Transportation System Plan

Wasco County Transportation System Plan

Wasco County, Oregon

July 2009

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The contents of this document do not necessarily reflect the views or policies of the State or Oregon.

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Technical Memorandum #3: Existing Transportation Conditions

Technical Memorandum #4: Future Conditions Analysis

Technical Memorandum #5: Transportation Improvement Alternatives Analysis

Technical Memorandum #6-7: Preferred Transportation Plan

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Preface

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

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Section 1
Introduction

Introduction

OVERVIEW

Wasco County, in conjunction with the Oregon Department of Transportation (ODOT), initiated the creation of a Transportation System Plan (TSP) in 2008. The TSP will guide the management and development of transportation facilities within Wasco County, incorporating the county's vision, while remaining consistent with state and local plans and policies. This plan provides Wasco County with the necessary elements to be adopted as the transportation element of the County's comprehensive plan. In addition, the plan provides ODOT and Wasco County with guidance in regards to their future planning efforts.

State of Oregon planning rules require that the TSP be based on the current comprehensive plan land use map and must also provide a transportation system that accommodates the expected 20-year growth in population and employment. The contents of this TSP are guided by Oregon Revised Statute (ORS) 197.712 and the Department of Land Conservation and Development (DLCD) administrative rule known as the Transportation Planning Rule (TPR). These laws and rules require that jurisdictions develop the following:

- a road plan for a network of arterial and collector streets;
- a bicycle and pedestrian plan;
- an air, rail, water, and pipeline plan;
- a transportation financing plan; and,
- policies and ordinances for implementing the transportation system plan.

The TPR requires that alternative travel modes be given consideration along with the automobile, and that reasonable effort be applied to the development and enhancement of the alternative modes in providing the future transportation system. In addition, the TPR requires that local jurisdictions adopt land use and subdivision ordinance amendments to protect transportation facilities and to provide bicycle and pedestrian facilities between residential, commercial, employment, and institutional areas.

TSP PROCESS

The Wasco County TSP was developed through a process that identified transportation needs, developed and analyzed potential alternative approaches for addressing those needs, and developed an improvement and financing plan that best address Wasco County's forecasted needs. The following steps were involved in this process:

- Reviewing state, regional, and local transportation plans and policies that the Wasco County 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 year 2030, if growth occurs as expected, but no transportation improvements are made other than those already funded.
- Identifying and evaluating improvement alternatives intended to address Wasco County's future transportation needs.
- Developing a prioritized set of improvements and strategies that meet the plan goals and objectives.
- Estimating the revenue available for transportation projects through the year 2030, assuming reduced, consistent, and increased transportation funding.
- Compiling the results of this work into this TSP document,
- Review and adoption of the TSP by Wasco County Planning Commission and County Court.

PUBLIC INVOLVEMENT

The planning process was guided by a Technical Advisory Committee (TAC), which was comprised of key stakeholder agencies and other community representatives. These included Wasco County Public Works and Planning Departments, the City of The Dalles, the Oregon Department of Transportation, the Oregon Department of Land Conservation and Development, and Mid-Columbia Fire & Rescue.

The TAC was responsible for reviewing the technical aspects of the TSP. The TAC reviewed several memoranda and convened at a total of five TAC meetings during the process of developing the TSP. The TAC meetings focused on all aspects of the TSP development, including existing deficiencies and forecast needs; presentation and review of alternatives; presentation and review of a preferred transportation and funding plan; and, presentation and review of recommended ordinance 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, and priorities. These meetings were held in the City of The Dalles and the City of Maupin. All comments were addressed in the alternatives analysis and final plan development. Finally, the draft plans were discussed with the Planning Commission and County Court at public hearings.

PLAN STUDY AREA

Wasco County is located in north-central Oregon and includes an area of 2,395 square miles. Figure 1-1 shows a map of Wasco County, including the urban growth boundary (UGB) of each incorporated city within the County. The primary study area for the Wasco County TSP consists of all areas of the county located outside the UGBs of incorporated cities and outside the boundary of the Confederated Tribes of Warm Springs and the Mt. Hood National Forest. Although the TSP is primarily a rural TSP, some attention was paid to the City of The Dalles urban area for project planning and coordination purposes.

Based on the requirements of the Transportation Planning Rule, the study of County roadways and intersections is generally limited to those with the highest classifications – collectors and arterials – as well as state highways. However, local street issues such as street connectivity, design standards, and safety are also discussed where appropriate.

TSP ORGANIZATION AND METHODOLOGY

The development of Wasco County's TSP began with a review of the local and statewide plans and policies that guide land use and transportation planning in the County. The plan and policy review is presented in **Section 2** of this plan. Goals and objectives for the TSP, as developed by the Technical Advisory Committee (TAC) are presented in **Section 3.**

An inventory of the existing transportation system documented all major transportation-related facilities and services within the UGB. The transportation system inventory allowed for an objective assessment of the current system's operational performance, safety, and general function, which is summarized in **Section 4**.

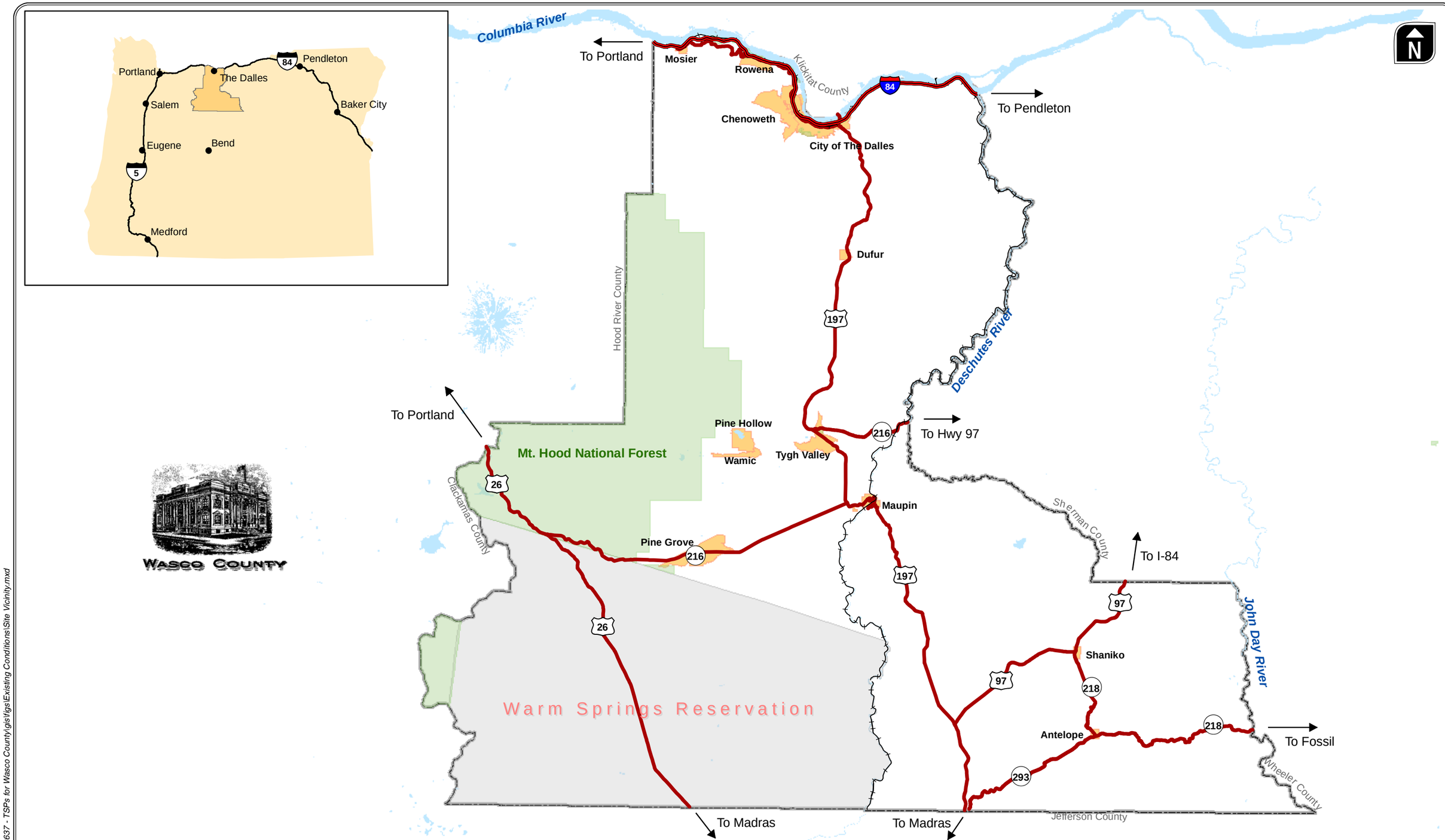
Long-term (year 2030) transportation system forecasts were developed based on ODOT future volume estimates and input from ODOT Transportation Planning and Analysis Unit (TPAU). **Section 5** of this report details the development of anticipated long-term (year 2030) future transportation needs within the UGB.

A preferred plan was developed that reflected a consensus on which elements should be incorporated into the County's long-term transportation system. The preferred plan was based on transportation needs summarized in **Section 6**. Transportation needs were identified by the TAC, comments received from the County staff, Wasco County residents, and ODOT representatives.

Having identified a preferred set of alternatives, the next phase of the planning process involved presenting and refining the individual elements of the TSP through a series of decisions and recommendations leading to the preferred plan. The preferred plan identified in **Section 7**, Transportation System Plan, include a roadway plan and a pedestrian and bicycle plan, as well as plans for other transportation modes serving Wasco County.

Section 8, Transportation Finance Element, provides an analysis and summary of the alternative funding sources to finance the identified transportation system improvements. The recommended modifications presented in **Section 9**, LUDO Ordinance Modifications and Comprehensive Plan Policy Language, include specific changes in development ordinances to implement the TSP and to achieve compliance with the Oregon Transportation Planning Rule (OAR 660 Division 12).

Sections 1 through 9 comprise Volume 1 of the TSP and provide the main substance of the plan. These are supplemented by Technical Appendices in Volume 2 which contains the technical memoranda documenting the existing conditions analysis, forecast needs, and alternatives analysis.



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STUDY AREA MAP
WASCO COUNTY, OREGON

FIGURE
1-1

Section 2
Plans, Policies, and Standards Review

Plans, Policies, and Standards Review

One of the project objectives of the TSP Update is to ensure that the County's TSP reflects and is consistent with local and state transportation policies and standards. To meet these objectives, a review and evaluation of existing plans, policies, standards, and laws that are relevant to the TSP update was conducted. Detailed information from this review, including a complete list of the documents reviewed, can be found in Technical Memorandum #2 located in Volume 2 of the Technical Appendix.

The summary of federal, state, regional, and local documents, as they relate to transportation planning in Wasco County, provided the policy framework for the TSP planning process. State documents and requirements were summarized as they applied to the Wasco County TSP, as were applicable local city policies and regulations that had potential impacts on the county transportation system.

Given the prominence of the City of The Dalles, a number of local documents were also reviewed for policies that could have impacts to the Wasco County TSP. Reviewed documents include the City Comprehensive Plan (2006), the Growth Management Report (2007), Land Use and Development Ordinances (2008), and The Dalles Transportation System Plan (2006). Finally, the Downtown Local Street Network Plan for the City of Mosier (2003) was reviewed to round out the prominent local jurisdiction planning documents.

The regulatory review includes an assessment of Wasco County's Land Use and Development Ordinance and how well it complies with the requirements of the State's Transportation Planning Rule (TPR, OAR 660, Division 12). The review summarizes the requirements of TPR Section -0045, Implementation of the Transportation System Plan, lists the applicable implementation elements of the TPR, and demonstrates where the adopted County regulations comply, or where amendments to code language are needed to comply with the TPR. The recommendations were executed by the development of draft code language (see Section 9, LUDO Ordinance Modifications and Comprehensive Plan Policy Language).

Section 3
Goals and Objectives

Goals and Objectives

The goals and objectives presented in this section will guide the development of the transportation system in Wasco County. The goals relate to: Mobility and Connectivity; Multimodal Users; Safety; Environment; and, Planning and Funding. Objectives for each goal are also provided, which identify the course of action intended to achieve each goal.

GOAL 1: MOBILITY AND CONNECTIVITY

Plan and develop an interconnected system of roads that will link communities for all users and will address existing and future needs for transportation of goods and people in the region.

Objectives

- Promote adequate transportation linkages between communities.
- Promote and maintain an integrated and linked network of arterial, collector, and local streets that minimizes travel distances.
- Maintain roadway performance standards for the efficient movement of people and goods.

GOAL 2: SAFETY

Provide a transportation system that promotes the safety of current and future travel modes for all users.

Objectives

- Reduce incidence and severity of motor vehicle, pedestrian, and bicycle crashes.
- Provide a transportation system that allows for adequate emergency vehicle access to all land uses.
- Promote railway and highway safety at and near railway intersections.
- Develop access management standards for all county road facilities.

GOAL 3: MULTIMODAL USERS

Provide a multimodal transportation system that permits the safe and efficient transport of people and goods.

Objectives

- Support the development of public transit opportunities.
- Promote an interconnected network of bicycle and pedestrian facilities throughout the County.

- Consider bicycle and pedestrian facilities needs during construction of new roads and during upgrades of existing roads.
- Support the development of recreational bicycling and hiking facilities.

GOAL 4: ENVIRONMENT

Provide a transportation system that balances transportation services with the need to protect the environment.

Objectives

- Develop a multimodal transportation system that avoids reliance upon one form of transportation as well as minimizes energy consumption and air quality impacts.
- Encourage development patterns that decrease reliance on motor vehicles.

GOAL 5: PLANNING AND FUNDING

Maintain the safety, physical integrity, and function of the County transportation network through a sound and sustainable financing plan.

Objectives

- Continue and enhance the partnering relationships with local jurisdictions and the Oregon Department of Transportation.
- Maintain long-term County Road Fund stability.
- Evaluate new innovative funding sources for transportation improvements.
- Ensure that the existing transportation network is conserved through maintenance and preservation.

I-84 CHENOWETH INTERCHANGE POLICY STATEMENT

The transportation function of the I-84 Chenoweth Interchange is to provide safe and efficient access to the Port and industrial land in the western part of The Dalles (the area located east of the interchange). In addition to its primary function, the Chenoweth Interchange remains an important facility for accessing the Discovery Center and existing commercial lands in the vicinity of the city's industrial center. The interchange also serves local residential and commercial traffic circulating from I-84 to Highway 30 and West 6th Street.

Section 4
Existing 2008
Transportation Conditions

Existing 2008 Transportation Conditions

Wasco County's transportation system provides facilities serving many different modes of transportation. This section documents the existing system, including the following modes:

- Road System (auto/truck)
- Pedestrian and Bicycle
- Public Transit
- Rail
- Marine
- Air
- Pipeline and Transmission System

ROAD SYSTEM

Roadways serve the largest share of trips and support many of the modes discussed in this section. Automobiles/trucks, pedestrians, bicyclists, transit users, marine vessels, and freight transportation all rely on roadways to some degree for mobility and access to various land uses, such as rail, marine, air, and pipeline/transmission facilities. The following sections define the Wasco County roadways and summarize their functional classification, existing traffic operations, safety, and pavement conditions.

The following jurisdictions own and manage the entire public roadway system within Wasco County. Figure 4-1 identifies county and non-county roadway facilities.

- **Wasco County** owns and maintains approximately 697 miles of roadway, which includes 300 miles of paved roadway. The majority of the county roadways are concentrated in the central north-south portion of the County, which contains the irrigated lands and the population centers. In addition, the majority of the roads have rural characteristics: two travel lanes, no bike lanes, no sidewalks, and minimum shoulders.
- **The Oregon Department of Transportation (ODOT)** owns upwards of 270 miles of state highways within the County, including some of those most heavily traveled roadways. These highways provide regional mobility within the county and serve as major transportation links to other areas of the state.
- **The United States Forest Services (USFS)** owns and maintains the roadways within the Mt. Hood National Forest, located in the western area of the county. These roadways have been used historically to access logging areas and provide emergency fire access; however they are seeing more recreational use. This plan does not include a description of the specific roadways under USFS jurisdiction. ODOT maps of Wasco County include roadways within

the Mt. Hood National Forest and are available for download at www.oregon.gov/ODOT/TD/TDATA/gis/CountyMaps. A vicinity map of Mt. Hood National Forest is available on the USFS website (www.fs.fed.us/r6/mthood/maps/vicinity-map).

- **The Confederated Tribes of Warm Springs** own and maintain the roadways within the Warms Springs Indian Reservation area. The reservation is located in the southwest area of the county. The roadways within the reservation are mainly used for logging and emergency fire access. This plan does not include a description of the specific roadways under the jurisdiction of the Confederated Tribes of Warm Springs.
- **The Incorporated Cities of The Dalles, Dufur, Maupin, Mosier, Shaniko, and Antelope** own and maintain the roadways within their city limits that are not owned or maintained by ODOT or the County. These roadways provide local access and serve local trips. This plan does not summarize the roadways within the urban growth boundary of the incorporated cities. The Dalles is the only incorporated city that has an adopted Transportation System Plan (TSP); The plan can be accessed or downloaded on the city's website at www.ci.the-dalles.or.us.

County Roadways

Wasco County owns and manages the following roadways that serve as a valuable component of the countywide and statewide transportation network:

- **Bakeoven Road** is a two-lane highway that runs parallel to and east of US 197. It serves as the primary connection to land in the southeast quadrant of the county. Bakeoven Road provides the most direct connection between the incorporated cities of Maupin and Shaniko.
- **Cherry Heights Road (Chenoweth Creek Road)** provide two-lane roadway connections between the northwest portion of The Dalles and properties in the northwest portion of Wasco County.
- **Dry Hollow Road and Olney Road** provide a circuitous route from the south side of The Dalles to properties within three to four miles of the incorporated city.
- **Dufur Valley Road** provides an east-west connection from US 197 at Dufur west to OR 35.
- **Emerson Loop Road** is a two-lane roadway that provides a circuitous route that connects lower-order roadway facilities in the northeast portion of Wasco County to Eightmile Road and US 197.
- **Fifteenmile Road** is classified by ODOT as a Rural Major Collector. The route parallels I-84 in the northeast corner of Wasco County.
- **Friend Road** is a two-lane road that connects unincorporated Friend to US 197 at a location south of Dufur, via a NE/SW alignment.
- **Sevenmile Hill Road** provides a connection from the northwest corner of The Dalles to Mosier. This route serves local traffic in the northwest portion of Wasco County.

- **Lower Eightmile Road** runs parallel to Eightmile Creek throughout the county. Lower Eightmile Road begins on the east side of The Dalles and runs east through Petersburg. The roadway runs north-south from Petersburg to US 197 and continues southwest after crossing US 197.
- **Fivemile Road, Mill Creek Road, Skyline Road, and Threemile Road** compose an arterial network that provides northeast-southwest connections between The Dalles and those portions of Wasco County that are west of US 197.

State Highways

ODOT maintains the following highways in Wasco County:

- **Interstate 84 (Columbia River 002)** is a major 4-lane, east-west interstate freeway along the north edge of Wasco County which parallels the Columbia River.
- **US 26 (Warm Springs Highway 053)** is a two-lane highway that runs through the southwestern portion of Wasco County. It is a Statewide Highway, a classified Freight Route, a classified Expressway, and is part of the National Highway System. In working as part of an interconnected national and state network, US 26 and its Expressway designation provides for higher speed interurban travel with minimal disruptions.
- **US 30 (Historic Columbia River Highway 100)** is a two-lane highway that parallels I-84 from Mosier to US 197 in The Dalles. US 30 is a District Highway and is part of the National Highway System.
- **US 97 (Sherman 042)** is a two-lane highway that runs through the southeastern portion of Wasco County connecting to Sherman County to the north and Jefferson County to the south. US 97 is a Statewide Highway, a classified Freight Route, and a Scenic Byway.
- **US 197 (The Dalles-California Highway 004)** is a two-lane highway that provides connection from I-84, the City of Dufur, the unincorporated community of Tygh Valley, the City of Maupin, and ultimately to the junction with US 97 in south Wasco County. US 197 is a Regional Highway with a Special Transportation Area (STA) designation in the City of Maupin.
- **OR 206 (Celilo-Wasco 301)** is a two-lane highway that connects to I-84 in the northeast corner of Wasco County and runs parallel to I-84 for the entirety of it's length in Wasco County. The highway continues to the southeast through Sherman County and provides a connection to Condon and ultimately Heppner. ODOT classifies OR 206 as a District Highway
- **OR 216 (Wapinita 044)** is a two-lane east-west highway that provides a connection between US 26 and US 197/City of Maupin. OR 216 follows the US 197 route from the City of Maupin to Tygh Valley where it splits off **(Sherars Bridge 290)** and continues east into Sherman County. Both segments of OR 216 are designated as District Highways.
- **OR 218 (Shaniko-Fossil 291)** is a two-lane highway connecting Shaniko, Antelope, and Wheeler County in the southeastern part of Wasco County. OR 218 is a District Highway and is classified as a Scenic Byway.

- **OR 293 (Antelope Highway 293)** is a two-lane highway that provides a connection between the City of Antelope and the US 97 corridor to the west. OR 293 is a District Highway.

Functional Classification

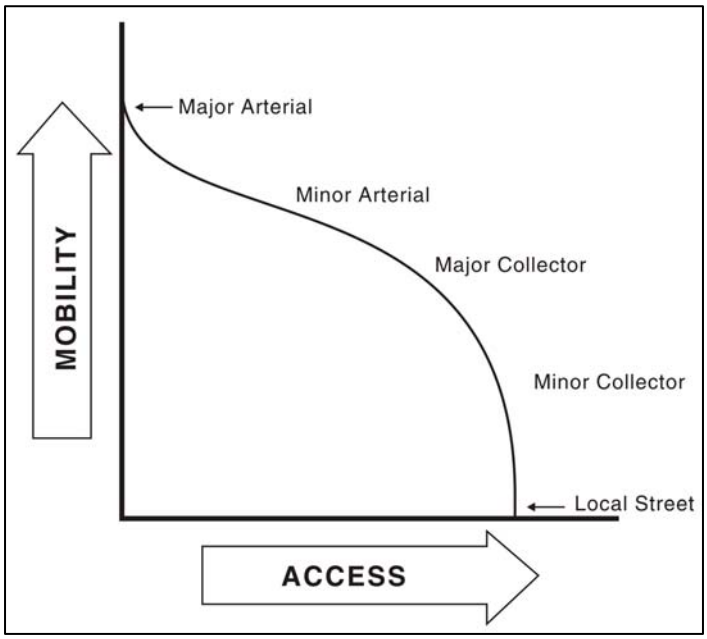
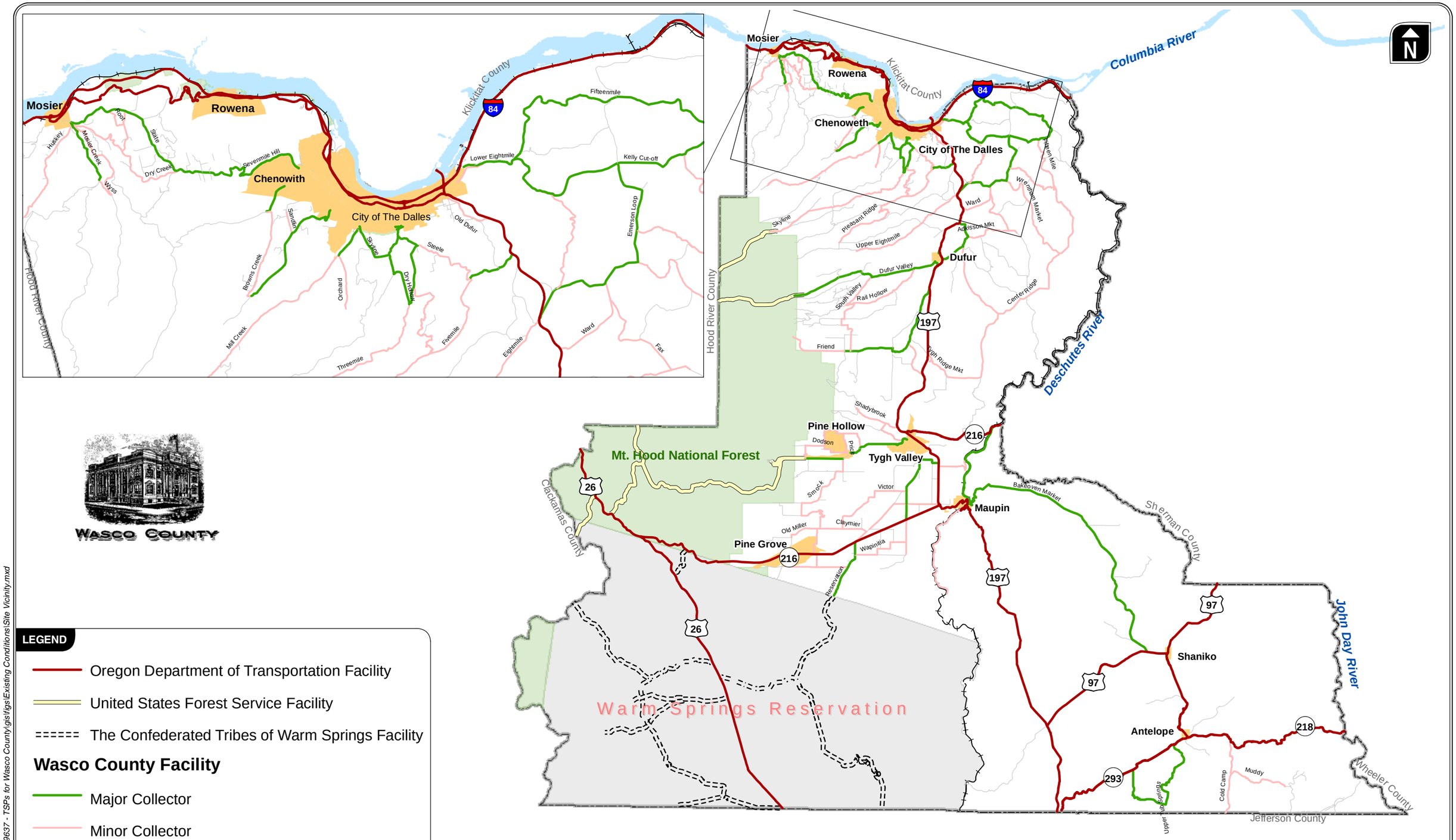


Figure 4-1 summarizes the existing functional classifications of county and state highways as denoted on ODOT's map rendering of Wasco County and does not represent the final classification for the TSP. A roadway's functional classification describes its role in the transportation system. The function and role of the roadway can be described in terms of the character of service the roadway provides. In general, the functional classification of a roadway is based on the varying degree of its two primary functions: 1) mobility, and 2) accessibility to adjacent land uses. Among other standards, the tools that are commonly used to govern the classification include: roadway width, posted/design speed, right-of-way dedications, access spacing requirements, and types of pedestrian and bicycle facilities provided.

ODOT classifies its highways based on the 1999 Oregon Highway Plan. The classifications are mainly based on the significance of the highway in the statewide transportation system. "Interstate Highway" is given the highest priority and is considered a freeway that provides connections between major cities within Oregon and neighboring states. "Statewide Highway" is considered to be a highway of statewide significance, providing mobility throughout the state. "Regional Highway" and "District Highway" provide regional and district- level mobility, respectively. ODOT classifications of the state highways within Wasco County are provided in Table 4-1.



