation projects.

ESTIMATED REVENUE

The City of The Dalles has three primary sources for funding transportation projects: a three-cent fuel tax, the State Motor Vehicle Fund, and the Federal Aid Urban Exchange Funds. The Transportation SDC Fund accounts for the receipt and expenditures of revenues to construct collector and arterial street improvements and is funded by SDC fees assessed on new development.

The primary sources of revenue for the Transportation Fund have been the State of Oregon gas tax and, to a lesser extent, state revenue sharing and the FAU fund exchange program. Recognizing the impact that the installation of public utilities have on the need for street repairs, the City of The Dalles established two revenue sources for the Transportation Fund: franchise fees from the City's water and wastewater funds. The Transportation Fund covers the City's street, bike lane, and right-of-way. Table 7-1 summarizes transportation-related funding for the past five fiscal years (FY) as well as projections for the most recent fiscal year, which ended in June 2016.

Table 7-1. Transportation Revenue

	FY 10-11	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16
State Motor Vehicle Fund	$658,647	$783,286	$789,715	$825,100	$835,291	$832,610
FAU Exchange Funds	$303,202		$304,776		$566,438	$303,202
Local Fuel Tax	$396,102	$434,026	$442,468	$449,660	$476,806	$498,814
System Development Charges	$39,010	$168,629	$276,341	$95,479	$35,334	$100,000
Other Local Revenue Sources	$286,779	$290,878	$284,792	$296,364	$409,895	$581,231
Total	$ 1,683,740	$ 1,676,819	$ 2,098,092	$ 1,666,603	$ 2,242,777	$ 1,781,253

Based on the information provided in Table 7-1, the city has an average of $1.87 million per year in transportation revenues. The City's FY 15-16 budget for Street Fund Revenues is $2.27 million.

Records provided by the City indicate revenues have exceeded expenditures in FY 12-13 and FY 13-14 (FY 14-15 was not complete at the time of review). Budgeted Expenditures for FY 15-16 are summarized in Table 7-2.

Table 7-2. Fiscal Year 2015-2016 Budgeted Transportation Expenditures

	FY 12-13	FY 13-14	FY 14-15	FY 15-16
Personnel	$646,000	$600,000	$718,700	$759,700
Materials and Services	$442,000	$384,500	$605,300	$626,000
Capital Outlay	$121,900	$284,000	$249,200	$299,200
Other	$302,600	$538,300	$438,200	$585,600
Total	$1,512,500	$1,806,800	$2,011,400	$2,270,500

Based on records of expenditures in the current budget, the City anticipates spending 13 percent of the annual Street Fund budget on capital projects. If this level of funding is maintained for capital projects over the 20-year planning horizon, the City could fund approximately $6 million in capital projects.

PLANNED TRANSPORTATION SYSTEM COST SUMMARY

Table 7-3 provides a summary of the City's expected share of the capital cost associated with construction of the transportation system needs identified in the TSP. For projects with multiple funding partners, it was assumed that the City would be required to provide a local match as a contribution to the project. The local match was assumed to vary between 11 and 25 percent, depending on the type and scale of the project. The actual match may vary by project. As shown, the City's expected contribution to the planned system is approximately $23.4 million over the 20 year period, including approximately $4.9 million in high priority projects, $4.9 million in medium priority projects, $13.6 million in low priority and development driven projects. Note that this cost does not include the financial commitments required for on-going maintenance and rehabilitation of the existing transportation system. Based on the anticipated $6 million in funds available for capital improvement projects over the next 20 years, **the financially constrained plan includes the high priority projects only**.

Table 7-3. Planned Transportation System Cost Summary (Expected City Contribution)

Project Type	High Priority (Cost Constrained Projects)	Medium Priority	Low Priority/ Development Driven	*Total*
Roadway	$900,000	$1,900,000	$3,300,000	*$6,100,000*
Intersection	$1,755,000	$500,000	$215,000	*$2,500,000*
IAMP	--	$367,500	$8,045,000	*$8,400,000*
Safety	$325,500	$34,000	$6,000	*$370,000*
Pedestrian/Trail	$382,700	$1,998,000	$498,000	*$2,900,000*
Bicycle	$1,527,000	$49,300	$1,559,000	*$3,100,000*
Bridge	$5,000	$20,000	--	*$25,000*
Total	**$4,900,000**	**$4,900,000**	**$13,600,000**	***$23,400,000***

Additional grants and funding opportunities that may be used to help fill the gap in funding projects are summarized in the following section.

LOCAL FUNDING MECHANISMS

At the local level, the City can draw on a number of potential funding mechanisms to increase funding for the TSP improvements.

Typically, as properties with road frontage develop, developers of subdivisions are required to build the road frontage along their property, consistent with City standards. Individual properties are only required to construct sidewalk when a new curb line is established. These enhancements allow the transportation system to be developed incrementally at the same time as land develops. Property owners are only required to pay for improvements in proportion to the development's impact on the transportation system.