WASCO COUNTY

LEGEND

- Oregon Department of Transportation Facility
- United States Forest Service Facility
- The Confederated Tribes of Warm Springs Facility

Wasco County Facility

- Major Collector
- Minor Collector
- Local

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HIGHWAY FUNCTIONAL CLASSIFICATION
WASCO COUNTY, OREGON

FIGURE **4-1**

TABLE 4-1 ODOT HIGHWAY FUNCTIONAL CLASSIFICATIONS

Highway	Classification	NHS	Freight Route	Scenic Byway	Special Designation
I-84 (Columbia River Highway 002)	Interstate Highway	Yes	Yes	No	-
US 26 (Warm Springs 053)	Statewide Highway	Yes	Yes	No	Expressway
US 30 (Historic Columbia River Highway 100)	District Highway	No	No	Yes	-
US 97 (Sherman 042)	Statewide Highway	Yes	Yes	Yes[2]	-
US 197 (The Dalles-California 004)	Regional Highway	No	No	No	STA[1]
OR 206 (Celilo-Wasco 301)	District Highway	No	No	No	-
OR 216 (Wapinita 044) (Sharers Bridge 290)	District Highway District Highway	No No	No No	No No	- -
OR 218 (Shaniko-Fossil 291)	District Highway	No	No	Yes[3]	-
OR 293 (Antelope Highway 293)	District Highway	No	No	No	-

[1] US 197 has a Special Transportation Area designation through downtown Maupin from milepost 44.97 to 45.29.
[2] Milepost -0.06 to 56.53 is designated as a scenic byway
[3] Milepost 0.00 to 23.07 is designated as a scenic byway

Wasco County has not classified non-state highways. However, in coordination with ODOT's statewide county map renderings, a functional classification of county roadways has been identified. The roadways are primarily classified as major and minor collectors. Local jurisdictions typically establish the functional classification of roadways using the following classification hierarchy:

- **Arterials** represent the highest class of roadway. These roadways are intended to provide mobility by serving high volumes of through traffic, traveling at higher speeds. They also serve truck movements and should emphasize traffic movement over local land access. In some cases, arterial streets are further designated as "major/principal" or "minor". Major/principal arterials have higher design speeds, fewer accesses per mile, and usually do not permit direct private driveways accesses. Minor arterials provide slightly lower travel speeds and have a few more accesses than major/principal arterials.
- **Collectors** represent the intermediate roadway class. As their name suggests, these roadways collect traffic from the local street system and distribute it to the arterial street system. These roadways provide a balance between traffic movement and land access and should provide extended continuous stretches of roadway to facilitate traffic circulation through the county. Collector streets are sometimes divided into two categories – urban collector/rural major collector and minor collector. Urban collector/rural major collector have the same basic roadway design, but are differentiated by urban features like bike lanes

and sidewalk as well as permitted adjacent land use (i.e., the land is inside or outside the Urban Growth Boundary). Minor collectors serve lower volume of traffic and have lower design speeds than urban collector/rural major collector.

- **Local** roads and streets are the lowest roadway class. Their primary purpose is to provide local land access and to carry locally generated traffic at relatively low speeds to the collector street system. Local streets should provide connectivity through neighborhoods, but should be designed to discourage cut-through vehicular traffic.

Traffic Operations

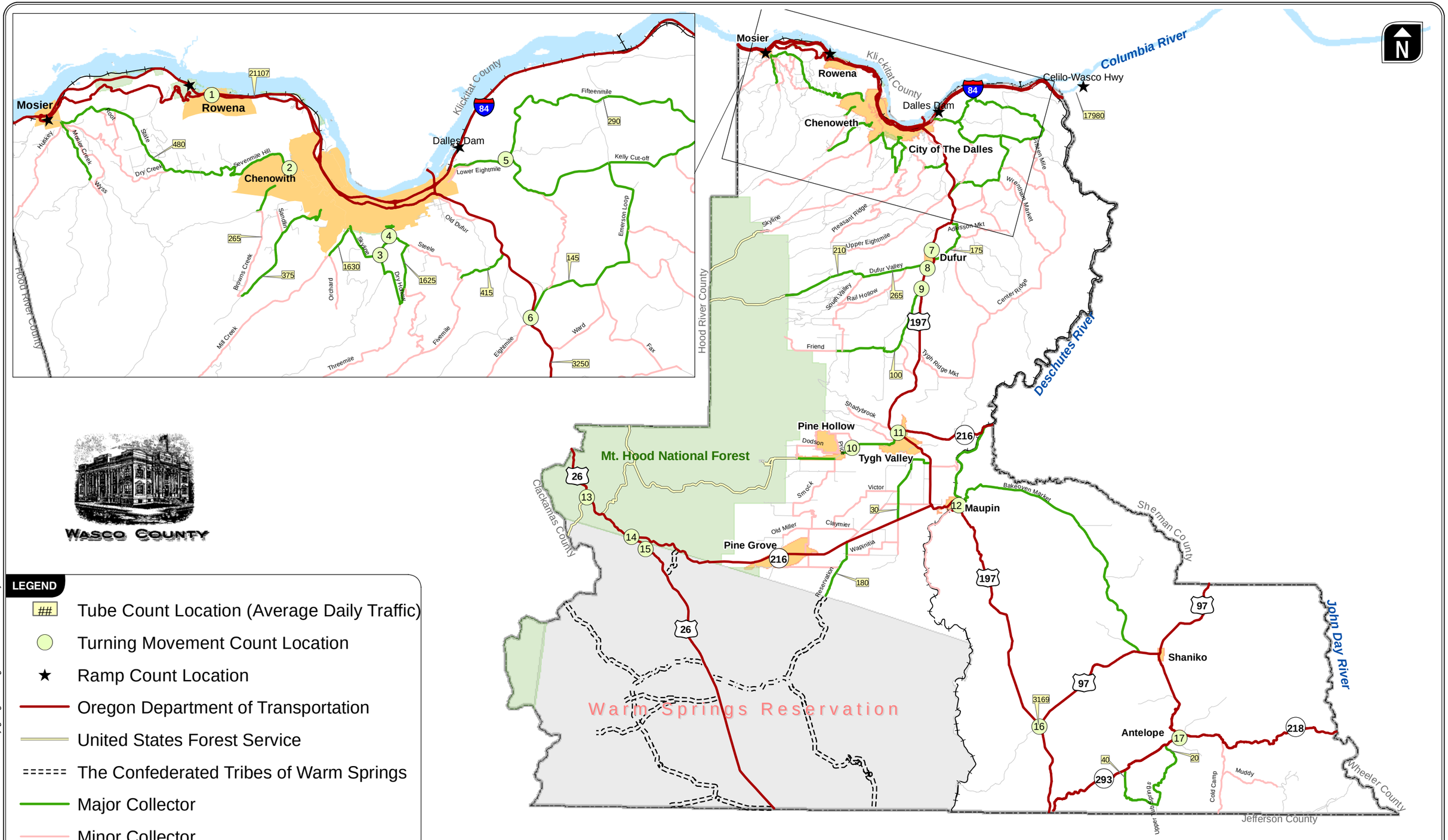
As part of the scope of work developed for this TSP, a number of highway segments, intersections, and freeway interchanges were identified for study, as shown in Figure 4-2. The operational conditions of the identified components of the existing roadway system were evaluated to identify potential capacity constraints within Wasco County. The traffic volumes used in the analysis were developed from a compilation of count data obtained from ODOT. Traffic volume counts at interchange ramps were performed in May 2008. Additional intersection counts were conducted in December 2008.

Average daily traffic (ADT) count data was obtained from ODOT permanent automatic traffic recorders (ATR), 2007 ODOT volume tables, and counts conducted in December 2008. Figure 4-2 summarizes the seasonally-adjusted existing 2008 ADT volumes on major facilities in Wasco County.

Intersections

Each intersection count was seasonally adjusted based on ODOT's methodology to obtain 30th highest hour volumes (additional detail regarding these adjustments can be found in the Technical Appendix Volume Two). The existing conditions traffic operational analysis was conducted based on the 30th highest hour traffic volumes at each study intersection. Figure 4-3 shows the existing lane configurations and traffic control devices. Figure 4-4 provides the 2008 30th highest hour volumes and the 2008 operational analysis results at all study intersections. As shown in Figure 4-4, all intersections were found to operate at level-of-service "C" or better and a maximum volume-to-capacity (V/C) ratio of 0.14 during the 30th highest hour condition[1].

[1] The mobility standard specified in the OHP is a maximum volume-to-capacity (V/C) ratio of 0.70 for interstate, statewide, and regional highways located outside of Urban Growth Boundary and surrounded by rural land. The mobility standard is 0.75 for District Highways or Local Interest Roads.



WASCO COUNTY

LEGEND

- ## Tube Count Location (Average Daily Traffic)
- Turning Movement Count Location
- ★ Ramp Count Location
- Oregon Department of Transportation
- United States Forest Service
- The Confederated Tribes of Warm Springs
- Major Collector
- Minor Collector
- Local

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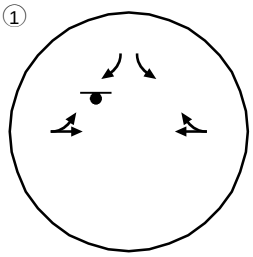
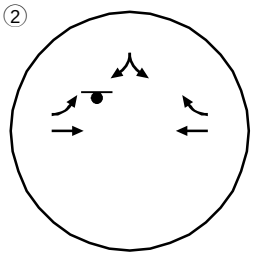
TRAFFIC COUNT LOCATIONS
WASCO COUNTY, OREGON

FIGURE **4-2**

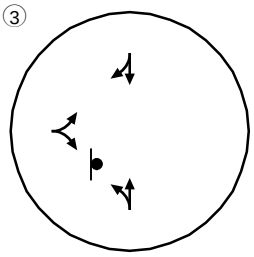
Rowena River Road &
Historic Columbia River Highway
①



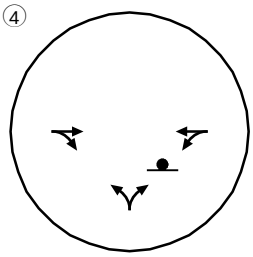
Sevenmile Hill Road &
Chenoweth Creek Road
②



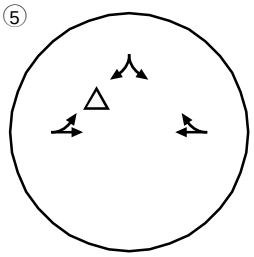
Olney Road &
Dry Hollow Road
③



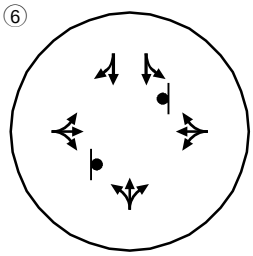
Olney Road &
Threemile Road
④



Fifteenmile Road &
Lower Eightmile Road
⑤



US 197 &
Eightmile Road
⑥



US 197 &
Dufur Bypass Road (North)
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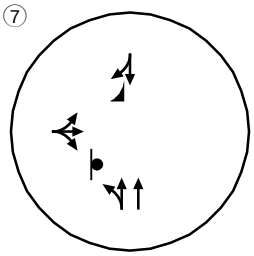

US 197 &
Dufur Bypass Road (South)
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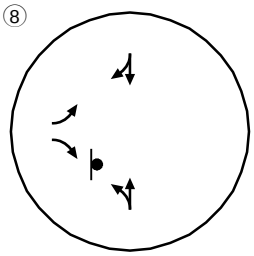
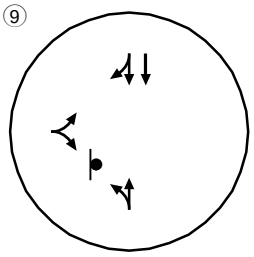
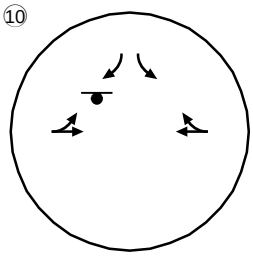


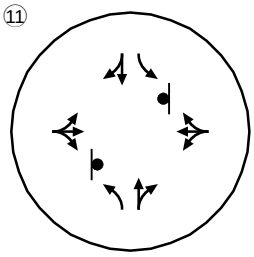
US 197 &
Dufur Gap Road
⑨



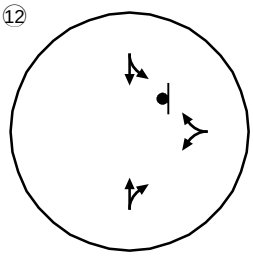
Ross Road &
Wamic Market Road
⑩



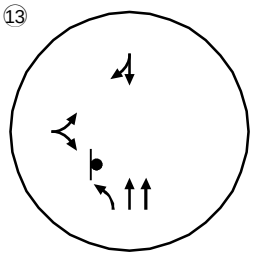
US 197 &
OR 216
⑪



US 197 &
Bakeoven Road
⑫



US 26 &
Oregon Skyline Road
⑬



US 26 &
OR 216
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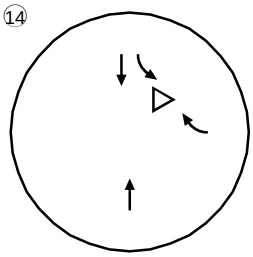
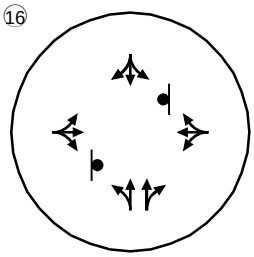
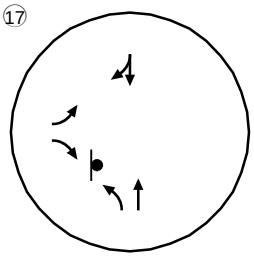


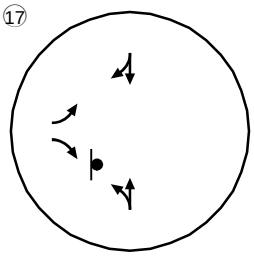
US 26 &
East Gate
⑯



US 197 &
US 97
⑰



OR 218 &
OR 293
⑰



LEGEND

- STOP SIGN
- YIELD SIGN
- PORK CHOP

EXISTING LANE CONFIGURATIONS & TRAFFIC CONTROL DEVICES WASCO COUNTY, OREGON

FIGURE **4-3**

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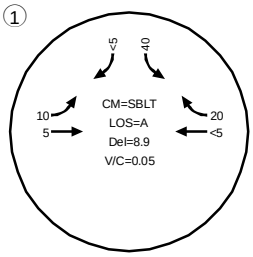
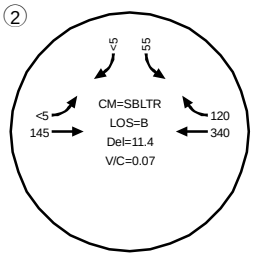
Rowena River Road &
Historic Columbia River Highway

1



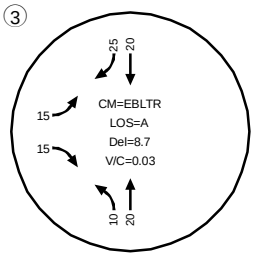
Sevenmile Hill Road &
Chenoweth Creek Road

2



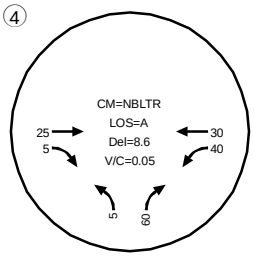
Olney Road &
Dry Hollow Road

3



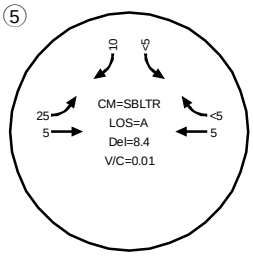
Olney Road &
Threemile Road

4



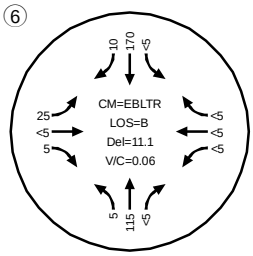
Fifteenmile Road &
Lower Eightmile Road

5



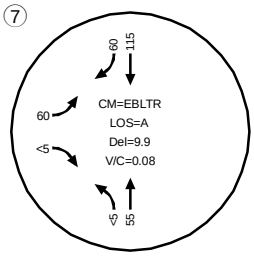
US 197 &
Eightmile Road

6



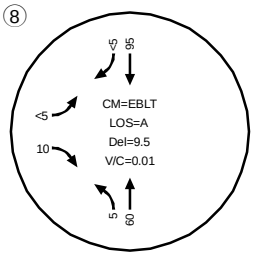
US 197 &
Dufur Bypass Road (North)

7



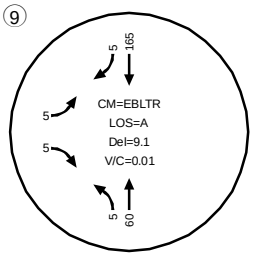
US 197 &
Dufur Bypass Road (South)

8



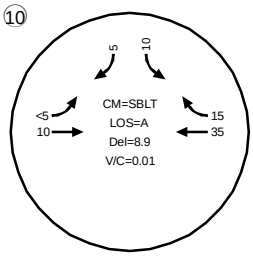
US 197 &
Dufur Gap Road

9



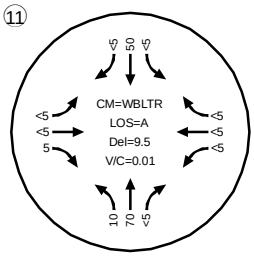
Ross Road &
Wamic Market Road

10



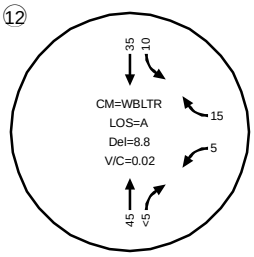
US 197 &
OR 216

11



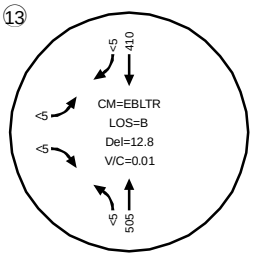
US 197 &
Bakeoven Road

12



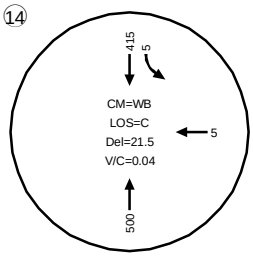
US 26 &
Oregon Skyline Road

13



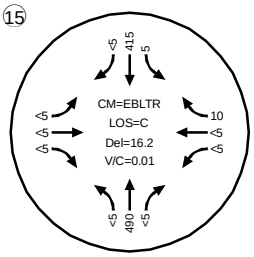
US 26 &
OR 216

14



US 26 &
East Gate

15



US 197 &
US 97

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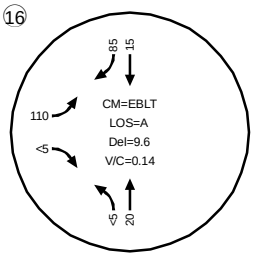
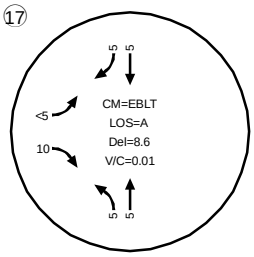


OR 218 &
OR 293

17



LEGEND

CM = INTERSECTION CRITICAL MOVEMENT

LOS = INTERSECTION LEVEL OF SERVICE

Del = INTERSECTION AVERAGE CONTROL DELAY

V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

EXISTING 30TH HIGHEST HOUR TRAFFIC CONDITIONS
WASCO COUNTY, OREGON

FIGURE
4-4

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Freeways/Interchanges

Highway Capacity Manual procedures were followed to conduct an analysis of freeway operations at interchanges on I-84 within Wasco County, excluding those located within The Dalles UGB. Table 4-2 provides a summary of operations at ramp terminal intersections.

TABLE 4-2 EXISTING RAMP TERMINAL OPERATIONS

Ramp Terminal Intersection	Critical Movement	V/C Ratio	Delay	LOS
I-84 Eastbound/Westbound Mosier	EB	0.16	9.1	A
I-84 Eastbound at Rowena	EB	0.03	8.6	A
I-84 Westbound at Rowena	WB	0.03	8.7	A
I-84 Eastbound at Dalles Dam	EB	0.09	8.9	A
I-84 Westbound at Dalles Dam	WB	0.01	8.7	A
I-84 Eastbound at Celilo-Wasco	EB	0.06	8.6	A
I-84 Westbound at Celilo-Wasco	WB	0.01	8.7	A

As shown in Table 4-2, all I-84 ramp terminal intersections located outside the City of The Dalles in Wasco County operate with V/C ratios of less then 0.20 and level-of-service “A”. All ramp terminal intersections operate well below the maximum acceptable V/C ratio of 0.70.

Table 4-3 provides a summary of freeway capacity analysis on I-84.

TABLE 4-3 EXISTING I-84 CAPACITY ANALYSIS RESULTS

Segment or Ramp Merge/Diverge	LOS	Critical Flow Rate	Units[1,2]	Mobility Standard (V/C ratio)	Calculated V/C Ratio
I-84 Mosier Interchange (Exit 69)					
EB I-84 Freeway Segment	B	815	pc/h/l	0.70	0.49
WB I-84 Freeway Segment	B	765	pc/h/l	0.70	0.46
EB Off Ramp Diverge	B	1,630	pc/h	0.70	0.37
EB On Ramp Merge	B	1,495	pc/h	0.70	0.33
WB Off Ramp Diverge	B	1,520	pc/h	0.70	0.35
WB On Ramp Merge	B	1,565	pc/h	0.70	0.34
I-84 Rowena Interchange (Exit 76)					
EB I-84 Freeway Segment	A	610	pc/h/l	0.70	0.36
WB I-84 Freeway Segment	B	760	pc/h/l	0.70	0.45
EB Off Ramp Diverge	B	1,520	pc/h	0.70	0.35
EB On Ramp Merge	B	1,500	pc/h	0.70	0.33
WB Off Ramp Diverge	B	1,530	pc/h	0.70	0.35
WB On Ramp Merge	B	1,510	pc/h	0.70	0.33
I-84 Dalles Dam Interchange (Exit 88)					
EB I-84 Freeway Segment	A	610	pc/h/l	0.70	0.36
WB I-84 Freeway Segment	A	760	pc/h/l	0.70	0.45
EB Off Ramp Diverge	B	1,215	pc/h	0.70	0.28
EB On Ramp Merge	B	1,185	pc/h	0.70	0.26
WB Off Ramp Diverge	B	1,080	pc/h	0.70	0.25
WB On Ramp Merge	B	1,080	pc/h	0.70	0.23
I-84 Celilo-Wasco Highway Interchange (Exit 97)					
EB I-84 Freeway Segment	A	590	pc/h/l	0.70	0.35
WB I-84 Freeway Segment	A	515	pc/h/l	0.70	0.31
EB Off Ramp Diverge	B	1,180	pc/h	0.70	0.27
EB On Ramp Merge	B	1,110	pc/h	0.70	0.24
WB Off Ramp Diverge	B	1,035	pc/h	0.70	0.24
WB On Ramp Merge	B	930	pc/h	0.70	0.20

[1]pc/h/l = passenger cars per hour per lane
[2]pc/ h = passenger cars per hour

As shown in Table 4-3, the critical flow rates at each location on I-84 are compared to the maximum service flow rate to estimate a volume-to-capacity (V/C) ratio. At each merge or diverge point on I-84, the critical point of traffic flow was identified based on demand volumes. No ramp volumes warranted separate analysis due to low demand. The calculated V/C ratios at all points on I-84 are less than the maximum of 0.70 specified in the OHP.

Two-Lane Highways

An analysis of two-lane highway operations within Wasco County was conducted based on procedures outlined in the ODOT Analysis Procedures Manual (APM) and the HCM.

The peak hour volumes used in the analysis of state-owned facilities were obtained from ODOT as hourly counted volumes collected in December 2008 or as historical AADT volumes recorded in 2007. Where hourly count data was not provided, the peak hour two-way highway volumes were conservatively estimated to be 15 percent of the AADT volumes. A growth rate of two percent was applied to 2007 AADT volumes, which were developed based on an average of growth rates identified on US 97, US 197, US 26, and OR 216. All peak hour volumes were also adjusted by a peak hour factor to estimate a two-way demand flow rate during the peak 15-minute period.

Table 4-4 provides a summary of capacity analysis results on state-owned, two-lane, undivided highways.

TABLE 4-4 EXISTING TWO-LANE HIGHWAY CAPACITY ANALYSIS OF STATE FACILITIES

Roadway	ADT	Traffic Volume Source	PHF	Two-Way Demand Flow	Critical Flow Rate (pc/h)	Mobility Standard (V/C Ratio)	Calculated V/C Ratio
US 26 (at OR 216)	4,515	Hourly Count	0.88	495	3,200	0.70	0.15
US 30 (South of Discovery Drive)	1,325	ODOT 2007 AADT	0.88	240	3,200	0.70	0.07
US 97 (South of US 197)	3,170	Hourly Count	0.88	290	3,200	0.70	0.09
US 97 (East of US 197)	2,245	ODOT 2007 AADT	0.88	405	3,200	0.70	0.13
US 197 (at Boyd Market Road)	3,250	Hourly Count	0.88	350	3,200	0.70	0.11
US 197 (at Fifteenmile Road)	1,735	Hourly Count	0.88	180	3,200	0.70	0.06
OR 206 (East of I-84)	830	ODOT 2007 AADT	0.90	145	3,200	0.70	0.05
OR 216 (East of US 26)	235	ODOT 2007 AADT	0.88	40	3,200	0.70	0.01
OR 216 (West of US 197)	620	ODOT 2007 AADT	0.88	110	3,200	0.70	0.03
OR 216 (East of US 197)	255	ODOT 2007 AADT	0.88	45	3,200	0.70	0.01
OR 218 (South of US 97)	100	ODOT 2007 AADT	0.88	20	3,200	0.70	0.01
OR 293 (East of US 97)	185	ODOT 2007 AADT	0.88	35	3,200	0.70	0.01

AADT = Average Annual Daily Traffic

As shown in Table 4-4, the existing V/C ratios on all two-lane state highways within Wasco County are less than 0.20. The calculated V/C ratios are compared to ODOT's standard of 0.70 set forth in the OHP.

Volumes on Wasco County highways were obtained from a variety of sources. Where hourly count data could not be determined from the daily count data, the peak hour two-way highway volumes were conservatively estimated to be 15 percent of the seasonally-adjusted ADT volumes counted in December 2008. All peak hour volumes were also adjusted by a peak hour factor to estimate a two-way demand flow rate during the peak 15-minute period. Table 4-5 provides a summary of the capacity analysis results on two-lane, undivided highways maintained by Wasco County.

TABLE 4-5 EXISTING TWO-LANE HIGHWAY CAPACITY ANALYSIS OF COUNTY FACILITIES

Roadway	ADT	Volume Source	PHF	Two-Way Demand Flow	Critical Flow Rate (pc/h)	Mobility Standard* (V/C Ratio)	Calculated V/C Ratio
Boyd Loop Road (East of US 197)	175	2008 ADT	0.88	30	3,200	0.70	0.01
Browns Creek Road (South of Chenoweth Creek Road)	265	Hourly Count	0.88	185	3,200	0.70	0.06
Cherry Heights Road (Northeast of Wells Road)	375	2008 ADT	0.88	65	3,200	0.70	0.02
Dufur Valley Road (West of Rail Hollow Road)	265	2008 ADT	0.88	45	3,200	0.70	0.01
Dufur Valley Road (West of South Valley Road)	210	2008 ADT	0.88	40	3,200	0.70	0.01
Emerson Loop Road (East of Lower Eight Mile)	145	Hourly Count	0.88	5	3,200	0.70	0.01
Fifteenmile Road (East of Moody Road)	290	2008 ADT	0.88	50	3,200	0.70	0.02
Fivemile Road (West of OR 197)	415	Hourly Count	0.88	55	3,200	0.70	0.02
Friend Road (West of Dufur Gap Road)	100	2008 ADT	0.88	20	3,200	0.70	0.01
Juniper Flat Road (West of OR 216)	30	Hourly Count	0.88	25	3,200	0.70	0.01
Lower Tub Springs (South of OR 218)	40	Hourly Count	0.88	5	3,200	0.70	0.01
Mill Creek Market Road (Northeast of Orchard Road)	1,630	2008 ADT	0.88	290	3,200	0.70	0.09
Reservation Road (South of OR 216)	180	Hourly Count	0.88	65	3,200	0.70	0.02
State Road (at Sevenmile Hill Road)	480	Hourly Count	0.88	25	3,200	0.70	0.01
Threemile Road (Southeast of Steele Road)	1,625	2008 ADT	0.88	290	3,200	0.70	0.09
Upper Tub Springs (South of Hwy 218)	20	Hourly Count	0.88	10	3,200	0.70	0.01

*ODOT mobility standards are not applicable to County facilities, however they are shown here as a relative measure of comparison.

As shown in Table 4-5, the existing volume-to-capacity ratios on all two-lane Wasco County facilities are less than 0.10. The calculated volume-to-capacity ratios are compared to ODOT's standard of 0.70 set forth in the OHP. County two-lane roadways are not subject to ODOT standards; however, these provide a baseline for comparison since the County has not established local mobility standards for highways.

The two-way demand flow is measured as a passenger car equivalent, which takes into account the impacts of heavy vehicles and grade on the flow of traffic. Within Wasco County, roadway grade

was assumed to not impact capacity of the roadways, although it may reduce the quality of service and increase delay. A five-percent heavy vehicle factor was applied to account for the impact of heavy vehicles within the traffic stream.

Road Safety

The crash history of the collector-level and higher roadway segments and intersections within Wasco County has been summarized and compared to statewide averages for similar facilities.

Crash History

A summary of reported crashes was provided by ODOT's Crash Analysis and Reporting Unit. Reports were obtained for a 3-year period from January 1, 2005 to December 31, 2007 for all major state highway segments, collector-level and higher county roadway segments, and the major (collector-collector) intersections identified in the scope of work.

Summaries of the reported crashes and calculated crash rates for highway segments and intersections are provided in Table 4-6 and Table 4-7, respectively. Exposure on highway segments was measured in terms of traffic volumes based on 2007 AADT provided by ODOT. Intersection exposure was measured in terms of total entering vehicles (TEV), which was derived from the peak hour volumes used in the intersection operational analysis. The peak hour was assumed to be ten percent of the daily volume.

ODOT publishes statewide average roadway segment crash rates for the past three years for urban and rural areas, by functional classification. The statewide average roadway segment crash rates are provided in Table 4-6 for comparison to calculated crash rates for highways in Wasco County.

TABLE 4-6 EXISTING ROADWAY SEGMENT CRASH HISTORY (JANUARY 2005 – DECEMBER 2007)

Highway	Segment	Mile Post	Crash Rates			Statewide Average[1]		
			2005	2006	2007	2005	2006	2007
I-84 (Columbia River Highway)	Western boundary of Wasco County to western city limits of Mosier	67.72 - 69.63	0.02	0.10	0.13	0.31	0.29	0.28
	Western city limits of Mosier to eastern city limits of Mosier	69.63 - 70.63	0.04	0.08	0.20			
	Eastern city limits of Mosier to western city limits of The Dalles	70.63 - 82.27	0.08	0.09	0.09			
	Western city limits of The Dalles to eastern city limits of The Dalles	82.27 - 87.79	0.00	0.00	0.00			
	Eastern city limits of The Dalles to Deschutes River Bridge	87.79 - 99.85	0.06	0.04	0.06			
US 26 (Warm Springs Highway)	Western boundary of Wasco County to southern boundary of Wasco County	62.16 - 96.48	0.01	0.01	0.02	0.98	0.93	0.99
US 30 (Historic Columbia River Highway)	Milepost 55 to northern city limit of Mosier	55 - 57.28	0.00	0.00	0.30	0.98	0.93	0.99
	Northern city limit of Mosier to southern city limit of Mosier	57.28 - 58.28	0.00	1.66	1.66			
	Southern city limit of Mosier to northern city limit of The Dalles	58.28 - 72.37	0.10	0.00	0.10			
US 97 (Sherman Highway)	Eastern boundary of Wasco County to Northern city limits of Shaniko	48.81 - 56.04	0.17	0.06	0.17	0.98	0.93	0.99
	Northern city limits of Shaniko to southern city limits of Shaniko	56.04 - 56.98	0.46	0.00	0.46			
	Southern city limits of Shaniko to southern boundary of Wasco County	56.98 - 68.66	0.21	0.11	0.07			
US 197 (The Dalles-California Highway)	Southern city limits of The Dalles to northern city limits of Dufur	1.28 - 12.74	0.13	0.13	0.26	0.98	0.93	0.99
	Northern city limits of Dufur to southern city limits of Dufur	12.74 - 13.10	0.00	0.00	0.00			
	Southern city limits of Dufur to northern city limits of Maupin	13.10 - 43.96	0.14	0.14	0.16			
	Northern city limits of Maupin to southern city limits of Maupin	43.96 - 46.40	0.00	1.02	0.34			
	Southern city limits of Maupin to US 97	46.40 - 74.26	0.43	0.25	0.40			
OR 216 (Wapinitia Highway)	US 26 to US 197	0.17 - 26.03	0.10	0.29	0.29	0.98	0.93	0.99

Highway	Segment	Mile Post	Crash Rates			Statewide Average[1]		
			2005	2006	2007	2005	2006	2007
OR 218 (Antelope Highway)	Jefferson County/Wasco County to Shaniko-Fossil Highway	0.79 - 13.52	0.84	1.27	0.00	0.98	0.93	0.99
OR 218 (Shaniko-Fossil Highway)	Southern city limits of Shaniko to northern city limits of Antelope	0.56 - 7.31	1.69	1.69	0.00	0.98	0.93	0.99
	Northern city limits of Antelope to southern city limits of Antelope	7.31 - 8.24	0.00	0.00	0.00			
	Southern city limits of Antelope to John Day River Bridge	8.24 - 23.07	0.47	0.00	0.47			

[1] I-84 Crash Rates were compared to statewide averages for Interstate Freeways in Rural Areas. All other non-interstate crash rates were compared to statewide averages for Minor Arterials in Rural Areas.

TABLE 4-7 EXISTING INTERSECTION CRASH HISTORY (JANUARY 2005 – DECEMBER 2007)

Intersection	Number of Crashes	TEV	Crash Rate	Crash Type					Severity		
				Angle	Rear-End	Turning	Fixed-Object	Other	PDO	Injury	Fatality
US 26/ OR 216	1	9,275	0.10	-	-	-	1	-	-	1	-
US 97/ US 197	2	2,360	0.77	-	-	-	-	2	1	1	-
US 197/Bakeoven Road	1	1,048	0.87	-	-	-	-	1	1	-	-
US 197/Dufur Bypass Road [North]	1	2,934	0.31	-	-	-	1	-	-	1	-
US 197/Eightmile Road	2	3,341	0.55	-	-	1	1	-	1	1	-
Chenoweth Creek Road/ Sevenmile Hill Road	1	2,890	0.32	-	-	-	1	-	-	1	-
Dry Hollow/Olney Road	1	690	1.32	-	-	-	1	-	-	1	-
Dry Hollow/ThreemileRoad	0	300	0	-	-	-	-	-	-	-	-

[1] TEV = Total entering vehicles
[2] PDO = Property damage only
[3] Crash Rate = Crashes per million entering vehicles

As shown in Table 4-6, the crash rates for several roadway segments exceed the average statewide crash rate. Further investigation of each facility that exceeded the average statewide crash rate is described below:

US 30 – Northern city limit of Mosier to the southern city limit of Mosier

- The calculated crash rate of 1.66 crashes per million entering vehicles (MEV) is not expected to reflect a crash pattern, but is reflective of the short length of the study segment (one mile). The segment crash history shows one crash per year in 2006 and 2007.

US 197 – Northern city limits of Maupin to southern city limits of Maupin

- The calculated average crash rate of 1.02 crashes per MEV for 2006 exceeds the statewide average of 0.93 for Minor Arterials in Rural Areas.

- A review of the reported crashes in 2006 and 2007 show that two crashes occurred at approximately the same location (milepost 45.46). Based on the crash reports, the crashes occurred on a sloped roadway with an approximately 180-degree curve. One resulted in an overturned vehicle and one resulted in collision with fixed roadside objects.

- Two of the three crashes in 2006 were reported to be caused by factors associated with the driver's physical condition (fatigued/weary and reckless driving).

OR 218 – Wheeler County/Wasco County to Shaniko-Fossil Highway

- The calculated average crash rate of 1.27 crashes per MEV for 2006 exceeds the statewide average of 0.93 for Minor Arterials in Rural Areas.

- Three crashes were reported in 2006 which resulted in one injury and two property damage only crashes.

- Three of the five crashes reported in the three-year study period were reported at the same location (milepost 1.0). There is a curved alignment of the road and an unsignalized intersection at this location. The three crashes resulted in one overturned vehicle and two fixed objects collisions.

- Three crashes were reported as caused by improper driving and one was associated with excessive speed.

- Recent signing upgrades near milepost 1.0 were installed in 2007 by ODOT. The additional signing along with previous roadway segment improvements has potentially addressed issues associated with roadway unfamiliarity. As such, no additional improvements are recommended at this time.

OR 218 – Southern city limits of Shaniko to northern city limits of Antelope

- The calculated average crash rate of 1.69 crashes per MEV in 2005 and 2006 exceeds the statewide averages of 0.98 and 0.93 for Minor Arterials in Rural Areas in the respective year.
- One crash was reported per year within this segment in 2005 and 2006 resulting in one injury and one property damage only crash.
- The injury crash was a single-vehicle crash that involved a motorcycle.
- No trends or countermeasures can be identified based on the limited crash frequency.

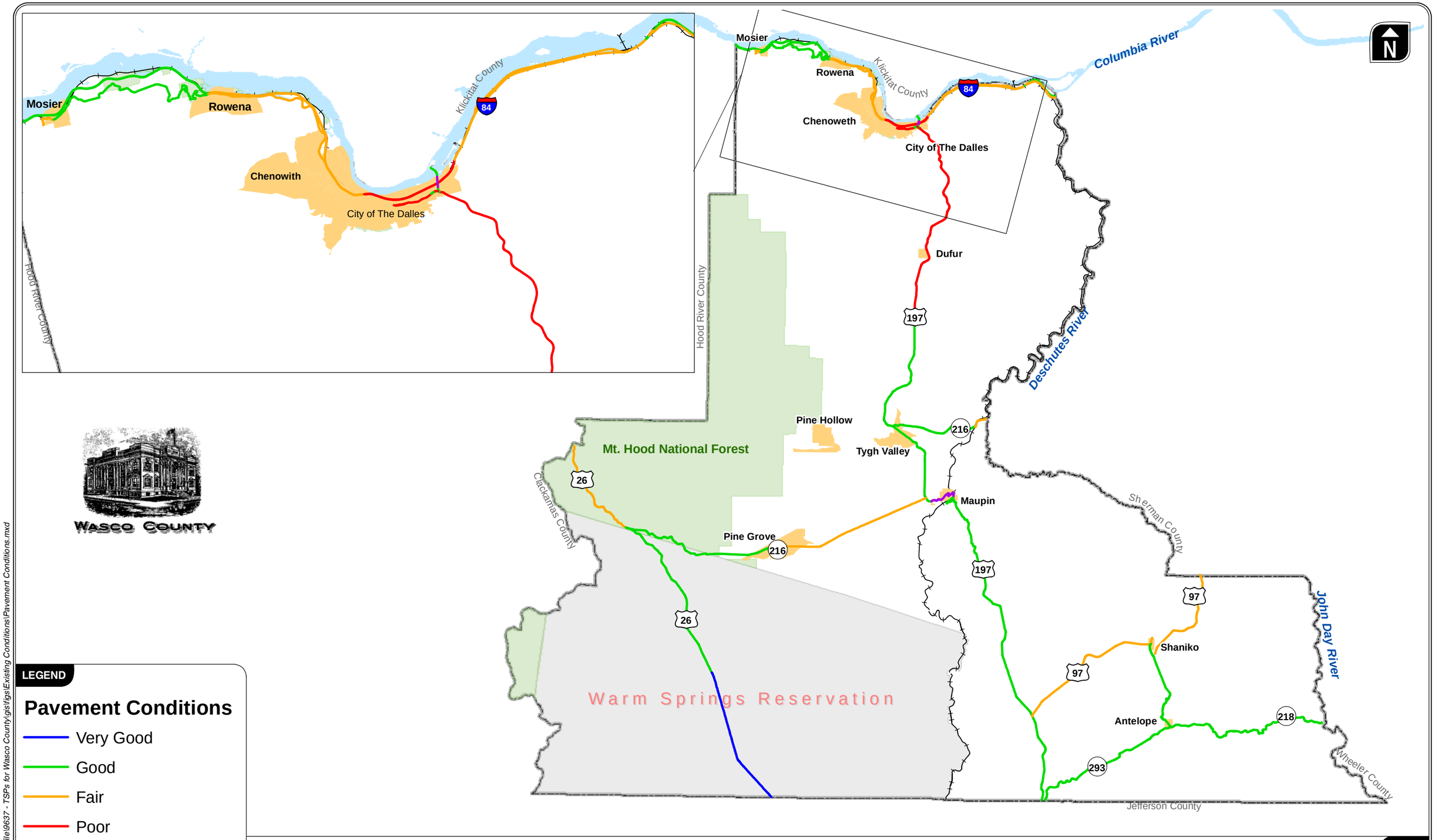
Safety Priority Index System

ODOT developed the Safety Priority Index System (SPIS) to identify and prioritize sites where a countermeasure or multiple countermeasures could be implemented to potentially reduce the number of crashes. One intersection, the OR 216/Reservation Road intersection, is in the 90-95th percentile of the current statewide 2005 – 2007 SPIS within Wasco County.

Pavement Condition

ODOT monitors the pavement condition of state highways through the Pavement Management System, which determines whether the pavement is in Very Good, Good, Fair, Poor, or Very Poor condition. Figure 4-5 provides a summary of the pavement conditions reported by ODOT in November 2008. Based on the conditions reported there are less than 5 miles of pavement that is in "very poor" condition. The only segment of "very poor" pavement conditions is on US 197 between Maupin and the US 197/OR 216 junction. Segments with "poor" pavement conditions are more frequent and include five different facilities. The longest section of "poor" pavement is on US 197 and spans a segment that begins in The Dalles and continues south through Dufur. Field observations in February 2009 confirmed these segments as those that have greater need of improvements than other segments of highway.

Wasco County Public Works department also maintains a pavement condition database for county roadways. Each year Wasco County Public Works visually inspects small segments of all paved roads and records the type, severity, and amount of distress observed. A Pavement Condition Index is calculated from the observations. The ratings are as follows: 100 to 86 is excellent, 85 to 71 is very good, 70 to 56 is good, 55 to 41 is fair, 40 to 26 is poor, 25 to 11 is very poor and 10 to 0 is considered failed. A summary of pavement conditions ratings for County collector level or higher county facilities is provided in Table 4-8.



WASCO COUNTY

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PAVEMENT CONDITIONS
WASCO COUNTY, OREGON

FIGURE 4-5

TABLE 4-8 EXISTING PAVEMENT CONDITIONS

Roadway	Date	Average PCI	Qualitative Assessment
Boyd Loop Road	Nov-07	86	very good
Browns Creek Road	Jul-08	83	very good
Cherry Heights Road	May-07	82	very good
Dufur Valley Road	Jul-08	79	very good
Emerson Loop Road	Dec-08	83	very good
Fairbanks Market Road	Dec-08	85	very good
Fivemile Road	Dec-08	91	excellent
Friend Road	Dec-08	86	very good
Juniper Flat Road	May-07	84	very good
Lower Tub Springs	May-07	80	very good
Mill Creek Market Road	May-07	80	very good
Reservation Road	Dec-08	93	excellent
State Road	May-07	82	very good
Three Mile Road	May-07	80	very good
Upper Tub Springs	May-07	80	very good

100-86 = Excellent
85-71 = Very Good
70-56 = Good
55-41 = Fair
40-26 = Poor
25-11 = Very Poor
10-0 = Fail

As shown in Table 4-8, no deficiencies were reported on all County collector level or higher two-lane highways. All highways were reported to have "very good" or "excellent" pavement conditions.

PEDESTRIAN & BICYCLE SYSTEM

The pedestrian and bicycle modes serve a variety of needs including relatively short trips to major attractors, recreational trips, circulation within parklands, and access to transit (generally for trips under ¼-mile to bus stops). Bicycle travel can be a viable commuting option, particularly in areas where bicycle lanes, paved shoulders and other amenities (such as: secure bicycle parking, work-place showers, and bus-mounted bicycle racks) are provided. Walking is also a viable choice for commute trips in areas with mixed-use development and residential neighborhoods adjacent to employments centers. In rural areas of the County, walking and bicycling mainly serves as a form of recreation or exercise, rather than to serve as a viable mode of transportation for commerce due to the relatively long distances between originations and destinations.

In Wasco County, the majority of pedestrian and bicycle trips are short trips, including trips to the school, recreational areas, etc. However, the long distances between activity centers combined with the high speed and volume of traffic on major highways creates a transportation system that is potentially undesirable and/or unsafe for non-auto users. As a result, roadways with a low volume of traffic are preferred routes for pedestrian and bicycle use.

Existing pedestrian and bicycle facilities in Wasco County include a multi-use trail along the Columbia River and several bike routes that are commonly travelled. The multi-use trail extends a length of almost 5 miles in each direction along the Columbia River between the Columbia Gorge Discovery Center and Union Street in the City of The Dalles. Although there are many routes that cyclists use throughout the county, several have been specifically identified by The Dalles Cycling Association and mapped in order to promote cycling in The Dalles and its perimeter. The four cycling routes identified include:

- Mosier Loop: West of The Dalles the 34 mile loop connects Mosier to The Dalles. The north portion of the loop route runs along the Columbia River through Rowena and the south portion runs along rural roadways such as Sevenmile Hill Road and State Road between Mosier and The Dalles.
- The Dalles-Hood River: West of The Dalles, the out-and-back route follows the northern route of Mosier Loop from The Dalles through Rowena and Mosier, and extends to Hood River. The Dalles-Hood River route is approximately 23.2 miles in each direction.
- Cherry Heights Loop: The 17.4 mile loop begins and ends in The Dalles and runs along roadways to the southwest of The Dalles. The loop follows Chenoweth Creek Road, Browns Creek Road, and Cherry Heights Road.
- Eightmile Road and Fifteenmile Loops: A short loop (29 miles) and a long loop (38 miles) are identified in the rural areas of Wasco County to the east of The Dalles. The short loop runs along Emerson Loop Road, Kelly Cutoff Road, and Fifteenmile Road. The long loop extends on Emerson Loop Road for 9 miles before returning to Kelly Cutoff Road.

The Oregon Bicycle and Pedestrian Plan identifies the following categories of bicycle and pedestrian design treatments; Shared Roadway on roadway with average daily traffic (ADT) less than 3,000 vehicles; Shoulder Bikeways with six-foot shoulders; Bike Lanes on major collectors; Multi-Use Path adjacent to high traffic volume roadways; and Wide Paved Shoulders for walking on highways and rural County roadways.

On average state highways including: US 26, US 97, and US 197 carry daily volumes of greater than 3,000 vehicles per day. All other State and County roadways in rural parts of Wasco County have an ADT of less than 3,000 vehicles, which is consistent with ODOT guidelines for shared bicycle use. However, most of the roadways are not signed to warn motorists of the potential for encountering bicyclists on the roadways. In addition, County roadways with low volume of traffic tend to have high speed motorists and poor sight distance, making it potentially unsafe for bicyclists.

PUBLIC TRANSIT SERVICE

Existing public transportation service in Wasco County is provided by the Transportation Network. The Transportation Network, a member of the Gorge TransLink, provides dial-a-ride service for The Dalles and select portions of Wasco County. Service is provided Monday-Friday from 8:00 a.m. to 5:00 p.m. More information is available on the Gorge TransLink's website at www.gorgetranslink.com.

The Hood River County Transportation District offers public transportation services through Columbia Area Transit (CAT). CAT provides fixed-route service between Hood River, Mosier, and The Dalles on a daily basis and between Portland and The Dalles on a weekly basis. The current schedule provides two transit trips per day between The Dalles, Mosier, and Hood River during the morning and evening time periods. Stop locations in The Dalles include: Rosauers, Columbia Gorge Community College, and The Transportation Center, located at 201 Federal Street. The stop location in Mosier is at Pocket Park.

Service to Portland is provided on Thursdays only. In The Dalles the pick-up and drop-off location is The Transportation Center. Stops include the CAT office (Hood River), Gateway MAX Station (Portland), Portland Art Museum, Oregon Health Sciences University, and Clackamas Town Center. Up-to-date schedules, stop location descriptions, and more information on transportation services offered by The Hood River County Transportation District is provided on their website at http://community.gorge.net/hrctd.

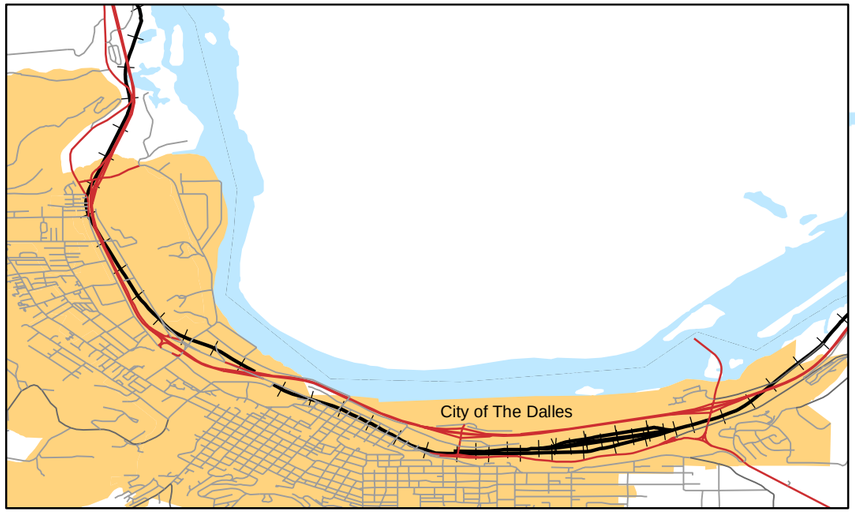
RAIL

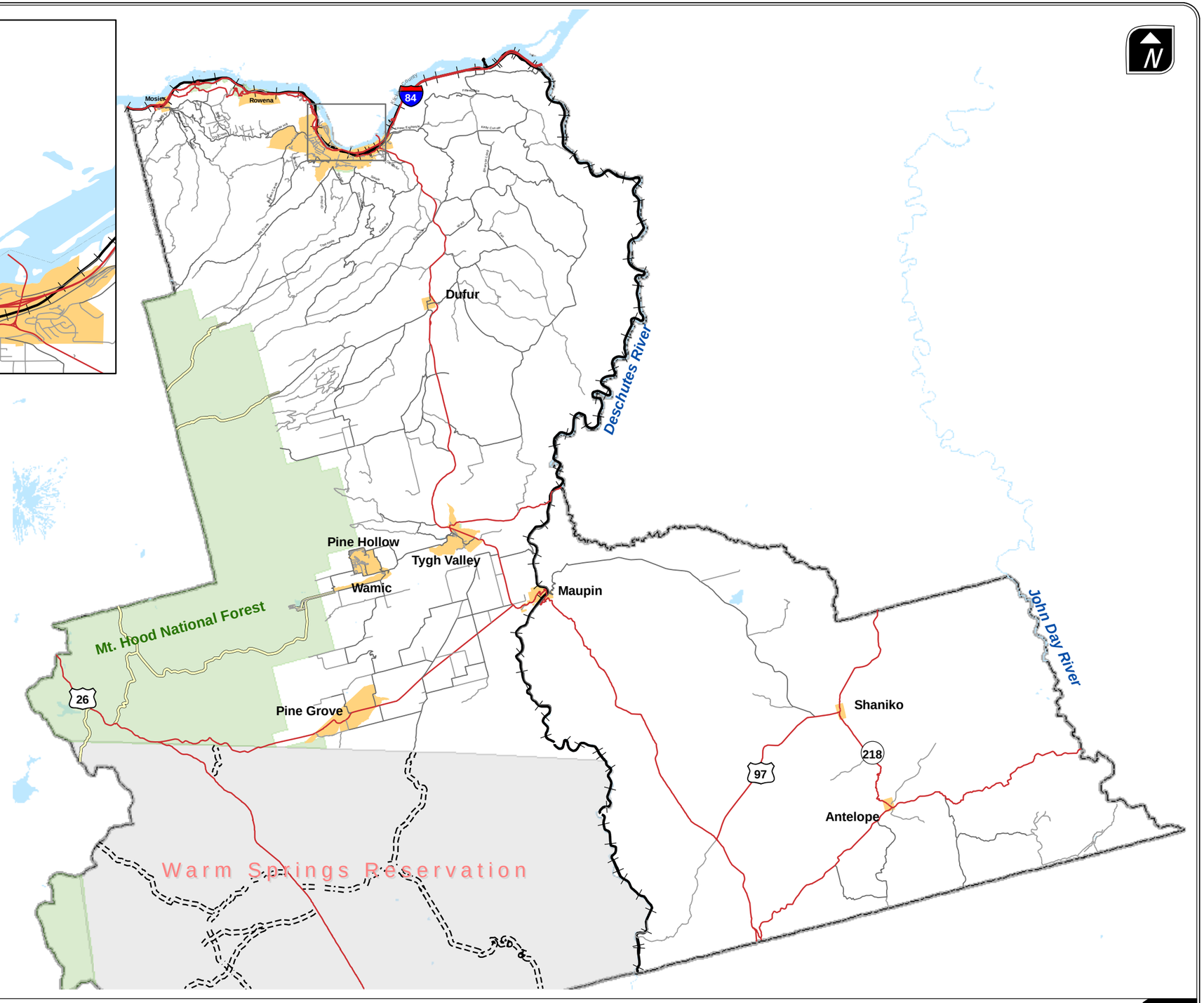
Wasco County contains part of the Union Pacific (UP) Railroad's east-west main line. As shown in Figure 4-6 the UP track runs along the south bank of the Columbia River. This UP main line provides the most direct connection from the Pacific Northwest to the Overland Route via Pocatello, Idaho, and Cheyenne, Wyoming. The UP main line is maintained in Federal Railroad Association (FRA) Class 5 condition that permits operation of freight trains at up to 80 mph and passenger trains at up to 90 mph with no weight or dimension restrictions.

The Burlington Northern Santa Fe Railway (BNSF) is Oregon's second largest transcontinental railroad. A north-south BNSF line runs roughly along the county line between Wasco County and Sherman County before diverging into the south central part of Wasco County and points south. BNSF maintains this line up to FRA Class 4 conditions with no weight or dimension restrictions. The maximum allowable speeds for Class 4 lines are 60 mph for freight and 80 mph for passenger trains. BNSF identified needed improvements to five tunnels on its north-south line through central Oregon, located along an 88-mile stretch in Wasco and Jefferson Counties. Improvements were deemed necessary to provide clearances sufficient for "high-cube," 9-foot 6-inch containers stacked one on top of another in a double-stack configuration.

Both UP and BNSF provide cargo freight rail service. BNSF services, schedules, and other information can be found online at www.bnsf.com. Similar information for UP Railroad is found online at www.uprr.com.

Amtrak provides a throughway bus service at The Transportation Center in The Dalles. The service provides bus transport to nearby Amtrak stations with an established train platform. The nearest Amtrak station with a train platform is Wishram, Washington, approximately 15 miles east of The Dalles. The Wishram station is located on the Empire Builder route, which provides connections to: Portland, Oregon; Vancouver, Washington; Spokane, Washington; West Glacier, Montana; Fargo, North Dakota; St. Paul/Minneapolis, Minnesota; Milwaukee, Wisconsin; and, Chicago, Illinois. Amtrak schedules and station information is available at www.amtrak.com.





WASCO COUNTY

LEGEND

Railroad Lines

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EXISTING RAIL MAP
WASCO COUNTY, OREGON

FIGURE
4-6

MARINE

The Port of The Dalles is located on the Columbia River although it is primarily a marketing entity for industrial land in the region. In general, the Port owns industrial and commercial sites, some with riverfront barge access. Currently no known marine freight is loaded from sites within the Port of The Dalles, but the potential for such facilities exists. The Port also owns and operates a 120-slip marina facility with moorage for all types of boats with drafts up to 14 feet. A public boat launch ramp is also available at the marina.

Adjacent to the Port of The Dalles is a private facility that currently provides storage and transport of wheat via the Columbia River. Based on a conversation with the facility operator, approximately 800,000 bushels of wheat can be stored on site and a barge can transport up to 120,000 bushels. Opportunities to more fully utilize marine transport resources available to Wasco County residents and farmers will require development of additional facilities.

AIR

One public air transportation facility, The Columbia Gorge Regional/The Dalles Municipal Airport, serves Wasco County. The Airport is not located within the County, but is located directly across the Columbia River from The Dalles, in the State of Washington. The Airport is jointly owned by the City of The Dalles and Klickitat County in Washington State. Despite the location, the Columbia Gorge Regional/The Dalles Municipal Airport is included in the statewide air transportation study, and serves many large local commercial companies, heavy industrial firms, and the United States Forest Service. More information, including: runway information, aviation services, and commercial property availability is available online at www.columbiagorgeairport.com.