Table 7-4 outlines other potential funding sources at the local level that could be implemented in the future in the City of The Dalles. In general, local funding sources are more flexible than funding obtained from state or federal grant sources.

Table 7-4. Potential Local Funding Mechanisms

Funding Source	Description	Potential Application in The Dalles
User Fee	Fees tacked on to a monthly utility bill or tied to the annual registration of a vehicle to pay for improvements, expansion, and maintenance on the street system.	Preliminary street improvements
Street Utility Fees/Road Maintenance Fee	The fee is based on the number of trips a particular land use generates and is usually collected through a regular utility bill.	System-wide transportation facilities including streets, sidewalks, bike lanes, and trails
Stormwater SDCs, Grants, and Loans	Systems Development Charges, Grants, and Loans obtained for the purposes of making improvements to stormwater management facilities.	Primarily street improvements
Optional Tax	A tax that can be used to fund improvements, and gives the taxpayer the option to pay. Generally paid at the same time other taxes are collected, optional taxes are usually less controversial and easily collected since they give the taxpayer a choice whether or not to pay the additional tax.	System-wide transportation facilities including streets, sidewalks, bike lanes, trails, and transit
Public/Private Partnerships	Public/private partnerships have been used in several places 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 charging stations, public parking lots, bicycle lockers, or carshare facilities.	System-wide transportation facilities including streets, sidewalks, bike lanes, trails, and transit
Tax Increment Financing (TIF)	A tool cities use to create special districts (tax increment areas) where public improvements are made in order to generate private-sector development. During a defined period, the tax base is frozen 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, trails, and transit
Local Improvement Districts (LID)	A local improvement district is a geographic area where local property owners are assessed a fee to cover the cost of a public improvement in that area.	Improvements to the transportation system in a local area where local property owners will benefit from the improvement.

STATE AND FEDERAL GRANTS

In addition to local funding sources, the City of The Dalles can seek to leverage opportunities for funding from grants at the State and Federal levels for specific projects. The current Federal transportation bill, Fixing America's Surface Transportation (FAST) Act, was signed into law on December 4, 2015 providing long-term funding certainty for surface transportation.

In Oregon, most federal monies are administered through ODOT and regional planning agencies. Most, but not all, of these programs are oriented toward transportation versus recreation, with an emphasis on reducing auto trips and providing inter-modal connections. Federal funding is intended for capital improvements and safety and education programs, and projects must relate to the surface transportation system.

Table 7-5 outlines those sources and their potential applications.

Table 7-5. Potential State and Federal Grants

Source ID	Source Title	Award Cycle	Intended Use	Applicable Project Types	Administration Agency	Deadline	Local Match	Website
1	STIP - Enhance	Biennial	Activities that enhance, expand, or improve the transportation system. Projects that improve or enhance the state's multimodal transportation system.	All	ODOT	August	10%	http://www.oregon.gov/ODOT/TD/STIP/Pages/WhatsChanged.aspx
2	*Connect*Oregon	Biennial	Non-highway transportation projects that promote economic development in Oregon.	Non-highway modes	ODOT	November	20%	http://www.oregon.gov/ODOT/TD/TP/pages/connector.aspx
3	Immediate Opportunity Funds	Biennial	Support primary economic development through the construction and improvement of street and roads.	All	ODOT	On-going	50%	http://www.oregon.gov/ODOT/TD/EA/reports/IOF_PolicyGuidelines2015%20doc.pdf
4	All Roads Transportation Safety (ARTS)	Biennial	Address safety needs on all public roads in Oregon; reduce fatal and serious injury crashes.	All hot spot and systemic safety projects	ODOT	Varies	8%	http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/Pages/ARTS.aspx
5	Federal Transit Administration Discretionary Grant Programs	Varies	Fund design, construction, and maintenance of pedestrian and/or bicycle projects that enhance or are related to public transportation facilities.	Pedestrian projects within one-half mile and bicycle projects within three miles of a public transit stop	FTA	Varies	Varies	http://www.fta.dot.gov/grants/FAST.html
6	Rivers, Trails, and Conservation Assistance Program	Annual	Technical assistance for recreation and conservation projects.	Shared-use paths	National Park Service	August	None	http://www.nps.gov/ncrc/programs/rtca/contactus/cu_apply.html
7	Oregon Parks and Recreation Local Government Grants	Annual	Primary use is recreation; transportation allowed. Construction limited to outside road right-of-way, only in public parks or designated recreation areas	Shared-use paths	OPRD	Varies	20%	http://www.oregon.gov/oprd/grants/pages/local.aspx
8	Recreational Trails Program	Annual	Recreational trail-related projects, such as hiking, running, bicycling, off-road motorcycling, and all-terrain vehicle riding.	Shared-use paths	OPRD	Varies	20%	http://www.oregon.gov/oprd/grants/pages/trails.aspx
9	Land and Water Conservation Fund	Annual	Acquire land for public outdoor recreation or develop basic outdoor recreation facilities	Shared-use paths, bikeways, sidewalks	OPRD	Varies	50%	http://www.oregon.gov/oprd/grants/pages/lwcf.aspx

Many funding opportunities target specific project types, including bicycle and pedestrian projects. In order to utilize City and State funding as efficiently as possible, these alternative funding opportunities should be considered for specific projects, as applicable.