The airport has two runways with the longest paved runway extending 5,097 feet. The airport is at an elevation of 243 feet. Approximately 66 aircraft are based at the airport, with a daily aircraft operations average of approximately 45 aircraft per day. The Columbia Gorge Regional/The Dalles Municipal Airport is listed as a "Category 3" airport in Oregon's "core system" of airports. Category 3 airports serve large geographic areas with numerous small communities. They provide access to the air transportation system for communities that have surface travel times greater than 90 minutes to the next larger (Category 1 or 2) airport.

The nearest Category 1 airport is the Portland International Airport located approximately 80 miles west of The Dalles. More information about Portland International Airport is available online at www.flypdx.com. Other regional airports that provide commercial service include Redmond Municipal Airport in Redmond, Oregon and Eastern Oregon Regional Airport in Pendleton, Oregon. Redmond is approximately 115 miles south of The Dalles and Pendleton is approximately 125 miles to the east. More information about the Redmond Municipal Airport is available at www.ci.redmond.or.us. Information about flights at Eastern Oregon Regional Airport is available at www.pendleton.or.us.

Chenoweth Airpark is a private airport established in 1959 and located three miles west of The Dalles. Permission to use the airport is required in advance. The runway has an asphalt surface and is approximately 2,450 feet by 75 feet.

Pine Hollow Airport is located 2 miles northwest of Wamic, Oregon. It is a private air strip and permission to use the air strip is required in advance. The airstrip is turf, with a 25-foot wide gravel center. The total dimension of the airstrip is 2,400 feet by 130-feet wide.

PIPELINE AND TRANSMISSION SYSTEM

Wasco County contains one major interstate transmission pipeline. The facility is a 36-inch diameter natural gas pipeline operated by Gas Transmission Northwest Corporation. This line runs through the southeast portion of the county enroute from Canada to California. The line transmits between 800 million and 1 billion cubic-feet of Canadian natural gas to California each day. Wasco County recognizes the potential for future lines to bisect the county as future demand for natural gas increases.

Additional pipeline transportation in and through Wasco County includes transport of water and sewer within incorporated cities, and transmission lines for electricity and telephone service throughout the county.

Section 5
Future 2030
Transportation Conditions

Future 2030 Transportation Conditions

This section provides a summary of 2030 future transportation conditions and identifies transportation needs and subsequent impact on the transportation system based on future land uses, and projected population and employment demographics. Transportation needs were identified for multimodal elements of the transportation system including: auto/truck, pedestrian, bicycle, transit, rail, marine, air, and pipeline/transmission modes.

POPULATION AND EMPLOYMENT FORECASTS

Existing and forecast year 2030 population and employment estimates were developed consistent with OAR 660-12-030, estimates prepared by the Oregon Department of Employment, and the population forecasts developed by Wasco County. The 2030 population and employment forecasts for Wasco County were prepared by Angelo Planning Group. Reporting on population and employment projections is important in understanding the demand and impact that projected growth in the county may have on transportation facilities over the next 20 years.

FUTURE TRANSPORTATION CAPACITY NEEDS

An analysis of the forecast 2030 transportation system capacity of State highways and Wasco County collectors and arterials was conducted based on Level 1 trending forecast of traffic volumes. The operational results were analyzed to identify improvements needed to meet State and County operational standards for each respective functional class in 2030.

Forecast Traffic Volume

Annual growth rates were applied to existing 2008 volumes to estimate forecast 2030 traffic volumes. Annual growth for each ODOT facility was estimated using a Level 1 trending forecast, in accordance with ODOT's Analysis Procedures Manual (APM).

For state highways, the Future Volume Tables available on the ODOT Transportation Planning Analysis Unit (TPAU) website were used to estimate an annual growth factor. The growth factors developed from the Future Volume Tables were prepared in coordination with TPAU staff.

Historic ADT volumes for County roadways were reviewed in order to estimate future growth on County highways. Over an 8-year period from 2000 to 2008 no consistent volume growth trends were identified due to variations in the historic ADT volumes. In order to provide a conservative analysis and account for potential future growth, an annual growth rate of one percent was applied to all County roadways.

Future Conditions Operations

The technical analysis of the forecast 2030 transportation system is based on ADT for roadway segments and 30th highest hour traffic volume forecasts for intersections. Figure 5-1 summarizes the study intersections and segments included in the analysis.

Intersections

The future conditions traffic operational analysis was conducted based on the peak 15-minute period of traffic flow at each study intersection. Because traffic flow patterns change over time, ODOT default peak hour factors were applied based on the level of facility (minor street, minor arterial, or major street), as outlined in the ODOT APM. Figure 5-2 illustrates the lane configurations and traffic control devices used in the future conditions analysis. No changes to the existing lane configurations and traffic control devices were incorporated in this analysis.

Figure 5-3 provides the 2030 30th highest hour volumes and operational analysis results at all study intersections. As shown in Figure 5-3, all intersections were found to operate with volume-to-capacity (V/C) ratios of less than 0.25 and level-of-service "A". The mobility standard specified in the 1999 Oregon Highway Plan is a maximum V/C ratio of 0.70 for interstate, statewide, and regional highways located outside of Urban Growth Boundary and surrounded by rural land. The mobility standard is 0.75 for District Highways or Local Interest Roads.

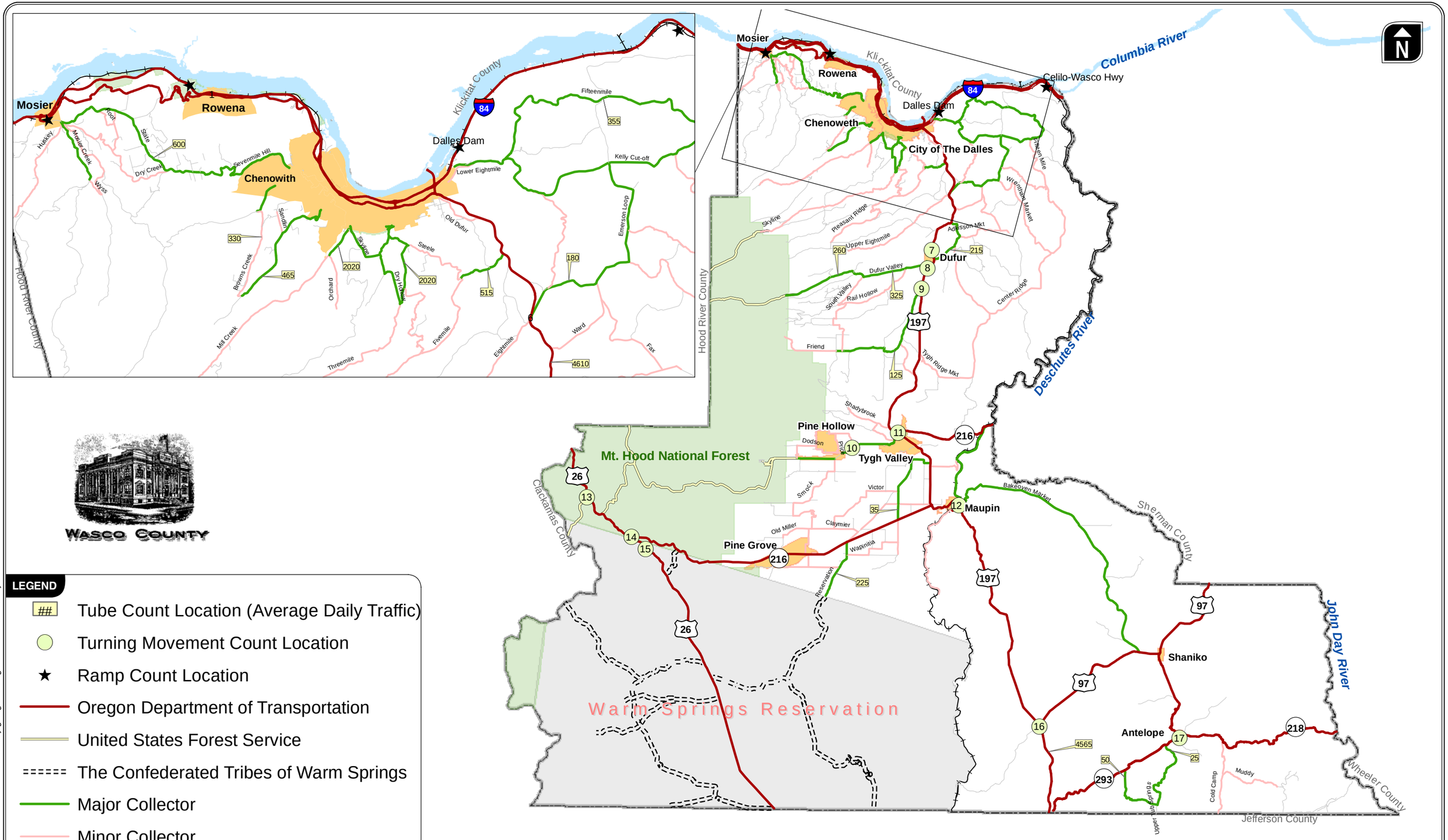
Freeways/Interchanges

Highway Capacity Manual procedures were followed to conduct an analysis of freeway operations at interchanges on I-84 within Wasco County, excluding those located within The Dalles UGB. A peak hour factor of 0.90, based on default values for Major streets outlined in the APM, was applied to each ramp terminal intersection. Table 5-1 provides a summary of forecasted 2030 future traffic operations at the ramp terminal intersections.

TABLE 5-1 FORECAST 2030 FUTURE RAMP TERMINAL INTERSECTION OPERATIONS

Ramp Terminal Intersection	Critical Movement	V/C Ratio	Delay	LOS
I-84 Eastbound/Westbound Mosier	EB	0.23	9.6	A
I-84 Eastbound at Rowena	NB	0.13	9.6	A
I-84 Westbound at Rowena	WB	0.05	8.8	A
I-84 Eastbound at Dalles Dam	EB	0.09	8.9	A
I-84 Westbound at Dalles Dam	WB	0.01	8.7	A
I-84 Eastbound at Celilo-Wasco	EB	0.06	8.6	A
I-84 Westbound at Celilo-Wasco	WB	0.01	8.7	A

As shown in Table 5-1, all I-84 ramp terminal intersections in Wasco County (excluding those located within The Dalles UGB) are forecast to operate with V/C ratios of less than 0.25 and level-of-service "A". The OHP specifies a maximum acceptable V/C ratio of 0.70.



WASCO COUNTY

LEGEND

- ## Tube Count Location (Average Daily Traffic)
- Turning Movement Count Location
- ★ Ramp Count Location
- Oregon Department of Transportation
- United States Forest Service
- The Confederated Tribes of Warm Springs
- Major Collector
- Minor Collector
- Local

TRAFFIC COUNT LOCATIONS
WASCO COUNTY, OREGON

FIGURE **5-1**

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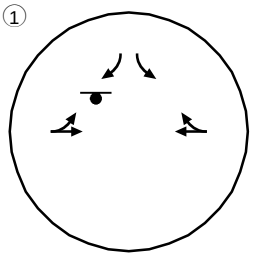
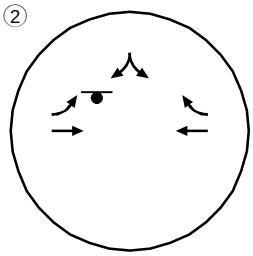
Rowena River Road &
Historic Columbia River Highway
①



Sevenmile Hill Road &
Chenoweth Creek Road
②



Olney Road &
Dry Hollow Road
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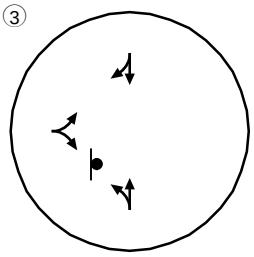

Olney Road &
Threemile Road
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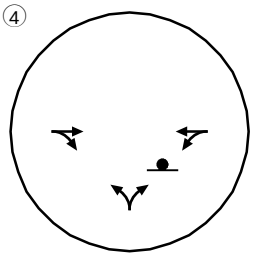
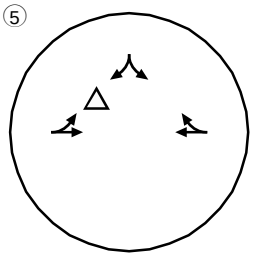


Fifteenmile Road &
Lower Eightmile Road
⑤



US 197 &
Eightmile Road
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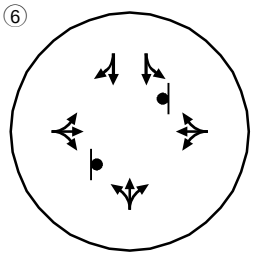

US 197 &
Dufur Bypass Road (North)
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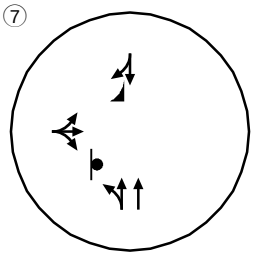

US 197 &
Dufur Bypass Road (South)
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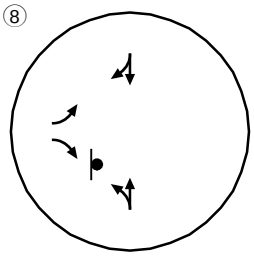

US 197 &
Dufur Gap Road
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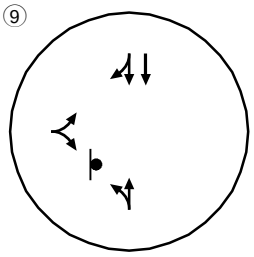

Ross Road &
Wamic Market Road
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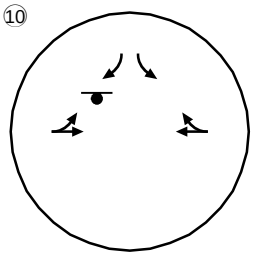

US 197 &
OR 216
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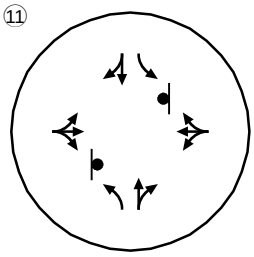
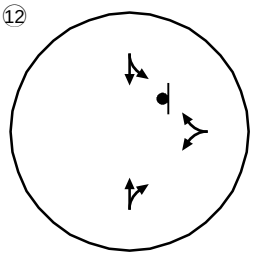
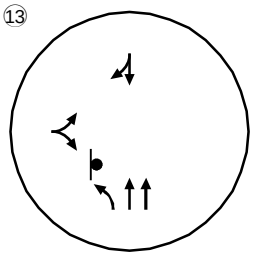


US 197 &
Bakeoven Road
⑫



US 26 &
Oregon Skyline Road
⑬



US 26 &
OR 216
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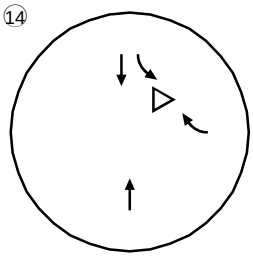
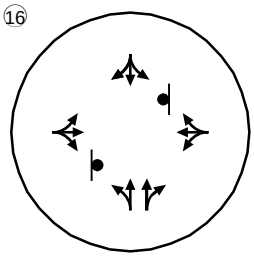
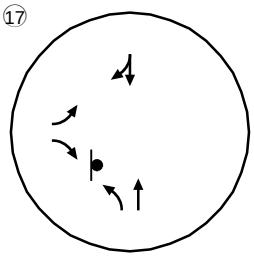


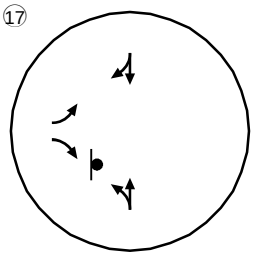
US 26 &
East Gate
⑯



US 197 &
US 97
⑰



OR 218 &
OR 293
⑰



LEGEND

- STOP SIGN
- YIELD SIGN
- PORK CHOP

FUTURE LANE CONFIGURATIONS & TRAFFIC CONTROL DEVICES WASCO COUNTY, OREGON

FIGURE **5-2**

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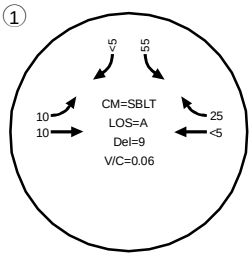
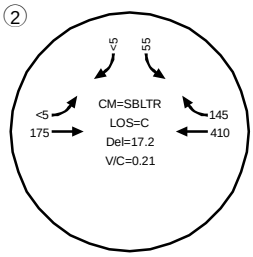
Rowena River Road &
Historic Columbia River Highway

1



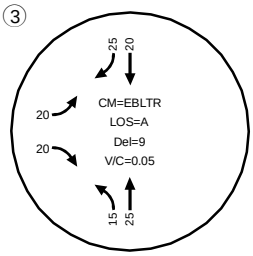
Sevenmile Hill Road &
Chenoweth Creek Road

2



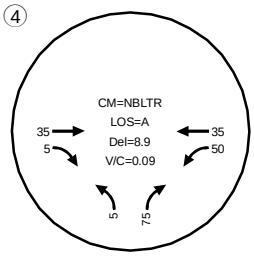
Olney Road &
Dry Hollow Road

3



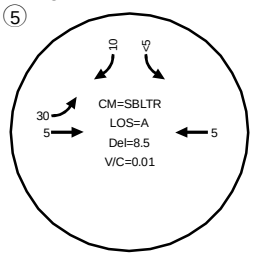
Olney Road &
Threemile Road

4



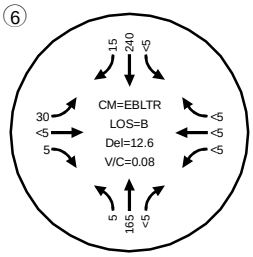
Fifteenmile Road &
Lower Eightmile Road

5



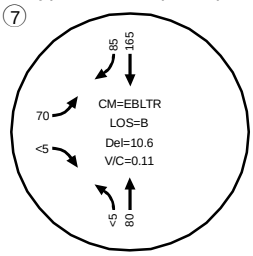
US 197 &
Eightmile Road

6



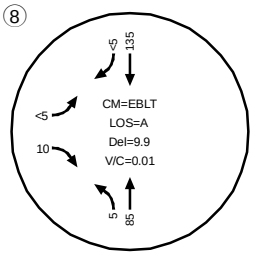
US 197 &
Dufur Bypass Road (North)

7



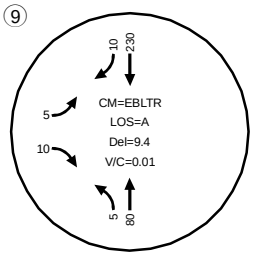
US 197 &
Dufur Bypass Road (South)

8



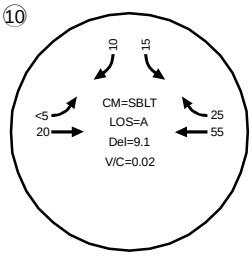
US 197 &
Dufur Gap Road

9



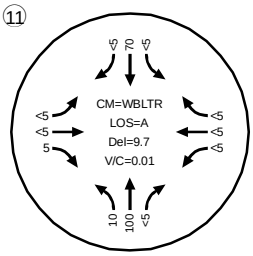
Ross Road &
Wamic Market Road

10



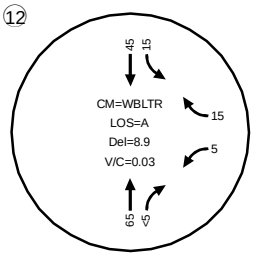
US 197 &
OR 216

11



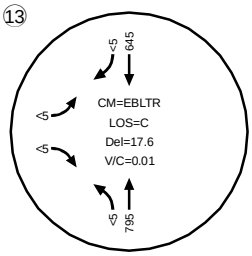
US 197 &
Bakeoven Road

12



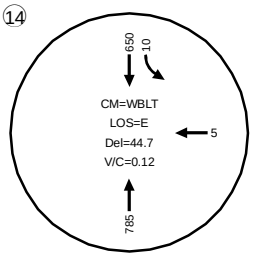
US 26 &
Oregon Skyline Road

13



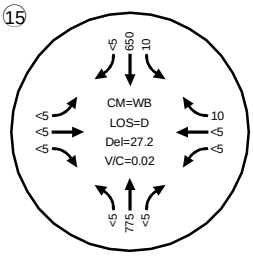
US 26 &
OR 216

14



US 26 &
East Gate

15



US 197 &
US 97

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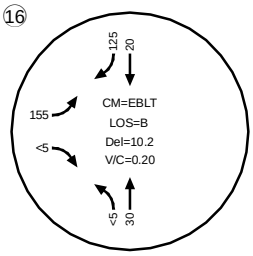
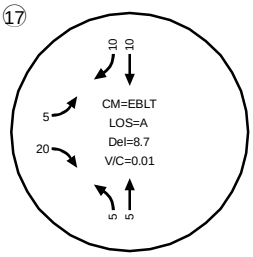


OR 218 &
OR 293

17



LEGEND

CM = INTERSECTION CRITICAL MOVEMENT

LOS = INTERSECTION LEVEL OF SERVICE

Del = INTERSECTION AVERAGE CONTROL DELAY

V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

2030 30TH HIGHEST HOUR TRAFFIC CONDITIONS
WASCO COUNTY, OREGON

FIGURE
5-3

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Freeway capacity analysis was conducted at merge ramp, diverge ramp, and basic freeway segments at each interchange location. Table 5-2 provides a summary of the future freeway capacity analysis results on I-84.

TABLE 5-2 I-84 FORECAST 2030 CAPACITY ANALYSIS RESULTS

Segment or Ramp Merge/Diverge	LOS	Critical Flow Rate	Units[1,2]	Mobility Standard (V/C ratio)	Calculated V/C Ratio
I-84 Mosier Interchange (Exit 69)					
EB I-84 Freeway Segment	B	1,250	pc/h/l	0.70	0.75
WB I-84 Freeway Segment	B	1,175	pc/h/l	0.70	0.70
EB Off Ramp Diverge	B	1,670	pc/h	0.70	0.38
EB On Ramp Merge	B	1,535	pc/h	0.70	0.33
WB Off Ramp Diverge	B	1,555	pc/h	0.70	0.35
WB On Ramp Merge	B	1,600	pc/h	0.70	0.35
I-84 Rowena Interchange (Exit 76)					
EB I-84 Freeway Segment	A	935	pc/h/l	0.70	0.56
WB I-84 Freeway Segment	B	1,170	pc/h/l	0.70	0.70
EB Off Ramp Diverge	B	1,560	pc/h	0.70	0.36
EB On Ramp Merge	B	1,535	pc/h	0.70	0.33
WB Off Ramp Diverge	B	1,570	pc/h	0.70	0.36
WB On Ramp Merge	B	1,545	pc/h	0.70	0.34
I-84 Dalles Dam Interchange (Exit 88)					
EB I-84 Freeway Segment	A	895	pc/h/l	0.70	0.53
WB I-84 Freeway Segment	A	760	pc/h/l	0.70	0.45
EB Off Ramp Diverge	B	1,245	pc/h	0.70	0.28
EB On Ramp Merge	B	1,210	pc/h	0.70	0.26
WB Off Ramp Diverge	B	1,105	pc/h	0.70	0.25
WB On Ramp Merge	B	1,105	pc/h	0.70	0.24
I-84 Celilo-Wasco Highway Interchange (Exit 97)					
EB I-84 Freeway Segment	A	870	pc/h/l	0.70	0.52
WB I-84 Freeway Segment	A	760	pc/h/l	0.70	0.45
EB Off Ramp Diverge	B	1,205	pc/h	0.70	0.27
EB On Ramp Merge	B	1,135	pc/h	0.70	0.25
WB Off Ramp Diverge	B	1,060	pc/h	0.70	0.24
WB On Ramp Merge	B	955	pc/h	0.70	0.21

[1]pc/h/l = passenger cars per hour per lane
[2]pc/ h = passenger cars per hour

As shown in Table 5-2, the critical flow rates at each location on I-84 are compared to the maximum service flow rate to estimate a volume-to-capacity (V/C) ratio. At each merge or diverge point on I-84, the critical point of traffic flow was identified based on demand volumes. No ramp volumes warranted separate analysis due to low demand volume. The calculated V/C ratios at all points on I-84 are equal to or less than the maximum of 0.70 specified in the OHP, except the eastbound I-84 freeway segment at Mosier. The eastbound I-84 freeway segment at Mosier is forecast to operate with a V/C ratio of 0.75.

Two-Lane Highways

An analysis of two-lane highway operations within Wasco County was conducted based on procedures outlined in the APM and the HCM.

Peak hour two-way highway volumes were conservatively estimated to be 15 percent of the 2008 AADT volumes used in the existing conditions analysis. All peak hour volumes were also adjusted by a peak hour factor to estimate a two-way demand flow rate during the peak 15-minute period. A default peak hour factor was applied based on the ODOT APM.

The two-way demand flow is measured as a passenger car equivalent, which takes into account the impacts of heavy vehicles and grade on the flow of traffic. Within Wasco County, roadway grade is expected to have minimal effect on capacity or quality of service of the roadways. A 5-percent heavy vehicle factor was applied to account for the impact of heavy vehicles within the traffic stream, which fluctuates with the seasons and farming activities. Based on ODOT standard saturation flow rates, a critical flow rate of 3,200 passenger cars per hour (1,600 per lane) was assumed for calculation of V/C ratios.

Table 5-3 provides a summary of the future 2030 two-lane capacity analysis results on state-owned, undivided highways.

TABLE 5-3 FORECAST 2030 TWO-LANE HIGHWAY CAPACITY ANALYSIS OF STATE FACILITIES

Roadway	Forecast 2030 ADT	Traffic Volume Source	PHF	Two-Way Demand Flow	Calculated V/C Ratio
US 26 (at OR 216)	7,095	Hourly Count	0.90	760	0.24
US 30 (South of Discovery Drive)	1,880	ODOT 2007 AADT	0.90	330	0.10
US 97 (South of US 197)	4,565	Hourly Count	0.90	410	0.13
US 97 (East of US 197)	3,230	ODOT 2007 AADT	0.90	565	0.18
US 197 (at Boyd Market Road)	4,610	Hourly Count	0.90	480	0.15
US 197 (at Fifteenmile Road)	2,465	Hourly Count	0.90	250	0.08
OR 206 (East of I-84)	705	ODOT 2007 AADT	0.90	125	0.04
OR 216 (East of US 26)	350	ODOT 2007 AADT	0.90	60	0.02
OR 216 (West of US 197)	1,280	ODOT 2007 AADT	0.90	225	0.07
OR 216 (East of US 197)	525	ODOT 2007 AADT	0.90	90	0.03
OR 218 (South of US 97)	180	ODOT 2007 AADT	0.90	30	0.01
OR 293 (East of US 97)	295	ODOT 2007 AADT	0.90	50	0.02

AADT = Average Annual Daily Traffic

As shown in Table 5-3, the 2030 forecast V/C ratios on all two-lane state highways within Wasco County are less than 0.25. The calculated V/C ratios are compared to ODOT's standard of 0.70 set forth in the OHP. There is expected to be available capacity to serve future forecast demand volumes as well as additional traffic, if needed.

An annual factor of one percent was applied to existing peak hour volumes developed for existing conditions analysis of County facilities to estimate forecast 2030 peak hour volumes. All peak hour volumes were adjusted by a peak hour factor to estimate a two-way demand flow rate during the peak 15-minute period. Table 5-4 provides a summary of the capacity analysis results on two-lane, undivided highways maintained by Wasco County.

TABLE 5-4 FORECAST 2030 TWO-LANE HIGHWAY CAPACITY ANALYSIS OF WASCO COUNTY FACILITIES

Roadway	Forecast 2030 ADT	Volume Source	PHF	Two-Way Demand Flow	Calculated V/C Ratio
Boyd Loop Road (East of US 197)	215	2008 ADT	0.85	40	0.01
Browns Creek Road (South of Chenoweth Creek Road)	330	Hourly Count	0.85	60	0.02
Cherry Heights Road (Northeast of Wells Road)	465	2008 ADT	0.85	85	0.03
Dufur Valley Road (West of Rail Hollow Road)	325	2008 ADT	0.85	60	0.02
Dufur Valley Road (West of South Valley Road)	260	2008 ADT	0.85	50	0.02
Emerson Loop Road (East of Lower Eight Mile)	180	Hourly Count	0.85	35	0.01
Fairbanks Market Road (East of Fifteenmile Road)	355	2008 ADT	0.85	65	0.02
Fivemile Road (West of OR 197)	515	Hourly Count	0.85	95	0.03
Friend Road (West of Dufur Gap Road)	125	2008 ADT	0.85	25	0.01
Juniper Flat Road (West of OR 216)	35	Hourly Count	0.85	10	0.01
Lower Tub Springs (South of OR 218)	50	Hourly Count	0.85	10	0.01
Mill Creek Market Road (Northeast of Orchard Road)	2,020	2008 ADT	0.85	375	0.12
Reservation Road (South of OR 216)	225	Hourly Count	0.85	40	0.01
State Road (at Sevenmile Hill Road)	600	Hourly Count	0.85	110	0.03
Three Mile Road (Southeast of Steele Road)	2,020	2008 ADT	0.85	375	0.12
Upper Tub Springs (South of Hwy 218)	25	Hourly Count	0.85	5	0.01

*ODOT mobility standards are not applicable to County facilities, however they are shown here as a relative measure of comparison.

As shown in Table 5-4, the existing volume-to-capacity ratios on all two-lane Wasco County roadways are equal to or less than 0.12. The calculated volume-to-capacity ratios are compared to ODOT's standard of 0.70 set forth in the OHP. County two-lane roadways are not subject to ODOT standards; however, these provide a baseline for comparison since the County has not established local mobility standards for county roadways.

Section 6
Future 2030
Transportation Needs &
Alternatives

Future 2030 Transportation Needs & Alternatives

This section identifies the future multimodal transportation needs in Wasco County. As noted in the 2030 Future Conditions summary, there are no forecast capacity deficiencies identified for any of the major highway or roadway facilities serving the County. As such, the identification of future transportation needs and alternatives primarily focuses on improving roadway and intersection operations from a safety, maintenance, and modernization perspective. From these needs, a list of projects was developed, refined, and finalized as part of the formal TSP (see Section 7).

Roadway Network Needs and Alternatives

Since the forecast 2030 analysis determined there are no capacity related deficiencies on any of the major highway or roadway facilities, a supplemental safety and operations assessment was conducted. Projects identified during this process were developed through a combination of windshield surveys conducted by the project team, feedback from technical advisory committee, and public input. Each project was then evaluated to determine a potential mitigation measures and a cost estimate was completed. An overview of these projects is outlined below.

Threemile Road/Steele Road Intersection

The existing Threemile Road/Steele Road intersection has expansive paving and traffic priority is not clearly defined on some approaches. A modification of the overall intersection geometry that reduces the paved surface area and more clearly defines the traffic priority is recommended.

US 97/US 197 Junction

The junction of US 97 and US 197 is a large, high-speed intersection where US 197 intersects on a horizontal curve creating some unconventional turning movements and unique skew angles that can be a challenge for large trucks. In addition, S. Junction Road creates an unconventional fourth leg to the intersection. Given that the identification of potential improvements is beyond the size and scope of this TSP, a more detailed study of potential improvements is needed.

US 197/Boyd Loop Road Intersection

Currently there are two intersections that provide access from Boyd Loop Road to US 197. Both connections intersect US 197 at acute angles (25-40 degrees) creating limited sight distance. To minimize connections to US 197 and improve the overall sight distance, the need for a realigned Boyd Loop Road intersection was identified.

US 197/Fivemile Road Intersection

A county landfill located off of Fivemile Road generates a considerable amount of daily vehicle and truck traffic. To more efficiently and safely accommodate turning movements, a northbound left-turn lane and a southbound right-turn lane are needed along US 197. Given that the highway currently has steep embankments and environmental and residential impacts, a more detailed study of potential improvements is needed.

US 197/Wasco County Landfill Access Road

A feasibility study is recommended to investigate the potential for a new alternate route from US 197 to the Wasco County landfill.

US 197 Realignment

ODOT has preliminarily identified the need for a realignment of a portion of US 197 from the Wapinita Highway Junction to the northern Mosier city limits. A detailed project scope is being developed by ODOT.

OR 216/Junifer Flat Road/Nature Pasture Road Intersection

A windshield survey has noted some sight distance limitations for vehicles on Juniper Flat Road accessing OR 216. A project has been recommended to minimize the sight distance limitations by reducing the impacts of the crest vertical curve on OR 216.

Wamic Market Road/Ross Road Intersection

Currently the eastbound left-turn from Wamic Market Road to Ross Road can occur at high speeds (45 mph or greater). The westbound right turn must stop and yield to that movement. Due to high-speed movements, required sight distance is greater than that provided due to a crest vertical curve. As such, a project has been recommended to combine multiple stop-control intersections into one stop-controlled intersection and to eliminate sight distance constraints for existing stop-controlled movements.

Pedestrian and Bicycle Needs

Based on the rural nature of Wasco County and the distances between destinations, there was no identification of specific sidewalk or other pedestrian improvement needs. At the same time, Wasco County is becoming an increasingly popular haven for recreational cycling along County roadways. A formal identification and recognition of cycling routes within the County was formally recommended as part of the TSP process.

Old Moody Road Shared Bike Route

For improved recreational opportunities, a recommendation was made to include the paving of a 4-mile section of Old Moody Road.

County TIP Roadway Needs

Wasco County has historically maintained a list of needs on various County owned and maintained roadways. This project list makes up the formal Transportation Improvement Program (TIP) and consists of various maintenance, paving, and roadway reconstruction projects that have been identified to maintain a safe, efficient, and reliable roadway network. Each of these projects were further evaluated and refined through the TSP committee process. As a result, all of the TIP projects were recommended to be included as part of the formal TSP project list outlined in Section 7. This overlap ensures that the needs assessment of the TIP is consistent with the broader multimodal needs evaluation of the TSP.

ODOT STIP Needs

Like the Wasco County TIP, current ODOT State Transportation Improvement Program (STIP) projects applicable to Wasco County were identified as part of the needs and evaluation process. There are currently a total of two projects, both involving various sections of I-84. For consistency and coordination purposes, both projects were recommended to be included as part of the formal TSP project list outlined in Section 7.

Future Rail, Airport, Pipeline, and Transmission Needs

The Oregon Rail Plan (ORP) states that future growth of freight rail traffic is difficult to predict and is uncertain. Although future capacity needs are uncertain, rail companies were contacted to identify their future needs in the ORP. Within Wasco and Jefferson Counties the ORP identified a need for adequate clearance for five tunnels located on an 88-mile stretch of BNSF to allow for high-cube double-stack traffic. When the ORP was published in November 2001, the State did not have funding in place to support these improvements.

Future growth and development is a top priority of the Columbia Gorge Regional/The Dalles Municipal (CGRDM) Airport. However, there are currently no projects scheduled that are expected to increase the volume of air travel. No other long-term plans have been identified that suggest future air travel needs will increase at the CGRDM or private airports within the County over the next 20 years.

Wasco County recognizes the potential for future lines to bisect the county as future demand for natural gas increases. One proposal by Palomar Gas Transmission, a partnership between NW Natural and TransCanada, would provide additional capacity and reliability to the natural gas transmission system. Currently, NW Natural is dependent on a single interstate gas transmission pipeline for the gas it needs to serve its 655,000 home, business, and industrial customers. The proposed 36-inch-diameter underground pipeline will be approximately 217 miles long and connect to an existing gas pipeline located northeast of Shaniko. As proposed the route would run east-west through Wasco County adjacent to Maupin and Pine Grove. The project is anticipated to be completed in late 2011.

Section 7
Transportation System Plan

Transportation System Plan

This section outlines the preferred transportation system plan for Wasco County which includes TSP elements consistent with OAR 660-12-020 and goals of OAR 660-12-025. The preferred plan includes recommendations for the County's transportation system, including:

- Roadway System Plan
- Access Management Plan
- Pedestrian and Bicycle System Plan
- Public Transportation System Plan
- Air/Marine/Rail/Pipeline/Transmission System Plan

The transportation components presented in this section were developed in accordance with the requirements of Oregon's Transportation Planning Rule (TPR). These elements have been developed concurrent with the findings presented in the existing and future forecast conditions analysis. The plan also conveys the interests of the citizens, business owners, and governmental agencies within Wasco County, as expressed by the Technical Advisory Committee (TAC) and citizen input during the plan's development.

The preferred plan is focused on areas outside of the incorporated cities of Antelope, The Dalles, Dufur, Maupin, Mosier, and Shaniko. Information on County roadways within the incorporated cities was included, but no assessments were conducted on areas within incorporated cities. Coordination with each incorporated city is encouraged in order to provide the greatest level of planning consistency.

ROADWAY SYSTEM PLAN

The Wasco County roadway system plan reflects the anticipated operations and circulation needs through the year 2030 and provides guidance on how to facilitate vehicular and freight traffic over the next 20 years. The plan focuses on the County owned and maintained rural roadway system including all rural local roadways. All state highways residing within the County are identified for coordination purposes.

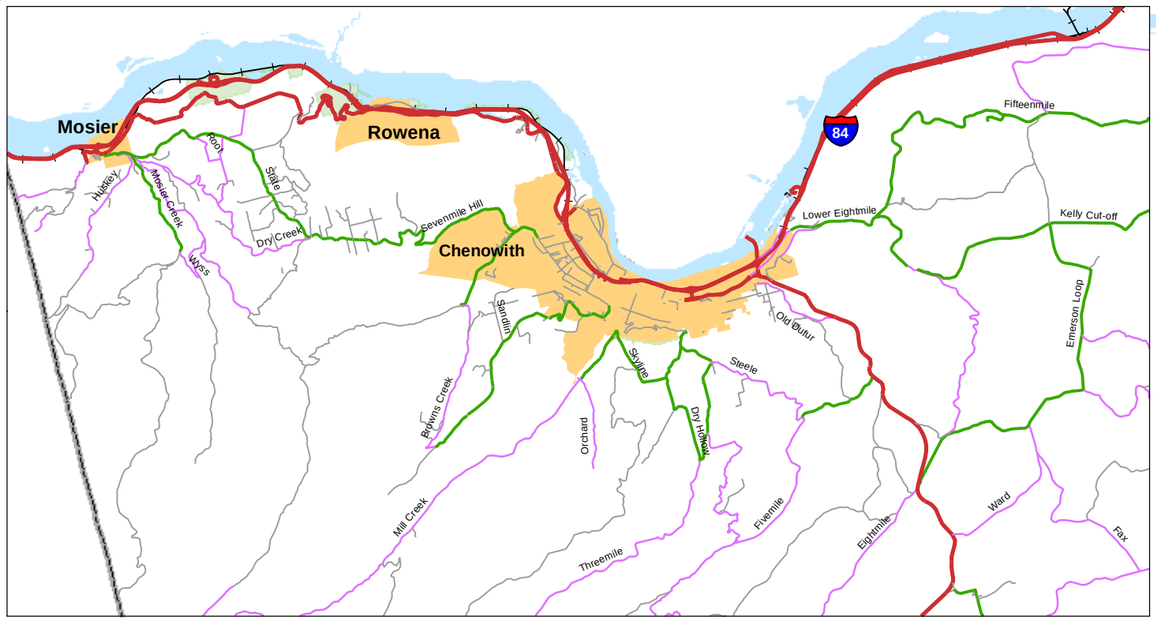
Functional Classifications

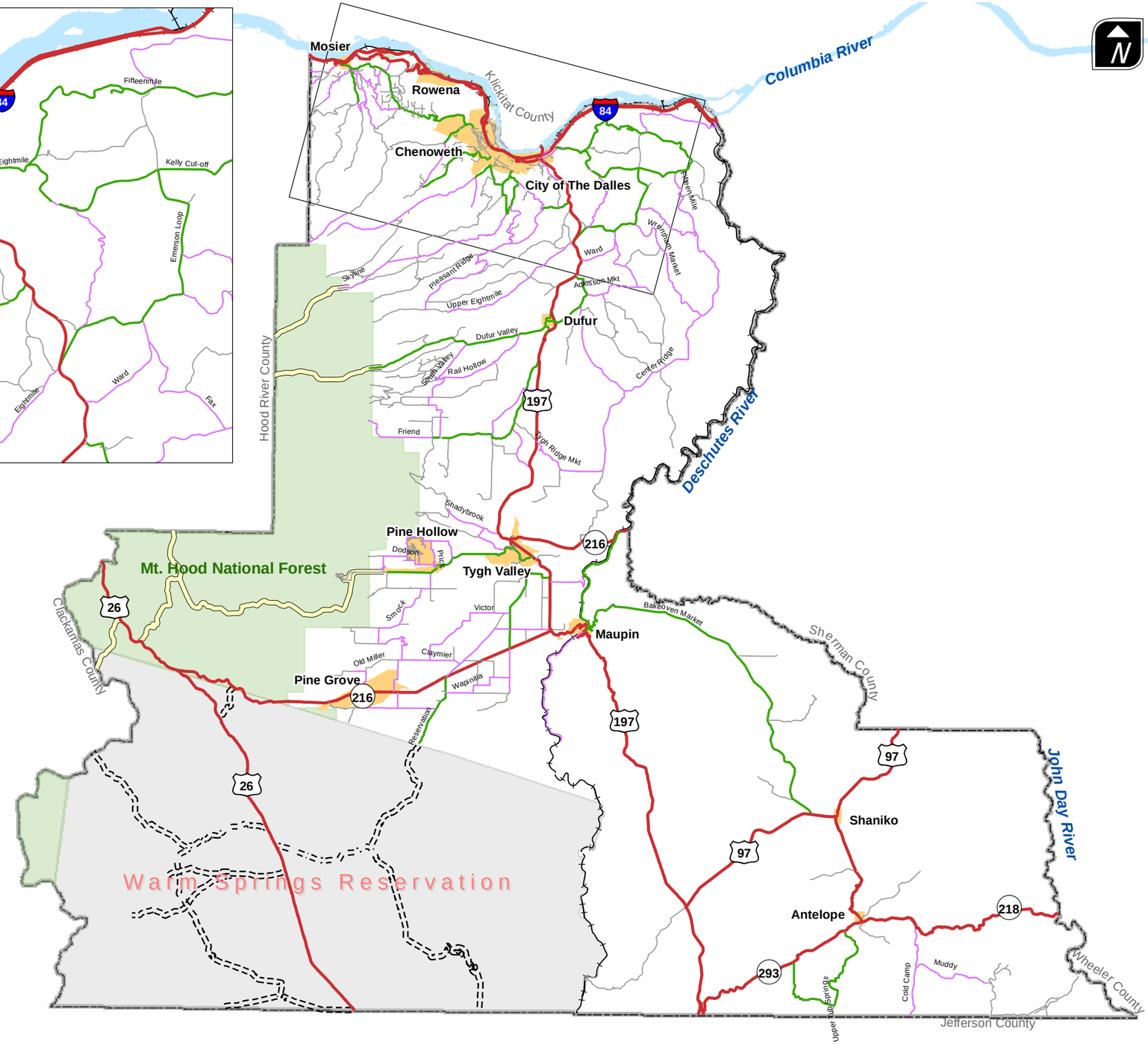
Functional classification of a roadway characterizes the intended purpose, amount and type of vehicular traffic it is expected to carry, provisions for non-auto travel, and the roadway's design standards. The classification considers access to adjacent land uses and the transportation modes that should be accommodated.

The functional classification system for Wasco County includes: Rural Arterial, Rural Major Collector, Rural Minor Collector, and Rural Local Road. Table 7-1 provides a detailed description of each classification. Figure 7-1 presents the functional classifications for all existing and planned County roadways.

TABLE 7-1 WASCO COUNTY FUNCTIONAL CLASSIFICATION DESCRIPTIONS

Functional Classification	Description	Typical Average Daily Traffic Range
Rural Arterial	Primary function is to carry high levels of regional vehicular traffic at high speeds; connects the collector road system to freeways; provides connection to other cities and communities; serves major traffic movements; access control may be provided through medians and/or channelization;	>2,000
Rural Major Collector	Primary function is to serve traffic between neighborhoods and community facilities; principal carrier between arterials and local roads; provides some degree of access to adjacent properties, while maintaining circulation and mobility for all users; carries lower traffic volumes at slower speeds than arterials; typically has two or three lanes; bicycle facilities may be exclusive or shared roadways depending on traffic volumes, speeds, and extent of bicycle travel.	500 – 2,000
Rural Minor Collector	Primary function is to connect rural residential areas with arterials and major collector roads; has slower speeds to enhance safety; bicycle facilities may be exclusive or shared roadways depending on traffic volumes, speeds, and extent of bicycle travel.	250 – 400
Rural Local Road	Primary function is to provide direct access to adjacent land uses; characterized by short roadway distances, slow speeds, and low volumes; offers a high level of accessibility; serves passenger cars, pedestrians, and bicycles, but not through trucks. Local roads may be paved or unpaved.	<250





WASCO COUNTY

LEGEND

Wasco County Facilities

- Arterial (Classification Reserved for Future Designation)
- Major Collector
- Minor Collector
- Local

Non-County Facilities

- ODOT Facility
- United States Forest Service Facility
- The Confederated Tribes of Warm Springs Facility

PROPOSED FUNCTIONAL CLASSIFICATION
WASCO COUNTY, OREGON

FIGURE **7-1**

H:\projfile\9637 - TSPs for Wasco County\gis\Proposed Functional Classification.mxd

Design Standards

The roadway design standards take into consideration roadway function and operational characteristics, including traffic volume, capacity, operating speed, and safety. The design standards are necessary to ensure that as the road system develops, it will be capable of safely and efficiently serving the traveling public, while also accommodating the orderly development of adjacent lands. The County's rural roadway design standards for all County owned and maintained facilities are shown by functional classification in Table 7-2.

Sidewalks and bicycle lanes have not been included in the roadway design standards because the majority of County roadways are rural in nature and sidewalks are not a typical feature on these facilities. The standards do include shoulder widths which are adequate to accommodate a low volume of pedestrian and bicycle traffic.

Design standards for County roadways within urban areas (incorporated cities) are provided in Table 7-3 in order to maintain consistency with incorporated cities within the County. Coordination with each incorporated city is encouraged in order to provide the greatest consistency with the most current design standards.

While not specifically outlined in this plan, improvements on state highways must meet ODOT design and operating standards.

TABLE 7-2 RURAL WASCO COUNTY ROADWAY DESIGN STANDARDS

	Rural Local Roads*									Rural Minor Collector			Rural Major Collector			Rural Arterial		
	Unpaved			Unpaved			Paved			Paved			Paved			Paved		
Design ADT	<25			25-250			25-250			250-400			400 – 2,000			>2,000		
Terrain[1]	L	R	M	L	R	M	L	R	M	L	R	M	L	R	M	L	R	M
Design Speed (mph)	30	30	20	30	30	20	30	30	20	40	30	20	50	40	30	60	50	40
Max Grade (%)	7	10	12	7	10	12	7	10	12	7	9	12	6	8	10	3	4	8
Stopping Sight Distance (ft)	220	235	135	220	235	135	220	235	135	340	230	135	475	350	235	600	610	350
Passing Sight Distance (ft)	-	-	-	-	-	-	1,090	[2]	[2]	1,470	[2]	[2]	1,835	[2]	[2]	2,135	[2]	[2]
Traveled Way Width (ft)	18	18	18	22	22	22	22	22	22	22	22	22	24	24	24	24	24	24
Paved Shoulder Width (each side)																		
- Non Bike Route	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	2	2	2
- Bike Route (ft)	-	-	-	-	-	-	-	-	-	2	2	2	5	5	5	6	6	6
Gravel Shoulder Width (each side)	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2
Roadway Width (Non Bike / Bike Route) (ft)	18	18	18	22	22	22	26	26	26	28 30	28 30	28 30	30 38	30 38	30 38	32 40	32 40	32 40
Number of Lanes	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum ROW Width (ft)	50	50	50	50	50	50	50	50	50	60	60	60	60	60	60	60	60	60
Preferred Access Spacing[3]	75			100			100			150			300			500		

* Table 7-2 provides standards for public roadways only. Design standards for private roadways are outlined in Wasco County's Development Ordinance.

[1] L= Level, R=Rolling, M=Mountainous

[2] See AASHTO manual for guidance.

[3] Lower spacing may be allowed when supported by a traffic study and/or approved by the County Engineer.

TABLE 7-3 URBAN WASCO COUNTY ROADWAY DESIGN STANDARDS

	Local Street	Urban Minor Collector	Urban Major Collector	Urban Arterial
Design ADT	<1,000	1,000-3,000	3,000–6,000	>6,000
Design Speed (mph)	25	25-30	25-35	25-35
Max Grade	12%	10%	10%	6%
Minimum ROW Width (ft)	58	64	63-76	90
Number and Width of Lanes	2 12' Travel Lanes	2 12' Travel Lanes	2 12' Travel Lanes	3 Two 12' Travel Lanes 14' Center Turn Lane
Traveled Way Width (ft)	36	40	52	50 or 66
On-Street Parking (ft)	Not striped	8 (each side)	8 (each side)	8 (each side), optional
Sidewalk Width (ft)	5 (each side)	5 (each side)	5 (each side)	5 (each side)
Bike Lane Width (ft)	-	-	6	6
Preferred Access Spacing (ft)[1]	50	150-300	150-300	300-600

Note: The urban roadway design standards apply to all County roadways in urban areas (incorporated communities). However, local roadway design standards may be utilized when deemed appropriate.

[1] Decreased spacing may be allowed when supported by a traffic study and/or approved by the local jurisdiction.

Access Management Policy

Managing access to the County's road system is necessary to preserve capacity and maintain safety of the County's arterial and collector system. Capacity is preserved by minimizing the number of points where traffic flow may be disrupted by traffic entering and exiting the roadway. Access management also enhances safety along roadways by minimizing the number of potential conflict points. Table 7-2 (rural) and Table 7-3 (urban) show the access spacing standard for all driveways and private roads accessing collector and arterial County facilities.

Access to state facilities is governed by ODOT's access management standards provided in the most current version of the 1999 Oregon Highway Plan and in Oregon Administrative Rule 734-051. Table 7-4 provides the spacing standard on ODOT facilities.

TABLE 7-4 ODOT HIGHWAY SPACING STANDARDS

Posted Speed (mph)	ODOT Classification	Rural[1]		Urban[1]		UBA[1]	STA[1]
		Expressway[2]	Other	Expressway[2]	Other		
>= 55	Statewide Regional District	5,280 5,280 5,280	1,320 990 700	2,640 2,640 2,640	1,320 990 700		
50	Statewide Regional District	5,280 5,280 5,280	1,100 830 550	2,640 2,640 2,640	1,100 830 550		
40 & 45	Statewide Regional District	5,280 5,280 5,280	990 750 500	2,640 2,640 2,640	990 750 500		
30 & 35	Statewide Regional District		770 600 400		720 425 350	720 425 350	*
<= 25	Statewide Regional District		550 450 400		520 350 350	520 350 350	*

Notes:
[1]Measurement of the approach road spacing (feet) is from center to center on the same side of the roadway.
[2]Spacing for Expressway at-grade intersections only; refer to Table 12, Appendix C of the latest version of the OHP for interchange spacing.
UBA: Urban Business Area
STA: Special Transportation Area
*Where driveways are allowed and land-use permits, the minimum spacing for driveways is 175 feet or mid-block if the current block spacing is less than 350 feet. (See Note ❹ in Appendix C, OHP)

ODOT's standards also apply to access spacing on County facilities located within the management area of a freeway or expressway interchange, as defined by OAR 734-051.

The Oregon Transportation Planning Rule (TPR) defines access management as a set of measures regulating access to streets, roads, and highways, from public roads and private driveways. The TPR requires that new connections to arterials and state highways be consistent with designated access management categories. This TSP includes an access management policy that maintains and enhances the integrity (i.e., capacity, safety, and level of service) of Wasco County's roadways.

Access management standards vary depending on the functional classification and purpose of a given roadway. Roadways on the higher end of the functional classification system (i.e., arterials and major collectors) tend to have higher spacing standards, while facilities such as minor collectors and local streets allow more closely spaced access points. These standards apply to new development or redevelopment; existing accesses are allowed to remain as long as the land use does not change. As a result, access management is a long-term process in which the desired access spacing to a street slowly evolves over time as redevelopment occurs.

Given the general rural nature of the county, it is not expected that variances to access spacing standards will be needed often. In the unique circumstance that a variance is needed a conditional access permit may be issued by Wasco County or ODOT, as appropriate.

Traffic Operations Standards

Wasco County has an obligation to maintain a safe, convenient, and economical transportation system. A maximum volume-to-capacity (v/c) ratio of 0.85 during a typical weekday peak hour should be maintained for all County-owned or maintained intersections located outside of an urban incorporated jurisdiction. At intersections where one or more approaches is maintained by another jurisdiction such as ODOT, the more restrictive standards apply. For unsignalized intersections, the v/c ratio should be based on the intersection's critical movement. For signalized intersections, the ratio is based on the overall intersection operation.

In incorporated urban areas, the locally adopted operation standards apply. For all County-owned or maintained intersections located inside the City of The Dalles urban growth boundary, the level of service standards of the City of The Dalles apply. All intersection operations analyses follow the methodology described in the latest edition of the Highway Capacity Manual (HCM), published by Transportation Research Board (TRB).

IMPLEMENTATION PLAN

This section outlines specific transportation system improvement projects as well as a categorization of the identified improvements into two groups: near-term and long-term. The categorization presented reflects the relative time period in which it may be foreseeable for the County to implement the project; it is not intended to limit the selection of a project or the order in which projects will be implemented. The County will need to periodically update its TSP and will review the need and timing for improvements at those times.

Long-term projects may or may not be feasible within the twenty-year planning horizon, for reasons of both need and resources. However, they represent a vision for an efficient transportation system in the future and they have been identified to support the preservation of the opportunities as future conditions may warrant them.

The construction of roads, water, sewer, and electrical facilities in conjunction with local development activity should be coordinated if the County is to develop in an orderly and efficient way. Consequently, the planned improvements identified should be considered in light of developing infrastructure sequencing plans, and may need to be modified accordingly.

The planned transportation improvement projects in Wasco County include those identified to address various transportation issues, which generally include:

- *Operations:* These projects provide the roadway capacity needed to accommodate future traffic flows and reduce delay.
- *Safety:* These projects consider opportunities to improve existing facilities to reduce probability and severity of crashes.
- *Pedestrian and Bicycle Enhancements:* These projects improve existing facilities or create new facilities that provide greater connectivity and increase access to pedestrian and bicycle routes.
- *Heavy Maintenance:* These projects address needs identified by the County that relate to roadway, roadside, or drainage and cannot be conducted as part of regular maintenance activities.
- *Full Reconstruction:* These projects include reconstruction of the roadway including removal of existing roadway, and placement of aggregate base and asphalt pavement.
- *Feasibility Studies:* These projects have identified the need for some level of long-term improvements to different roadway segments or intersections. Given the size and complexity, a more detailed evaluation of potential improvements has been identified that is beyond the scope of the TSP.

While site-specific projects, such as adding turn lanes at an existing intersection, have been included to improve conditions at particular locations, the projects reflect a broader goal which is to develop an efficient transportation network that will reduce reliance on the state highways and limit potential for motor vehicle crashes.

Rural Transportation Improvements

The planned near- and long-term transportation improvements within unincorporated areas of Wasco County are listed in Table 7-5. The table includes a project letter for reference to the project location illustrated in Figure 7-2. Additionally, the table includes preliminary cost estimates with 40-percent contingency for the projects, excluding right-of-way. Potential non-binding funding sources were also identified for each project and are subject to negotiation at the time of project execution. Wasco County Transportation Improvement Program (TIP) project costs were estimated by the County while Project "G" was estimated by ODOT. All projects identified as part of the STIP were estimated by ODOT as well.