The following sections provide more detail on some of the identified funding sources.

1) Statewide Transportation Improvement Program - Enhance

The Statewide Transportation Improvement Program (STIP) is ODOT's short-term capital improvement program, providing project funding and scheduling information for the department and Oregon's metropolitan planning organizations. STIP project lists are updated every two years, with four-year project lists. Project lists are developed through the coordinated efforts of ODOT, federal and local governments, Area Commissions on Transportation, tribal governments, and the public.

In developing this program, ODOT must verify that the identified projects comply with the Oregon Transportation Plan, ODOT Modal Plans, Corridor Plans, local comprehensive plans, and FAST Act planning requirements. The STIP must fulfill federal planning requirements for a staged, multi-year, statewide, intermodal program of transportation projects. Specific transportation projects are prioritized based on federal planning requirements and the different state plans. ODOT consults with local jurisdictions before highway-related projects are added to the STIP. Stand-alone bicycle/pedestrian projects are an eligible funding category, and multi-modal roadway projects that contain a planned pedestrian or bicycle improvement can also be funded through this mechanism.

In 2012, the Oregon Transportation Commission (OTC) and ODOT changed how the State Transportation Improvement Program (STIP) is developed. The STIP is no longer developed as a collection of projects for specific pools of funding dedicated to specific transportation modes or specialty programs. The STIP is primarily divided into two broad categories: Fix-It and Enhance. Enhance activities expand or improve the transportation system and Fix-It activities preserve the transportation system.

The Fix-It project selection process is similar to prior STIPs, as these projects are developed mainly from ODOT management systems that help identify needs based on technical information for things like pavement and bridges.

The Enhance process was a significant change and reflects ODOT's goal to become a more multimodal agency and make investment decisions based on the system as a whole, not for each mode or project type separately. The agency has requested assistance from our local partners in developing the STIP and identifying those projects that assist in moving people and goods through the transportation system.

More information: http://www.oregon.gov/ODOT/TD/STIP/Pages/WhatsChanged.aspx

Surface Transportation Program

The Surface Transportation Program (STP) provides states with flexible funds that may be used for a variety of projects on any Federal-Aid Highway including the National Highway System, bridges on any public road, and transit facilities. Bicycle and pedestrian improvements are eligible activities under the STP.

The STIP-Enhance statewide multi-modal selection process awards STP funds in conjunction with TAP and other funds.

Transportation Alternative Program

The Transportation Alternative Program (TAP) is intended to promote projects that improve all modes of transportation. A federal program administered by ODOT, the Transportation Enhancement (TE) program is funded by a set-aside of Surface Transportation Program (STP) monies. Ten percent of STP funds are designated for TE activities, which include the "provision of facilities for pedestrians and bicycles, provision of safety and educational activities for pedestrians and bicyclists," and the "preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian and bicycle trails).

The STIP-Enhance statewide multi-modal selection process awards TAP funds in conjunction with STP and other funds.

2) ConnectOregon

*Connect*Oregon is a lottery-backed bond initiative to invest in air, rail, marine, transit, and bicycle/pedestrian infrastructure to ensure Oregon's transportation system is strong, diverse, and efficient.

*Connect*Oregon projects are eligible for up to 70% of project costs for grants. A minimum 30% cash match is required from the recipient for all grant funded projects. Projects eligible for funding from state fuel tax revenues (section 3a, Article IX of the Oregon Constitution, the Highway Trust Fund), are not eligible for *Connect*Oregon funding. If a highway or public road element is essential to the complete functioning of the proposed project, applicants are encouraged to work with their ODOT region, city, or county to identify the necessary funding sources.

All Oregonians will reap the benefits from enhancing Oregon's transportation infrastructure. People and businesses, as well as the environment, will benefit by having a more efficient, productive transportation system that improves Oregon's business environment, ultimately leading to more jobs and a more sound economy.