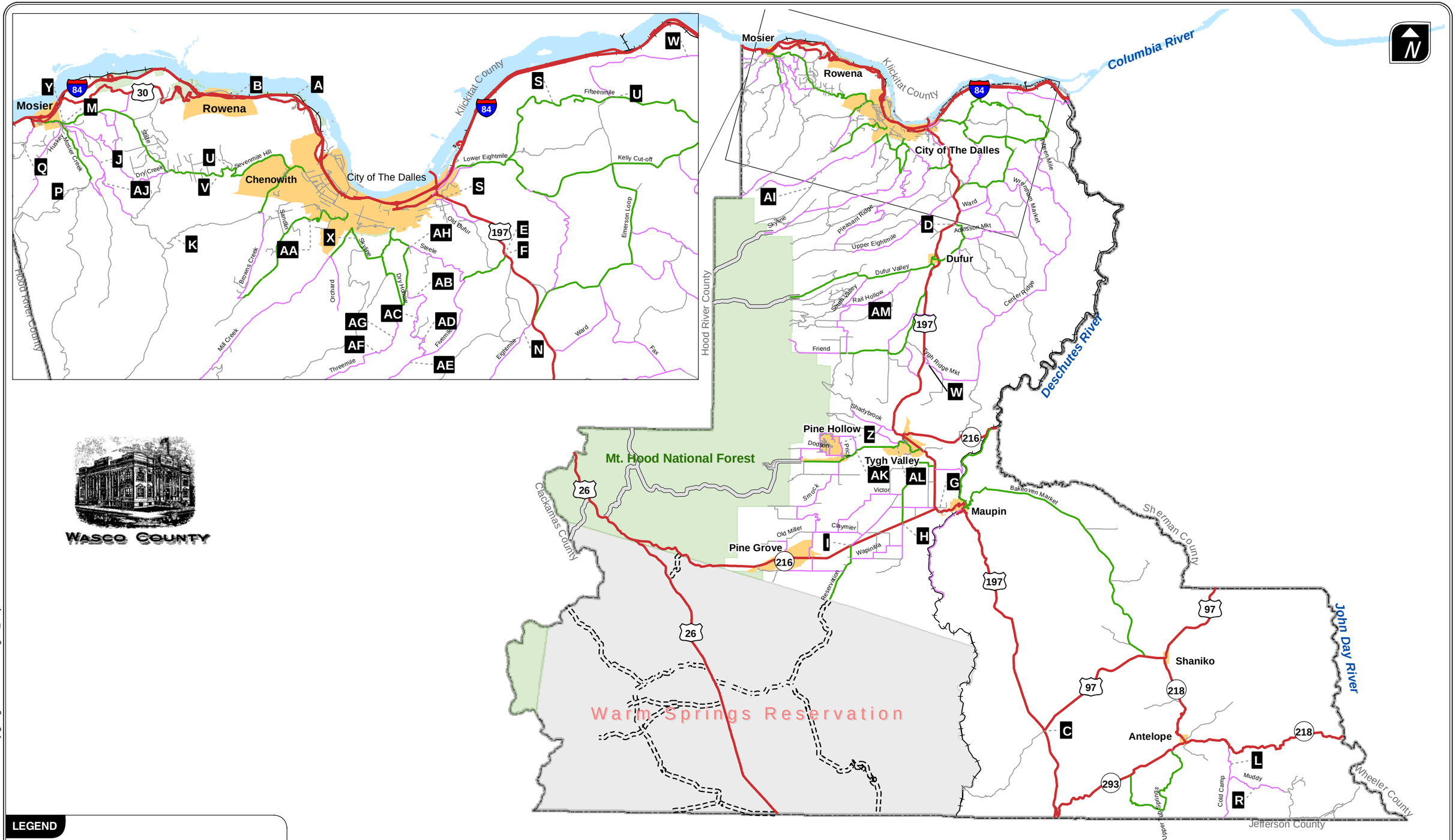
The implementation plan incorporates the preferred financing plan, which identifies that a limited amount of money will be available to fund projects. As a result, only improvements that are planned for implementation and are expected to have funding are shown in the near-term time frame. The long-term project timeline reflects the fact that some projects are not needed immediately and it will take time to accumulate the funds to build those projects.

TABLE 7-5 WASCO COUNTY RURAL TRANSPORTATION IMPROVEMENT PROGRAM

Project Identifier	Project Name	Project Description	Project Category	Source	Project Cost Estimate[1]	Potential Funding Source		
						ODOT	County	City
Short-Term Projects								
A	I-84: Hood River - The Dalles Dam Access Bundle 207	Replace/repair bridges; preservation work; median barrier	Bridge	2008-2011 STIP	$43,000,000	P		
B	I-84: Rowena Bluff Rockfall Project Development	Develop project for construction, coordinate with Columbia Gorge Commission	Operations	2008-2011 STIP	$480,000	P		
C	Threemile Road/ Steele Road Intersection Reconfiguration	Modify intersection geometry and traffic control by realigning as a stop-controlled intersection that reduces the overall paved surface and clearly defines traffic priority.	Operations, Safety	TAC	$15,000		P	
Long-Term Projects								
D	US 97/US 197 Highway Junction Intersection Reconfiguration Study	Prepare a study to formally evaluate options for realignment/reconfiguration of the US97/US197/South Jct. Road intersection.	Intersection Reconfiguration Feasibility Study	TAC	$50,000	P		
E	US 197/Boyd Loop Road Intersection Study	Evaluate options for realignment/reconfiguration of the US 197/Boyd Loop Road intersection to intersect US 197. Currently, there are two intersections that provide access from Boyd Loop to US 197. Both intersect US 197 at acute angles (25-40 degrees). Sight distance from Boyd Loop to US 197 is difficult due to angle of intersection.	Intersection Reconfiguration Feasibility Study	TAC	$50,000	P		
F	US 197/Fivemile Road Intersection Safety Feasibility Study	Intersection study to investigate feasibility of reconstruction of highway to include turn lanes at Fivemile Road. Highway widening could include: 16 foot northbound left-turn lane on US 197 and 14 foot southbound right-turn lane. Wasco County has received complaints that trucks heading to the County landfill (located off of Fivemile Road west of US 197) block the through traffic on US 197 while waiting to turn. Roadway has steep embankments on both sides at this location and known environmental and residential impacts.	Intersection Improvement Feasibility Study	TAC	$50,000	P		
G	US 197 Realignment: Wapinitia Hwy Jct. (milepost 43.0) to Maupin City Limits	Reconstruct/realign roadway onto embankment that has been placed for new alignment.	Modernization	TAC	$3,500,000	P		
H	US 197/Wasco County Landfill Access Road Feasibility Study	Conduct a study of the feasibility of constructing an alternate route from US 197 (near MP 3.05) along the top of the ridge to the Wasco County Landfill.	Roadway Planning Feasibility Study	TAC	$50,000	P	S	
I	OR 216/Juniper Flat/Natural Pasture Road Safety Improvements	Reduce sight distance restrictions for minor street traffic on Juniper Flat at OR 216. Modifications to intersection and/or elevation of OR 216 to reduce impacts of crest vertical curve to the west of Juniper Flat.	Safety	TAC	$700,000	P		
J	OR 216/Reservation Road Safety Improvements	Monitor intersection crash history to verify that recent crash frequency and trends do not continue. Intersection is currently in 90-95th percentile on ODOT's SPIS list. There are no observable safety concerns based on field review. Improvement options could include realignment of Old Wapinitia Road to the west of the Gas Station/Market and realignment of Reservation Road at OR 216 to make a 90-degree 4-way intersection.	Safety	ODOT SPIS	-	P		
K	Behrens Road Reconstruction	Full reconstruction from Carroll to Digger Road.	Full Reconstruction	TAC	$300,000		P	
L	Chenoweth Creek Road Maintenance	Heavy maintenance from end of pavement to Vensel Road.	Heavy Maintenance, Safety	WC TIP	$570,000		P	
M	Cold Camp Road Heavy Maintenance	Heavy maintenance from Hwy 218 to Muddy Road.	Heavy Maintenance, Safety	WC TIP	$300,000		P	
N	Carroll Road Reconstruction	Full reconstruction from Dry Creek to MP 1.37.	Full Reconstruction	WC TIP	$550,000		P	
O	Eightmile Road Reconstruction	Full reconstruction from US 197 to Pine Hollow Road.	Full Reconstruction	TAC	$1,500,000		P	
P	Fifteenmile Road Reconstruction	Full reconstruction from Lower Eightmile to Company Hollow.	Full Reconstruction	TAC	$2,300,000		P	
Q	Godberson Road Heavy Maintenance	Heavy maintenance on initial grade off Wilson Road.	Heavy Maintenance, Safety	WC TIP	$100,000		P	
R	Hood River Road Heavy Maintenance	Heavy maintenance from end of pavement to Proctor Road (0.53 miles in length).	Heavy Maintenance, Safety	WC TIP	$150,000		P	

Project Identifier	Project Name	Project Description	Project Category	Source	Project Cost Estimate[1]	Potential Funding Source		
						ODOT	County	City
S	Muddy Road Heavy Maintenance	Heavy maintenance from Cold Camp Road to MP 1.56.	Heavy Maintenance, Safety	WC TIP	$200,000		P	
T	Old Dufur North Reconstruction	Full reconstruction from Richmond St to 3 mile creek.	Full Reconstruction	TAC	$300,000		P	
U	Old Moody Road Shared Bike Route	Pave 4-mile segment (24 feet width) of Old Moody Road for shared use by bicycles and automobiles.	Bicycle, Pavement	TAC	$10,700,000		P	
V	Sevenmile Hill Road Reconstruction	Full reconstruction from Chenoweth Creek to MP 0.73.	Full Reconstruction	WC TIP	$300,000		P	
W	Sevenmile Hill Road Reconstruction	Full reconstruction from Harvey Pit to 1981 job.	Full Reconstruction	WC TIP	$400,000		P	
X	Shared Bike Route on Tygh Ridge Road	Pave 1.5 mile segment (24 feet width) of Tygh Ridge for shared bicycle use by bicycles and automobiles.	Bicycle, Pavement	TAC	$4,000,000		P	
Y	Skyline Road Reconstruction	Full reconstruction from packing plant to end of pavement.	Full Reconstruction	TAC	$1,100,000		P	
Z	State Road Reconstruction	Full reconstruction from Mosier Creek bridge to MP 1.23.	Full Reconstruction	WC TIP	$340,000		P	
AA	Price Road Reconstruction	Reconstruct and pave from Ross Road to end of pavement.	Pavement, Safety	TAC	$660,000		P	
AB	Knob Hill Road Reconstruction	Full reconstruction from Cherry Heights to MP 0.83.	Full Reconstruction	WC TIP	$330,000		P	
AC	Pleasant Ridge Road Reconstruction: Segment A	Full reconstruction from Threemile Road to grindings.	Full Reconstruction	WC TIP	$500,000		P	
AD	Pleasant Ridge Road Reconstruction: Segment B	Full reconstruction from grindings to Dolan Rd.	Full Reconstruction	WC TIP	$600,000		P	
AE	Pleasant Ridge Road Reconstruction: Segment C	Reconstruct and pave from Dolan Road to Fivemile Road and provide a bicycle route.	Full Reconstruction, Bicycle, Safety	WC TIP	$590,000		P	
AF	Pleasant Ridge Road Reconstruction: Segment D	Reconstruct and pave from 5 mile intersection to Quarter-horse Ranch (0.95 miles in length)	Pavement, Safety	WC TIP	$480,000		P	
AG	Threemile Road Reconstruction	Full reconstruction from End Pavement to Skyline.	Full Reconstruction, Safety	WC TIP	$3,000,000		P	
AH	Threemile Road Reconstruction	Full reconstruction from Dry Hollow to End of Pavement.	Full Reconstruction	WC TIP	$670,000		P	
AI	Upper Mill Creek Heavy Maintenance	Heavy maintenance from end of pavement to bus turn-around.	Heavy Maintenance, Safety	WC TIP	$200,000		P	
AJ	Vensel Road Reconstruction	Full reconstruction from Digger Road to Columbia River Resort.	Full Reconstruction	WC TIP	$220,000		P	
AK	Wamic Market Road/ Ross Road Intersection Safety	Combine multiple stop-control intersections into one stop-controlled intersection to eliminate sight distance constraints for existing stop-controlled movements and encourage slower speeds for turning movements. Currently the eastbound left-turn from Wamic Market Road to Ross Road can occur at high speeds (45 mph or greater). The westbound right turn must stop and yield to that movement. Due to high-speed movements, required sight distance is greater than that provided due to a crest vertical curve.	Intersection Improvement Feasibility Study	TAC	$50,000		P	
AL	Wamic Market Road Safety	Reconstruct roadway segments along steep grade. Phase I of the project has been completed; future sections are identified for improvements under Phase II.	Full Reconstruction, Safety	WC TIP	$1,800,000		P	
AM	Winslow Road Heavy Maintenance	Heavy maintenance from Rail Hollow Road to 2004 job.	Heavy Maintenance	WC TIP	$430,000		P	

[1] Cost estimate is planning level only. Does not include ROW cost
STIP: Statewide Transportation Improvement Project
TAC: Technical Advisory Committee
ODOT SPIS: Oregon Department of Transportation Safety Priority Index System
WC TIP: Wasco County Transportation Improvement Project
P : Primary party with potential funding and implementation responsibility
S : Secondary party with potential funding and implementation responsibility



WASCO COUNTY

LEGEND

#	Project Identifier (See Table 7-5 for details)

RURAL TRANSPORTATION IMPROVEMENT PROJECTS
LOCATION MAP
WASCO COUNTY, OREGON

FIGURE **7-2**

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As shown in Table 7-5, only three projects identified within Wasco County are expected to be implemented in the near-term time period; two are identified in ODOT's 2008-2011 STIP. The approximate cost of near-term projects is $43.5 million and the approximate cost of long-term projects is $37.0 million.

Projects D, E, F, and H require a more detailed analysis and/or public involvement effort to resolve certain transportation issues. In these cases, the TSP identifies feasibility or intersection studies at an estimated cost of $50,000; actual project costs will be determined by each study.

Urban Transportation Improvement Projects

ODOT, Wasco County, and The City of The Dalles identified transportation improvement projects on County facilities within incorporated areas. All transportation improvement projects within incorporated areas of Wasco County are summarized in Table 7-6.

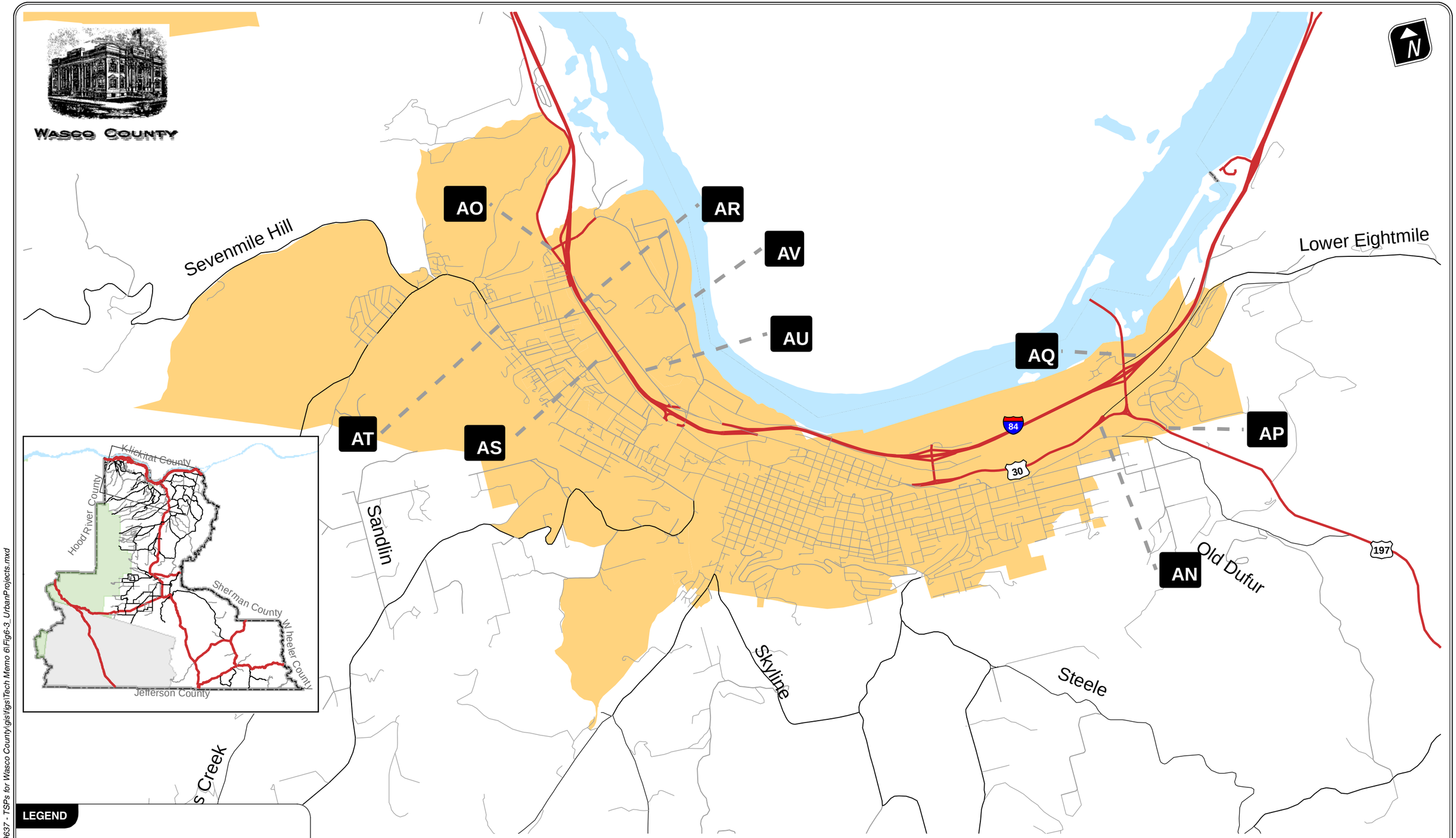
No improvements included in Table 7-6 are planned for implementation and are not expected to have funding in the near-term time frame. All projects are identified on the long-term project timeline, which reflects the fact that some projects are not needed immediately, and it will take time to accumulate the funds to build them.

The table includes a project letter for reference to the project location illustrated in Figure 7-3. Additionally, the table includes preliminary cost estimates. Wasco County Transportation Improvement Program (TIP) project costs were estimated by the County, Projects "AO" and "AP" were estimated by ODOT, and all others were identified in The Dalles TSP (updated December 2006). All the identified urban projects should be incorporated in the next update of the City of The Dalles TSP.

TABLE 7-6 WASCO COUNTY URBAN TRANSPORTATION IMPROVEMENT PROGRAM

Project Identifier	Project Name	Project Description	Project Category	Source	Project Cost Estimate[1]	Potential Funding Source		
						ODOT	County	City
AN	US 30/Lower Eightmile Road Intersection	Redesign Intersection.	Safety, Operations	The Dalles TSP	$250,000	P		S
AO	US 30 Chenoweth Creek Bridge Rehabilitation	Deck widening and rail replacement of historical bridge located outside the northern boundary of The Dalles UGB.	Enhancement	TAC	$575,000	P		
AP	OR 197/Fremont Street Overpass	New overpass at US 197.	Safety, Operations	The Dalles TSP	$12,100,000	P	S	S
AQ	Bret Clodfelter Way Reconstruction and Paving	Pave and add shoulders and bike lanes from US 197 to gate.	Pavement, Bike	WC TIP	$150,000		P	S
AR	Hostetler Street Widening	Widen roadway from 6th Street to 10th Street and restripe to provide bike lanes; add sidewalks and curb.	Safety, Pedestrian/Bike	The Dalles TSP	$2,000,000		P	S
AS	Snipes Street Widening	Widen to major collector cross-section from W. 9th Place to 10th Street.	Safety, Operations	The Dalles TSP	$1,000,000		P	S
AT	West 10th Street Improvements	Add curb and sidewalk from Walnut Street to UGB boundary near Chenoweth Creek Bridge.	Enhancement	TAC	Not Available		P	S
AU	West 2nd Street Widening	Widen, re-stripe for bike lanes, add curbs and sidewalks from Webber Street to Hostetler Street.	Enhancement	TAC	Not Available		P	S
AV[3]	River Road Improvements	Widen entire length of River Road to Major Collector cross-section, add bike lanes, curb and sidewalk.	Enhancement	TAC	Not Available		P	S

[1] Cost estimate is planning level only. Does not include ROW cost.
[2] The cost estimate developed for project AP is preliminary and will be further refined through a scoping process to be conducted in late 2009.
[3] Refer to the I-84 Chenoweth Interchange Area Management Plan (IAMP) for more information on specific improvements planned on River Road and preliminary cost estimates.
WC TIP: Wasco County Transportation Improvement Project
TAC: Technical Advisory Committee
P : Primary party with potential funding and implementation responsibility
S : Secondary party with potential funding and implementation responsibility



LEGEND

Project Number (See Table 7-6)

URBAN TRANSPORTATION IMPROVEMENT PROJECTS
WASCO COUNTY, OREGON

FIGURE 7-3

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PEDESTRIAN AND BICYCLE SYSTEM PLAN

The future population growth in the incorporated areas of the County will increase the need of expanding the existing multi-use paths in the County and to provide new paths in and around the incorporated areas to encourage residents and visitors to ride bicycles for transportation. Providing a connected network of pedestrian and bicycle facilities is important for:

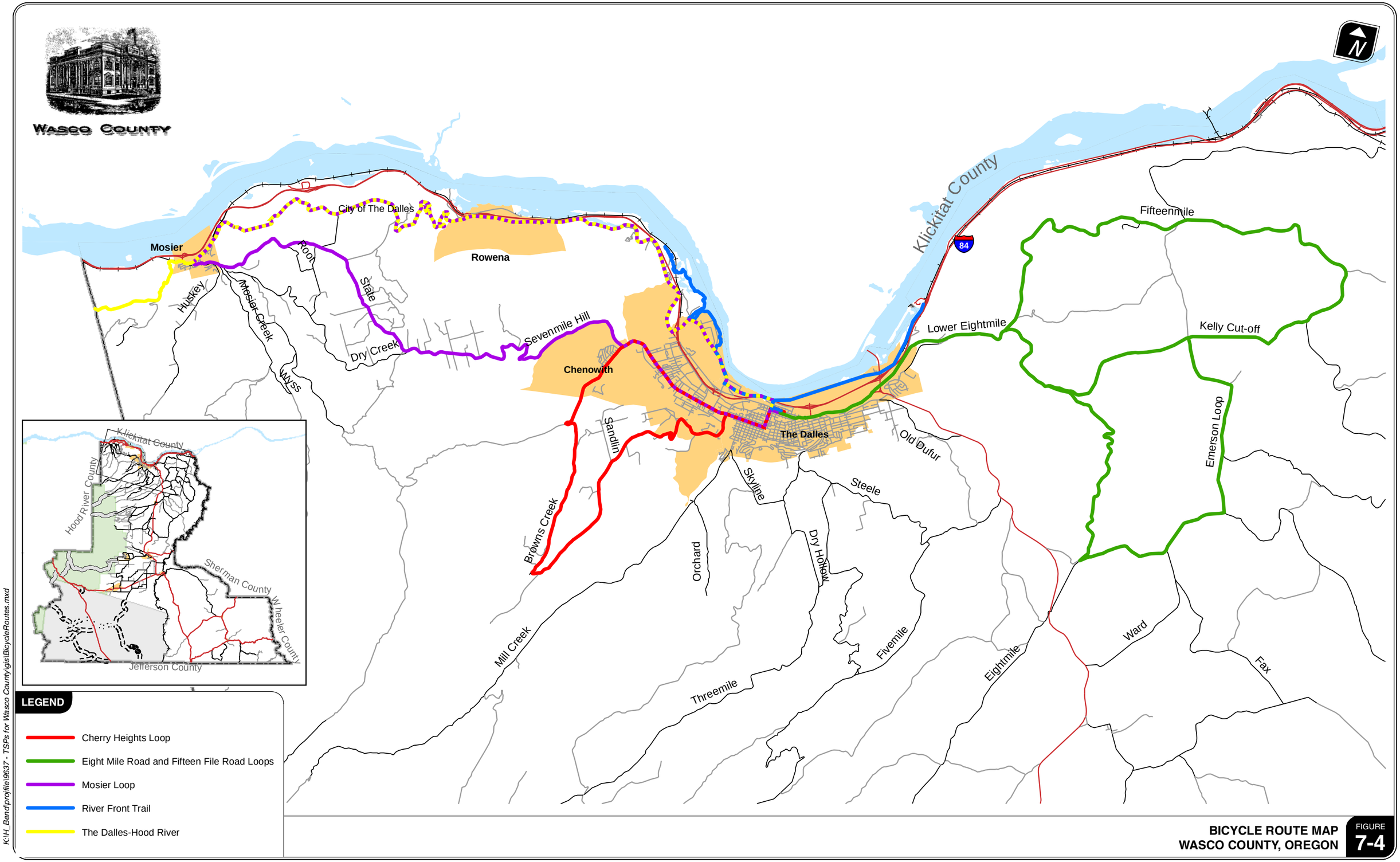
- Serving shorter trips from neighborhoods to area activity centers, such as schools, churches, and neighborhood commercial uses;
- Providing access to public transit; and
- Meeting residents' recreational needs.

In rural Wasco County, bicycle and pedestrian design standards provide paved shoulders on higher-volume roadways to facilitate pedestrian and bicycle travel. As development occurs, and as County funding permits, gaps in the existing pedestrian and bicycle systems will be filled.

Figure 7-4 illustrates a network of bicycle routes that provides an interconnected bicycle system for recreational and commuter use. These routes are consistent with the routes identified by The Dalles Cycling Association and are regularly used by local residents and visiting cyclists.

Bicyclists are encouraged to consider the impacts of increased volumes of heavy vehicles hauling agricultural products during the peak harvest months from June through September. In order to help cyclists choose a bicycle route that avoids the areas of harvest the following recommendations are provided based knowledge of typical season harvest patterns:

- From June 1 to July 15 all routes shown in Figure 7-4 are equally preferred. Expected traffic related to cherry harvest is primarily concentrated the roadways immediately south of The Dalles.
- From July 15 through September routes west of US-197 are preferred. Expected traffic related to wheat harvest is primarily concentrated on the roadways east of The Dalles and east of US 197.



BICYCLE ROUTE MAP
WASCO COUNTY, OREGON

FIGURE 7-4

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PUBLIC TRANSPORTATION PLAN

The Mid-Columbia Economic Development District, under contract with the Association of Oregon Counties, prepared the Wasco County Coordinated Transportation Plan (CTP) update for a four-year period from 2009 to 2012. The plan provides a framework to guide the investment of transportation resources in public transportation. As such, improvements and future funding of public transportation in Wasco County should be implemented in accordance with the CTP.

The CTP satisfies state and federal requirements for Special Transportation Fund agencies. It was developed as a tool to help local transportation providers and communities improve public transportation services, increase efficiency of services, and expand outreach to meet growing needs. The coordinated transportation plan also defines and prioritizes general strategies that the transit service providers can use to develop specific projects.

AIR SERVICE

The Columbia Gorge Regional/The Dalles Municipal Airport serves Wasco County. The Airport is not located within the County, but is located directly across the Columbia River from The Dalles, in the State of Washington. The Airport is jointly owned by the City of The Dalles and Klickitat County in Washington State. Despite the location, the Columbia Gorge Regional/The Dalles Municipal Airport is included in the statewide air transportation study, and serves many large local commercial companies, heavy industrial firms, and the United States Forest Service.

Future growth and development is a top priority of the Columbia Gorge Regional/The Dalles Municipal (CGRDM) Airport. However, there are currently no projects scheduled that are expected to increase the volume of air travel. No other long-term plans have been identified that suggest future air travel needs will increase at the CGRDM or private airports within the County over the next 20 years. However, the County will consider opportunities to bring other air travel options to the region and make efforts to support those opportunities as they become available.

MARINE SYSTEM PLAN

Currently no known marine freight is loaded from sites within the Port of The Dalles, but the potential for such facilities exists. The Port operates a marina that was updated in 2004 and features moorage for all types of vessels with drafts up to 14 feet (in most areas). Moorage is available for both boathouses and open moorage for power and sail vessels. Fuel is available by appointment by calling a member of The Dalles Yacht Club. A public boat launch ramp is also located at the east end of the Marina.

Adjacent to the Port of The Dalles a private facility is currently in operation that provides storage and transport services for wheat. Based on a conversation with the facility operator, approximately 800,000 bushels of wheat can be stored on site until it is shipped. The facility can load barges on-site with capacity of up to 120,000 bushels each.

A new multi-purpose dock is expected to be completed in November 2009, which will increase marine access and services provided within Wasco County. The dock is proposed at the end of

Union Street within the City of The Dalles and is currently in the design phase. Preliminary designs include a fixed-pier dock that can support a jib crane and fork lift for loading and unloading cargo. A second floating dock would serve approximately 12 to 15 pleasure boats and up to a 400 foot tour boat. Recognizing these future plans, Wasco County is committed to looking for opportunities to continue to help identify and expand marine transportation opportunities over the next 20 years.

RAIL SERVICE

Wasco County contains part of the Union Pacific (UP) Railroad's east-west main line. As shown in Figure 7-5, the UP Railroad lies along the south bank of the Columbia River. This UP main line provides the most direct connection from the Pacific Northwest to the Overland Route via Pocatello, Idaho, and Cheyenne, Wyoming. The UP main line is maintained in Federal Railroad Association (FRA) Class 5 condition that permits operation of freight trains at up to 80 mph and passenger trains at up to 90 mph with no weight or dimension restrictions.

The Burlington Northern Santa Fe Railway (BNSF) is Oregon's second largest transcontinental railroad. A north-south BNSF line runs roughly along the county line between Wasco County and Sherman County before diverging into the south central part of the County and points south. BNSF maintains this line up to FRA Class 4 conditions with no weight or dimension restrictions. The maximum allowable speeds for Class 4 lines are 60 mph for freight and 80 mph for passenger trains. BNSF identified needed improvements to five tunnels on its north-south line through central Oregon, located along an 88-mile stretch in Wasco and Jefferson Counties. Improvements were deemed necessary to provide clearances sufficient for "high-cube," 9-foot 6-inch containers stacked one on top of another in a double-stack configuration.

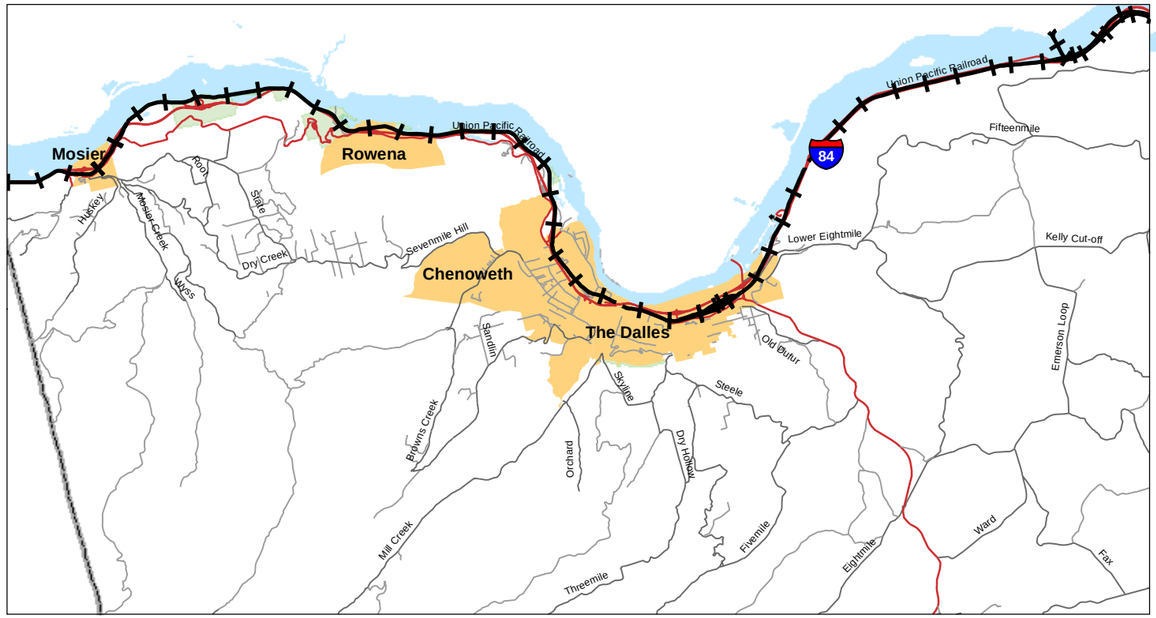
Amtrak provides a throughway bus service at The Transportation Center in The Dalles. The service provides bus transport to nearby Amtrak stations with an established train platform. The nearest Amtrak station with a train platform is Wishram, Washington, approximately 15 miles east of The Dalles.

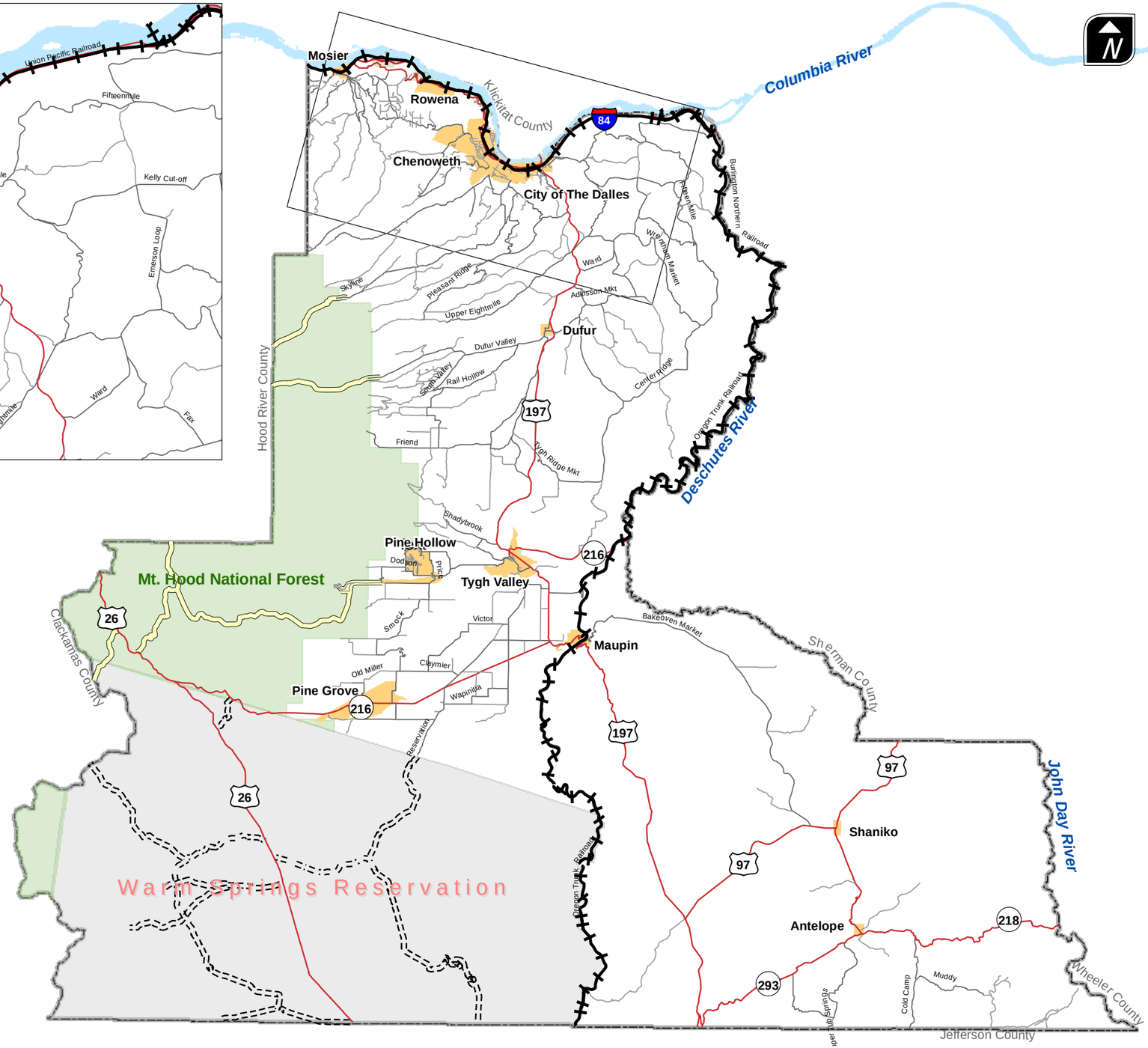
The ORP states that future growth of freight rail traffic is difficult to predict and is uncertain. ODOT Rail does not currently have any plans for major improvements to rail service over the next 20 years within Wasco County. However, Wasco County is committed to working with all rail operators and recognizing future changes or opportunities needed maintain the existing system for the next 20 years.

PIPELINE AND TRANSMISSION SYSTEM PLAN

One major interstate transmission pipeline traverses Wasco County. The facility is a 36-inch diameter natural gas pipeline operated by Gas Transmission Northwest Corporation. This line runs through the southeast portion of the county from Canada to California. The line transmits between 800 million and 1 billion cubic-feet of Canadian natural gas to California each day.

Wasco County recognizes the potential for future pipeline and transmission lines to bisect the county as future demand for natural gas increases. As a result, the County is committed to working with outside interests to safely and efficiently plan for and properly locate these lines.





WASCO COUNTY

LEGEND

Rairoad Lines

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RAIL SERVICE MAP
WASCO COUNTY, OREGON

FIGURE **7-5**

Section 8
Transportation Finance Element

Transportation Finance Element

Funding for transportation projects is increasingly in short supply even as existing infrastructure ages and transportation demands increase. The TPR requires that the Wasco County TSP address transportation funding, including the following elements:

- a list of planned transportation facilities and major improvements;
- a general estimate of the timing for planned transportation facilities and major improvements;
- determination of rough cost estimates for the transportation facilities and major investments identified in the TSP; and,
- a discussion of existing and potential financing sources to fund the development of each transportation facility and major improvement (which can be described in terms of guidelines or local policies).

The finance element provides a means for evaluating the likelihood that projects can be funded within the timelines identified in the TSP. Frequently, the costs for improvement projects exceed available funding. The financing element provides a context for evaluating projects and defining priorities in order to build on available opportunities and preserve existing infrastructure.

CURRENT WASCO COUNTY TRANSPORTATION FUNDING REVENUES

Currently, the county's operation program for 700+ miles of paved and gravel roads comes almost entirely from outside sources in the form of transfer payments from the federal government and the State of Oregon. The federal payments once were related to the harvest of trees on federal forest land in the county and the payments were a means of compensating the county for wear and tear on public roads used to haul logs to mills and finished products to market. Not all county roads were used for hauling logs and wood products, but the harvest of trees was large enough that the revenue generated from logging on federal land supported the maintenance of virtually all county roads. As logging declined, the federal government in 2000 passed a five-year Safety Net law guaranteeing that counties would continue to receive annual funding at historic harvest levels but congressional support for continuing those temporary payments is waning.

Transfer payments from the State of Oregon are the second largest source of revenue the county relies on to maintain its road network. The Oregon Department of Transportation redistributes revenue that it collects from fuel sales, weight-mile taxes, driver and vehicle fees, and other sources to local governments across the state. The formula used to distribute funds differs for cities and counties.

For Wasco County and virtually all cities and counties in Oregon, gas tax revenue has not been keeping pace with costs. A combination of factors is weakening this revenue source's purchasing power. The biggest problem is that the fuel tax rate is not indexed, so inflation is eroding its purchasing power. In addition, the combination of improved vehicle fleet mileage and the use of non-taxed alternative fuel vehicles is affecting the amount of fuel sold disproportionately to vehicle miles traveled. Consequently, wear and tear on the road system is outstripping available revenues to accomplish needed maintenance and capital improvement projects. Recent forecasts by ODOT predict that without significant increases in the tax rate, fuel tax revenue will continue lagging inflation and decline in value to local road authorities.

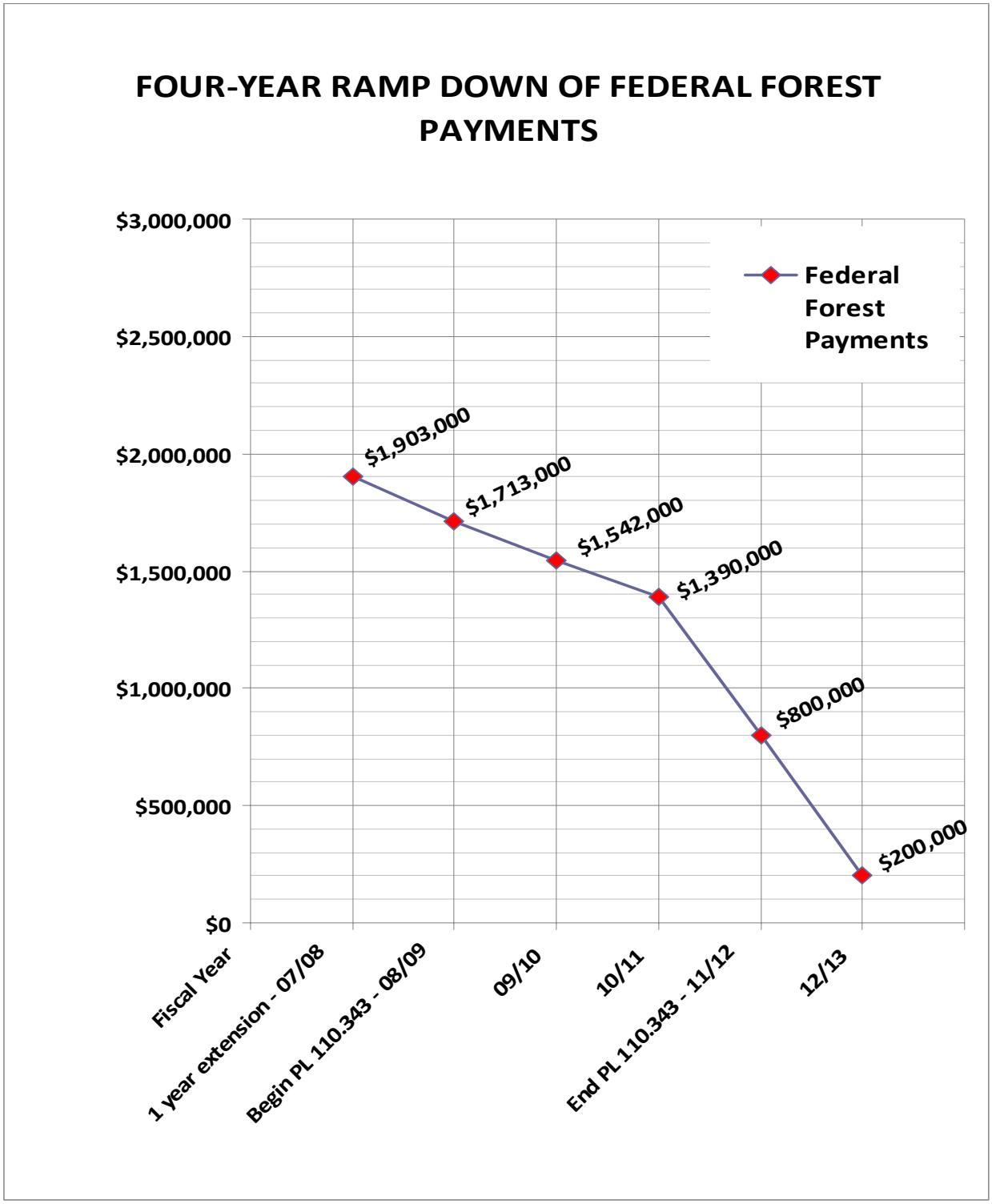
In the 2008-09 fiscal year state and federal payments accounted for most of Wasco County road fund revenue. That revenue was used to pay salaries of county employees, for materials and services, road maintenance, and minor improvements. Table 8-1 shows the sources and uses of revenue in the County road fund.

TABLE 8-1 EXISTING WASCO COUNTY ROAD FUND

Revenue	Amount	Percentage
Federal Forest Receipts	$1,900,000	55%
STP (federal fund exchange with state)	$207,000	6%
ODOT - various transfer funds	$1,337,000	39%
Total Revenue	*$3,444,000*	
Expenses	**Amount**	**Percentage**
Personal Services	$1,786,200	52%
Materials & Services	$1,270,400	37%
Capital Outlay	$387,400	11%
Total Expenditures	*$3,444,000*	

While the declining purchasing power of state shared revenue is alarming and needs to be addressed, more problematic is an expectation that special federal forest payments will be phased out within four years, which will eliminate the Road Fund's primary revenue source. Figure 8-1 below, which is based on federal public law 110.343, shows what this will mean for overall payments. Under this new legislation, the first payment would be approximately $200,000 below the prior year's Safety Net extension payment. Annual payments would decline at about $200,000 in each of the next two years and the final payment would be reduced by around $500,000. The cumulative effect would reduce federal contributions to the road fund by more than $1 million over this four year span. After that, there would be no special legislation guiding federal timber payments, which will leave the county's federal timber revenue based on the annual timber harvest from the Mt. Hood National Forest. Those receipts are estimated at $200,000 per year but it is not possible to accurately estimate those payments from year to year.

Figure 8-1 Wasco County Federal Timber Payments



ROAD FUND FINANCING OPTIONS

Wasco County faces two inter-related financing problems: how to finance operations and how to finance capital projects. Presently, all public works funding is devoted to operations; there is no funding for capital projects. Strategies for addressing these needs may generally be grouped into six categories. Three of the seven strategies may be dismissed for technical and logistical reasons. They include privatization, earmarking, and tolling. That leaves the following strategies for meeting the road fund's fiscal needs: make better use of existing resources, lower road standards, secure more funding from outside sources, and raise local revenue through user fees and taxes. Observations on the use of these strategies are discussed below. They are not all mutually exclusive.

Make Better Use of Existing Resources

Wasco County has been employing this strategy for more than 20 years. The county road department is currently staffed with 30% fewer personnel than were on staff a decade ago. The department has streamlined procedures, reduced the size of work crews, contracted services, and bought equipment to increase worker productivity. The County has completely eliminated all capital improvement programming for county roads and uses all the revenue it has at its disposal to maintain existing roads. While the County certainly will take steps to do more with less, at the margin it is difficult to see how efficiency measures will be able to offset a 55% decline in revenue over the next four years. The amount of revenue lost is roughly equal to the salaries and benefits paid to all public works personnel. Assuming efficiency measures result in 2% to 5% savings, the county will still be facing a significant gap in its operating budget and will have no revenue for capital projects.

Alter Road Network Design and Operating Standards

While altering road standards does not generate or supplement revenue, it has the effect of reducing the cost to operate and maintain the road network and allows the County to stretch its existing resources. Assuming the efficiency measures do not address the funding problem, the County is left with two options: lower standards or raise revenue (or both).

Lowering and modifying standards could involve many actions. The most obvious is to change the design standard for certain types of roads that then would reduce operating costs. For example, the County could allow certain roads to revert from paved to gravel surfaces.

The county also could abandon certain roads now under its jurisdiction and allow them either to be classified as public roads not subject to maintenance responsibility, or transfer its authority to another entity, such as a city or a special district. Transferring authority to another entity may require that the County first bring the road up to a standard acceptable to the other road authority, but many counties have found that on a life-cycle basis, this is less costly than keeping the road.

The County also may consider altering its operating and design standards for roads to reduce costs for example by modifying its snow and ice removal protocols. These measures could marginally reduce operating costs but it is unlikely that these measures alone would have a significant effect on operating costs.

Secure More External Funding

The County may elect to lobby third parties to increase the revenue it receives in transfer payments. With so much riding on the loss of third-party funding, this would seem a prudent strategy. As noted earlier, however, that strategy appears to be losing political support.

The County's main third-party source is the State of Oregon. As noted earlier, Wasco County relies heavily on state shared fuel taxes and registration and title fees to finance its road fund. Table 8-2 shows forecast allocations to Oregon Counties based on the existing revenue allocation formula. The problem with this forecast is that while the amount is increasing the rate of growth is not keeping pace with operating and construction costs, because the fuel tax rate is fixed.

TABLE 8-2 ODOT COUNTY APPORTIONMENT REVENUE FORECAST

Fiscal Year	2009	2010	2011	2012	2013
Dollars (in millions)	$162.2	$165.1	$173.8	$175.0	$179.3
Percent Change	-	+ 1.8%	+ 5.3%	+ 0.7%	+ 2.4%

A number of modifications to the current system are being studied, including a proposed one-time increase in the gas tax rate and a proposal to replace the gas tax with a mileage tax.

Although not predictable, external funding for development related transportation improvements will continue to be secured as part of the development/redevelopment review and approval process.

Local Taxes and User Fees

Many types of user fees and taxes may be collected to finance road construction and operations. On that premise, it is assumed that the county will need to develop local revenue sources to supplement or replace federal resources if it hopes to maintain current levels of service and assuming that changes in state or federal financing, coupled with efficiency measures are not enough to close the funding gap. The following table lists options that the county may wish to consider for funding local roads. The sources include a mix of fees and taxes, some of which if implemented would have implications for other aspects of the county budget.

TABLE 8-3 LOCAL REVENUE SOURCES

Source	Description	Comments
General Fund	Property taxes from the county's permanent tax rate.	Diverting general fund revenue to the Road Fund would have significant consequences for other county services.
Supplemental 5-year Serial Levy	Voter approved property tax levied in addition to the county's permanent tax rate.	A road fund serial levy would have to be approved by voters every five years. A one-time approval would buy time for the county to develop other options. This method could fund operations and capital programs, some of which might reduce future maintenance requirements.
Road Utility Fee	Monthly user fee with revenue dedicated to road operations. May be enacted legislatively but could be challenged and brought to a vote.	This type of fee is becoming more common in cities but would require substantial investment in rate studies, administrative staffing, software and computer systems to enable the county to collect the revenue. This source is generally better suited to funding operations than for capital improvements, but it may free up existing resources for capital projects.
Vehicle Registration Fee	An extra fee on all motor registered vehicles in the county. May be authorized legislatively but could be challenged and brought to a vote.	Collection would be problematic if the state were unwilling to act as a collection agent for the county, but otherwise would be easy to implement. This source could fund operations or capital programs.
Motor Vehicle Title Fee	Require that all motor vehicles registered in the county also have their title recorded as personal property with the County.	This would generate two sources of revenue: from the fee itself and from personal property taxes levied on motor vehicles. This could be problematic for renters and would increase taxable property that the Assessor must account for.
County Gas Tax	May be enacted legislatively but could be challenged and brought to a vote.	A local-option fuel tax would be easy to collect because the infrastructure is already in place. Would generate revenue for the county from motorists passing through the county. This method could fund operations and capital programs.

CONCLUSION

Based on current trends, it does not appear that Wasco County will have any long-term funds for the identified capital improvement projects in the TSP. Therefore, the County will need to rely on a combination of new and expanded local revenue sources as outlined in Table 8-3 and a continuation of transfer funds from ODOT.

Section 9
LUDO Ordinance Modifications and Comprehensive Plan Policy Language

LUDO Ordinance Modifications and Comprehensive Plan Policy Language

The TPR, as codified in OAR 660-012-0045, requires that local jurisdictions amend land use regulations to reflect and implement the TSP. To that end, proposed regulatory language was developed in order to comply with the TPR and to ensure that local ordinances are consistent with the updated TSP. Proposed implementation language can be found in Volume 2 Technical Appendix, Recommended Land Use and Development Ordinance Amendments. The document reiterates the specific TPR requirements that are necessary for the County to address and provides specific text amendments to the Land Use and Development Ordinance that meet these requirements. Suggested language can be considered "best practices" and, in some instances, the *Model Development Code & Users Guide for Small Jurisdictions* was used as a reference document for recommended code revisions.

To the extent possible, proposed amendments to the Land Use and Development Ordinance were developed and formatted to be consistent with the existing structure of this regulatory document in order to expedite a code amendment process. In addition to the recommendations, further amendments to the Land Use and Development Ordinance may be necessary to ensure consistency within the document and to more seamlessly integrate new criteria with existing requirements. For this reason, the memorandum includes proposed amendments to the adopted land use ordinance but final recommended changes to the Wasco County Land Use and Development Ordinance will be part of a separate local adoption action.

Appendix A

Public Involvement Process for TSP Development

Appendix A - Public Involvement Process

The Wasco County Transportation System Plan benefited from an effective public process, facilitating the identification of transportation system deficiencies as well as potential solutions. The following table summarizes the public involvement meetings and open houses, and the dates on which they occurred.

TABLE A-1 PUBLIC INVOLVEMENT MEETINGS AND OPEN HOUSE SUMMARY

Event	Location	Date
TAC Meeting #1	N/A: Conference Call	December 17, 2008
PMT Meeting #1	N/A: Conference Call	December 17, 2008
TAC/PMT Meeting #2	The Dalles, OR	April 2, 2009
Public Open House #1	The Dalles, OR	April 2, 2009
TAC/PMT Meeting #3	The Dalles, OR	April 30, 2009
TAC/PMT Meeting #4	Maupin, OR	June 10, 2009
Public Open House #2	Maupin, OR	June 10, 2009
TAC/PMT Meeting #5	The Dalles, OR	July 22, 2009

As shown in Table A-1, a total of five meetings were held with the TAC and PMT members over an 8-month period beginning in December 2008. Two open houses were held, one in The Dalles, one in Maupin. The open house locations were chosen in order to provide more convenient locations for residents that live in or around The Dalles (April 2, 2009) or those that live in the southern or central region of Wasco County (June 10, 2009).

Each meeting and open house agenda is attached for reference.

Appendix B

Transportation
Improvement Project
Prospectus Sheets

Project #: A	**I-84: Hood River - The Dalles Dam Access Bundle 207**		
Description: Replace/repair bridges; preservation work; median barrier			
Category: Bridge	**Classification:** Interstate	**Potential Funding Source:** ODOT	**Time Frame:** Short-Term
Project Costs:	$43,000,000		

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☑	☐	☐	☐	☐

Project Location:

Illustrative Section:

Project #: B	**I-84: Rowena Bluff Rockfall Project Development**

Description: Develop project for construction, coordinate with Columbia Gorge Commission

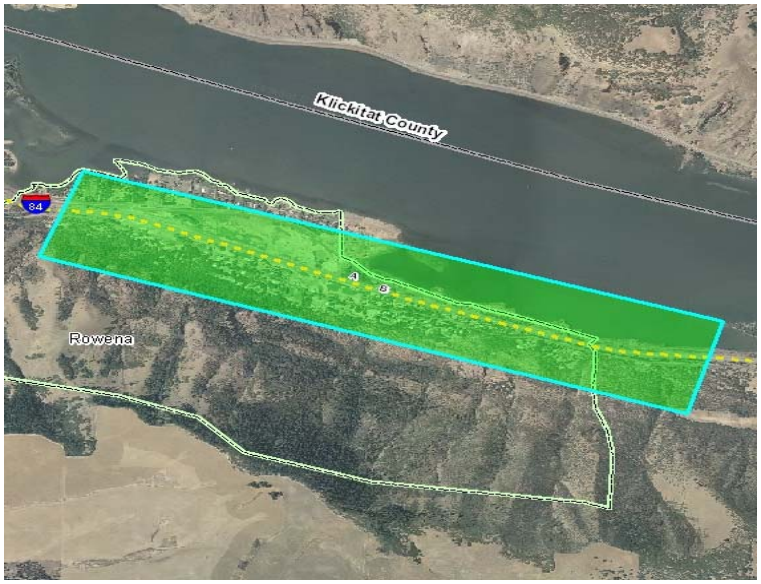
Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Operations	N/A	ODOT	Short-Term

Project Costs:	$480,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☑	☐	☐	☐

Project Location:



Illustrative Section:

Project #: C	**Threemile Road/ Steele Road Intersection Operations and Safety Improvements**

Description: Modify intersection geometry and traffic control by realigning as a stop-controlled intersection that reduces the overall paved surface and clearly defines traffic priority.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Operations, Safety	Major Collector	Wasco County	Short-Term

Project Costs:	$15,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☐

Project Location:

Illustrative Section:

Project #: D	**US 97/US 197 Highway Junction Intersection Study**

Description: Evaluate options for realignment/reconfiguration of the US97/US197/South Jct. Road intersection.