3) Immediate Opportunity Funds

The purpose of the "Immediate Opportunity Fund" (IOF) is to support primary economic development in Oregon through the construction and improvement of streets and roads. The 1987 Oregon Legislature created state funding for immediate economic opportunities with certain motor vehicle gas-tax increases. Access to this fund is discretionary and the fund may only be used when other sources of financial support are unavailable or insufficient. The IOF is not a replacement or substitute for other funding sources. The IOF is designed to meet the following objectives:

A. Provide needed street or road improvements to influence the location, relocation or retention of a firm in Oregon.
B. Provide procedures and funds for the Oregon Transportation Commission (OTC) to respond quickly to economic development opportunities.
C. Provide criteria and procedures for Business Oregon, other agencies, local governments and the private sector to work with the Oregon Department of Transportation (ODOT) in providing road improvements needed to ensure specific job development opportunities for Oregon or to revitalize business or industrial centers.

4) ODOT All Roads Transportation Safety (ARTS) program

In late 2012 ODOT reached out to the League of Oregon Cities (LOC) and the Association of Oregon Counties (AOC) to mutually agree upon principles for a program that allocates funding for safety improvement projects to all agencies throughout the state. The program applies Federal Highway funding from the Highway Safety Improvement Program (HSIP) to roads managed by Oregon Counties and Cities.

ARTS currently splits funding between hot-spot and systemic safety projects. Hot spot safety projects are individual locations where a unique countermeasure could be applied to reduce the frequency and severity of crashes. Systemic safety projects include multiple locations where many low-cost countermeasures can be applied. Hot spot projects are most-likely to be funded if the project addresses a crash location with a history of fatal or debilitating (Injury A) crashes, consistent with the FAST Act.

ARTS project funding will be allocated through the Statewide Transportation Improvement Program (STIP).

5) Federal Transit Administration Discretionary Grant Programs

The Federal Transit Administration (FTA) views walking and bicycling as modes that complement public transit, as many people either begin or end a trip on public transportation, on foot, or by bicycle. The FTA issued a policy statement that defines a catchment area around transit stops within which bicycle and pedestrian projects are eligible for FTA financial support. All pedestrian projects within one-half mile and bicycle projects within three miles of a public transit stop are considered to have a de facto relationship with public transportation. Projects within this catchment area are thereby eligible for one

of the grant programs administered by the FTA to fund the design, construction, and maintenance of pedestrian and/or bicycle projects that enhance or are related to public transportation facilities.

More information: http://www.fta.dot.gov/grants/FAST.html

6) Rivers, Trails, and Conservation Assistance Program

The Rivers, Trails, and Conservation Assistance Program (RTCA) is a National Parks Service (NPS) program providing technical assistance via direct NPS staff involvement to establish and restore greenways, rivers, trails, watersheds and open space. The RTCA program provides only for planning assistance—there are no implementation monies available. Projects are prioritized for assistance based on criteria including conserving significant community resources, fostering cooperation between agencies, serving a large number of users, encouraging public involvement in planning and implementation, and focusing on lasting accomplishments. This program may benefit trail development in The Dalles indirectly through technical assistance, particularly for community organizations, but should not be considered a future capital funding source.

More information: http://www.nps.gov/ncrc/programs/rtca/contactus/cu_apply.html

7) Oregon Parks and Recreation Local Government Grants

The Oregon Parks and Recreation Department (OPRD) administers a Local Government Grants program using Oregon Lottery revenues. The grants may pay for acquisition, development, and major rehabilitation projects for public outdoor park and recreation areas and facilities. The amount of money available for grants varies depending on the approved OPRD budget. Grants are available for three categories of projects: small projects (maximum $50,000 request), large projects (maximum $750,000 request, or $1,000,000 for land acquisition), and small community planning projects (maximum $25,000 request). Several projects identified in this Plan would meet the grant eligibility requirements.

More information: http://www.oregon.gov/OPRD/GRANTS/local.shtml

8) Recreational Trails Program

OPRD administers Recreational Trails Grants for recreational-related projects including trails for hiking, biking, running, all-terrain vehicle riding, etc. The grants are administered by the Oregon Parks and Recreation Department (OPRD) and awarded annually.

More information: **http://www.oregon.gov/OPRD/GRANTS/Pages/trails.aspx**

9) Land and Water Conservation Fund

OPRD administers The Land and Water Conservation Fund grants to state and local governments for developing outdoor recreation areas for public use. These grants require the local governments to match the funding.

More information: http://www.oregon.gov/OPRD/GRANTS/Pages/lwcf.aspx

VOLUME I: APPENDICES

Appendix A: Project Prospectus Sheets

VOLUME II: TECHNICAL APPENDICES

1. Technical Memorandum 1: Plans and Policy Review
2. Technical Memorandum 2: Goals and Objectives
3. Technical Memorandum 3: Existing Conditions
4. Technical Memorandum 4: Future Travel Demand
5. Technical Memorandum 5: Alternatives Analysis
6. Transit Feasibility Analysis
7. Technical Memorandum 6: Preferred Plan
8. Land Use Development Ordinance Amendments
9. Transportation Planning Rule (TPR) Findings