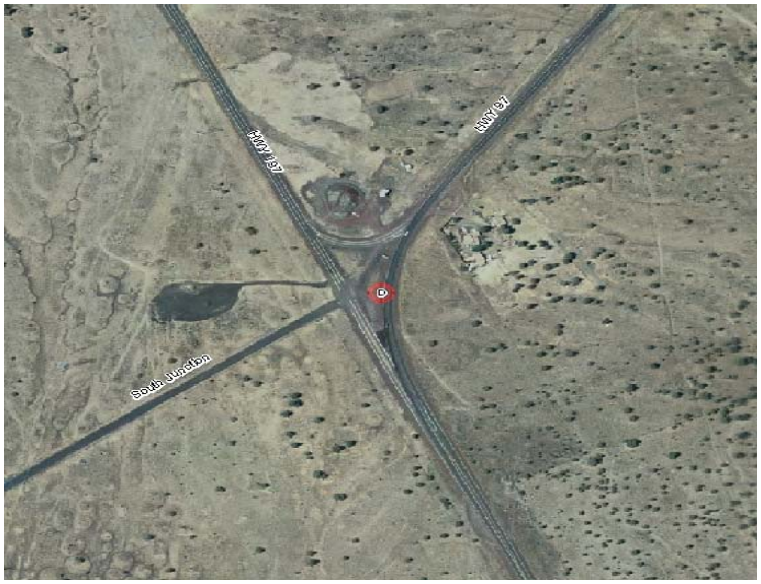
Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Operations, Safety	State Highway	ODOT	Medium-Term

Project Costs:	$50,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☐

Project Location:



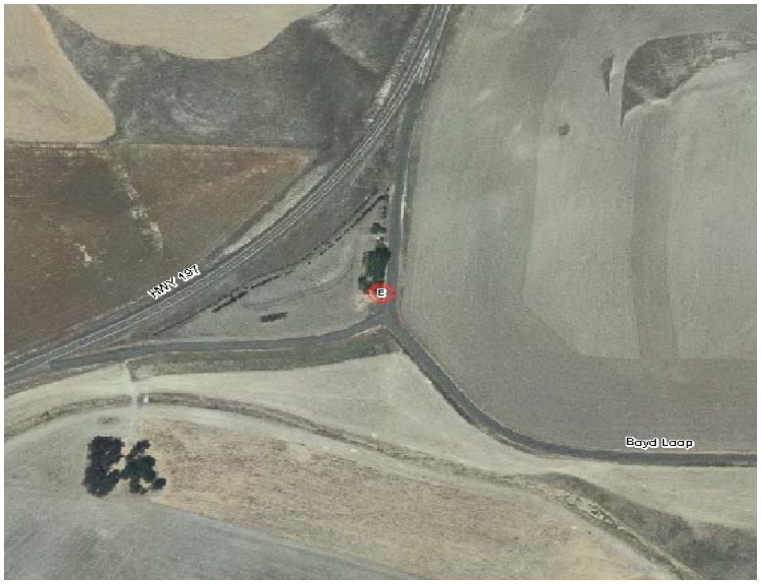
Illustrative Section:

Project #: E	**US 197/Boyd Loop Road Intersection Study**		
Description:	Evaluate options for realignment/reconfiguration of the US 197/Boyd Loop Road intersection to intersect US 197. Currently, there are two intersections that provide access from Boyd Loop to US 197. Both intersect US 197 at acute angles (25-40 degrees). Sight distance from Boyd Loop to US 197 is difficult due to angle of intersection.		
Category: Safety	**Classification:** State Highway	**Potential Funding Source:** ODOT	**Time Frame:** Medium-Term
Project Costs:	$50,000		

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☑	☐	☐	☐

Project Location:



Illustrative Section:

Project #: F	**US 197/Fivemile Road Intersection Safety Feasibility Study**

Description: Intersection study to investigate feasibility of reconstruction of highway to include turn lanes at Fivemile Road. Highway widening could include: 16 foot northbound left-turn lane on US 197 and 14 foot southbound right-turn lane. Wasco County has received complaints that trucks heading to th County landfill (located off of Fivemile Road west of US 197) block the trough traffic on US 197 while waiting to turn. Roadway has steep embankments on both sides at this location and known environmental and residential impacts.

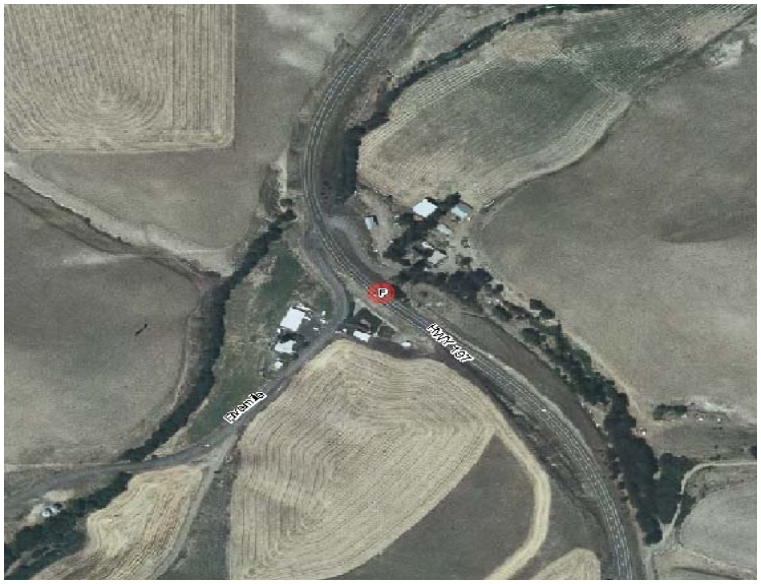
Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Operations, Safety	State Highway	ODOT	Medium-Term

Project Costs:	$50,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☐

Project Location:



Illustrative Section:

Project #: G	**US 197 Realignment: Wapinitia Hwy Jct. (milepost 43.0) to Maupin City Limits**

Description: Reconstruct/realign roadway onto embankment that has been placed for new alignment.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Modernization	State Highway	ODOT	Long-Term

Project Costs:	$3,500,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☐

Project Location:

Illustrative Section:

Project #: H	**US 197/Wasco County Landfill Access Road Feasibility Study**

Description: Conduct a study of the feasibility of constructing an alternate route from US 197 (near MP 3.05) along the top of the ridge to the Wasco County Landfill.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Operations, Safety	State Highway	ODOT; Wasco County	Medium-Term

Project Costs:	$50,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☑	☑	☐	☐	☐

Project Location:

Illustrative Section:

Project #: I	**OR 216/Juniper Flat/Natural Pasture Road Safety Improvements**

Description: Reduce sight distance restrictions for minor street traffic on Juniper Flat at OR 216. Modifications to intersection and/or elevation of OR 216 to reduce impacts of crest vertical curve to the west of Junipe Flat.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Safety	State Highway	ODOT	Long-Term

Project Costs:	$700,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☑	☐	☐	☐

Project Location:

Illustrative Section:

Project #: J	**OR 216/Reservation Road Safety Improvements**

Description: Monitor intersection crash history to verify that recent crash frequency and trends do not continue. Intersection is currently in 90-95th percentile on ODOT's SPIS list. There are no observable safety concerns based on field review. Improvement options could include realignment of Old Wapinitia Road to the west of the Gas Station/Market and realignment of Reservation Road at OR 216 to make a 90-degree 4-way intersection.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Safety	State Highway	ODOT	Long-Term

Project Costs: $0

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☑	☐	☐	☐

Project Location:

Illustrative Section:

Project #: K	**Behrens Road Reconstruction**

Description: Full reconstruction from Carroll to Digger Road.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Full Reconstruction	Minor Collector	Wasco County	Long-Term

Project Costs:	$300,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☑	☐	☐	☑

Project Location:

Illustrative Section:

Project #: L	**Chenowith Creek Road Maintenance**		
Description: Heavy maintenance from end of pavement to Vensel Road.			
Category: Heavy Maintenance, Safety	**Classification:** Local	**Potential Funding Source:** Wasco County	**Time Frame:** Long-Term
Project Costs:	$570,000		

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☑	☐	☐	☑

Project Location:

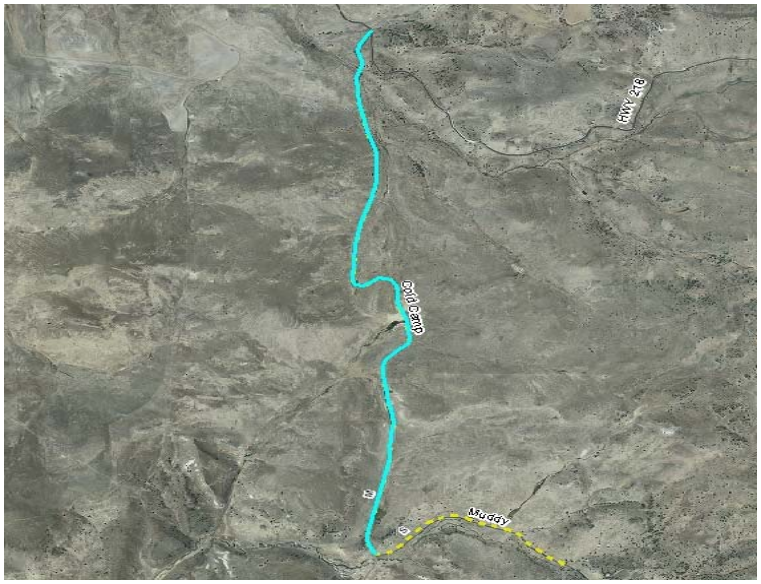
Illustrative Section:

Project #: M	**Cold Camp Road Heavy Maintenance**		
Description: Heavy maintenance from Hwy 218 to Muddy Road.			
Category: Heavy Maintenance, Safety	**Classification:** Minor Collector	**Potential Funding Source:** Wasco County	**Time Frame:** Long-Term
Project Costs:	$300,000		

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☑	☐	☐	☑

Project Location:



Illustrative Section:

Project #: N	**Carroll Road Reconstruction**

Description: Full reconstruction from Dry Creek to MP 1.37.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Full Reconstruction	Minor Collector	Wasco County	Long-Term

Project Costs:	$550,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☑

Project Location:

Illustrative Section:

Project #: O	**Eightmile Road Reconstruction**

Description: Full reconstruction from US 197 to Pine Hollow Road.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Full Reconstruction	Minor Collector	Wasco County	Long-Term

Project Costs:	$1,500,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☑

Project Location:

Illustrative Section:

Project #: P	**Fifteenmile Road Reconstruction**

Description: Full reconstruction from Lower Eightmile to Company Hollow.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Full Reconstruction	Major Collector	Wasco County	Medium-Term

Project Costs:	$2,300,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☑

Project Location:

Illustrative Section:

Project #: Q	**Godberson Road Heavy Maintenance**		
Description: Heavy maintenance on initial grade off Wilson Road.			
Category: Heavy Maintenance, Safety	**Classification:** Local	**Potential Funding Source:** Wasco County	**Time Frame:** Long-Term
Project Costs:	$100,000		

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☑	☐	☐	☑

Project Location:

Illustrative Section:

Project #: R	**Hood River Road Heavy Maintenance**		
Description: Heavy maintenance from end of pavement to Proctor Road (0.53 miles in length).			
Category: Heavy Maintenance, Safety	**Classification:** Minor Collector	**Potential Funding Source:** Wasco County	**Time Frame:** Long-Term
Project Costs:	$150,000		

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☑	☐	☐	☑

Project Location:

Illustrative Section:

Project #: S	**Muddy Road Heavy Maintenance**

Description: Heavy maintenance from Cold Camp Road to MP 1.56.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Heavy Maintenance, Safety	Minor Collector	Wasco County	Long-Term

Project Costs:	$200,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☑	☐	☐	☑

Project Location:

Illustrative Section:

Project #: T	**Old Dufur North Reconstruction**

Description: Full reconstruction from Richmond St to 3 mile creek.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Full Reconstruction	Minor Collector	Wasco County	Long-Term

Project Costs:	$300,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☑

Project Location:

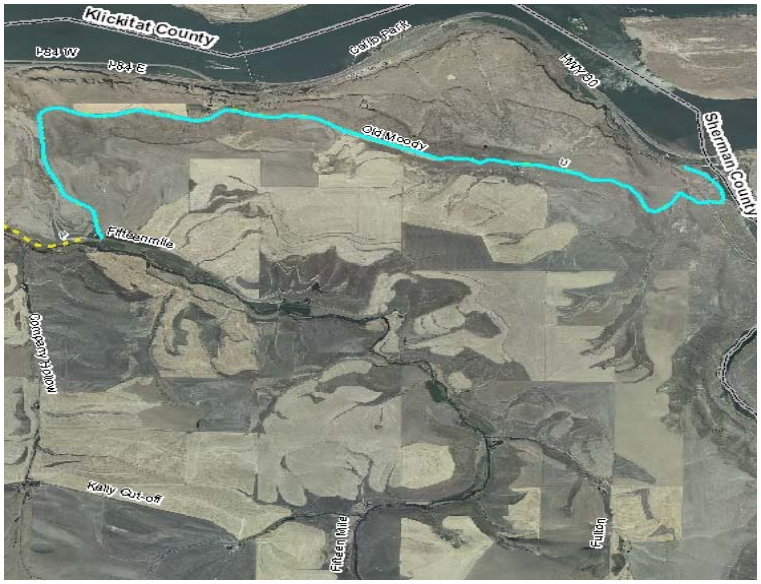
Illustrative Section:

Project #: U	**Old Moody Road Shared Bike Route**		
Description: Pave 4-mile segment (24 feet width) of Old Moody Road for shared use by bicycles and automobiles.			
Category: Bicycle, Pavement	**Classification:** Minor Collector	**Potential Funding Source:** Wasco County	**Time Frame:** Long-Term
Project Costs:	$10,700,000		

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☐	☐	☑	☑

Project Location:



Illustrative Section:

Project #: V	**Sevenmile Hill Road Reconstruction**		
Description: Full reconstruction from Chenowith Creek to MP 0.73.			
Category: Full Reconstruction	**Classification:** Major Collector	**Potential Funding Source:** Wasco County	**Time Frame:** Long-Term
Project Costs:	$300,000		

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☑

Project Location:

Illustrative Section:

Project #: W	**Sevenmile Hill Road Reconstruction**		
Description: Full reconstruction from Harvey Pit to 1981 job.			
Category: Full Reconstruction	**Classification:** Major Collector	**Potential Funding Source:** Wasco County	**Time Frame:** Long-Term
Project Costs:	$400,000		

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☑

Project Location:

Illustrative Section:

Project #: X	**Shared Bike Route on Tygh Ridge Road**		
Description: Pave 1.5 mile segment (24 feet width) of Tygh Ridge for shared bicycle use by bicycles and automobiles.			
Category: Bicycle, Pavement	**Classification:** Minor Collector	**Potential Funding Source:** Wasco County	**Time Frame:** Long-Term
Project Costs:	$4,000,000		

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☐	☐	☑	☑

Project Location:

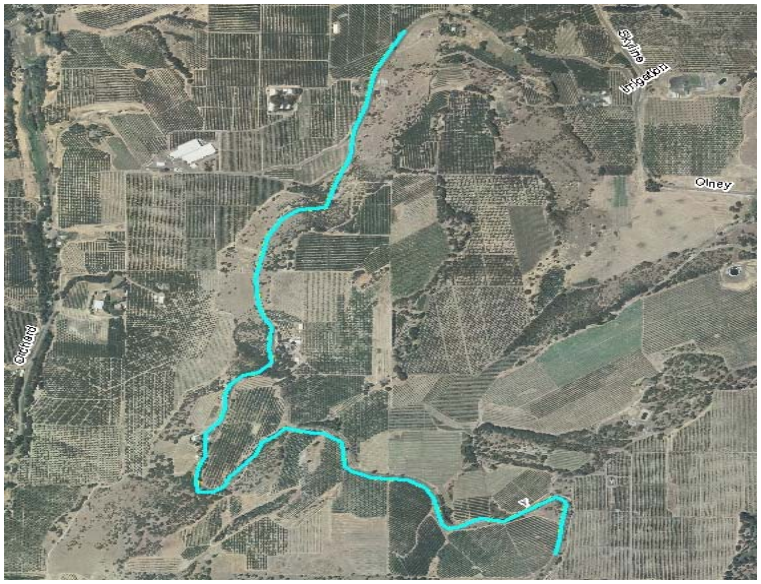
Illustrative Section:

Project #: Y	**Skyline Road Reconstruction**		
Description: Full reconstruction from packing plant to end of pavement.			
Category: Full Reconstruction	**Classification:** Major Collector; Local	**Potential Funding Source:** Wasco County	**Time Frame:** Long-Term
Project Costs:	$1,100,000		

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☑

Project Location:



Illustrative Section:

Project #: Z	**State Road Reconstruction**

Description: Full reconstruction from Mosier Creek bridge to MP 1.23.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Full Reconstruction	Major Collector	Wasco County	Long-Term

Project Costs:	$340,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☑

Project Location:

Illustrative Section:

Project #: AA	**Price Road Reconstruction**

Description: Reconstruct and pave from Ross Road to end of pavement.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Pavement, Safety	Minor Collector	Wasco County	Long-Term

Project Costs:	$660,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☑	☐	☐	☑

Project Location:

Illustrative Section:

Project #: AB	**Knob Hill Road Reconstruction**

Description: Full reconstruction from Cherry Heights to MP 0.83.

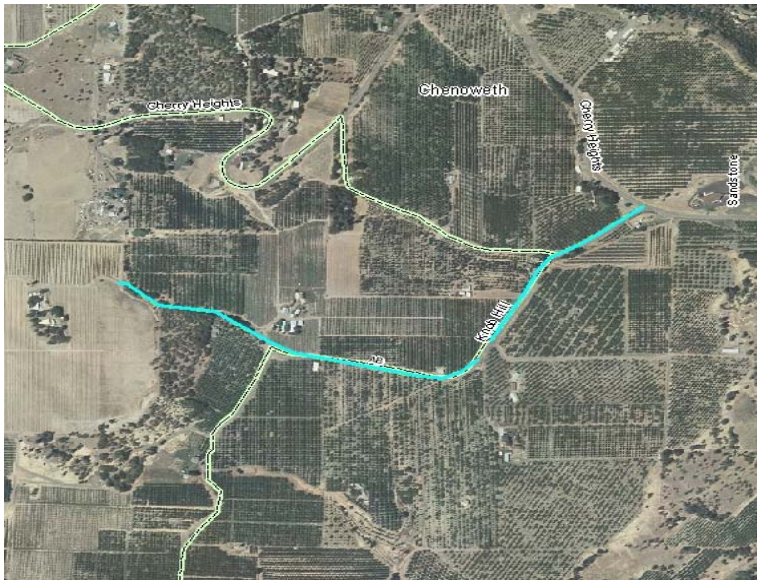
Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Full Reconstruction	Local	Wasco County	Long-Term

Project Costs:	$330,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☑

Project Location:



Illustrative Section:

Project #: AC	**Pleasant Ridge Road Reconstruction: Segment A**

Description: Full reconstruction from Threemile Road to grindings.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Full Reconstruction	Minor Collector	Wasco County	Long-Term

Project Costs:	$500,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☑

Project Location:

Illustrative Section:

Project #: AD	**Pleasant Ridge Road Reconstruction: Segment B**

Description: Full reconstruction from grindings to Dolan Rd.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Full Reconstruction	Minor Collector	Wasco County	Long-Term

Project Costs:	$600,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☑

Project Location:

Illustrative Section:

Project #: AE	**Pleasant Ridge Road Reconstruction: Segment C**

Description: Reconstruct and pave from Dolan Road to Fivemile Road and provide a bicycle route.

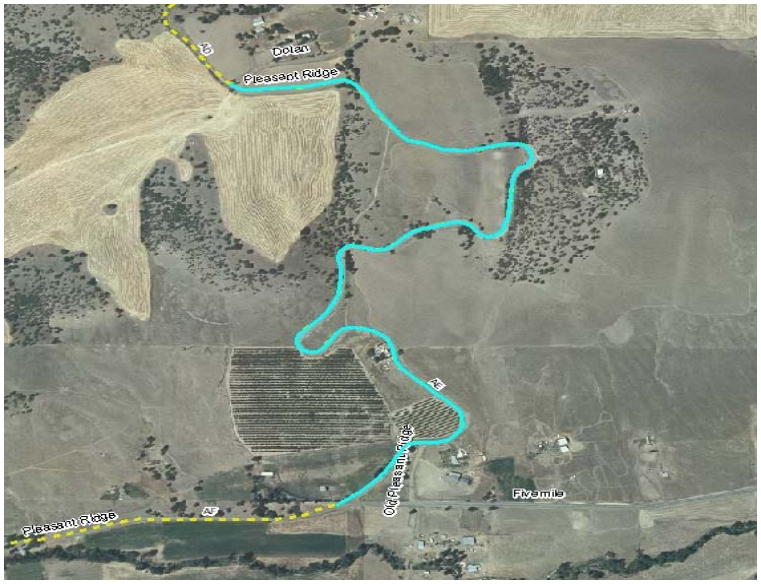
Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Full Reconstruction, Bicycle, Safety	Minor Collector	Wasco County	Long-Term

Project Costs:	$590,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☑	☑

Project Location:



Illustrative Section:

Project #: AF	**Pleasant Ridge Road Reconstruction: Segment D**		
Description: Reconstruct and pave from 5 mile intersection to Quarter-horse Ranch (0.95 miles in length)			
Category: Pavement, Safety	**Classification:** Minor Collector	**Potential Funding Source:** Wasco County	**Time Frame:** Long-Term
Project Costs:	$480,000		

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☑	☐	☐	☑

Project Location:

Illustrative Section:

Project #: AG	**Threemile Road Reconstruction**

Description: Full reconstruction from End Pavement to Skyline.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Full Reconstruction, Safety	Minor Collector	Wasco County	Long-Term

Project Costs:	$3,000,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☑

Project Location:

Illustrative Section:

Project #: AH	**Threemile Road Reconstruction**

Description: Full reconstruction from Dry Hollow to End of Pavement.

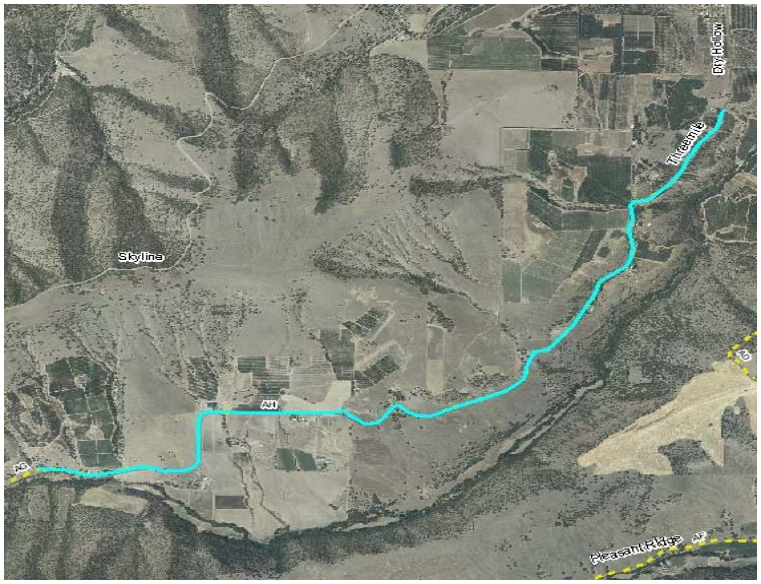
Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Full Reconstruction	Minor Collector	Wasco County	Medium-Term

Project Costs:	$670,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☑	☐	☐	☑

Project Location:



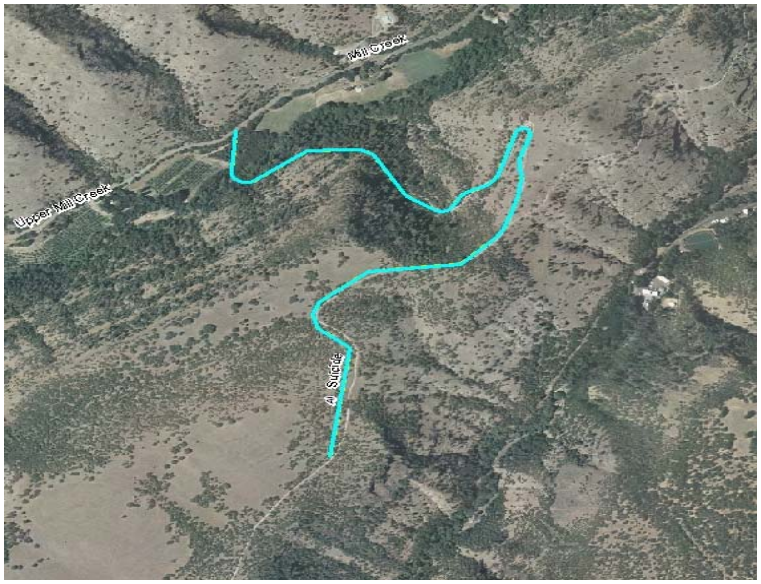
Illustrative Section:

Project #: AI	**Upper Mill Creek Heavy Maintenance**		
Description: Heavy maintenance from end of pavement to bus turn-around.			
Category: Heavy Maintenance, Safety	**Classification:** Minor Collector	**Potential Funding Source:** Wasco County	**Time Frame:** Medium-Term
Project Costs:	$200,000		

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☑	☐	☐	☑

Project Location:



Illustrative Section:

Project #: AJ	**Vensel Road Reconstruction**

Description: Full reconstruction from Digger Road to Columbia River Resort.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Full Reconstruction	Minor Collector	Wasco County	Medium-Term

Project Costs:	$220,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☑	☐	☐	☐	☐	☑

Project Location:

Illustrative Section:

Project #: AK	**Wamic Market Road/ Ross Road Intersection Safety**

Description: Combine multiple stop-control intersections into one stop-controlled intersection to eliminate sight distance constraints for existing stop-controlled movements and encourage slower speeds for turning movements. Currently the eastbound left-turn from Wamic Market Road to Ross Road can occur at high speeds (45 mph or greater). The westbound right turn must stop and yield to that movement. Due to high-speed movements, required sight distance is greater than that provided due to a crest vertical curve.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Operations, Safety	Major Collector	Wasco County	Long-Term

Project Costs:	$50,000

Project Goals Met:

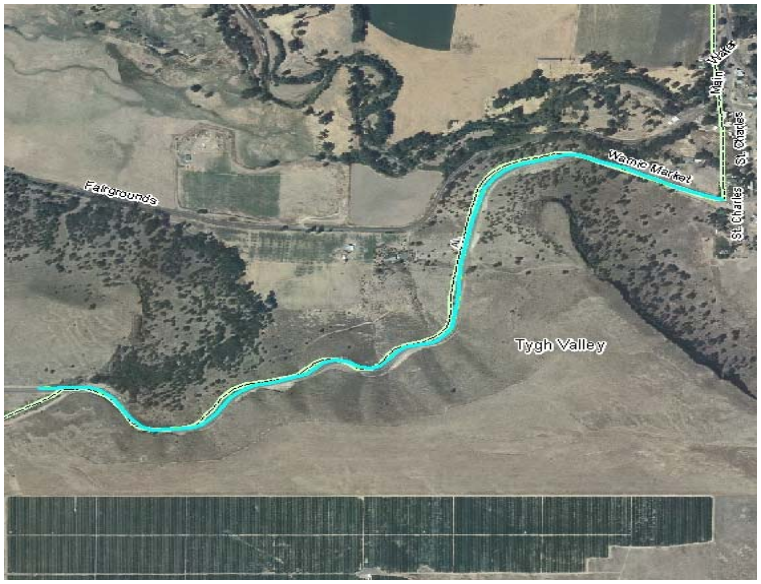
Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☑	☑	☐	☐	☐

Project Location:

Illustrative Section:

Project #: AL	**Wamic Market Road Safety**				
Description: Reconstruct roadway segments along steep grade. Phase I of the project has been completed; future sections are identified for improvements under Phase II.					
Category: Full Reconstruction, Safety	**Classification:** Major Collector	**Potential Funding Source:** Wasco County	**Time Frame:** Long-Term		
Project Costs:	$1,800,000				
Project Goals Met:					
Efficiency ☑	Capacity ☐	Safety ☑	Transit ☐	Ped/Bike ☐	Maintenance ☑

Project Location:



Illustrative Section:

Project #: AM	**Winslow Road Heavy Maintenance**

Description: Heavy maintenance from Rail Hollow Road to 2004 job.

Category:	**Classification:**	**Potential Funding Source:**	**Time Frame:**
Heavy Maintenance	Local	Wasco County	Long-Term

Project Costs:	$430,000

Project Goals Met:

Efficiency	Capacity	Safety	Transit	Ped/Bike	Maintenance
☐	☐	☐	☐	☐	☑

Project Location:

Illustrative Section: