CITY OF THE DALLES
TRANSPORTATION SYSTEM PLAN

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Prepared for
The City of The Dalles
The Dalles, Oregon

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CHAPTER 1: INTRODUCTION

The purpose of this study is to develop a community-based multi-modal transportation system plan (TSP) that addresses transportation needs for a twenty-year period (1995 – 2015) associated with anticipated future growth in The Dalles urban area. The TSP is being prepared to address federal and state regulations that require urban areas to do long-range planning, as well as to serve as a guide for the community in the management of the existing transportation facilities and for the design and implementation of future transportation facilities.

The long-range plan will implement portions of the Oregon Transportation Plan (OTP) and 1999 Oregon Highway Plan, as well as the City's Local Street Network Plan, 1st Street Streetscape Plan and the Downtown Parking Plan. It will be in conformance with Goal 12, the Oregon Transportation Planning Rule (TPR), Oregon Administrative Rule 734.051 and the federal Intermodal Surface Transportation Efficiency Act (ISTEA), thereby helping to ensure that the City of The Dalles is eligible for future state and federal funding. The planning effort included community involvement, and it was guided by local public agency staff.

The Dalles TSP was originally prepared over a period from 1993 through 1999 with a final document dated June 1999 to cover a 20-year period (thereby the 1995 – 2015 planning period). In 2005, several sections of the document were updated to bring the TSP into compliance with the current TPR and the *1999 Oregon Highway Plan*. Street functional classification designations were updated to be consistent with the Federal Aid Functional Classification Mapping System. The project list was updated to reflect projects completed, new projects in the city's capital improvement program, and other changes in the project parameters.

THE PLANNING AREA

The Dalles is the county seat and, with almost half of the county's population, is the largest city in Wasco County. Located in the Columbia River Gorge along the eastern foothills of the Cascade Mountain Range, the city serves as the hub of the agricultural economy in north-central Oregon.

The Dalles TSP planning area includes the City of The Dalles and the area within the city's Urban Growth Boundary (UGB). The planning area is shown in ***Figure 1***. Roadways included in the TSP fall under several jurisdictions: The Dalles, Wasco County, and the State of Oregon.

The Dalles is served by two state highways: Interstate 84 (I-84) and US 197. The interstate is a four-lane, limited access facility that connects The Dalles to Portland, located 85 miles to the west, and then passes through Idaho and Utah to the east. There are currently six interchanges with I-84 in The Dalles. These interchanges connect at several points along old US 30 and at US 197 where it crosses into Washington. US 197 is a two-lane highway that connects to US 97 and Bend located 132 miles to the south. It extends northward into Washington, terminating at State Route 14. US 30 from the Chenowith Interchange on the west to the Marina Interchange on the east is under city jurisdiction.

A grid pattern of local streets has been maintained through much of The Dalles as it has developed over the years. The grid follows the general contour of the Columbia River and is divided into sections by various topographical features. The core of the grid lies between Mill Creek and Kelly Avenue/Seventh Street. This section contains the old downtown business district and many of the older residential areas. Another well-developed but less dense grid runs eastward from Kelly Avenue to Morton Street. The two grid sections are slightly skewed and, as a result, not all of the roadways

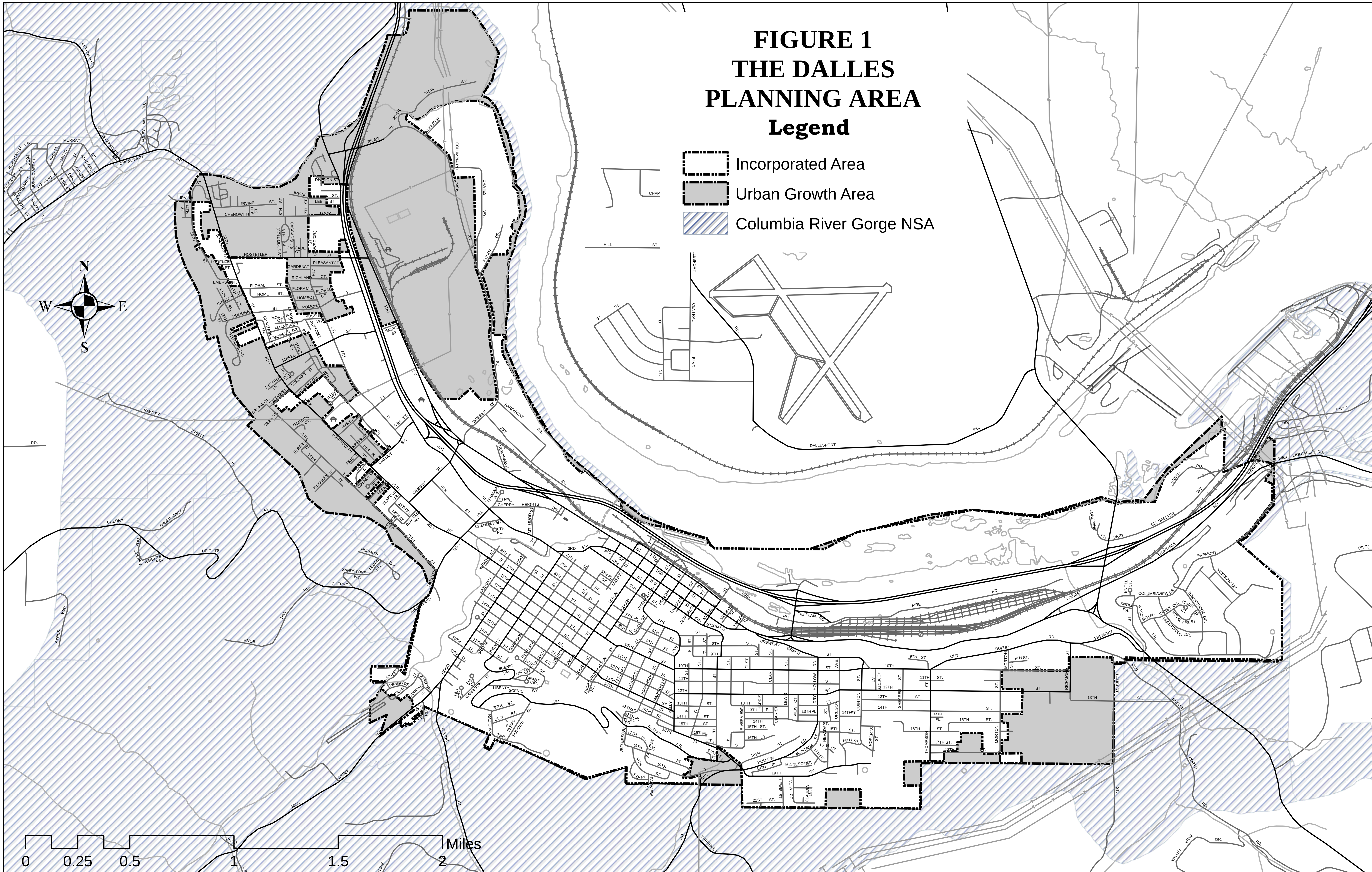
FIGURE 1
THE DALLES
PLANNING AREA
Legend
Incorporated Area
Urban Growth Area
Columbia River Gorge NSA
N
W
E
S
0
0.25
0.5
1
1.5
2
Miles

continue through. A third, less densely developed grid lies northwest of the core section. This grid has much larger blocks than the other grid segments.

A land use zoning map of The Dalles is shown in ***Figure 2***. The majority of the commercial zoning lies along Sixth Street. In the downtown core, a one-way couplet of Second and Third Street serves most of the commercial development. Additional commercial development is focused around the US 197 interchange with I-84.

Residential development lies along the hills primarily to the south of the commercial zones. The core of The Dalles is fairly developed with mostly infill residential development remaining. Areas on the east and west sides of the city are where most of the new residential development is occurring.

The industrial zones lies mostly along the waterfront and the adjacent railroad tracks. An industrial park has been established in the northwestern part of the city, between the railroad tracks and the river. This area is also home to the Port of The Dalles.

THE PLANNING PROCESS

The draft TSP was initially developed in 1998-99 through a series of technical analyses combined with systematic input and review by the City of The Dalles, a Transportation Advisory Committee (TAC), and the public. A graphical presentation of the planning process is illustrated on ***Figure 3***.

Public Involvement

Community involvement was an important part of developing the draft TSP in 1998-99. Interaction with the community was achieved in two ways: holding open community meetings and through a Transportation Advisory Committee.

For the 2005 update of the TSP, several meetings took place between September 2004 and April 2005. Two public meetings and four stakeholder meetings were held during this time period. The stakeholder meetings were comprised of local citizens identified by the City. In addition, the Urban Renewal Advisory Committee met three times and the project management team met six times during the same time period. These meetings provided the public with opportunities for input as well as updates from the project team. All of the above meetings were tied to two other projects, the 1st Street Streetscape Plan and the Downtown Parking Plan.

Goals and Objectives

Using input from the city, the TAC, and the community, a set of goals and objectives were defined for The Dalles TSP. These goals and objectives were then used to make decisions about various potential improvement projects. They are described in Chapter 2: Goals and Objectives.

Review Existing Plans and Policies

To begin the planning process, existing plans and policies that related to the evaluation and development of the transportation system in The Dalles urban area were reviewed. The review established the history of planning in the city. It identifies how population and employment were projected and how those projections compare with current measurements; what street system improvements were planned and which were implemented; how other transportation facilities were planned and implemented; and how the city is currently managing its ongoing development. The review of existing plans and policies is summarized in Appendix B of this report.

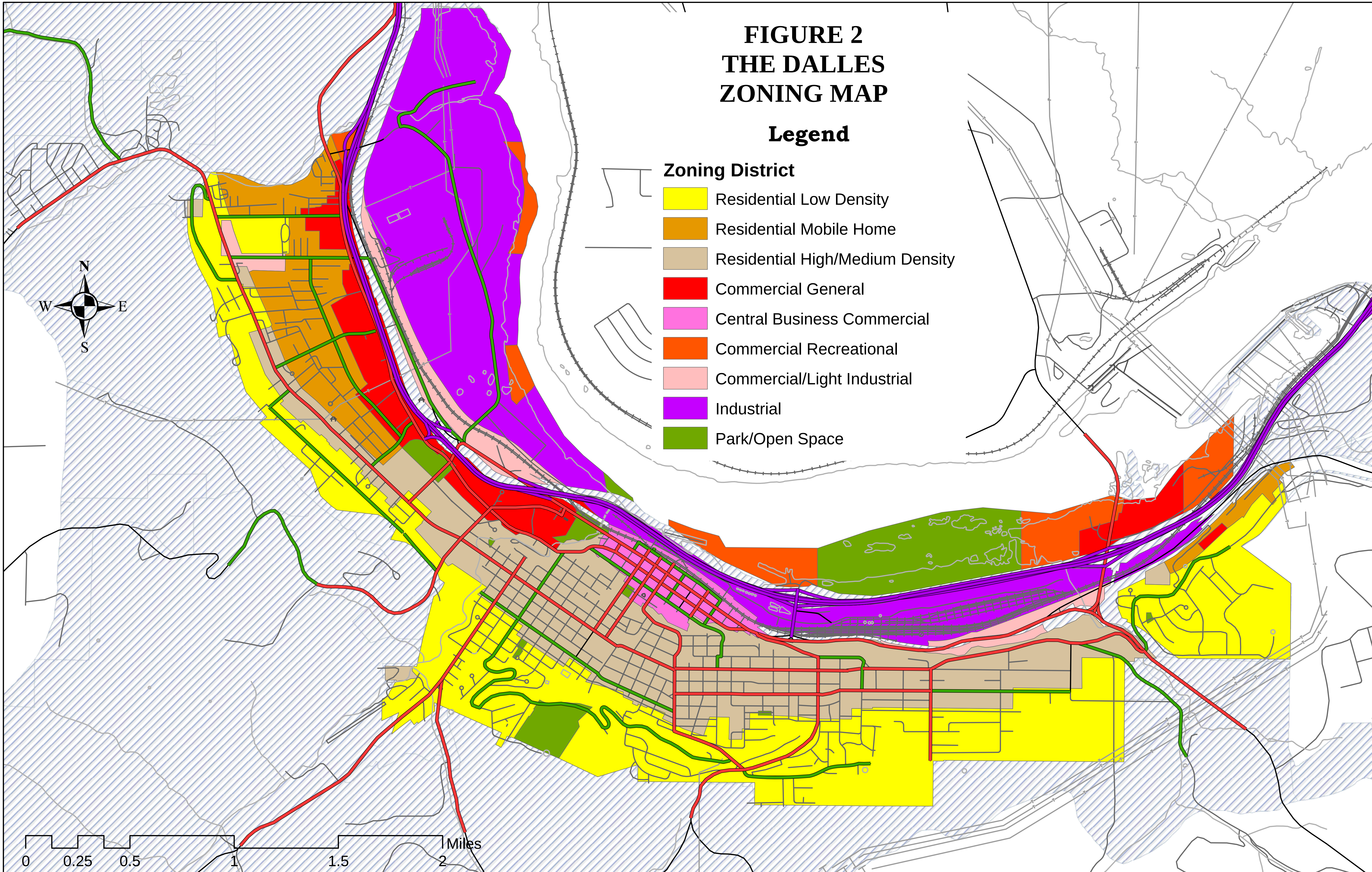
FIGURE 2
THE DALLES
ZONING MAP
Legend
Zoning District
Residential Low Density
Residential Mobile Home
Residential High/Medium Density
Commercial General
Central Business Commercial
Commercial Recreational
Commercial/Light Industrial
Industrial
Park/Open Space
N
S
E
W
0
0.25
0.5
1
1.5
2
Miles

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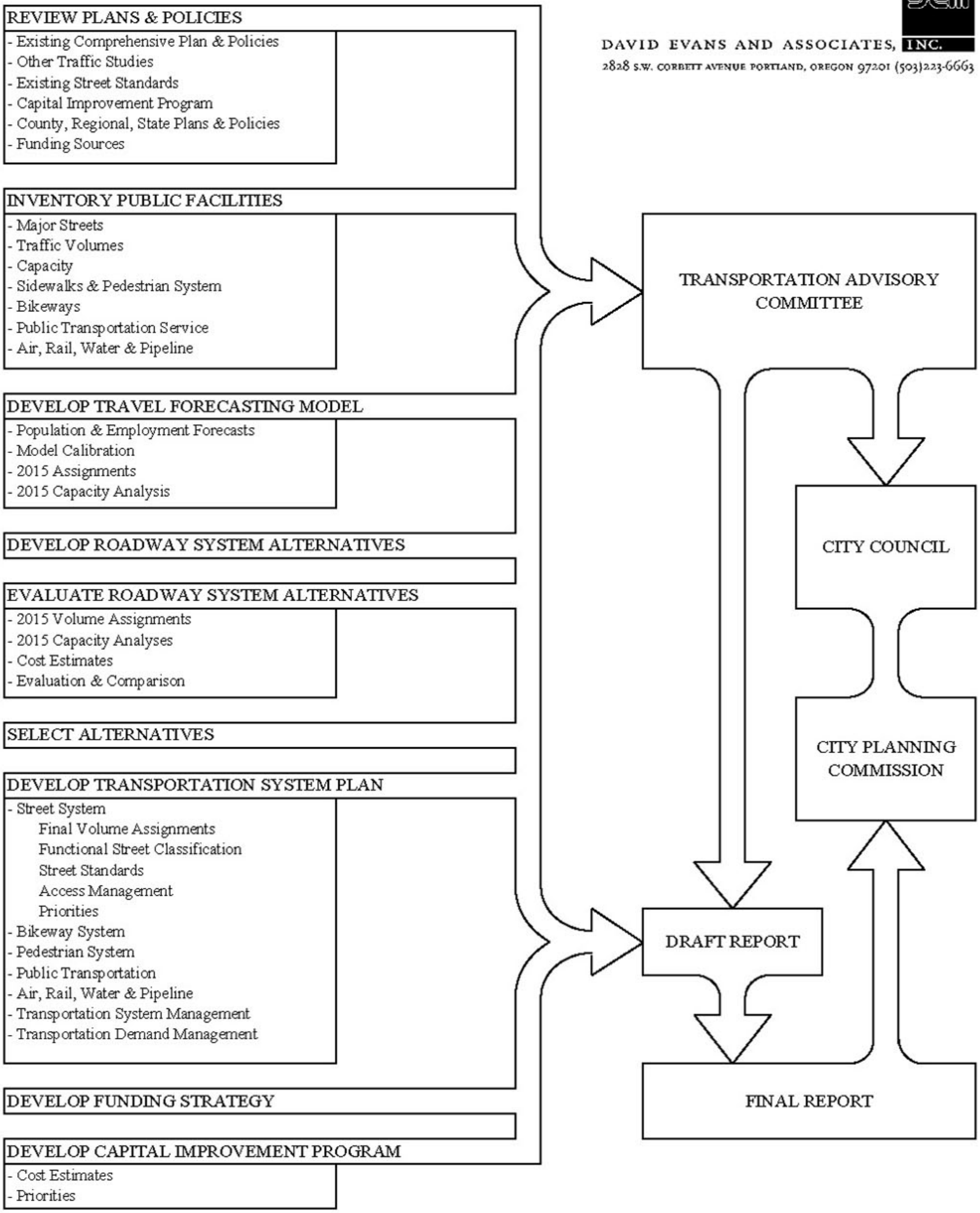

FIGURE 3
THE PLANNING PROCESS

Inventory Existing Public Facilities

The inventory of existing facilities catalogs the current transportation system and identifies how that system currently operates (this analysis and inventory was not updated in 2005). The results of the inventory are described in Chapter 3: Current Transportation Conditions. Table A-1 in Appendix A summarizes the inventory of the existing arterial and collector street system as it existed in 1993.

Forecast Demographics and Travel Demand

As required by the TPR, the TSP must address a 20-year forecasting period. The 20-year travel forecasts (1995-2015) were developed based on projections of population and employment by different land use categories within the Urban Growth Boundary and the Chenowith Urban Reserve Area outside the UGB. These projections, along with current street capacity and travel time characteristics were then entered into a computer model to develop 2015 travel forecasts. This process is described in detail in Chapter 4: Future Travel Demand.

Roadway System Alternatives

Once the travel demand forecasting model was developed, a series of roadway system alternatives were evaluated. The initial alternative evaluated was the "base future," which is the current street system plus any committed street system improvements. Based on projected capacity deficiencies and safety concerns identified in the base future alternative, alternative network improvements were evaluated. After comparing the alternatives with the goals and objectives established at the beginning of the process, a recommended street system plan was selected. The evaluation is described in Chapter 5: Transportation Improvement Options Analysis.

Develop Transportation System Plan

The TSP was then developed for each mode of transportation as described in Chapter 6: Transportation System Plan. The street system plan was developed from the forecasting and alternatives evaluation described above. The bicycle and pedestrian plans were developed to follow requirements set forth by the Oregon TPR and the *Oregon Bicycle and Pedestrian System Plan*, and they were based on input received from the TAC and the public. The public transportation, air, water, rail, and natural gas pipeline plans were developed based on discussions with the owners and operators of those facilities.

Develop Funding Plan and Capital Improvement Program

The capital improvement program was developed from the short-range improvements and the recommended street system plan, while the funding analysis examined methods for financing these improvements. Chapter 7: Funding Options and Financial Plan describes the funding options and financial plan.

TRANSPORTATION SYSTEM PLAN REQUIREMENTS

The City of The Dalles TSP needs to meet the requirements of ISTEA, the Statewide Planning Goal 12 and its implementing division, the TPR (OAR Chapter 660, Division 12). Goal 12 affects all levels of government, and requires that transportation plans be coordinated among all jurisdictions. The requirements for ISTEA are parallel to those required by the Oregon TPR.

Federal Intermodal Surface Transportation Efficiency Act

The ISTEA is a landmark federal legislation that specifies requirements for statewide and metropolitan area long-range planning. The law does not specify planning requirements for areas with less than a 50,000 population, such as the City of The Dalles urban area. The legislation is, however, relevant to the City of The Dalles TSP study as it redefines the manner in which federal aid is provided for highway and transit programs. The planning requirements under ISTEA are parallel to those required by Oregon's TPR.

Goal 12

In the mid-1970s, Oregon adopted 19 Statewide Planning Goals to be implemented in comprehensive plans. The aim of Goal 12, Transportation, is "to provide and encourage a safe, convenient and economic transportation system."

Each community, region, and metropolitan area updated the transportation element of their comprehensive plans according to the following guidelines set forth in Goal 12.

> *"A transportation plan shall (1) consider all modes of transportation including mass transit, air, water, pipeline, rail, highway, bicycle and pedestrian; (2) be based upon an inventory of local, regional and state transportation needs; (3) consider the differences in social consequences that would result from utilizing differing combinations of transportation modes; (4) avoid principal reliance upon any one mode of transportation; (5) minimize adverse social, economic and environmental impacts and costs; (6) conserve energy; (7) meet the needs of the transportation disadvantaged by improving transportation services; (8) facilitate the flow of goods and services so as to strengthen the local and regional economy; and (9) conform with local and regional comprehensive land use plans."*

Oregon Transportation Planning Rule

The Oregon Transportation Planning Rule (TPR) was developed by the Oregon Land Conservation and Development Commission (LCDC) and the Oregon Department of Transportation (ODOT), and was adopted in April 1991. OAR 660 Division 12, the Transportation Planning Rule, implements Statewide Planning Goal 12.

Essentially, the TPR requires that cities, counties, Metropolitan Planning Organizations (MPOs), and state agencies prepare and adopt TSPs. A TSP is "a plan for one or more transportation facilities that are planned, developed, operated, and maintained in a coordinated manner to supply continuity of movement between modes, and within and between geographic and jurisdictional areas."

The ultimate aim of the TPR is to encourage a multi-modal transportation network throughout the state that will reduce our reliance on the automobile. It ensures that local, state, and regional transportation systems "support a pattern of travel and land use in urban areas that will avoid the air pollution, traffic and livability problems faced by other areas of the country."

Transportation Planning Rule Requirements for The Dalles

The City of The Dalles falls into the jurisdiction category of cities with a population between 2,500 and 25,000 that are located outside of a major urban area. Therefore, they must develop and adopt a TSP which includes:

A street system plan for a network of arterial and collector roadways
A bicycle and pedestrian plan
A public transportation plan
An air, rail, water, and natural gas pipeline plan
Policies and land use regulations for implementing the TSP
A transportation financing program

In addition to the TSP, the City of The Dalles must adopt land use and subdivision ordinance amendments consistent with the requirements in the TPR to protect transportation facilities for their identified functions. In particular, these amendments should include street standards and access control measures.

The city should also amend land use and subdivision ordinances to require bicycle parking facilities and facilities for safe, convenient, and direct pedestrian and bicycle access within and between residential, commercial, employment, and institutional areas.

As part of the 2005 TSP update, the TPR was reviewed so that this section could be updated to include any relevant amendments. The most recent significant changes to the TPR affecting The Dalles were adopted in 1998, and are addressed in the 1999 TSP. Subsequent amendments to the TPR do not apply to The Dalles. Therefore, as of 2005, The Dalles TSP complies with the TPR.

Oregon Transportation Plan

The OTP was completed and adopted by the Oregon Transportation Commission in September 1992. Several alternative approaches to developing the transportation plan were evaluated as part of the OTP planning process. The preferred plan presented in the OTP followed the Livability Approach, which "depends heavily on the concept of minimum levels of service within each transportation mode to assure appropriate transportation alternatives to all areas of the state."

In its inventory of existing facilities, the OTP identifies several transportation facilities of significance in The Dalles. These include:

Interstate 84
AMTRAK inter-city passenger rail service via the Portland to Salt Lake City line (no longer in service)
Greyhound inter-city bus service along the Portland-Boise-Salt Lake City route
Freight rail service provided by the Union Pacific Railroad (UPRR)
Barge and river transportation provided by City of The Dalles
The Columbia Gorge Regional Airport
Local transit service

Oregon Highway Plan

The 1999 Oregon Highway Plan (OHP) establishes policies and investment strategies for Oregon's state highway system over a 20-year period and refines the goals and policies found in the Oregon Transportation Plan. Policies in the OHP emphasize the efficient management of the highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments, and the use of new techniques to improve road safety and capacity. These policies also link land use and transportation, set standards for highway performance and access management, and emphasize the relationship between state highways and local road, bicycle, pedestrian, transit, rail, and air systems.

US 30 through the Dalles is identified as a District Highway and Scenic Byway, US 197 is identified as a Regional Highway and I-84 is identified as an Interstate Highway and Statewide Freight Route in the State Highway Classification System Policy in the Oregon Highway Plan[1]. ODOT uses the state highway classification system to guide management and investment decisions regarding state highway facilities.

District Highways are facilities of county-wide significance and function largely as county and city arterials or collectors. They provide connections and links between small urbanized areas, rural centers and urban hubs, and also serve local access and traffic. The management objective is to provide for safe and efficient, moderate to high-speed continuous-flow operation in rural areas reflecting the surrounding environment and moderate to low-speed operation in urban and urbanizing areas for traffic flow and for pedestrian and bicycle movements.

Regional Highways typically provide connections and links to regional centers, Statewide or Interstate Highways, or economic or activity centers of regional significance. The management objective is to provide safe and efficient, high-speed, continuous-flow operation in rural areas and moderate to high-speed operations in urban and urbanizing areas. A secondary function is to serve land uses in the vicinity of these highways.

Interstate Highways provide connections to major cities, regions of the state, and other states. A secondary function in urban areas is to provide connections for regional trips within the metropolitan area. The Interstate Highways are major freight routes and their objective is to provide mobility. The management objective is to provide for safe and efficient high-speed continuous-flow operation in urban and rural areas.

The goal of the highway classification system is to provide direction for managing the system and a basis for developing funding strategies for improvements. The system will be used in the development of corridor plans, transportation system plans, major investment studies, review of local plan and zoning amendments, periodic review of local comprehensive plans, highway project selection, design and development, and facility management decisions including road approach permits. The following are implementation strategies included in the Oregon Highway Plan that are of significance to state highways through The Dalles urban area:

Highway Mobility Standards (Policy 1F): "It is the policy of the State of Oregon to use highway mobility standards to maintain acceptable and reliable levels of mobility on the state highway system." These standards shall be used for –

- **Identifying** state highway mobility performance expectations for planning and plan implementation;

- **Evaluating** the impacts on state highways of amendments to transportation plans, acknowledged comprehensive plans and land use regulations pursuant to the Transportation Planning Rule (OAR 660-12-060); and

- **Guiding** operations decisions such as managing access and traffic control systems to maintain acceptable highway performance.

Classification and [Access] Spacing Standards (Policy 3A): "It is the policy of the State of Oregon to manage the location, spacing and type of road and street intersections and approach roads on state

[1] Oregon Department of Transportation - Highway Division, *1999 Oregon Highway Plan*, March, 1999.

highways to assure the safe and efficient operation of state highways consistent with the classification of the highways."

The following are implementation strategies included in the Oregon Highway Plan that are of significance to I-84 through The Dalles urban area include:

- The maximum volume to capacity (v/c) ratio is 0.70 for I-84, an Interstate (NHS) Freight Route through a non-MPO area where non-freeway speed limit is greater or equal to 45 mph.

- Spacing standards for access to statewide highways in urban areas where the posted speed is greater or equal to 55 mph is 1,320 feet.

- Grade separated interchanges on I-84 are subject to OHP Policy 3C, Interchange Access Management Areas (IAMPs), which requires developing an IAMP to ensure the safe and efficient operation between connecting roadways and to minimize the need for major improvements of existing interchanges.

The following are implementation strategies included in the Oregon Highway Plan that are of significance to US 197 through The Dalles urban area:

- The maximum volume to capacity (v/c) ratio is 0.80 for US 197, a Regional Highway through a non- MPO area where non-freeway speed limit is less than 45 mph.

- Spacing standards for driveways on, and approaches to Regional Highways in urban areas is 750 feet where the posted speed is 45 mph. *[Source: OHP Appendix C, Table 14]*

- Old Highway US 30 is still an ODOT facility west of the Chenowith Interchange and east of the Brewery Grade interchange with I-84. With the completion of the Chenowith interchange, the ownership of US 30 between the above mentioned interchanges was transferred to the city.

Statewide Intercity Passenger Service Plan

The policy requires that specialized transportation services, airport, and intercity common carrier services must be planned as an integrated system to provide accessibility between communities. The following minimum levels of service standards for intercity passenger services apply to The Dalles:

- Intercity passenger service should be available for an incorporated city or groups of cities within five miles of one another having a combined population of over 2,500, and located 20 miles or more from the nearest Oregon city with a larger population and economy. Services should allow a round-trip to be made within a day.

- Local public transit services and elderly and disadvantaged service providers should regularly connect with intercity passenger services.

- To the extent possible, direct interconnections should be available between intercity bus, air, rail, airport limousine services, and local transit services.

- Services shall be provided in compliance with the Americans with Disabilities Act (ADA) requirements for all modes and transfer facilities.

Bicycle and Pedestrian Service Plan

The following are principles established for bikeway development in the *Oregon Bicycle and Pedestrian Plan* that apply to the City of The Dalles:

- Bicycle and pedestrian networks should be developed and promoted in all urban areas to provide safe, direct, and convenient access to all major employment, shopping, educational, and recreational destinations in a manner that would double person-trips by bicycle and walking.

- Secure and convenient bicycle storage available to the public should be provided at all major employment and shopping centers, park-and-ride lots, passenger terminals, and recreation destinations.

- Statewide and regional bicycle systems should be integrated with other transportation systems in urban and rural areas to accommodate commuting and other trips by bicycle. Safe, direct, and continuous bikeways free of unnecessary delays should be provided along all urban arterial and major collector routes.

CHAPTER 2: GOALS AND OBJECTIVES

The purpose of the TSP is to provide a guide for the City of The Dalles to fulfill its goals and objectives of improved mobility in the 21st century. Throughout the planning process, each element of the plan was evaluated against these parameters.

OVERALL TRANSPORTATION GOAL

Develop an urban area transportation system that enhances the livability of The Dalles and accommodates growth and development through careful planning and management of existing and future transportation facilities.

GOAL 1: Enhance transportation user safety.

Objectives

1.1 Identify measures to enhance safety along streets and at street intersections in The Dalles urban area.

1.2 Develop revised street cross section standards for local, collector, and arterial streets to enhance safety (and mobility) for vehicles, pedestrians, and bicyclists.

1.3 Develop a system for prioritizing pavement maintenance and rehabilitation.

1.4 Maintain sufficient roadway width and turning radii to ensure safe passage of the motoring public while integrating with pedestrian and bicycle movement.

GOAL 2: Enhance transportation mobility.

Objectives

2.1 Develop a safe and efficient arterial and collector street system that provides additional north-south and east-west local access routes, thereby relieving traffic congestion on the street system[1].

2.2 Develop a street system plan that identifies the need for additional arterial and collector streets throughout the city to accommodate future growth.

2.3 Improve vehicular access to the downtown area.

2.4 Develop a street system plan that maintains The Dalles as a hub by providing access for development in outlying areas.

2.5 Evaluate the need for additional traffic signals in the city, including at the I-84 interchanges.

2.6 Improve intersection operations through downtown by measures including, but not limited to, coordinating traffic signals along the highway.

1 North-south direction refers to roadways perpendicular to the Columbia River; east-west direction refers to roadways parallel to the Columbia River.

2.7 Maintain The Columbia Gorge Regional Airport as a transportation facility of regional importance to meet the needs of the Mid-Columbia area.

2.8 Encourage the provision of adequate barge handling facilities to meet the present and future barge traffic on the Columbia River.

2.9 Identify recommended truck routes and required street improvements to safely accommodate the north-south truck movement from the hillside orchards to the downtown processing plants, and access to the commercial and industrial areas.

2.10 Develop access management strategies for US 30, specifically in relation to businesses located along the highway.

GOAL 3: Increase the use of alternative travel modes through improved safety and service.

Objectives

3.1 Develop a bicycle and pedestrian facility network.

3.2 Encourage transit service for The Dalles urban area.

3.3 Provide adequate transit access to shopping/services for the transportation disadvantaged.

3.4 Upgrade handicapped transportation services.

3.5 Maintain sidewalks, providing clear and level surfaces that are adequate for use by all citizens.

3.6 Provide pedestrian and bicycle access, especially when direct motor vehicle access is not possible.

3.7 Evaluate the need for separate bike paths or multi-use trails.

GOAL 4: Develop a transportation system that supports planned land uses.

Objectives

Identify roadway system needs to serve undeveloped areas so that steps can be taken to preserve rights-of-way and maintain adequate traffic circulation.

4.1 Integrate new arterial and collector routes into the existing city grid system.

4.2 Identify improvements to existing policies and standards that address street connectivity and spacing.

4.3 Maintain on-street parking, specifically in the downtown area.

CHAPTER 3: CURRENT TRANSPORTATION CONDITIONS

As part of the planning process, as part of the original work done on the draft TSP in 1993, DEA conducted an inventory of the existing street system including physical characteristics and traffic volumes. Existing bikeways; public transportation; and rail, air, water, and pipeline services were also reviewed.

ROADWAYS

The Dalles, like many other smaller communities in Oregon, developed along the state highways serving the region. However, with the construction of I-84 at its northern border, most of the conflict between highway traffic and local traffic was eliminated.

The Dalles has developed around a strong street grid pattern that is evident even today in the central and older parts of town. Several barriers to traffic flow interrupt this grid pattern. These include natural barriers such as the generally hilly terrain and Mill Creek and Chenowith Creek, and it also includes man-made barriers such as I-84 and US 197. US 197 spans across the Columbia River, connecting The Dalles and the surrounding areas to Washington State. The railroad runs along the northern edge of the city, along the Columbia River, and has at-grade intersections with local streets.

DEA, with the support of city staff, measured and examined the current transportation conditions of the existing roadways during 1992 and 1993. Data collection included a physical inventory of the city's arterial, collector, and local roads and a traffic count program that measured volumes at about 50 street or intersection locations.

Inventory

The existing street system inventory was conducted in 1993 for all of the arterial, collector, and local roads within The Dalles as well as those in Wasco County that interact with city streets. Interstate 84 (a freeway) was not included in the inventory. Inventory elements include:

- Street classification jurisdiction
- Street and right-of-way width
- Number of travel lanes
- Presence of on-street parking, sidewalks, or bikeways
- Speed limits

Figure 4 shows the roadway functional classification and the location of traffic signals. Appendix Table A-1 lists the complete inventory. Other roadway characteristics, such as pavement conditions, length of roadway, and curb location are included as part of the pavement management program prepared separately from this report.

Freeways generally carry long-distance traffic through a region. Some of the traffic on freeways may exit/enter to travel to/from the regional street system. Because of the access restriction, however, short-distance local trips are discouraged. Interstate 84 is the only freeway serving the City of The Dalles.

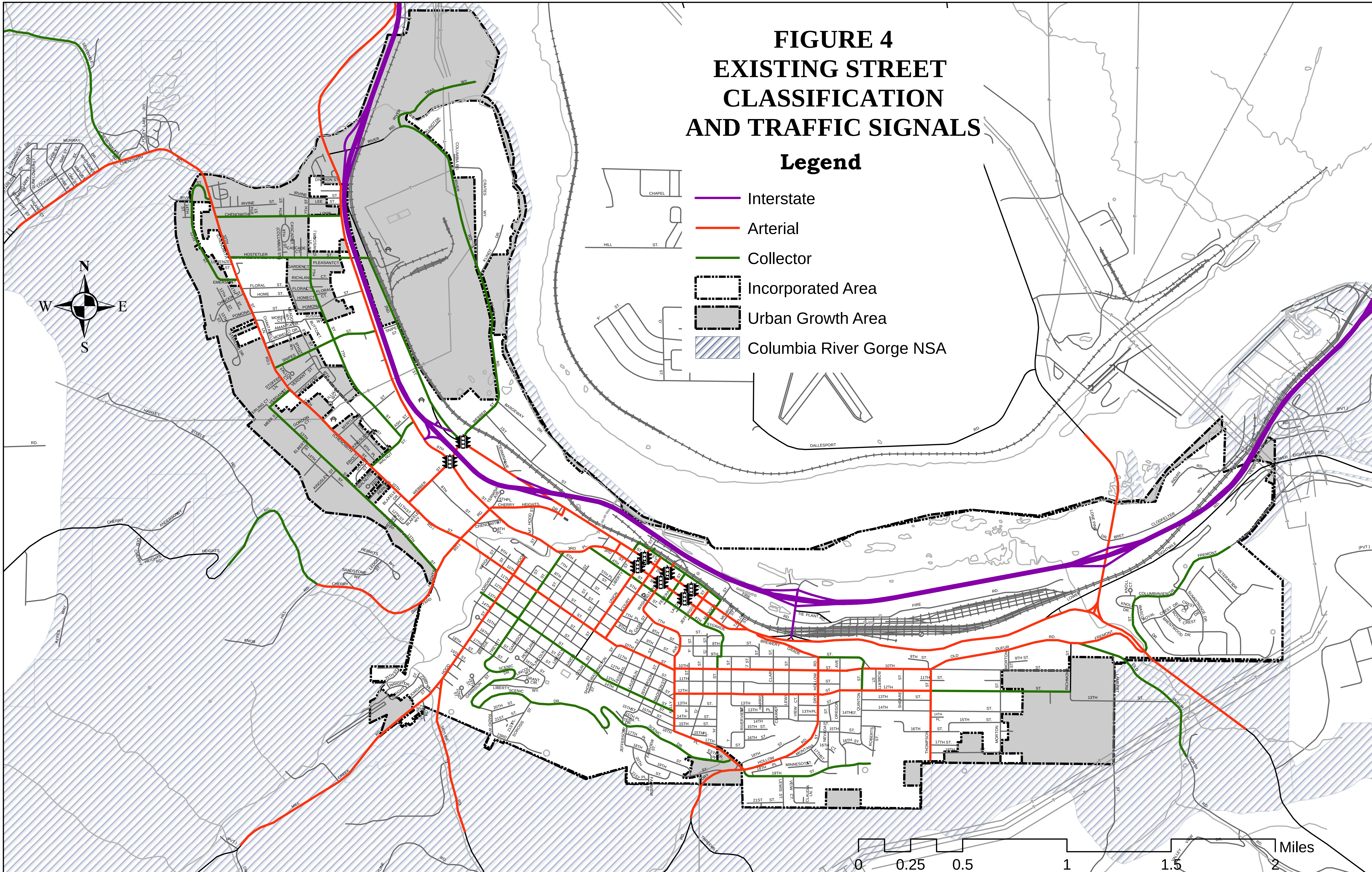
FIGURE 4
EXISTING STREET
CLASSIFICATION
AND TRAFFIC SIGNALS
Legend
Interstate
Arterial
Collector
Incorporated Area
Urban Growth Area
Columbia River Gorge NSA
N
S
E
W
0
0.25
0.5
1
1.5
2
Miles

Arterial Streets

Arterial streets form the primary roadway network within and through a region. They provide a continuous road system that distributes traffic between neighborhoods and districts. Generally, arterial streets are high capacity roadways that carry high traffic volumes with minimal localized activity. In The Dalles, the currently designated arterial network consists of state, county, and city streets. These arterial streets include:

- Second Street from Webber Street to US 197
- Third Street from 3rd Place to 2nd Street
- Sixth Street from northwest Urban Growth Boundary to 3rd Place
- Third Place from 6th Street to 3rd Street
- Chenowith Road from west Urban Reserve Area Boundary to 10th Street
- Tenth Street from Chenowith Road to Old Dufur Road
- Old Dufur Road from 10th Street to Fremont Street
- Fremont Street from Old Dufur Road to US 197
- Twelfth Street from Kelly Avenue to Thompson Street
- Webber Street from 10th Street to 2nd Street
- Cherry Heights Road from south Urban Growth Boundary to 6th Street
- Mount Hood Street from south Urban Growth Boundary to 10th Street
- Skyline Road from south Urban Growth Boundary to Mount Hood Street
- Union Street from 14th Street to 1st Street
- Court Street from 10th Street to 1st Street
- Sixteenth Place from Dry Hollow Road to Kelly Avenue
- Kelly Avenue from 16th Place to 7th Street
- Seventh Street from Kelly Avenue to Washington Street
- Washington Street from 7th Street to 1st Street
- Jefferson Street from 4th Street to 1st Street
- Madison Street from 4th Street to 1st Street
- Dry Hollow Road from 16th Place to Brewery Grade
- Brewery Grade from Dry Hollow Road to US 30
- Thompson Street from 18th Street to 10th Street
- US 197 from south Urban Growth Boundary to north Urban Growth Boundary

Since 1993, one additional arterial street has been added to the system:

- Cherry Heights Road from 6th Street to 2nd Street

Collector Streets

The function of urban collector streets, on the other hand, is equally divided between mobility and access. Collector streets connect local neighborhoods or district traffic to the arterial network. Generally, they do not connect together to form a continuous network because they are not designed to provide alternative routes to the arterial street system. Streets currently designated as collector streets in The Dalles include:

- River Road from northern terminus to 2nd Street
- First Street from Union Street to Madison Street
- Second Street from 6th Street to Webber Street

- Fourth Street from 3rd Place to 4th Street Grade
- Fourth Street Grade from 4th Street to 9th Street
- Seventh Street from Hostetler Street to Walnut Street
- Ninth Street from Dry Hollow Road to 10th Street
- Twelfth Street from Thompson Street to eastern terminus
- Columbia View Drive from US 197 to east Urban Growth Boundary
- Thirteenth Street from Irvine Street to Emerson Street
- Thirteenth Street from Verdant Street to Cherry Heights Road
- Thirteenth Street from Mount Hood Street to Kelly Avenue
- Sevenmile Hill Road from north Urban Reserve Area Boundary to Chenowith Road
- Scenic Drive from Trevitt Street to 16th Place
- Nineteenth Street from Dry Hollow Road to eastern terminus
- Irvine Street from 13th Street to 10th Street
- Chenowith Loop from 10th Street to 6th Street
- Hostetler Street from 10th Street to 2nd Street
- Emerson Street from 13th Street to 10th Street
- Snipes Street from 10th Street to 6th Street
- Walnut Street from 10th Street to 6th Street
- Trevitt Street from Scenic Drive to 6th Street
- Old Dufur Road from south Urban Growth Boundary to Fremont Street

Traffic Signals

Six traffic signals were in place in 1993 when the transportation system inventory was conducted. These signals were located at the following intersections:

- Second Street and Union Street
- Third Street and Union Street
- Second Street and Washington Street
- Third Street and Washington Street
- Second Street and Laughlin Street
- Third Street and Laughlin Street

Since then, traffic signals have been added at two locations:

- Second Street and Webber Street
- Sixth Street and Webber Street

Traffic

Traffic volumes on the major streets in The Dalles were measured during 1992 and 1993[1]. The measured 24-hour, two-way volumes are shown on ***Figure 5***. The widest band width illustrates that the highest volumes occur along the US 30 corridor. The greatest east-west activity occurs along the Second/Third Street couplet with about 18,000 vehicles per day traveling along those streets. The two-way, AM and PM peak hour volumes are shown on ***Figure 6*** and ***Figure* 7.**

A comparison of the morning and evening traffic indicates a build-up of traffic throughout the day. For example, PM peak hour volumes on the Second/Third Street couplet are nearly twice as high as those

[1] Traffic volumes were not updated for 2005

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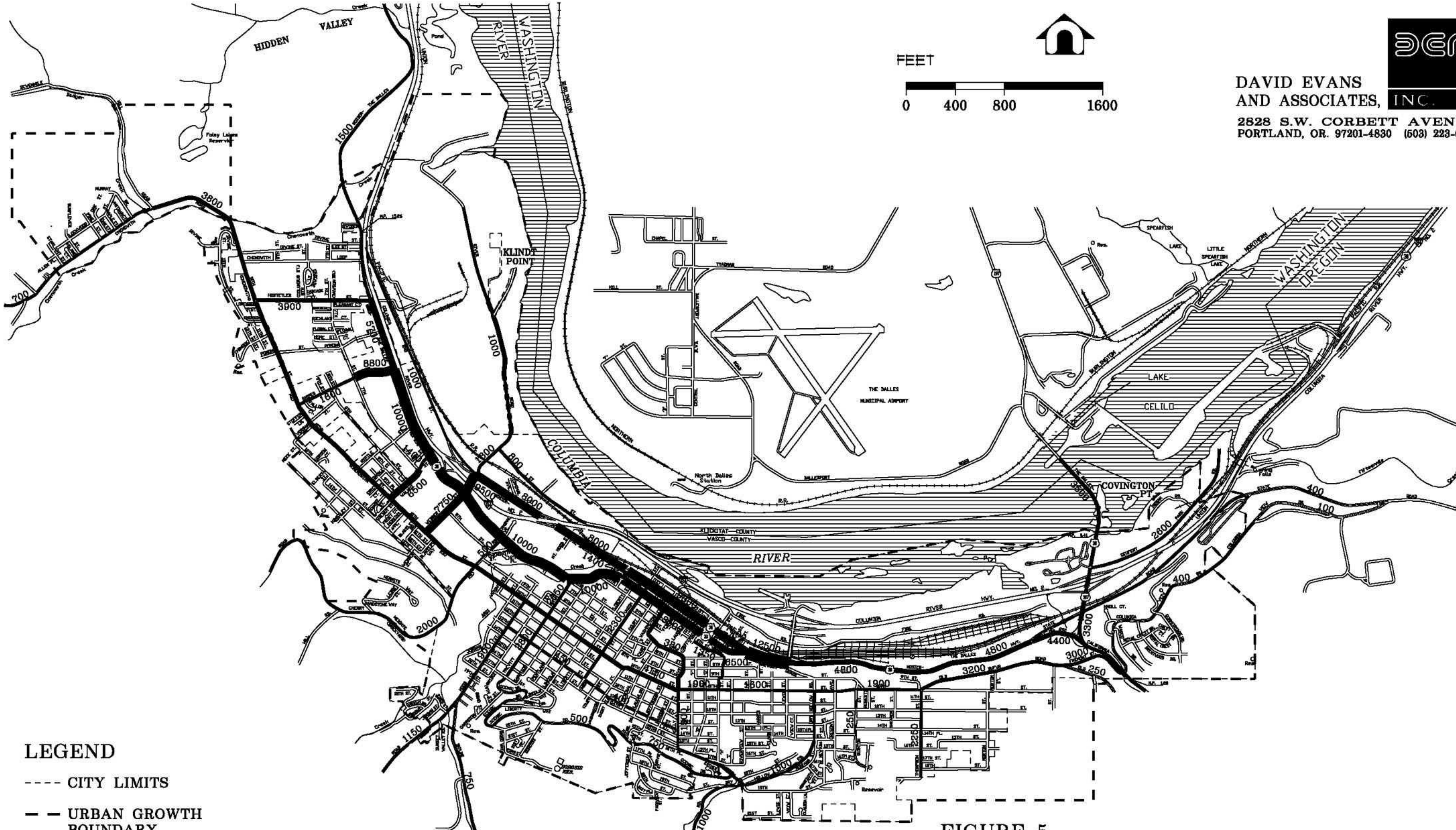

LEGEND

- - - - CITY LIMITS

— — URBAN GROWTH BOUNDARY

FIGURE 5

1993 WEEKDAY 24-HOUR TWO-WAY TRAFFIC VOLUMES

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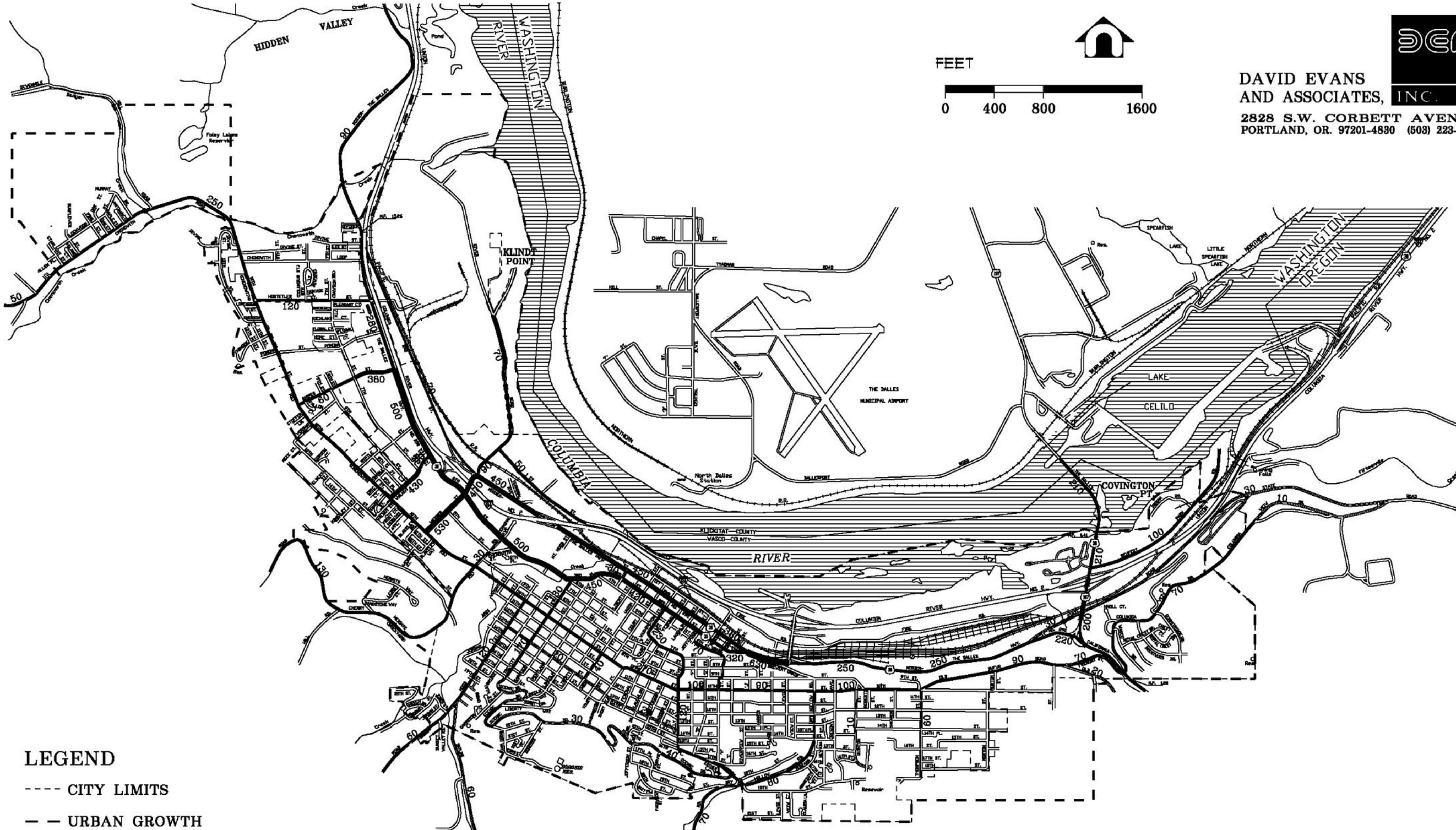

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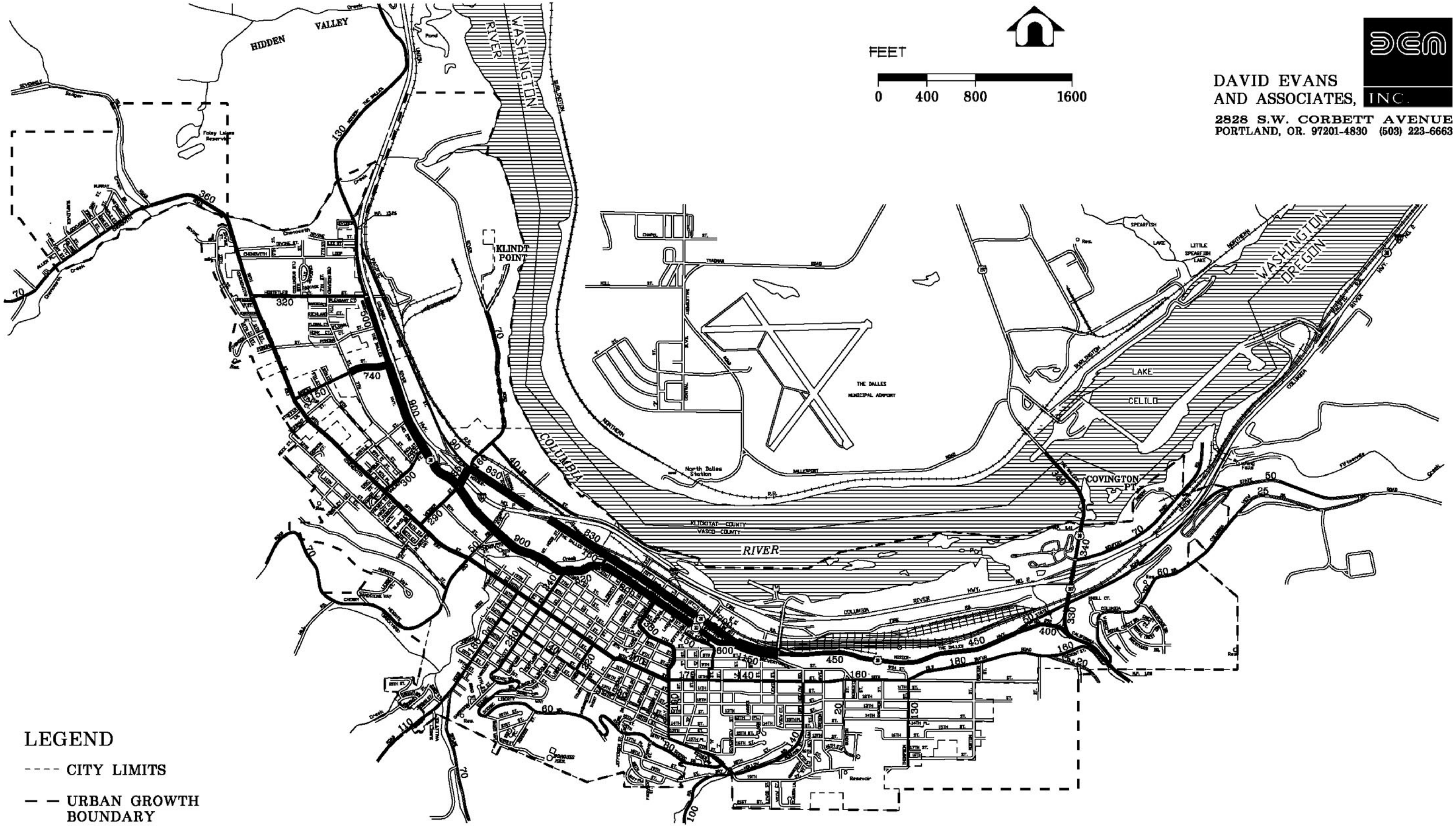
LEGEND

- - - CITY LIMITS

— — URBAN GROWTH BOUNDARY

FIGURE 6

1993 WEEKDAY AM PEAK HOUR TRAFFIC VOLUMES



LEGEND

- - - - CITY LIMITS

— — URBAN GROWTH BOUNDARY

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FIGURE 7

1993 WEEKDAY PM PEAK HOUR TRAFFIC VOLUMES

in the AM peak hour. Because the highest hourly volumes occur in the afternoon/evening period, testing and evaluation of the street system was performed for the PM peak hour volumes.

Street Capacity

Transportation engineers have established various standards for measuring traffic capacity of roadways or intersections[2]. Each standard is associated with a particular level of service (LOS) or mobility measured in the vehicle capacity of the facility, or V/C, one wishes to provide. The LOS concept requires consideration of factors which include travel speed, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort and convenience, and operating cost. Six standards have been established ranging from Level A where traffic flow is relatively free to Level F where the street system is totally saturated or jammed with traffic.

The capacity of each of the major streets was calculated in a generalized way to compare with the PM peak hour traffic volumes to determine locations of capacity deficiencies. Capacity is estimated so that roadways operating below capacity represent traffic conditions of LOS A to LOS D while capacity deficiencies are identified as LOS E or F conditions. For two-lane roadways, which comprise most of The Dalles, capacity was estimated at about 700 vehicles per hour in each direction. The one-way roadways, such as the couplet, would have double the capacity, or about 1,400 vehicles per hour in each direction. Three-lane roadways with very high turning activity, such as sections of Sixth Street, would have a capacity of about 900 vehicles per hour in each direction. These capacity estimates do not specifically address intersection operations.

A volume to capacity ratio (v/c) is the peak hour traffic volume (vehicles/hour) on a highway section divided by the maximum volume that the highway section can handle. For example, when v/c equals 0.85, peak hour traffic uses 85 percent of a highway's capacity; 15 percent of the capacity is not used. If the traffic volume entering a highway section exceeds the section's capacity, traffic queues will form and lengthen for as long as there is excessive demand. When v/c is less than but close to 1.0 (e.g., 0.95), traffic flow becomes very unstable. Small disruptions can cause traffic flow to break down and long traffic queues to form. This is a particular concern for freeways because the capacity of a freeway under stop-and-go traffic conditions is lower than the capacity when traffic is flowing smoothly.

Comparing these general capacity estimates with the 1993 traffic volumes shown in Figure 5 and Figure 6 indicates that the major road segments in The Dalles are operating at LOS C or better, indicating little or no congestion. All of the signalized intersections are also estimated to operate at LOS C or better during the weekday PM peak hour. The un-signalized intersections of Webber Street with both Second Street (three-way, stop-controlled) and Sixth Street (four-way, stop-controlled) were identified as being deficient at the time current conditions were analyzed in 1993. However, with the installation of traffic signals at these intersections, they currently operate at LOS C or better during the weekday PM peak hour.

PEDESTRIAN SYSTEM

The most basic transportation option is walking. Walking is the most popular form of exercise in the United States and can be performed by people of all ages and all income levels. However, it is not often considered as a means of travel. This is mainly because pedestrian facilities are generally an afterthought and not planned as an essential component of the transportation system.

[2] Transportation Research Board, *1985 Highway Capacity Manual*, Special Report 209. National Research Council, 1985.

The relatively small size of The Dalles indicates that walking could be employed regularly to reach a variety of destinations. Encouraging pedestrian activities may not only decrease the use of the personal automobile but may also provide benefits for retail businesses. Where people find it safe, convenient, and pleasant to walk, they may linger and take notice of shops that was overlooked before. They may also feel inclined to return to renew the pleasant experience time and again.

As is typical of most towns the size of The Dalles, the sidewalk system in the older core of the city is mostly complete. Sidewalks are also provided along streets fronting new site developments that have occurred in the last few years. However, some of the older street system outside of the central area does not have sidewalks provided along its length.

To assess the condition of the existing sidewalk system in The Dalles, a comprehensive inventory was conducted between November 2001 and April 2002. The results of that inventory and subsequent analysis were summarized in a report entitled "Sidewalk Improvement Plan." (Appendix D). The major finding of the Plan was that The Dalles, while having an extensive network of sidewalks, had many areas where sidewalks were either completely lacking or were discontinuous, were in need of repair, or did not meet current ADA requirements.

The Dalles Riverfront Plan identifies a recreational trail (Multi-purpose Path) along the Columbia River with access points at Chenowith Creek, Webber Street, and Riverfront Park. The proposed trail would be approximately 10 miles long. Of this, three segments totaling 1.93 miles were completed in 1993. These include the trail from the west end of the Marina parking lot to Bargeway Road, the Taylor Lakes to railroad segment, and the segment from the railroad to the Discovery Center site. In June 2005, approximately 6 miles of the trail have been completed. The 12-foot-wide pathway would provide for two-directional bicycle traffic along with its shared use by joggers and other pedestrians. Connectors would include the Mill Creek Trail and the Chenowith Creek Trail.

The Mill Creek Trail is a proposed recreational trail along the west bank of Mill Creek with several potential access points from residential streets. The trail would turn west from Mill Creek and connect with the street system at the intersection of Cherry Heights Road and Thirteenth Street.

The Chenowith Creek Trail is a proposed recreational trail along Chenowith Creek. It would begin at the Riverfront Trail and extend southward to Tenth Street with an at-grade crossing at Sixth Street.

BICYCLE SYSTEM

Like pedestrians, bicyclists are often overlooked when considering transportation facilities. However, cycling is a very efficient mode of travel. Bicycles take up little space on the road or when parked, do not contribute to air or noise pollution, and offer relatively higher speeds than walking. Because of the small size of The Dalles, a cyclist can travel to any destination in town within a matter of minutes.

Bicycling should be encouraged to reduce the use of automobiles for short trips in order to reduce some of the negative aspects of urban growth. Noise, air pollution, and traffic congestion could be mitigated if more short trips were taken by bicycle or on foot. Typically, a short trip that would be taken by bicycle is around two miles; on foot, the distance commonly walked is around ½ mile.

During the 1993 transportation system inventory, the only existing bike lane was located on West Sixth Street. Since then, bike lanes have been added to Tenth Street, Cherry Heights Road, Webber Street, and Second Street.

The Riverfront, Mill Creek, and Chenowith Creek Trails would also be accessible for bicycle use.

A *Bicycle Master Plan* was prepared for The Dalles urban area in 1993 (Appendix E). The plan included recommended bike paths, bike lanes, shoulder bikeways, and shared roadways.

PUBLIC TRANSPORTATION

Public transportation in The Dalles consists of long-distance Greyhound bus service and some demand responsive bus service.

Greyhound schedules four buses through The Dalles each day. Two buses travel west-east on the Portland-Boise-Salt Lake City route. The other two buses travel west-northeast on the Portland-Spokane route. Transfers to other routes allow bus riders to travel throughout the United States.

For senior citizens and the transportation disadvantaged, the senior center sponsors a minibus service. This service operates Monday through Friday with four vehicles. Service is available throughout the city, in Dallesport, and out of town as well, if requested.

The Mid-Columbia Council of Governments has created Transportation Network which operates additional demand responsive service available to everyone. This service has been in operation for two years. They have two vans and one 12-passenger bus operating Monday through Friday. This service is available to residents throughout Wasco County. Currently, they are providing 1,300 to 1,500 rides per month. Although the vehicles are not full, the service is at capacity in terms of time.

AMTRAK had scheduled two trains through The Dalles each day; however, this service was discontinued in May 1997. The westbound train was destined for Portland, Oregon, while the eastbound train was destined for Salt Lake City, Utah. Each of these trains connected with other lines for service throughout the United States.

RAIL SERVICE

The Dalles is served commercially by the Union Pacific Railroad (UPRR). The UPRR tracks run east-west along the Columbia River Gorge, providing vital transport for industry in The Dalles and Wasco County. This commercial rail service allows industry to ship goods throughout the United States.

AIR SERVICE

The Columbia Gorge Regional Airport is located across the Columbia River in Klickitat County, Washington. The Dalles Municipal Airport is a general aviation airport and a frequent military airplane stopover. It has no passenger or commercial service, though commercial service is expected in the future (see the 2000 *Oregon Aviation Plan, An Element of the Oregon Transportation Plan,* by the Oregon Department of Transportation Aeronautics Division). The air traffic is composed mainly of private pilots and agricultural sprayers. The Portland, Oregon, airport is the nearest international airport.

WATER TRANSPORTATION SERVICE

Water transportation service to The Dalles is almost exclusively by towboat and barge, although a marina is available for private use. Barge loading and unloading facilities are available, but container transport is not possible. The barges carry mainly one of two products: wood chips or grain. Wood chips require service to Longview, Washington, while grain barges generally travel to Portland, Oregon.

NATURAL GAS PIPELINE SERVICE

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

CHAPTER 4: FUTURE TRAVEL DEMAND

The travel demand forecast for the study area collector and arterial street system was based on the land use and roadway designations contained in the existing *City of The Dalles Comprehensive Plan*. The travel demand was estimated for the PM peak hour of a typical weekday in 2015 using a computer modeling program TMODEL2[1]. The weekday PM peak hour was modeled because it represents the critical time period of traffic operations for most of the city's collector and arterial street system. Average weekday daily traffic demand was determined assuming that an average of ten percent of the daily traffic occurs during the PM peak hour.

The Dalles travel demand forecasting model was developed through a five-step process. The first step in forecasting the travel demand involved definition of the study area, including the development of traffic analysis zones (TAZs) and the collector and arterial streets being modeled. Next, future population and employment were estimated by TAZ, and productions and attractions were calculated for each TAZ based on standard trip generation rates. The production and attraction trips were then distributed between TAZs, and the trips were then assigned to the study area collector and arterial street system. The following describes each step in the modeling process, and outlines the key assumptions for the City of The Dalles.

STUDY AREA DEFINITION

The first step in modeling requires defining the study area. For this definition, a roadway network and TAZ system that accurately represent the road system and density of land use activity in the study area were developed.

The study area for the TSP is defined primarily by the city's UGB. In addition, the study area includes residential land northwest of the UGB, known as Murray's Addition, which contributes traffic in the study area. The map included with this report shows the study area boundary.

Because the study area boundary differs from The Dalles city limits and UGB, the demographic data contained in this report should not be compared directly with existing data for the city, nor should the projections be used in other studies associated with the city limits or UGB.

Roadway System Network

The study area encompasses the limits of the roadway system network for the city. A network composed of arterial and collector roads was selected. This network includes all of the state highways, most of the county roads, and city streets that are vital to the circulation of traffic in The Dalles.

Each roadway in the network has specific distance, speed, and capacity characteristics that are important factors in the traffic forecasting process. These factors help determine the route that a driver takes when traveling between two locations.

Traffic Analysis Zones

In addition to defining the study area network, a TAZ system was also developed. The TAZ system divides the study area into smaller analysis units that are used to tie land use activity and trip generation to physical locations within the network.

[1] TMODEL2, Micro-computer software by Professional Solutions, Inc./Metro, 1991.

Within the study area boundaries, 50 TAZs were defined. Physical barriers, land use, and roadway characteristics were factors used to determine the TAZ structure. Whenever possible, the TAZs were developed to have homogeneous land use characteristics because this system results in the most accurate traffic assignment.

Each TAZ is then connected to the network by one or more representative roadways. Since the traffic network does not include every road that exists within the study area, one connector may represent many local roads that are loading onto a collector or arterial street.

Outside of the study area, eight zones load traffic from external locations, generally traffic from other cities. These zones produce three types of trips. The first type is through trips that begin in one external zone and end in another external zone but will pass through the city. For example, a vehicle traveling from Dufur to Portland might take US 197 to The Dalles, pass through the study area and take I-84 to Portland. The second type is a trip that begins in at another location and ends in the city. An example would be a resident of The Dalles who returns during the afternoon peak period after shopping at the Factory Outlet mall in Troutdale. The last type is a trip that begins in the city and ends at another location, such as someone who leaves from their workplace in The Dalles to their residence in Mosier during the afternoon peak period. In the modeling process, the trips traveling to and from these external zones are associated with the actual roads leading into The Dalles.

EXISTING AND FUTURE DEMOGRAPHICS

Once the TAZ system was defined, both existing and future (2015) land use forecasts were developed. The existing land use was used in the model calibration process. The future land use was the basis for the future travel demand forecasts.

The land use characteristics that define growth in the city are population and employment. For the travel forecasting model, population was represented by the number of single-family and multi-family dwelling units in each traffic analysis zone. Employment was evaluated by type of land use (i.e., retail/commercial, office, industrial, etc.).

During the 20-year planning period, The Dalles is forecast to remain as the center for economic activity in the Mid-Columbia area. Assuming current trends continue, The Dalles will experience moderate population and employment growth over the next 20 years (1995-2015). According to the estimates, there is enough buildable residential land within the UGB to accommodate the expected growth. However, the forecast indicates that the UGB will be built to capacity three to five years past the 20-year (2015) planning horizon.

Employment growth will at least keep pace with population growth, and may grow at a slightly faster rate as more residents will demand goods and services and will work within the urban area rather than in resource-related jobs outside the city. Local retail development will increase at a rate approximately 60 to 70 percent faster than the increase in population during the 20-year (1995-2015) planning period. New retail development is expected to be largely concentrated around the I-84/US 197 interchange and along US 30 west of downtown.

New industrial development in The Dalles urban area is expected to be located largely in the industrial park located in the northwestern part of the city, west of River Road and between I-84 and the Columbia River. The growth in industrial development is expected to outpace the growth in population during the 20-year (1995-2015) planning period by 40 percent. Local office, medical, government, and school development is expected to keep pace with the increase in population during the 20-year planning period.

Table 1 contains a summary of existing and future housing and employment by land use category. Appendix C contains the complete forecast by TAZ in Tables C-1 through C-3 together with a detailed explanation of the land use forecasting process. Also, the TAZ structure is illustrated in the Appendix as Figure C-1.

TABLE 1
CURRENT AND PROJECTED POPULATION AND EMPLOYMENT

Land Use	Current 1995	Forecast 2015	Projected Increase
Single-Family Dwelling Units	5,141	6,139	19%
Multi-Family Dwelling Units	1,312	1,763	34%
Retail/Commercial Employees	1,339	1,894	41%
Office Employees	242	311	29%
Industrial Employees	1,040	1,407	35%
Medical Employees	903	1,233	37%
Discovery Center Employees	10	65	550%
Government Employees	428	520	21%
School Employees	548	685	25%
Total Population	**14,776**	**18,630**	**26%**
Total Dwelling Units	**6,453**	**7,902**	**22%**
Total Employment	**4,510**	**6,115**	**36%**

Current Population

The 1995 population is estimated at 14,776 for the study area. The number of dwelling units in the study area is estimated at 6,453, of which 5,141 (80 percent) are single-family homes (including manufactured housing) and 1,312 (20 percent) are multi-family units. Population and housing figures are presented in Appendix Table C-1.

The current (1995) population and housing were estimated based upon the 1990 US Census data, available at the census block level. The 1990 census block data were aggregated into study area TAZs to develop the 1990 population and housing data by TAZ. According to The Dalles' most recent comprehensive plan (1994), the city's population is expected to increase at an average rate of 1.1 percent per year. Therefore, the study area total was estimated for 1995 based on the 1990 census counts and the 1.1 percent annual growth rate, resulting in a total population of 14,776.

The 1995 population and housing estimates for each TAZ were based on the assumption that residential infill has occurred throughout the study area, with some TAZs experiencing more growth than others in the past five years. Information obtained from the City of The Dalles planning department identified the higher-growth areas in the eastern portion of the city, where much of the city's recent housing construction has occurred.

Year 2015 Population

Population and housing counts were forecast to the year 2015 to meet the 20-year planning outlook of the TSP. DEA used an average annual growth rate of 1.1 percent to calculate the 2015 population of the study area. This growth rate was used by the City of The Dalles in preparing its comprehensive plan. The projected 2015 population for the study area is 18,630.

Population and housing growth will be concentrated in the TAZs most able to accommodate it. Most TAZs in the study area are largely developed and will accommodate only infill or replacement units. Some TAZs on the edges of the study area, however, contain substantial amounts of vacant buildable land designated for residential use and can accommodate The Dalles' expected growth.

The amount and type (single- or multi-family) of residential development in each TAZ was estimated based on information provided by the City of The Dalles. The comprehensive plan states that available single-family land is expected to develop at a density of approximately four dwelling units per acre (du/acre). Land designated for manufactured home development is expected to develop at approximately six units per acre, and multi-family land at 10 to 15 units per acre. DEA used the city's inventory of vacant buildable land to approximate the acreage of such land in each TAZ.

Additional dwelling units were then added to 1995 estimated dwelling units to determine 2015 totals. Under these assumptions, the study area would contain a total of 7,902 dwelling units. Of these, 6,139 (78 percent) would be single-family dwellings, and 1,763 would be multi-family dwelling units (22 percent).

Population for each TAZ was estimated using expected average household sizes as stated in the city's comprehensive plan. Single-family units were assumed to contain 2.4 persons per household, and multi-family units will have 2.1 persons per household. The resulting total population is 18,630.

Current Employment

The current employment in the study area was estimated by TAZ based on field surveys, document research, and telephone interviews. Most available employment statistics are for Wasco County as a whole rather than for the City of The Dalles. In addition, because employment data needed to be specific to the study area for computer analysis, it was necessary to estimate employment located in each TAZ. Therefore, DEA obtained employment information through document research and telephone interviews. Sources included The City of The Dalles, The Dalles Chamber of Commerce, the Oregon Employment Department, and various businesses and agencies located in the study area.

The Dalles currently has an average of 4,472 non-agricultural jobs in the TSP study area. Employment estimates by type of work are shown in Table 1. The 1995 population-to-employment ratio in the study area is 3.28 to 1, which is higher than average. In most urban areas, the ratio usually falls between 2.1 and 3.0. A Lower ratio occurs where almost all employment is contained within an urban area and is based primarily in manufacturing, commercial, and service industries. Higher ratios occur where many jobs in an area are resource-based, e.g., in agriculture, forestry, mineral extraction; where a large number of employees commute to work in other areas; or where unemployment is high.

Agricultural jobs represent 20 to 25 percent of total employment in Wasco County and likely account for a portion of employment in The Dalles. In addition, The Dalles has a high percentage, relative to the state average, of residents over age 65 (Comprehensive Plan, 1994). It can be assumed that most of these residents are retired. These factors help explain the relatively high population-to-employment ratio in the study area.

Year 2015 Employment

The employment forecast for the TSP is not intended to be a full-sector (agricultural and non-agricultural) forecast. The projections do not include agricultural jobs because the TSP is for facilities and improvements within the study area, and agricultural-related trips have only minor impacts on traffic patterns in the study area. The 2015 employment forecast, with a total employment of 6,115, is shown in Table 1.

Future employment is based on several assumptions. It was assumed that most medical, government, and school employment would increase at approximately the same rate as the population--25 percent over the next 20 years. Employment in already developed commercial areas was assumed to increase by 20 percent. Commercial and industrial land identified in the city's inventory of vacant buildable land was assigned employment based on average densities (employees per gross acre) of the expected land use. The Dalles currently has quite low employee densities, 1.9 employees per gross commercial acre and 1.3 employees per gross industrial acre. However, these densities will increase as infill occurs.

To calculate future employment in TAZs that are largely undeveloped, DEA first estimated the amount of buildable land based on maps contained in the city's comprehensive plan. Employment was then assigned based on average densities (employees per gross acre) of the expected land use, which were calculated from information contained in the Institute of Transportation Engineers' *Trip Generation* report and from previous demographic studies done for small cities in Oregon.

For vacant land, DEA assigned densities of three employees per commercial acre and two employees per industrial acre. We assumed that all available commercial and industrial land would be developed by 2015, most at low densities, with the exception of the large amount of vacant industrial land in the northwest part of the urban area. This area will probably still have some room for development and was assumed to be 75 percent developed by 2015.

The future employment at the Columbia Gorge Discovery Center was obtained from the Discovery Center Office. At build-out of the Discovery Center, it is estimated that the Discovery Center would attract 150,000 visitors annually and it would have a total of 65 employees.

As mentioned above, the study area's current population-to-employment ratio is 3.29 to 1. The ratio will probably decrease somewhat as The Dalles grows, creating more demand for urban services and increasing the share of "urban" employment in relation to resource-based employment. Based on the assumptions used for the 2015 forecast, the population-to-employment ratio would be 3.05.

TRIP GENERATION

Vehicle trip generation, the next step in the modeling process, is a method of estimating the number and type of trips a specific land use will produce or attract based on historic data and surveys of similar developments. The trip generation estimates were made for each traffic analysis zone in the planning area on the basis of the type and quantity of households and employees. Trip generation rates applied to these land uses were derived from the Institute of Transportation Engineers report, *Trip Generation* (Fifth Edition, 1991). These rates were modified to reflect generalized land use categories for planning purposes on the basis of experience in other similar size cities in Oregon and through the travel model calibration process. These trip rates also reflect the existing level of transit service and use of alternative modes. An increase in transit ridership or use of other modes is not expected to be large enough to have a significant effect on traffic demand and street requirements. These rates are summarized on Table 2.

Each trip is defined by the land use from which it originates, the land use for which it is destined, and the purpose of the trip. Trip generation rates were refined for each origin and destination for four purposes.

Home-based work - Trips between home and a place of employment
Home-based shopping - Trips between home and a retail center for the purpose of shopping
Home-based other - Trips between home and another land use for a purpose other than employment or shopping (e.g., school trips)
Non-home based - Trips between two non-residential land uses.

The amount of traffic generated for each TAZ was estimated for the PM peak hour by multiplying the number of households or employees by the appropriate origin and destination trip generation rate by trip purpose.

TABLE 2
TRIP GENERATION RATES

Trip Type		Trips/Dwelling Unit		Trips/Employee					
		Single Family	Multi-Family	Retail/ Comm.	Industrial	Hospital	Govt. Office	Office	School
Home Based	Origin	0.03	0.02	0.10	0.40	0.10	0.68	0.49	0.68
Work	Destination	0.39	0.27	0.00	0.05	0.00	0.00	0.00	0.00
Home Based	Origin	0.10	0.07	0.93	0.00	0.00	0.00	0.00	0.00
Shopping	Destination	0.19	0.13	0.58	0.00	0.00	0.00	0.00	0.00
Home Based	Origin	0.16	0.11	0.00	0.00	0.09	0.00	0.00	0.21
Other	Destination	0.08	0.06	0.18	0.00	0.03	0.00	0.00	0.10
Non-Home	Origin	0.07	0.05	0.58	0.05	0.02	0.16	0.09	0.16
Based	Destination	0.08	0.06	0.79	0.05	0.06	0.16	0.12	0.35
Total Rates	Origin	0.36	0.25	1.61	0.45	0.21	0.84	0.58	1.05
Total Rates	Destination	0.74	0.52	1.55	0.10	0.09	0.16	0.12	0.45

The trip generation from the Columbia Gorge Discovery Center was based on an annual visitor estimate of 150,000 obtained from the Discovery Center. It was estimated that of the 150,000 annual visitors, 80 percent would visit the center during the peak summer months between May and September. The peak daily attendance during the peak summer months is estimated at 800 visitors a day. Approximately 44 percent of the 800 daily visitors during the summer are estimated to attend the facility during the peak four hours of the afternoon.

Thus, an estimated 176 visitors would arrive and another 176 visitors would leave the site during the peak afternoon hour in summer[2]. Assuming a vehicle occupancy of 2.6, it is estimated that 70 vehicles would arrive at the site, and another 70 vehicles would leave the site during the peak weekday PM peak hour.

Trip origins and destinations were also calculated for the three external roadways leading into The Dalles. These trip calculations are based on historic growth along the roadways and potential increases in population and/or employment outside of the UGB.

[2] The peak in-grounds crowd during the peak afternoon hour in summer is estimated at 475 visitors, based on an average stay of 2.7 hours.

TRIP DISTRIBUTION

Vehicle trip distribution, the fourth step in the modeling process, is a method of determining the origin and destination of trips within the study area. For each TAZ, trip origins were distributed to all of the trip destinations within the planning area and to the roads leading out of the study area. (Trip origins were also calculated for the roads leading into the area.)

A standard gravity model was used for trip distribution. The basic premise of the gravity model is that the number of trips between two areas is directly related to the size of the attractions or destinations in each zone and inversely related to the travel time between zones. For example, if two destination zones of equal size were located 10 and 15 minutes from the origin zone, more of the trips from the origin zone would be distributed to the closer destination zone. Likewise, if two destination zones of different sizes were located equal driving times from the origin zone, more trips would be distributed to the larger destination zone. This procedure was followed for trips originating in all 24 internal zones and the roads leading into the study area.

Trips generated by the Discovery Center were distributed separately. It was assumed that 87 percent of the trips generated by the center would come from the east along I-84. These trips from the east include 74 percent from the Tri-Cities and other areas in eastern Washington and another 13 percent from other eastern locations. Another ten percent are assumed to travel from the west along I-84. The remaining three percent would come from the south.

TRIP ASSIGNMENT

Trip assignment, the final step in the modeling process, is a method of assigning trips distributed between origin zones and destination zones to specific paths on the street system. The forecasting model used a capacity-constrained assignment methodology that assigns traffic in percentage increments to the street system based on travel time. For the first increment, each trip is assigned to the shortest route between its origin and destination based on travel time. The travel time on each route is then adjusted to account for congestion and delay that may result from the first incremental assignment. As the fastest route becomes congested, its travel time increases, possibly making a previously slower route the faster of the two. For the second increment of traffic, each trip follows the same guidelines and is assigned to the shortest route, and then travel times are readjusted to account for the new level of congestion. This process continues until all the increments have been assigned. Using this procedure, the traffic between a single origin/destination pair could be assigned to several routes depending on the congestion of each route, thereby simulating “real world” motorists’ choices on a travel route.

Model Calibration

Prior to assigning 2015 traffic, this entire process of estimating trip generation, distribution, and assignment was completed for 1995[3] conditions and compared with actual measurements on the roadway system. The theory behind calibration reasons that if the model forecasts current conditions reasonably well, the same process should then provide a reasonably good estimate of future conditions.

To calibrate the model, the trip generation, distribution, and assignment process was repeatedly modified until the assigned volumes were within approximately ten percent of the actual counts. The data collected from the phone surveys were used in the calibration procedure to adjust the trip distribution process. Roadway speed was the key factor used to adjust the trip assignment process.

3 The model was calibrated to 1995 because the existing population and employment data was collected for this base year.

Data on through traffic were also used to calibrate the model. Through traffic was measured in the summer of 1995 by matching the license numbers of all vehicles entering and leaving the city. Observers were stationed at all entry and exit points to the city, including at the on- and off-ramps to I-84. Through traffic along I-84 was not measured during the survey. The survey found that excluding through traffic along I-84, 20 percent of all trips entering the study area during the weekday PM peak hour are through trips.

Future Assignments

For the future traffic analysis, 2015 traffic was assigned to a street system that included projects that have already been approved and are planned for construction. This assignment, called the "base future" condition, was used to determine which sections of the street system would be deficient within the next 20 years.

CHAPTER 5:
TRANSPORTATION IMPROVEMENT OPTIONS ANALYSIS

The traffic volumes in The Dalles are forecast to increase in the future as a result of the anticipated growth in population and employment in the urban area. This chapter presents an evaluation of 2015 traffic demand for a base future street network and eight transportation network improvement options. These improvements options were identified to meet capacity deficiencies, address safety issues, improve traffic circulation, and provide access to developing areas.

In addition to the base future option, the following improvements were evaluated:

- Improve Intersection of US 30 and Brewery Grade.
- Widen 10th Street between Washington Street and Lewis Street.
- Improve Intersection of US 30 and Lower Eight Mile Road.
- Widen River Road Chenowith Creek Bridge.
- Improve Intersection of US 197 and Fremont Street/Columbia View Drive.
- West Gateway.
- Connect 19th Street to Thompson Street.
- Extend Thompson Street to 10th Street.
- Install Traffic Signals at both Ends of Cherry Heights Rd.

As discussed in the remaining sections of this chapter, not all of these considered improvements were recommended. These recommendations were based on costs and benefits relative to traffic operations, the transportation system, and community livability.

EVALUATION CRITERIA

The evaluation of the potential transportation improvements was based on a review many factors. Improvements to traffic circulation and shifts in traffic volumes were identified. In addition, three factors were evaluated qualitatively: 1) safety; 2) environmental factors, such as air quality, noise, and water quality; and 3) socioeconomic and land use impacts, such as right-of-way requirements and impacts to adjacent lands. The final factor in the evaluation of the potential transportation improvements were costs which were estimated in 2005 dollars based on preliminary alignments.

BASE FUTURE CONDITION

The "base future" condition assumes that no changes will be made to the existing street system except for those improvements already planned and funded. These include:

The Chenowith Interchange on I-84 to the west of the city that will provide direct access to the proposed industrial area in the northwest portion of the city. (Completed)
The arterial connection between Sixth Street and Second Street, with the connection at Sixth Street located directly across from the intersection with Cherry Heights Road. (Completed)
The extension of Mt Hood Street from 6th Street to Cherry Heights Rd. (Completed)

At the same time, population and employment will increase by about 30 percent, resulting in increased traffic demand upon the street system. By comparing the future traffic demand with the unchanged street system, we can determine where future traffic problems are likely to occur.

The preceding chapter described in detail how the forecasting model was developed. The results of the base future 2015 model run are shown in ***Figure 8***. The forecast vehicular traffic volumes along US 30 west of Webber Street are projected to increase from the current 900 vehicles to 1,090 vehicles during the weekday PM peak hour by 2015 (an average annual rate of 0.9 percent). East of Brewery Grade, vehicular traffic volumes along US 30 during the weekday PM peak hour are projected to increase from the 450 vehicles to 600 vehicles by 2015 (an average annual rate of 1.3 percent). In the central part of town, vehicular traffic volumes along the US 30 couplet during the weekday PM peak hour are projected to increase from the 1,500 vehicles to 1,740 vehicles by 2015 (an average annual rate of 0.7 percent).

Traffic volumes along 6th Street between Cherry Heights Road and the downtown Second Street/Third Street couplet are estimated to be lower in the future than the existing condition. This is because traffic between the downtown area and the commercial area along Sixth Street would be diverted to the new connection between Cherry Heights Road and Second Street, constructed as a part of the Safeway shopping center development. As a result of the diversion, the traffic volumes along this section of Sixth Street over the Mill Creek Bridge are estimated to decrease during the weekday PM peak hour from 900 vehicles currently to 830 vehicles by 2015. An estimated 420 vehicles during the weekday PM peak hour would be diverted to the new Cherry Heights/Second Street connection.

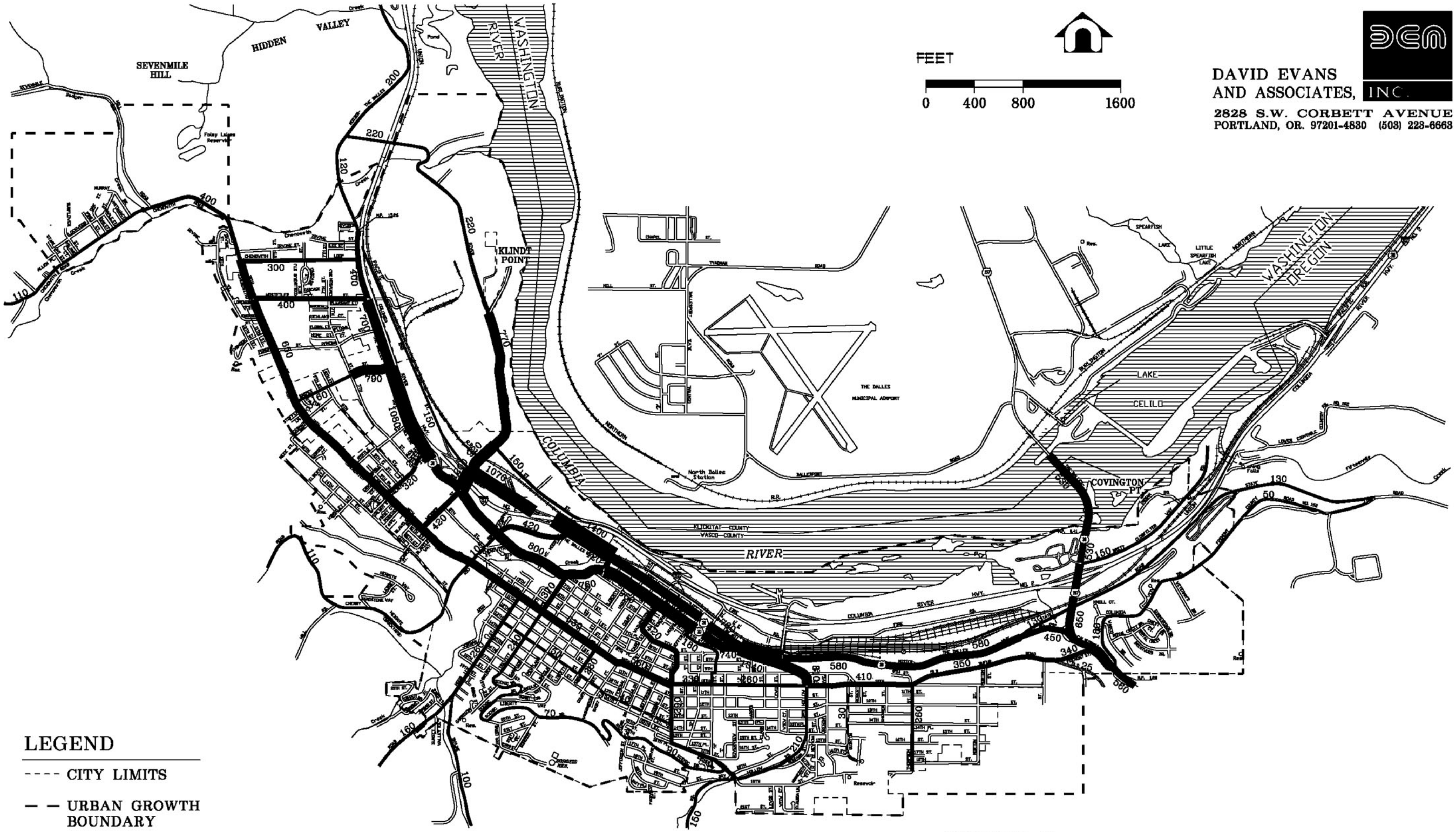
The highest increases in vehicular traffic volumes are forecast along Second Street between the couplet and Webber Street. Traffic during the weekday PM peak hour along Second Street is estimated to increase from 830 vehicles to 1430 vehicles by 2015. Part of the increase in traffic volumes along Second Street would be due to the diversion of traffic away from 6th Street to the new connection between Second Street and Sixth Street.

Traffic along city streets is projected to increase by between 20 and 50 percent in the older, central part of town, while higher percentage volume increases are forecast along street segments located in areas that are expected to attract new residential and non-residential development. Examples of high growth areas include River Road, with the weekday PM peak hour traffic volume forecast to increase from the current 70 to 900 by 2010, and Old Dufur Road, with the weekday PM peak hour traffic volume forecast to increase from the current 180 to 400 by 2015.

The forecast increase in traffic volumes in the future is estimated to result in slightly worse operating conditions at critical intersections in the urban area. However, we estimated that all existing signalized intersections would continue to operate at a LOS C or better. The estimated levels of service during the 2015 weekday PM peak hour at critical intersections in the urban area are illustrated in Table 3.

TABLE 3
FORECAST 2015 PEAK HOUR LEVELS OF SERVICE

Intersection	Level of Service
Second Street and Washington Street	0.50 - A
Third Street and Washington Street	0.73 - C
Second Street and Union Street	0.56 - B
Third Street and Union Street	0.68 - C
Webber Street and Second Street	0.88 - C
Webber Street and Sixth Street	0.66 - C



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LEGEND

- CITY LIMITS
- URBAN GROWTH BOUNDARY

FIGURE 8

2015 WEEKEND PM PEAK HOUR TRAFFIC VOLUMES

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OPTIONS EVALUATION

Since no capacity deficiencies were identified in The Dalles' transportation system in the future, the optional transportation system improvements were developed to improve safety conditions at existing locations and to provide access to developing areas in the city. These transportation system options were developed with the help of the TAC, keeping in mind the goals and objectives of the transportation plan.

Option 1: Revise Zoning and Development Codes

Overview: One of the goals of the Oregon TPR is to reduce the reliance on the automobile. One way a city can do this is through amendments in zoning and development codes to permit mixed use developments and increases in density. Specific amendments include allowing neighborhood commercial uses within residential zones and allowing residential uses within commercial zones.

Improvement: Amend zoning and development codes to permit mixed use developments and increases in density in certain areas of The Dalles.

Impacts: Such code amendments can encourage residents to walk and bicycle throughout the community by providing shorter travel distances between land uses. Maintaining the livability of the community encourages new residents and businesses to locate in The Dalles, helping to keep the area economically viable.

Cost: No direct costs are associated with making the comprehensive plan policy and zoning code amendments.

Recommendation: The Dalles has already taken steps to address this improvement (e.g. Neighborhood Center Overlay, Section 5.040 of the Land Use Development Ordinance). Further support and implementation of these policies is recommended.

Option 2: Implement Transportation Demand Management Strategies

Overview: The TPR also recommends that cities should evaluate Transportation Demand Management Strategies (TDMs) measures as part of their TSPs. These strategies are designed to change the demand on the transportation system by providing facilities for other modes of transportation, implementing carpooling programs, and applying other demand management measures such as staggering work schedules at local businesses.

Improvement: The Dalles can implement TDM measures in a variety of ways. They can construct and maintain walkways and bikeways to improve safety for pedestrians and bicyclists and encourage more residents to limit their use of motorized vehicles. The Dalles can work with Wasco County and Hood River County to establish a Columbia River carpooling program. They can also work with local businesses to help set up carpooling programs and stagger work shifts.

Impacts: Implementing TDM measures in The Dalles can improve the livability of a city by improving traffic, bicyclist, and pedestrian safety. With more emphasis on walking or biking in the city, conditions such as air quality and noise levels would be improved as well.

Cost: The estimated cost to install a new sidewalk on one side of an existing street is around $20 per linear foot (2005 costs). This includes a 5-foot-wide walkway composed of four inches of concrete and two inches of aggregate. Curbing would cost an additional $12 to $20 per linear foot (2005 costs).

The cost to construct an asphalt sidewalk is about $10 per linear foot (2005 costs). This estimate assumes that the asphalt pad is six feet wide and composed of two inches of asphalt and four inches of aggregate. Asphalt sidewalks require more maintenance than concrete sidewalks. Maintenance would include sealing every five years at about $0.50 per linear foot (2005 costs) and resurfacing every ten years at about $2.50 per linear foot (2005 costs).

The cost to install bike lanes on both sides of an existing road is around $45 to $50 per linear foot (2005 costs). This cost includes widening the roadway by five feet on both sides, installing curbs, using a fill composed of four inches of asphalt and nine inches of aggregate, and placement of a eight-inch painted stripe.

These costs for are for standalone improvements; the costs can be reduced when they are included as needed in roadway improvement projects throughout The Dalles.

Costs associated with an intra- or inter-county carpool program were not determined as part of this plan.

Recommendation: Implementing TDM strategies would provide needed facilities for pedestrians and bicyclists, increase the safety of the roadway system, and enhance the quality of life in The Dalles. Therefore, the TDM strategies summarized above are recommended for inclusion in the TSP.

Option 3: Improve Intersection of US 30 and Brewery Grade

Overview:Brewery Grade connects Dry Hollow Road and E.10th Street to US 30 just east of the downtown area. The street is constructed on a very steep grade and it intersects US 30 at a skewed angle, with its alignment almost parallel to US 30 until it makes a sharp right-angle turn at its intersection with US 30.

The intersection has been improved by the City of The Dalles since the 1999 TSP was completed. This was done primarily through lane reconfiguration and has helped with turning conflicts especially with trucks turning right from Brewery Grade. Large trucks must now turn left and loop back to eastbound on US 30. This is not ideal but limits trucks turning into on-coming lane of traffic

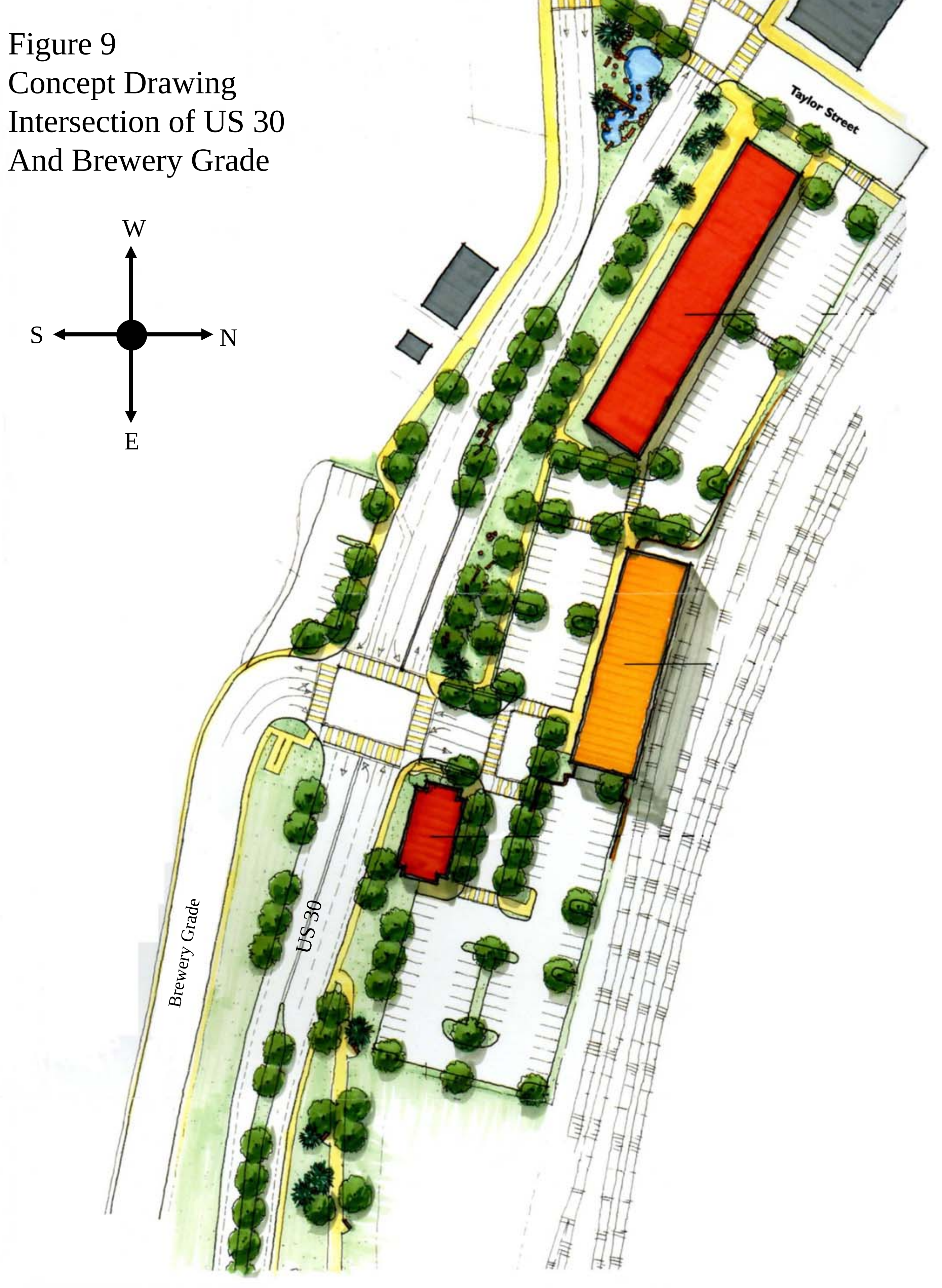
Another problem arises because westbound highway traffic is currently split into two lanes as it approaches the intersection with Brewery Grade. The southern lane remains level and carries traffic from the freeway interchange, while the northern lane carrying US 30 through traffic from the east dips below the interchange and is climbing as it approaches the intersection with Brewery Grade. The new, temporary lane configuration does not allow this traffic to make a left on to Brewery Grade. Traffic must now turn left and loop back to eastbound on US 30 to then make a right onto Brewery Grade.

Improvement: Four-way traffic signalization with a combination of improvements would address the problems. In June of 2004, the City completed a TGM Quick Response project that addressed this intersection and the freeway access. It included 30 percent engineered drawings and traffic a study (***Figure 9***).

The northerly lane on westbound US 30 should be closed and all the through traffic should be routed onto only one northern lane. Thus, the right-turn traffic from the freeway interchange would no longer have a free turn; they would be stop-controlled at the intersection with US 30.

At the Brewery Grade intersection, a left-turn lane would be provided on westbound US 30 at the planned four-way traffic signal.

Figure 9
Concept Drawing
Intersection of US 30
And Brewery Grade



The centerline of US 30 would be moved to the north while holding the northern edge of the highway so as to provide a slightly larger radius for traffic turning right from Brewery Grade onto eastbound US 30. The realignment of US 30 will require a small piece right of way from the property on the north west of the intersection with Brewery Grade; the realignment would be accomplished within the existing right of way for the section east of Brewery Grade.

A traffic signal would be installed at the intersection.

Impacts: These improvements would reduce the number of conflicts between the vehicles. The traffic from Brewery Grade would have more room to turn without intruding into on-coming traffic lanes. The traffic on US 30 would no longer have to weave across traffic to access Brewery Grade.

Cost: It is estimate that all of the improvements would total $2,250,000 (2005 costs).

Recommendation: Because it will improve safety and operations, this project is recommended for inclusion in the TSP.

Option 4: Widen Tenth Street between Washington Street and Lewis Street

Overview: Tenth Street serves continuous east-west travel in The Dalles, west of US 197. It currently carries 400 vehicles during the weekday PM peak hour. With future development in The Dalles, travel demand along 10th Street during the weekday PM peak hour in 2015 is estimated to increase to 630 vehicles between Trevitt Street and Washington Street and to 340 vehicles between Washington Street and Dry Hollow Road. Tenth Street is currently narrow between Washington Street and Lewis Street. The pavement is 36 feet wide between Washington Street and Kelly Street, and it is only 28 to 32 feet wide between ‘F’ Street and Lewis Street. The street is constructed on a 60-foot right-of-way west of Kelly Avenue and it is constructed on a 40- to 50-foot right-of-way between Kelly Avenue and Lewis Street.

Improvement: Because Tenth Street is the only local road other than US 30 which crosses the entire length of the city, we propose upgrading the roadway to better accommodate traffic. The existing street would be widened to 40 feet, and additional right-of-way would be acquired so as widen the right-of-way to 60 feet to accommodate the wider street. The 40-foot-wide pavement would include two 11.5-foot travel lanes (one in each direction), two five-foot bike lanes (one on each side), and a seven-foot parking lane on one side. Continuous curb, gutter, and sidewalks would be provided on both sides of the street.

Tenth Street is constructed on a 50-foot-wide right-of-way between Kelly Avenue and one lot west of ‘G’ Street. An additional ten-foot-wide right-of-way take would be required to accommodate the wider street. A ten-foot-wide right-of-way take is proposed on the north side of the street. Since houses on the north side of the street have enough setback, this would require land only takes with impacts to landscaping/fencing of nine houses.

Tenth Street is constructed on a 50-foot-wide right-of-way between one lot west of ‘G’ Street and two lots east of ‘I’ Street, and it narrows to 45 feet wide between ‘I’ Street and ‘J’ Street. It is proposed that the additional right-of-way be taken from properties on the north side of the street only. Sixteen properties would be impacted on the north side of the street. Of these, 14 properties have houses with enough setback so that they would require land only takes with impacts to landscaping/fencing. On the remaining two properties, the house structure would be impacted and it would require a take of the total property.

Tenth Street is constructed on a varying 40- and 45-foot-wide right-of-way between ‘J’ Street and Lewis Street. It is proposed that the additional right-of-way be taken from properties on the south side of the street only. Fifteen properties would be impacted on the south side of the street. Twelve of these properties have the house structure would be impacted and it would require a take of the total property. The remaining three properties have houses with enough setback so that they would require land only takes with impacts to landscaping/fencing.

Impacts: The major advantage of improving Tenth Street would be the improved connection between residential areas as well as access to the schools. It would also encourage some neighborhood commercial development along its length. The average travel distances may be slightly reduced, saving energy. The parallel route may also reduce some of the minor congestion in downtown, which would improve air and noise quality. It would also improve the general livability of the community.

The primary disadvantage of this project would be the impacts to some of the adjacent property owners, particularly along the very narrow sections of the roadway. Widening the roadway would require some right-of-way acquisition. Some increases in overall traffic volumes near these residences would also occur.

Cost: The total construction and right-of-way acquisition cost is estimated at $1,188,300 (1999 dollars). This estimate includes a construction cost for the wider street of $218,600. The total right-of-way acquisition cost of improving Tenth Street to a 40-foot-wide pavement built on a 60-foot-wide right-of-way is estimated at $969,700. This includes a credit of $179,800 from the sale of surplus land from properties that would have to be acquired due to the impact on their house structures.

Recommendation: Because of the overall community value of a through route along Tenth Street, this project is recommended for inclusion in the TSP.

Option 5: Improve Intersection of US 30 and Lower Eight Mile Road

Overview: US 30 and Lower Eight Mile Road currently intersect at a skewed angle, and the intersection is characterized by a very confusing, non-standard design containing several channelizing islands that direct traffic negotiating the intersection. The two directions of traffic along US 30 are unnecessarily separated by channelizing islands that provide storage for traffic turning left from eastbound US 30 onto Lower Eight Mile Road. Also, a very short connecting roadway serves traffic between Lower Eight Mile Road and US 30 to and from the east. The TAC was concerned about this intersection and it was recognized as a problem by the local ODOT District Office.

Improvement: The intersection would be redesigned so that Lower Eight Mile Road intersects US 30 at a right-angle, and a standard separate left-turn lane be provided for eastbound US 30 traffic turning into Lower Eight Mile Road. At the intersection with US 30, Lower Eight Mile Road would consist of one inbound lane and two outbound lanes consisting of separate right-turn and left-turn lanes. The right-turn from westbound US 30 to Lower Eight Mile Road would remain as a free right. These improvements would be accomplished within the existing intersection by removal and relocation of the existing channelizing islands (***Figure 10***).

Impacts: These improvements would simplify the operations of the intersection, making it less confusing for drivers on both US 30 and Lower Eight Mile Road.

Cost: The improvements are estimated to cost $10,000 (1999 dollars).

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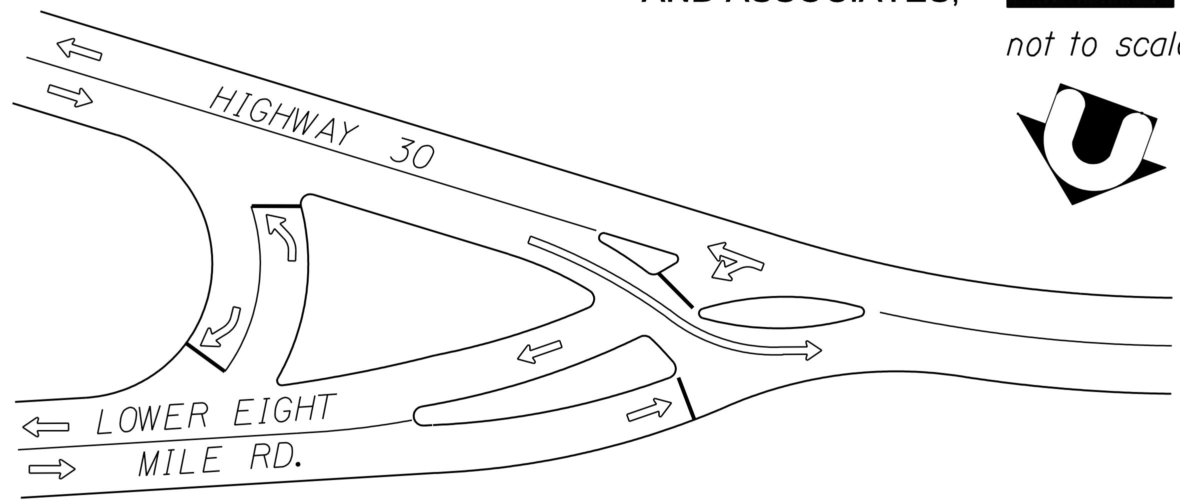
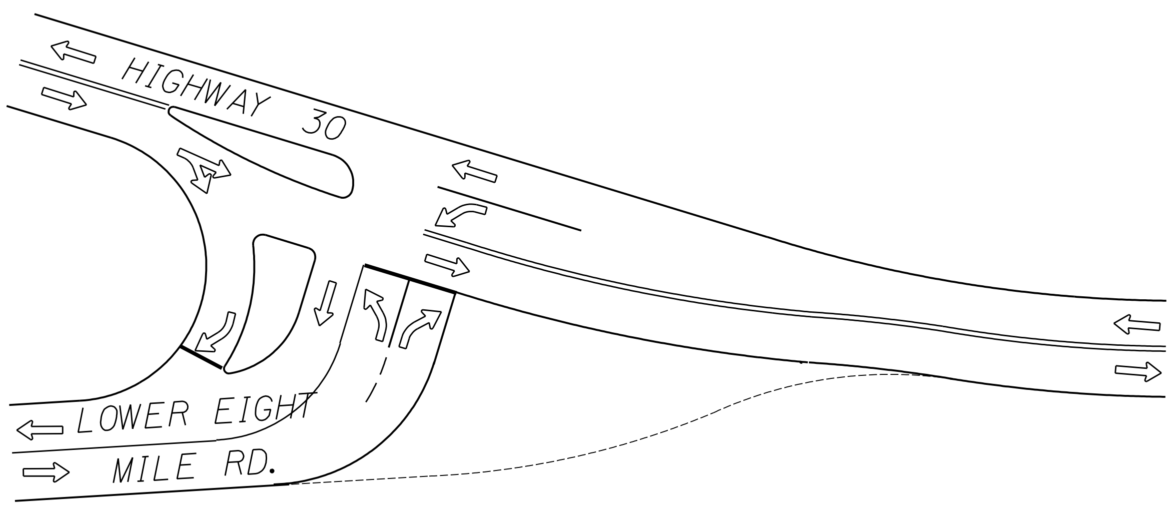
not to scale



EXISTING CONFIGURATION



PROPOSED DESIGN CONCEPT

FIGURE 10

Schematic Improvement-Intersection of Highway 30 and Lower Eight Mile Road

Recommendation: Because it will improve safety and operations, this project is recommended for inclusion in the TSP.

Option 6: Widen River Road Chenowith Creek Bridge

Overview: The River Road crossing over Chenowith Creek is currently narrow and can accommodate only one lane of traffic. With the anticipated growth in industrial development in this area, the existing narrow bridge may not be adequate to accommodate the traffic growth in the future.

Based on a review of the inspection report of the existing structure, it was determined that the bridge is currently in fair condition and it has a load rating of 21 tons operating and 12 tons inventory. This restricts the size of vehicles that can safely operate on this structure, as the bridge is not designed to the current HS-25 loading requirement. With the industrial nature of the development in the area, it is estimated that heavy truck traffic will use this route.

Improvement: Since it would be necessary to maintain traffic along this route during construction, and the existing bridge structure does not lend itself to staged construction in-place, it is recommended that the existing bridge structure be replaced. The new structure will be designed to meet current HR-25 loading requirements. The new approach roadway would be constructed 32 feet wide and the bridge deck would be constructed 36 feet wide.

Impacts: This Bridge is important to the circulation of traffic in the industrial park along the river and to operations for the Port of The Dalles. The completed Riverfront Trail will also use this bridge to cross Chenowith Creek.

The construction of a new bridge structure could have some potential environmental impacts to Chenowith Creek associated with construction and increased run-off from the wider roadway surface.

Cost: The cost of the new bridge over Chenowith Creek is estimated to be $411,950 (1999 dollars).

Recommendation: Because it will benefit the traffic circulation in the port industrial area and serve as part of the Riverfront Trail, this project is recommended for inclusion in the TSP.

Option 7: Improve Intersection of US 197 and Fremont Street/Columbia View Drive

Overview: The intersection of US 197 and Fremont Street/Columbia View Drive currently has a slightly higher than average crash rate. A total of four crashes occurred at this intersection during the three-year period from January 1990 to December 1992. A majority of these crashes were between vehicles turning onto or crossing the highway from the two stop-controlled side streets, Fremont Street and Columbia View Drive.

The intersection is currently characterized by northbound traffic along the highway going down a long steep grade (six percent) and traveling at speeds of about 55 miles per hour (mph). Conflicts occur when vehicles both enter the highway from Columbia View Drive and Fremont Street and attempt to merge with the faster moving highway traffic or when they try to cross the highway to continue towards town.

The area east of US 197 and south of the railroad is forecast to experience high growth in the future. This will result in an increase in travel demand at the Columbia View Drive approach during the weekday PM peak hour from the current 60 vehicles to 260 vehicles in 2015. The travel demand at the

Fremont Street approach is estimated to increase during the weekday PM peak hour from the current 160 vehicles to 390 vehicles in 2015.

To identify a solution for US 197 and Fremont Street/Columbia View Drive, additional analysis and design will be needed.

Improvement: To be determined

Impacts: This improvement would provide added east-west capacity between the neighborhoods on either side of US 197. It would also reduce conflicting movements with high-speed vehicles.

Cost: Unknown at this time.

Recommendation
Undertake a refinement plan for US 197 @ Fremont Street/Columbia View Drive that will evaluate alternative improvements to address congestion and safety issues at this location.

Option 8: West Gateway, Lincoln to Webber Streets

Overview: The Columbia Gateway Urban Renewal Agency completed a conceptual plan for the West Gateway project. It would include streetscape, access, and traffic improvements. The goal was to create a gateway into the downtown area, slow traffic, signalize the East 2nd and Cherry Heights Road intersection, and provide better access onto adjacent properties. East 2nd Street is a main arterial carrying traffic from downtown to Webber Street. It is accessed from the freeway by two off-ramps, east and west bound, with a 35 mile speed limit merge onto East 2nd Street; and by Cherry Heights Road intersection just east of the eastbound off-ramp. Driveway access to several businesses is difficult especially west of the west bound off-ramp. Pedestrian access from the merge of both ramps is non-existent although pedestrians use the area and a need exists for a sidewalk on both sides of the street.

Improvement: Three-way traffic signalization at the East 2nd and Cherry Heights Road intersection with a combination of other improvements would address the problems. In 2003, the City completed an Urban Renewal design project that addressed this intersection, access to properties, and the freeway access east of the east bound off-ramp.

A traffic signal would be installed at the intersection of Cheery Heights Road.
East 2nd Street would be slightly curved east of the Cherry Heights intersection, the travel lanes narrowed, and streetscape landscaping would be added to help traffic to slow through this area. Sidewalks would be added on both sides of East 2nd Street from the Lincoln Street intersection to the freeway off-ramp.

Impacts: These improvements would reduce the speed of vehicles. The traffic from the off-ramp would slow down in order to get through the signalized intersection and pedestrian safety would be greatly enhanced. A gateway with streetscape landscaping would create an attractive entry into the downtown area.

Cost: It is estimate that all of the improvements would total $2,500,000 (2005 costs).

Recommendation: Because it will improve safety and operations, this project is recommended for inclusion in the TSP.

Option 9: Connect Nineteenth Street to Thompson Street

Overview: Nineteenth Street provides primary access to Mid-Columbia Medical Center. Currently Nineteenth Street dead ends just east of the Medical Center.

Improvements: Nineteenth Street would be extended east to align and connect with existing Thompson Street located in the southeast portion of the planning area. The pavement of the new connection would be 44 feet wide and it would be constructed within a 60-foot-wide right-of-way. Also, continuous curb, gutter, planting strip, and sidewalks would be provided on both sides of the street.

Impacts: The major advantage of the new connection is that it would provide a more direct access to the Mid-Columbia Medical Center from the existing and future development east of Thompson Street. This connection would reduce some of the traffic demand on Dry Hollow Road. It would also reduce the distances that many of the Medical Center employees and patients would have to travel. Shorter travel distances result in decreased energy consumption and improved air quality and noise conditions. Shorter travel distances are also very important to ambulances and other emergency service providers.

The disadvantages of this project include fairly rugged terrain and the need for water and sewer connections. These factors will drive up the cost of construction.

Cost: The cost of constructing the new connection is estimated at $1,220,000 (1999 dollars).

Recommendation: Because it would reduce travel distances and decrease emergency vehicle response time, this project is recommended for inclusion in the TSP.

Option 10: Thompson Street: 19th to 10th Street

Overview: This nine block length of Thompson Street is currently in bad repair. It intersects with several east-west streets and carries traffic between these east-west streets. It would eventually connect with East 19th street that would be extended through from the west past the Mid-Columbia Medical Center. With this connection, Thompson Street would carry a lot more traffic.

Improvement: The improvements would include sidewalks, curb and gutters, storm drain, and travel lanes with on-street parking.

Impacts: These improvements would bring the substandard street to City standards.

Cost: No estimate has been developed since the engineering has not been completed.

Recommendation: Because it will improve safety and operations, this project is recommended for inclusion in the TSP.

Option 11: Install Traffic Signals at Both Ends of Cherry Heights Road

Overview: The intersections of Terminal Street at West Sixth Street and Cherry Heights Road and West Second Street are both projected to experience very heavy traffic demand. Without traffic signals, the traffic on Cherry Heights Road would find it very difficult to access either West Sixth or West Second Street. Since this route is expected to provide relief to Webber Street, access to and from Cherry Heights Road is critical to traffic circulation.

Improvement: Install actuated traffic signals at the Cherry Heights Road intersections with West Sixth Street and West Second Street.

Impacts: Adding more traffic signals along West Sixth Street and West Second Street will slow through traffic on those roadways. However, traffic traveling on and off Cherry Heights Road will greatly benefit from the signals, especially movements involving left turns.

Cherry Heights Road is a major agricultural truck route through The Dalles. The traffic signals would facilitate product movement from the orchards south of the city to the processing plants along the waterfront.

Overall delays at the intersections will likely be reduced improving air quality in the area.

The actuated traffic signals would also enable pedestrians to cross both West Sixth and West Second Street with greater ease and safety.

Cost: The cost of installing an actuated traffic signal is estimated at about $125,000 (2005 costs). For two signals, the total improvement would be $250,000.

Recommendation: Because the traffic signals would decrease overall delay and improve traffic circulation, they are recommended for inclusion in the TSP.

SUMMARY

Table 4 summarizes the recommendations of the transportation improvement options based on the evaluation process described in this chapter. Chapter 5: Transportation Improvement Options describes how these improvement options fit into the modal plans for The Dalles.

TABLE 4
TRANSPORTATION IMPROVEMENT OPTIONS
RECOMMENDATION SUMMARY

Option	Recommendation
1. Revise Zoning and Development Codes	Implement
2. Implement Transportation Demand Management Strategies	Implement
3. Improve Intersection of US 30 and Brewery Grade	Implement
4. Widen Tenth Street between Washington Street and Lewis Street	Implement
5. Improve Intersection of US 30 and Lower Eight Mile Road	Implement
6. Widen River Road Chenowith Creek Bridge	Implement
7. Improve Intersection of US 197 and Fremont Street/Columbia View Drive	Further Refinement
8. West Gateway	Implement
9. Connect Nineteenth Street to Thompson Street	Implement
10. Thompson Street: 19th to 10th	Implement
11. Install Traffic Signals at Both Ends of Cherry Heights Road Street	Implement

CHAPTER 6: TRANSPORTATION SYSTEM PLAN

The TSP includes plans for all modes of transportation. Components of the street system plan include street classification and street width standards, access management standards, and street improvements. Suggested transportation demand measures are also included. Lastly, a plan implementation program is presented.

STREET FUNCTIONAL CLASSIFICATION SYSTEM

The development of the City of The Dalles TSP provides the city with an opportunity to review and revise the currently adopted street functional classification system and the street cross section design standards.

Street functional classification systems relate the design of a roadway to its function. The function is determined by operational characteristics such as traffic volume, operating speed, safety, and capacity.

The current city street functional classification system designates streets within the city UGB as either freeway, arterial roadways or collector roadways (see ***Figure 4***). All other roadways are considered local roadways. Under the currently adopted street functional classification system, a majority of the classified streets are designated as arterial roadways, with a much smaller proportion of the classified streets designated as collector streets.

In 2005, this section of The Dalles TSP was evaluated and updated in order to be consistent with the federal aid urban functional classification mapping system. New cross sections that reflect the adoption of the federal classification system for arterial and collector streets are also being included as part of this update process.

A roadway's functional classification is determined by the type of traffic it serves (for example local versus through traffic) and the access provided to properties located along the roadway. At one end of the spectrum, streets classified as arterials primarily serve traffic traveling through the urban area; at the other end, residential cul-de-sac streets serve only traffic accessing properties having frontage on the street. In between the two ends of the spectrum, streets such as collectors serve a combination of through traffic as well as direct access to land.

The proposed street classification, as shown in ***Figure 11***, designates US 30 and US 197 through The Dalles urban area as major arterial roadways. Several other segments also remain as arterials. These streets were classified as arterials because they have mobility as their primary characteristic with limited or restricted service to local development. Although they do provide some access to abutting property, such service is only incidental to the primary functional responsibility of moving through traffic along the roadway.

Arterial Streets

Roadways designated as arterial roadways in the city's street functional classification plan are classified as either major arterial or minor arterial designations with a primary function of mobility for through traffic with controlled access to the surrounding land.

Major arterials carry the highest traffic volumes, serving the major activity centers of urbanized areas. For major arterials, access to abutting land is subordinate to travel mobility. The **minor arterial** classification includes all arterials that are not designated as major. This classification places more

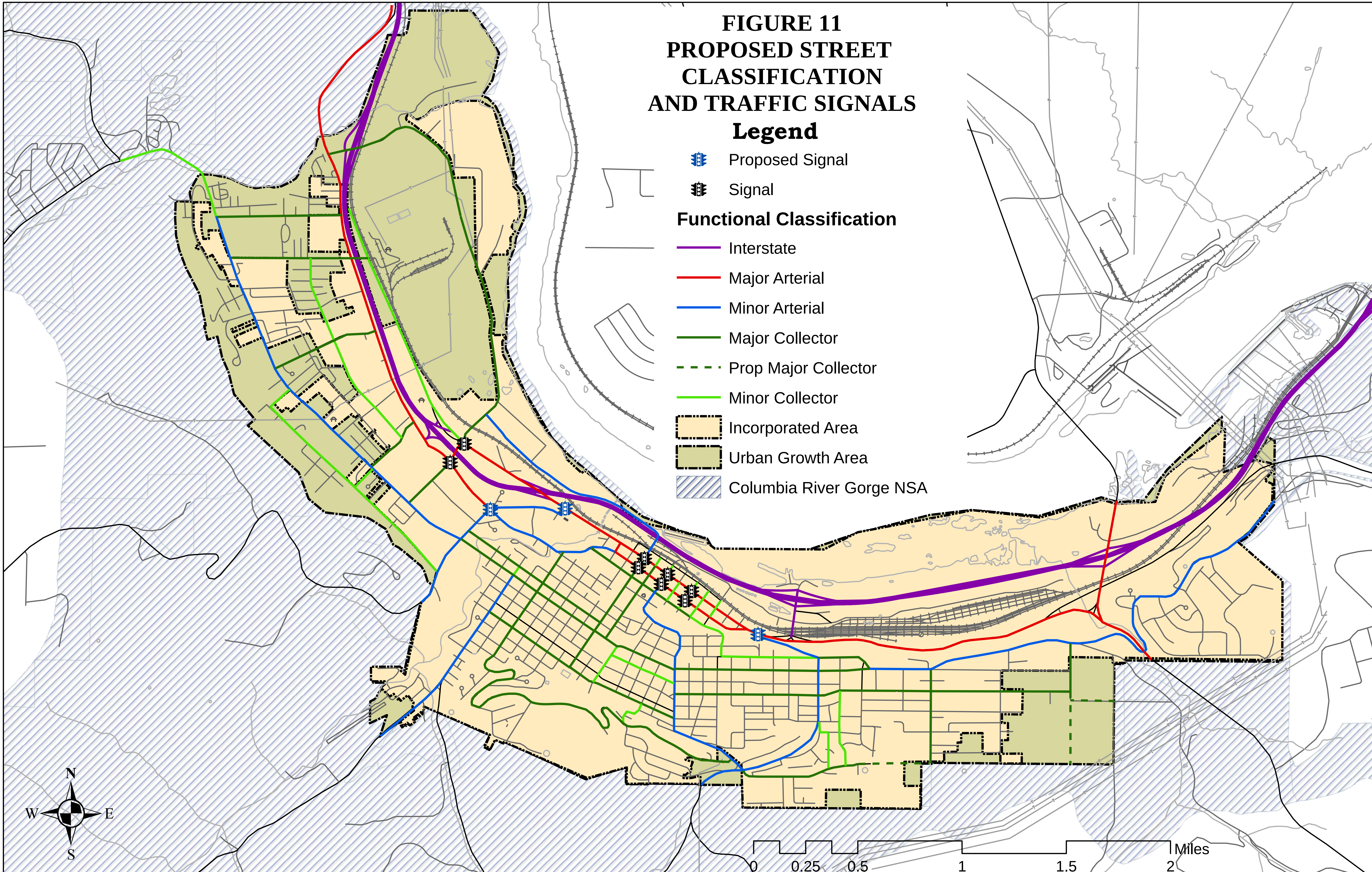


FIGURE 11
PROPOSED STREET CLASSIFICATION AND TRAFFIC SIGNALS
Legend
Proposed Signal
Signal
Functional Classification
Interstate
Major Arterial
Minor Arterial
Major Collector
Prop Major Collector
Minor Collector
Incorporated Area
Urban Growth Area
Columbia River Gorge NSA
N
W
E
S
0
0.25
0.5
1
1.5
2
Miles

emphasis on land access, accommodating shorter trips and distributing trips to smaller geographic areas than major arterials.

Major Arterial Streets

Streets proposed as major arterial streets in The Dalles include:

- Second Street from Webber Street to US 197.
- Third Street from Lincoln Street to 2nd Street
- Webber Street from 6th Street to 2nd Street
- Sixth Street (partially US 30) from northwest Urban Growth Boundary to Cherry Heights Road
- Cherry Heights Road from 6th Street to 2nd Street
- Lincoln Street from 2nd Street to 3rd Street
- US 197 from south Urban Growth Boundary to north Urban Growth Boundary

Minor Arterial Streets

Streets proposed as minor arterial streets in The Dalles include:

- Sixth Street from northwest Cherry Heights Road to Third Place
- Chenowith Road from Sevenmile Hill Road to 10th Street
- Tenth Street from Chenowith Road to Cherry Heights Road
- Old Dufur Road from 10th Street to Fremont Street
- Fremont Street from Old Dufur Road to US 197
- Fremont Street from US 197 to E. Knoll
- Columbia View Drive from E. Knoll to the eastern UGB
- Cherry Heights Road from south Urban Growth Boundary to 6th Street
- Mount Hood Street from south Urban Growth Boundary to 10th Street
- Union Street from 3rd Street to West 1st Street
- W. First Street from Union Street to Webber Street
- Webber Street from W. 1st to W. 2nd Streets
- Sixteenth Place from Dry Hollow Road to Kelly Avenue
- Kelly Avenue from 16th Place to 7th Street
- Seventh Street from Kelly Avenue to Washington Street
- Washington Street from 7th Street to 2nd Street
- Dry Hollow Road from 3 Mile Road to Brewery Grade
- Brewery Grade from Dry Hollow Road to US 30
- E. Tenth Street from E. 9th Street to Old Dufur Road.

Collector Streets

The remaining roadways previously designated as arterial roadways in the city's currently adopted street functional classification plan are re-classified to either major collector or minor collector designations depending upon their width, speed, local access and traffic circulation functions. They actually function as collector streets. Their primary function is not just mobility; rather their function is equally divided between mobility for through traffic and access to the surrounding land.

Major Collector Streets

Major collector streets in The Dalles urban area include:

- River Road from Chenowith Interchange to Webber Street – Wasco County roadway
- Webber Street from Bargeway to W. 1st Street
- Third Place from 6th Street to 3rd Street
- Third Street from Third Place to Lincoln Street
- Fourth Street from Third Place to Jefferson Street
- Nineteenth Street from Dry Hollow Road to Oakwood Drive
- Nineteenth Street from Oakwood Drive to Thompson Street (Proposed)
- Hostetler Street from 10th Street to 2nd Street
- Webber Street from 10th Street to 6th Street
- Union Street from 14th Street to 3rd Street
- Thompson Street from 19th Street to 10th Street
- Twelfth Street from Kelly Avenue to Richmond Street
- Fourteenth Street from Mount Hood Street to Kelly Avenue
- Mt. Hood Street from 10th Street to 9th Street
- Tenth St. from Cherry Heights Road to E. 9th Street
- Scenic Drive from Trevitt Street to Sixteenth Place
- Snipes Street from Tenth Street to Sixth Street
- Walnut Street from Tenth Street to Sixth Street
- Trevitt Street from 17th Street to 3rd Place
- Richmond Street from southern terminus to Old Dufur Road
- E. Ninth Street from Brewery Grade to 10th Street
- Chenowith Loop Road from 6th Street to 10th Street
- W. Ninth Street from Union Street to Cherry Heights Road
- Skyline Road from south Urban Growth Boundary to Mount Hood Street
- Court Street from 10th Street to 2nd Street

Minor Collector Streets

Minor collector streets in The Dalles urban area include:

- Second St. from Webber Street to Hostetler Street
- Fourth St. Grade from Jefferson Street to E 9th Street
- Jefferson Street from 4th Street to 2nd Street
- Federal Street from 4th Street to 2nd Street
- Laughlin Street from 4th Street to 1st Street
- Madison St. from 3rd Street to 1st Street
- Seventh Street from Hostetler Street to Walnut Street
- Verdant Street from 10th Street to 13th Street
- Thirteenth Street from Verdant Street to Cherry Heights Road
- Walnut Street from 13th Street to 10th Street
- Oregon Street from 12th Street to 19th Street
- E. Ninth Street from 4th Street Grade to Dry Hollow Road
- Jefferson Street from 14th Street to Scenic Drive

- Court Street from 1st Street to 2nd Street
- Washington Street from 1st Street to 2nd Street

Street Design Standards

Street design standards relate the design of a roadway to the function performed by that roadway. For example, arterial streets need to be designed to carry through traffic at higher speeds. At other end of the spectrum, local streets need to be designed to carry local access traffic at lower speeds. Collector streets are designed to carry a combination of through and local traffic.

Street design standards are necessary to provide a community with roadways that are relatively safe, aesthetic, and easy to administer when new roadways are planned or constructed. The standards for The Dalles are based on experience and policies and publications of the profession. They also meet requirements of the TPR.

Whatever the function, all streets shall be designed so that they:

- Promote the safety and convenience of vehicular and non-vehicular traffic
- Protect the safety of neighborhood residents
- Protect the residential character of neighborhoods by limiting traffic volume, speed, noise and fumes
- Encourage the efficient use of land

Urban street design standards are recommended for all streets since the City of The Dalles TSP includes land within the UGB. This includes land outside the city boundary, which may presently have a rural appearance, as these lands will ultimately be part of the urban area. Retrofitting rural streets to urban standards in the future is expensive and controversial; it is better to initially build them to an acceptable urban standard.

The proposed street cross section design standards for the City of The Dalles street system are summarized in Table 5 and described in the following pages.

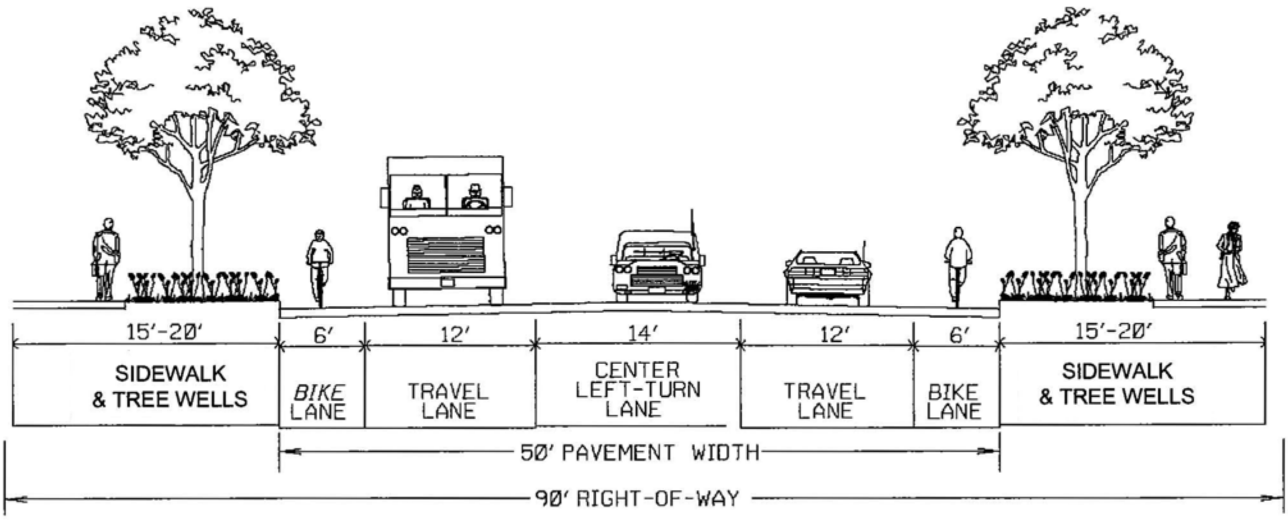
Two-way Arterial Streets

Arterial streets form the primary roadway network within and through a region. They provide a continuous roadway system that distributes traffic between different neighborhoods and districts. Their primary function is to provide mobility, with limited or restricted service to adjacent land development. In cases where restricting access is not practical, such as build-out of the surrounding land, their design may be modified to include a center turn lane that separates the turning traffic accessing the surrounding land from the through traffic on the street.

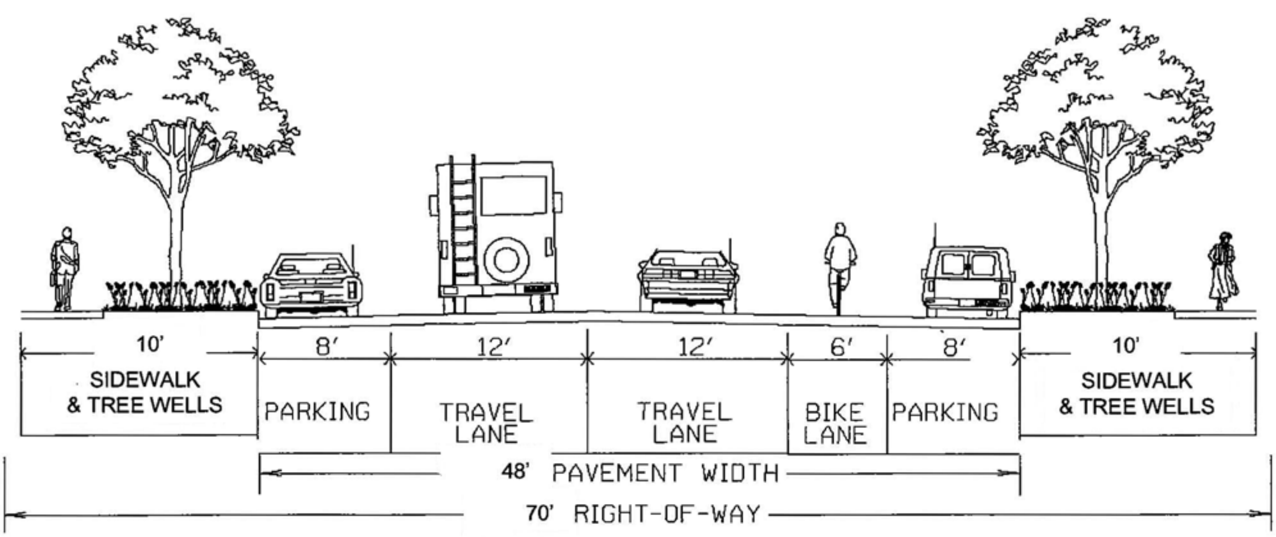
Three-Lane Arterial

Arterial streets shall be built with no on-street parking. A 50-foot paved width can accommodate a 3-lane arterial cross section with bike lanes on both sides. The roadway shall be striped to provide two travel lanes (one in each direction), two bike lanes and a center left-turn lane (***Figure 12***).

Sidewalks shall be 10 feet wide and located on both sides of the roadway. A hardscape strip is required to provide a buffer between the sidewalk and roadway travel lanes. To break-up the mass of pavement and provide a more “human scale” to the street, street trees shall be planted at regular intervals in tree wells at the back of the curb.

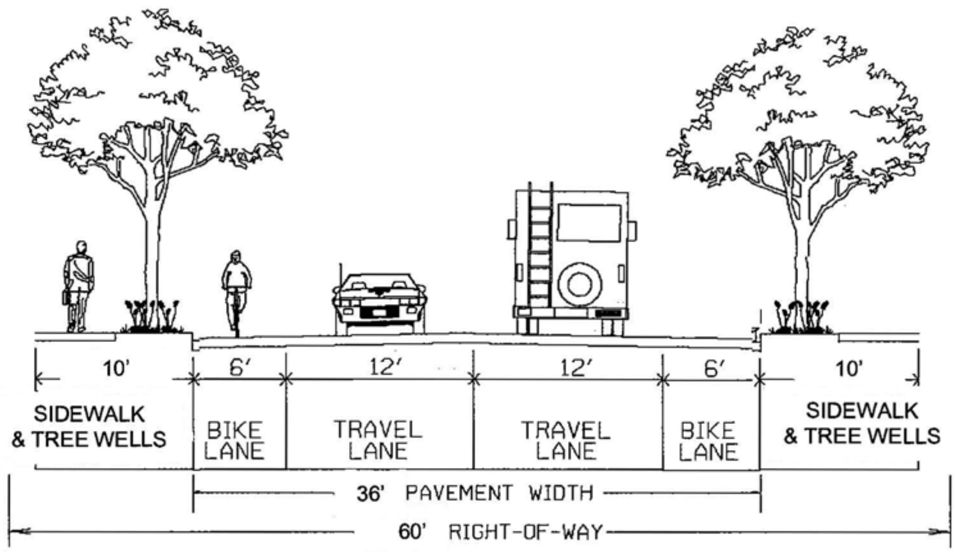


Three Lane Arterial

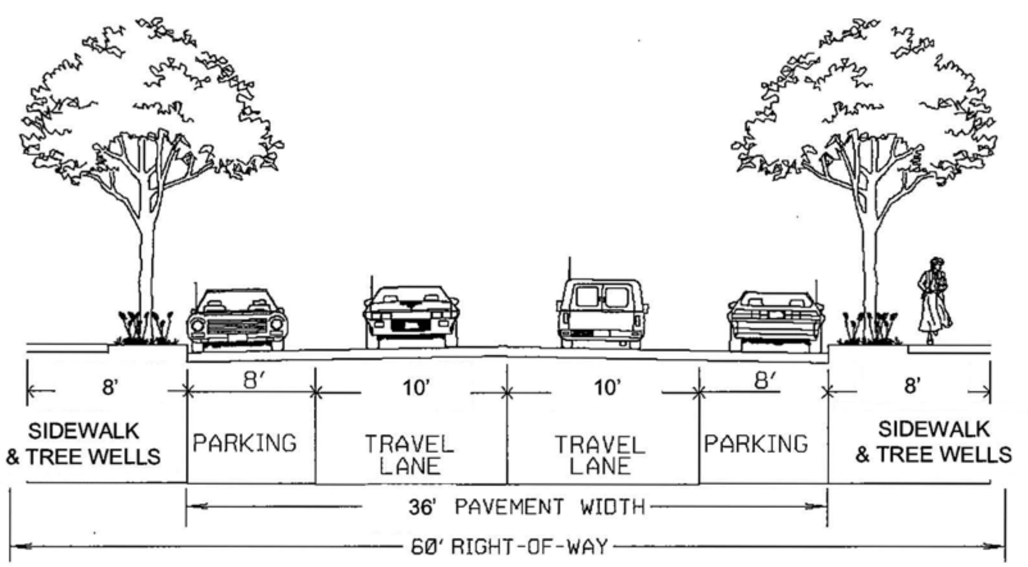


One-Way Arterial

Figure 12
Street Design Standards



Major Collector



Minor Collector

Figure 12
Street Design Standards

The entire cross-section, including sidewalks, curbs, and pavement, can be accommodated within a 90-foot right-of-way.

The inclusion of a center turn lane may be unnecessary in situations where access along the arterials is limited through regulation or development patterns. In such cases, the center left-turn lane shall be developed with a raised median between left-turn lanes.

One-Way Arterial Streets

Typically, the conventional arterial street is a multi-lane facility with an equal number of lanes for traffic in each direction. Often, however, one-way operation is employed where a single two-way street does not have adequate capacity and does not lend itself readily to improvement to accommodate anticipated traffic demand. In such cases, two parallel streets are converted to one-way operations. The one-way operations provide higher capacity, especially when left-turning movements are heavy at numerous intersections along the arterial. Two one-way arterial cross-sections are shown in ***Figure 12***.

This roadway section shall be 46 feet wide and striped to provide two travel lanes, a bike lane on the right side of the road, and two parking lanes.

Sidewalks for this section shall be located adjacent to the roadway with no planting strip. They shall be 10 feet wide, excluding curb, and located on both sides of the street. To break-up the mass of pavement and provide a more "human scale" to the street, street trees shall be planted at regular intervals in tree wells at the back of the curb.

The entire cross-section, including sidewalks, curbs, and pavement, can be accommodated within a 67-foot right-of-way.

Collector Streets

Collector streets connect local neighborhoods or districts to the arterial network. Two levels of collector streets are included in The Dalles street classification. Major collector streets are intended to carry more through traffic than local traffic. A major collector street can serve residential, commercial, industrial, or mixed land uses. Minor collector streets provide the vital link between arterial/major collector and local streets. They are intended to carry mostly local neighborhood traffic feeding it on to the arterial and major collector street system. Four collector street standards have been developed, as shown in ***Figure 12 & 13***.

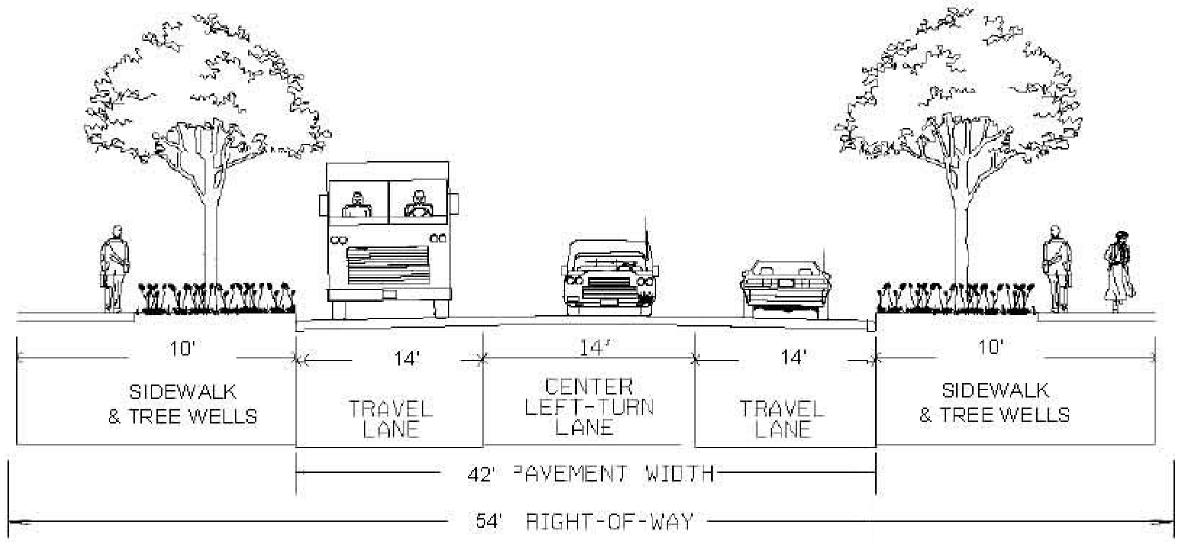
Major Collector

The major collector street shall have 36 feet of pavement. This section shall be striped to provide two travel lanes and two bike lanes.

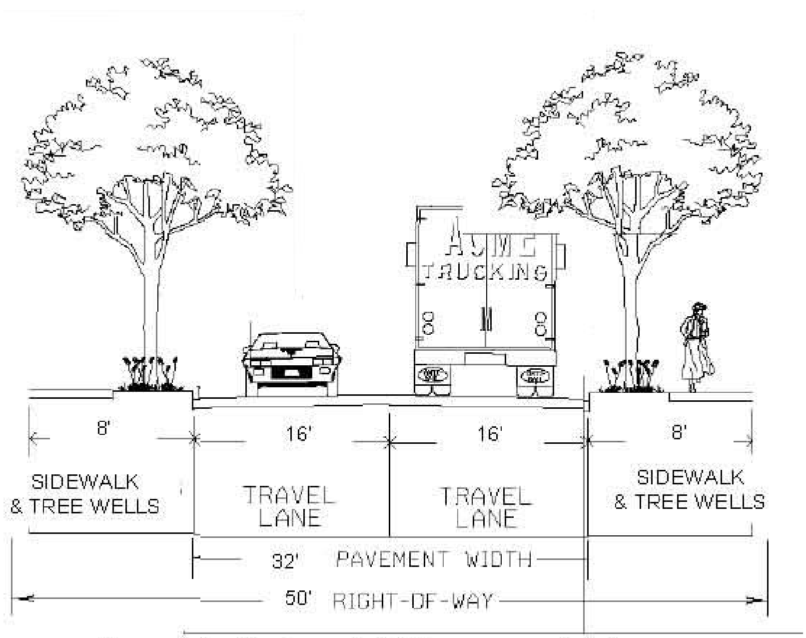
Sidewalks shall be a minimum of 5 feet wide on both sides of the street. They shall be separated from the roadway by a hardscape strip at least 5 feet wide that shall be designed to allow street trees in tree wells. The entire cross-section can be accommodated within a 60-foot right-of-way.

Minor Collector

The minor collector street shall have 36 feet of pavement. This section shall be striped to provide two travel lanes and two parking lanes.

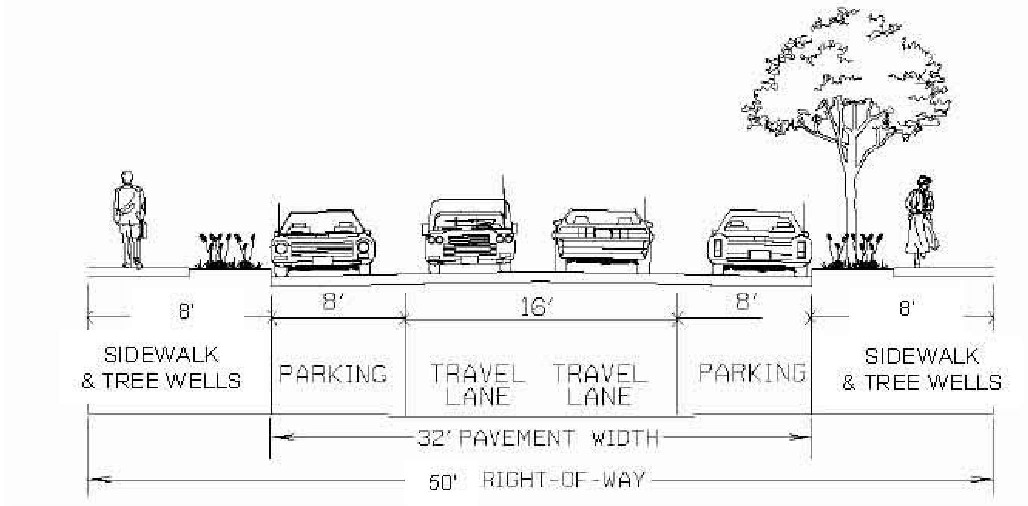


Collector in Industrial Area

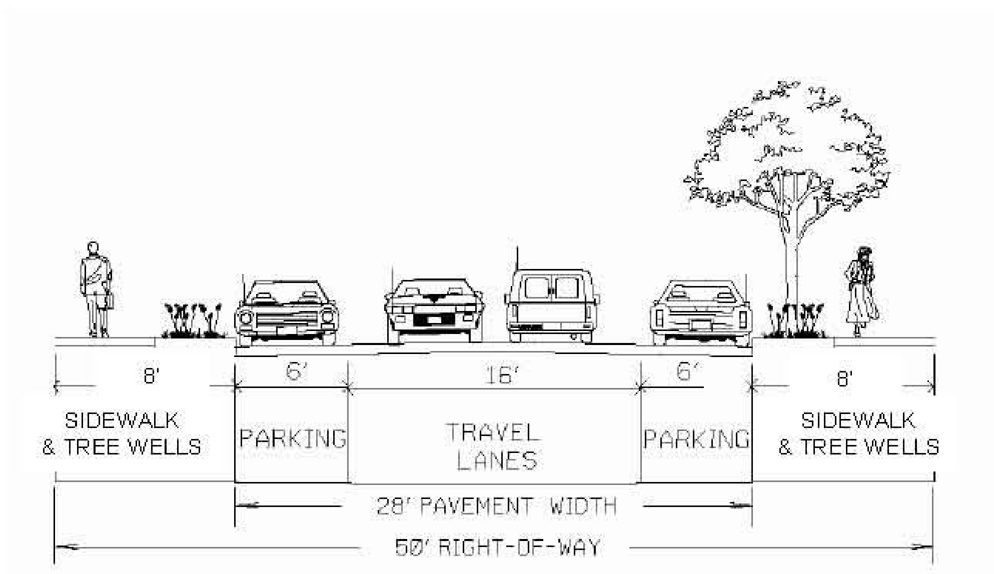


Local in Industrial/Commercial Area

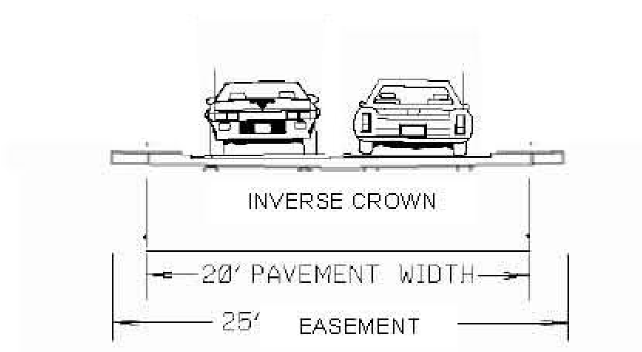
Figure 13
Street Design Standards



Local Residential "Type A"



Local Residential "Type B"



Private Street/Alley

Figure 13
Street Design Standards

Sidewalks shall be located on both sides of the street with a minimum width of 5 feet. Sidewalks shall be separated from the roadway by a hardscape strip at least 5 feet wide that shall be designed to allow street trees in tree wells.

The entire cross-section can be accommodated within a 60-foot right-of-way.

Collector in Industrial Areas

The industrial urban collector street shall be 42 feet wide. The pavement section shall be striped to provide two travel lanes and a two-way left turn lane.

Sidewalks shall be a minimum of 5 feet wide. They shall be separated from the roadway by hardscape strip at least 5 feet wide that shall be designed to allow street trees in tree wells. Overall, the sidewalk and hardscape strip dimension shall be 10 feet.

The entire cross-section, including sidewalks, planting strip, curbs, and pavement, can be accommodated within a 54-foot right-of-way.

Local Streets

Local streets form the majority of the street system in The Dalles. They are designed to carry the very low traffic volumes associated with the local uses that abut them. In The Dalles, the local streets help form part of the grid system; however, they are not intended to function as alternate routes to the arterial and collector street system. Local streets can serve either residential traffic, industrial or even low-volume commercial land uses.

The overriding consideration in the design of a local street is to provide direct access to land; the convenience of the through motorist is a secondary consideration. This holds true for all adjacent land uses.

To maintain neighborhoods, local residential streets shall be designed to encourage low speed travel and to discourage through traffic. Design speeds on local residential streets shall be 15 to 25 mph. When traffic volumes exceed approximately 1,000 to 1,200 vehicles per day, the residents on that street will begin to notice the traffic as a noise and safety problem.

On local industrial/commercial streets, accommodating large vehicles is an important consideration. Trucks must be able to maneuver in and out of driveways. These maneuvers often block local roadways for short periods of time.

Lastly, a good, well-connected grid system of relatively short blocks can minimize excessive volumes of motor vehicles by providing a series of equally attractive or restrictive travel options. This street pattern is also beneficial to pedestrians and bicyclists.

Six local street standards have been provided, as shown in ***Figure 13***.

TABLE 5
PROPOSED CITY STREET DESIGN STANDARDS

Road Type	Right-of-Way (feet)	On-Street Facilities: Pavement Width (feet)	Bike Lane (1) (feet)	Parking Lane (feet)	Curbs	Off-Street Facilities: Sidewalk (feet)	Planting Strip (2) (feet)	Total w/o Curbs (feet)
Arterial Streets								
Three-Lane Arterial	90	50	6 each side	None	Yes	5-10 each side	None	5-10 each side
One-Way Arterial with No Planting Strip	67	46	6 right side	8 each side	Yes	10 each side	None	10 each side
Collector Streets								
Major Collector	60	36	6 each side	None	Yes	5 each side	5 Optional	5-12 each side
Minor Collector	60	36	None	8 each side	Yes	5 each side	5 Optional	5-11 each side
Collector in Industrial Areas (3)	60	40	6 each side	None	Yes	5 each side	5 each side	10 each side
Local Streets								
Local in Industrial Areas	60	36	None	None	Yes	5-6 each side	5 Optional	5-11 each side
Type “A” Residential Street	60	32	None	Non-Striped	Yes	5-6 each side	8 each side	13-14 each side
Type “B” Residential Street	50	28	None	Non-Striped	Yes	5-6 each side	8 each side	13-14 each side
Residential Private Road	42	20	None	None	Yes	5-6 each side	5 each side	11 each side
Private Road	25	20	None	None	None	None	None	None

Notes:

(1) Bike lanes shall be located on both sides of the street except on one-way streets where they shall be located on the right side of the roadway. Bike lanes shall be located adjacent to the curb unless on-street parking is present. Then, they shall be located between the right-most travel lane and the parking lane.

(2) The planting strip shall be optional for all road types that have striped on-street parking. On arterial streets with no parking, a planting strip shall be included.

(3) Although it is preferable to have sidewalks on both sides of the industrial major collector, sidewalks may be located on only one side of the street.

Local Industrial/Commercial

A 32-foot-wide pavement section shall be provided for local streets in industrial or low-volume commercial areas (see ***Figure 13***). This section shall provide for two travel lanes.

Detached sidewalks shall be located on both sides of the street with a minimum width of 5 feet. They shall be separated from the roadway by either a landscape or hardscape strip at least 5 feet wide that shall be designed to allow street trees.

The entire cross-section, including sidewalks, planting strip, curbs, and pavement, can be accommodated within a 50-foot right-of-way.

Local Residential Type "A"

The local residential street shall have 32 feet of pavement. This section shall provide for two travel lanes and on-street parking on both sides of the street.

Sidewalks shall be a minimum of 5 feet wide and located on both sides of the street. They shall be separated from the roadway by either a landscape or hardscape strip at least 5 feet wide that shall be designed to allow street trees. Overall, the sidewalk and hardscape strip dimension shall be 8 feet.

The entire cross-section, including sidewalks, hardscape strip, curbs, and pavement, can be accommodated within a 50-foot right-of-way.

Local Residential Type "B"

The residential Type "B" is a variation of the residential street and shall only be permitted for streets where individual block lengths are shorter and 440 linear feet and/or streets that serve 16 or fewer lots for a cul-de-sac and 1,000 ADT for all other local residential streets. The pavement shall be 28 feet wide.

Because of the low volume of traffic, sidewalks shall not be required. When they are provided sidewalks shall be located on one or both sides of the street and shall have a minimum width of 5 feet. They shall be separated from the roadway by either a landscape or hardscape strip at least 5 feet wide that shall be designed to allow street trees. Overall, the sidewalk and landscape/hardscape strip dimension shall be 8 feet.

The entire cross-section, including sidewalks, planting strip, curbs, and pavement, can be accommodated within a 50-foot right-of-way.

Private Road/Alley

The private road shall have 20 feet of pavement with no on-street parking allowed. Because of the low volume of traffic, sidewalks shall not be required on private roads. The entire cross-section, can be accommodated within a 25-foot easement. The easement shall not include curbs or sidewalks. Drainage shall be provided along the center of the street by constructing the private road or alley with an inverted crest.

Alleys can be a useful way to diminish street width by providing rear access and parking to residential areas. Including alleys in a subdivision design allows homes to be placed closer to the street and eliminates the need for garages to be the dominant architectural feature. This pattern, once common, has been recently revived as a way to build better neighborhoods. In addition, alleys can be useful in commercial and industrial areas, allowing access by delivery trucks off of the main streets. Alleys shall be encouraged in the urban area of The Dalles.

Cul-de-Sac Streets

Cul-de-sac streets shall only be permitted in cases where development of a through street is not physically possible and shall not conflict with the Local Street Master Plan; for example, when topographic constraints prevent the development of a through street or in cases where existing development in the area precludes the development of a through street. When it becomes necessary to provide a cul-de-sac street in a new development, pedestrian and bicycle facilities shall be provided to connect the cul-de-sac street with the existing through street network in the area.

Cul-de-sac streets shall not exceed 440 feet in length and/or serve more than 16 dwelling units. Because the streets are short and the traffic volumes relatively low, the street width can be narrower than a standard residential street. The residential lane standard is acceptable for a cul-de-sac street.

Because the cul-de-sac streets are open at only one end, they should be designed with a special turning area at the closed end. Typically, this shall be a ‘bulb’ design with a 38-foot curb-side radius. However, under certain conditions, a ‘hammerhead’ or ‘tee’ type of turnaround may be considered. Any alternative turnaround designs shall be approved by the Fire Marshall and City Engineer prior to construction.

Separated Bicycle and Pedestrian Pathways

These facilities are located within exclusive rights-of-way and with minimal cross flow by motor vehicles. They shall be thought of as extensions of the roadway system in that they are intended for the exclusive or preferential use of bicycles and pedestrians in much the same way as freeways are intended for the exclusive or preferential use of motor vehicles. Sometimes they provide a commuting bicyclist or pedestrian with a short-cut (for example, a connection between cul-de-sac streets through a residential neighborhood). At other times, they provide an enjoyable recreational opportunity.

Pathway widths vary from 10 feet to 12 feet, depending on usage. Standards include:

- **10 feet** – The 10-foot pathway shall be the standard width for two-way paths. The pathway shall have good sight distance and be clear of vegetation and other obstacles. It may serve as a community-wide facility.

- **12 feet** – The 12-foot standards shall be applied to community-wide facilities that accommodate a variety of high uses (i.e. bicycles, joggers, and pedestrians). It shall be clear of vegetation and other obstacles and have good sight distance.

Pathways shall be accommodated in an 18-foot right-of-way.

Urban Bike Lanes

Bike lanes shall be provided on all arterial and collector streets. Where a bikeway is proposed within the street right-of-way, 12 feet of roadway pavement (between curbs) shall be provided for a six-foot bikeway on each side of the street. Except in rare circumstances, bicycle lanes on one-way streets shall be located on the right side of the roadway, be one-way, and flow in the same direction as vehicular traffic. The striping shall be done in conformance with the *State Bicycle and Pedestrian Plan* (1995).

In cases where curb parking will exist with a bike lane, the bike lane shall be located between the parking and travel lanes. In some situations, curb parking may have to be removed to permit a bicycle lane.

The bikeways on new streets or streets to be improved as part of the street system plan shall be added when the improvements are made. The implementation program identifies an approximate schedule for these improvements.

On arterial and collector streets that are not scheduled to be improved as part of the street system plan, bicycle lanes shall be added to the existing roadway at any time to encourage cycling, or when forecast traffic volumes exceed 2,500 to 3,000 vehicles per day. The striping of bicycle lanes on streets that lead directly to schools shall be a high priority.

Urban Sidewalks

Sidewalks shall be included on all urban streets as an important component of the pedestrian system. When sidewalks are located directly adjacent to the curb, they cannot accommodate such impediments as mailboxes, street light standards, and sign poles without widening the sidewalk since these features reduce the effective width of the walk. Sidewalks buffered from the street by a hardscape strip eliminate obstructions in the walkway, provide a more pleasing design as well as a buffer from traffic, and make the sidewalk more useable.

To maintain a safe and convenient walkway for at least two adults, a minimum 5-foot sidewalk shall be used in residential areas; a minimum 10-foot sidewalk shall be constructed along most arterials and major collectors, especially near commercial retail and school areas which may be characterized by higher pedestrian activity.

Sidewalk standards for general roadway classifications are:

- **Arterial** – Sidewalks on arterial streets shall be a minimum of 5-feet wide if separated from the roadway by a 10-foot wide hardscape strip. If on-street parking is provided, the sidewalk shall be located adjacent to the curb but must be at least 10 feet wide.

- **Collector** – Sidewalks on major and minor collector streets shall be a minimum of 5 feet wide. In general, they shall be separated from the street by at least a 5-foot wide hardscape strip. If on-street parking is provided, the sidewalk shall be located adjacent to the curb. Sidewalks adjacent to the curb shall be wider than 5 feet if possible.

- **Local** – Sidewalks on local streets shall be a minimum of 5 feet wide and be separated from the roadway by a 5-foot wide hardscape strip.

A complete pedestrian system shall be implemented in the urban portion of The Dalles planning area. Generally, every urban street shall have sidewalks on both sides of the roadway as shown in Figure 12 through Figure 13. Exceptions may include portions of Scenic Drive, where a sidewalk shall be provided on only one side of the roadway. In addition, pedestrian and bicycle connections shall be provided between any cul-de-sac or other dead-end streets.

Another essential component of the urban sidewalk system is street crossings. Intersections shall be designed to provide safe and comfortable crossing opportunities. This includes not only signal timing (to ensure adequate crossing time) and crosswalks, but also such enhancements as curb extensions and center medians.

Street Connectivity

Street connectivity is important because a well-connected street system provides more capacity than a disconnected one, provides alternate routes for local traffic, and is more pedestrian and bicycle-friendly.

Public streets serve a range of access and mobility needs, with facilities typically emphasizing either access or mobility. At one end of the access-mobility spectrum, freeways and expressways focus on mobility by moving high volumes of traffic at high speeds. Arterials and collectors combine mobility and access functions, with arterials generally emphasizing mobility over access and vice-versa for collectors. Local streets make up the majority of lane-miles in a city's transportation network, and function primarily as access routes connecting travel origins and destinations to the broader transportation network.

A well-connected local street network such as the downtown grid in The Dalles diffuses the traffic load by providing multiple connecting routes to any given destination. With increased connectivity, the need to construct ever-wider roadways with associated right-of-way needs and impacts to developed property can be reduced. Routes that are more direct tend to attract more traffic, but multiple connections provide nearby or parallel local routes offering comparable travel time. By spreading traffic around rather than concentrating it on a single route, multiple connections also help avoid excessive noise impacts on adjacent properties.

A well-connected local street system also benefits bicyclists and pedestrians. Shorter travel time and more direct access encourage additional bicycle and pedestrian travel. Multiple connections also offer pedestrians and bicyclists routes with less traffic and fewer potential conflicts with vehicles, creating a more pleasant travel environment.

The Dalles currently has a very effective grid street system in the central core area including downtown and the area over the hill south of the downtown area. The grid system structure deteriorates outside the core area. Ensuring that the core area grid street system development is extended as development occurs is critical to city's continued livability. To this end, a maximum block perimeter of 1,200 feet is recommended.

The City of The Dalles Local Street Master Plan (1999 Administrative Draft Plan) was drafted to address the City's local street planning needs and the associated State requirements as specified in OAR 660-12-045(e)(b) of the Transportation Planning Rule (TPR). The Local Street Master Plan, which contains recommendations for local street connectivity, is an important part of implementing the City's TSP.

With peak hour operations at level of service C or better, as reported in the City's TSP, it is unlikely that there is any appreciable level of diversion onto local streets created by drivers seeking to avoid congestion on arterial or collector roadways.

The Local Street Master Plan notes that access and traffic speed are the issues typically associated with the local street network, rather than congestion and level of service (LOS). As the TSP notes, the City's arterials and collector streets function at LOS C or higher, meaning that no real operation deficiencies exist for which the local network has to compensate. The Local Street Master Plan is divided into three Sections including the Existing Local Street System Documentation, the Future Local Street System, and Implementation Tools (Appendix F). The findings and recommendations of the Local Street Master Plan are incorporated by reference into the City's TSP.

ACCESS MANAGEMENT

Access management is the process that provides (or manages) access to land development while simultaneously preserving the flow of traffic on the surrounding road system in terms of safety and capacity.

Access management is an important key to balanced urban growth. As evidence, the lack of a prudent access management plan has led to miles of strip commercial development along the arterial streets of many urban areas. Business activities along arterial streets lead to increased traffic demands and the provision of roadway improvements to accommodate the increasing traffic demand. Roadway improvements stimulate more business activity and traffic demands. This often continues in a cyclical fashion, and requires extensive capital investments for roadway improvements and relocation. However, with the tightening of budgets by federal, state, and local governments, the financial resources to pay for such solutions are becoming increasingly scarce.

Reducing capital expenditures is not the only argument for access management. Access management is also essential to preserving the 'functional integrity' of the street system by reserving the high speed and high capacity roads for longer distance trips, and assigning the lowest restriction of access to local roads.

Additional driveways along arterial streets lead to an increased number of potential conflict points between vehicles entering and exiting the driveway and through vehicles on the arterial streets. This not only leads to increased vehicle delay and a deterioration in the level of service on the arterial, but also leads to a reduction in safety. Thus, it is essential that all levels of government try to maintain the efficiency of existing arterial streets through better access management.

Access Management Techniques

The primary goal of an access management program is enhanced mobility and improved safety by limiting the number of traffic conflicts. A traffic conflict point occurs where the paths of two traffic movements intersect. In the order of increasing severity, vehicle maneuvers on the street system that result in potential conflicts includes diverge, merge, and cross. In each case, drivers of one or more vehicles may need to take appropriate action in order to avoid a collision.

Crossing conflicts are the most serious because of the potential for high speed head-on collisions, nearly head-on collisions, or right-angle collisions. Hence, these conflict points are often referred to as 'major conflict points.' Diverge and merge conflicts are potentially less severe and are often referred to as 'minor conflict points.' Diverge conflicts occur when a driver executes a left-turn or right-turn maneuver, and merge conflicts occur where a vehicle makes a left or right-turn and enters a through traffic stream.

The area and complexity of the crossing conflicts are also affected by the roadway cross section. For example, on a two-lane roadway, each of the conflict points with the traffic stream approaching from the left and the right involves only one lane. With a four-lane cross section, each conflict point involves two lanes.

Traffic conflicts can be reduced either by restricting the number of access points along the arterial or by separating the conflict areas through traffic operations improvements.

The number of access points to an arterial can be restricted through the following techniques:

- Restrict spacing between access points based on the type of development and the speed along the arterial.
- Share access points between adjacent properties.
- Provide access via collector or local streets where possible.
- Construct frontage roads to separate local traffic from through traffic.
- Provide service drives to prevent spill-over of vehicle queues onto the adjoining roadways.
- Provide acceleration, deceleration, and right turn only lanes.
- Install median barriers to control conflicts associated with left turn movements.
- Install side barriers to the property along the arterial to restrict access width to a minimum.

Other access management strategies are described on the following pages.

Access Management Strategies

Access management strategies consist of managing the number of access points and/or providing traffic and facility improvements. The solution is a balanced, comprehensive program that provides reasonable access while maintaining the safety and efficiency of traffic movement. Standards have been developed for regulating driveway spacing, driveway width, number of driveways per property frontage, driveway sight distance, joint driveways, cross access, and other access management techniques.

Minimum Spacing of Driveways

Regulating the minimum spacing of driveways and public street intersections along the highway reduces the frequency of conflict by separating adjacent, basic conflict areas and limiting the number of basic conflict points per length of highway. An additional effect is that driveway vehicles will be delayed less by standing queues at signal-controlled intersections.

General Access Management

Driveway regulation or access management is hierarchical, ranging from complete access control on freeways to increasing use of streets for access purposes, parking and loading at the local and minor collector level. Table 6 describes recommended general access management guidelines by roadway functional classification and appropriate adjacent land use type.

In cases where standard access spacing cannot be met on arterial or collector streets due to the specific characteristics of the site and it use, the spacing shall not be reduced below the safe stopping sight distance for the posted speed on the roadway. Safe stopping sight distance shall be consistent with AASHTO guidelines[1].

These access management restrictions are not intended to eliminate existing intersections or driveways. Rather, they are best implemented by instituting them into the land use permitting process and applying them as new development occurs.

The challenge is greater in applying access management guidelines to a developed major arterial due to right-of-way limitations and concerns by the owners of the adjacent properties and the affected businesses. In such cases, such as along Old US 30 west of downtown, access management can be implemented as part of roadway improvement plans or as part of roadway retrofits plans.

[1] American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets 1990*.

TABLE 6
GENERAL ACCESS MANAGEMENT GUIDELINES

Functional Classification	Minimum Posted Speed	Minimum Spacing between Driveways and/or Streets	Appropriate Adjacent Land Use Type
Arterial Street (2-Way)	25-40 mph	300-400 feet	Community/neighborhood commercial near major intersections Industrial/office/low volume retail and buffered medium or higher density residential between intersections
Arterial Street (1-Way)	25-35 mph	150-300 feet	Community Commercial/office
Major Collector Street	25-35 mph	150-300 feet	light industry/offices and buffered medium or low density residential neighborhood commercial near some major intersections
Minor Collector Street	25-35 mph	75-150 feet	primarily lower density residential
Industrial Collector	25-35 mph	150-300 feet	Industrial

State Highway Access Management

Old US 30 and US 197 are the most heavily traveled routes through The Dalles (excluding I-84). Therefore, access management is important to promoting safe and efficient travel for both local and long distance users along US 30 and US 197 in The Dalles.

Goal 3 in the *1999 Oregon Highway Plan* addresses the issue of access management on state highways. Access management is balancing access to developed land while ensuring movement of traffic in a safe and efficient manner. To achieve effective transportation it is necessary to have a blend and balance of road facilities. Each performs its unique function, since no single class of highway can provide both high levels of movement and high levels of access to property. The spectrum ranges from freeways that provide for ease of movement through higher speeds, higher capacity and freedom from interruption to local residential streets that serve a diverse group of users from pedestrians to garbage collectors and emergency response vehicles by providing ease of access through slow speeds and numerous driveways.

Access can be managed a number of different ways, including freeway interchange placement and design, driveway and road spacing and design, traffic signal location, median design and spacing of openings, connectivity and the use of turn lanes. The challenge is to determine how to best apply these access management techniques on Oregon’s state highway system to safely protect the highway efficiency and investment, contribute to the health of Oregon’s local, regional and statewide economies, and support and maintain livable communities.

Implementation of access management is essential if the safety, efficiency and investment of the existing and planned state highways are to be protected. Roads link together as a chain and the roadway system is only as effective as its weakest link. The amount of access and how it is allowed to a state highway is a critical factor in determining how long the facility can remain functional, and is the largest contributor to safety. An uncontrolled number of driveways to a highway can cause it to be very unsafe, and some highways will not serve their intended function to carry people, freight, and goods throughout the state. Implementation of access management techniques produces a more constant traffic flow, which helps to reduce congestion, fuel consumption and air pollution.

The criteria for State Access Management Policies and the standards are found in Appendix C of the Oregon Highway Plan and are implemented through OAR 734.051. These policies and standards are to be applied to the development of all ODOT highway construction, reconstruction or modernization projects and approach road permits, as well as all planning processes involving state highways, including corridor plans, refinement plans, state and local transportation system plans and local comprehensive plans.

The policy and procedures for Deviations and the standards, and the policy and procedures for Appeals portions of the Access Management Policies as set forth in OAR 734.051 apply to local governments, private applicants, and state agencies, including ODOT, where there is a desire to apply standards and criteria different than those outlined in the Access Management Policies, for the following instances:

All approach road and private road crossing requests for approaches to state highways.
New state highway construction projects and new highway plans.
Any reconstruction or modernization work on state highways.

All proposed traffic control devices on the state highway system must have prior approval of the State Traffic Engineer and may include criteria not set forth in these policies.

Policy 3A, Classification and [Access] Spacing Standards, of the OHP states: "It is the policy of the State of Oregon to manage the location, spacing and type of road and street intersections and approach roads on state highways to assure the safe and efficient operation of state highways consistent with the classification of the highways." For highways in The Dalles, access to state highways is defined as follows –

Freeways – Interstate (I – 84)

- Freeways are multi-lane highways that provide for the most efficient and safe high speed and high volume traffic movement.
- Interstate Freeways are subject to federal interstate standards as established by the Federal Highway Administration.
- Freeways are subject to ODOT's Interchange Policy.
- ODOT owns the access rights and direct access is not allowed. Users may enter or exit the roadway only at interchanges.
    - Preference is given to through traffic.
    - Driveways are not allowed.
- Traffic signals are not allowed.
- Parking is prohibited.
- Opposing travel lanes are separated by a wide median or a physical barrier.
- Grade separated crossings that do not connect to the freeway are encouraged to meet local transportation needs and to enhance bicycle and pedestrian travel.

The primary function is to provide connections and links to major cities, regions of the state, and other states.

Access management standards for I-84 as given in Table 12 in Appendix C of the OHP shown below in Table 7.

TABLE 7
INTERCHANGE SPACING

Access Management Classification	Area	Interchange Spacing
Interstate and Non-Interstate Freeways (NHS)	Urban	3 miles (5 kilometers)
	Rural	6 miles (10 kilometers)

In addition to defining the spacing of interchanges on the interstate, Appendix C of the Oregon Highway Plan also establishes access management spacing standards for connecting roads. Table 16 and Figure 18 in Appendix C establish spacing standards for two-lane connecting roads. These are shown in Table 8 and 9 below.

TABLE 8:
MINIMUM SPACING STANDARDS APPLICABLE TO FREEWAY INTERCHANGES WITH TWO-LANE CROSSROADS

Category of Mainline	Type of Area	Spacing Dimension			
		A	X	Y	Z
Freeway	Fully Developed Urban	1 mi. (1.6 km)	750 ft. (230 m)	1320 ft. (400 m)	750 ft. (230 m)
	Urban	1 mi. (1.6 km)	1320 ft. (400 m)	1320 ft. (400 m)	990 ft. (300 m)
	Rural	2 mi. (3.2 km)	1320 ft. (400 m)	1320 ft. (400 m)	1320 ft. (400 m)

Notes:

1) If the crossroad is a state highway, these distances may be superseded by the Access Management Spacing Standards, providing the distances are greater than the distances listed in the above table.
2) No four-legged intersections may be placed between ramp terminals and the first major intersection.
A =Distance between the start and end of tapers of adjacent interchanges
X =Distance to the first approach on the right; right in/right out only
Y =Distance to first major intersection; no left turns allowed in this roadway section
Z =Distance between the last right in/right out approach road and the start of the taper for the on-ramp

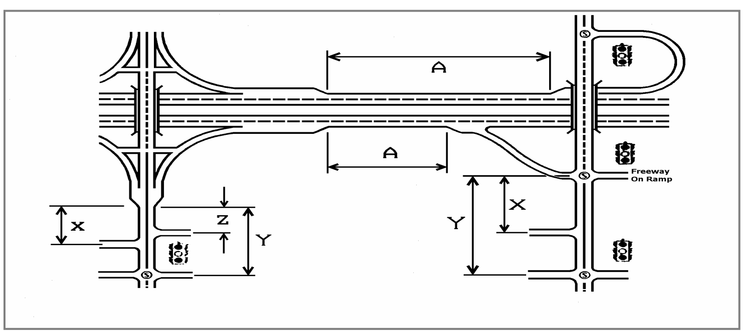
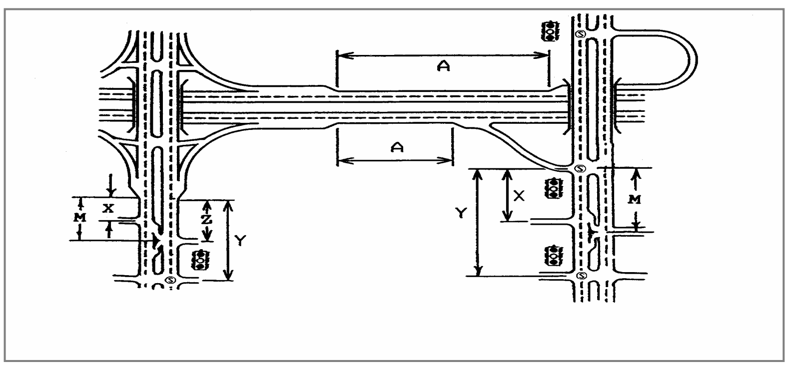


TABLE 9:
MINIMUM SPACING STANDARDS APPLICABLE TO FREEWAY INTERCHANGES WITH MULTI-LANE CROSSROADS

Category of Mainline	Type of Area	Spacing Dimension				
		A	**X**	**Y**	**Z**	**M**
Freeway	Fully Developed Urban	1 mi. (1.6 km)	750 ft. (230 m)	1320 ft. (400 m)	990 ft. (300 m)	1320 ft. (400 m)
	Urban	1 mi. (1.6 km)	1320 ft. (400 m)	1320 ft. (400 m)	1320 ft. (400 m)	1320 ft. (400 m)
	Rural	2 mi. (3.2 km)	1320 ft. (400 m)	1320 ft. (400 m)	1320 ft. (400 m)	1320 ft. (400 m)

Notes:
1) If the crossroad is a state highway, these distances may be superseded by the Access Management Spacing Standards, providing the distances are greater than the distances listed in the above table.
2) No four-legged intersections may be placed between ramp terminals and the first major intersection.
A=Distance between the start and end of tapers of adjacent interchanges
X=Distance to first approach on the right; right in/right out only
Y=Distance to first major intersection
Z=Distance between the last approach road and the start of the taper for the on-ramp
M=Distance to first directional median opening. No full median openings are allowed in non-traversable medians to the first major intersection Figure 19: Measurement of Spacing Standards for Table 17



Regional Highways (US 197)

- Regional Rural Highways provide for efficient and safe medium to high speed and medium to high volume traffic movements.
- These highways serve as routes passing through areas which have moderate dependence on the highway to serve land access.
- The function of the highway supports selected acquisition of access rights. Purchase of access rights should be considered where beneficial such as, but not limited to, ensuring safe and efficient operation between connecting highways in interchange areas, protecting resource lands, preserving highway capacity on land adjacent to an urban growth boundary, or ensuring

safety on segments with sharp curves, steep grades or restricted sight distance, or those with a history of accidents.

The primary function of these highways is to provide connections and links to regions within the state, and between small urbanized areas and larger population centers through connections and links to Freeways, Expressways, or Statewide Highways.

The function of the highway is consistent with selected acquisition of access rights. Purchase of access rights should be considered where beneficial such as, but not limited to, ensuring safe and efficient operation between connecting highways in interchange areas, protecting resource lands, or ensuring safety on segments with sharp curves, steep grades or restricted sight distance, or those with a history of accidents.

Access management standards for US 197 are given in Table 14 in Appendix C of the OHP shown below in Table 10.

TABLE 10:
ACCESS MANAGEMENT SPACING STANDARDS FOR REGIONAL HIGHWAYS (MEASUREMENT IS IN FEET)*

	Rural		Urban			
Posted Speed	**Expressway****	**Other**	**Expressway****	**Other**	**UBA**	**STA**
≥55	5280	990	2640	990		
50	5280	830	2640	830		
40 & 45	5280	750	2640	750		
30 & 35		600		600	425	150
≤25		450		450	350	150

TABLE 11:
ACCESS MANAGEMENT SPACING STANDARDS FOR DISTRICT HIGHWAYS (Measurement is in Feet)*

	Rural		Urban			
Posted Speed	**Expressway****	**Other**	**Expressway****	**Other**	**UBA**	**STA**
≥55	5280	700	2640	700		
50	5280	550	2640	550		
40 & 45	5280	500	2640	500		
30 & 35		400		400	350	150
≤25		400		400	350	150

District Highways (US 30)

- These highways provide for safe and efficient medium speed and medium to high volume traffic movements.
- Traffic movement demands and access needs are more evenly balanced, with reasonable access to abutting property.

The function of the highway supports acquisition of access rights in limited circumstances, recognizing the balanced demands of traffic movement and access needs. Purchase of access rights should be considered where beneficial such as, but not limited to, ensuring safe and efficient operation between connecting highways in interchange areas, protecting resource lands, preserving highway capacity on land adjacent to an urban growth boundary, or ensuring safety on segments with sharp curves, steep grades or restricted sight distance, or those with a history of accidents.
The primary function of these highways is to provide connections and links to intercity, inter-community and intra-city movements.

Access management standards for US 30 is given in Table 15 in Appendix C of the OHP shown above in Table 10.

The function of the highway is consistent with acquisition of access rights in limited circumstances, recognizing the balanced demands of traffic movement and access needs. Purchase of access rights should be considered where beneficial such as, but not limited to, ensuring safe and efficient operation between connecting highways in interchange areas, protecting resource lands, or ensuring safety on segments with sharp curves, steep grades or restricted sight distance, or those with a history of accidents.

US 30 was turned over to The Dalles from the Chenoweth Interchange on the West to the Marina Interchange on the East. Access management between those two points should follow the general access management guidelines identified in Table 6.

STREET, BICYCLE, AND PEDESTRIAN SYSTEM ELEMENT

The street system element of The Dalles TSP includes a list of street, bicycle, and pedestrian system projects. The list identifies improvements needed on the city's arterial and collector street system to serve the long-range needs for mobility and accessibility, based upon adopted land use patterns.

The project list was identified based on an evaluation of the existing roadway system in terms of its relationship to the study area goals and objectives and to relevant state and federal regulations. These objectives relate to making the most efficient use of the existing transportation infrastructure; and to providing adequate mobility, safety, and accessibility to all modes of transportation. The list was reviewed by 1999 TAC members and was altered as necessary to reflect local priorities and information available to local agency staff.

The proposed street system improvement projects summarized in Table 12 and illustrated in ***Figure 14*** identifies improvements needed on the arterial and collector street system in the project study area to serve the needs of through and local traffic, based upon adopted land use patterns. Besides new street connections, the list also includes projects that would widen existing streets to provide adequate vehicular capacity and to provide safe access via bicycle and pedestrian modes of travel.

In 2005, this section was updated to include the street, bicycle and pedestrian projects that have been proposed since the 1999 TSP update. The new projects are shown on ***Figure 14***, *Street Improvement Projects,* in Table 12, *Street, Bicycle and Pedestrian Improvement Projects* as items 10S through 23S and in the project list at the end of this element.

The projects are listed so that all sixteen short-range projects appear at the beginning of the list in Table 12. Next on the list, the two intermediate-range projects are listed; and finally, the list includes six long-range projects.

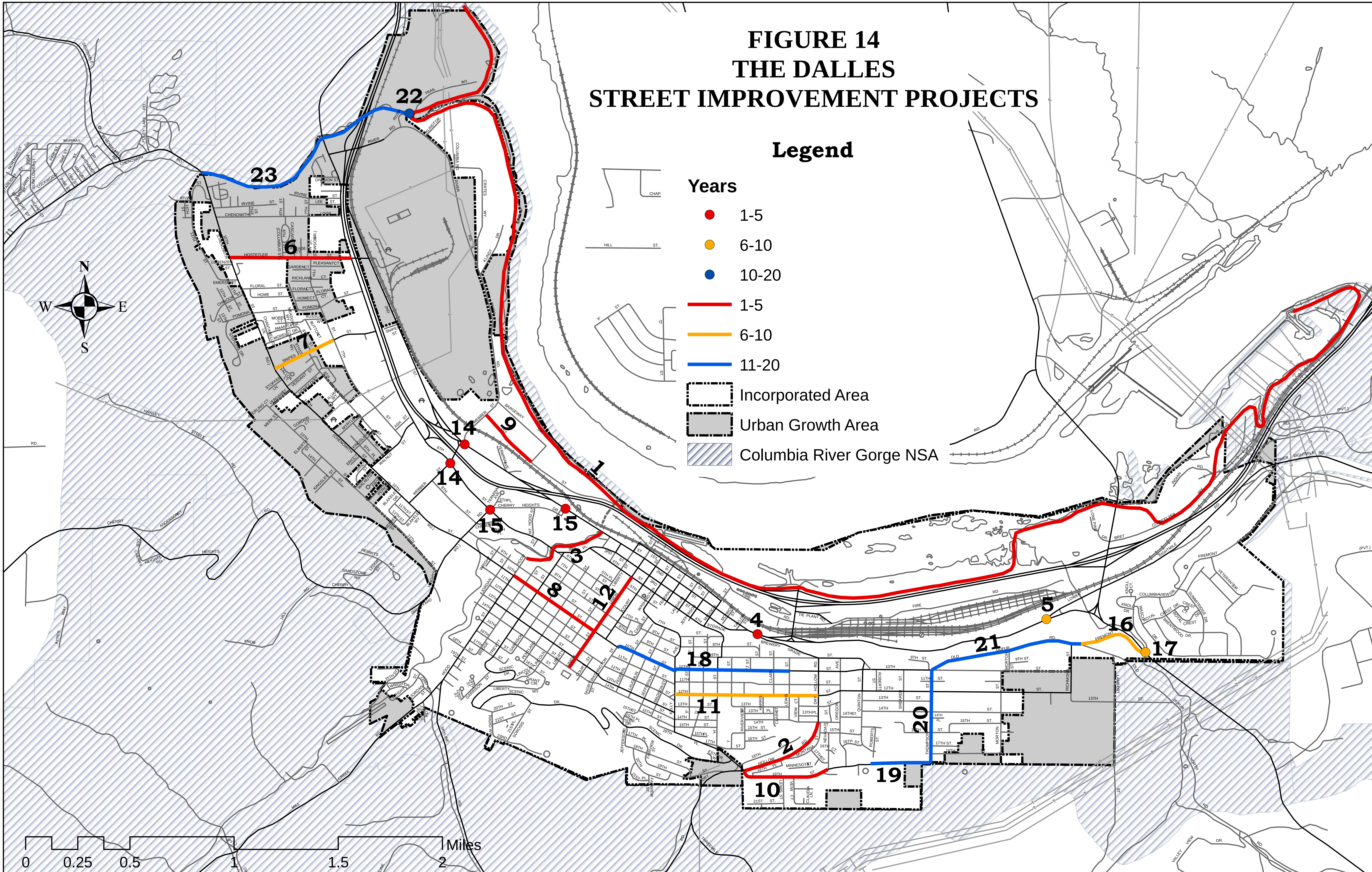


FIGURE 14
THE DALLES
STREET IMPROVEMENT PROJECTS
Legend
Years
1-5
6-10
10-20
1-5
6-10
11-20
Incorporated Area
Urban Growth Area
Columbia River Gorge NSA
0
0.25
0.5
1
1.5
2
Miles
N
S
E
W

The projects are arranged alphabetically within each term period. North-south street improvements describe the project location from south to north, and the east-west street improvement projects describe the project location from west to east. Intersection improvement locations are described with the north-south street listed first, and then the east-west cross street.

The following information is included for each project in the list in Table 12:

- Project location, including termini
- General project description
- Project improves travel by mode
- Project justification
- Project phasing
- Financial partners
- Project distance in miles (where applicable)
- Project cost

Project Characteristics

Each of the above items identified in the preliminary draft project list is explained in the following discussion.

Project Location

For most projects, the description of location is a street segment defined by the street name and termini. For others, the location is an intersection. Location information will be refined when further analysis and preliminary engineering is conducted prior to construction.

Project Description

Only a general description of each project is included. Project information will be refined several times between a project's inclusion in this list and its construction. A project is analyzed before it is added to a capital improvement program and again when preliminary engineering is undertaken a year or two prior to construction.

When planning is undertaken for specific projects, many variables are considered including: traffic volumes and turns, accident history, the percentage of trucks and buses, the location of intersecting streets and driveways, the available right-of-way, topographic constraints, utility conflicts, and impacts on property owners. After such information has been analyzed, general descriptions from this plan can be refined and more specific information can be made available.

Generally, high-cost projects require more analysis and planning than low-cost projects. For example, the construction of an arterial street for a new location may require a corridor or location study, and environmental analysis, public hearings, and right-of-way negotiations and acquisition. In some cases, an affirmative vote of residents of the city or county may also be required. On the other end of the scale, installation of traffic signals, for example, may require only limited technical analysis and preparation of construction plans and specifications.

Table 12

Street, Bikeway, and Pedestrian System Improvements Project List

New Project No.	Project Location	Project Description	Project Improves Travel by Mode			Project Justification					Project Phasing	Financial Partners				Project Cost
			Vehicle	Bicycle	Pedestrian	Access	Economic	Safety	Operations	Upgrade		ODOT	County	The Dalles	Other	$000
1S	Riverfront Trail	Complete Construction of Bike/Ped Trail		■	■	■		■			Short			■	■	$500
2S	Dry Hollow Road, 14th to 19th Street	Re-stripe existing pavement to provide bike lanes		■		■		■		■	Short			■		$8
3S	Mill Creek, 2nd - 8th Place	Construct Bikeway and Pedestrian Trail		■	■	■		■			Short			■	■	$500
4S	Second Street and Brewery Grade	Redesign Intersection	■	■	■			■	■	■	Short	■		■		$2,200
5M	Highway 30 and Lower Eight Mile Road	Redesign Intersection	■	■	■			■	■		Intermediate	■		■		$250
6S	Hostetler Street, Sixth to Tenth Street	Re-stripe to provide bike lanes; add curbs and sidewalks		■	■	■		■		■	Short		■			$2,000
7M	Snipes Street, 7th to 10th Street	Widen to Major Collector cross-section		■	■	■		■		■	Intermediate		■			$1,000
8S	Tenth Street, Union Street and Mt. Hood Road	Remove street surface and provide overlay	■							■	Short			■		$250
9S	West First Street, Webber Street to Railroad Spur	Widen to Industrial Collector Standards	■		■			■	■		Short			■		$1,200
10S	Nineteenth Street, Dry Hollow Road and MCMC	Remove street surface and provide overlay	■							■	Short			■		$200
11M	Twelfth Street, Kelly Avenue and Dry Hollow Road	Remove street surface and provide overlay	■							■	Intermediate			■		$300
12S	Union Street, 4th - 14th Streets	Remove street surface and provide overlay	■							■	Short			■		$300
13M	East Nineteenth Street, Nineteeth Street to Dry Hollow Road	Widen to Local Residential Type "A" cross-section	■		■	■			■		Short			■		$500
14S	West 2nd & W 6th Streets @ Webber	Improve traffic signals	■		■			■	■	■	Short			■		$180
15S	West 2nd & W 6th Streets/Cherry Heights Road Intersections	Install traffic signals	■		■			■	■		Short			■		$500
16M	Fremont Street, Old Dufur Road to Highway 197	Widen shoulders to provide bike lane	■	■	■	■		■		■	Intermediate		■	■		$1,000
17M	Highway 197 and Fremont Street/Columbia View Drive	Re-design Intersection	■	■	■	■		■	■		Intermediate	■	■	■		$7,000

Table 12

Street, Bikeway, and Pedestrian System Improvements Project List

New Project No.	Project Location	Project Description	Project Improves: Vehicle	Bicycle	Pedestrian	Project Justification: Access	Economic	Safety	Operations	Upgrade	Project Phasing	Financial Partners: ODOT	County	The Dalles	Other	Project Cost $000
18L	Tenth Street, Washington to Lewis Street	Widen to Major Collector cross-section	■	■				■	■	■	Long			■		$2,000
19L	Nineteenth Street, Dead End to Thompson Street	Construct to Major Collector cross-section	■	■	■	■	■				Long			■		$1,220
20L	Thompson Street, Tenth to Nineteenth Street	Widen to Major Collector cross-section		■	■	■		■		■	Long			■		$2,500
21L	Old Dufur Road, Tenth to Fremont Street	Widen to Minor Collector cross section with curb/parking.sidewalk one-side	■	■	■	■		■		■	Long		■	■		$2,500
22L	River Road over Chenoweth Creek	Widen Bridge	■	■	■	■	■	■			Long	■	■	■		$1,500
23L	Chenoweth Creek	Construct Bikeway and Pedestrian Trail		■	■	■		■			Long			■	■	$750
Short Term Project Costs Total																**$7,838**
Intermediate Term Project Costs Total																**$10,050**
Long Term Project Costs Total																**$10,470**
Total Project Costs																**$28,358**

Project Improves Travel by Mode

Projects in the list are aimed at improving some or all of the following three travel modes: vehicle, bicycle, and pedestrian.

Approximately 50 percent of the street improvement projects would improve travel by vehicular mode. These include street projects that would add mainline through capacity, projects that would add median turning lanes, as well as those projects that would upgrade the street to urban or rural standards. Also, all of the street improvement projects would improve travel by the bicycle mode and about 80 percent would improve travel for pedestrians through the provision of bicycle lanes/shoulder bikeways and sidewalks, respectively.

Project Justification

Seven different project justifications are shown in the roadway projects list. Multiple justifications are indicated for most projects. The following is an explanation of those project justifications:

Access improvements are specified as a justification for 14 street and highway projects. New collector and arterial streets designed to serve presently undeveloped land are labeled as access improvements. Many existing streets proposed for upgrading also qualify since a portion of the forecast traffic increase is from land that is presently undeveloped.

Economic development is indicated on three projects where access would be improved for land designated for commercial and industrial use. Economic development is generally regarded as the attraction and expansion of employers, thus the emphasis on commercial and industrial sites.

Safety is indicated as a justification for 15 proposed projects on the street and highway list. A majority of the proposed projects are designed to improve safety for bicyclists and pedestrians. Improvements in other instances, such as outlying collector streets, may be needed as the area grows and traffic increases, to maintain or enhance safety conditions.

Operations improvement is included as a justification for four of the projects in the list. Most of these projects are intersections where excessive delays occur or are anticipated. Some other projects include widening of the roadway to accommodate additional travel lanes, a raised median, or a continuous two-way left-turn only lane.

Upgrade to urban standards is included as a justification on ten of the projects in the list. In developing the list, it was assumed that urban standards (including curbs, gutters, and sidewalks) were appropriate for most collector and arterial streets within the UGB. Streets constructed to urban standards are generally thought to be more aesthetically pleasing, safer, and less costly to maintain than those not constructed to urban standards. In addition, streets constructed to urban standards generally include underground storm drainage.

Project Phasing

Projects in the list are divided into the general categories: short-, medium-, and long-range according to the phase in which construction would take place. Since environmental analysis, design, engineering work, and right-of-way acquisition precede construction, these activities may be undertaken in the phase preceding that listed for construction.

The proposed phasing is not an implementation schedule since no priorities have been set within each phase. The actual timing for project implementation will be determined later via updates of the three-year Transportation Improvement Program (TIP) by ODOT, and updates to the capital improvement programs for Wasco County and the City of The Dalles. The construction of any project is contingent upon the availability of revenues in the future. Thereby, inclusion of a project in a particular phase does not represent a commitment to complete the project during that phase. It is expected that some projects may be accelerated and others delayed.

The project phasing is based on a 1997 estimate of project need and justification, funding availability and rate of land development. Should any of the factors that influence phasing prove different than expected, changes in phasing may be required. For example, a more rapid than expected land development or the occurrence of a safety or operational problem may result in the need to advance a project. Availability of funds restricted to a particular type of project may also make it appropriate to advance or delay a project.

The projects in the short-, intermediate- and long-range phases generally have the following characteristics:

Projects identified as **short-range** needs are expected to be needed within five years of plan adoption (2010). The short-range projects are generally designed to correct existing deficiencies (e.g., maintenance, operational or safety problems) with a lower improvement cost.

Projects identified as **Intermediate-range** needs are expected to be needed six to ten years after plan adoption (2011-2015). Intermediate-range projects generally include collector and arterial streets that need to be upgraded to urban standards where future land development is likely to occur in the first half of the planning period. In addition, intermediate-range projects include those projects needed to correct level of service or operational problems, but that have long lead times before construction due to high capital cost, the need to purchase right-of-way or the need to complete environmental assessments, and also those projects for which funding has not yet been identified and is unlikely to be available in the short-range.

Projects identified as **long-range** are expected to be needed more than ten years after plan adoption (2016+). Long-range projects generally include those projects needed to ensure that urban standards are provided on all the remaining collector streets within the urban growth boundary. In addition, long-range projects also include higher capital costs for which funding will be unlikely until the later years after plan adoption.

Financial Partners

This category indicates the agencies that would be responsible for providing funding for the project. For projects that have more than one source of agency funding, the agency that currently has jurisdiction over the roadway segment is indicated as the likely lead.

Since project timing and financing are not binding, the financial partner listing does not represent a commitment by a particular agency to construct that project. For example, Wasco County has been indicated as the lead for all county road improvement projects. However, the county may expect the City of The Dalles to take the lead on roadway improvements and upgrades of county roads located inside The Dalles UGB and/or city limits.

Project Cost

The costs shown in this project list are preliminary planning estimates calculated in 1996 dollars. The estimates include the cost of construction, engineering, and right-of-way acquisition, where appropriate. Cost estimates are based upon costs of similar street and highway projects constructed in recent years.

Cost estimates will be refined as the construction date approaches. More precise cost estimates will be prepared when projects are proposed for inclusion in local agencies' capital improvement programs. Even more detailed estimates will be made during preparation of design engineering and construction specifications. Among the variables that influence the cost are right-of-way acquisition, storm drainage facilities and utility relocations. The cost of these can vary greatly and may not be known until engineering work is completed.

Recommended Improvements

Each of the recommended improvements is discussed in the following pages.

Short-range improvements (designated with and "S" after the project number) would be implemented in a time frame of less than five years (By 2010). The required short-range improvements were identified based on field observations, traffic volume measurements, accident analysis, and an analysis of current capacity and circulation deficiencies. In 2005, this section was updated to include the street, bicycle and pedestrian projects that have been proposed since the 1999 TSP update. Projects identified as intermediate-range needs (designated with and "M" after the project number) are expected to be needed five to ten years after plan adoption (2011-2015). Finally, projects identified as long-range needs (designated with and "L" after the project number) are expected to be needed more than ten years after plan adoption (2016+). The new projects are shown in ***Figure 14***, *Street Improvement Projects*, in Table 12, *Street Bicycle and Pedestrian Improvement Projects* as items 10S through 23S and the project list at the end of this element.

<u>1S: Riverfront Trail</u>

A separated bicycle and pedestrian recreational trail is proposed along the Columbia River with access points at Chenoweth Creek, Webber Street, Union Street, and Riverfront Park. The bicycle and pedestrian pathway should be paved to be 12 feet wide, with an additional three feet of area adjacent to the pavement graded to provide clearance from trees, poles, walls, fences, guardrails, and other lateral obstructions. The 12-foot-wide pathway would provide for two-directional bicycle traffic along with its shared use by joggers and other pedestrians.

The complete length of the proposed trail is approximately 10 miles. Of this, several segments totaling 6 miles are already completed in 1999. These include the trail from the west end of the Marina parking lot to the Cherry Growers processing plant, the Discovery Center to River Road (3.4 miles), and The Dalles Dam to the ODOT property.

<u>2S: Dry Hollow Road between Fourteenth Street and Nineteenth Street</u>

Dry Hollow Road is classified as a major collector street. The existing pavement from Ninth Street to Fourteenth Street is 52 feet wide with on-street parking and curbs and sidewalks on both sides of the street. The existing pavement from Fourteenth Street to Nineteenth Street is narrower at 42 feet wide; parking is provided on both sides. The segment is curbed on both sides, and has intermittent sidewalks on the east side only. Bike lanes should be provided along the narrower 42-foot-wide pavement between Fourteenth Street and Nineteenth Street by removing on-street parking along the west side of the street. The 42-foot-wide pavement should be re-striped to include two travel lanes (one in each direction), two bike lanes (one on each side) and a parking lane on one side of the street.

<u>3S: Mill Creek Trail</u>

A separated bicycle and pedestrian recreational trail is proposed along the west bank of Mill Creek with several potential access points from residential streets. The trail would turn west from Mill Creek and connect with the street system at the intersection of Cherry Heights Road and Thirteenth Street. The bicycle and pedestrian pathway should be paved to be 12 feet wide, with an additional three feet of area adjacent to the pavement graded to provide clearance from trees, poles, walls, fences, guardrails, and other lateral obstructions. The 12-foot-wide pathway would provide for two-directional bicycle traffic along with its shared use by joggers and other pedestrians.

<u>4S: Intersection of Second Street and Brewery Grade</u>

A number of improvements have been implemented at the intersection of Brewery Grade and Second Street to address operational and safety problems. The northern viaduct lane and westbound lane on Second Street from the Boat Basin Overpass are merged to a single westbound traffic lane. Westbound traffic on Second Street from the Boat Basin Overpass desiring access to Brewery Grade can enter a protected shelter lane for the left hand turn movement. Traffic on Brewery Grade entering Second Street is channeled into a dedicated right or left hand turn lane. The left turn lane enters a westbound shelter lane protected from through westbound traffic. Eastbound traffic on Second Street is channelized at Taylor Street to provide a designated lane eastbound leaving downtown The Dalles and a dedicated lane up Brewery Grade. An actuated traffic signal should be installed at the intersection as a future improvement when growth and development of properties on the north side of Second Street occurs.

<u>5M: Intersection of US 30 and Lower Eight Mile Road</u>

The intersection of US 30 and Lower Eight Mile Road should be redesigned to form a right-angle. A standard separate left-turn lane should be provided for eastbound US 30 traffic turning into Lower Eight Mile Road. At the intersection with US 30, Lower Eight Mile Road should consist of one inbound lane and two outbound lanes consisting of separate right-turn and left-turn lanes. The right-turn from westbound US 30 to Lower Eight Mile Road should remain as a free-right.

<u>6S. Hostetler Street between Sixth Street and Tenth Street</u>

Hostetler Street is classified as a major collector street in this segment. The existing pavement is 36 feet wide with parking on both sides of the street. The existing street between Sixth Street and Tenth Street should be re-striped to include two travel lanes and two bike lanes on each side of the street. Also, curbs and sidewalks should be added on both sides of the street.

7M: Snipes Street between Sixth Street and Tenth Street

Snipes Street is classified as a minor collector street from Sixth Street to Tenth Street. The existing pavement from Sixth Street to Ninth Street is 44 feet wide with on-street parking permitted on both sides of the street, and it is 22 feet wide for the two block segment from Ninth Street to Tenth Street with no on-street parking. The existing street from Ninth Street to Tenth Street should be widened to include two travel lanes (one in each direction) for shared bicycle use and two parking lanes (one on one side). Also, curbs and sidewalks should be provided on both sides of the pavement.

8S: West 10th – Union to Mt. Hood

West 10th Street is classified as a minor arterial from Union to Mt. Hood Streets. Street surface needs to be removed and street overlaid.

9S: West 1st Street [Rebuild if LID Fails]

All of West 1st Street is classified as a major collector. The existing street between Webber Street and the railroad spur should be widened to include two travel lanes (one in each direction), curbs provided on both sides of the pavement and a sidewalk on the north side of the roadway.

10S: East 19th, Dry Hollow to Mid Columbia Medical Center (MCMC)

East 19th Street between Dry Hollow and MCMC is classified as a major collector. Street surface needs to be removed and street overlaid.

11M: East 12th Street - Kelly to Dry Hollow

East 12th Street is classified as a major collector from Kelly Street east to Dry Hollow Rd. Street surface needs to be removed and street overlaid.

12S: Union St – 4th to 14th Street

Union Street is classified as a major collector from 4th Street to 14th Street and as a minor arterial from 3rd Street to 1st Street. According to the 5-Year CIP, Union Street needs to be profiled and paved.

13M: East 19th Street – 19th to Dry Hollow Rd

All of East 19th Street is classified as a major collector. The existing street between 19th Street and Dry Hollow Road should be widened to include two travel lanes (one in each direction), and two parking lanes (one on one side). Also, curbs and sidewalks should be provided on both sides of the pavement.

14S: West 2nd and West 6th Street @ Webber

West 2nd and West 6th Streets are classified as a major arterial where they intersect with Webber Street. The 5-Year CIP calls for traffic control signals on Webber at both West 2nd and West 6th Streets.

15S: West 2nd and West 6th Streets @ Cherry Heights Road

The intersection of Cherry Heights Road with West 2nd and West 6th Street is classified as a major and minor arterial respectively. Traffic control signals to be installed at the intersection of West 2nd and West 6th Streets and Cherry Heights Road.

16M: Fremont Street between US 197 and Old Dufur Road

Fremont Street is classified as a minor arterial street. The existing pavement is generally 20 feet wide with two ten-foot travel lanes, no shoulders, and no on-street parking permitted. The roadway should be widened to accommodate two travel lanes and a bike lanes on each side of the street. Also, curbs shall be provided on both sides of the street and sidewalks shall be provided on one side of the street.

17M: Intersection of US 197 and Fremont Street/Columbia View Drive (Wasco County roadway)

To improve safety at the intersection of US 197 and Fremont Street/Columbia View Drive, an over-crossing of the highway should be added to allow through traffic to cross the highway unimpeded and without the conflicts of the at-grade crossing. Also, ramps should be provided to access the highway and they would be designed so that all ingress would be by a right-turn. The actual design of this improvement will be determined through further study.

18L: Tenth Street from Washington Street to Lewis Street

Because Tenth Street is the only road other than (Former) US 30 which crosses the entire length of the city, the roadway should be upgraded to better accommodate traffic. The existing street should be widened to minor arterial standard and additional right-of-way should be acquired so as widen the right-of-way to 60 feet to accommodate the wider street.

19L: Nineteenth Street from Dead End to Thompson Street

Nineteenth Street provides primary access to Mid-Columbia Medical Center. Nineteenth Street currently dead ends just east of the medical center. Nineteenth Street should be extended east to align and connect with the existing Thompson Street located in the southeast portion of the planning area. The pavement of the new connection should be built to major collector standards with two travel lanes, two bike lanes and a parking lane on one side. Also, continuous curb, gutter, planting strip, and sidewalks should be provided on both sides of the street.

20L: Thompson Street between Tenth Street and Nineteenth Street

Thompson Street is classified as a major collector street. The existing pavement from Tenth Street to Nineteenth Street is 26 to 28 feet wide with intermittent on-street parking and no curbs and sidewalks, accommodated within a 60-foot right-of-way. The existing street from Tenth Street to Nineteenth Street should be widened to major collector standards within the existing right-of-way.

21L: Old Dufur Road from Tenth Street to Fremont Street

Old Dufur Road is classified as a minor collector street in this segment. The existing pavement is generally 30 feet wide with two travel lanes and on-street parking permitted on both sides of the street. The roadway should be widened to minor collector standards to accommodate a shoulder bike lane on each side of the street.

22L: River Road over Chenowith Creek

The River Road crossing over Chenowith Creek is currently narrow and can accommodate only one lane of traffic. Since it would be necessary to maintain traffic along this route during construction, and the existing bridge structure does not lend itself to staged construction in-place, the existing bridge structure should be replaced. The new structure will be designed to meet current HR-25 loading requirements. The new approach roadway should be constructed to accommodate a major collector street.

23L: Chenowith Creek Trail

A separated bicycle and pedestrian recreational trail is proposed along Chenowith Creek from Riverfront Trail to Tenth Street with an at-grade crossing at Sixth Street. The bicycle and pedestrian pathway should be paved to be 12 feet wide, with an additional three feet of area adjacent to the pavement graded to provide clearance from trees, poles, walls, fences, guardrails, and other lateral obstructions. The 12-foot-wide pathway would provide for two-directional bicycle traffic along with its shared use by joggers and other pedestrians.

BIKEWAY PLAN

Bicycles are legally classified as vehicles that may be ridden on most public roadways in Oregon. Because of this, bicycle facilities shall be designed to allow bicyclists to emulate motor vehicle drivers. Shared roadway facilities are common on city street systems. On a shared roadway facility, bicyclists share the normal vehicle lanes with motorists. Where bicycle travel is significant, bike lanes are most appropriate.

Bicycle lanes are currently provided in The Dalles along segments of US 30 in the commercial area west of downtown. While all streets in The Dalles urban area should accommodate safe travel by bicyclists, a bikeway network providing a higher level of service for bicyclists should be implemented along all designated arterial and collector streets to encourage bicycle use.

In 1993, the City adopted a *Bicycle Master Plan*. Where new bike lanes are recommended, they should be provided on each side of the road and be five to six feet wide, when feasible. Bike lanes are located adjacent to the curb, except where there is curb parking or a right-turn lane. Where these conditions occur, the bike lane will be located between the through travel lane and the parking or right-turn lane. The bike lane will be marked for travel in the same direction as the adjacent travel lane. The striping shall be done in conformance with the *Manual on Uniform Traffic Control Devices*.

The bikeways on new streets or streets to be improved as part of the street system plan shall be added when the improvements are made. The Street, Bicycle and Pedestrian System Project List identify an approximate schedule for these improvements. ***Figure 15*** shows the recommended bikeway plan.

PEDESTRIAN FACILITIES PLAN

Six percent of the journey-to-work trips in Wasco County take place by the walking mode of travel. This is higher than the national average of 3.9 percent.

Upgrades to existing facilities and expansion of the sidewalk system are planned to increase the use of walking for the journey-to-work and non-work trips. The upgrade of the pedestrian system should include the filling in missing sidewalk links and design of subdivision layouts so that they provide for non-roadway pedestrian links between subdivisions and neighborhood commercial areas and schools.

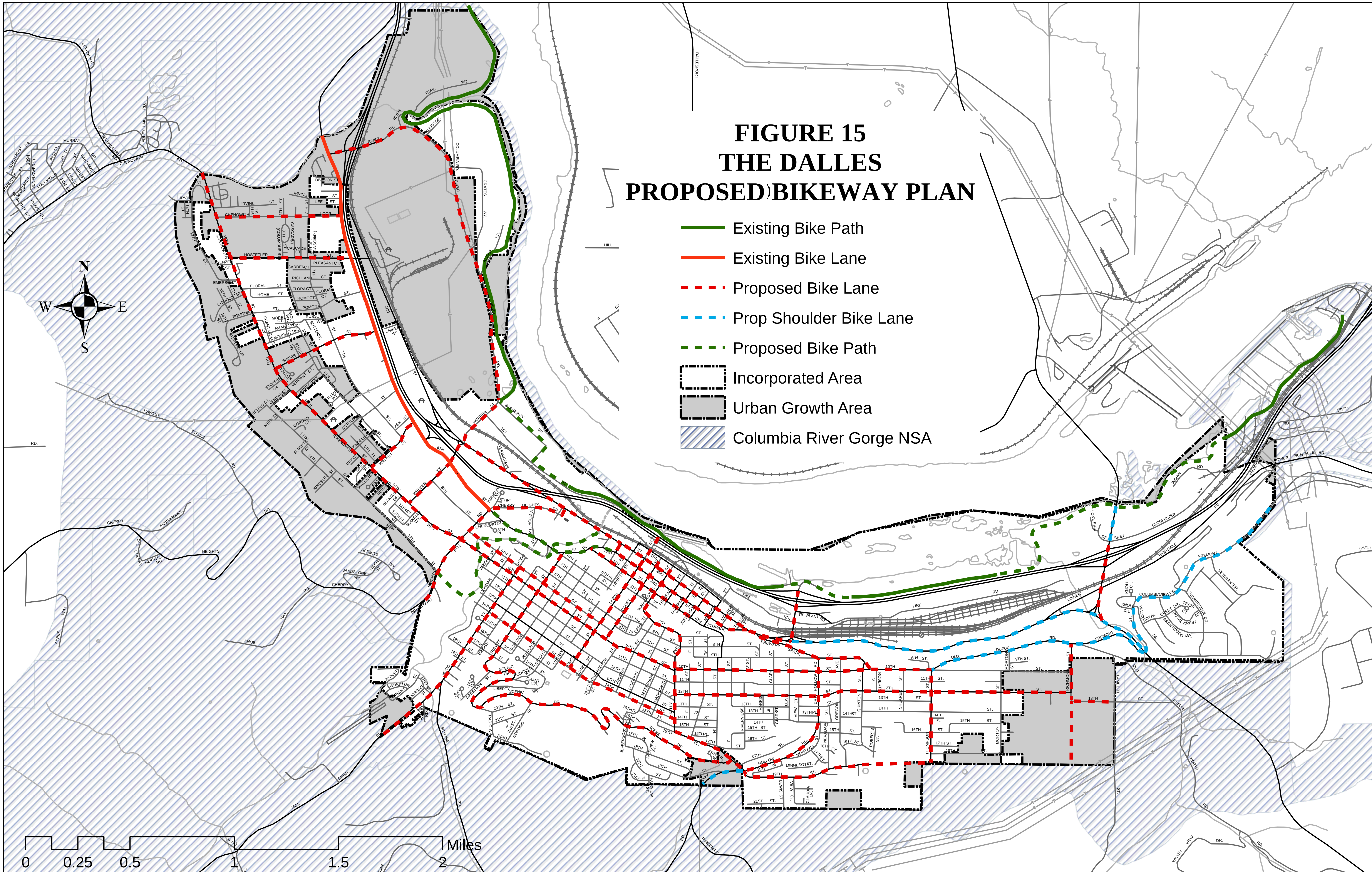


FIGURE 15
THE DALLES
PROPOSED BIKEWAY PLAN
Existing Bike Path
Existing Bike Lane
Proposed Bike Lane
Prop Shoulder Bike Lane
Proposed Bike Path
Incorporated Area
Urban Growth Area
Columbia River Gorge NSA
N
S
E
W
0
0.25
0.5
1
1.5
2
Miles

Sidewalks are required on both sides along all streets within the urban growth boundary, meeting the requirements set forth in the street design standards. Sidewalks and walkways should be required in new developments in the metropolitan area and they should be provided in connection with most major street improvement projects. Also, a systematic approach to filling gaps in the sidewalk system and an annual allocation for construction is recommended. The highest priority for sidewalk construction should be given to locations near schools, parks, and heavily used transit corridors. Safety should be a prime consideration in evaluation and design.

A complete pedestrian system shall be implemented in the city. Every paved street shall have sidewalks on both sides of the roadway meeting the requirements set forth in the street standards. Pedestrian access on walkways shall be provided between all buildings including shopping centers and abutting streets and adjacent neighborhoods.

Over time, sidewalks shall be added to streets that currently lack them and are not programmed for improvements. The priority streets shall be collector and arterial roadways where pedestrians feel most uncomfortable because of the higher traffic volumes these roadways carry. Also, sidewalk improvements along streets that lead to schools and parks will be given higher priority. Residential streets shall also have sidewalks; however, because they are lower vehicular traffic volume streets, they shall be lower priority for adding sidewalks.

Consideration may be given to providing curb extensions to shorten crossing distances and to alert motorists to the presence of pedestrians. These are rounded extensions of the sidewalk located at intersections. Curb extensions allow motor vehicle turning movements while improving visibility for both the pedestrian and motorists, as well as shortening pedestrian crossing distances.

TRUCK ROUTES

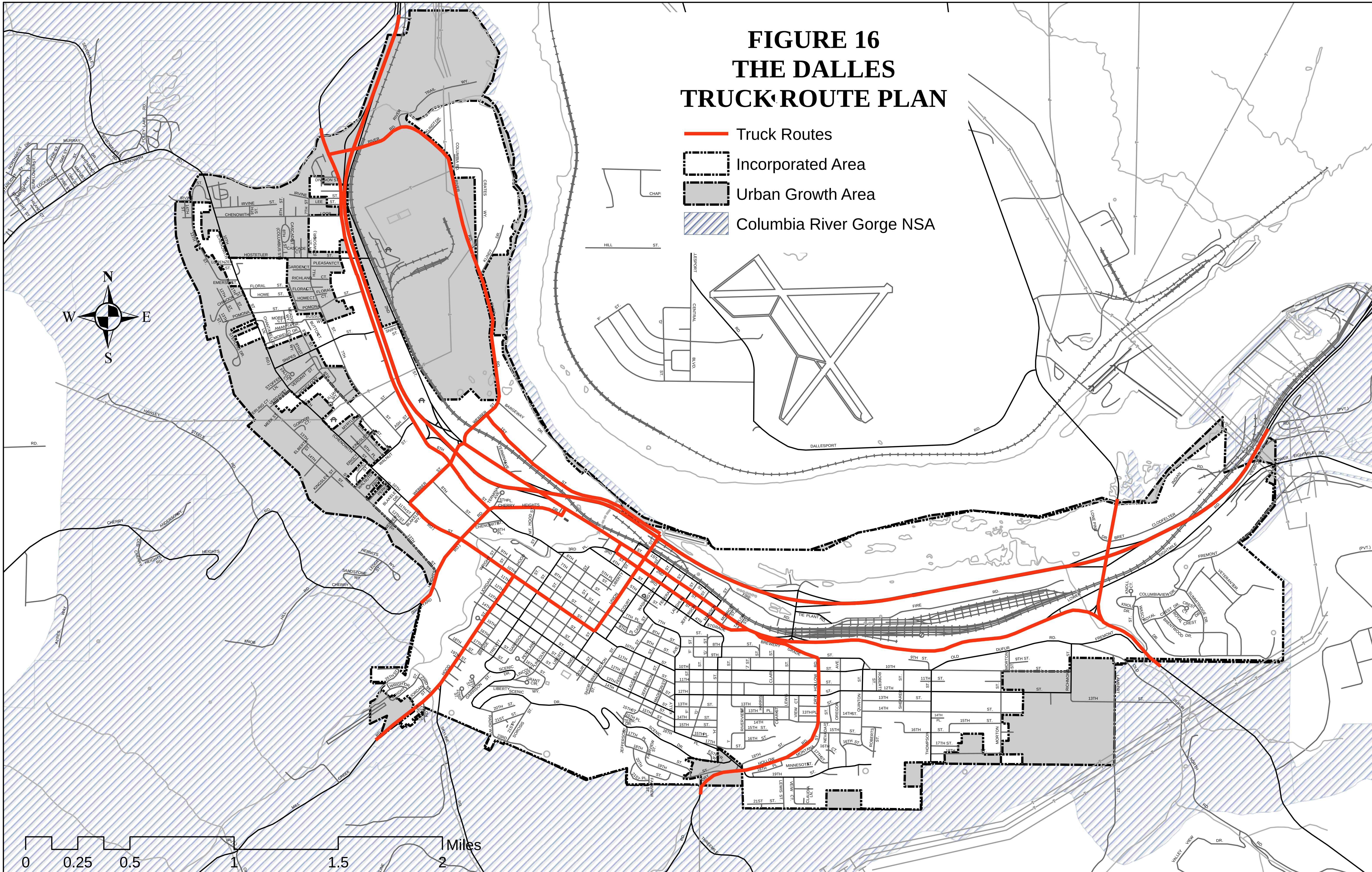
The truck route plan for The Dalles is prepared to address required street improvements to safely accommodate the north-south truck movement from the hillside orchards to the downtown processing plants, and to provide access to the commercial and industrial areas.

All arterial roadways in The Dalles under the proposed Street Functional Classification Plan (***Figure 16***) are proposed as designated truck routes. These include Interstate 84, US 197, and US 30. Also, all streets in the industrial area northwest of downtown (including River Road) are proposed to be designated as truck routes.

Besides arterial roads and roads in the industrial area, trucks in The Dalles also currently travel along north-south routes that connect the cherry processing plants along the river to the agricultural areas to the south. These north-south roads pass through residential areas, and truck use in these areas conflicts with other local traffic. However, because of the unique topography of The Dalles, the agricultural truck traffic is forced to use city streets that pass through residential areas. The truck route plan is intended to keep trucks on designated routes that are or can be improved for safe use by trucks, while keeping other areas free of truck traffic.

Trucks accessing the processing plants along the river travel along one of three roads that connect to the agricultural areas to the south. These include Dry Hollow Road, Mount Hood Street (including Skyline Road), and Cherry Heights Road. The proposed truck route plan routes trucks coming into town via Dry Hollow Road to continue along the road and access US 30 and the downtown area via Brewery Grade. This would keep them from using the Sixteenth Place/Kelly Avenue/Seventh Street/Washington Street route; the streets along this route are mostly narrow and there is high degree

FIGURE 16
THE DALLES
TRUCK ROUTE PLAN



of on-street parking and pedestrian activity. The proposed improvements at the US 30/Brewery Grade intersection will facilitate and make it attractive for trucks to use the proposed truck route.

Trucks accessing the downtown processing plant from Mount Hood Street will travel along Tenth Street eastbound to Union Street into downtown. Those accessing the riverside plant from Mount Hood Street will travel west along Tenth Street to north along Webber Street to the plant.

Trucks accessing the downtown processing plant from Cherry Heights Road will travel along the new Cherry Heights extension to US 30 into downtown. Those accessing the riverside plant from Cherry Heights Road will travel west along Sixth Street to north along Webber Street to the plant. The extension of Cherry Heights Road to US 30, including the proposed improvements at the intersection of Cherry Heights Road with Second Street and Sixth Street will facilitate and make it attractive for trucks to use the proposed truck route.

The proposed truck route plan is shown in ***Figure 16***.

TRANSPORTATION DEMAND MANAGEMENT PLAN

Through transportation demand management (TDM), the peak travel demands could be reduced or spread to more efficiently use the transportation system, rather than building new or wider roadways. Techniques that have been successful and could be initiated to help alleviate some traffic congestion include carpooling and vanpooling, alternative work schedules, bicycle and pedestrian facilities, and programs focused on high density employment areas.

The major effect of the TDM programs would be on the home-to-work and return trips. The journey-to-work census data for 1990 indicated that 74 percent of the journey-to-work trips in the Wasco County area are the drive-alone type. Of the remaining 26 percent of the journey-to-work trips, 13 percent use carpools, six percent walked to work, one percent biked to work, and six percent used other travel modes. Overall, 67 percent of the journey-to-work trips in The Dalles urban area are the drive-alone type. Of the remaining 33 percent of the daily trips, 32 percent use carpools, and less than one percent walk/bicycle or take transit to their destination.

Alternative Work Schedules

Alternative work schedules (*such as flex-time or staggered work hours*), especially with large employers, can help spread the peak period traffic volumes over a longer time period, thus providing greater service out of a fixed-capacity roadway. Staggered work hours should be encouraged with new industries and be coordinated to eliminate high surges of traffic.

Ridesharing

The effectiveness of subsidizing ridesharing and increasing rideshare convenience depends not only upon the particular tool chosen, but also upon the combination of tools chosen. Consequently, general estimates of the effectiveness of these tools are difficult to obtain. Specific estimates of particular combinations of tools could be evaluated using a TDM model.

The city can work with large employers, to establish a carpool and vanpool program. These programs will help to reduce the travel and parking requirements, and to reduce air pollution. Employers can encourage ridesharing by providing matching services subsidizing vanpools, establishing preferential car and vanpool parking and convenient drop-off sites, and through other promotional incentives.

Pedestrian/Bicycle Facilities

The planned provision of adequate facilities for bicycles (and pedestrians) along arterial and collector streets and many local streets in the metropolitan area is expected to significantly increase the attractiveness and competitiveness of bicycles as a travel mode.

Telecommuting

The effectiveness of telecommuting in reducing demand would depend on the number of employees for which telecommuting is an option, the level of participation of their employers, and the average number of telecommuting days. Employees eligible for telecommuting would come mostly from information industries such as accounting, data processing, programming, and engineering design. Production lines, construction, or sales, in contrast, would not provide many opportunities for telecommuting. Some employers require part of each employee's time each week to be spent in the office; others allow the employee flexibility to use telecommuting exclusively.

MODAL PLANS

Public Transportation

The Dalles has a mixture of long-distance and local demand-responsive transit services. Greyhound provides inter-city transit service to The Dalles, connecting it via Portland and Salt Lake City to the rest of the continental United States. The senior center sponsors a demand-responsive minibus service for travel anywhere within the city, in Dallesport, and out of town as well, if requested. The Mid-Columbia Council of Governments (MCCOG) operates additional demand responsive service available to everyone in Wasco County.

No specific expansion of either Greyhound service or the senior service is planned at this time; however, MCCOG has funding to conduct a county-wide transit study in 1999. The study will examine the adequacy of existing transit services in the area and how they can better serve residents.

AMTRAK passenger rail service was discontinued in May 1997. Reduction of non-profitable AMTRAK routes is ongoing throughout the country. Resumption of passenger rail service is unlikely in the short-term but The Dalles should support efforts to bring service back to the Columbia Corridor.

The existing public transportation services already meet the requirements of the *Oregon Transportation Plan*. Connections are possible and convenient between all the services provided, and the service frequency meets the required daily trip to a larger city specified for communities the size of The Dalles. However, growth should be guided so that it does not prevent transit development in the future.

No costs have been estimated for this modal plan. Grants may be available to conduct feasibility studies. State and federal funding may be available to purchase equipment.

Rail Service

Union Pacific Railroad provides freight service. No plans are known to alter these services to The Dalles. Efforts should be made by the city to retain or expand its rail service to foster growth in the industrial area.

Air Service

The Dalles Municipal Airport is located across the Columbia River in Klickitat County, Washington, outside the city's UGB. There are no commercial flights to the airport at this time; however, efforts to solicit air service are ongoing.

Because The Dalles Municipal Airport is located across the river, land use impacts by growth of The Dalles will not affect operations.

Water Transportation Service

Water transportation service to The Dalles is almost exclusively by towboat and barge, although a marina is available for private use. Barge loading and unloading facilities are available, but container transport is not possible. The barges carry mainly one of two products: wood chips or grain. Wood chips require service to Longview, Washington, while grain barges generally travel to Portland, Oregon.

Pipeline Service

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

CHAPTER 7: FUNDING OPTIONS AND FINANCIAL PLAN

The TPR requires TSPs to evaluate the funding environment for recommended improvements. This evaluation must include a listing of all recommended improvements, estimated costs to implement those improvements, a review of potential funding mechanisms, and an analysis of existing sources' ability to fund proposed transportation improvement projects. The Dalles TSP identifies about $19 million in improvements recommended over the next 20 years (1995-2015). This section of the TSP provides an overview of The Dalles' revenue outlook and a review of some funding and financing options that may be available to the City of The Dalles.

Pressures from increasing growth throughout much of Oregon have created an environment of estimated improvements that remain unfunded. The Dalles will need to work with Wasco County and ODOT to finance new transportation projects over the 20-year planning horizon (1995-2015). The actual timing of these projects will be determined by the rate of population and employment growth actually experienced by the community. This TSP assumes an annual growth rate of 1.1 percent. If population growth exceeds this rate, the improvements may need to be accelerated. Slower than expected growth will relax the improvement schedule.

HISTORICAL STREET IMPROVEMENT FUNDING SOURCES

In Oregon, state, county, and city jurisdictions work together to coordinate transportation improvements. In addition to this overlapping jurisdiction of the road network, transportation improvements are funded through a combination of federal, state, county, and city sources. Table 13 shows the distribution of road revenues for the different levels of government within the state by jurisdiction level. Although these numbers were collected and tallied in 1991, ODOT estimates that these figures accurately present the current revenue structure for transportation-related needs.

TABLE 13
SOURCES OF ROAD REVENUES BY JURISDICTION LEVEL

	Jurisdiction Level			Statewide
Revenue Source	State	County	City	Total
State Road Trust	58%	38%	41%	48%
Local	0%	22%	55%	17%
Federal Road	34%	40%	4%	30%
Other	9%	0%	0%	4%

Source: ODOT 1993 Oregon Road Finance Study.

At the state level, nearly half (48 percent in Fiscal Year 1991) of all road-related revenues are attributable to the State Highway Fund, whose sources of revenue include fuel taxes, weight-mile taxes on trucks, and vehicle registration fees. As shown in Table 8, the state road trust is a considerable source of revenue for all levels of government. Federal sources (generally the federal highway trust account and federal forest revenues) comprise another 30 percent of all road-related revenue. The remaining sources of road-related revenues are generated locally, including property taxes, LIDs, bonds, traffic impact fees, road user taxes, general fund transfers, receipts from other local governments, and other sources.

As a state, Oregon generates 94 percent of its highway revenues from user fees, compared to an average of 78 percent among all states. This fee system, including fuel taxes, weight distance charges, and registration fees, is regarded as equitable because it places the greatest financial burden upon those who create the greatest need for road maintenance and improvements. Unlike many states that have indexed user fees to inflation, Oregon has static road-revenue sources. For example, rather than assessing fuel taxes as a ***percentage*** of price per gallon, Oregon's fuel tax is a fixed amount (currently 24 cents) per gallon.

Transportation Funding in Wasco County

Transportation revenues and expenditures for Wasco County are shown in Table 14 and Table 15. These tables present receipts and disbursements for road and street purposes as reported by counties to ODOT and the League of Oregon Cities.

TABLE 14
WASCO COUNTY TRANSPORTATION-RELATED REVENUES

	1993-94	1994-95	1995-96
Land Sales/Rentals	$37,100	$37,920	$40,880
Interest	$130,184	$144,023	$118,022
State Highway Fund	$1,049,788	$1,072,643	$1,099,367
National Forest Reserve Revenue	$1,578,316	$1,581,364	$1,541,291
BLM Land Sales	$10,651	$4,036	$3,119
Mineral Leases	$178		$134
Federal Flood Control	$188	$189	$204
Other Local Sources	$63,077	$281,251	$109,517
Other State Sources		$180,559	$26,393
Federal Emergency Funds			$1,242,024
Total Revenues	$2,869,482	$3,301,985	$4,180,951

Source: Wasco County.

Revenues have risen from less than $3 million to over $4 million from 1993-94 to 1995-96. Although over $1.2 million of this increase is directly attributable to federal funds provided for flood relief in the 1996 fiscal year, the county incurred over $3.1 million in flood-related expenditures during the year. Resources were directed to flood-related spending at the expense of county capital projects (declining from $1.7 million in 1994/1995 to $888,000 in 1995-96) and regular operations and maintenance (decreasing from $1.7 million in 1994/1995 to $1.4 million in 1995-96).

TABLE 15
WASCO COUNTY TRANSPORTATION-RELATED EXPENSES

	1993-94	1994-95	1995-96
Capital Projects	$1,071,822	$1,713,401	$887,550
Operations and Maintenance	$1,417,063	$1,736,491	$1,413,237
Admin. and General Engineering	$116,069	$109,147	$176,186
Federal Emergency Exp. (FEMA)			$3,114,208
Total Expenditures	$2,604,954	$3,559,039	$5,591,181

Source: Wasco County.

Historical Revenues and Expenditures in the City of The Dalles

The City of The Dalles accounts for its Street and Storm Funds together. Sources of revenues for the Street and Storm Funds include the following:

- The local gas tax
- The State Federal Assistance Urban (FAU) Exchange Fund
- The State Motor Vehicle Fund

Other revenue from interdepartmental sources, interest on the fund balances, and the sale of fixed assets

A summary of this budget's activity is shown in Table 16 and Table 17. The state motor vehicle tax is the most significant source of revenue accounting for over approximately one-half of the budget's income (over $500,000 annually). The local gas tax also provides a significant source of stable income to the city, providing approximately $300,000 annually (or over 30 percent of the fund's revenue). Flood-related needs also had an impact on the city's revenue stream. The "Miscellaneous Revenue" line includes Federal Emergency Management Act (FEMA) moneys distributed to The Dalles in the 1997 Fiscal Year.

TABLE 16
THE DALLES STREET AND STORM BUDGET REVENUES

	1994-95	1995-96	1996-97	1997-98	1998-99
Working Capital	$646,492	$593,500	$520,236	$251,997	$92,128
Local Gas Tax	$318,791	$320,000	$325,000	$310,000	$310,000
ADA Ramps Grant	$-	$-	$-	$-	
State FAU Exchange Fund	$43,313	$-	$59,310	$114,310	$55,000
State Highway Fund	$516,588	$519,456	$516,421	$510,000	$510,000
Misc. Sales & Service	$27,382	$2,500	$500	$500	$500
Interdepartmental Revenue	$26,352	$28,054	$95,540	$19,840	$19,840
Interest Income	$31,681	$30,000	$16,000	$20,000	$16,000
Other Misc. Revenue	$1,956	$-	$170,195	$72,240	$72,240
Sale of Fixed Assets	$680	$-	$-	$-	$0
Transfers	$-	$-	$-	$-	$0
Total Revenues	**$966,743**	**$900,010**	**$1,182,966**	**$1,046,890**	**$983,580**

Source: The City of The Dalles.

Increased spending for streets has been partly the cause of increased expenditures overall, leading to a drawdown of the fund's working capital balance. Spending on street materials and services has increased 60 percent in two years (from approximately $250,000 in the 1994-95 year to an estimated $410,000 in the 1996-97 year). Capital outlay related to streets tripled (from $93,000 in 1994-95 to nearly $300,000 in 1996-97). In order to fund increasing expenditures related to capital projects and street construction and maintenance, the City of The Dalles has been using its working capital balance, drawing it down from nearly $650,000 in 1994-95 to an estimated $92,000 in 1998-99. In addition, the city has continued to transfer funds from the street and storm budget to the general fund, the unemployment reserve fund, and the Public Works reserve fund.

TABLE 17
THE DALLES STREET AND STORM BUDGET EXPENDITURES

	1994-95	1995-96	1996-97	1997-98	1998-99
Storm Sewer Personnel	$143,956	$158,735	$158,857	$139,314	$143,069
Materials and Services	$44,163	$72,952	$72,183	$50,600	$51,827
Capital Outlay	$26,737	$44,665	$3,074	$3,457	$3,650
Street Personnel	$316,569	$306,704	$305,978	$336,242	$345,318
Street Materials & Services	$256,695	$378,702	$411,060	$385,776	$353,660
Street Capital Outlay	$93,207	$277,438	$292,679	$252,619	$132,240
Transfer to General Fund	$107,532	$75,698	$46,835	$29,951	$29,951
Transfer to Unempl. Reserve	$2,800	$2,800	$2,800	$2,800	$2,800
Transfer to PW Reserve	$50,000	$20,000	$258,800		
Contingency	$113,231	$152,169	$114,427	$98,128	$19,193
Total Expenditures	**$1,154,890**	**$1,489,863**	**$1,666,693**	**$1,298,887**	**$1,081,708**

Source: City of The Dalles.

Transportation Revenue Outlook in The Dalles

ODOT's policy section recommends certain assumptions in the preparation of transportation plans. In its *Financial Assumptions* document prepared in March 1995, ODOT projected the revenue of the State Highway Fund through year 2018. The estimates are based on the following assumptions:

- Fuel tax (and weight-mile fee) increases of 1 cent per gallon per year, with an additional 1 cent per gallon every fourth year.
- TPR goals are met.
- Inflation occurs at an average annual rate of 3.7 percent (as assumed by ODOT).

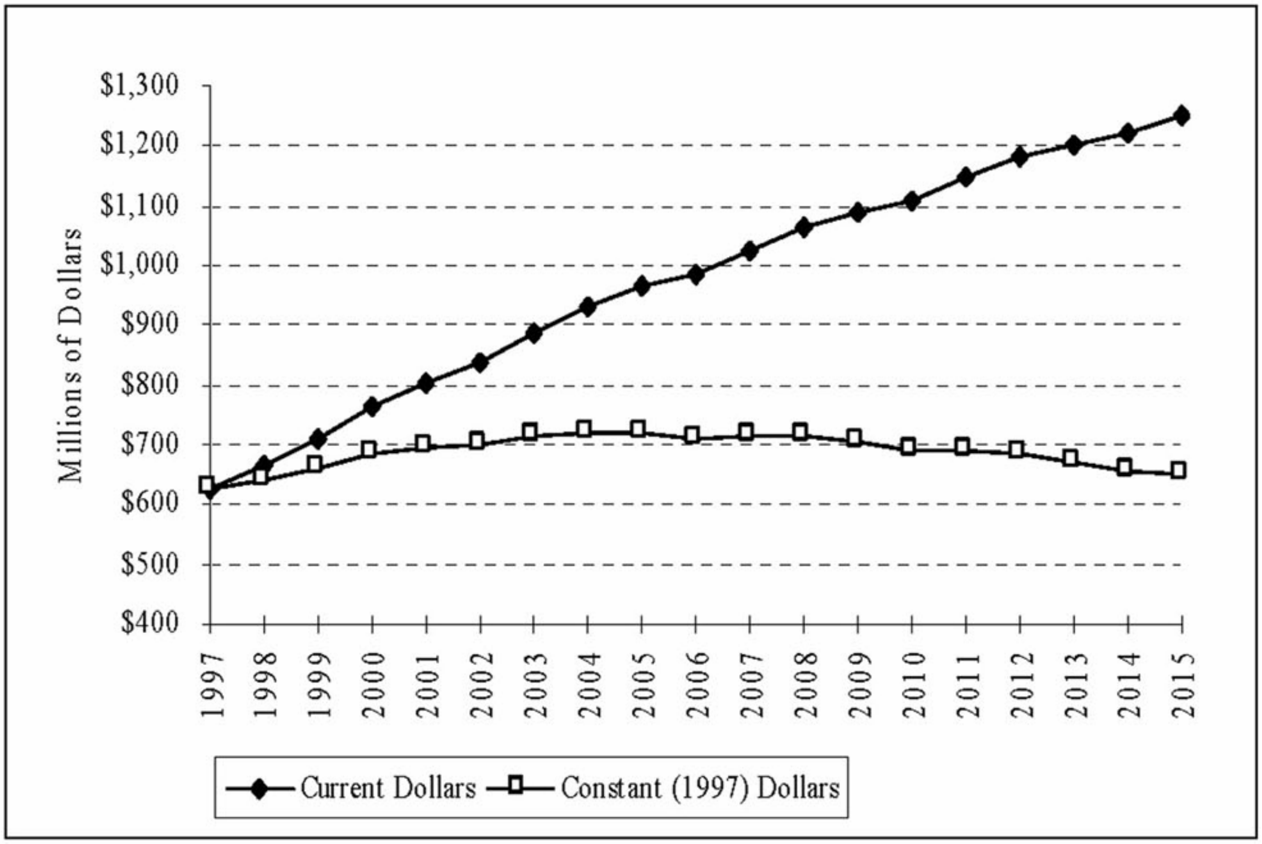
Figure 17 shows the forecast in both current-dollar and inflation-deflated constant (1997) dollars. As highlighted by the constant-dollar data, the highway fund is expected to grow faster than inflation early in the planning horizon, with growth slowing to a rate somewhat less than inflation around year 2004, continuing a slight decline through the remainder of the planning horizon.

As the State Highway Fund and the Local Gas Tax are expected to remain significant sources of funding for The Dalles, the city is highly susceptible to changes in the State Highway Fund. From 1994-1998, the State Highway Fund supplied approximately one-half of The Dalles' total revenue, while the local gas tax provided nearly one-third of all revenues. Assuming that the proportion of revenues provided to The Dalles by the State Highway Fund remains constant, estimated revenue from this source for selected years is shown in Table 18.

By expressing this revenue in constant (1997) dollars, the decrease in funding in the middle of the planning horizon is evident: The resources from the State Highway Fund for the City of The Dalles is expected to increase 15 percent from its current level of just over $516,000 to $593,000 by year 2004, declining again to approximately $534,000 by year 2015.

In order to analyze the city's ability to fund the recommended improvements from current sources, DEA applied the following assumptions:

ODOT State Highway Fund assumptions as outlined above.



Source: ODOT Financial Assumptions.

FIGURE 17

STATE HIGHWAY FUND
(MILLIONS OF DOLLARS)

The State Highway Fund will continue to account for approximately one-half of the city's Street and Storm Fund.
The local gas tax and other local sources continue to provide stable revenue streams.
The proportion of actual revenues (exclusive of working capital) available for capital expenditures for street improvements will decrease to the 1998-99 level of approximately 13.4 percent.

TABLE 18
ESTIMATED REVENUE FROM THE STATE HIGHWAY FUND

Year	The Dalles Share	CAARG (1)
1995 (2)	$516,600	
2000 (3)	$563,627	3.99%
2005 (3)	$592,248	1.00%
2010 (3)	$568,900	-0.80%
2015 (3)	$533,761	-1.27%

Notes:

(1) Compound Average Annual Rate of Growth

(2) 1995 expressed in current dollars.

(3) Future years expressed in constant (1997) dollars

Given current resources and the assumptions outlined above, the City of The Dalles is expected to be able to fund capital expenditures totaling approximately $2.7 million (constant 1997 dollars) from currently-available resources in the 1998-2015 time period. Applying the above assumptions to the estimated level of State Highway Fund resources, estimated resources for capital expenditures in the City of The Dalles are shown in Table 19.

TABLE 19
CITY OF THE DALLES RESOURCES AVAILABLE FROM CURRENT SOURCES FOR CAPITAL OUTLAY

Period	Potential Funding (Existing Sources)
1998-2000	$423,963
2001-2005	$756,914
2006-2010	$752,897
2011-2015	$714,348
Total	**$2,648,122**

Source: City of The Dalles.

REVENUE SOURCES

In order to finance the full range of recommended transportation system improvements listed in this TSP, it will be important to consider a range of funding sources. Although the property tax has traditionally served as the primary revenue source for local governments, property tax revenue goes into general fund operations, and is typically not available for street improvements or maintenance. Despite this limitation, the use of alternative revenue funding has been a trend throughout Oregon as the full implementation of Measure 5 has significantly reduced property tax revenues. This trend is expected to continue with the recent passage of Measure 47. The alternative revenue sources described in this section may not all be appropriate in The Dalles; however, this overview is being provided to illustrate the range of options currently available to finance transportation improvements during the next 20 years.

Property Taxes

Property taxes have historically been the primary revenue source for local governments. However, property tax revenue goes into general fund operations, and is not typically available for street improvements or maintenance. The dependence of local governments on this revenue source is due, in large part, to the fact that property taxes are easy to implement and enforce. Property taxes are based on real property (i.e., land and buildings) which have a predictable value and appreciation to base taxes upon. This is as opposed to income or sales taxes that can fluctuate with economic trends or unforeseen events.

Property taxes can be levied through: 1) tax base levies, 2) serial levies, and 3) bond levies. The most common method uses tax base levies that do not expire and are allowed to increase by six percent per annum. Serial levies are limited by amount and time they can be imposed. Bond levies are for specific projects and are limited by time based on the debt load of the local government or the project.

The historic dependence on property taxes is changing with the passage of Ballot Measure 5 in the early 1990s. Ballot Measure 5 limits the property tax rate for purposes other than payment of certain voter-approved general obligation indebtedness. Under full implementation, the tax rate for all local taxing authorities is limited to $15 per $1,000 of assessed valuation. As a group, all non-school taxing authorities are limited to $10 per $1,000 of assessed valuation. All tax base, serial, and special levies are subject to the tax rate limitation. Ballot Measure 5 requires that all non-school taxing districts' property tax rate be reduced if together they exceed $10 per $1,000 per assessed valuation by the county. If the non-debt tax rate exceeds the constitutional limit of $10 per $1,000 of assessed valuation, then all of the taxing districts' tax rates are reduced on a proportional basis. The proportional reduction in the tax rate is commonly referred to as compression of the tax rate.

Measure 47, an initiative petition, was passed by Oregon voters in November 1996. It is a constitutional amendment that reduces and limits property taxes and limits local revenues and replacement fees. The measure limits 1997-98 property taxes to the lesser of the 1995-96 tax minus ten percent, or the 1994-95 tax. It limits future annual property tax increase to three percent, with exceptions. Local governments' lost revenue may be replaced only with state income tax, unless voters approve replacement fees or charges. Tax levy approvals in certain elections require 50 percent voter participation.

The State Legislature created Measure 50, which retains the tax relief of Measure 47 but clarifies some legal issues. This revised tax measure was approved by voters in May 1997.

The League of Oregon Cities (LOC) estimated that direct revenue losses to local governments, including school districts, will total $467 million in fiscal year 1998, $553 million in 1999, and increasing thereafter. The actual revenue losses to local governments will depend on actions of the Oregon Legislature. LOC also estimates that the state will have revenue gains of $23 million in 1998, $27 million in 1999, and increasing thereafter because of increased personal and corporate tax receipts due to lower property tax deduction.

Measure 50 adds another layer of restrictions to those which govern the adoption of tax bases and levies outside the tax base, as well as Measure 5's tax rate limits for schools and non-schools and tax rate exceptions for voter approved debt. Each new levy and the imposition of a property tax must be tested against a longer series of criteria before the collectible tax amount on a parcel of property can be determined.

System Development Charges

System Development Charges (SDCs) are becoming increasingly popular in funding public works infrastructure needed for new local development. Generally, the objective of systems development charges is to allocate portions of the costs associated with capital improvements upon the developments that increase demand on transportation, sewer or other infrastructure systems.

Local governments have the legal authority to charge property owners and/or developers fees for improving the local public works infrastructure based on projected demand resulting from their development. The charges are most often targeted towards improving community water, sewer, or transportation systems. Cities and counties must have specific infrastructure plans in place that comply with State guidelines in order to collect SDCs.

The City of The Dalles could implement SDCs for their transportation system. The fee is collected when new building permits are issued. The city would calculate the fee based on trip generation of the proposed development. Residential calculations would be based on the assumption that a typical household will generate a given number of vehicle trips per day. Nonresidential use calculations are based on employee ratios for the type of business or industrial uses. The SDC revenues would help fund the construction of transportation facilities necessitated by new development.

State Highway Fund

Gas tax revenues received from the State of Oregon are used by all counties and cities to fund street and road construction and maintenance. In Oregon, the state collects gas taxes, vehicle registration fees, overweight/overheight fines, and weight/mile taxes and returns a portion of the revenues to cities and counties through an allocation formula. The revenue share to cities is divided among all incorporated cities based on population. Like other Oregon cities, the City of The Dalles uses its State Gas Tax allocation to fund street construction and maintenance.

Local Gas Taxes

The Oregon Constitution permits counties and incorporated cities to levy additional local gas taxes with the stipulation that the moneys generated from the taxes will be dedicated to street-related improvements and maintenance within the jurisdiction. At present, The Dalles is one of only a few local governments (others include the City of Woodburn and Multnomah and Washington Counties) which levy a local gas tax. The City of The Dalles may consider raising its local gas tax as a way to generate additional street improvement funds. However, with relatively few jurisdictions exercising this tax, an increase in the cost differential between gas purchased in The Dalles and gas purchased in neighboring communities may encourage drivers to seek less expensive fuel elsewhere. Any action will need to be supported by careful analysis to minimize the unintended consequences of such an action.

Vehicle Registration Fees

The Oregon Vehicle Registration Fee is allocated to the state, counties and cities for road funding. Oregon counties are granted authority to impose a vehicle registration fee covering the entire county. The Oregon Revised Statutes would allow Wasco County to impose a biannual registration fee for all passenger cars licensed within the county. Although both counties and special districts have this legal authority, vehicle registration fees have not been imposed by local jurisdictions. In order for a local vehicle registration fee program to be viable in Wasco County, all the incorporated cities and the county would need to formulate an agreement which would detail how the fees would be spent on future street construction and maintenance.

Local Improvement Districts

The Oregon Revised Statutes allow local governments to form Local Improvement Districts (LIDs) to construct public improvements. LIDs are most often used by cities to construct localized projects such as streets, sidewalks, or bikeways. The statutes allow formation of a district by either the city government or property owners. Cities that use LIDs are required to have a local LID ordinance that provides a process for district formation and payback provisions. Through the LID process, the costs of local improvements are generally spread out among a group of property owners within a specified area. The cost can be allocated based on property frontage or other methods such as traffic trip generation. The types of allocation methods are only limited by the Local Improvement Ordinance. The cost of LID participation is considered an assessment against the property which is a lien equivalent to a tax lien. Individual property owners typically have the option of paying the assessment in cash or applying for assessment financing through the city. Since the passage of Ballot Measure 5, cities have most often funded local improvement districts through the sale of special assessment bonds.

Other User Fees

There may be other user fees that the City of The Dalles can levy on residents and businesses based on specific geographic areas or specialized needs. For example, legislation relating to systems development charges may allow certain SDCs for businesses if the expenditures can be directly linked to the businesses charged. More analysis will be required to ensure that the rational nexus criteria would be satisfied.

Hotel/Motel Tax

In reviewing alternative sources of funding for transportation improvements, the Hotel/Motel tax has been suggested as a potential funding source. Given the demands of this funding mechanism and the proposed uses of these funds, further analysis will be required for the potential employment of the Hotel/Motel tax as a funding source for transportation improvements.

Urban Renewal Plan

The City of the Dalles' Urban Renewal Plan was developed to redevelop and revitalize blighted parts of the city, in conformance with current development standards. With funds available to it, the Urban Renewal Agency is entitled to fund various infrastructure projects, including projects related to the wastewater system, storm sewer system, water supply and distribution system, street system, and general landscaping, and pedestrian amenities. Road projects currently include projects related to connectivity, signalization, and road widening. This project list could be expanded to include additional projects identified in this Transportation System Plan that also address the key objectives of the Urban Renewal Plan.

Grants and Loans

The majority of the grant and loan programs available today are geared towards economic development and not specifically for construction of new streets. Typically, grant programs target areas that lack basic public works infrastructure needed to support new or expanded industrial businesses. Because of the popularity of some grant programs such as the Oregon Special Public Works Fund, the emphasis has shifted to more of a loan program. Many programs require a match from the local jurisdiction as a condition of approval. Because grant programs are subject to change, they should not be considered a secure long-term funding source for the City of The Dalles.

These programs include the Immediate Opportunity Grant and the Oregon Special Public Works Fund program that are described below.

Immediate Opportunity Grant Program

The Oregon Economic Development Department (OEDD) and ODOT collaborate to administer a grant program designed to assist local and regional economic development efforts. The program is funded to a level of approximately $5,000,000 per year through state gas tax revenues. The following are primary factors in determining eligible projects:

- Improvement of public roads.
- Inclusion of an economic development-related project of regional significance.
- Creation of primary employment.
- Ability to provide local funds to match grant (lesser matches may also be considered).

The maximum amount of any grant under the program is $500,000. Local governments which have received grants under the program include Washington County, Multnomah County, Douglas County, City of Hermiston, Port of St. Helens, and the City of Newport.

Oregon Special Public Works Fund

The Special Public Works Fund (SPWF) program was created by the 1995 State Legislature as one of the several programs for the distribution of funds from the Oregon Lottery to economic development projects in communities throughout the state. The program provides grant and loan assistance to eligible municipalities primarily for the construction of public infrastructure that support commercial and industrial development that result in permanent job creation or job retention. To be awarded funds, each infrastructure project must support businesses wishing to locate, expand, or remain in Oregon. SPWF awards can be used for improvement, expansion, and new construction of public sewage treatment plants, water supply works, public roads, and transportation facilities.

While SPWF program assistance is provided in the form of both loans and grants, the program emphasizes loans in order to assure that funds will return to the state over time for reinvestment in local economic development infrastructure projects. The maximum loan amount per project is $11,000,000 and the term of the loan cannot exceed the useful life of the project or 25 years, whichever is less. Interest rates for loans funded with the State of Oregon Revenue Bonds are based on the rate the state may borrow through the Oregon Economic Development Department Bond Bank. The department may also make loans directly from the SPWF and the term and rate on direct loans can be structured to meet project needs. The maximum grant per project is $500,000, but may not exceed 85 percent of the total project cost.

Jurisdictions that have received SPWF funding for projects that include some type of transportation-related improvement include the Cities of Baker City, Bend, Cornelius, Forest Grove, Madras, Portland, Redmond, Reedsport, Toledo, Wilsonville, Woodburn, and Douglas County.

ODOT Funding Options

The State of Oregon provides funding for all highway-related transportation projects through the Statewide Transportation Improvement Program (STIP) administered by the Oregon Department of Transportation. The STIP outlines the schedule for ODOT projects throughout the state. The STIP, which identifies transportation for a three-year funding cycle, is updated on an annual basis. Starting with the 1998 budget year, ODOT will then identify projects for a four-year funding cycle. In developing this funding program, ODOT must verify that the identified projects comply with the OTP, ODOT modal plans, corridor plans, local comprehensive plans, and ISTEA planning requirements. The STIP must fulfill ISTEA planning requirements for a staged, multi-year, statewide, intermodal program of transportation projects. Specific transportation projects are prioritized based on a review of the ISTEA planning requirements and the different state plans. ODOT consults with local jurisdictions before highway related projects are added to the STIP.

The highway-related projects identified in The Dalles TSP will be considered for future inclusion on the STIP. The timing of including specific projects will be determined by ODOT based on an analysis of all the project needs within Region 4. The TSP will provide ODOT with a prioritized project list for The Dalles area for the next 20 years. The City of The Dalles, Wasco County, and ODOT will need to communicate on an annual basis to review the status of the STIP and the prioritization of individual projects within the project area. Ongoing communication will be important for the city, county, and ODOT to coordinate the construction of both local and state transportation projects.

ODOT also has the option of making some highway improvements as part of their ongoing highway maintenance program. Types of road construction projects that can be included within the ODOT maintenance programs are intersection realignments, additional turn lanes, and striping for bike lanes. Maintenance related construction projects are usually done by ODOT field crews using state equipment. The maintenance crews do not have the staff or specialized road equipment needed for large construction projects.

An ODOT funding technique that will likely have future application to The Dalles TSP is the use of state and federal transportation dollars for off-system improvements. Until the passage and implementation of ISTEA, state and federal funds were limited to transportation improvements within highway corridors. ODOT now has the authority and ability to fund transportation projects that are located outside the boundaries of the highway corridors. The criteria for determining what off-system improvements can be funded has not yet been clearly established. It is expected that this new funding technique will be used to finance local system improvements that reduce traffic on state highways or reduce the number of access points for future development along state highways.

FINANCING TOOLS

In addition to funding options, the recommended improvements listed in this plan may benefit from a variety of financing options. Although often used interchangeably, the words financing and funding are not the same. Funding is the actual generation of revenue by which a jurisdiction pays for improvements; some examples include the sources discussed above: property taxes, SDCs, fuel taxes, vehicle registration fees, LIDs, and various grant programs. In contrast, financing refers to the collecting of funds through debt obligations.

There is a number of debt financing options available to the City of The Dalles. The use of debt to finance capital improvements must be balanced with the ability to make future debt service payments and to deal with the impact on its overall debt capacity and underlying credit rating. Again, debt financing should be viewed not as a source of funding, but as a time shifting of funds. The use of debt to finance these transportation-system improvements is appropriate since the benefits from the transportation improvements will extend over the period of years. If such improvements were to be tax financed immediately, a large short-term increase in the tax rate would be required. By utilizing debt financing, local governments are essentially spreading the burden of the costs of these improvements to more of the people who are likely to benefit from the improvements and lowering immediate payments.

General Obligation Bonds

General obligation bonds (GO) are voter-approved bond issues that represent the least expensive borrowing mechanism available to municipalities. GO bonds are typically supported by a separate property tax levy specifically approved for the purposes of retiring debt. The levy does not terminate until all debt is paid off. The property tax levy is distributed equally throughout the taxing jurisdiction according to assessed value of property. General obligation debts typically used to make public improvement projects that will benefit the entire community.

State statutes require that the general obligation indebtedness of a city not exceed three percent of the real market value of all taxable property in the city. Since general obligation bonds would be issued subsequent to voter approval, they would not be restricted to the limitations set forth in Ballot Measures 5, 47, and 50. Although new bonds must be specifically voter approved, Measure 47 and 50 provisions are not applicable to outstanding bonds, unissued voter-approved bonds, or refunding bonds.

Limited Tax Bonds

Limited tax general obligation bonds (LTGOs) are similar to general obligation bonds in that they represent an obligation of the municipality. However, a municipality's obligation is limited to its current revenue sources and is not secured by the public entity's ability to raise taxes. As a result, LTGOs do not require voter approval. However, since the LTGOs are not secured by the full taxing power of the issuer, the limited tax bond represents a higher borrowing cost than general obligation bonds. The municipality must pledge to levy the maximum amount under constitutional and statutory limits, but not the unlimited taxing authority pledged with GO bonds. Because LTGOs are not voter approved, they are subject to the limitations of Ballot Measures 5, 47, and 50.

Bancroft Bonds

Under Oregon statute, municipalities are allowed to issue Bancroft bonds that pledge the city's full faith and credit to assessment bonds. As a result, the bonds become general obligations of the city but are paid with assessments. Historically, these bonds provided a city with the ability to pledge its full faith and credit in order to obtain a lower borrowing cost without requiring voter approval. However, since Bancroft bonds are not voter approved, taxes levied to pay debt service on them are subject to the limitations of Ballot Measures 5, 47, and 50. As a result, since 1991, Bancroft bonds have not been used by municipalities who were required to compress their tax rates.

FUNDING REQUIREMENTS

The Dalles TSP identifies a range of transportation improvements recommended during the next 20 years to address problems and expand the transportation system to support a growing population and economy. The improvements include approximately $11 million in state-funded projects, $2.9 million in county-funded projects, and nearly $3.5 million in municipally-funded improvements. The total cost of all projects is estimated at $19.1 million. Three priority levels have been identified:

Short-Range: prior to year 2010
Intermediate-Range: between year 2011 and year 2015
Long-Range: after year 2015

Estimated costs by financial leader and priority level are shown in Table 20.

TABLE 20
TRANSPORTATION IMPROVEMENTS
FUNDING REQUIREMENT SUMMARY

Project Phase	State	County	The Dalles	Other	Total
Short-Range	$11,008,000	$521,000	$2000	$1,490,000	$13,021,000
Intermediate-Range		$2,015,000	$250,000		$2,265,000
Long-Range		$412,000	$3,277,000	$165,000	$3,854,000
Total	$11,008,000	$2,948,000	$3,529,000	$1,655,000	**$19,140,000**

Oregon Department of Transportation Projects

ODOT will be the lead jurisdiction and primary source of funding for future transportation improvements that impact the operation of state highways. These three projects will cost a total of approximately $11 million in 1997 dollars. All three the projects have been classified as short-range priorities. Individual projects and their cost estimates are shown in Table 21.

TABLE 21
STATE TRANSPORTATION IMPROVEMENTS
FUNDING REQUIREMENTS AND PRIORITY LEVEL

Project	Estimated Project Cost
Short-Range	
Chenowith Interchange	$10,748,000
Redesign Intersection of US 30 and Brewery Grade	$250,000
Redesign Intersection of US 30 and Lower Eight Mile Road	$10,000
Subtotal	$11,008,000
TOTAL	**$11,008,000**

County Projects

This TSP identifies six projects with Wasco County as the lead financial partner. Three of the six are short-range projects with grant funding secured, two are estimated to be built in the intermediate-range, and the final project has been classified as a long-range project The six projects, their priority classification, and cost estimates are shown in Table 22.

TABLE 22
COUNTY TRANSPORTATION IMPROVEMENTS
FUNDING REQUIREMENTS AND PRIORITY LEVEL

Project	Estimated Project Cost
Short-Range (2005-2010)	
Widen Chenowith Loop Road	$288,000
Re-stripe Hostetler Street	$156,000
Widen Snipes Street	$77,000
Subtotal	$521,000
Intermediate-Range (2011-2015)	
Widen Fremont Street/Redesign 197 Intersection	$715,000
Redesign US 197/Fremont Street/Columbia View Drive Intersection	$1,300,000
Subtotal	$2,015,000
Long-Range (2016+)	
Widen River Road Bridge	$412,000
Subtotal	$412,000
TOTAL	**$2,948000**

Local Projects

This TSP identifies five transportation improvement projects with The Dalles as the lead jurisdiction. One of these five projects has been categorized as a short-range priority and should be undertaken within three years. The remaining four projects are long-range priorities and are estimated to cost nearly $3.3 million. The estimated costs of the projects have been categorized by priority level and summarized in Table 23.

TABLE 23
LOCAL TRANSPORTATION IMPROVEMENTS
FUNDING REQUIREMENTS AND PRIORITY LEVEL

Project	Estimated Project Cost
Short-Range (2005-2010)	
Re-stripe Dry Hollow Road for bike lanes	$2,000
Subtotal	$2,000
Intermediate-Range (2011-2015)	
Add traffic signal at West Sixth/Terminal Street	$125,000
Add traffic signal at West Second/Terminal Street	$125,000
Subtotal	$250,000
Long-Range (2016+)	
Widen Tenth Street, Washington to Lewis	$1,188,000
Construct Nineteenth Street	$1,220,000
Widen Thompson Street	$396,000
Widen Old Dufur Road	$473,000
Subtotal	$3,277,000
TOTAL	**$3,529,000**

Based on the current revenue sources for The Dalles and the improvements recommended in this TSP, The Dalles faces a funding deficit for the long-range priority classification. The funding deficit totals $881,000 over the 20-year planning horizon (1995-2015). A summary of the funding situation based on cost estimates for recommended projects and estimated resources is shown in Table 24.

TABLE 24
ESTIMATED FUNDING DEFICIT
RECOMMENDED TRANSPORTATION SYSTEM IMPROVEMENTS

Project Phase	Local Funding Requirements	Potential Revenue (Existing Sources)	Remaining Surplus (Deficit)	Cumulative Funding Surplus (Deficit)
Short-Range	$2,000	$424,000	$422,000	$422,000
Intermediate-Range	$250,000	$757,000	$507,000	$929,000
Long-Range	$3,277,000	$1,467,000	($1,810,000)	($881,000)

Many local governments in Oregon are seeking alternative revenue sources to fund street improvements and operations. Two potential sources of local revenue for The Dalles include a proposed Utility Access Fee and the adoption of a Systems Development Charge (SDC) for transportation projects.

Proposed Utility Access Fee

In addition to currently-available resources, a proposed utility access fee is expected to generate annual revenues of $72,240. If approved and successful in generating steady revenue streams, this proposed fee could generate an additional $1.2 million during the 1998 to 2015 planning horizon, as shown in Table 25.

TABLE 25
POTENTIAL REVENUE OF THE PROPOSED UTILITY ACCESS FEE

Project Phase	Potential Revenue (Proposed Access Fee)
Short-Range	$144,480
Intermediate-Range	$361,200
Long-Range	$722,400
Total	**$1,228,080**

Applying this additional revenue, generated by the proposed utility access fee, to the funding deficit, the City of The Dalles can begin to "close the gap" between the funding requirements of the recommended projects in this TSP and the funding resources. The funding outlook for each priority level is shown in Table 26.

TABLE 26
FUNDING OUTLOOK
APPLYING REVENUE FROM THE PROPOSED UTILITY ACCESS FEE

Project Phase	Funding Surplus (Deficit)	Potential Revenue (Proposed Access Fee)	Remaining Funding Surplus (Deficit)	Cumulative Funding Surplus (Deficit)
Short-Range	$422,000	$145,000	$567,000	$567,000
Intermediate-Range	$507,000	$361,000	$868,000	$1,435,000
Long-Range	($1,810,000)	$722,000	($1,088,000)	$347,000

As shown in Table 26, the cumulative funding deficit, ($881,000 over the planning horizon), could be met with the successful implementation of the proposed utility access fee and the commitment of these funds to the capital improvements recommended in this TSP.

Implementation of Systems Development Charges

Another option for the City of The Dalles is implementation of a Transportation Systems Development Charge. Currently, very few cities along the I-84 corridor utilize street SDCs; however, Hood River has sewer, water, and park SDCs, and several cities (including Hermiston, Ontario, and La Grande) are seeking to implement sewer and water SDCs.

By statute, SDC fees must be related to improvements serving new development. In other words, there must be a documented relationship between the need for capital outlays and the development being charged. In the case of The Dalles' improvements, the projects often have multiple justifications, several of which are linked to expanding capacity. For example, **access** improvements include the provision of access to undeveloped parcels of land, **economic** development improvements serve primarily to attract or expand employment uses, and **operations** improvements are often provided as a result of increased traffic volumes. Further analysis and documentation will be required to implement SDCs; this analysis is intended to generate discussion by providing an illustration of SDCs as a potential funding sources

Over the 20-year planning horizon (1995-2015) for this TSP, there is a total of $3.5 million in locally-funded improvements. By using only locally-funded projects, county projects which have already secured funding, more regional state-funded projects, and projects not related to capacity are removed from the pool of projects driven by new development.

Based on household and employment projections and standard number of trips generated by use, there will be an estimated increase of 41,700 total daily trips by year 2015, as shown in Table 27. The resulting cost per trip is estimated at about $85.

TABLE 27
SDC TRIP GENERATION ESTIMATES

Land Use	**1995**	**2015**	**1995-2015 Increase**	**Trips per Day**	**Total Trips**
Residential					
Single-Family Dwelling Units	5,141	6,139	998	9.5	9,481
Multi-Family Dwelling Units	1,312	1,763	451	6.3	2,841
Non-Residential					
Retail/Commercial Employees	1,339	1,894	555	40.0	22,200
Office Employees	242	311	69	7.0	483
Industrial Employees	1,040	1,407	367	3.0	1,101
Medical Employees	903	1,233	330	6.5	2,145
Government Employees	428	520	92	15.0	1,380
School Employees	548	685	137	15.0	2,055
Total					**41,686**

Based on the number of trips per day generated by each use, potential SDCs could be up to $950 per single-family dwelling unit and $630 per multi-family unit as shown in Table 28. SDCs for non-residential uses would range from $300 to $4,000 per employee depending on trip generation expectations by type of use.

TABLE 28
POTENTIAL SDC RATES BASED ON IMPROVEMENT COSTS

Land Use	Trips per Day	SDC Charge	
Residential			
Single-Family Dwelling Units	9.5	$805	per dwelling unit
Multi-Family Dwelling Units	6.3	$535	per dwelling unit
Non-Residential			
Retail/Commercial Employees	40.0	$3,400	per employee
Office Employees	7.0	$595	per employee
Industrial Employees	3.0	$255	per employee
Medical Employees	6.5	$555	per employee
Government Employees	15.0	$1,275	per employee
School Employees	15.0	$1,275	per employee

After providing the documentation necessary, The Dalles may wish to compare its potential SDCs with those of other communities. Jurisdictions may choose to adopt SDCs that account for only a certain proportion of recommended improvements. The Dalles' leadership may determine that SDCs covering the total cost of improvements related to new development would be too much of a disincentive to development; in this case, SDCs can be set generate a certain percentage of the capital improvements. Table 29 shows the total revenue that could be generated through use of SDCs at a 50 percent level and a 25 percent level.

TABLE 29
REVENUE GENERATED BY POTENTIAL SDCS

	50 Percent SDC		Revenue Generated	25 Percent SDC		Revenue Generated
Residential						
Single-Family Dwelling Units	$405	per dwelling unit	$404,000	$200	per dwelling unit	$200,000
Multi-Family Dwelling Units	$270	per dwelling unit	$122,000	$135	per dwelling unit	$61,000
Non-Residential						
Retail-Commercial	$1,700	per employee	$944,000	$850	per employee	$472,000
Office-Commercial	$300	per employee	$21,000	$150	per employee	$10,000
Industrial	$130	per employee	$48,000	$65	per employee	$24,000
Medical	$280	per employee	$92,000	$140	per employee	$46,000
Government	$640	per employee	$59,000	$320	per employee	$29,000
School	$640	per employee	$88,000	$320	per employee	$44,000
Total Revenue			$1,778,000			**$886,000**

The revenue generated through implementation of SDCs is one option that may be used to fill the gap in funding between existing sources and capital required to fund recommended improvements.

FUNDING OPTIONS CONCLUSIONS

This TSP identifies 19 projects recommended for The Dalles' planning area over the 20-year planning horizon (1995-2015). The three state projects will cost an estimated $11 million in current 1997 dollars. Wasco County has secured grant funding for the three short-term county-led projects, totaling $521,000; an additional $2.4 million is needed for the intermediate- and long-term Wasco County projects. The seven local projects are estimated to cost $3.5 million. The remaining three projects are expected to be funded through either local LIDs or federal funds.

In addition to traditional property taxes and funding from the State Highway Fund, The Dalles will need to evaluate the availability of alternative funding sources. Debt financing, system development charges, local improvement districts, and state and federally sponsored funding programs are some of the financing options that may be available to The Dalles. Although there is a wide range of possible funding options, the selected option must address all applicable requirements. Two distinct possibilities for additional funding are the proposed utility access fee and the implementation of Systems Development Charges. The Dalles will need to evaluate its options and work with Wasco County and ODOT in evaluating potential avenues for implementing this TSP.

CITY OF THE DALLES
TRANSPORTATION SYSTEM PLAN
APPENDICES

Prepared June 1999
Updated November 2005

Prepared for
The City of The Dalles
The Dalles, Oregon

Prepared by
David Evans and Associates, Inc.
Portland, Oregon

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Jurisdiction	Classification	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limit
1st St.											
River Rd.	Port of The Dalles	City	Local	40	22	Unstriped	Two-way	No	No	No	25
Union St.	Court St.	City	Arterial	80	29	1	One-way	Yes	1 Side	No	20
Court St.	Washington St.	City	Arterial	80	29	1	One-way	Yes	1 Side	No	20
Washington St.	Federal St.	City	Arterial	80	36	1	One-way	Yes	No	No	20
Federal St.	Laughlin St.	City	Arterial	80	28	1	One-way	Yes	No	No	20
Laughlin St.	Jefferson St.	City	Arterial	80	24	1	One-way	Yes	No	No	20
Jefferson St.	Madison St.	City	Arterial	80	31	1	One-way	Yes	No	No	20
2nd St.											
I-84	Hostetler St.	County	Collector	60	37	1	Two-way	Yes	No	No	40
Hostetler St.	City Limits	County	Collector	60	42	1	Two-way	Yes	No	No	40
City Limits	Split	City	Collector	60	36	1	Two-way	No	No	No	40
2nd St. SEB											
Split	I-84 WB On Ramp	City	Collector	NA	17	1	One-way	No	No	No	40
I-84 WB On Ramp	I-84 WB On Ramp	City	Collector	NA	21	1	One-way	No	No	No	40
I-84 WB On Ramp	Webber St.	City	Collector	NA	28	1	One-way	No	No	No	40
2nd St. NWB											
Split	I-84 WB On Ramp	City	Collector	NA	26	2	One-way	No	No	No	40
I-84 WB On Ramp	Webber St.	City	Collector	NA	24	2	One-way	No	No	No	40
2nd St.											
Webber St.	Terminal Ave.	State	Arterial	NA	48	2	Two-way	Intermittent	No	No	35
Terminal Ave.	I-84 WB Off Ramp	State	Arterial	NA	62	2	Two-way	Intermittent	No	No	35
I-84 WB Off Ramp	I-84 EB Off Ramp	State	Arterial	NA	34	2	Two-way	No	No	No	35
I-84 EB Off Ramp	Mount Hood St.	State	Arterial	NA	49	2	Two-way	No	No	No	35
Mount Hood St.	Pentland St.	State	Arterial	80	52	2	Two-way	Intermittent	Intermittent	No	35
Pentland St.	Lincoln St.	State	Arterial	80	52/35	2	Two-way	Intermittent	Yes	No	30
Lincoln St.	Liberty St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Liberty St.	Union St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Union St.	Court St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Court St.	Washington St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Washington St.	Federal St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Federal St.	Laughlin St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Laughlin St.	Jefferson St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Jefferson St.	Madison St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Madison St.	Monroe St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Monroe St.	Taylor St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Taylor St.	3rd St.	State	Arterial	60	42	2	One-way	No	Yes	No	20
2nd St. - US 30											
3rd St.	Brewery Grade	State	Arterial	100	46/72	2	Two-way	Intermittent	Intermittent	No	35
Brewery Grade	US 30 WB Merge	State	Arterial	100	87	3	Two-way	No	No	No	40
US 30 WB Merge	I-84 Access Rd.	State	Arterial	100	50	3	Two-way	No	No	No	40
I-84 Access Rd.	US 30 WB Split	State	Arterial	100	46	3	Two-way	No	No	No	40
US 30 WB Split	State Rd. to WB	State	Arterial	100	32	2	Two-way	No	No	No	40
State Rd. to WB	State Rd. to EB	State	Arterial	100	40	2	Two-way	No	No	No	40
State Rd. to EB	US 197	State	Arterial	100	36/40	2	Two-way	No	No	No	40
2nd St. - US 30 WB Through											
US 30 Merge	US 30 Split	State	Arterial	100	25	1	One-way	No	No	No	40
3rd Pl.											
6th St.	Trevitt St.	City	Arterial	60	48	2	Two-way	Intermittent	Yes	No	30
Trevitt St.	4th St.	City	Arterial	60	36	2	Two-way	Intermittent	Yes	No	25
4th St.	Pentland St.	City	Arterial	60	42	2	Two-way	Intermittent	Yes	No	25
3rd St.											
Pentland St.	Lincoln St.	State	Arterial	60	42	2	Two-way	Yes	Yes	No	20
Lincoln St.	Liberty St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lane	Speed Limit
Liberty St.	Union St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Union St.	Court St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Court St.	Washington St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Washington St.	Federal St.	State	Arterial	60	42	2	One-way	Yes	Yes	No	20
Federal St.	Laughlin St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Laughlin St.	Jefferson St.	State	Arterial	60	39	2	One-way	Yes	Yes	No	20
Jefferson St.	Madison St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Madison St.	Monroe St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Monroe St.	Taylor St.	State	Arterial	60	40	2	One-way	Yes	Yes	No	20
Taylor St.	2nd St.	State	Arterial	60	53	2	One-way	Yes	Yes	No	20
4th St.											
3rd Pl.	Lincoln St.	City	Arterial	60	40	2	Two-way	No	Yes	No	25
Lincoln St.	Liberty St.	City	Arterial	60	40	2	Two-way	No	Yes	No	25
Liberty St.	Union St.	City	Arterial	60	39	2	Two-way	No	Yes	No	25
Union St.	Court St.	City	Arterial	60	40	2	Two-way	No	Yes	No	25
Court St.	Washington St.	City	Arterial	60	40	2	Two-way	No	Yes	No	25
Washington St.	Federal St.	City	Arterial	60	37	2	Two-way	No	Yes	No	25
Federal St.	Laughlin St.	City	Arterial	60	36	2	Two-way	No	Yes	No	25
Laughlin St.	Jefferson St.	City	Arterial	60	38	2	Two-way	No	Yes	No	25
4th St. Grade											
Jefferson St.	7th St.	City	Collector	60	34	2	Two-way	No	Intermittent	No	25
7th St.	8th St.	City	Collector	60	30	2	Two-way	No	Yes	No	25
8th St.	9th St.	City	Collector	60	30	2	Two-way	Intermittent	Yes	No	25
5th St.											
Union St.	Court St.	City	Local	60	40	Unstriped	Two-way	Yes	Yes	No	25
Court St.	Washington St.	City	Local	60	38	Unstriped	Two-way	Yes	Yes	No	25
Washington St.	End	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
6th St. - US 30											
Chenowith Creek	I-84 EB Off Ramp	State	Arterial	NA	24	2	Two-way	No	No	No	40
I-84 EB Off Ramp	Division St.	State	Arterial	NA	40	2	Two-way	No	No	Yes	40
Division St.	Irvine St.	State	Arterial	NA	40	2	Two-way	No	No	Yes	40
Irvine St.	Lee St.	State	Arterial	NA	40	2	Two-way	No	No	Yes	40
Lee St.	Chenowith Loop	State	Arterial	NA	42	2	Two-way	No	No	Yes	40
Chenowith Loop	Hostetler St.	State	Arterial	NA	40	2	Two-way	No	No	Yes	40
Hostetler St.	Pomona St.	State	Arterial	NA	39/70	2	Two-way	Intermittent	No	Yes	40
Pomona St.	Snipes St.	State	Arterial	NA	55/69	2	Two-way	Intermittent	No	Yes	40
Snipes St.	Myrtle St.	State	Arterial	NA	62/68	3	Two-way	Intermittent	Intermittent	Yes	40
Myrtle St.	Ash St.	State	Arterial	NA	68	3	Two-way	Intermittent	Intermittent	Yes	40
Ash St.	Walnut St.	State	Arterial	NA	67	3	Two-way	Intermittent	Intermittent	Yes	35
Walnut St.	I-84 EB Off Ramp	State	Arterial	NA	68	3	Two-way	Yes	Yes	Yes	30
I-84 EB Off Ramp	I-84 EB On Ramp	State	Arterial	NA	67	3	Two-way	No	Intermittent	Yes	30
I-84 EB On Ramp	Webber St.	State	Arterial	NA	67	3	Two-way	Yes	Yes	Yes	30
6th St.											
Webber St.	Cherry Heights Rd.	City	Arterial	100	64	3	Two-way	Yes	Yes	Yes	30
Cherry Heights Rd.	Chenowith St.	City	Arterial	100	64	3	Two-way	Yes	Yes	Yes	30
Chenowith St.	Jordan St.	City	Arterial	60-100	44	2	Two-way	Yes	Yes	No	30
Jordan St.	3rd Pl.	City	Arterial	60	45	2	Two-way	Intermittent	Yes	No	30
3rd Pl.	Trevitt St.	City	Local	60	30	Unstriped	Two-way	No	Intermittent	No	25
Trevitt St.	Garrison St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Garrison St.	Pentland St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Pentland St.	Lincoln St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Lincoln St.	Liberty St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
7th Pl.											
Court St.	Washington St.	City	Local	40	36	Unstriped	Two-way	Yes	Yes	No	25
Washington St.	Case St.	City	Local	40	30	Unstriped	Two-way	Yes	Yes	No	25

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limit
7th St.											
Irvine St.	Chenowith Loop	County	Local	50	28	Unstriped	Two-way	Yes	Intermittent	No	25
Hostetler St.	Pleasant Ct.	County	Collector	50	24	2	Two-way	Yes	No	No	25
Pleasant Ct.	Garden Ct.	County	Collector	50	24	2	Two-way	Yes	No	No	25
Garden Ct.	Richland Ct. (N)	County	Collector	50	25	2	Two-way	Yes	No	No	25
Richland Ct. (N)	Richland Ct. (S)	County	Collector	50	25	2	Two-way	Yes	No	No	25
Richland Ct. (S)	Floral Ct. (N)	County	Collector	50	25	2	Two-way	Yes	No	No	25
Floral Ct. (N)	Floral Ct. (S)	County	Collector	50	25	2	Two-way	Yes	No	No	25
Floral Ct. (S)	Home Ct. (N)	County	Collector	50	25	2	Two-way	Yes	No	No	25
Home Ct. (N)	Home Ct. (S)	County	Collector	50	25	2	Two-way	Yes	No	No	25
Home Ct. (S)	Pomona St.	County	Collector	50	25	2	Two-way	Yes	No	No	25
Pomona St.	Snipes St.	City	Collector	50-80	42	2	Two-way	Yes	Intermittent	No	25
Snipes St.	Myrtle St.	City	Collector	80	44/30	2	Two-way	Yes	Intermittent	No	25
Myrtle St.	Ash St.	City	Collector	80	56	2	Two-way	Yes	Intermittent	No	25
Ash St.	Walnut St.	City	Collector	80	56	2	Two-way	Yes	Yes	No	25
Trevitt St.	Garrison St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Garrison St.	Pentland St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Pentland St.	Lincoln St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Lincoln St.	E of Lincoln St.	City	Local	60	30	Unstriped	Two-way	Yes	Intermittent	No	25
Union St.	Court St.	City	Local	60	36/42	Unstriped	Two-way	Yes	Yes	No	25
Washington St.	Case St.	City	Arterial	70	41	2	Two-way	Yes	Intermittent	No	25
Case St.	Federal St.	City	Arterial	70	40	2	Two-way	Yes	Intermittent	No	25
Federal St.	Laughlin St.	City	Arterial	60	40	2	Two-way	Yes	Yes	No	25
Laughlin St.	Kelly Ave.	City	Arterial	60	40	2	Two-way	Yes	Yes	No	25
Kelly Ave.	F St.	City	Local	40	22	Unstriped	Two-way	Yes	Intermittent	No	25
F St.	G St.	City	Local	30	17	Unstriped	Two-way	Yes	No	No	25
G St.	4th St. Grade	City	Local	40	33/12	Unstriped	Two-way	Intermittent	No	No	25
8th Pl.											
Chenowith St.	Dead End	City	Local	60	44	Unstriped	Two-way	Yes	Yes	No	25
Court St.	Washington St.	City	Local	30	20	Unstriped	Two-way	No	No	No	25
Washington St.	Case St.	City	Local	30	20	Unstriped	Two-way	Yes	Intermittent	No	25
8th St.											
W of Chenowith Loop	Chenowith Loop	County	Local	50	23	Unstriped	Two-way	Yes	No	No	25
Chenowith Loop	Cascade St. (W)	County	Local	50	24	Unstriped	Two-way	Yes	No	No	25
Cascade St. (W)	Cascade St. (E)	County	Local	50	25	Unstriped	Two-way	Yes	No	No	25
Cascade St. (E)	Cascade Ct.	County	Local	50	24	Unstriped	Two-way	Yes	No	No	25
Cascade Ct.	Hoestetler St.	County	Local	50	25	Unstriped	Two-way	Yes	No	No	25
W of Snipes St.	Snipes St.	County	Local	40	20	Unstriped	Two-way	No	No	No	25
Snipes St.	Verdant St.	County	Local	50	22	Unstriped	Two-way	No	No	No	25
Verdant St.	Myrtle St.	County	Local	50	22	Unstriped	Two-way	Intermittent	No	No	25
Myrtle St.	Walnut St.	County	Local	50	24	Unstriped	Two-way	Yes	No	No	25
Webber St.	Cherry Heights Rd.	City	Local	60	44	Unstriped	Two-way	Yes	Intermittent	No	25
W of Mount Hood St.	Mount Hood St.	City	Local	60	12	Unstriped	Two-way	No	No	No	25
Bridge St.	Trevitt St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Trevitt St.	Garrison St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Garrison St.	Pentland St.	City	Local	60	30	Unstriped	Two-way	Yes	Intermittent	No	25
Pentland St.	Lincoln St.	City	Local	60	30	Unstriped	Two-way	Yes	Intermittent	No	25
Lincoln St.	Liberty St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Liberty St.	Union St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Union St.	Court St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Court St.	Washington St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Case St.	Federal St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Federal St.	Laughlin St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Laughlin St.	Kelly Ave.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Kelly Ave.	F St.	City	Local	60	30	Unstriped	Two-way	1 Side	Yes	No	25

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limit
F St.	G St.	City	Local	60	30	Unstriped	Two-way	1 Side	Yes	No	25
G St.	4th St. Grade	City	Local	60	30	Unstriped	Two-way	1 Side	Yes	No	25
4th St. Grade	Harris St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
9th Pl.											
W of Kingsley St.	Kingsley St.	County	Local	40	22	Unstriped	Two-way	Yes	No	No	25
Kingsley St.	Walnut St.	County	Local	40	22	Unstriped	Two-way	Yes	No	No	25
9th St.											
Irvine St.	Chenowith Loop	County	Local	60	34	Unstriped	Two-way	Yes	No	No	25
W of Snipes St.	Snipes St.	County	Local	40	20	Unstriped	Two-way	Yes	No	No	25
Myrtle St.	Kingsley St.	County	Local	40	22	Unstriped	Two-way	Intermittent	No	No	25
Kingsley St.	Walnut St.	County	Local	40	22	Unstriped	Two-way	Intermittent	No	No	25
Cherry Heights Rd.	Wright St.	City	Local	60	44	Unstriped	Two-way	Yes	Yes	No	25
Wright St.	Jordan St.	City	Local	60	41/36	Unstriped	Two-way	Yes	Yes	No	25
Jordan St.	Mount Hood St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Mount Hood St.	Bridge St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Bridge St.	Trevitt St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Trevitt St.	Garrison St.	City	Local	60	41	Unstriped	Two-way	Yes	Yes	No	25
Garrison St.	Pentland St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Pentland St.	Lincoln St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Lincoln St.	Liberty St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Liberty St.	Union St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Union St.	Court St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Federal St.	Laughlin St.	City	Local	50	26	Unstriped	Two-way	Yes	Yes	No	25
Laughlin St.	Kelly Ave.	City	Local	50	26	Unstriped	Two-way	Yes	Yes	No	5
Kelly Ave.	F St.	City	Local	40	24	Unstriped	Two-way	Yes	Yes	No	25
F St.	G St. (S)	City	Local	40	24	Unstriped	Two-way	Yes	No	No	25
G St. (S)	G St. (N)	City	Local	40	31	Unstriped	Two-way	Yes	Yes	No	25
G St. (N)	H St.	City	Local	40	31	Unstriped	Two-way	Yes	Yes	No	25
H St.	4th St. Grade	City	Local	40	31	Unstriped	Two-way	Yes	Yes	No	25
4th St. Grade	I St.	City	Local	40	31	Unstriped	Two-way	Yes	Yes	No	25
I St.	J St.	City	Local	40	31	Unstriped	Two-way	Yes	Yes	No	25
J St.	Harris St.	City	Local	40	31	Unstriped	Two-way	Yes	Yes	No	25
Harris St.	Clark St.	City	Local	40	31	Unstriped	Two-way	Yes	Yes	No	25
Clark St.	Lewis St.	City	Local	40	31	Unstriped	Two-way	Yes	Yes	No	25
Lewis St.	Brewery Grade	City	Local	40	43	Unstriped	Two-way	Yes	Yes	No	25
Brewery Grade	Dry Hollow Rd.	City	Arterial	50	36	2	Two-way	Yes	Yes	No	25
Dry Hollow Rd.	Oregon Ave.	City	Collector	60	36	2	Two-way	Yes	Yes	No	25
Oregon Ave.	Quinton St.	City	Collector	60	36	2	Two-way	Yes	Yes	No	25
Quinton St.	10th St.	City	Collector	60	35	2	Two-way	Intermittent	1 Side	No	25
NW of 10th St.	10th St.	City	Local	60	12	Unstriped	Two-way	No	No	No	25
10th St.											
Chenowith Loop	Hostetler	County	Arterial	60	41	2	Two-way	Yes	No	No	35
Hostetler	Lorenzen St.	County	Arterial	60	41	2	Two-way	Yes	No	No	35
Lorenzen St.	Emerson St.	County	Arterial	60	41	2	Two-way	Yes	No	No	35
Emerson St.	Chinook St.	County	Arterial	60	41	2	Two-way	Yes	No	No	35
Chinook St.	Pomona St.	County	Arterial	60	42	2	Two-way	Yes	No	No	35
Pomona St.	Snipes St.	County	Arterial	60	42	2	Two-way	Yes	No	No	35
Snipes St.	Stoffer Lane	County	Arterial	60	42	2	Two-way	Yes	No	No	35
Stoffer Lane	Verdant St.	County	Arterial	60	42	2	Two-way	Yes	No	No	35
Verdant St.	Myrtle St.	County	Arterial	60	42	2	Two-way	Yes	No	No	35
Myrtle St.	Kingsley St.	County	Arterial	60	43	2	Two-way	Yes	No	No	5
Kingsley St.	Eric Ct.	County	Arterial	60	43	2	Two-way	Yes	No	No	5
Eric Ct.	Sandy St.	County	Arterial	60	43	2	Two-way	Yes	No	No	35
Sandy St.	Walnut St. (N)	City	Arterial	60	44	2	Two-way	Yes	No	No	35
Walnut St. (N)	Walnut St. (S)	City	Arterial	60	44	2	Two-way	Yes	No	No	35

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limit
Walnut St. (S)	Frost Ct.	City	Arterial	60	44	2	Two-way	Yes	No	No	35
Frost Ct.	Perkins Ave.	City	Arterial	60	44	2	Two-way	Yes	No	No	35
Perkins Ave.	Blakeley Dr.	City	Arterial	60	44	2	Two-way	Yes	Intermittent	No	35
Blakeley Dr.	Webber St.	City	Arterial	60	44	2	Two-way	Yes	Yes	No	35
Webber St.	Blakeley Way	City	Arterial	60	44	2	Two-way	Yes	Yes	No	35
Blakeley Way	Cherry Heights Rd.	City	Arterial	60	45	2	Two-way	Yes	Yes	No	35
Cherry Heights Rd.	Wright St.	City	Arterial	60	44	2	Two-way	Yes	Yes	No	25/20
Wright St.	Jordan St.	City	Arterial	60	40	2	Two-way	Yes	Yes	No	25
Jordan St.	Mount Hood St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Mount Hood St.	Bridge St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Bridge St.	Trevitt St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Trevitt St.	Garrison St.	City	Arterial	60	36/40	2	Two-way	Yes	Yes	No	25
Garrison St.	Pentland St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Pentland St.	Lincoln St.	City	Arterial	60	41	2	Two-way	Yes	Yes	No	25
Lincoln St.	Liberty St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Liberty St.	Union St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Union St.	Court St.	City	Arterial	60	40	2	Two-way	Yes	Yes	No	25
Court St.	Washington St.	City	Arterial	60	40	2	Two-way	Yes	Yes	No	25
Washington St.	Federal St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Federal St.	Laughlin St. (S)	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Laughlin St. (S)	Laughlin St. (N)	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Laughlin St. (N)	Jefferson St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Jefferson St.	Kelly Ave.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Kelly Ave.	F St.	City	Arterial	60	40	2	Two-way	Yes	Yes	No	25
F St.	G St.	City	Arterial	60	26	2	Two-way	1 Side	Yes	No	25
G St.	H St.	City	Arterial	60	26	2	Two-way	1 Side	Yes	No	25
H St.	I St.	City	Arterial	60	26/31	2	Two-way	1 Side	Yes	No	25
I St.	J St.	City	Arterial	60	26	2	Two-way	1 Side	Yes	No	25
J St.	Clark St.	City	Arterial	50-60	26	2	Two-way	1 Side	Yes	No	25
Clark St.	Lewis St.	City	Arterial	50	26	2	Two-way	1 Side	Yes	No	25
Lewis St.	Dry Hollow Rd.	City	Arterial	50	36	2	Two-way	Yes	Yes	No	25
Dry Hollow Rd.	Oregon Ave.	City	Arterial	50	36	2	Two-way	Yes	Yes	No	25
Oregon Ave.	Quinton St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Quinton St.	9th St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
9th St.	Roberts St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Roberts St.	Shearer St.	City	Arterial	60	36	2	Two-way	Yes	1 Side	No	25
Shearer St.	Thompson St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Thompson St.	Morton St. (S)	City	Local	60	24	Unstriped	Two-way	No	No	No	25
Morton St. (S)	Morton St. (N)	City	Local	60	23	Unstriped	Two-way	No	No	No	25
Morton St. (N)	Richmond St.	City	Local	60	23	Unstriped	Two-way	No	No	No	25
11th St.											
NW of Chinook St.	Chinook St.	County	Local	60	20	Unstriped	Two-way	Yes	No	No	25
Chinook St.	SE of Chinook St.	County	Local	60	24	Unstriped	Two-way	Yes	No	No	25
Blakeley Dr.	Blakeley Way	City	Local	50	32	Unstriped	Two-way	Yes	No	No	25
Wright St.	Jordan St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Jordan St.	Mount Hood St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Mount Hood St.	Bridge St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Bridge St.	Trevitt St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Trevitt St.	Garrison St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Garrison St.	Pentland St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Pentland St.	Lincoln St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Lincoln St.	Liberty St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Liberty St.	Union St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Washington St.	Federal St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Federal St.	Laughlin St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limi
Laughlin St.	Jefferson St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Jefferson St.	Madison St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Madison St.	Kelly Ave.	City	Local	60	40	Unstriped	Two-way	Yes	Yes	No	25
Kelly Ave.	F St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
F St.	G St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
G St.	H St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
H St.	I St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
I St.	J St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
J St.	Clark St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Clark St.	Lewis St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Lewis St.	Dry Hollow Rd.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Dry Hollow Rd.	Oregon Ave.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
W of Thompson St.	Thompson St.	City	Local	50	36	Unstriped	Two-way	Yes	Intermittent	No	25
Thompson St.	E of Thompson St.	City	Local	40	24	Unstriped	Two-way	Yes	No	No	25
12th St.											
NW of Chinook St.	Chinook St.	County	Local	60	20	Unstriped	Two-way	Yes	No	No	25
Chinook St.	SE of Chinook St.	County	Local	60	18	Unstriped	Two-way	Intermittent	No	No	25
Blakeley Dr.	Blakeley Way	City	Local	50	32	Unstriped	Two-way	Yes	No	No	25
Jordan St.	Mount Hood St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Mount Hood St.	Bridge St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Bridge St.	Trevitt St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Trevitt St.	Garrison St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Garrison St.	Pentland St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Pentland St.	Lincoln St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Lincoln St.	Liberty St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Liberty St.	Union St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
Union St.	Court St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Court St.	Washington St.	City	Local	60-80	36	Unstriped	Two-way	Yes	Yes	No	25
Washington St.	Federal St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Federal St.	Laughlin St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Laughlin St.	Jefferson St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Jefferson St.	Madison St.	City	Local	60	41	Unstriped	Two-way	Yes	Yes	No	25
Madison St.	Fork/Split	City	Local	60	30	Unstriped	Two-way	Intermittent	Yes	No	25
Fork/Split	Kelly Ave. (S)	City	Local	60	33	Unstriped	Two-way	No	Yes	No	25
Fork Split	Kelly Ave. (N)	City	Arterial	60	29	2	Two-way	No	Yes	No	25
Kelly Ave. (N)	F St.	City	Arterial	60	35	2	Two-way	Yes	Yes	No	25
F St.	G St.	City	Arterial	60	35	2	Two-way	Yes	Yes	No	25
G St.	H St.	City	Arterial	60	35	2	Two-way	Yes	Yes	No	25
H St.	I St.	City	Arterial	60	34	2	Two-way	Yes	Yes	No	25
I St.	J St.	City	Arterial	50	37	2	Two-way	Yes	Yes	No	25
J St.	Harris St.	City	Arterial	50	37	2	Two-way	Yes	Yes	No	25
Harris St.	Clark St.	City	Arterial	50	37	2	Two-way	Yes	Yes	No	25
Clark St.	Lewis St.	City	Arterial	50	37	2	Two-way	Yes	Yes	No	25
Lewis St.	View Ct.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
View Ct.	Dry Hollow Rd.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Dry Hollow Rd.	Oregon Ave.	City	Arterial	60	40	2	Two-way	Yes	Yes	No	25
Oregon Ave.	Quinton St.	City	Arterial	60	37	2	Two-way	Yes	Yes	No	25
Quinton St.	Roberts St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Roberts St.	Shearer St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Shearer St.	Thompson St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
Thompson St.	Morton St.	City	Collector	60	24	2	Two-way	No	No	No	25
Morton St.	Richmond St.	City	Collector	60	24	2	Two-way	No	No	No	25
Richmond St.	E of Richmond St.	County	Collector	60	?	?	?	?	?	?	?
13th Pl.											
Riverview St.	Harris St.	City	Local	50	14	Unstriped	Two-way	No	No	No	25

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limit
Harris St.	Clark St.	City	Local	50	14	Unstriped	Two-way	No	No	No	25
View Ct.	Dry Hollow Rd.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
13th St.											
Irvine St.	Emerson St.	County	Collector	60	24	2	Two-way	No	No	No	25
Verdant St.	Meek St.	County	Collector	50	32	2	Two-way	Intermittent	No	No	25
Meek St.	Gordon Ct.	County	Collector	50	32	2	Two-way	Intermittent	No	No	25
Gordon Ct.	Elberta St.	County	Collector	50	32	2	Two-way	Intermittent	No	No	25
Elberta St.	Myrtle St.	County	Collector	50	33	2	Two-way	Intermittent	No	No	25
Myrtle St.	Kingsley St.	County	Collector	50	33	2	Two-way	Intermittent	No	No	25
Kingsley St.	Walnut St.	County	Collector	50	30	2	Two-way	No	No	No	25
Walnut St.	Perkins Ave.	County	Collector	50	20	2	Two-way	Yes	No	No	25
Perkins Ave.	Webber St.	County	Collector	40	15	1	Two-way	Yes	No	No	25
Webber St.	Cherry Heights Rd.	County	Collector	40	19	2	Two-way	Yes	No	No	25
Jordan St.	Mount Hood St.	City	Collector	60	42	2	Two-way	Yes	Yes	No	25
Mount Hood St.	Bridge St.	City	Collector	60	42	2	Two-way	Yes	Yes	No	25
Bridge St.	Trevitt St.	City	Collector	60	39	2	Two-way	Yes	Yes	No	25
Trevitt St.	Garrison St.	City	Collector	60	42	2	Two-way	Yes	Yes	No	25
Garrison St.	Pentland St.	City	Collector	60	42	2	Two-way	Yes	Yes	No	25
Pentland St.	Lincoln St.	City	Collector	60	42	2	Two-way	Yes	Intermittent	No	25
Lincoln St.	Liberty St.	City	Collector	60	42	2	Two-way	Yes	Yes	No	25
Liberty St.	Union St.	City	Collector	60	42	2	Two-way	Yes	Yes	No	25
Union St.	Court St.	City	Collector	60	42	2	Two-way	Yes	Yes	No	25
Court St.	Washington St.	City	Collector	60	42	2	Two-way	Yes	Yes	No	25
Washington St.	Short St.	City	Collector	60	42	2	Two-way	Yes	Intermittent	No	25
Short St.	Federal St.	City	Collector	60	30	2	Two-way	Yes	Intermittent	No	25
Federal St.	Laughlin St.	City	Collector	60	30	2	Two-way	Yes	Intermittent	No	25
Laughlin St.	Jefferson St.	City	Collector	60	30	2	Two-way	Yes	Intermittent	No	25
Jefferson St.	Madison St.	City	Collector	60	30	2	Two-way	Yes	Intermittent	No	25
Madison St.	Kelly Ave.	City	Collector	60	30	2	Two-way	Yes	Intermittent	No	25
Kelly Ave.	F St.	City	Local	60	45	Unstriped	Two-way	Yes	Yes	No	25
F St.	G St.	City	Local	60	42	Unstriped	Two-way	Yes	Intermittent	No	25
G St.	H St.	City	Local	60	42	Unstriped	Two-way	Yes	Yes	No	25
I St.	Riverview St.	City	Local	40	26	Unstriped	Two-way	1 Side	Yes	No	25
Riverview St.	Harris St.	City	Local	40	26	Unstriped	Two-way	1 Side	Yes	No	25
Harris St.	Clark St.	City	Local	40	26	Unstriped	Two-way	1 Side	Yes	No	25
Clark St.	Lewis St.	City	Local	40	26	Unstriped	Two-way	1 Side	Yes	No	25
View Ct.	Dry Hollow Rd.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Dry Hollow Rd.	Nevada St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Nevada St.	Oregon Ave.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Quinton St.	Shearer St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Shearer St.	Thompson St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Richmond St.	Lambert St.	City	Local	40	22	Unstriped	Two-way	No	No	No	25
14th Pl.											
Thompson St.	E of Thompson St.	City	Local	60	24	Unstriped	Two-way	Yes	No	No	25
14th St.											
Elberta St.	Myrtle St.	County	Local	50	34	Unstriped	Two-way	Yes	No	No	25
Myrtle St.	Kingsley St.	County	Local	50	34	Unstriped	Two-way	Yes	No	No	25
Kingsley St.	SE of Kingsley St.	County	Local	50	?	?	?	?	?	?	?
Jordan St.	Mount Hood St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Mount Hood St.	Bridge St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Bridge St.	Trevitt St.	City	Local	60	30	Unstriped	Two-way	Intermittent	Yes	No	25
Trevitt St.	Garrison St.	City	Local	60	30	Unstriped	Two-way	Intermittent	Yes	No	25
Garrison St.	Pentland St.	City	Local	60	30	Unstriped	Two-way	Intermittent	Yes	No	25
Pentland St.	Lincoln St.	City	Local	60	30	Unstriped	Two-way	Intermittent	Yes	No	25
Lincoln St.	Liberty St.	City	Local	60	30	Unstriped	Two-way	Intermittent	Yes	No	25

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limi
Liberty St.	Union St.	City	Local	60	33	Unstriped	Two-way	Yes	Yes	No	25
Union St.	Court St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Court St.	Washington St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Washington St.	Short St.	City	Local	50	26	Unstriped	Two-way	1 Side	Yes	No	25
Short St.	Federal St.	City	Local	50	26	Unstriped	Two-way	1 Side	Yes	No	25
Federal St.	Laughlin St.	City	Local	50	26	Unstriped	Two-way	1 Side	Intermittent	No	25
Laughlin St.	Jefferson St.	City	Local	50	26	Unstriped	Two-way	1 Side	Intermittent	No	25
Jefferson St.	Madison St.	City	Local	50	26	Unstriped	Two-way	1 Side	Yes	No	25
Madison St.	Kelly Ave.	City	Local	50	26	Unstriped	Two-way	1 Side	Yes	No	25
Kelly Ave.	F St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
F St.	G St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
G St.	H St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Riverview St.	Clark St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Clark St.	Lewis St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Lewis St.	View Ct.	City	Local	50	36	Unstriped	Two-way	Yes	Intermittent	No	25
View Ct.	Dry Hollow Rd.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Dry Hollow Rd.	Nevada St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Nevada St.	Oregon Ave.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Oregon Ave.	Quinton St.	City	Local	50	37	Unstriped	Two-way	Yes	Yes	No	25
Quinton St.	Shearer St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Shearer St.	Thompson St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Thompson St.	Morton St.	City	Local	60	24	Unstriped	Two-way	Yes	No	No	25
Morton St.	E of Morton St.	City	Local	60	20	Unstriped	Two-way	No	No	No	25
15th Pl.											
W of Terrace Dr.	Terrace Dr.	City	Local	60	13	Unstriped	Two-way	No	No	No	25
Terrace Dr.	E of Terrace Dr.	City	Local	60	26	Unstriped	Two-way	Yes	No	No	25
G St.	E of G St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
15th St.											
W of Mount Hood St.	Mount Hood St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Mount Hood St.	Bridge St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Trevitt St.	Garrison St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Garrison St.	Pentland St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Pentland St.	Lincoln St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
Lincoln St.	Liberty St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Jefferson St.	Madison St.	City	Local	50	12	Unstriped	Two-way	Yes	No	No	25
Madison St.	Monroe St.	City	Local	50	26	Unstriped	Two-way	Yes	No	No	25
Monroe St.	Kelly Ave.	City	Local	50	26	Unstriped	Two-way	Yes	No	No	25
Kelly Ave.	G St.	City	Local	50	30	Unstriped	Two-way	Yes	No	No	25
G St.	H St.	City	Local	50	17/36	Unstriped	Two-way	Intermittent	Intermittent	No	25
I St.	Riverview St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Riverview St.	Dead End	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Montana St.	Nevada St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Nevada St.	Oregon Ave.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Oregon Ave.	Quinton St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Quinton St.	Roberts St.	City	Local	30	15	Unstriped	Two-way	No	No	No	25
Roberts St.	E of Roberts St.	City	Local	30	15	Unstriped	Two-way	No	No	No	25
16th St.	Morton St.	City	Local	60	36	Unstriped	Two-way	Yes	No	No	25
16th Ct.											
W of Nevada St.	Nevada St.	City	Local	80	60	Unstriped	Two-way	Yes	Yes	No	25
Nevada St.	E of Nevada St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
16th Pl.											
Monroe St.	Kelly Ave.	City	Local	60	29	Unstriped	Two-way	Yes	No	No	25
Kelly Ave.	G St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
G St.	17th St.	City	Arterial	60	37	2	Two-way	Yes	Intermittent	No	25
17th St.	Scenic Dr.	City	Arterial	60	36	2	Two-way	Yes	Intermittent	No	25

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limit
Scenic Dr.	18th St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
18th St.	Dry Hollow Rd.	City	Arterial	60	35	2	Two-way	No	No	No	25
16th St.											
Mount Hood St.	Bridge St.	City	Local	60	18	Unstriped	Two-way	No	No	No	25
Bridge St.	Trevitt St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Trevitt St.	Garrison St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
W of Pentland St.	Pentland St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Pentland St.	Lincoln St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Lincoln St.	Liberty Way	City	Local	60	34	Unstriped	Two-way	Yes	Intermittent	No	25
Riverview St.	Dead End	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Oregon Ave.	Quinton St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Shearer St.	Thompson St.	City	Local	60	20	Unstriped	Two-way	Intermittent	No	No	25
Thompson St.	15th St.	City	Local	60	22	Unstriped	Two-way	Intermittent	No	No	25
15th St.	E of 15th St.	City	Local	60	17	Unstriped	Two-way	No	No	No	25
Morton St.	Richmond St.	City	Local	60	15	Unstriped	Two-way	No	No	No	25
17th Pl.											
Jefferson St.	Fairview St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
17th St.											
Mount Hood St.	Bridge St.	City	Local	60	26	Unstriped	Two-way	Yes	No	No	25
Bridge St.	Trevitt St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
Trevitt St.	E of Trevitt St.	City	Local	60	29	Unstriped	Two-way	Yes	Intermittent	No	25
H St.	I St.	City	Local	50	30	Unstriped	Two-way	Yes	Intermittent	No	25
I St.	Riverview St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Montana St.	Minnesota St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Minnesota St.	Nevada St.	City	Local	50	36/39	Unstriped	Two-way	Yes	Yes	No	25
Thompson St.	E of Thompson St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
18th St.											
Jordan St.	Mount Hood St.	City	Local	60	31	Unstriped	Two-way	Yes	No	No	25
Mount Hood St.	Bridge St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Jefferson St.	20th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
20th St.	Fairview St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Fairview St.	Dead End	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
16th Pl.	E of 16th Pl.	City	Local	40	19	Unstriped	Two-way	Yes	No	No	25
Thompson St.	Morton St.	City	Local	60	28	Unstriped	Two-way	No	No	No	25
19th St.											
W of Mount Hood St.	Mount Hood St.	City	Local	50	37	?	?	?	?	?	?
Mount Hood St.	E of Mount Hood St.	City	Local	50	36	Unstriped	Two-way	Yes	Intermittent	No	25
W of Garrison St.	Garrison St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Fairview St.	20th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
20th St.	Dry Hollow Rd. Overlap	County	Local	50	36/23	Unstriped	Two-way	Yes	Intermittent	No	25
Dry Hollow Rd. Overlap	16th Pl.	County	Local	60	30	Unstriped	Two-way	Intermittent	No	No	25
Dry Hollow Rd.	Lewis St.	City	Arterial	60	44	2	Two-way	Yes	Yes	No	25
Lewis St.	View Ct.	City	Arterial	80	44	2	Two-way	Yes	Yes	No	25
View Ct.	Hospital Access	City	Arterial	80	44	2	Two-way	Yes	Yes	No	25
Hospital Access	Nevada St.	City	Arterial	80	44	2	Two-way	Yes	Yes	No	25
Nevada St.	Oregon Ave.	City	Arterial	80	44	2	Two-way	Yes	Yes	No	25
Oregon Ave.	Reservoir Access	City	Arterial	80	44	2	Two-way	Yes	Yes	No	25
Reservoir Access	Dead End	City	Arterial	80	44	2	Two-way	Yes	No	No	25
20th St.											
Scenic Dr.	Radio Way	City	Local	50	36	Unstriped	Two-way	Yes	Intermittent	No	25
adio Way	Dead End	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
18th St.	21st Pl.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
21st Pl.	Fairview St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Fairview St.	19th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
21st Pl.											

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limi
21st St.	S of 21st St.	City	Local	50	26	Unstriped	Two-way	Intermittent	Intermittent	No	25
20th St.	Fairview St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
21st St.											
Radio Way	21st Pl.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
21st Pl.	Sorosis St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Dead End	Lewis St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
View Ct.	Claudia Lane	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Claudia Lane	E of Claudia Lane	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
22nd St.											
W of Garrison St.	Garrison St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
23rd St.											
Wright St.	Jordan St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Jordan St.	Mount Hood St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Radio Way	Sorosis St.	City	Local	50	20	Unstriped	Two-way	No	Intermittent	No	25
Sorosis St.	E of Sorosis St.	City	Local	50	14	Unstriped	Two-way	No	No	No	25
25th St.											
W of Wright Dr.	Wright Dr.	City	Local	50	36	Unstriped	Two-way	Yes	Intermittent	No	25
Allen Pl.											
Starlight St.	Dead End	County	Local	50	20	Unstriped	Two-way	No	No	No	25
Ash St.											
7th St.	6th St.	City	Local	80	56	Unstriped	Two-way	Yes	Yes	No	25
Bargeway Rd.											
River Rd.	SE of River Rd.	City	Collector	40	24	2	Two-way	No	No	No	25
Blakeley Dr.											
12th St.	11th St.	City	Local	50	31	Unstriped	Two-way	Yes	No	No	25
11th St.	10th St.	City	Local	50	31	Unstriped	Two-way	Yes	No	No	25
Blakeley Way											
12th St.	11th St.	City	Local	50	31	Unstriped	Two-way	Yes	No	No	25
11th St.	10th St.	City	Local	50	31	Unstriped	Two-way	Yes	No	No	25
Brentwood Dr.											
E of Summit Ridge Dr.	Summit Ridge Dr.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Summit Ridge Dr.	Royal Crest Dr.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Royal Crest Dr.	Columbia View Dr.	City	Local	60	34	Unstriped	Two-way	Yes	Intermittent	No	25
Brewery Grade											
US 30	9th St.	City	Arterial	60-70	44	2	Two-way	Intermittent	Intermittent	No	25
Bridge St.											
18th St.	17th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
17th St.	16th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
16th St.	15th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
15th St.	14th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
14th St.	13th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
13th St.	12th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
12th St.	11th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
11th St.	10th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
9th St.	8th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
Cascade Ct.											
8th St.	Dead End	County	Local	50	24	Unstriped	Two-way	Intermittent	No	No	25
Cascade St.											
W 8th St.	E 8th St.	County	Local	50	24	Unstriped	Two-way	Yes	No	No	25
Case St.											
8th Pl.	8th St.	City	Local	40	20	Unstriped	Two-way	Yes	Intermittent	No	25
8th St.	7th Pl.	City	Local	40	26	Unstriped	Two-way	No	Yes	No	25
7th Pl.	7th St.	City	Local	20	25	Unstriped	Two-way	Yes	Intermittent	No	25
Chenowith Loop											

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limit
10th St.	9th St.	County	Collector	40	40	2	Two-way	Yes	No	No	25
9th St.	8th St.	County	Collector	40	40/30	2	Two-way	Yes	No	No	25
8th St.	7th St.	County	Collector	40	24	2	Two-way	Yes	No	No	25
7th St.	US 30	County	Collector	40	24	2	Two-way	Yes	No	No	25
Chenowith Rd.											
UGB (~0.1 mi.)	Starlight St.	County	Arterial	60	25	2	Two-way	No	No	No	35
Starlight St.	Hiland Ct.	County	Arterial	60	24	2	Two-way	No	No	No	35
Hiland Ct.	Sunflower St.	County	Arterial	60	24	2	Two-way	No	No	No	35
Sunflower St.	Pine St.	County	Arterial	60	24	2	Two-way	No	No	No	35
Pine St.	Oak St.	County	Arterial	60	24	2	Two-way	No	No	No	35
Oak St.	Maple St.	County	Arterial	60	24	2	Two-way	No	No	No	35
Maple St.	Whitman St.	County	Arterial	60	24	2	Two-way	No	No	No	35
Whitman St.	Seven Mile Rd.	County	Arterial	60	24	2	Two-way	No	No	No	35
Seven Mile Rd.	Irvine St. on S side	County	Arterial	60	24	2	Two-way	No	No	No	35
Irvine St. on S side	Irvine St. on N side	County	Arterial	60	24/40	2	Two-way	No	No	No	35
Irvine St. on N side	Chenowith Loop	County	Arterial	60	40	2	Two-way	No	No	No	35
Chenowith St.											
Cherry Heights Rd.	8th Pl.	City	Local	60	41	Unstriped	Two-way	Yes	Yes	No	25
8th Pl.	6th St.	City	Local	60	41	Unstriped	Two-way	Yes	Yes	No	25
Cherry Heights Rd.											
Hill Rd.	Sandstone Way	County	Collector	60	24	2	Two-way	No	No	No	35
Sandstone Way	13th St.	County	Arterial	60	30	2	Two-way	No	No	No	35
13th St.	10th St.	City	Arterial	60	42	2	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Arterial	80	44	2	Two-way	Yes	Yes	No	25
9th St.	8th St.	City	Arterial	80	44	2	Two-way	Yes	Yes	No	25
8th St.	6th St.	City	Arterial	80	44	2	Two-way	Yes	Yes	No	25
Chinook St.											
SW of 12th St.	12th St.	County	Local	60	20	Unstriped	Two-way	Intermittent	No	No	25
12th St.	11th St.	County	Local	60	21	Unstriped	Two-way	Intermittent	No	No	25
11th St.	10th St.	County	Local	60	21	Unstriped	Two-way	No	No	No	25
Clark St.											
Dead End	14th St.	City	Local	50	36	Unstriped	Two-way	Yes	Intermittent	No	25
14th St.	13th Pl.	City	Local	50	14	Unstriped	Two-way	No	No	No	25
13th Pl.	13th St.	City	Local	50	22	Unstriped	Two-way	No	No	No	25
12th St.	11th St.	City	Local	50	31	Unstriped	Two-way	Yes	Intermittent	No	25
11th St.	10th St.	City	Local	50	18	Unstriped	Two-way	1 Side	No	No	25
10th St.	9th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
9th St.	N of 9th St.	City	Local	60	32	Unstriped	Two-way	Yes	No	No	25
Claudia Lane											
21st St.	Dead End	City	Local	50	28	Unstriped	Two-way	Yes	Yes	No	25
Columbia View Dr.											
US 197	E Knoll Dr.	City	Collector	90-100	31	2	Two-way	No	No	No	35
E Knoll Dr.	Wasco Dr.	City	Collector	80-90	42	2	Two-way	Intermittent	No	No	35
Wasco Dr.	E Knoll Dr.	City	Collector	80	54	2	Two-way	Intermittent	Intermittent	No	25
E Knoll Dr.	Brentwood Dr.	City	Collector	80	45	2	Two-way	Yes	Yes	No	25
Brentwood Dr.	Summit Ridge Dr.	City	Collector	80	45	2	Two-way	Yes	Intermittent	No	25
Summit Ridge Dr.	City Limits (~0.4 mi.)	City	Collector	80	34	2	Two-way	No	No	No	25
Court St.											
S of 14th St.	14th St.	City	Local	80	36	Unstriped	Two-way	Yes	No	No	25
14th St.	13th St.	City	Local	80	36	Unstriped	Two-way	Yes	Yes	No	25
13th St.	12th St.	City	Local	80	37	Unstriped	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Arterial	80	47	2	Two-way	Yes	Yes	No	20
9th St.	8th Pl.	City	Arterial	80	47	2	Two-way	Yes	Yes	No	20
8th Pl.	8th St.	City	Arterial	80	47	2	Two-way	Yes	Yes	No	20
8th St.	7th Pl.	City	Arterial	80	48	2	Two-way	Yes	Yes	No	20

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limit
7th Pl.	7th St.	City	Arterial	80	48	2	Two-way	No	Yes	No	20
7th St.	5th St.	City	Arterial	80	48	2	Two-way	Yes	Yes	No	20
5th St.	4th St.	City	Arterial	80	54	2	Two-way	Yes	Yes	No	20
4th St.	3rd St.	City	Arterial	80	56	2	Two-way	Yes	Yes	No	20
3rd St.	2nd St.	City	Arterial	80	58	2	Two-way	Yes	Yes	No	20
2nd St.	1st St.	City	Arterial	80	57	2	Two-way	Yes	Yes	No	20
Crest Ct.											
Royal Crest Dr.	Dead End	City	Local	60	34	Unstriped	Two-way	Yes	No	No	25
Dawson Dr./7th St.											
NW of Hostetler St.	Hostetler St.	County	Local	40	22	Unstriped	Two-way	No	No	No	25
Division St.											
W of US 30	US 30	County	Local	20	30	Unstriped	Two-way	Yes	No	No	25
Dry Hollow Rd.											
19th St.	Montana St.	City	Arterial	60-140	42	2	Two-way	No	Intermittent	No	40
Montana St.	14th St.	City	Arterial	80-120	36	2	Two-way	No	Intermittent	No	40/25
14th St.	13th Pl.	City	Arterial	80	52	2	Two-way	Yes	Yes	No	25
13th Pl.	13th St.	City	Arterial	80	52	2	Two-way	Yes	Yes	No	25
13th St.	12th St.	City	Arterial	80	53	2	Two-way	Yes	Yes	No	25
12th St.	11th St.	City	Arterial	80	53	2	Two-way	Yes	Yes	No	25
11th St.	10th St.	City	Arterial	80	52	2	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Arterial	80	52	2	Two-way	Yes	Yes	No	25
E Knoll Ct.											
E Knoll Dr.	Dead End	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
E Knoll Dr.											
Columbia View Dr.	E Knoll Ct.	City	Local	50	36	Unstriped	Two-way	Yes	Intermittent	No	25
E Knoll Ct.	Columbia View Dr.	City	Local	50	36	Unstriped	Two-way	Yes	Intermittent	No	25
Elberta St.											
14th St.	13th St.	County	Local	50	34	Unstriped	Two-way	Yes	No	No	25
Emerson St.											
13th St.	10th St.	County	Local	50	31	Unstriped	Two-way	Intermittent	No	No	25
Eric Ct.											
SW of 10th St.	10th St.	County	Local	50	24	Unstriped	Two-way	No	No	No	25
Esther Way											
Scenic Dr.	Dead End	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
F St.											
14th St.	13th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
13th St.	12th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
12th St.	11th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
11th St.	10th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
10th St.	N of 10th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
9th St.	8th St.	City	Local	60	36	Unstriped	Two-way	Yes	No	No	25
8th St.	7th St.	City	Local	60	36	Unstriped	Two-way	Yes	No	No	25
Fairview St.											
S of 21st Pl.	21st Pl.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
21st Pl.	20th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Fallon Ct.											
Snipes St.	Dead End	City	Local	30	15	Unstriped	Two-way	Yes	No	No	25
Federal St.											
14th St.	13th St.	City	Local	60	38	Unstriped	Two-way	Yes	Yes	No	25
13th St.	12th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
12th St.	11th St.	City	Local	60	33	Unstriped	Two-way	Yes	Yes	No	5
11th St.	10th St.	City	Local	60	35	Unstriped	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Local	60	32/36	Unstriped	Two-way	Yes	Yes	No	25
9th St.	8th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
8th St.	7th St.	City	Local	60	18	Unstriped	Two-way	Yes	Intermittent	No	25

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limit
S of 4th St.	4th St.	City	Collector	75	38	2	Two-way	Yes	Intermittent	No	20
4th St.	3rd St.	City	Collector	75	56	2	Two-way	Yes	Yes	No	20
3rd St.	2nd St.	City	Collector	75	57	2	Two-way	Yes	Yes	No	20
2nd St.	1st St.	City	Collector	75	59	2	Two-way	Yes	Yes	No	20
Fire Rd.											
Washington St.	Madison St.	City	Local	60	23	Unstriped	Two-way	No	No	No	25
Madison St.	Clark St.	City	Local	60	18	Unstriped	Two-way	No	No	No	25
Clark St.	Access to I-84	City	Local	60	20	Unstriped	Two-way	No	No	No	25
Access to I-84	End	City	Local	60	25	Unstriped	Two-way	No	No	No	25
Floral Ct.											
W of 7th St.	7th St.	County	Local	40	24	Unstriped	Two-way	Yes	No	No	25
7th St.	E of 7th St.	County	Local	40	22	Unstriped	Two-way	Yes	No	No	25
Fremont St.											
Old Dufur Rd.	US 197	City	Arterial	60	22	2	Two-way	No	No	No	35
Frost Ct.											
Dead End	10th St.	County	Local	20	20	Unstriped	Two-way	No	No	No	25
G St.											
16th Pl.	15th Pl.	City	Local	60	36	Unstriped	Two-way	Intermittent	Intermittent	No	25
15th Pl.	15th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
15th St.	14th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
14th St.	13th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
13th St.	12th St.	City	Local	60	34	Unstriped	Two-way	Yes	Yes	No	25
12th St.	11th St.	City	Local	60	35	Unstriped	Two-way	Yes	Yes	No	25
1th St.	10th St.	City	Local	60	34	Unstriped	Two-way	Yes	Yes	No	25
0th St.	9th St.	City	Local	60	34	Unstriped	Two-way	Yes	Yes	No	25
9th St.	8th St.	City	Local	60	45	Unstriped	Two-way	Yes	Yes	No	25
8th St.	7th St.	City	Local	60	12	Unstriped	Two-way	No	No	No	25
Garden Ct.											
W of 7th St.	7th St.	County	Local	40	25	Unstriped	Two-way	Yes	No	No	25
Garrison St.											
S of 22nd St.	22nd St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
22nd St.	19th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
19th St.	Scenic Dr.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
17th St.	N of 17th St.	City	Local	60	29	Unstriped	Two-way	Yes	No	No	25
16th St.	15th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
15th St.	14th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
14th St.	13th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
13th St.	12th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
12th St.	11th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
11th St.	10th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Local	60	40	Unstriped	Two-way	Yes	Yes	No	25
9th St.	8th St.	City	Local	60	41	Unstriped	Two-way	Yes	Yes	No	25
8th St.	7th St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
7th St.	6th St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
Gorden Ct.											
13th St.	NE of 13th St.	County	Local	50	17	Unstriped	Two-way	No	No	No	25
Grant Cir.											
Lincoln Way	Dead End	City	Local	30	23	Unstriped	Two-way	Yes	Intermittent	No	25
H St.											
17th St.	15th St.	City	Local	60	42	Unstriped	Two-way	Yes	Yes	No	25
th St.	14th St.	City	Local	60	42	Unstriped	Two-way	Yes	Yes	No	25
4th St.	13th St.	City	Local	60	42	Unstriped	Two-way	Yes	Yes	No	25
13th St.	12th St.	City	Local	60	42	Unstriped	Two-way	Yes	Yes	No	25
12th St.	11th St.	City	Local	60	37	Unstriped	Two-way	Yes	Yes	No	25
11th St.	10th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Lim
10th St.	9th St.	City	Collector	60	36	2	Two-way	Yes	Yes	No	25
Harris St.											
13th Pl.	13th St.	City	Local	40-60	36	Unstriped	Two-way	Yes	Yes	No	25
13th St.	12th St.	City	Local	50	32	Unstriped	Two-way	Yes	Yes	No	25
9th St.	8th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Hermits Way											
W of Ledge St.	Ledge St.	County	Local	50	20	Unstriped	Two-way	No	No	No	25
Ledge St.	Dead End	County	Local	50	20	Unstriped	Two-way	No	No	No	25
Hiland Ct.											
Dead End	Chenowith Rd.	County	Local	50	34	Unstriped	Two-way	Yes	No	No	25
Home Ct.											
W of 7th St.	7th St.	County	Local	40	23	Unstriped	Two-way	Yes	No	No	25
7th St.	E of 7th St.	County	Local	40	15	Unstriped	Two-way	No	No	No	25
Hostetler St.											
10th St.	8th St.	County	Collector	40	35	2	Two-way	No	No	No	30
8th St.	Dawson Dr.	County	Collector	50	35	2	Two-way	No	No	No	30
Dawson Dr.	7th St.	County	Collector	50	35	2	Two-way	No	No	No	30
7th St.	US 30	County	Collector	40	35/44	2	Two-way	No	No	No	30
US 30	2nd St.	County	Local	40	28	Unstriped	Two-way	No	Intermittent	No	30
2nd St.	N of 2nd St.	County	Local	40	40	Unstriped	Two-way	No	No	No	15
I St.											
17th St.	15th St.	City	Local	50	36	Unstriped	Two-way	Yes	No	No	25
I St.											
13th St.	12th St.	City	Local	50	35	Unstriped	Two-way	Yes	Yes	No	25
12th St.	11th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
11th St.	10th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Local	50	35	Unstriped	Two-way	Yes	Yes	No	25
Irvine St.											
W of 13th St.	13th St.	County	Local	40	20	Unstriped	Two-way	No	No	No	25
13th St.	Chenowith Rd.	County	Local	40	24	Unstriped	Two-way	No	No	No	25
Chenowith Rd.	9th St.	County	Local	40	24	Unstriped	Two-way	No	No	No	25
9th St.	E of 9th St.	County	Local	40	24	Unstriped	Two-way	Yes	No	No	25
W of 7th St.	7th St.	County	Local	40	15	Unstriped	Two-way	No	No	No	25
7th St.	US 30	County	Local	40	33/20	Unstriped	Two-way	Yes	Intermittent	No	25
J St.											
13th St.	12th St.	City	Local	50	14	Unstriped	Two-way	No	No	No	25
12th St.	11th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Local	50	22	Unstriped	Two-way	Yes	No	No	25
Jefferson St.											
18th St.	17th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
17th St.	Scenic Dr.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
15th St.	14th St.	City	Local	60	24	Unstriped	Two-way	No	No	No	25
14th St.	13th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
13th St.	12th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
12th St.	11th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
11th St.	10th St.	City	Local	60	35	Unstriped	Two-way	Yes	Yes	No	25
S of 4th St.	4th St.	City	Arterial	80	30	2	Two-way	No	No	No	20
4th St.	3rd St.	City	Arterial	80	56	2	Two-way	Yes	Yes	No	20
3rd St.	2nd St.	City	Arterial	80	60	2	Two-way	Yes	Yes	No	20
2nd St.	1st St.	City	Local	80	60	Unstriped	Two-way	Yes	Yes	No	20
Jordan St.											
S of 23rd St.	23rd St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
18th St.	14th St.	City	Local	50	12	Unstriped	Two-way	No	No	No	25
14th St.	13th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
13th St.	12th St.	City	Local	60	35	Unstriped	Two-way	Yes	Yes	No	25

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limit
12th St.	11th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
11th St.	10th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
9th St.	N of 9th St.	City	Local	60	27	Unstriped	Two-way	Yes	No	No	25
S of 6th St.	6th St.	City	Local	60	40	Unstriped	Two-way	Intermittent	Yes	No	25
Kelly Ave.											
16th St.	15th St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
15th St.	14th St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
14th St.	13th St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
13th St.	12th St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
12th St.	11th St.	City	Arterial	60	44	2	Two-way	Yes	Yes	No	25
11th St.	10th St.	City	Arterial	60	44	2	Two-way	Yes	Yes	No	20
10th St.	9th St.	City	Arterial	60	36	2	Two-way	No	Yes	No	20
9th St.	8th St.	City	Arterial	50	33	2	Two-way	No	Yes	No	20
8th St.	7th St.	City	Arterial	50	33	2	Two-way	No	Yes	No	20
Kingsley St.											
S of Loring St.	Loring St.	County	Local	40	?	?	?	?	?	?	?
Loring St.	14th St.	County	Local	40	36	Unstriped	Two-way	Yes	No	No	25
14th St.	13th St.	County	Local	40	36	Unstriped	Two-way	Yes	No	No	25
10th St.	9th Pl.	County	Local	40	22	Unstriped	Two-way	No	No	No	25
9th Pl.	9th St.	County	Local	40	22	Unstriped	Two-way	No	No	No	25
Lambert St.											
13th St.	Old Dufur Rd.	City	Local	40	19	Unstriped	Two-way	No	No	No	35
hlin St.											
14th St.	13th St.	City	Local	60	37	Unstriped	Two-way	Yes	Intermittent	No	25
13th St.	12th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
12th St.	11th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
11th St.	10th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Local	40	26	Unstriped	Two-way	Intermittent	Yes	No	25
9th St.	8th St.	City	Local	40	26	Unstriped	Two-way	Intermittent	Yes	No	25
8th St.	7th St.	City	Local	40	18	Unstriped	Two-way	Yes	Intermittent	No	25
S of 4th St.	4th St.	City	Local	60	40	Unstriped	Two-way	Yes	Yes	No	20
4th St.	3rd St.	City	Local	60	40	Unstriped	Two-way	Yes	Yes	No	20
3rd St.	2nd St.	City	Local	60	40	Unstriped	Two-way	Yes	Yes	No	20
2nd St.	1st St.	City	Local	60	40	Unstriped	Two-way	Yes	Yes	No	20
Ledge St.											
Sandstone Way	Hermits Way	County	Local	50	20	Unstriped	Two-way	No	No	No	25
Lee St.											
7th St.	US 30	County	Local	40	20/24	Unstriped	Two-way	Yes	Intermittent	No	25
Lewis St.											
S of 21st St.	21st St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
21st St.	19th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
14th St.	13th St.	City	Local	40	28	Unstriped	Two-way	Yes	Yes	No	25
13th St.	12th St.	City	Local	40	28	Unstriped	Two-way	Yes	Intermittent	No	25
12th St.	11th St.	City	Local	40	30	Unstriped	Two-way	Yes	Intermittent	No	25
11th St.	10th St.	City	Local	40	29	Unstriped	Two-way	Yes	1 Side	No	25
10th St.	9th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Liberty St.											
15th St.	14th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
14th St.	13th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
2th St.	11th St.	City	Local	60	18	Unstriped	Two-way	Yes	No	No	25
1th St.	10th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Local	60	31	Unstriped	Two-way	Yes	Yes	No	25
9th St.	8th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
6th St.	4th St.	City	Local	60	32	Unstriped	Two-way	Yes	Yes	No	20

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limi
4th St.	3rd St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	20
3rd St.	2nd St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	20
Liberty Way											
Scenic Dr.	Lincoln St.	City	Local	50	36	Unstriped	Two-way	Yes	Intermittent	No	20
Lincoln St.											
16th St.	15th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
15th St.	14th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
14th St.	13th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
13th St.	12th St.	City	Local	60	18	Unstriped	Two-way	No	No	No	25
12th St.	11th St.	City	Local	60	23	Unstriped	Two-way	No	Intermittent	No	25
11th St.	10th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Local		36	Unstriped	Two-way	Yes	Yes	No	25
8th St.	N of 8th St.	City	Local	60	14	Unstriped	Two-way	No	No	No	25
7th St.	6th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
4th St.	3rd St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	20
3rd St.	2nd St.	City	Arterial	60	42	2	Two-way	No	Yes	No	20
Lincoln Way											
Grant Cir.	16th St.	City	Local	50	32	Unstriped	Two-way	Yes	Intermittent	No	25
Lockwood St.											
Starlight St.	Sunflower St.	County	Local	50	34	Unstriped	Two-way	Yes	No	No	25
Sunflower St.	Pine St.	County	Local	50	12	Unstriped	Two-way	No	No	No	25
Pine St.	Oak St.	County	Local	50	12	Unstriped	Two-way	No	No	No	25
Oak St.	Maple St.	County	Local	50	22	Unstriped	Two-way	Yes	No	No	25
Maple St.	Murray Dr.	County	Local	50	34	Unstriped	Two-way	Yes	No	No	'5
Lorenzen St.											
S of 10th St.	10th St.	City	Local	40	18	Unstriped	Two-way	No	No	No	25
Loring St.											
NW of Myrtle St.	Myrtle St.	County	Local	40	10	?	?	?	?	?	?
Myrtle St.	Kingsley St.	County	Local	40	12	Unstriped	Two-way	No	No	No	25
Kingsley St.	Webber St.	County	Local	40	12	Unstriped	Two-way	No	No	No	25
Madison St.											
15th St.	14th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
14th St.	13th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
13th St.	12th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
12th St.	11th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
S of 3rd St.	3rd St.	City	Arterial	80	59	2	Two-way	Yes	Yes	No	20
3rd St.	2nd St.	City	Arterial	80	61	2	Two-way	Yes	Yes	No	20
2nd St.	1st St.	City	Arterial	80	61	2	Two-way	Yes	Yes	No	20
1st St.	Fire Rd.	City	Arterial	80	54	2	Two-way	Yes	Intermittent	No	20
Maple St.											
Lockwood St.	Chenowith Rd.	County	Local	50	34	Unstriped	Two-way	Yes	No	No	25
Meek St.											
SW of 13th St.	13th St.	County	Local	50	16	Unstriped	Two-way	No	No	No	25
Minnesota St.											
Dead End	17th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Monroe St.											
15th St.	16th Pl.	City	Local	80	14	Unstriped	Two-way	No	No	No	25
3rd St.	2nd St.	City	Local	80	60	Unstriped	Two-way	Yes	Yes	No	20
2nd St.	N of 2nd St.	City	Local	80	61	Unstriped	Two-way	Yes	Yes	No	20
Montana St.											
Dry Hollow Rd.	17th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
17th St.	15th St.	City	Local	60	35	Unstriped	Two-way	Intermittent	Intermittent	No	25
15th St.	14th St.	City	Local	60	27/35	Unstriped	Two-way	No	Intermittent	No	25
Morton St.											
18th St.	16th St.	City	Local	60	23	Unstriped	Two-way	No	No	No	25

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limit
16th St.	15th St.	City	Local	60	23	Unstriped	Two-way	No	No	No	25
15th St.	14th St.	City	Local	60	24	Unstriped	Two-way	No	No	No	25
14th St.	12th St.	City	Local	60	24	Unstriped	Two-way	No	No	No	25
12th St.	10th St.	City	Local	60	18	Unstriped	Two-way	No	No	No	25
10th St.	Old Dufur Rd.	City	Local	60	18	Unstriped	Two-way	No	No	No	25
Mount Hood St.											
City Limits (~0.2 mi)	Sunset Valley Rd.	City	Arterial	60	25	2	Two-way	Yes	No	No	35
Sunset Valley Rd.	23rd St.	City	Arterial	60	26	2	Two-way	Yes	No	No	35
23rd St.	Skyline Rd.	City	Arterial	60	26	2	Two-way	Yes	No	No	35
Skyline Rd.	21st St.	City	Arterial	60	24	2	Two-way	1 Side	No	No	35
21st St.	20th St.	City	Arterial	60	42	2	Two-way	Yes	Yes	No	35
20th St.	19th St.	City	Arterial	60	42	2	Two-way	Yes	Yes	No	35
19th St.	18th St.	City	Arterial	60	42	2	Two-way	Yes	Yes	No	35
18th St.	17th St.	City	Arterial	60	42	2	Two-way	Yes	Yes	No	25
17th St.	16th St.	City	Arterial	60	42	2	Two-way	Yes	Yes	No	25
16th St.	15th St.	City	Arterial	60	42	2	Two-way	Yes	Yes	No	25
15th St.	14th St.	City	Arterial	60	42	2	Two-way	Yes	Yes	No	25
14th St.	13th St.	City	Arterial	60	42	2	Two-way	Yes	Yes	No	25
13th St.	12th St.	City	Arterial	60	42	2	Two-way	Yes	Yes	No	25
12th St.	11th St.	City	Arterial	60	42	2	Two-way	Yes	Yes	No	25
11th St.	10th St.	City	Arterial	60	42	2	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Arterial	60	42	2	Two-way	Yes	Yes	No	25
9th St.	8th St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
of 2nd St.	2nd St.	City	Local	60	50	Unstriped	Two-way	Yes	No	No	25
Murray Dr.											
Unpaved Surface	Lockwood St.	County	Local	50	20	Unstriped	Two-way	No	No	No	25
Lockwood St.	Chenowith Rd.	County	Local	50	34	Unstriped	Two-way	Yes	No	No	25
Myrtle St.											
S of Loring St.	Loring St.	County	Local	40	?	?	?	?	?	?	?
Loring St.	14th St.	County	Local	40	?	?	?	?	?	?	?
14th St.	13th St.	County	Local	40	12	Unstriped	Two-way	No	No	No	25
10th St.	9th St.	County	Local	40	20	Unstriped	Two-way	No	No	No	25
9th St.	8th St.	County	Local	40	20	Unstriped	Two-way	No	No	No	25
8th St.	7th St.	City	Local	60	23	Unstriped	Two-way	No	No	No	25
7th St.	US 30	City	Local	80	44	Unstriped	Two-way	Yes	Yes	No	25
Nevada St.											
19th St.	17th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
17th St.	16th Ct.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
16th Ct.	15th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
14th St.	13th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Oak St.											
Murray Dr.	Lockwood St.	County	Local	50	15	Unstriped	Two-way	No	No	No	25
Lockwood St.	Chenowith Rd.	County	Local	50	34	Unstriped	Two-way	Yes	Intermittent	No	25
Old Dufur Rd.											
10th St.	Morton St.	City	Arterial	60	30	2	Two-way	Yes	No	No	35
Morton St.	Richmond St.	City	Arterial	60	30	2	Two-way	Yes	No	No	35
Richmond St.	Fremont St.	City	Arterial	60	24	2	Two-way	No	No	No	35
Fremont St.	Lambert St.	City	Collector	60	23	2	Two-way	No	No	No	35
Lambert St.	City Limits (~0.1 mi.)	City	Collector	60	23	2	Two-way	No	No	No	35
Oregon Ave.											
of 16th St.	16th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
16th St.	15th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
15th St.	14th St. (W)	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
14th St. (W)	14th St. (E)	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
14th St. (E)	13th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limi
13th St.	12th St.	City	Local	50	36	Unstriped	Two-way	Yes	Intermittent	No	25
12th St.	11th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
11th St.	10th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Pentland St.											
16th St.	15th St.	City	Local	60	40	Unstriped	Two-way	Yes	Yes	No	25
15th St.	14th St.	City	Local	60	30	Unstriped	Two-way	Yes	Yes	No	25
14th St.	13th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
13th St.	12th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
12th St.	11th St.	City	Local	60	20	Unstriped	Two-way	Yes	No	No	25
11th St.	10th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
9th St.	8th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
8th St.	7th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
7th St.	6th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
3rd St.	2nd St.	City	Local	50	40	Unstriped	Two-way	Yes	Yes	No	20
Perkins Ave.											
13th St.	10th St.	County	Local	30	20	Unstriped	Two-way	No	No	No	25
Pine St.											
Unpaved Surface	Lockwood St.	County	Local	50	12	Unstriped	Two-way	No	No	No	25
Lockwood St.	Chenowith Rd.	County	Local	50	34	Unstriped	Two-way	Yes	Intermittent	No	25
Pleasant Ct.											
7th St.	E of 7th St.	County	Local	40	25	Unstriped	Two-way	Yes	No	No	25
Pomona St.											
W of 10th St.	10th St.	County	Local	60	22	Unstriped	Two-way	No	No	No	25
10th St.	7th St.	County	Local	80-50	43	Unstriped	Two-way	Yes	Yes	No	25
7th St.	US 30	County	Local	40	44	Unstriped	Two-way	Yes	Yes	No	25
Quinton St.											
Dead End	Roberts St.	City	Local	60	36	Unstriped	Two-way	Yes	No	No	25
Roberts St.	16th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
16th St.	15th St.	City	Local	60	36	Unstriped	Two-way	Yes	No	No	25
15th St.	14th St. (W)	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
14th St. (W)	14th St. (E)	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
14th St. (E)	13th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
13th St.	12th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
12th St.	10th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Collector	50	36	2	Two-way	Yes	1 Side	No	25
Radio Way											
20th St.	21st St.	City	Local	50	36	Unstriped	Two-way	Yes	Intermittent	No	25
21st St.	23rd St.	City	Local	50	36	Unstriped	Two-way	Yes	Intermittent	No	25
Richland Ct.											
W of 7th St.	7th St.	County	Local	40	23	Unstriped	Two-way	Yes	No	No	25
7th St.	E of 7th St.	County	Local		12	Unstriped	Two-way	No	No	No	25
Richmond St.											
16th St.	14th St.	County	Local	40	?	?	?	?	?	?	?
14th St.	13th St.	County	Local	40	?	?	?	?	?	?	?
13th St.	12th St.	County	Local	40	22	Unstriped	Two-way	No	No	No	25
12th St.	10th St.	County	Local	40	19	Unstriped	Two-way	No	No	No	25
10th St.	Old Dufur Rd.	City	Local	40	18	Unstriped	Two-way	No	No	No	25
River Rd.											
NW End	Port of The Dalles	County	Collector	40	25/32	2	Two-way	No	No	No	10
Port of The Dalles	Bargeway Rd.	County	Collector	40	25/32	2	Two-way	No	No	No	40
Riverview St.											
17th St.	16th St.	City	Local	50	32	Unstriped	Two-way	Yes	Yes	No	25
16th St.	15th St. (W)	City	Local	50	32	Unstriped	Two-way	Yes	Intermittent	No	25

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limit
15th St. (W)	15th St. (E)	City	Local	50	32	Unstriped	Two-way	No	No	No	25
15th St.	14th St.	City	Local	50	32	Unstriped	Two-way	Yes	Yes	No	25
14th St.	13th Pl.	City	Local	50	32	Unstriped	Two-way	Yes	Yes	No	25
13th Pl.	13th St.	City	Local	50	32	Unstriped	Two-way	Yes	Yes	No	25
Roberts St.											
S of Quinton St.	Quinton St.	City	Local	50	?	?	?	?	?	?	?
Quinton St.	15th St.	City	Local	50	36	Unstriped	Two-way	Yes	No	No	25
12th St.	10th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Royal Crest Dr.											
Wasco Dr.	Sherman Dr.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Sherman Dr.	Brentwood Dr.	City	Local	60	34	Unstriped	Two-way	Yes	Yes	No	25
Brentwood Dr.	Crest Ct.	City	Local	60	34	Unstriped	Two-way	Yes	Yes	No	25
Crest Ct.	Summit Ridge Dr.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Sandstone Way											
Cherry Heights Rd.	Ledge St.	County	Local	50-60	21	Unstriped	Two-way	No	No	No	25
Sandy St.											
Walnut St.	10th St.	City	Local	50	23	Unstriped	Two-way	No	No	No	25
Scenic Dr.											
Trevitt St.	Garrison St.	City	Collector	60	36	2	Two-way	Yes	Yes	No	25
Garrison St.	Grant Cir.	City	Collector	60-100	36	2	Two-way	Yes	Yes	No	25
Grant Cir.	Liberty Way	City	Collector	60	36	2	Two-way	Yes	Intermittent	No	25
Liberty Way	20th St.	City	Collector	60	36	2	Two-way	No	Intermittent	No	25
20th St.	Sorosis St.	City	Collector	60	36	2	Two-way	No	Intermittent	No	25
rosis St.	Pioneer Cemetery	City	Collector	60	36	2	Two-way	No	Intermittent	No	25
ioneer Cemetery	Terrace Dr.	City	Collector	60	30/32	2	Two-way	No	Intermittent	No	25
Terrace Dr.	Jefferson St.	City	Collector	60	36	2	Two-way	Intermittent	Intermittent	No	25
Jefferson St.	Esther Way	City	Collector	60	36	2	Two-way	Yes	Yes	No	25
Esther Way	16th Pl.	City	Collector	60	36	2	Two-way	Yes	Yes	No	25
Seufert Park Rd. (Lone Pine Dr.)											
US 197	Indian Rd.	City	Local	60	29	Unstriped	Two-way	No	No	No	25
Indian Rd.	Seufert Park	County	Local	60	21	Unstriped	Two-way	No	No	No	25
Seven Mile Rd.											
UGB (~0.5 mi.)	Chenowith Rd.	County	Collector	60	24	2	Two-way	Intermittent	No	No	25
Shearer St.											
16th St.	N of 16th St.	City	Local	50	12	Unstriped	Two-way	No	No	No	25
13th St.	12th St.	City	Local	50	35	Unstriped	Two-way	Yes	Yes	No	25
12th St.	10th St.	City	Local	40	16	Unstriped	Two-way	No	No	No	25
Sherman Dr.											
S of Royal Crest Dr.	Royal Crest Dr.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Short St.											
14th St.	13th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Skyline Rd.											
Mount Hood St.	City Limits (~0.2 mi.)	City	Collector	60	18	2	Two-way	No	No	No	35
Snipes St.											
10th St.	Fallon Ct.	County	Collector	60	22	2	Two-way	No	No	No	35
Fallon Ct.	9th St.	County	Collector	60	32/20	2	Two-way	Intermittent	No	No	35
9th St.	8th St.	County	Collector	60	44	2	Two-way	Yes	Intermittent	No	35
8th St.	7th St.	City	Collector	60	44	2	Two-way	Yes	Intermittent	No	35
7th St.	US 30	City	Collector	60	54/44	2	Two-way	Yes	Intermittent	No	35
Sorosis St.											
rd St.	21st St.	City	Local	50	20/40	Unstriped	Two-way	Intermittent	No	No	15
1st St.	Scenic Dr.	City	Local	50	20	Unstriped	Two-way	No	No	No	15
Starlight St.											
Unpaved Surface	Lockwood St.	County	Local	50	34	Unstriped	Two-way	No	No	No	25
Lockwood St.	Allen Pl.	County	Local	50	34	Unstriped	Two-way	Yes	No	No	25

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limit
Allen Pl.	Chenowith St.	County	Local	50	34	Unstriped	Two-way	Yes	No	No	25
State Rd.											
US 30 WB	US 30 EB	City	Local	60	39	Unstriped	Two-way	No	No	No	40
US 30 EB	Summit Ridge Dr.	City	Local	60	41/24	Unstriped	Two-way	Intermittent	Intermittent	No	40
Summit Ridge Dr.	Viewpoint Access Rd.	City	Local	60	24	Unstriped	Two-way	No	No	No	40
Viewpoint Access Rd.	City Limits (~0.2 mi.)	City	Local	60	24	Unstriped	Two-way	No	No	No	40
Stoffer Lane											
S of 10th St.	10th St.	County	Local	50	16	Unstriped	Two-way	No	No	No	25
Summit Ridge Dr.											
S of Brentwood Dr.	Brentwood Dr.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Brentwood Dr.	Royal Crest Dr.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Royal Crest Dr.	Columbia View Dr.	City	Local	60	36/34	Unstriped	Two-way	Yes	Yes	No	25
Columbia View Dr.	Dead End	City	Local	60	15	Unstriped	Two-way	No	No	No	25
Dead End	State Rd.	City	Local	60	15	Unstriped	Two-way	No	No	No	25
Sunflower St.											
Unpaved Surface	Lockwood St.	County	Local	50	33	Unstriped	Two-way	Yes	No	No	25
Lockwood St.	Chenowith Rd.	County	Local	50	34	Unstriped	Two-way	Yes	Intermittent	No	25
Sunset Valley Rd.											
Mount Hood St.	City Limits (~0.1 mi.)	City	Local	40	20	Unstriped	Two-way	Yes	No	No	35
Taylor St.											
3rd St.	2nd St.	City	Collector	80	53	2	Two-way	Yes	Yes	No	25
2nd St.	N of 2nd St.	City	Local	80	60	Unstriped	Two-way	Yes	Yes	No	25
Terminal Ave.											
6th St.	Dead End	City	Local	80	44	Unstriped	Two-way	Yes	No	No	[illegible]5
Terrace Dr.											
Scenic Dr.	15th Pl.	City	Local	60	27	Unstriped	Two-way	No	No	No	25
15th Pl.	15th St.	City	Local	60	25	Unstriped	Two-way	No	No	No	25
Thompson St.											
S of 18th St.	18th St.	City	Arterial	60	26	2	Two-way	Yes	No	No	25
18th St.	17th St.	City	Arterial	60	27	2	Two-way	Yes	No	No	25
17th St.	16th St.	City	Arterial	60	26	2	Two-way	Yes	No	No	25
16th St.	14th Pl.	City	Arterial	60	26	2	Two-way	No	No	No	25
14th Pl.	14th St.	City	Arterial	60	26	2	Two-way	No	No	No	25
14th St.	13th St.	City	Arterial	60	25	2	Two-way	No	No	No	25
13th St.	12th St.	City	Arterial	60	26	2	Two-way	No	No	No	25
12th St.	11th St.	City	Arterial	60	28	2	Two-way	No	No	No	25
11th St.	10th St.	City	Arterial	60	25	2	Two-way	Intermittent	No	No	25
Trevitt St.											
17th St.	16th St.	City	Collector	60	36	2	Two-way	Yes	Yes	No	25
16th St.	15th St.	City	Collector	60	30	2	Two-way	1 Side	Yes	No	25
15th St.	14th St.	City	Collector	60	30	2	Two-way	Intermittent	Yes	No	25
14th St.	13th St.	City	Collector	60	30	2	Two-way	Intermittent	Yes	No	25
13th St.	12th St.	City	Collector	60	36	2	Two-way	Intermittent	Yes	No	25
12th St.	11th St.	City	Collector	60	36	2	Two-way	Intermittent	Yes	No	25
11th St.	10th St.	City	Collector	60	36	2	Two-way	Intermittent	Yes	No	25
10th St.	9th St.	City	Collector	60	36	2	Two-way	Intermittent	Yes	No	25
9th St.	8th St.	City	Collector	60	33	2	Two-way	Intermittent	Yes	No	25
8th St.	7th St.	City	Collector	60	31	2	Two-way	No	Yes	No	25
7th St.	6th St.	City	Collector	60	33	2	Two-way	No	Yes	No	25
6th St.	3rd Pl.	City	Collector	60	30	2	Two-way	No	No	No	25
Union St.											
14th St.	13th St.	City	Local	60	35	Unstriped	Two-way	Yes	Yes	No	25
13th St.	12th St.	City	Local	60	35	Unstriped	Two-way	Yes	Yes	No	25
12th St.	11th St.	City	Local	60	35	Unstriped	Two-way	Yes	Yes	No	25
11th St.	10th St.	City	Local	60	33	Unstriped	Two-way	Yes	Yes	No	25

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limit
10th St.	9th St.	City	Arterial	60	40	2	Two-way	Yes	Yes	No	25
9th St.	8th St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
8th St.	7th St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	25
7th St.	5th St.	City	Arterial	60	36	2	Two-way	Yes	Yes	No	20
5th St.	4th St.	City	Arterial	60	37	2	Two-way	Yes	Yes	No	20
4th St.	3rd St.	City	Arterial	60	40	2	Two-way	Yes	Yes	No	20
3rd St.	2nd St.	City	Arterial	60	40	2	Two-way	Yes	Yes	No	20
2nd St.	1st St.	City	Arterial	60	40	2	Two-way	Yes	Yes	No	20
1st St.	Fire Rd.	City	Local	60	40	Unstriped	Two-way	No	No	No	20
US 197											
City Limits (~0.1 mi)	Columbia View Dr.	State	Arterial	NA	45	Unstriped	Two-way	No	No	No	45
Columbia View Dr.	Merge with US 30	State	Arterial	NA	55/47	Unstriped	Two-way	No	No	No	45
Merge with US 30	I-84 EB Ramps	State	Arterial	NA	39	Unstriped	Two-way	No	No	No	45
I-84 EB Ramps	I-84 WB Ramps	State	Arterial	NA	31	Unstriped	Two-way	No	No	No	45
I-84 WB Ramps	Seufert Park Rd.	State	Arterial	NA	51	Unstriped	Two-way	No	No	No	45
Seufert Park Rd.	Bridge	State	Arterial	NA	45	Unstriped	Two-way	Intermittent	No	No	45
Verdant St.											
13th St.	10th St.	County	Local	60	34	Unstriped	Two-way	No	No	No	25
10th St.	8th St.	County	Local	50	21	Unstriped	Two-way	No	No	No	25
View Ct.											
21st St.	19th St.	City	Local	60	36	Unstriped	Two-way	Yes	Intermittent	No	25
14th St.	13th Pl.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
13th Pl.	13th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
3th St.	12th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
..wpoint Access Rd.											
State Rd.	City Limits (~0.2 mi.)	City	Local	40	24	Unstriped	Two-way	No	No	No	25
Walnut St.											
13th St.	Sandy St.	County	Local	50	28	Unstriped	Two-way	No	No	No	25
Sandy St.	10th St.	County	Local	50	30	Unstriped	Two-way	No	No	No	25
10th St.	9th Pl.	City	Collector	60	24	2	Two-way	Yes	No	No	25
9th Pl.	9th St.	City	Collector	60	33	2	Two-way	Yes	No	No	25
9th St.	8th St.	City	Collector	60	25	2	Two-way	Yes	No	No	25
8th St.	7th St.	City	Collector	60	25/46	2	Two-way	Yes	Intermittent	No	25
7th St.	6th St.	City	Collector	60	47	2	Two-way	Yes	Intermittent	No	25
Wasco Dr.											
S of Royal Crest Dr.	Royal Crest Dr.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
Royal Crest Dr.	Columbia View Dr.	City	Local	60	44	Unstriped	Two-way	Yes	Yes	No	25
Washington St.											
S of 14th St.	14th St.	City	Local	80	29	Unstriped	Two-way	Yes	Yes	No	25
14th St.	13th St.	City	Local	80	39	Unstriped	Two-way	Yes	Yes	No	25
13th St.	12th St.	City	Local	80	53	Unstriped	Two-way	Yes	Yes	No	25
12th St.	11th St.	City	Local	80	52	Unstriped	Two-way	Yes	Yes	No	25
11th St.	10th St.	City	Local	80	54	Unstriped	Two-way	Yes	Yes	No	20
8th Pl.	8th St.	City	Local	25	20	Unstriped	Two-way	No	Intermittent	No	25
8th St.	7th Pl.	City	Local	25	14	Unstriped	Two-way	No	No	No	25
7th St.	5th St.	City	Arterial	75	52	2	Two-way	Yes	Yes	No	20
5th St.	4th St.	City	Arterial	75	51	2	Two-way	Yes	Yes	No	20
4th St.	3rd St.	City	Arterial	75	53	2	Two-way	Yes	Yes	No	20
3rd St.	2nd St.	City	Arterial	75	54	2	Two-way	Yes	Yes	No	20
2nd St.	1st St.	City	Arterial	75	54	2	Two-way	Yes	Yes	No	20
st St.	Fire Rd.	City	Local	75	?	?	?	?	?	?	?
..ober St.											
Loring St.	13th St.	County	Local	50	20	Unstriped	Two-way	No	No	No	25
13th St.	12th St.	City	Local	50	28	Unstriped	Two-way	No	No	No	25
10th St.	8th St.	City	Arterial	70	44	2	Two-way	Yes	Yes	No	35

TABLE A-1
Street System Inventory
City of The Dalles

Roadway		Juris-diction	Classi-fication	ROW Width	Street Width	Number of Travel Lanes	Direction	On-Street Parking	Sidewalk	Bike Lan	Speed Limit
8th St.	6th St.	City	Arterial	70	44	2	Two-way	Yes	Yes	No	35
6th St.	2nd St.	State	Arterial	NA	44	2	Two-way	No	No	No	35
2nd St.	1st St.	City	Collector	60	44	2	Two-way	Yes	Yes	No	40
1st St.	Bargeway Rd.	City	Collector	40	32	2	Two-way	No	No	No	40
Whitman Ct.											
Dead End	Chenowith Rd.	County	Local	50	34	Unstriped	Two-way	Yes	No	No	25
Wright Dr.											
Wright St. S Int.	25th St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
25th St.	Wright St. N Int.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Wright St.											
Wright Dr. S Int.	Wright Dr. N Int.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
Wright Dr. N Int.	23rd St.	City	Local	50	36	Unstriped	Two-way	Yes	Yes	No	25
11th St.	10th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
10th St.	9th St.	City	Local	60	36	Unstriped	Two-way	Yes	Yes	No	25
9th St.	N of 9th St.	City	Local	60	35	Unstriped	Two-way	Yes	Intermittent	No	25

MEMORANDUM

TO: DALL0001 File

FROM: Manish Babla

DATE: May 29, 1993

SUBJECT: **THE DALLES TRANSPORTATION MASTER PLAN PHASE I - TECHNICAL MEMORANDUM # 1 - REVIEW OF PAST PLANS AND POLICIES**

This memorandum summarizes the review of past plans and policies related to transportation system development in the City of The Dalles. The intent of the review is to acquaint the consultant, David Evans and Associates, Inc. (DEA), with the transportation issues in The Dalles.

The following reports were reviewed under this task:

1. The City of The Dalles Comprehensive Plan, City of The Dalles Planning Department, December, 1982.
2. The Dalles Traffic Safety Management Program, Oregon Traffic Safety Commission, May, 1981.
3. Proposed Narrow Streets Policy Report, City of The Dalles Planning Department, October, 1975.
4. Mid-Columbia Transportation Plan, Mid-Columbia Economic Development District, October, 1975.
5. Wasco County Advance Road Planning Program, Wasco County, October, 1973.
6. General Plan of Highway and Street Improvements for The Dalles, Oregon, Oregon State Highway Division, May, 1972.
7. A Traffic Safety Program and Arterial Street System for City of The Dalles, Oregon, City of The Dalles Community and Economic Development Department, December, 1970.
8. Street Report for The Dalles, Oregon, City of The Dalles, August, 1968.
9. Planning for Streets, The Dalles City Planning Commission, October, 1961.
10. 1993-1998 Six-Year Highway Improvement Program, Oregon Department of Transportation (ODOT), July 1992.
11. The Dalles Riverfront Plan: Master Plan and Action Recommendations, Wasco County, City of The Dalles, Port of The Dalles, National Park Service, October, 1989.

There is no current comprehensive multi-modal transportation plan document prepared for the City of The Dalles.

The basic content of each of the eleven documents as it relates to The Dalles transportation system, is summarized in the following pages.

THE CITY OF THE DALLES COMPREHENSIVE PLAN

The comprehensive plan recognizes the need for a multi-modal transportation system that conforms with local and regional land use plans; that meets the needs of the transportation disadvantaged; and that minimizes adverse social, economic, and environmental impacts and costs. The comprehensive plan discussion on the transportation system in The Dalles presents a single transportation goal and nine associated policies and implementing measures.

Transportation Goal

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

Policies

1. Mass transit and transportation for the disadvantaged in The Dalles urban area shall be encouraged.
2. Pedestrian, bicycle, and horse trails in the urban area shall be encouraged.
3. The Dalles Municipal Airport is a transportation facility of regional importance which shall be properly maintained to meet the needs of the mid-Columbia area.
4. Encourage the provision of adequate barge handling facilities to meet present and future barge traffic on the Columbia river.
5. Traffic and pedestrian circulation shall be improved in The Dalles urban area.
6. An adequate system of arterial and collector streets to provide for the needs of the residential, commercial, and industrial areas of the community shall be maintained.
7. Commercial and industrial developments shall provide adequate ingress and egress, off-street parking, and adequate landscaping.
8. Provide adequate access to the west side of the urban area.
9. Transportation services to make health and social services accessible to all residents shall be provided as funds are available.

Implementing Measures

1. A study shall be initiated by the City of The Dalles as funds are available to evaluate the need for mass transit in the urban area to consider an economically feasible mass transit and centrally located mass transit facilities
2. A study shall be initiated by the City of The Dalles to evaluate the feasibility and location of pedestrian, bicycle, and horse trails as funds are available.
3. The Dalles Municipal Airport Plan shall be implemented as funds are available.
4. If Congress authorizes a study of Bonneville Dam Locks, the Port and City of The Dalles and Wasco County shall encourage the construction of a deeper lock which would accommodate ocean-going vessels.
5. Traffic and Pedestrian circulation will be improved by the completion of the First Street project, increased traffic signalization, street improvements; i.e. curbs, sidewalks, and additional right-of-ways, bicycle, and pedestrian paths, and recommendations by the Traffic Safety Commission to the City Council.
6. Streets over estimated capacity shall be improved in accordance with the adopted programs for street improvements as funds become available.
7. The Planning Commission shall review all landscaping and off-street parking site plans to ensure conformance with the Zoning Ordinance and Comprehensive Plan.
8. The City of The Dalles in cooperation with the State Highway Department and the Port of The Dalles should initiate a study to consider the need, location, and costs for construction of an additional westbound exit off of Interstate 84N.
9. A convenient and economic system of transportation shall be encouraged to be provided for needy senior citizens and the handicapped and other transportation disadvantaged.

THE DALLES TRAFFIC SAFETY MANAGEMENT PROGRAM

This study was a follow-up to a Oregon Highway Safety Plan prepared by the Oregon Traffic Safety Commission in 1979. The study was designed to establish:

1. A Comprehensive Traffic Engineering Review of the city to provide the data and design details necessary for correction of hazardous conditions throughout the city.
2. An Accident Review Program for the city that would allow the identification of problem areas within the city.
3. A Traffic Control Improvement Program that will aid the city in providing up-to-date traffic control device inventories and identify future traffic control device needs.

4. A Street and Roadway Improvement Program that will help the city correct the hazardous conditions that exist within the city.

Fifteen Component projects were proposed by the study.

Project 1: Traffic Accident Analysis

The traffic accidents at intersections and in roadway sections during 1977, 1978, and 1979 were summarized to help determine the improvements that would be required to reduce special types of accidents. The analysis identified highest accident intersections and 10 highest accident road sections in the city.

The five highest accident intersections and the five highest accident roadway sections identified through the analysis are listed below:

1. Intersection of Hostelier Street and Sixth Street
2. Intersection of Federal Street and Second Street
3. Intersection of Chenowith Loop and Second Street
4. Intersection of Court Street and Fourth Street
5. Intersection of Washington Street and Third Street
6. Tenth Street, between Webber Street and Old Dufur Road
7. Twelfth Street, between Jordan Street and Morton Street
8. I-84 on-ramps at Webber, River, Second, and Sixth Streets
9. Jefferson Street, between Second Street and Seventeenth Street
10. Union Street, between Second Street and Fifteenth Street

Project 2: Signing

The project reviewed existing traffic signing in The Dalles and identified locations with signs that did not conform to the Manual on Uniform Traffic Control Devices (MUTCD) standards, and recommended new signs as well as changes to existing signing to make them conform to MUTCD standards.

Project 3: Vision Obstructions

The project identified roadway locations with visibility problems, with the aim of decreasing the number of intersection and non-intersection accidents.

Project 4: Speed Zoning

The project identified improvements to the speed zoning to provide uniform and consistent speed zones to provide for the safe and orderly flow of traffic.

Project 5: Pavement Striping

The project was aimed at providing a uniform system of pavement markings to be compatible with other projects being proposed by the city and this Traffic Safety Management Program, to reduce traffic accidents, and to provide the motoring public with a designated street system.

Project 6: Traffic Volume Counts

Traffic volume studies were conducted to obtain accurate information about the number and movement of vehicles and/or pedestrians within or through an area, or at selected points within an area.

Project 7: Special Routes

The project was aimed at providing a continuous route for heavy trucks though town or to specific areas of town to provide routes for emergency vehicles and for snow removal priority.

Project 8: One Way Streets

The project identified converting some of the existing two-way street to one-way operation with the aim of decreasing accidents and increasing the capacity of existing arterial streets at a minimum cost to citizens.

Project 9: Downtown Safety

Downtown projects were identified with the aim of reducing the number of traffic accidents in the Central Business District and to design improvements with the highest benefit to cost ratios.

Project 10: Bicycle Systems

The project was aimed at providing a continuous bicycle system to reduce bicycle accidents and provide mobility to bicyclists.

Project 11: Guardrail Improvements

The project was aimed at providing a method by which the City may determine the need for a future guardrail, to provide the City with standard plans for the installation of guardrails, and to reduce the severity of fixed object and guardrail involvement accidents.

Project 12: Intersection Improvements

The project was aimed at identifying strategies to improve traffic flow and safety at individual intersections. The following improvements were identified to meet the above-stated objective:

1. Traffic Signal at the intersections of Sixth Street with Snipes Street, Webber Street, and Terminal Street.
2. Traffic Signal at the intersection of Second Street and Mt. Hood Street
3. At the intersection of Second Street and Terminal Street, realign Terminal Street to be a 90 degree intersection with Second Street
4. Re-stripe turn lanes at the intersection of Sixth Street and Chenowith Street
5. At intersection of Third Street and Trevitt Street, post Trevitt Street for right-turn only
6. At intersection of Third Street and Lincoln Street, southbound Lincoln Street should be stopped at Third Street
7. At intersection of Tenth Street and Union Street, place school crossing signs back-to-back to end the illusion of a four-way stop

8. At intersection of Tenth Street and Washington Street, add curve warning signs with an advisory speed of 15 mph
9. At intersection of Tenth Street and Kelly Street, if Tenth Street is not made one-way, then re-stripe Tenth Street on the south side to align with the east side of the street
10. At intersection of Twelfth Street and Kelly Street, stripe south leg approach as right turn only
11. Re-stripe Ninth Street and Dry Hollow Road with changes in control signs at the intersection
12. Place Yield signs on Eleventh Street, Fourteenth Place, and Seventeenth Street at Thompson Street
13. At intersection of Old Dufur Road and Tenth Street, stripe westbound Tenth Street
14. Re-stripe Old Dufur Road at the intersection with Fremont Street
15. Place advance "Yield Ahead" warning sign and double arrow warning sign on Nevada and "Yield" sign on Fifteenth Street at Nevada

Project 13: Street Section Improvements

The project was aimed at reducing the number and severity of traffic accidents, to increase the capacity of the street system, and to have a minimum cost. The following improvements were identified to meet the above-stated objective:

1. Old Dufur Road should have a curve warning sign with an advisory speed sign of 30 mph, intersection warning signs, and directional guide signs at intersections with Fremont Street and Tenth Street
2. Sixteenth Street / Kelly Street curve should have a curve warning sign and an advisory speed sign of 15 mph
3. Terrace Drive from Scenic Drive to Fourteenth Street requires advance warning signs
4. Ninth and Tenth Streets from Lewis to Kelly Streets require three parking signs per block
5. Seventh Street from Washington Street to Kelly Street requires advanced curve warning signs
6. Second Street from Lincoln Street to I-84 ramps should be re-striped for the proposed traffic signal at Mt. Hood Street. Striping at the intersection should consist of a left turn lane and four through lanes tapering to two lanes
7. Sixth Street from Chenowith Street to Ash Street should be re-striped for a continuous left turn lane and four through lanes

8. Mt. Hood Street and Terminal Street should be continuous from Sixth Street to Second Street
9. The City should continue with the widening of the intersection of Sixth Street and Snipes Street
10. The City should encourage the State of Oregon to implement the plan for Highway 30 at Brewery grade and I-84 ramps

Project 14: State Highway Improvements

The following projects were identified to increase capacity and improve safety of the state highway system:

1. Channelization and traffic signal at the intersection of Highway 30 and Brewery Grade
2. Closure of the ramps on Second Street between Mt. Hood and Terminal Streets, and replace the ramps at Webber Street
3. Signalize the intersection of Sixth Street with Webber and Snipes Streets
4. Redirect traffic, through changes in traffic control, to use Lincoln and Pentland Streets at their intersection with the Highway 30 couplet
5. Reconstruct guardrail on Highway 30 from about Lewis Street east towards US 197
6. Re-stripe Highway 30 from Webber Street to Ash Street to five lanes to match Sixth Street east of Webber Street
7. Change signing and re-design Hostelier Street at Sixth and Second Streets

Project 15: Comprehensive Plan

The project was aimed at revising and updating the Transportation Section of the then existing City Comprehensive Plan in order to provide for the future safety of the public

PROPOSED NARROW STREETS POLICY REPORT

The proposed narrow streets policy report was designed to increase safety on the City's arterial and collector streets for motorists, pedestrians, and adjacent property-owners. The following standards were proposed:

1. Arterial and Collector streets with less than 28' of improved street (curb to curb) would be allowed no on-street parking;
2. Arterial and Collector streets with less than 36', but more than 28', of improved street (curb to curb) would be allowed on-street parking on one side of the street only (east side for north-south streets and south side for east-west streets);
3. Arterial and Collector streets with 36' or more of improved width (curb to curb) would be allowed on-street parking on both sides.

Additionally, the following street standards for arterial and collector street were listed in the report.

TABLE

CITY STREET STANDARDS

Street Type	City Street Standards		
	Right-of-Way	Improved Pavement Width	Sidewalks
<u>Arterials</u>			
Commercial or Industrial	100'	64'	6'-10'
Residential	80'	44'	6'-8'
<u>Collectors</u>			
Commercial or Industrial	80'	44'	6'-10'
Residential	60'	36'	6'-8'
<u>Locals</u>			
Commercial or Industrial	50'	36'	6'-10'
Residential	50'	36'	6'-10'

MID-COLUMBIA TRANSPORTATION PLAN

Unlike transportation plans developed by many agencies, this document does not stress specific projects which must be developed by other agencies to meet the area's needs, but rather describes the area, its needed transportation facilities, then culminates in a system by which the Mid-Columbia Economic Development District will evaluate proposals for Federal and federally assisted transportation projects.

WASCO COUNTY ADVANCE ROAD PLANNING PROGRAM

The program is a tool used by the Wasco County Road Department to allocate its road improvement projects which govern the reconstruction and improvement of existing County roads. The program involved classifying the County road system into urban and rural arterial, collector, and local roads, and then rating them to indicate the relative importance of similarly classified roads to establish a priority for roadway improvement programs.

GENERAL PLAN OF HIGHWAY AND STREET IMPROVEMENTS FOR THE DALLES, OREGON

The General Plan identified future (1980) traffic projections, capacity conditions, and required roadway improvement projects. The following six projects were identified in the General Plan:

1. Widen East Second Street from Taylor Street to Brewery Grade from two to four lanes
2. Increase capacity of East Third Street between Union and Washington Streets
3. Increase capacity of West Second Street between Lincoln and Webber Streets
4. Increase capacity of West Third Place/West Sixth Street between Lincoln and Myrtle Streets
5. Improvement of Tenth Street to arterial standards to provide an alternative east-west route
6. Union-Court Street couplet between Second and Tenth Streets

A TRAFFIC SAFETY PROGRAM AND ARTERIAL STREET SYSTEM FOR CITY OF THE DALLES

The project consisted of a complete inventory of roadways and traffic controls along roadways and at intersections in The Dalles. Also, the traffic operations and safety conditions were analyzed, and methods of financing established for improvement projects in The Dalles.

STREET REPORT FOR THE DALLES, OREGON

The report listed streets in The Dalles requiring nearly complete construction, curbing and/or widening, and also listing of streets outside the City limits.

PLANNING FOR STREETS

The plan identified future street facility requirements in The Dalles based on a 1956 traffic survey.

SIX-YEAR HIGHWAY IMPROVEMENT PROGRAM

The program identifies funding for a Senior Citizens Bus Service in fiscal years 1993, 1996, and 1997. The program identifies the construction of a bikeway on I-84 from Port Access Road to River Front Park for fiscal year 1995, and construction of an interchange at Chenowith Road for 1996. Also, the West Sixth and Second Street interchange and Mosier-The Dalles Highway at Webber Street improvement projects are identified as requested projects in the six-year program.

THE DALLES RIVERFRONT PLAN: MASTER PLAN AND ACTION RECOMMENDATIONS

The intent of the Riverfront Plan is to create a multipurpose greenway along a nine-mile stretch of the Columbia River in The Dalles. The plan would provide river access, recreational opportunities, and protection for important riverfront resources. In addition, the plan proposes to link riverfront commercial and industrial areas with each other and with other community activity centers.

The plan includes recreation, circulation and transportation, natural resource protection, cultural resource, scenic resource, and commercial and industrial development proposals. The circulation and transportation proposals are presented below:

- shuttle service and other alternative transportation to connect the Dam area with other riverfront attractions

- multipurpose Riverfront Trail and greenway trails linking riverfront activity areas

- support for developing a new west interchange and integrating it with other riverfront proposals

- an area-wide bikeway system

- a system of boat landings along the waterfront for tour boats and small craft

- shuttle service and other alternative transportation to connect the Dam area with other riverfront attractions

CC: Jennifer Danziger, DEA
Jay Lyman, DEA

City of The Dalles

Transportation System Plan

Demographic Forecast

Prepared for:

City of The Dalles, Oregon

June 22, 1995

DAVID EVANS AND ASSOCIATES, INC.
A PROFESSIONAL SERVICES CONSULTING FIRM
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I. INTRODUCTION

This report summarizes the methods and assumptions used by David Evans and Associates, Inc. (DEA) to estimate current population, housing, and employment in The Dalles and to forecast these demographics for the year 2015. The demographic data, presented in Tables 1, 2, and 3, were prepared for use in a computer transportation model, TModel 2, which uses housing, employment, and transportation data to determine future transportation needs. Identified needs then will be utilized to prepare the City of The Dalles' Transportation System Plan (TSP).

II. STUDY AREA

The study area for the TSP is defined primarily by the City's Urban Growth Boundary (UGB). In addition, the study area includes some residential land northwest of the UGB, known as Murray's Addition. This area is identified as transportation analysis zone (TAZ) 1. The map included with this report shows the study area boundary.

It is important to note that, because the study area boundary differs from The Dalles city limits and UGB, the demographic data contained in this report should not be compared directly with existing data for the city, nor should the projections be used in other studies associated with the city limits or UGB.

III. BASE CASE ESTIMATES AND METHODOLOGY

To begin the demographic work, DEA divided the study area into 50 TAZs. Dividing the area into zones enables the computer model to analyze traffic movements between localized areas. TAZ boundaries typically are based on land use, major streets, topography, natural constraints, and US Census blocks. All population and employment estimates for existing (base case) and forecasted conditions are divided according to the appropriate TAZs to enable the computer to track demographic change for different portions of the city.

Population and Housing

DEA's calculations result in an estimated 1995 population of 14,720 for the study area. The number of dwelling units in the study area is estimated at 6,410, of which 5,141 (80 percent) are single-family homes (including mobile homes) and 1,269 (20 percent) are multi-family units. Population and housing figures are presented in Table 1.

Table 1
Existing and Projected Housing and Population
The Dalles Study Area

	1990				1995 estimate				2015 forecast			
TAZ	Total du	SF du	MF du	Pop.	Total du	SF du	MF du	Pop.	Total du	SF du	MF du	Pop.
1	259	259	0	657	270	270	0	687	320	320	0	768
2	99	40	59	244	104	42	62	255	114	50	63	254
3	215	203	12	425	225	212	13	445	265	243	23	630
4	57	31	26	110	60	32	27	115	60	32	27	135
5	104	102	2	266	109	107	2	278	187	185	2	448
6	360	316	44	791	397	349	49	873	537	454	83	1,264
7	150	99	51	374	157	104	53	391	229	136	93	521
8	287	183	104	610	317	202	115	673	411	273	138	946
9*	2	1	1	119	2	1	1	125	2	1	1	125
10	114	112	2	250	120	117	2	262	184	144	40	430
11	42	2	40	48	44	2	42	50	123	25	98	265
12	1	1	0	2	1	1	0	2	1	1	0	3
13	64	34	30	118	67	36	31	123	67	36	31	151
14	0	0	0	0	0	0	0	0	0	0	0	0
15	204	87	117	353	213	91	122	369	226	92	134	502
16	110	95	15	251	115	99	16	263	183	167	16	434
17	46	42	4	101	48	44	4	106	48	44	4	114
18	313	227	86	672	328	238	90	703	328	238	90	759
19	16	16	0	32	17	17	0	33	17	17	0	40
20	2	2	0	4	2	2	0	4	2	2	0	5
21	112	104	8	236	117	109	8	247	117	109	8	279
22	355	336	20	876	371	351	20	916	383	363	20	914
23	154	146	9	388	161	152	9	405	161	152	9	384
24	276	180	96	621	289	188	100	650	289	188	100	663
25	0	0	0	0	0	0	0	0	0	0	0	0
26	58	2	56	30	61	2	59	31	61	2	59	128
27	0	0	0	0	0	0	0	0	0	0	0	0
28	172	124	48	353	180	130	50	369	180	130	50	417
29	1	1	0	4	1	1	0	4	1	1	0	3
30	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0
32	234	147	87	531	245	154	91	556	245	154	91	560
33	492	481	12	1,163	515	503	12	1,216	533	521	12	1,275
34	64	56	8	158	67	59	8	165	67	59	8	158
35	143	131	12	343	150	137	13	359	150	137	13	355
36	114	114	0	288	119	119	0	301	119	119	0	286
37	256	247	9	657	268	258	9	687	278	269	9	665
38	0	0	0	0	0	0	0	0	0	0	0	0
39	51	10	41	90	53	10	43	94	53	10	43	115
40	60	0	60	85	63	0	63	89	63	0	63	132
41	4	4	0	14	4	4	0	15	4	4	0	10
42	147	139	8	440	154	145	8	460	281	273	8	673
43	72	62	10	150	75	65	10	157	158	72	86	353
44	79	18	61	169	83	19	64	177	83	19	64	179
45	145	103	42	338	152	108	44	354	170	109	61	390
46	96	87	9	222	109	98	10	251	194	105	89	440
47	271	255	16	645	284	267	17	675	288	271	17	685
48	115	115	0	295	130	130	0	334	237	225	13	565
49	31	31	0	77	33	33	0	80	165	148	17	391
50	125	125	0	347	132	132	0	367	240	240	0	576
Total	6,072	4,868	1,204	13,945	6,410	5,141	1,269	14,720	7,823	6,139	1,685	18,391

* majority of population in TAZ 9 lives in group dwelling

du = dwelling units Pop. = population

SF = single-family MF = multi-family

To estimate current population and housing, DEA relied upon 1990 US Census data at the census block level. Block data were aggregated into study area TAZs to get the 1990 demographic information for each TAZ and the total study area. According to The Dalles' most recent Comprehensive Plan (1994), the city's population is expected to increase at an average rate of 1.1 percent per year. Therefore, the study area total was estimated for 1995 based on the 1990 census counts and the 1.1 percent annual growth rate, resulting in a total population of 14,720.

In estimating 1995 population and housing for each TAZ, DEA assumed that residential infill has occurred throughout the study area, with some TAZs experiencing more growth than others in the past five years. Information obtained from the City of The Dalles planning department identified the higher-growth areas. The population estimates for 1995 were calculated with a 0.91 percent average annual growth rate for most TAZs (this was the average growth rate between 1990 and 1993), and a 2 or 2.5 percent growth rate for TAZs 6, 8, 46, and 48. The higher growth rate was applied to TAZs in the eastern portion of the city, where much of the city's recent housing construction has occurred.

Base case housing estimates were derived using 1990 census data and the 1995 population estimates for each TAZ. The total number of dwelling units for 1995 in each TAZ was calculated by applying the 1990 ratio of population to dwelling units to the 1995 population estimates. The number of single- and multi-family dwelling units was similarly determined. The 1990 proportions of single- and multi-family units in each TAZ were calculated, then applied to the 1995 estimated total dwelling units in each TAZ.

Employment

According to DEA's estimates, The Dalles currently has an average of 4,472 non-agricultural jobs in the TSP study area. Employment estimates by type of work are shown in Table 2.

Most available employment statistics are for Wasco County as a whole rather than for the City of The Dalles. In addition, because employment data needed to be specific to the study area for computer analysis, it was necessary to estimate employment located in each TAZ. Therefore, DEA obtained employment information through document research and telephone interviews. Sources included The City of The Dalles, The Dalles Chamber of Commerce, the Oregon Employment Department, and various businesses and agencies located in the study area.

The 1995 population-to-employment ratio in the study area is 3.29 to 1, which is somewhat higher than average. In most urban areas, the ratio usually falls between 2.1 and 3.0. Lower ratios occur where almost all employment is contained within an urban area and is based primarily in manufacturing, commercial, and service industries. Higher ratios occur where

Table 2
1995 Employment Estimates
The Dalles Study Area

TAZ	Total	Commercial	Office	Industrial	Medical	Government	School	Students
1	0							
2	48					18	30	256
3	25	25						
4	861	166	5	690				
5	83						83	670
6	28	24			4			
7	3	3						
8	238	238						
9	174				123	26	25	
10	29	27	2					
11	154	154						
12	94	94						
13	42	30	8		4			
14	0							
15	63	45	8		10			
16	32				12		20	190
17	0							
18	74	58	8		8			
19	27	4	18		5			
20	66	54	12					
21	0							
22	38						38	275
23	100	2			3	10	85	708
24	242	8	49		3	182		
25	67	6	22		7	32		
26	129	27	27			75		
27	48	48						
28	94	10	22		52	10		
29	123	107	16					
30	129	110	19					
31	391	64	24	300	3			
32	5	5						
33	138	10			3		125	500
34	4	4						
35	39				6		33	257
36	0							
37	59	2					57	476
38	0							
39	0							
40	25					25		
41	104	4		50		50		
42	10	10						
43	0							
44	0							
45	16				16			
46	2		2					
47	16				16			
48	6						6	
49	0							
50	646				600		46	344
Total	4,472	1,339	242	1,040	875	428	548	3,676

Total Employment within Study Area = 4,472 many jobs in an area are resource-based, e.g., in agriculture, forestry, mineral extraction, etc.; where a large number of employees commute to work in other areas; or where unemployment is high. Agricultural jobs represent 20 to 25 percent of total employment in Wasco County and likely account for a portion of employment in The Dalles. In addition, The Dalles has a high percentage, relative to the state average, of residents over age 65 (Comprehensive Plan, 1994). It can be assumed that most of these residents are retired. These factors help explain the relatively high population-to-employment ratio in the study area.

It is interesting to note that agricultural jobs accounted for a smaller share of total county employment in 1994 (22 percent) than in the previous four years (approximately 25 percent). This trend is likely to continue as parts of the county urbanize, adding more industrial and commercial jobs.

IV. FORECAST

Population and Housing

Population and housing counts were forecast to the year 2015 to meet the 20-year planning outlook of the TSP. DEA used an average annual growth rate of 1.1 percent to calculate the 2015 population of the study area. This growth rate was used by the City of The Dalles in preparing its Comprehensive Plan.

Population and housing growth will be concentrated in the TAZs most able to accommodate it. Most TAZs in the study area are largely developed and will accommodate only infill or replacement units. Some TAZs on the edges of the study area, however, contain substantial amounts of vacant buildable land designated for residential use and can accommodate the majority of The Dalles' expected growth.

The amount and type (single- or multi-family) of residential development in each TAZ was estimated based on information provided by the City of The Dalles. The Comprehensive Plan states that available single-family land is expected to develop at a density of approximately four dwelling units per acre (du/acre). Land designated for mobile home development is expected to develop at approximately six units per acre, and multi-family land at 10 to 15 units per acre. DEA used the City's inventory of vacant buildable land to approximate the acreage of such land in each TAZ. Additional development was assumed to occur on vacant lands as follows:

Land Use Designation	Percentage of Buildable Land as Single- or Multi-Family	Density
R1 (single-family residential)	100% SF	4 du/acre
RMH (mobile home residential)	75% SF	6 du/acre
	25% MF	6 du/acre
R2 (multi-family residential)	50% SF	4 du/acre
	50% MF	10 du/acre
R3 (multi-family residential)	25% SF	4 du/acre
	75% MF	15 du/acre

Additional dwelling units were then added to 1995 estimated dwelling units to determine 2015 totals. Under these assumptions, the study area would contain a total of 7,823 dwelling units. Of these, 6,139 (78 percent) would be single-family dwellings, and 1,685 would be multi-family dwelling units (21 percent).

Population for each TAZ was estimated using expected average household sizes as stated in the city's Comprehensive Plan. Single-family units were assumed to contain 2.4 persons per household, and multi-family units will have 2.1 persons per household. The resulting total population is 18,391.

Table 1 indicates the number of housing units and population projected for each TAZ. The forecast shows some TAZs containing fewer people than they do currently. This is a result of declining household size.

With the exception of TAZ 1, all of the buildable land will lie within the city's UGB in 2015. Based on the assumptions in this report, the expected population can be accommodated within the UGB by 2015. Although outlying TAZs (7, 16, and 42) were assumed to be not fully developed in 20 years, most available land in the UGB will be built out by that time. At a 1.1 percent annual growth rate, expected residential densities, and buildable land inventory, the UGB will be built out by the year 2020.

Employment

The employment forecast for the TSP is not intended to be a full-sector (agricultural and non-agricultural) forecast. The projections do not include agricultural jobs because the TSP is for facilities and improvements within the study area, and agricultural-related trips have only minor impacts on traffic patterns in the study area. The 2015 employment forecast, with a total employment of 5,911, is shown in Table 3.

Table 3
2015 Projected Employment
The Dalles Study Area

TAZ	Total	Commercial	Office	Industrial	Medical	Government	School	Students
1	0	0	0	0	0	0	0	0
2	87	27	0	0	0	23	38	320
3	30	30	0	0	0	0	0	0
4	1,260	228	27	1,005	0	0	0	0
5	149	45	0	0	0	0	104	838
6	50	45	0	0	5	0	0	0
7	4	4	0	0	0	0	0	0
8	289	289	0	0	0	0	0	0
9	254	36	0	0	154	33	31	0
10	35	32	2	0	0	0	0	0
11	185	185	0	0	0	0	0	0
12	113	113	0	0	0	0	0	0
13	121	106	10	0	5	0	0	0
14	10	0	0	10	0	0	0	0
15	76	54	10	0	13	0	0	0
16	40	0	0	0	15	0	25	238
17	0	0	0	0	0	0	0	0
18	89	70	10	0	10	0	0	0
19	33	5	22	0	6	0	0	0
20	79	65	14	0	0	0	0	0
21	0	0	0	0	0	0	0	0
22	48	0	0	0	0	0	48	344
23	125	2	0	0	4	13	106	885
24	285	10	59	0	4	213	0	0
25	82	7	26	0	9	40	0	0
26	159	32	32	0	0	94	0	0
27	58	58	0	0	0	0	0	0
28	116	12	26	0	65	13	0	0
29	148	128	19	0	0	0	0	0
30	155	132	23	0	0	0	0	0
31	409	77	29	300	4	0	0	0
32	6	6	0	0	0	0	0	0
33	172	12	0	0	4	0	156	625
34	5	5	0	0	0	0	0	0
35	49	0	0	0	8	0	41	321
36	0	0	0	0	0	0	0	0
37	74	2	0	0	0	0	71	595
38	0	0	0	0	0	0	0	0
39	36	36	0	0	0	0	0	0
40	55	24	0	0	0	31	0	0
41	147	5	0	80	0	63	0	0
42	24	12	0	12	0	0	0	0
43	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0	0
45	20	0	0	0	20	0	0	0
46	2	0	2	0	0	0	0	0
47	20	0	0	0	20	0	0	0
48	8	0	0	0	0	0	8	0
49	0	0	0	0	0	0	0	0
50	808	0	0	0	750	0	58	430
Total	5,911	1,894	311	1,407	1,094	520	685	4,59

Total Employment within Study Area = 5,911

Future employment is based on several assumptions. It was assumed that most medical, government, and school employment would increase at approximately the same rate as population--25 percent over the next 20 years. Employment in already developed commercial areas was assumed to increase by 20 percent. Commercial and industrial land identified in the City's inventory of vacant buildable land was assigned employment based on average densities (employees per gross acre) of the expected land use. The Dalles currently has quite low employee densities (1.9 employees per gross commercial acre and 1.3 employees per gross industrial acre). (Current densities were derived using the inventory of developed land in the city's Comprehensive Plan and DEA's 1995 employment estimates.) However, these densities will increase as infill occurs. For vacant land, DEA assigned densities of 3 employees per commercial acre and 2 employees per industrial acre. It was assumed that all available commercial and industrial land would be developed by 2015, although at low densities, with the exception of the large amount of vacant industrial land in TAZ 4. This area will probably still have some room for development and was assumed to be 75 percent developed by 2015.

As mentioned above, the study area's current population-to-employment ratio is 3.29 to 1. The ratio will probably decrease somewhat as The Dalles grows, creating more demand for urban services and increasing the share of "urban" employment in relation to resource-based employment. Based on the assumptions used for the 2015 forecast, the population-to-employment ratio would be 3.11.

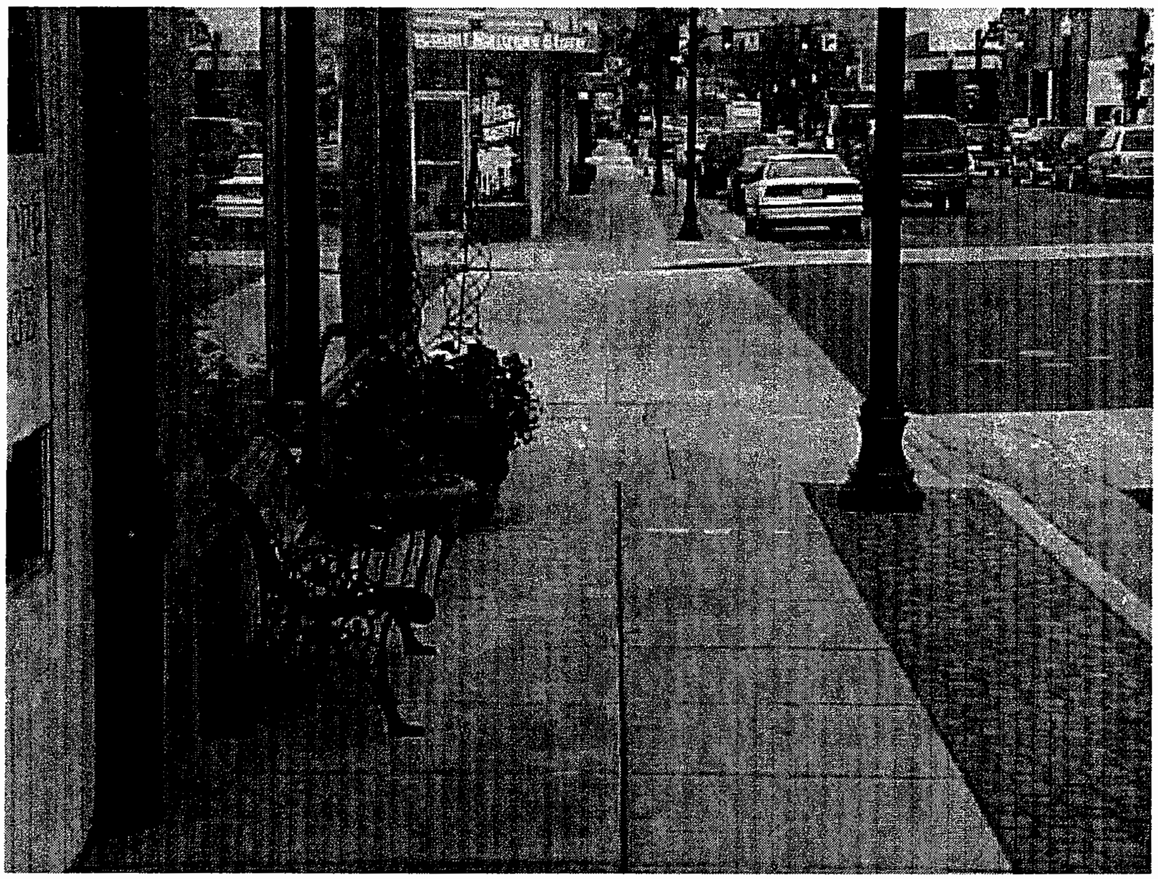
V. CONCLUSIONS AND LIMITATIONS OF THE DATA

Assuming current trends continue, The Dalles will experience moderate population and employment growth over the next 20 years. According to the estimates, there is enough buildable residential land within the UGB to accommodate the expected growth. However, the forecast indicates that the UGB will be built to capacity three to five years past the 20-year planning horizon.

Employment growth will at least keep pace with population growth, and may grow at a slightly faster rate as more residents will demand goods and services and will work within the urban area rather than in resource-related jobs outside the city.

This study was prepared to estimate current conditions and expected growth patterns which will be used in a computer model to determine future transportation needs. The amount of growth, and where it occurs, will affect traffic and transportation facilities in the study area. It should be noted that the study area was defined specifically for use with the computer model and that this demographic analysis was designed specifically for use in developing The Dalles' TSP. This report is not intended to provide an accurate economic forecast or housing analysis, and it should not be used for any purpose other than that for which it was designed.

SIDEWALK IMPROVEMENT PLAN



City of The Dalles
Community Development Department

313 Court St, The Dalles, OR 97058, Phone (541) 296-5481

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Appendix B	Sidewalk Inventory Protocols
Appendix C	Maps Displaying Hazards
Appendix D	City of The Dalles Standard Specifications

SIDEWALKS MAKE GOOD NEIGHBORHOODS

Sidewalks have a way of tying together a neighborhood. Realtors will attest that where sidewalks are good, the neighborhood becomes a more desirable place to live. Sidewalks serve so many purposes; recreation space for joggers, children with tricycles and pull toys; an informal meeting place for neighbors; and an encouragement for people to make more use of the most basic form of transportation – walking.

Be proud of your sidewalks. Take care of them and enjoy them.

PURPOSE

The city has recognized the need to provide a fair and reasonable approach to ensure compliance with the city sidewalk ordinances. In the past, compliance with the ordinances was driven by complaint. Through the use of a comprehensive sidewalk inventory to identify hazards, this plan relies on analysis. Through compliance, the plan will:

- Protect the community from injury by ensuring pedestrian safety through the repair of hazards
- Assist property owners in identifying and removing hazards in the most economical way
- Protect property owners from the expense of liability claims due to personal injury
- Develop ADA compliant corridors for ease of movement throughout the community

AUTHORITY

General Ordinance 91-1128 and 91-1129, as adopted by the City Council, outlines owner responsibility and liability pertaining to sidewalks adjacent to their property and are included in full in Appendix A.

SIDEWALK INVENTORY

Initiated as a response to the need for consistent enforcement, the goal of the sidewalk inventory was not only to identify hazards, but to also eliminate the feeling from a property owner of being singled out. In the past, enforcement began when a complaint was filed on a hazard existing on the sidewalk abutting a property. Through the comprehensive sidewalk inventory, which was conducted from November 2001 to April 2002, **all** hazards have been identified and will be addressed.

The inventory encompassed all properties within the city limits and was conducted by the Community Development Department. Staff members walked every sidewalk and categorized their status through the use of strict protocols. These protocols (Appendix B) were developed through a collaborative effort between the Community Development Department, Department of Public Works and Code Compliance Officers. The results of the inventory are housed in a database in the Community Development Department. Utilizing the city's Geographic Information System, maps were produced for analysis and property owners will be notified by letter of any hazards existing on their sidewalks. Map examples are included in Appendix C. Following are short explanations of protocol terms:

<u>No Sidewalk</u>

Some or all of a property is void of a sidewalk. (Figure 1)

<u>Trip Hazard</u>

Vertical misalignment between sidewalk panels or sidewalk and curb greater than three quarters of an inch. (Figure 2)

<u>Damaged Surface</u>

Surface of sidewalk contains structural defects negatively affecting pedestrian use. (Figure 3)

<u>ADA</u>

Americans with Disabilities Act – outlines accessibility issues and standards.

<u>Non-compliant corners and alleys</u>

Do not conform to ADA standards, and do not allow access. (Figure 4)

Non-standard corners and alleys

Do not conform to ADA standards, but do allow access. (Figure 5)

Vegetation growing on walk

Vegetation, whether growing on or overhanging the sidewalk, that negatively affects pedestrian use. (Figure 6)


Figure 1.


Figure 2.

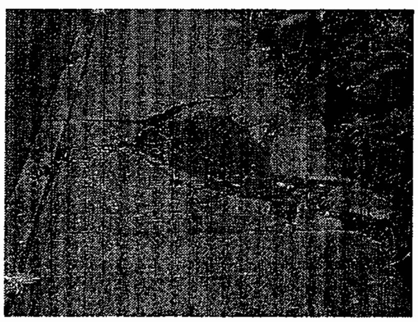


Figure 3.


Figure 4.

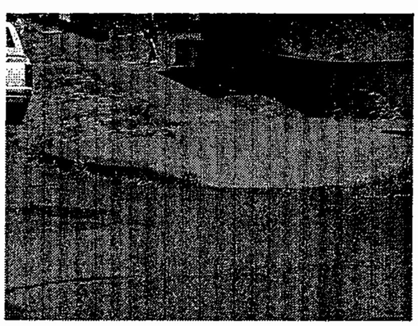


Figure 5.


Figure 6.

PLAN PHASES

After compiling the data, analyzing the maps displaying the sidewalk hazards, and discussions with city staff, it is apparent that attempting to bring all properties into compliance at one time is unreasonable. Therefore, working in phases to accomplish city wide compliance is recommended as follows:

PHASE ONE: DEVELOP ADA COMPLIANT CORRIDORS THROUGH THE COMMUNITY

The need to provide safe and accessible transit routes for persons with mobility disabilities is an important infrastructure improvement for any community. This was reiterated as a priority during the update of the Vision Action Plan and can be identified as a need when analyzing results of the sidewalk inventory. The first step, identification of corridors to bring into ADA compliance, has been accomplished through meetings between city staff from the Department of Public Works and representatives from the Handicap Accessibility Task Force in the autumn of 2000. It is recommended to utilize this information of optimum transit routes and begin compliance work in these corridors first. Property owners will be responsible for correcting any hazards existing adjacent to their properties, while the city will fund the installation of ADA compliant ramps along the corridor. The city estimates $1000 would cover the cost of the installation of one standard ADA ramp. Currently, the opportunity to secure partial funding for the ramps exists through the Oregon Economic and Community Development Block Grant Program. If awarded, the grant funds (up to $150,000) would help to initiate the process of providing accessible corridors in the community, and also the implementation of the plan. Following are the corridors identified in the autumn 2000 meetings.

- Connections between school buildings in the community
- Downtown through the 6th Street shopping district
- 10th Street
- 11th Street
- 12th Street
- Court Street
- Union Street
- Washington Street
- Webber Street

PHASE TWO: BRING ENTIRE CENTRAL BUSINESS COMMERCIAL ZONE INTO COMPLIANCE (see map Appendix C)

As the area of the city receiving the highest concentration of pedestrian traffic, the downtown core constitutes the next phase of compliance. Property owners would be responsible for correcting any hazards adjacent to their property in order to obtain compliance with city ordinances, including trip hazards, damaged surfaces and missing portions of sidewalks. The cost to a property owner is estimated at $80 per five foot by five foot section of sidewalk. However, property owners would not be required to install ADA compliant ramps, as the city would once again fund the installation in the future as monies are secured.

PHASE THREE: WORK IN ONE OR MORE LAND USE ZONES AT A TIME, BASED ON ANALYSIS IDENTIFYING CRITICAL AREAS, UNTIL ENTIRE CITY IS IN COMPLIANCE

The remainder of the city would be brought into compliance using existing land use zones for efficient tracking. Once again, property owners would be responsible for correcting any hazards adjacent to their property in order to obtain compliance with city ordinances, including trip hazards, damaged surfaces and missing portions of sidewalks. The cost to a property owner is estimated at $80 per five foot by five foot section of sidewalk. However, property owners would not be required to install ADA compliant ramps, as the city would fund the installation in the future as monies are secured.

PLAN MANAGEMENT

The management of the plan will require a significant amount of time for distributing letters, issuing permits, performing inspections, ensuring compliance and negotiating compromises for problem areas. The time frame estimated for city wide compliance varies with the appointment of the above activities. One individual performing all duties would constitute the most efficient manner to achieve the goal of compliance, while distributing tasks among several individuals in differing departments would cause the time frame to expand. The following options should be considered for efficiently implementing the plan:

OPTION ONE

- Initiate a sidewalk permit fee
- Use current staffing levels to implement Phase One and Phase Two (2 years)
- Use monies generated from sidewalk permit fees to fund a part-time Sidewalk Code Compliance position to implement Phase Three in year 3 (2-4 years)
- **Estimated time** of city wide compliance: 4 to 6 years

OPTION TWO

- Initiate a sidewalk permit fee
- Create a part-time Sidewalk Code Compliance position to implement all phases
- Use monies generated from sidewalk permit fees to fund the part-time Sidewalk Code Compliance position
- **Estimated time** of city wide compliance: 3 to 5 years

OPTION THREE

- Continue the free sidewalk permit
- Use current staffing levels to implement all phases
- **Estimated time** of city wide compliance: 8 to 12 years

The part-time Sidewalk Code Compliance position would work out of the Community Development Department and be responsible for notifications, inspections, data management, record keeping, dispute mitigation, negotiating compromises and overseeing all sidewalk related construction or issues. The position would ensure the effective use of the completed inventory to gain city wide compliance in a timely manner and to also alleviate the possibility of returning to a complaint based compliance system from a lack of staff time. An estimate of the funds generated through a permit fee and the cost of a part-time code compliance officer are outlined below.

Number of properties with existing hazards within city limits

Trip Hazards	401
Damaged Surface	417
Both Trip Hazard and Damaged Surface	926
No Sidewalk, curb line established	315
Partial Sidewalk, curb line established	217
Total	2276

Permit Fee Amount	Funds Generated*
$25.00	$56,900
$20.00	$45,520
$15.00	$34,140
$10.00	$22,760

*Based on all properties securing a permit, but inevitably some areas with terrain or engineering issues will not require a sidewalk to be installed, which will decrease the amount

Cost for one part-time (20 hrs/week) Code Compliance Officer

$11, 989 per year

NOTIFICATION

A "Notice to Repair" letter is generated within the Community Development Department and sent to the registered owner(s) of a property with an existing hazard, stating the nature of the hazard. Staff members from Code Compliance are available to schedule appointments and meet with property owners to identify and explain the specific reasons for the "Notice to Repair" letter. Staff can assist the property owner by outlining repair alternatives so the hazard can be corrected in the most economical way.

WHO CAN PERFORM THE REPAIRS

Upon securing a permit the following parties may eliminate hazards:

- Property owner
- Licensed contractor hired by the property owner
- Licensed contractor under legal contract with the City of The Dalles

REPAIR STANDARDS

Hazard repair will conform to City of The Dalles Standard Specifications which can be found in Appendix D.

TYPES OF REPAIRS

The following types of repairs are acceptable:

- Grinding of trip hazards less than 1 1/2 inches in height to an appropriate slope
- Removing and replacing whole panels to full depth
- Removing and replacing partial panels to full depth and width with inspector approval

  Skin patching is not an acceptable repair method
- Consulting the inspector to negotiate a solution to hazards caused by tree roots to avoid causing harm to the tree

PERMITS

Permits are required to be filed before hazard repair is initiated and they are available in the Community Development Department. The permit will be issued to the party making the repair.

INSPECTIONS

Form inspections are required and must be approved before any new concrete is poured. Post compliance inspections are also required for new concrete and grinding repairs. To schedule an inspection contact the city department listed in the "Notice to Repair" letter.

COMPLIANCE TIME FRAME

Property owners or licensed contractors have 30 days from the posted date on the "Notice to Repair" letter to secure a permit. Repair work must then be completed within 60 days of the filing of the permit. If no permit is secured, a letter of "Intent to Repair" will be sent by certified mail stating the property owner has 10 days to respond or The City of The Dalles contractor will repair the hazard and the property owner will be billed for the work, plus any permit fee and an administrative fee of 25% of the repair cost.

APPEALS

All disagreements and appeals which cannot be resolved by Code Compliance staff will be forwarded to the Community Development Department Director. The Director will investigate all such cases, conferring with the city engineer, and attempt to reach an agreement with the concerned party. In the event the Director fails to resolve the problem, the City Manager will investigate and seek a resolution. The efforts to resolve the dispute will be fully documented and be used as evidence, should the dispute be brought before City Council.

TIME EXTENSIONS

Requests for time extensions will be granted if reasonable cause exists. The following conditions may cause the Community Development Department to grant extended time to property owners to make repairs:

New Property Owner

A new property owner who acquired the property following the "Notice to Repair" letter, or the information did not get disclosed by the previous owner. These extensions are usually 30 days in length.

Legal Questions

Legal matters concerning ownership, responsibility, etc., of which the Community Development Department has been notified in writing. Extensions are granted until legal questions have been answered.

FINANCIAL ASSISTANCE

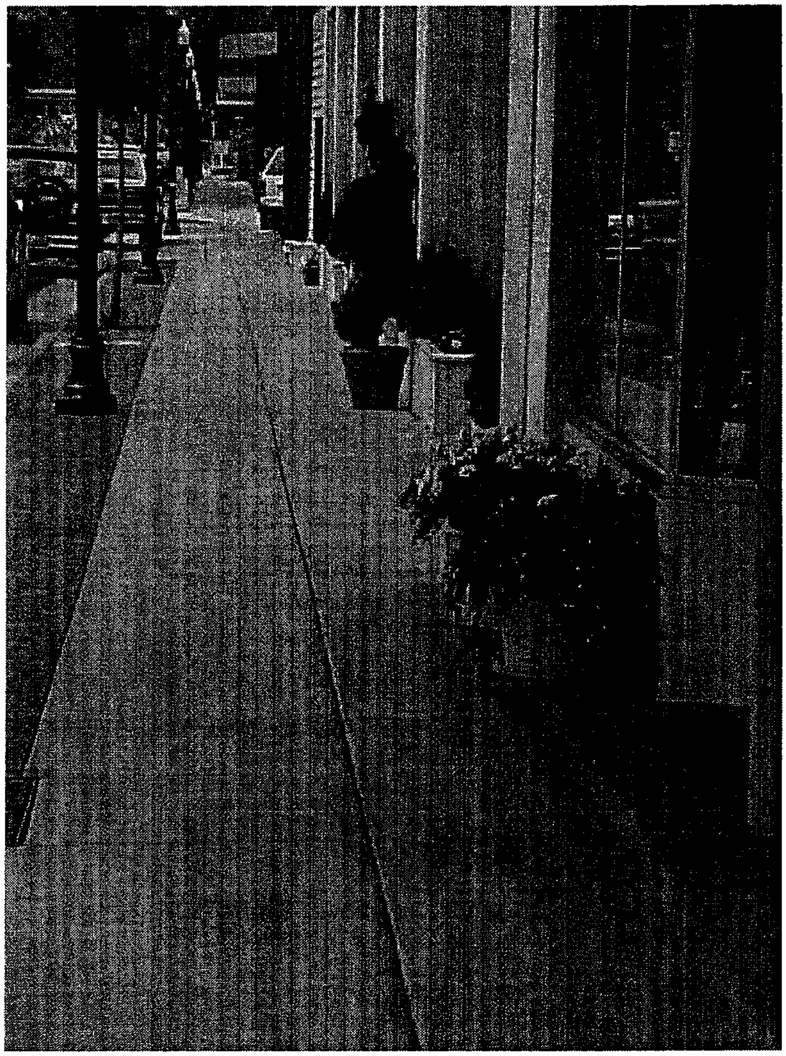
The goal of the Sidewalk Improvement Plan is to provide pedestrian safety through the repair of hazards in the most economical way. To help alleviate some of the economic burden to the property owner, the city will provide financial assistance to property owners in the following ways:

- Funding of ADA ramps through grants and budget allocations
- Securing legal contracts with a licensed contractor to lower the per foot cost of repairs
- Providing the standard Local Improvement District format for the repayment of repairs conducted by the city contractor

FUTURE COMPLIANCE

Upon completion of city wide compliance with the sidewalk ordinances, it is recommended to revisit the issue of hazards every five years. On going issues will need to be addressed through routine code compliance efforts, but a new sidewalk inventory should be conducted every five years to eliminate the return to a complaint based system of compliance. Thus ensuring quality neighborhoods and pedestrian safety for the citizens of The Dalles.

Be proud of your sidewalks.



Take care of them and enjoy them.

GENERAL ORDINANCE NO. 91-1128

AN ORDINANCE REGULATING THE CONSTRUCTION AND ALTERATION OF SIDEWALKS AND CURBS, PROVIDING A PENALTY, REPEALING GENERAL ORDINANCE NOS. 585, 670, 669, AND 701, AS AMENDED, AND DECLARING AN EMERGENCY.

THE PEOPLE OF THE CITY OF THE DALLES DO ORDAIN AS FOLLOWS:

Section 1. Definitions. As used in this chapter, except where the context otherwise indicates, the following terms are defined as follows:

A. "Council" means the city council.

B. "Engineer" means the duly appointed city engineer or any consulting engineering firm who contracts with the City to provide engineering services.

C. "Person" means every natural person, firm, partnership, association or corporation.

D. "Sidewalk" includes curbs.

Section 2. Standards and Specifications. Sidewalks and curbs shall be constructed, altered, and repaired in accordance with standards and specifications determined by the Engineer and adopted by the Council, by resolution or otherwise.

Section 3. Permit - Required - Application- Fee - Issuance.

A. No person shall construct, reconstruct, or repair any sidewalk or curb in or upon any public street or right-of-way without first obtaining a permit from the City, and complying with the provisions of the City's tree ordinance.

B. An application for a permit shall be filed with the City on a form provided by the City, together with such other information and data as may be required by the Engineer.

C. An applicant for a permit shall pay a permit fee to the City, which fee shall be set by Council by resolution.

D. After determining that the improvement is to be constructed in accordance with standard City specifications and after the permit fee is paid to the City, the City shall issue a permit for the work.

Section 4. Inspections authorized. The Engineer shall make such inspections as in his judgment may be required to determine that the construction of any improvement for which a permit has been issued is proceeding in accordance with the standard City specifications.

Section 5. Construction - Findings required. If any of the following conditions are found to exist, then the Council may proceed in the manner set forth in Sections 6 and 7:

A. Fifty percent or more of the footage of properties on one side of a street between two (2) intersecting streets from that side have sidewalks that meet the standards prescribed by City regulations for new sidewalk construction; or

B. Fifty percent or more of the footage of properties on one side of a street in any distance of three hundred feet or less into which no intersecting streets enter from that side have sidewalks that meet the standards prescribed by City regulations for new sidewalk construction; or

C. A dangerous condition to pedestrians or vehicular traffic exists in a street area; or

D. There is a general public necessity that a street be improved by the construction of a sidewalk thereon not to exceed one (1) block in length if platted as a block or three hundred feet if not platted, which sidewalk would connect with the sidewalk or sidewalks already constructed on such street or on cross streets intersecting therewith; or

E. A person constructing a new residential or commercial structure shall construct sidewalks and curbs necessitated by improvement of any street which is adjacent to the person's property. The City may waive this requirement if construction of the sidewalk and curbs is impracticable, or if construction would cause an economic hardship, due to topographic or physical conditions.

1. As part of a land use review decision, if the City determines that the level of development does not require the construction of a sidewalk and curbs at the present time, the City may require an owner to execute a non-remonstrance agreement which shall be recorded in the deed records of the Wasco County Clerk at the owner's expense.

Section 6. Construction - Notice and hearing. The Council, after making its findings, shall then, by resolution, declare its intention to have such sidewalks constructed and shall proceed as provided by Section 4 of General Ordinance No. 91-1127 to have a hearing; and after the hearing, unless there is a sufficient showing to the satisfaction of the Council that the sidewalks are not necessary, the Council shall order the construction of the sidewalks in front of the properties affected, with such sidewalk to meet City requirements. Notice of the decision of the Council shall be made by written notice to the record owners of the property, at their last known addresses as shown on by the records of the County Clerk or County Assessor, and such owners or their successors shall have a period of sixty (60) days in which to cause such sidewalks to be constructed.

Section 7. City construction. If a sidewalk is not constructed within sixty (60) days as required, after the order for construction has been given by the Council as provided by this section and Section 6, then the City may construct a sidewalk for the full street frontage in front of such property and proceed with such construction and the assessment and collection of the costs for such improvements, as provided by General Ordinance No. 91-1127.

Section 8. Sidewalk Construction Requested by the Property Owner. If a property owner petitions the Council for an order to build a sidewalk on the part of the street abutting on his or her property, agrees to pay cash or to make an application to pay the cost in installments as provided by the Bancroft Bonding Act, as amended from time to time, waives the right of service and publication of notice of construction, and consents to the assessment of the property upon which the sidewalk abuts, the Council may order the construction of the sidewalk, if in its judgment the sidewalk should be built.

Section 9. Penalty. Violation of this ordinance is punishable by a fine of not to exceed $500. Each day's violation of a provision of this ordinance shall constitute a separate punishable offense.

Section 10. Repeal. General Ordinance Nos. 585, 669, 670, and 701, as amended, are hereby repealed.

Section 11. Emergency. Whereas the charter of the City of The Dalles provides that the procedure for the construction of sidewalks shall be provided for by ordinance, and it is in the interest of public health and safety that sidewalks be constructed in a safe and proper manner; now, therefore, an emergency is declared to exist, and this ordinance shall go into full force and effect immediately upon its passage and approval.

Passed by City Council and approved by the Mayor June 11, 1991.

GENERAL ORDINANCE NO. 91-1129

AN ORDINANCE DECLARING RESPONSIBILITY AND LIABILITY FOR MAINTENANCE OF SIDEWALKS, AND DECLARING AN EMERGENCY.

THE PEOPLE OF THE CITY OF THE DALLES DO ORDAIN AS FOLLOWS:

Section 1. Owner responsibility and liability.

A. It shall be the duty of the owner or owners of lots or tracts of land abutting or adjoining the streets within the City to maintain the sidewalks extending along, in front of or abutting or adjoining such streets, in good repair and a safe condition.

B. The City of The Dalles shall be exempt from liability for damage or loss to person or property sustained as a result of a defective condition of any sidewalk. The owner of real property abutting a sidewalk is liable for any personal injury or property damage which occurs because of the owner's failure to maintain the sidewalk in good repair or safe condition.

C. If the City is required to pay damages for personal injury or property damage caused by the failure of an owner to maintain a sidewalk in good repair or safe condition, such owner shall reimburse the City for the amount of the damages thus paid, and for the attorney fees and costs of defending against the claim for damages. The City may maintain an action in a court of competent jurisdiction to enforce the provisions of this section.

D. For purposes of this ordinance, "sidewalk" shall include "curb".

Section 2. Notice of disrepair. If any sidewalk has deteriorated to such an extent as to render the same unserviceable or unsafe, the City may give notice of such condition by personally serving a printed or written notice upon the owner or owners thereof; or if such personal service cannot be made on the owner or owners, similar service may be made upon the person or persons living in or upon such premises; or if such premises be vacant, then upon the person or persons having charge and custody of such premises; or if service of notice cannot be made upon any of the persons named in the manner above provided, then by posting the notice in a conspicuous place upon the premises; and in all such cases where notice is not made personally upon at least one of the owners, a copy of the notice may be mailed to the owner or owners of record at their address as shown by the records of the Wasco County Clerk or Wasco County Assessor. Such notice shall demand that such defective sidewalk shall be repaired or rebuilt as shall be required to make the same both serviceable and safe within the time stated, which time shall not be less than twenty-four (24) hours nor more than thirty (30) days; or if the same is not so done within the time set forth in the notice, or with any extension of time granted by the City, the City shall proceed to repair or rebuild such sidewalk, and assess the cost thereof to the property; and the same shall be a lien upon such premises under the authority and in the manner contained in this ordinance. Any such sidewalk shall, when so repaired and rebuilt, conform to any rules, regulations or requirements for the same then in force within the City. [As amended by Ordinance No. 97-1219, passed by City Council and approved by the Mayor December 8, 1997.]

Section 3. City repair - Lien. If, within the time fixed in such notice, or within any extension of time granted by the City, such sidewalk has not been rebuilt or repaired as required, then the City Engineer may cause such sidewalk to be rebuilt or repaired and placed in good condition to meet the standards required by the City. The City shall then cause the costs of such repair and placing in good condition to be assessed against the lot, lots or tracts of land abutting such sidewalk, in the same manner as in an assessment for a local improvement. Such assessment shall be declared by ordinance and shall be entered in the docket of City liens, and shall thereupon become a lien against the property, and the creation of such lien and the collection and apportionment of such lien shall be done and performed substantially in the same manner as assessments for local improvements, but irregularities or informalities in the procedure shall be disregarded. [As amended by Ordinance No. 97-1219, passed by City Council and approved by the Mayor December 8, 1997.]

Section 4. Emergency. Whereas it is in the interests of public health and safety to require property owners to maintain sidewalks in good repair, and to establish a procedure to ensure that such repairs are made, now, therefore, an emergency is declared to exist, and this ordinance shall go into full force and effect immediately upon its passage and approval.

Passed by City Council and approved by the Mayor June 11, 1991.

Sidewalk Improvement Plan – Inventory Codes

No Sidewalk

1. Curb line established

2. Curb line established and misaligned or damaged

3. No curb line established

Existing Sidewalks

4. Trip Hazard
   a. Vertical misalignment of panels > ¾ inches
   b. Vertical misalignment between curb and walk > ¾ inches

5. Damaged Surface
   a. Excessively displaced by tree roots
   b. Irregular grade between panels > 4 inches
   c. Excessively cracked, chipped or voided
      i. < 33%
      ii. 33-66%
      iii. > 66%
   d. Horizontal misalignment between panels > 2 inches

6. ADA Compliance
   a. Non-compliant corners
   b. Non-standard corners
   c. Non-compliant alleys
   d. Non-standard alleys that allow access

7. Curb line missing or damaged

8. Vegetation growing on walk

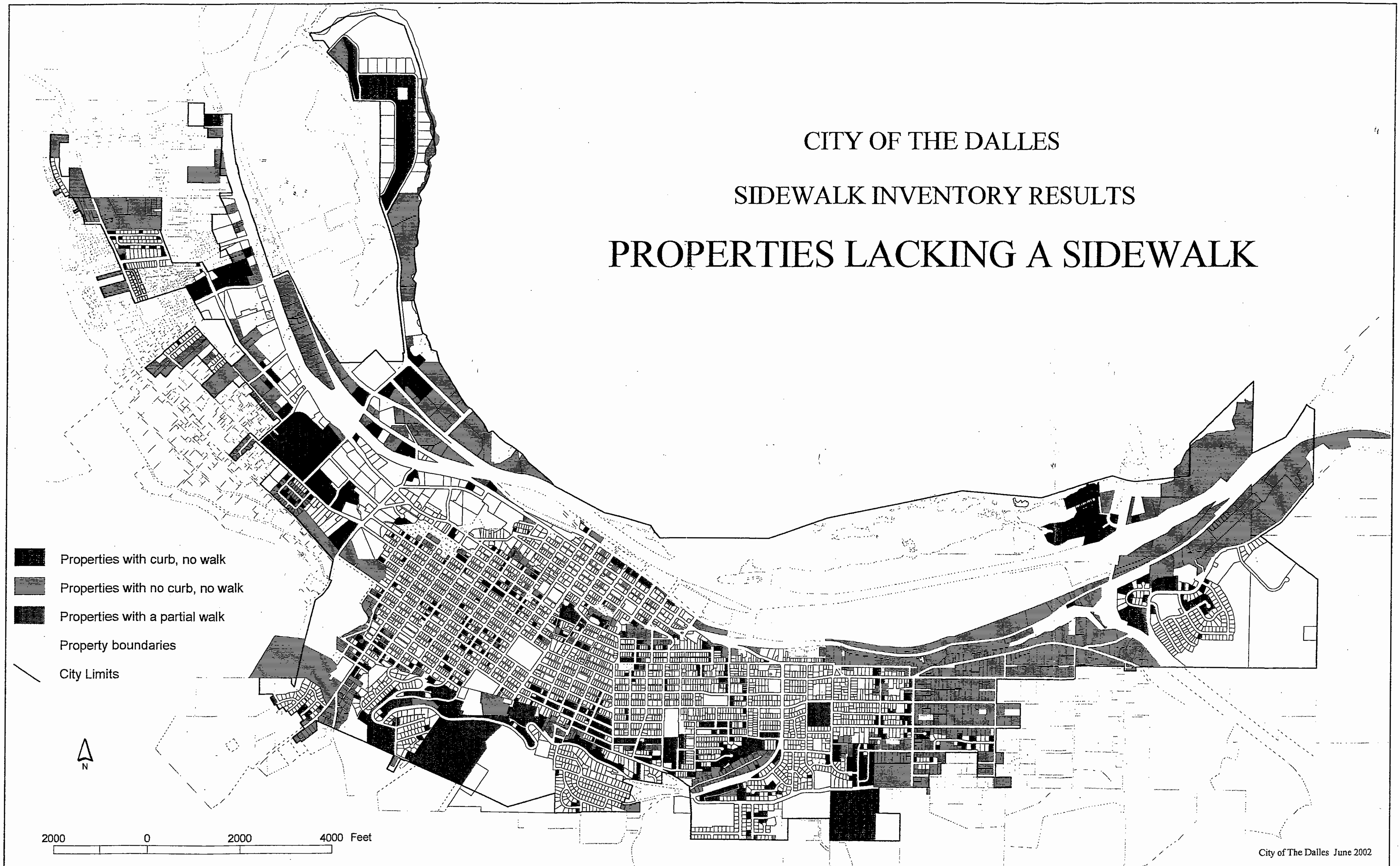
0. Meets city standards

Conditions Found in the Field

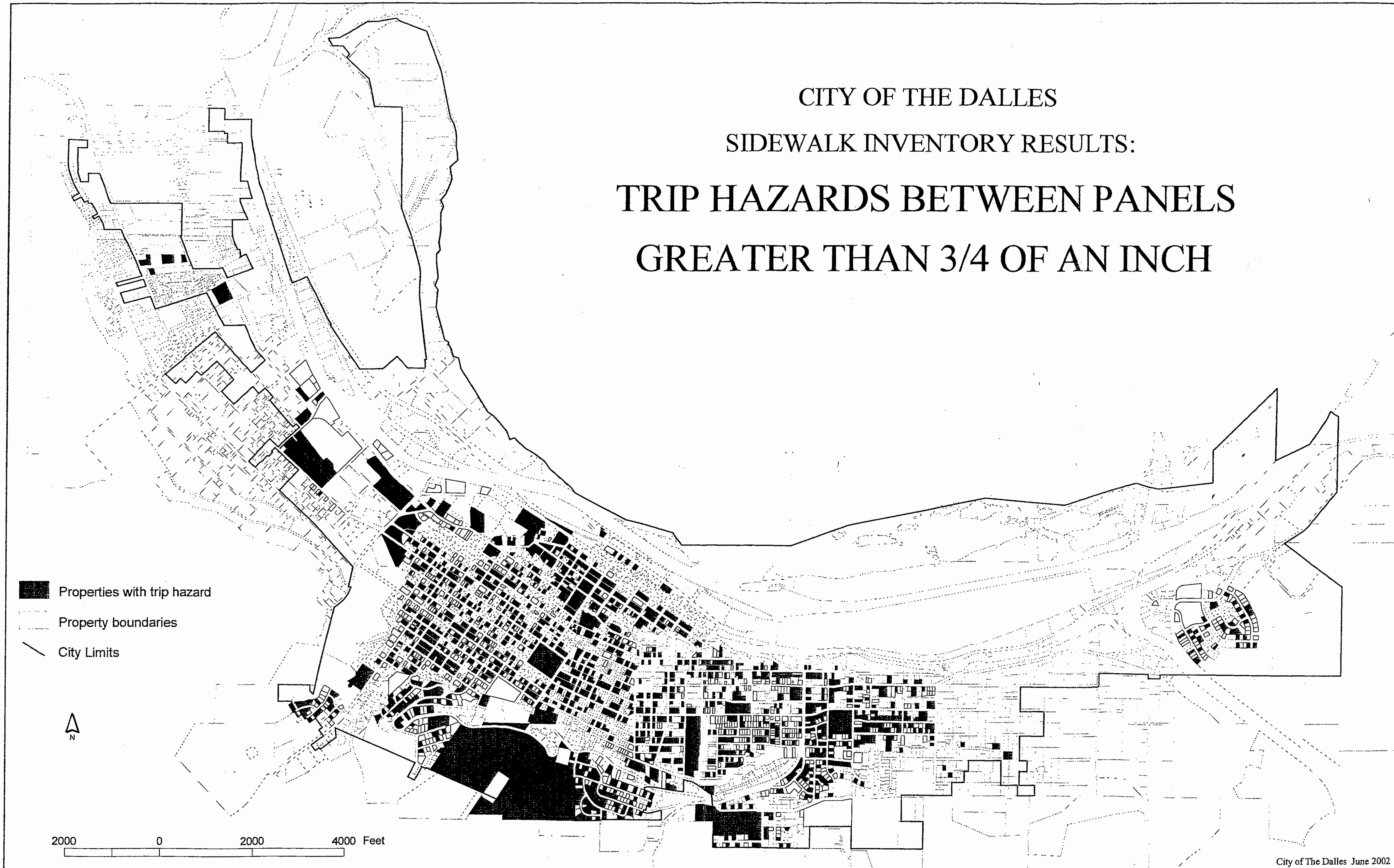
9.
10.
11.

********** Identify gravel streets on field map**********
********** Identify tree branches < 9 ft above walk**********

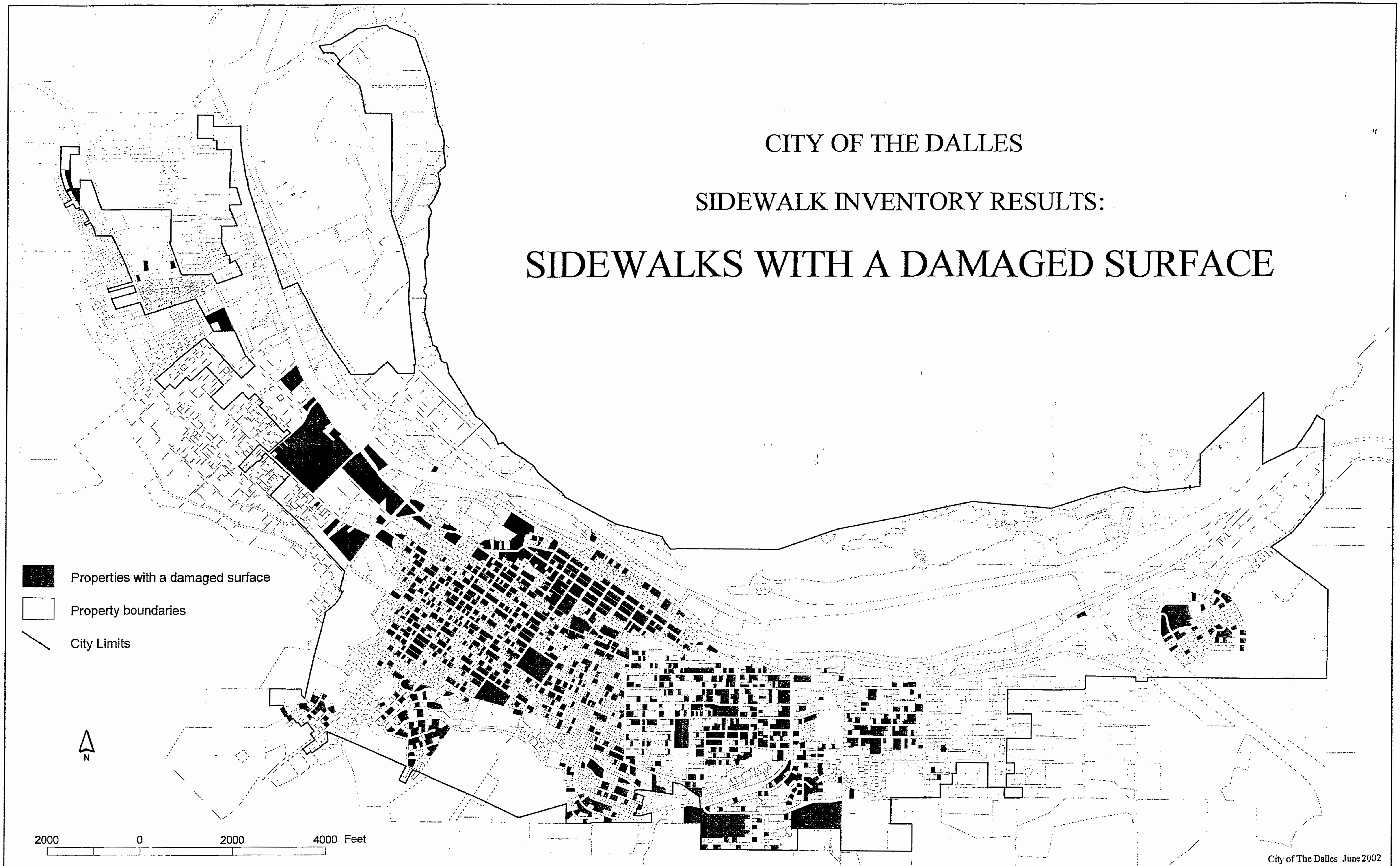
Appendix C

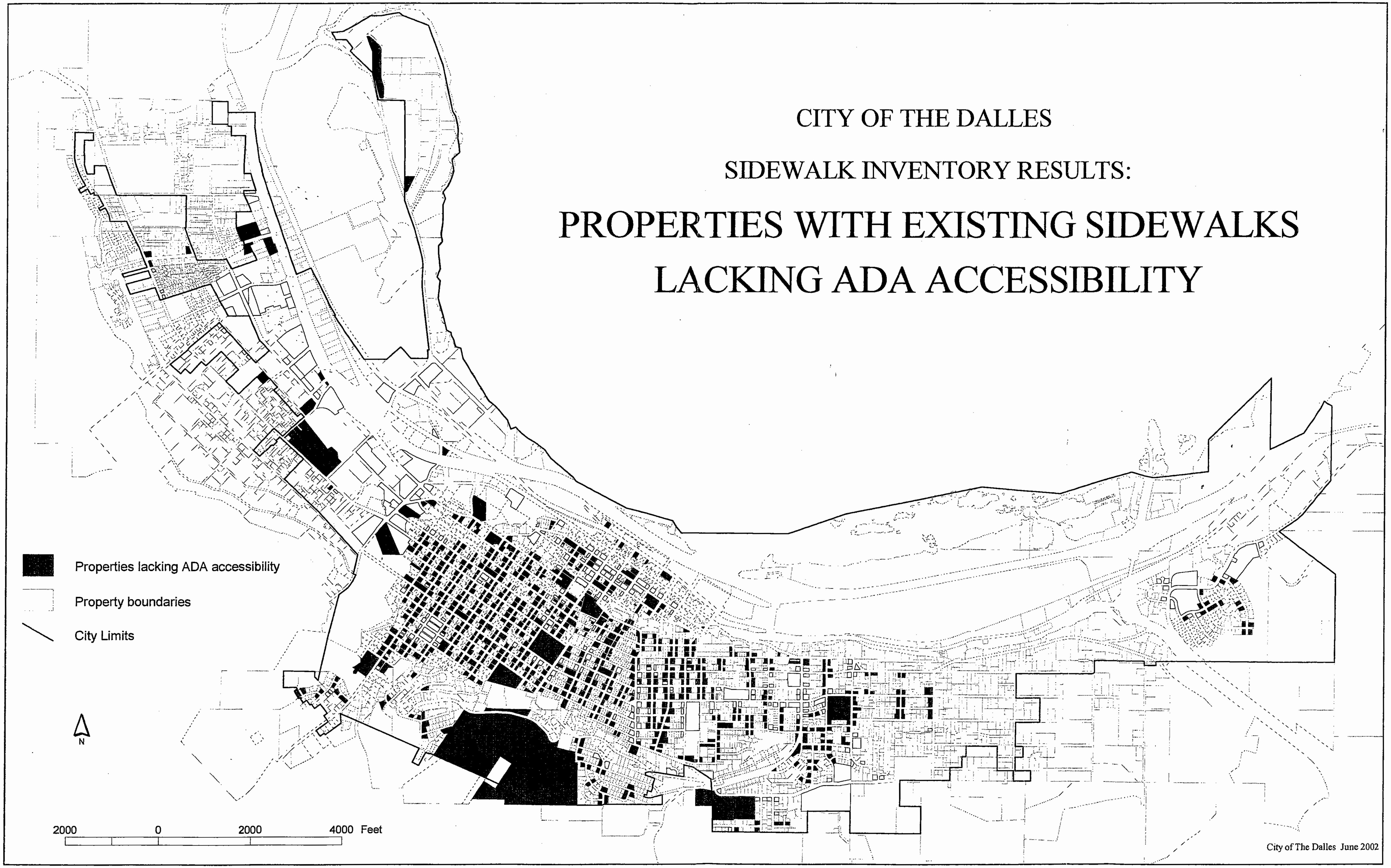


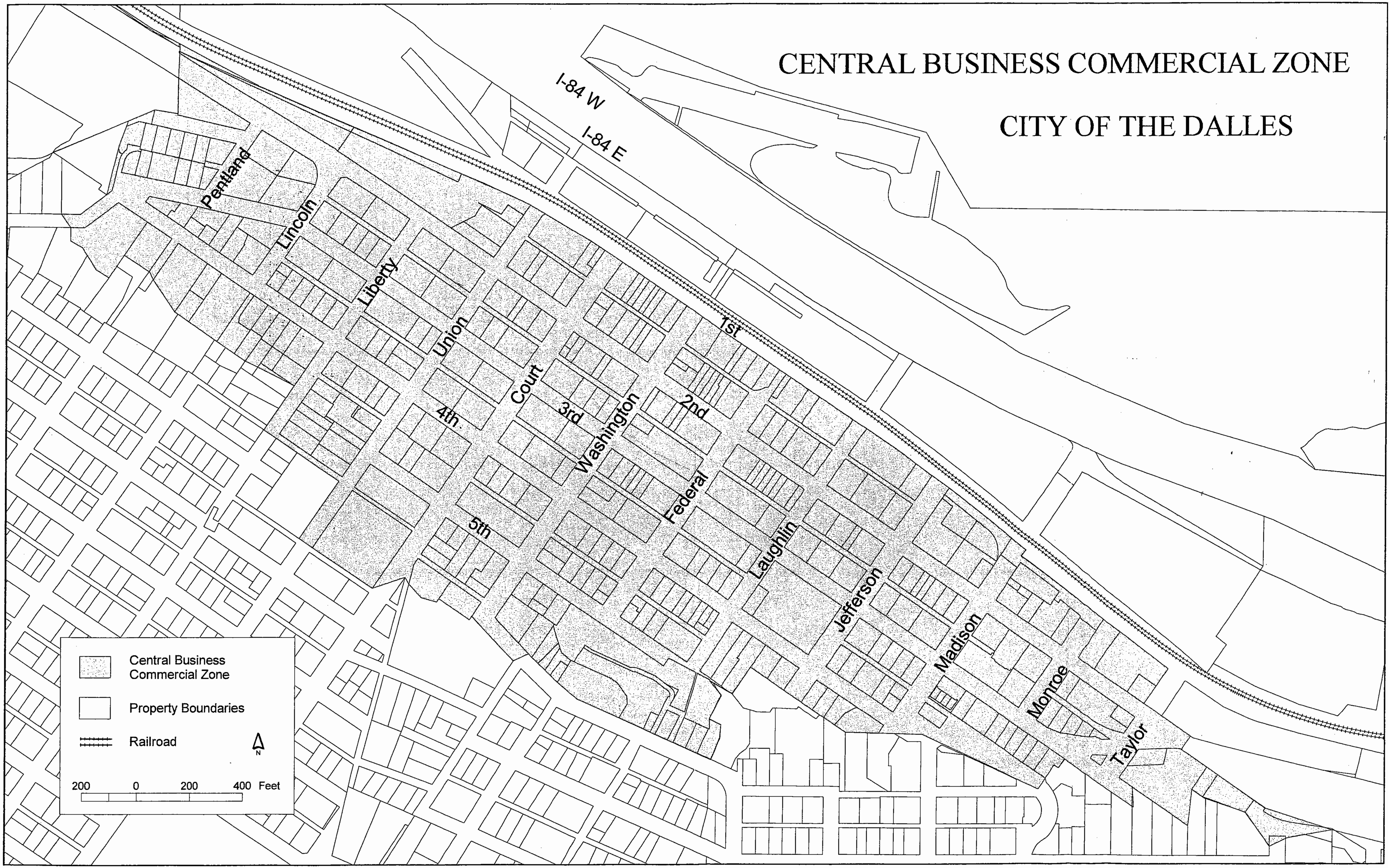
CITY OF THE DALLES
SIDEWALK INVENTORY RESULTS
PROPERTIES LACKING A SIDEWALK
Properties with curb, no walk
Properties with no curb, no walk
Properties with a partial walk
Property boundaries
City Limits
N
2000
0
2000
4000 Feet
City of The Dalles June 2002



CITY OF THE DALLES
SIDEWALK INVENTORY RESULTS:
TRIP HAZARDS BETWEEN PANELS
GREATER THAN 3/4 OF AN INCH
Properties with trip hazard
Property boundaries
City Limits
N
2000
0
2000
4000 Feet
City of The Dalles June 2002


CITY OF THE DALLES
SIDEWALK INVENTORY RESULTS:
SIDEWALKS WITH A DAMAGED SURFACE
Properties with a damaged surface
Property boundaries
City Limits
N
2000
0
2000
4000 Feet
City of The Dalles June 2002


CITY OF THE DALLES
SIDEWALK INVENTORY RESULTS:
PROPERTIES WITH EXISTING SIDEWALKS
LACKING ADA ACCESSIBILITY
Properties lacking ADA accessibility
Property boundaries
City Limits
N
2000
0
2000
4000 Feet
City of The Dalles June 2002


CENTRAL BUSINESS COMMERCIAL ZONE
CITY OF THE DALLES
I-84 W
I-84 E
Pentland
Lincoln
Liberty
Union
Court
Washington
Federal
Laughlin
Jefferson
Madison
Monroe
Taylor
1st
2nd
3rd
4th
5th
Central Business Commercial Zone
Property Boundaries
Railroad
N
200
0
200
400
Feet

CITY OF THE DALLES STANDARD SPECIFICATIONS

CONCRETE CURBS, SIDEWALKS, AND DRIVEWAYS

A. Scope

This section covers the work necessary for the construction of concrete curb sidewalks, wheelchair ramps, driveways and entrances, retaining walls, steps a foundation walls and footings, including all necessary excavation and gradi (except soiled rock excavation), embankment, compaction, setting of forms to li and grade, furnishing and placing concrete and expansion (isolation) joint finishing, curing, cleanup, and all labor, materials, equipment, and incidenta necessary to complete the work. The City, its officers, employees and agents wi not in any manner be answerable or accountable for any loss or damage from a cause whatsoever resulting to the work, or any part thereof, or to any equipmen materials or other things used or employed in prosecuting or completing the wor

B. Licensing, Bonding, and Insurance

All individuals doing such work within a public easement or right of wa dedicated to the City of The Dalles shall be licensed, bonded and insured a required herein (with the exception of a property owner performing such work i the right of way fronting his/her property). Contractors shall carry statutor workers compensation insurance, comprehensive general liability ($500,000 eac occurrence and $1,000,000 aggregate) which includes coverage fc products/completed operations and underground explosion and collapse, an automotive liability ($500,000 for all vehicles, hired and non-owned) Contractors shall bond and insure the work for 100% of replacement value for th life of the contract to ensure faithful performance and against all loss c damage by fire, theft, vandalism and malicious mischief. Policies and bonds shal be in the name of the Contractor and the City. Any loss shall be payable to th City, as trustee. Any payments made shall inure to the benefit of the City to th extent of the loss suffered by the City and the remaining balance for the los suffered by the Contractor.

C. Materials

1. Cement

Cement shall be any standard brand of Portland Cement in general use whic conforms to the requirements of AASHTO M-85, Type II.

2. Fine Aggregate

Fine aggregate for concrete shall consist of uniformly graded sand fron 3/8" to No. 100 sieve size having clean, strong and durable particles. The material shall be reasonably free from clay, organic material, and other deleterious substances and shall meet the requirements of ASTM 0-144 and AASHTO M-6. Sand for mortar shall meet the requirements of AASHTO M-15.

3. Coarse Aggregate

Coarse aggregate for concrete shall consist of rock, gravel, or other inert material of similar characteristics having clean, strong, and durable particles graded from 3/4" to No. 40 sieve size, reasonably free from all deleterious materials.

4. Aggregate Base

Base aggregate for concrete shall consist of crushed rock, gravel, or other inert material of similar characteristics having clean, strong, and durable particles graded from 3/4" to No. 200 sieve size, reasonably free from all deleterious materials. Seventy percent minimum of the base aggregate material shall have at least one fractured face.

5. Water

Water used in mixing Portland cement concrete shall be clean and free of oil, salt, acid, alkali, sugar, vegetable matter, or other deleterious substances and shall conform to the requirements of AASHTO T-26. Water of approved potable quality may be used without test.

6. Admixtures

Admixtures shall not be used without the express direction and approval of the Engineer. Entrained air shall be 6%, plus or minus 1%, for all exposed concrete. When specified, air-entering admixtures shall conform to the requirements of ASTM C-260; water-reducing, retarding, and accelerating admixtures shall conform to the requirements of ASTM O-494. In no case shall the chloride content of any admixture exceed 0.5 percent by weight.

7. Reinforcement

Reinforcing bars shall be deformed billet-steel conforming to the requirements of ASTM A-615, grade 60. Welded wire fabric shall conform to the requirements of ASTM A-185 or ASTM A-496, with minimum yield strength of 80,000 p.s.i.

8. Concrete

Concrete shall contain a minimum of five (5.5) sacks of cement per cubic yard and shall be proportioned so as to be easily workable, have a slump of between two (2) and four (4) inches, and develop a minimum 28-day compressive strength of 3000 psi. The water-cement ratio shall be less than or equal to 0.48. The Engineer may require that a certified copy of the proposed mix design be submitted for approval prior to construction. The Engineer may also require the contractor to form and laboratory test cylinders for strength. Where required, consolidate concrete using mechanical vibrators satisfactory to the Engineer. Vibrators shall be operated vertically and moved continuously so they will not cause segregation. Vibrators shall not come into contact with the forms or reinforcement and shall not be used to move the mix horizontally.

9. Forms

In areas where mechanical placement of concrete is not possible, and hand forming is required, place forms, aggregate base, reinforcement and expansion (isolation) joints and receive approval from the Engineer before pouring concrete. A minimum 48 hours notification time is required by the Engineer for form inspections.

Wood forms for concrete surfaces not subject to backfill shall be made of dressed lumber of uniform thickness, with a mortar-tight form liner of an approved type. Plywood will be accepted as a form liner if supported in an approved manner.

All forms will be treated with an approved release agent before placing

the concrete. Materials which will adhere to or discolor the concre
shall not be used.

10. Joint Materials

Expansion (isolation) joint fillers shall be pre-formed fiberboard typ 1/2" thick, and treated so as to be rot and vermin proof.

11. Curing Material

Curing materials shall conform to the requirements of AASHTO M-171 fc white polyethylene or burlap-polyethylene sheets or waterproof paper AASHTO M-148 for liquid membrane-forming compounds, or AASHTO M-182 fo burlap cloth.

D. Construction Detail

1. Subgrade Preparation

The subgrade shall be shaped to the required depth and width to provide firm, even surface. Soft and unsuitable material shall be removed an replaced with approved backfill material. Upon completion of the require excavation and/or embankment, the subgrade shall be thoroughly compacte to not less than 90% of optimum density per AASHTO T-99. Uneven or jagge existing concrete surfaces to be joined shall be saw cut unless otherwis specified.

2. Aggregate Base

Upon completion of the subgrade preparation, the aggregate base shall be placed and shaped to the required depth and width to provide a firm, even surface. The aggregate base shall be thoroughly compacted to not less than 95% of maximum density per AASHTO T-99. Before depositing concrete, debris shall be removed from the area to be occupied by the concrete. Base shall be dampened prior to placement of concrete.

3. Forms

Forms shall be set and maintained until concrete is sufficiently hardened. Forms shall be mortar tight and of sufficient rigidity to prevent distortion due to the pressure of the concrete and other loads incidental to construction operations. Forms shall be designed and constructed to prevent warping and opening of joints and so the finished concrete will conform to the proper final dimensions and contours.

4. Straight and Circular Curbs

Curbs shall be constructed according to the standard drawing to the specified line and grade. Circular curb is that which is constructed with a radius of thirty feet (30') or less. The top and face of finished curb shall be true and straight. The top surface shall be of uniform width, free from humps, sags, honeycombs, or other irregularities. The top and face of the curb shall not vary more than 0.02 foot at any point from a ten foot (10') straight edge except at grade changes and vertical curves. The curb shall at all points be constructed within 0.02 foot of true line, specified grade, cross section, and slope and within 0.04 foot of specified thickness.

Expansion (isolation) joints shall be provided opposite abutting expansion (isolation) joints, over expansion (isolation) joints in underlying concrete, at the points of tangency of circular curbs, at connections to existing curbs, and at connections to proposed or new driveways. Each expansion (isolation) joint shall be at right angles to the curb alignment, vertical to the face, and shall provide complete separation from the new concrete.

Contraction joints shall be scored across the top and front face of curbs as required to confine the contraction joint spacing to a maximum distance of fifteen feet (15'). Existing curbs shall be saw cut to make the joint between the old and new material. The Contractor shall remove forms from formed curbs while the concrete is still green and repair minor defects with mortar. Plastering shall not be permitted on the faces and exposed surfaces. Honey-combed and other structurally defective concrete shall be removed and replaced at no cost to the owner. Exposed surfaces shall be broom finished longitudinally. After placement and finishing, concrete shall be cured with an approved curing material, whether by application of curing compound to the damp concrete or by keeping the concrete protected and moist for at least 72 hours.

5. Sidewalks

Sidewalks shall be constructed according to the standard drawing to the specified line and grade. Sidewalks shall be constructed four inches (4") thick and the surface shall slope toward the street at the rate of 1/4" per foot. The surface shall not vary more than 0.02 foot at any point from a ten foot (10') straight edge except at grade changes and vertical curves. All work shall be within 0.02 foot of true line, specified grade, cross section, and slope, and within 0.04 foot of specified thickness.

Expansion (isolation) joints shall be provided opposite existing expansion (isolation) joints, over expansion (isolation) joints in underlying concrete, at each point of tangency, at connections to existing curbs, driveways, sidewalks, and pathways, around objects which protrude into the sidewalk, and at connections to proposed or new driveways. Expansion (isolation) joints shall be at right angles to the alignment, vertical to the surface, and shall provide complete separation from the new concrete.

The surface shall be marked into rectangles with a scoring tool at five foot (5') intervals and shall be broom finished transverse to the direction of traffic. Contraction joints shall be located at fifteen (15) foot intervals (every third joint). Contraction joints shall be formed to a depth of 1/4 of the thickness of the concrete and to a width of approximately 1/8 inch. Contraction joint edges shall be tooled. Contraction joints in sidewalks shall align with joints in curbs and structures located in walks. After placement and finishing, concrete shall be cured with an approved curing material, either by application of curing compound to the concrete of by keeping the concrete protected and moist for at least 72 hours.

6. Wheelchair Ramps

Wheelchair ramps shall be constructed at each street intersection and/or as directed by the Engineer, and conforming in all respects to the standard drawing for wheelchair ramps. Wheelchair ramps shall be constructed to a thickness of four inches(4") at all points except through the curb portion, which portion shall conform to the requirements for straight and circular curbs. Jointing, curing, finishing and tolerances shall be as specified for sidewalk construction.

7. Driveways

Driveways shall be constructed at the location indicated on the plans and/or as directed by the Engineer. Concrete thickness in driveways shall be a minimum of six (6) inches. Driveway construction and placement shall conform in all respects to the standard drawings for driveways and alley approaches. Jointing, finishing, curing, and tolerances shall be as specified for sidewalk construction. Where practicable, driveways shall be kept from excessive loading and strain for a period of seven days following construction.

8. <u>Steps</u>

Steps shall be constructed in accordance with the plans. If plans do not detail requirements for steps, the maximum and minimum rise, minimum tread width, tread slope, ramp requirements, landings and uniformity shall be as specified in the Uniform Building Code.

9. <u>Retaining Walls and Footings</u>

Retaining walls and footings shall be in accordance with plans submitted to and approved by the Engineer. Forms used shall achieve a smooth, uniform finish. Finish shall be sacked. Forms shall be set to line and grade which allow the finished product to meet specified tolerances.

10. <u>Reinforcement</u>

Reinforcing bars or wire mesh shall be placed in accordance with the drawings and applicable parts of WORSI "Manual for Placing Reinforcement Bars". Bars or mesh shall be supported in place with wire ties, clips, welds, metal hangars or chairs.

All splices shall be as shown on approved plans. In no case shall splices be less than 24 bar diameters or 12 inches, whichever is greater. Splices shall be staggered. Bars shall be wired tight together at splices.

11. <u>Foundations</u>

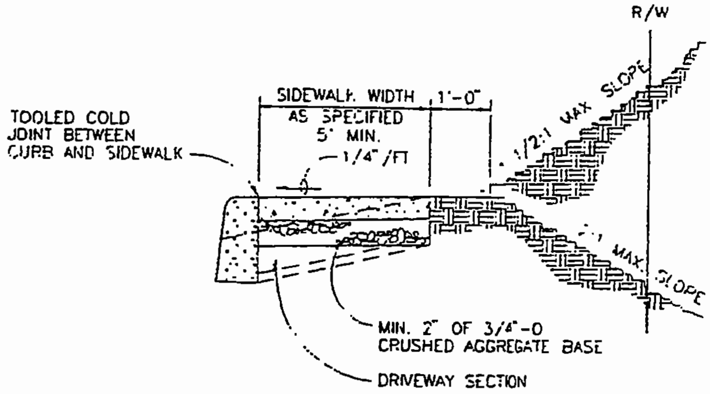
Foundations, if shown on the plans, shall be constructed as per the plans. Footings must be formed and shall be poured on firm, undisturbed ground or on compacted fills approved by the Engineer. Exposed concrete finish shall be uniform and smooth. Tie holes and other defects shall be patched with approved concrete patch to match texture and color of form finish. Form quality plywood, high density board, or metal forms in good condition shall be used as appropriate to provide the approved finish.

12. <u>Cleanup</u>

Areas adjacent to the work shall be trimmed and shaped to a neat condition and distributed areas restored to their original condition.

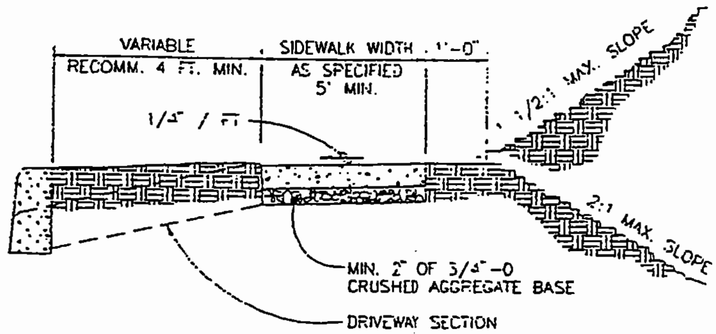
E. <u>Guarantee/Warranty</u>

The Contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom which shall appear within a period of one year from the date of final acceptance of the work. The City will give notice of observed defects with reasonable promptness. Repairs, replacements or changes made under warranty requirements shall be guaranteed for one year from the date of acceptance of the repairs, replacements or changes.

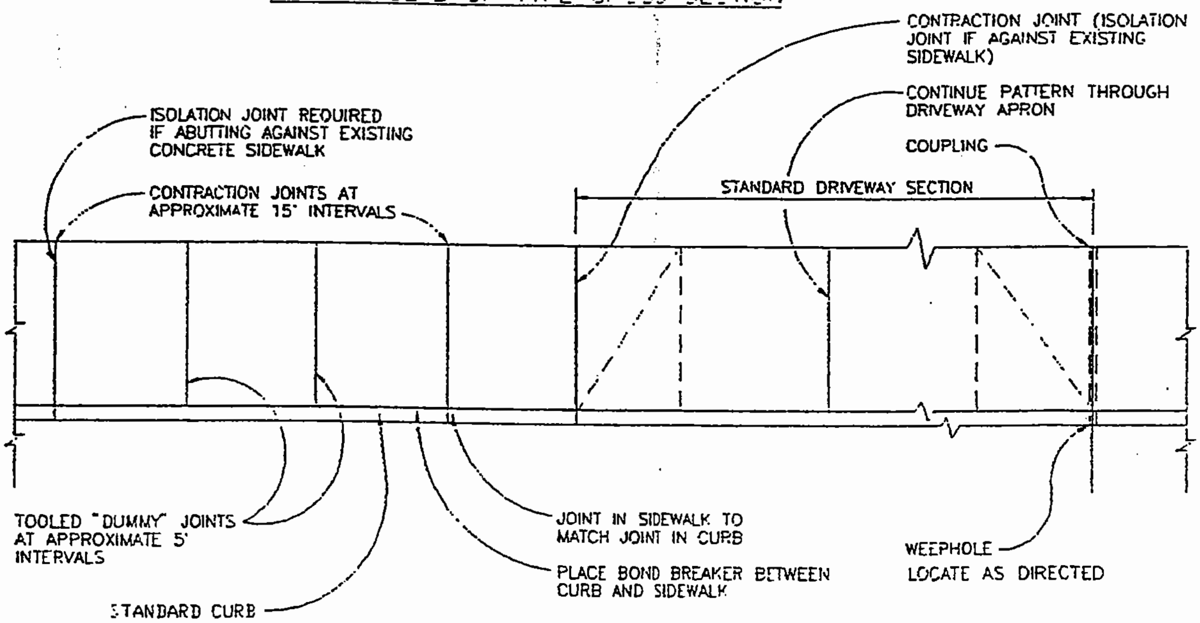


NOTE:
CONCRETE DEPTH FOR STANDARD SIDEWALKS SHALL BE NOMINAL 4" MIN., DRIVEWAY SECTIONS INCLUDING SIDEWALKS THROUGH DRIVEWAYS SHALL BE NOMINAL 6" MIN

TYPICAL CURB TYPE CROSS SECTION



TYPICAL SETBACK TYPE CROSS SECTION



TYPICAL PLAN VIEW

NOTE:
SIDEWALKS 8 FEET AND WIDER SHALL HAVE A LONGITUDINAL CONTRACTION JOINT AT THE MIDPOINT.

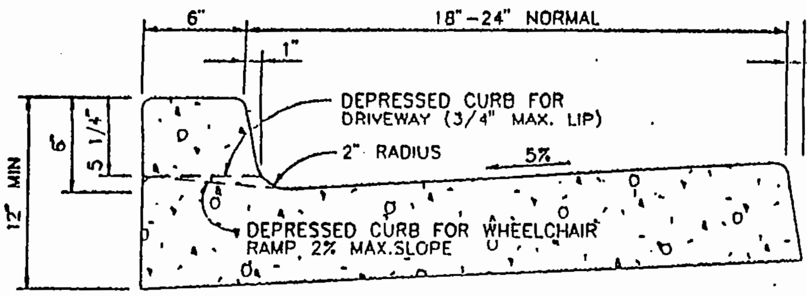
INSTALL 3" PVC WEEPHOLE PIPES IN SIDEWALKS AT LOCATIONS DIRECTED BY THE ENGINEER. PLACE CONTRACTION JOINT OVER THE TOP OF PIPE.

FINISH CONCRETE AS REQUIRED IN SPECIFICATIONS. IF NO FINISH IS SPECIFIED, USE A BROOM PATTERN.

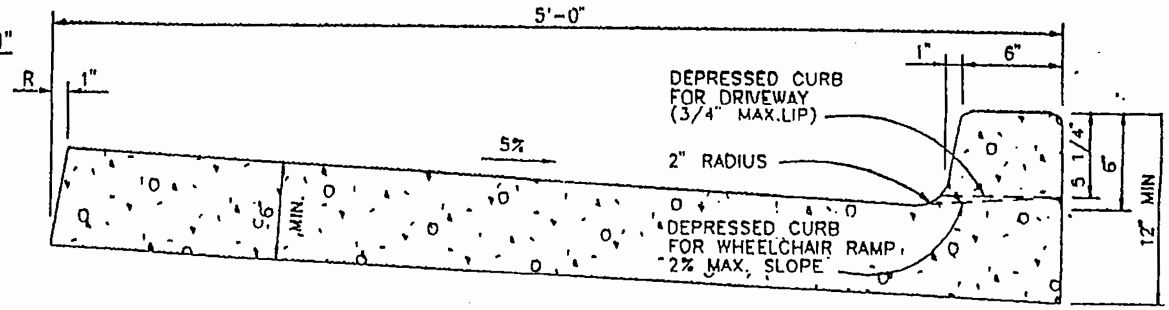
CITY OF THE DALLES	
SIDEWALK	
DATE: FEB 1997	DRAWING NO. TD-205

FILENAME: APWA0005.DWG

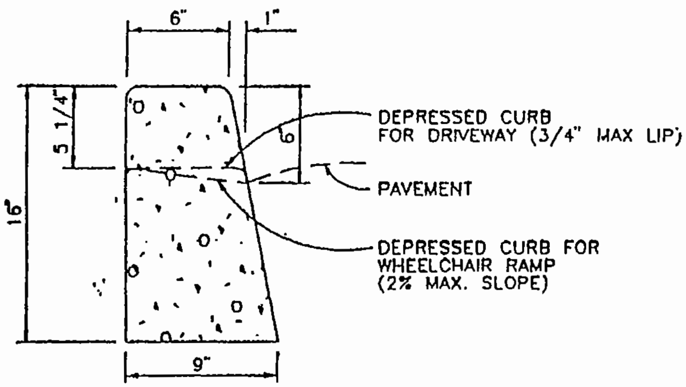
FILENAME: APWA0003.DWG



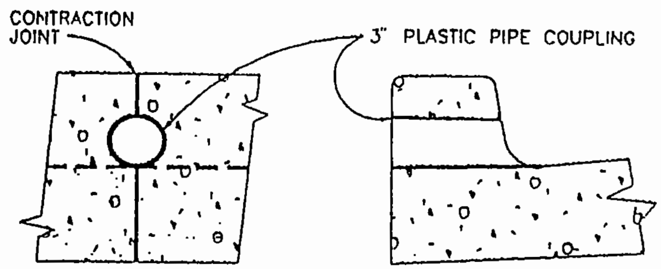
TYPICAL CURB & GUTTER



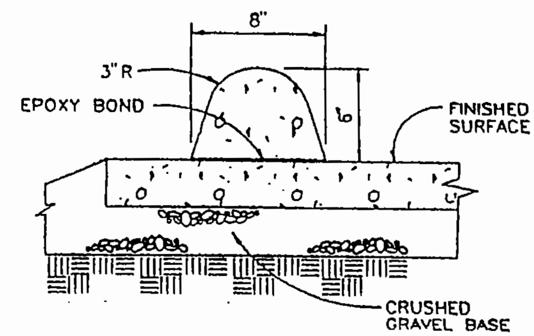
TYPICAL WIDE (5'-0")CURB & GUTTER



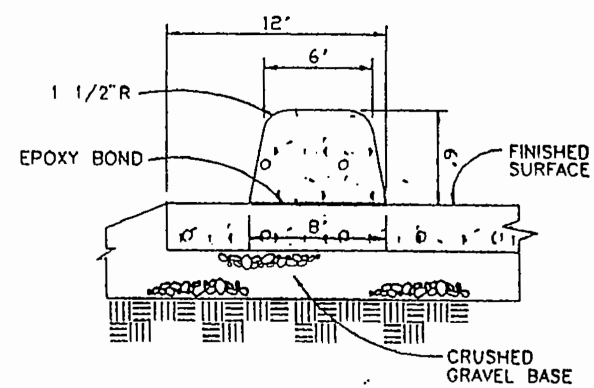
TYPICAL STRAIGHT CURB



WEEP HOLE THROUGH CURB



EXTRUDED AC BONDED CURB



EXTRUDED CONCRETE BONDED CURB

NOTES:

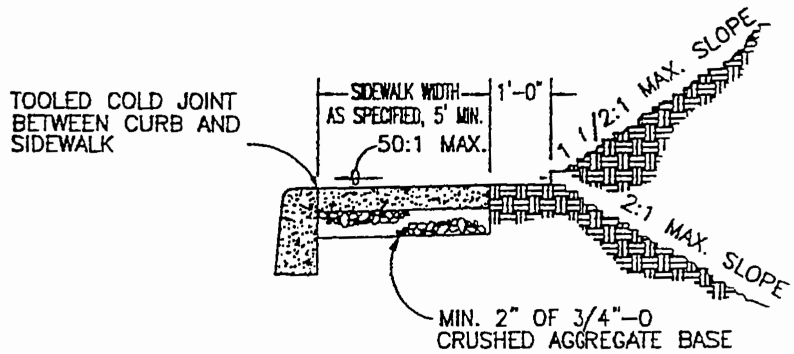
1. ALL RADII SHALL BE 3/4" EXCEPT AS OTHERWISE SHOWN.
2. ISOLATION JOINTS SHALL BE PLACED ONLY AS SPECIFIED.
3. CONTRACTION JOINTS SHALL BE PLACED AT 15' INTERVALS AND SHALL EXTEND AT LEAST 50% THROUGH THE CURB OR CURB AND GUTTER.
4. A CONTRACTION JOINT SHALL BE PLACED ALONG AND OVER WEEP HOLE THROUGH THE CURB AND THROUGH THE SIDEWALK.
5. WHEN SIDEWALKS ARE CONSTRUCTED, EXTEND 3" PIPE TO BACK OF SIDEWALK AND INSTALL COUPLING.

CITY OF THE DALLES

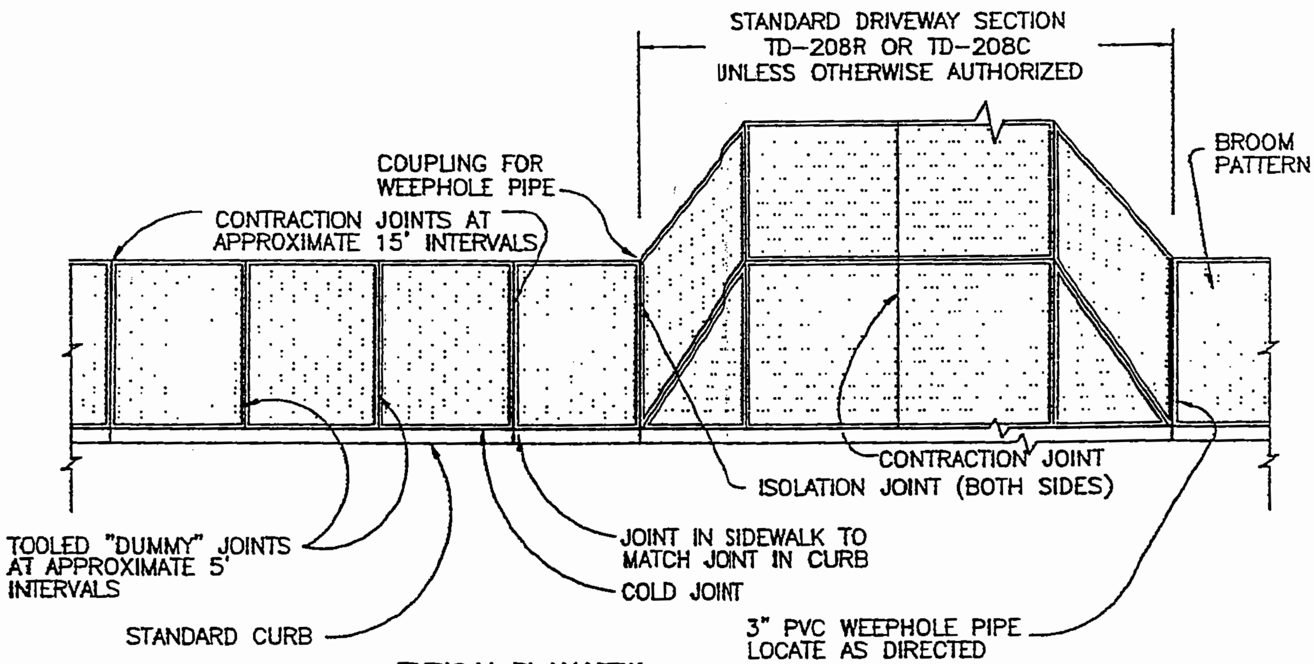
CURB AND GUTTER, CURB, AND WEEPHOLE

DATE: MAY 1996

DRAWING NO. TD-203



TYPICAL CURB TYPE CROSS SECTION



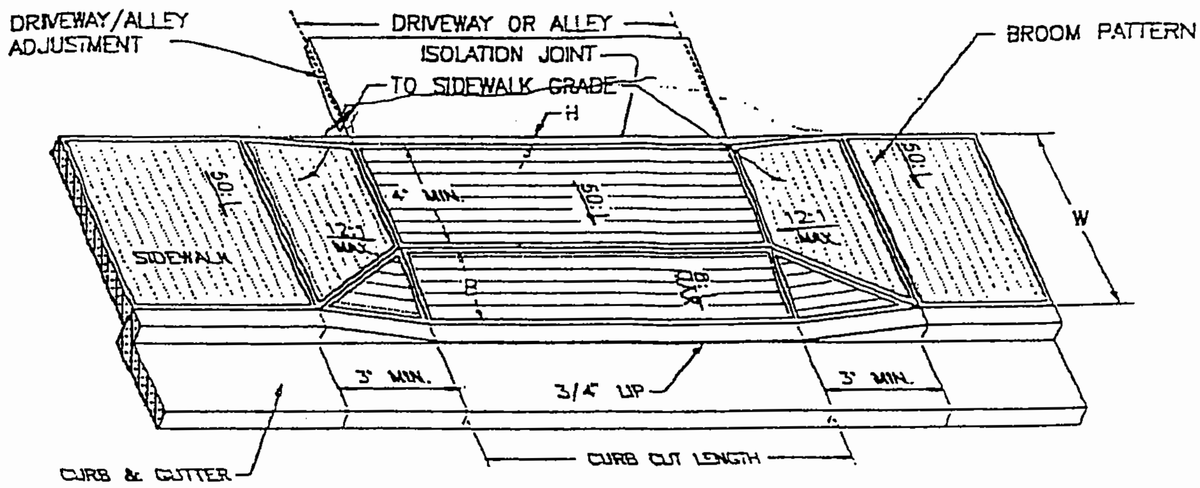
TYPICAL PLAN VIEW

NOTE:

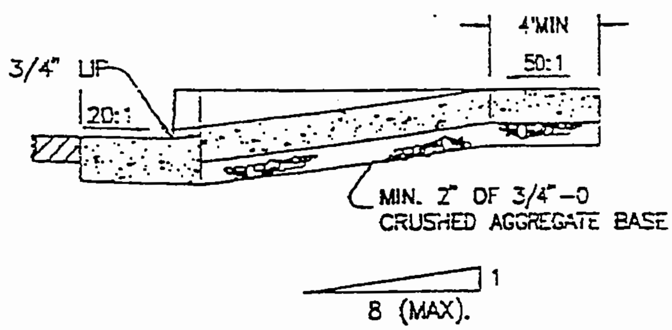
1. SIDEWALKS 8 FEET AND WIDER SHALL HAVE A LONGITUDINAL CONTRACTION JOINT AT THE MIDPOINT.
2. CONCRETE DEPTH FOR STANDARD SIDEWALKS SHALL BE NOMINAL 4" MIN.; THICKNESS IN DRIVEWAY SHALL BE 6" IN RESIDENTIAL AND 8" IN COMMERCIAL OR ALLEY APPROACHES.
3. INSTALL 3" PVC WEEPHOLE PIPES IN SIDEWALKS IN LOCATIONS AS DIRECTED BY THE ENGINEERS. PLACE CONTRACTION JOINT OVER THE TOP OF THE PIPE.
4. INSTALL ISOLATION JOINTS AT APPROXIMATELY 45' INTERVALS.
5. JOINTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH APWA DRAWING NO. 210.
6. FORMS, CONCRETE, NOTIFICATION, INSPECTION AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS.

CITY OF THE DALLES	
CURB-SIDE SIDEWALK	
DATE: AUG 1998	DRAWING NO. TD-205C

FILENAME: TD0005C.DWG



W	B	H	
5'	2'	0.27'	(3-1/4")
6'	2'	0.29'	(3-1/2")
7'	3'	0.19'	(2-1/4")
8'	4'	0.08'	(1")



TYPICAL SECTION THROUGH
DRIVEWAY/ALLEY RAMP

NOTES:

1. RESIDENTIAL DRIVEWAYS AND SIDEWALK SECTIONS THROUGH DRIVEWAYS SHALL HAVE A MINIMUM NOMINAL THICKNESS OF 6". CONCRETE STRENGTH SHALL BE 3300 PSI.
2. CONCRETE FOR COMMERCIAL USE AND ALLEY APPROACHES SHALL HAVE A MINIMUM NOMINAL THICKNESS OF 8". CONCRETE STRENGTH SHALL BE 3300 PSI.
3. CURB TRANSITIONS FOR COMMERCIAL USE AND ALLEY APPROACHES SHALL BE 5 FEET.
4. CONSTRUCT CONTRACTION JOINT IN CENTER OF DRIVEWAY WHEN DRIVEWAY WIDTH EXCEEDS 15'.
5. NO LIP AT GUTTER IF USED AS SIDEWALK ACCESS RAMP.
6. SEE SIDEWALK DETAILS FOR RESTRICTIONS AND SPECIFICATIONS NOT SHOWN.
7. THE 50:1 CROSS-SLOPE OF SIDEWALK IS MEASURED FROM HORIZONTAL. THE 12:1 SLOPE OF SIDEWALK TRANSITION TO DRIVEWAY/ALLEY IS RELATIVE TO THE RUNNING SLOPE OF THE SIDEWALK. THE SLOPE OF THE APRON IS MEASURED RELATIVE TO HORIZONTAL.

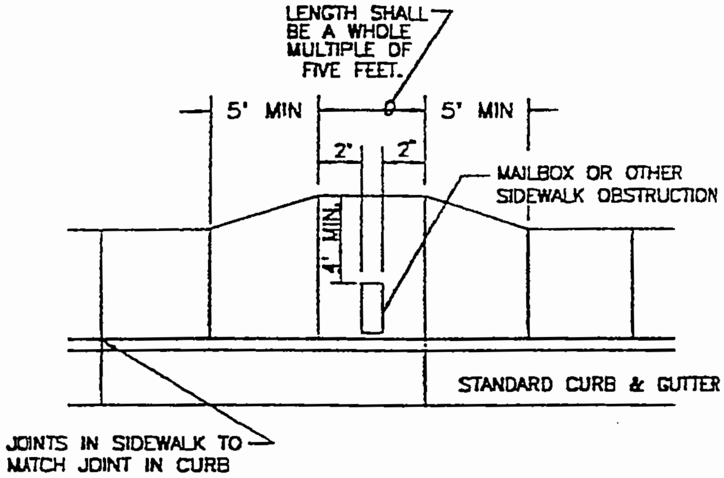
APWA OREGON CHAPTER

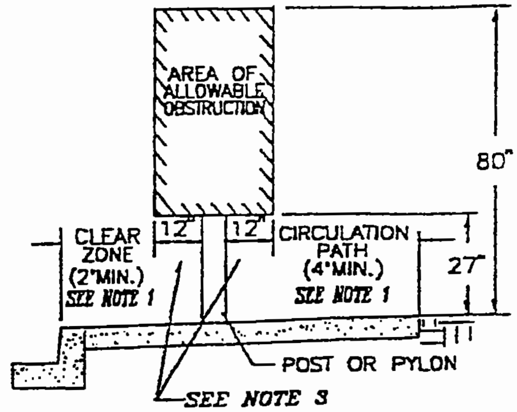
DRIVEWAY AND ALLEY APPROACHES WITH DEPRESSED CURBLINE SIDEWALK

DATE: AUG 1996

DRAWING NO. 208

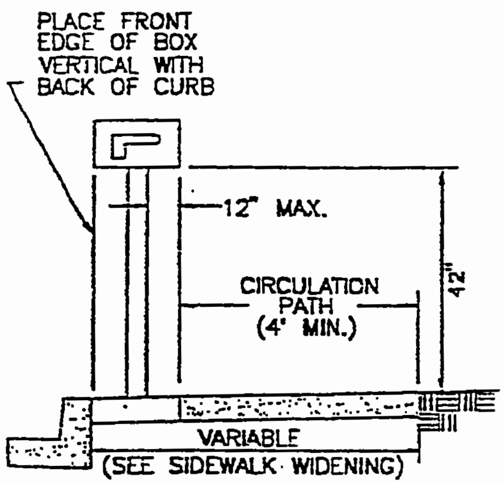
FILENAME: APWA0056.DWG



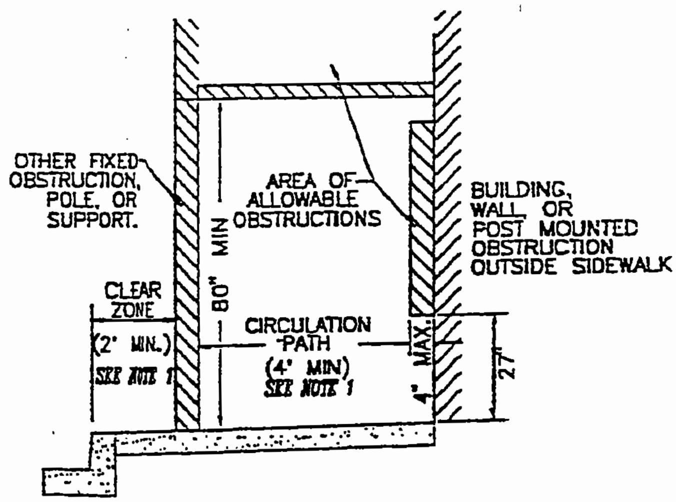


POST MOUNTED OBSTRUCTION WITHIN SIDEWALK

REQUIRED SIDEWALK WIDENING AROUND OBSTRUCTIONS



TYPICAL MAILBOX INSTALLATION



PROTRUDING OBJECTS AND OTHER OBSTRUCTIONS

NOTES:

1) CLEAR ZONE AND THE CIRCULATION PATH MAY BE COMBINED PROVIDING A 5 FOOT MINIMUM SIDEWALK WIDTH IS MAINTAINED.

2) DEFLECT SIDEWALK AROUND AREA OF OBSTRUCTION WHEN OVERHANGS EXCEED ALLOWABLE LIMITS.

3) WHEN OBSTRUCTIONS ARE LOCATED WITHIN THE SIDEWALK AREA THE DIMENSION APPLIES IN ALL DIRECTIONS.

4) INSTALL FULL DEPTH EXPANSION JOINT AROUND ALL OBSTRUCTIONS PENETRATING SIDEWALK SURFACE.

5) ON CUL-DE-SACS, PLACE FRONT EDGE OF MAILBOX 6 INCHES BEHIND BACK OF CURB.

6) EXCEPTIONS TO THE REQUIREMENTS IN THIS DRAWING MUST BE APPROVED BY THE ENGINEER AND MUST COMPLY WITH 'AMERICANS WITH DISABILITY ACT.'

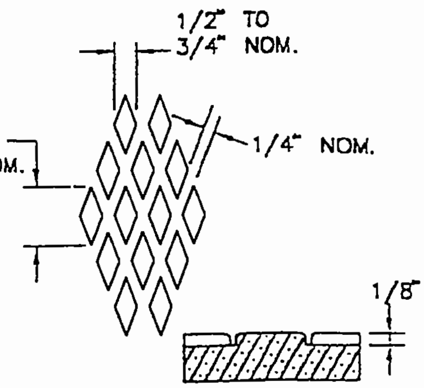
APWA OREGON CHAPTER

SIDEWALK DETAILS: OBSTRUCTIONS AND PROTRUDING OBJECTS

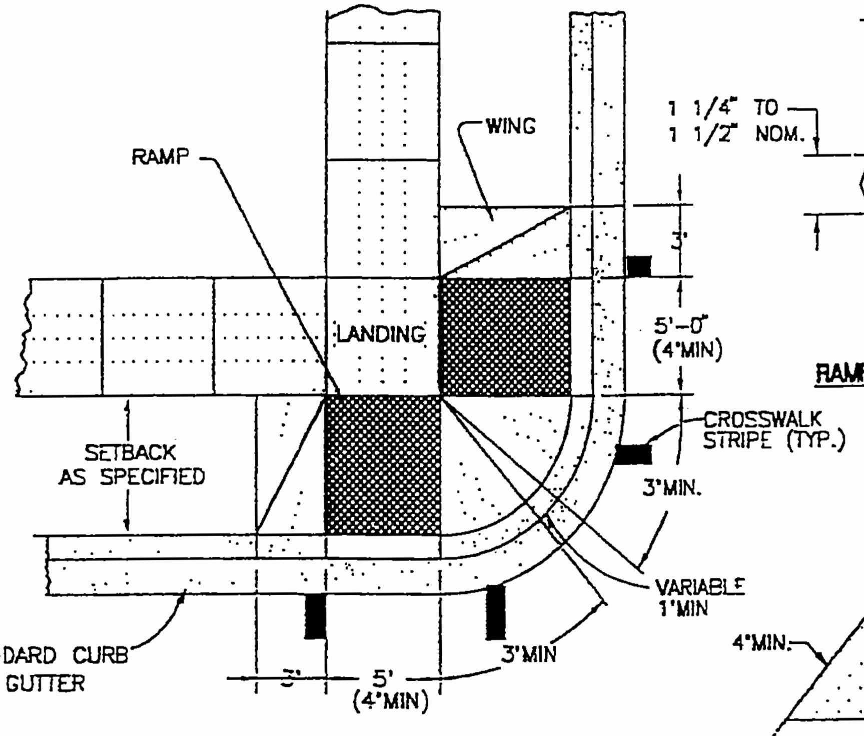
DATE: AUG 1996

DRAWING NO. 205-A

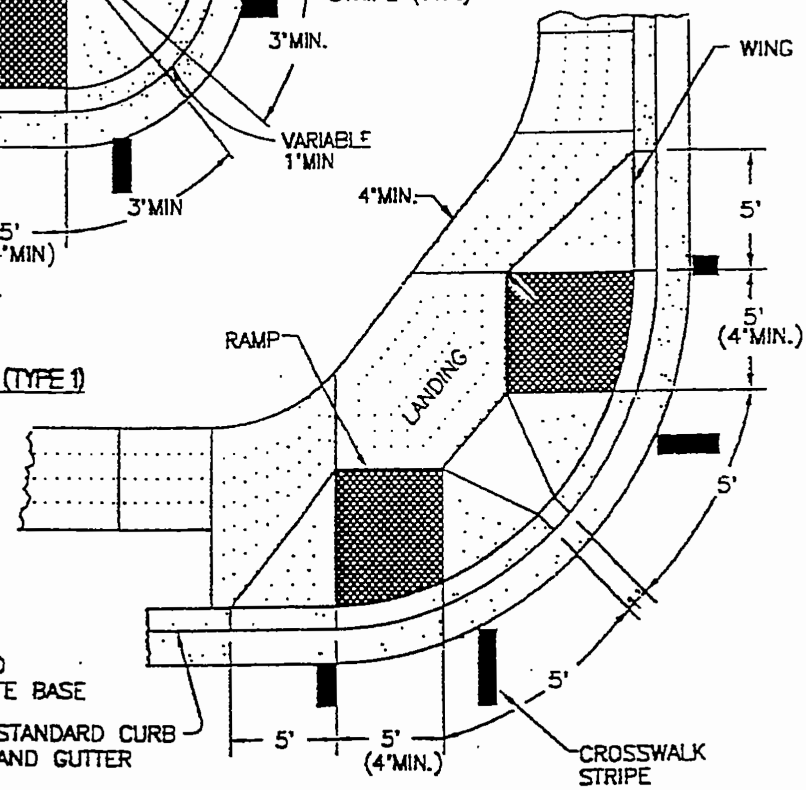
FILENAME: APWA0058.DWG

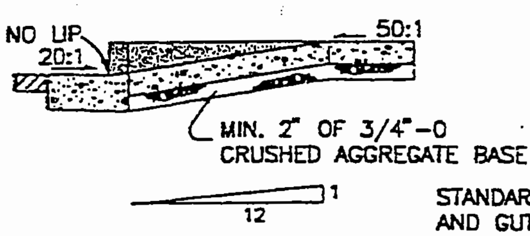


RAMP TEXTURE DETAIL



PERPENDICULAR CURB RAMPS (TYPE 1)





TYPICAL SECTION THROUGH RAMP

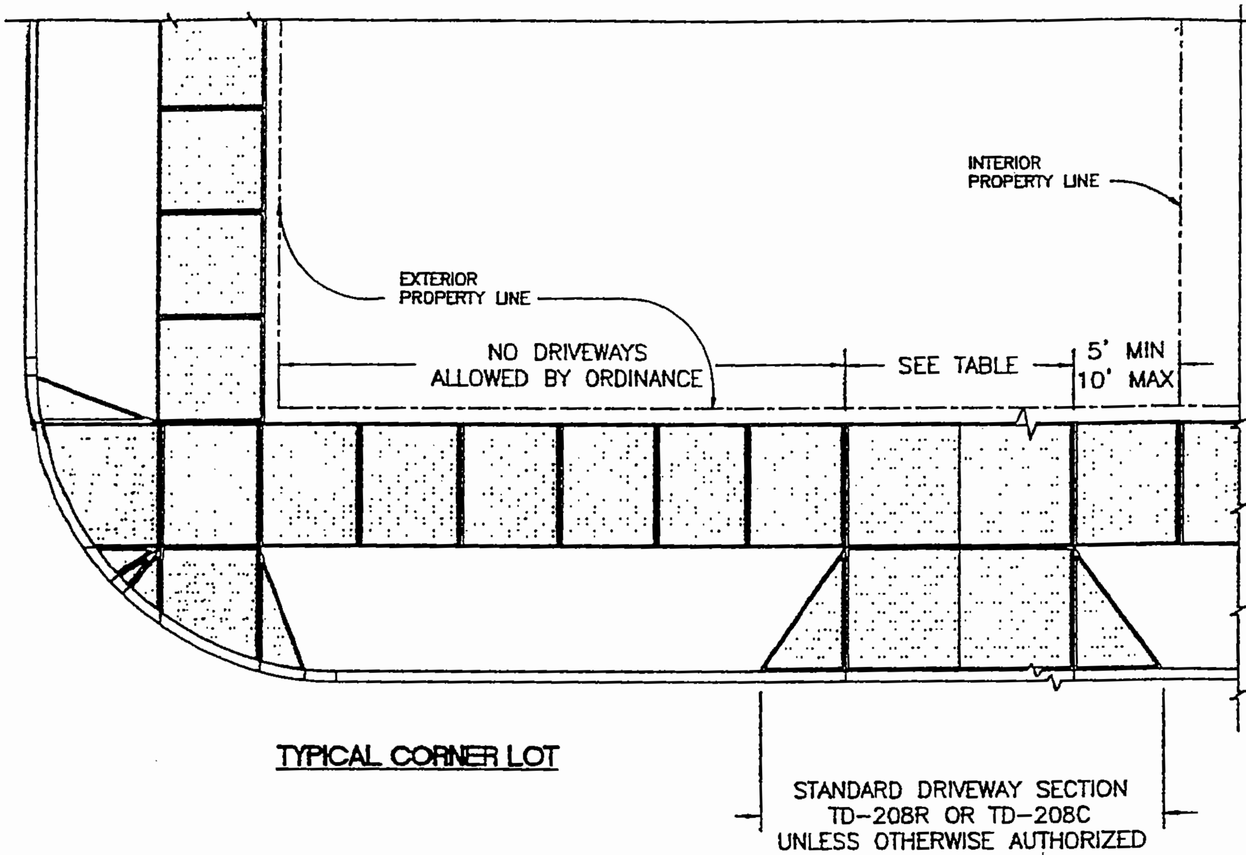
PERPENDICULAR CURB RAMPS (TYPE 2)

NOTES:

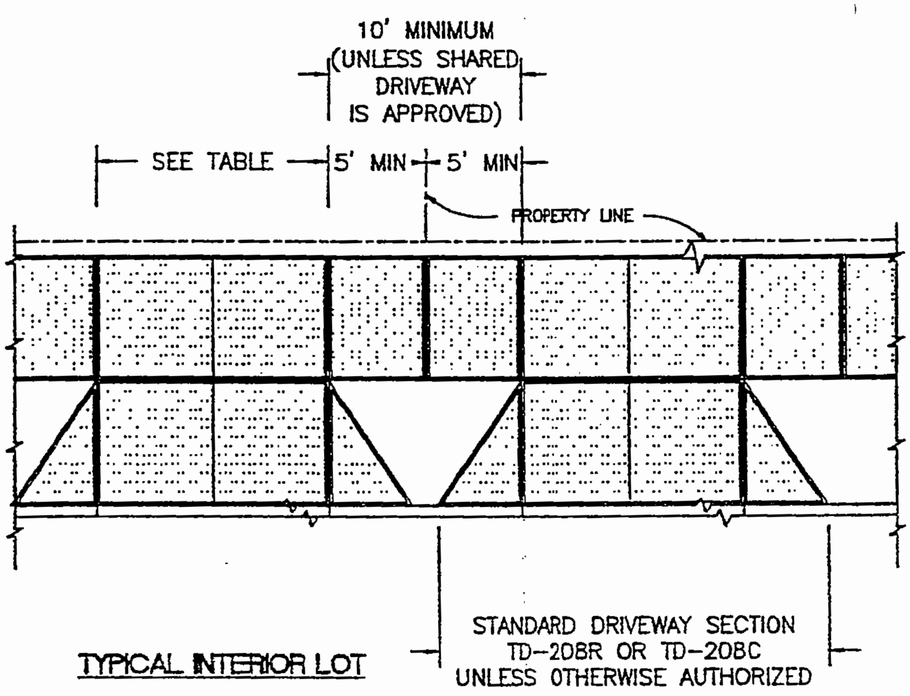
1. THE "AMERICANS WITH DISABILITIES ACT" (ADA) REQUIRES THAT ACCESS RAMPS TO SIDEWALKS CONFORM TO ALL FEDERAL GUIDELINES. EXCEPTIONS TO THE REQUIREMENTS IN THIS DRAWING MUST BE APPROVED BY THE ENGINEER AND MUST COMPLY WITH ADA.
2. NO ABOVE GROUND UTILITIES ARE PERMITTED WITHIN RAMP AREA.
3. LANDINGS SHALL BE PLACED AT THE TOP OF EACH RAMP. LANDING SLOPES SHALL NOT EXCEED 50:1 IN ANY DIRECTION. THE SLOPE OF THE SURFACING AT THE BOTTOM OF THE RAMP SHALL NOT EXCEED 20:1 FOR A DISTANCE OF 2' (SEE TYPICAL SECTION ABOVE).
4. MINIMUM LANDING DIMENSIONS SHALL BE 4' X 4'.
5. RAMP SURFACE SHALL BE TEXTURED WITH RAISED DIAMOND TEXTURE. TEXTURING SHALL BE DONE WITH AN EXPANDED METAL GRATE STAMPED INTO THE CONCRETE.
6. CONCRETE STRENGTH SHALL BE 3300 PSI.

APWA OREGON CHAPTER	
SIDEWALK ACCESS RAMPS	
DATE: AUG 1996	DRAWING NO. 206

FILENAME: APWA0055.DWG



TYPICAL CORNER LOT



TYPICAL INTERIOR LOT

FRONTAGE	MIN WIDTH	ONE DRIVE MAX WIDTH	TWO DRIVES MAX WIDTH
50' OR LESS	12'	20'	NOT ALLOWED
50 TO 100'	12'	24'	15' EA
OVER 100'	12'	24'	24' EA

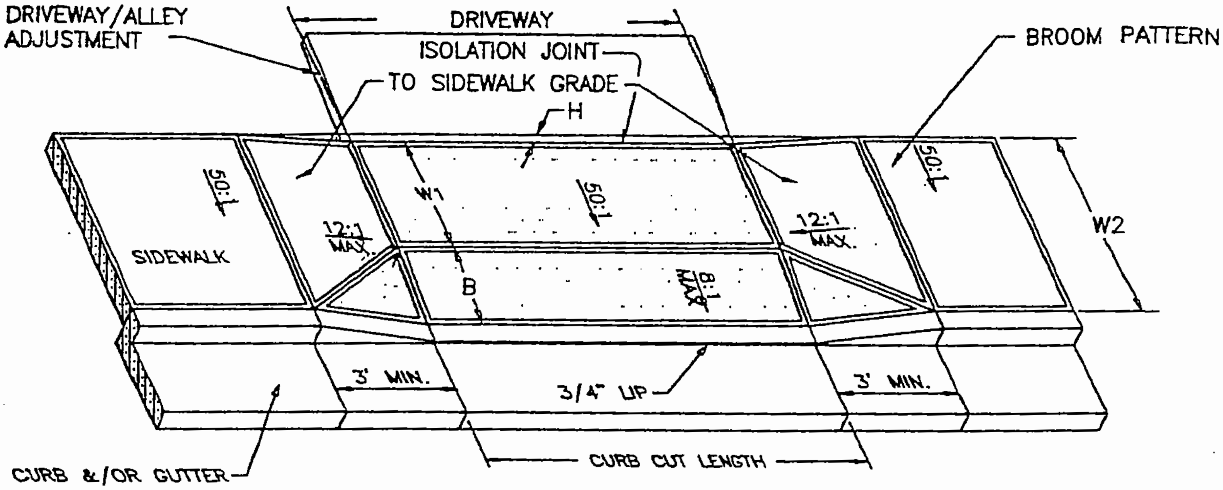
CITY OF THE DALLES

RESIDENTIAL DRIVEWAY PLACEMENT/WIDTH STANDARDS

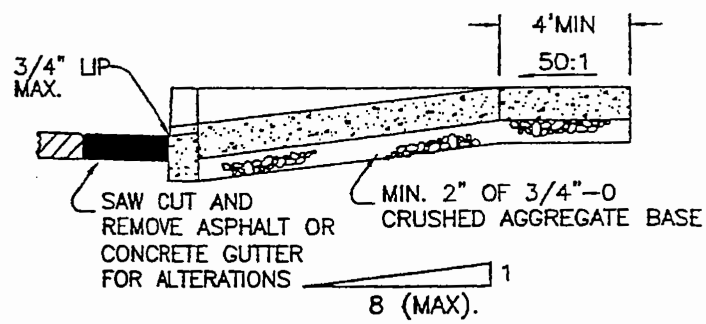
DATE: AUG 1998

DRAWING NO. TD-205RS

FILENAME: TDDRIVE.DWG



W1	W2	B	H	
3' MIN. (FOR ALTERATIONS ONLY)	5'	2'	0.27'	(3-1/4")
4' MIN. (FOR NEW CONSTRUCTION)	6'	2'	0.29'	(3-1/2")



TYPICAL SECTION THROUGH DRIVEWAY/ALLEY RAMP

NOTES:

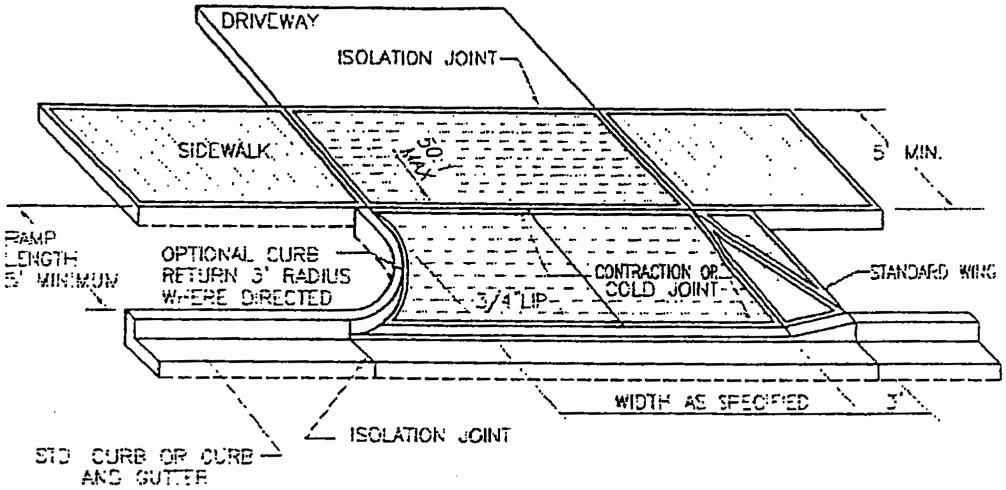
1. RESIDENTIAL DRIVEWAYS AND SIDEWALK SECTIONS THROUGH DRIVEWAYS SHALL HAVE A MINIMUM NOMINAL THICKNESS OF 6". CONCRETE STRENGTH SHALL BE 3300 PSI.
2. USE OF THIS TYPE OF DRIVEWAY APPROACH MAY BE RESTRICTED DUE TO DRAINAGE CONSIDERATIONS.
3. PLACE EXPANSION JOINTS WHERE NEW CONCRETE MEETS OLD FOR ALTERATIONS.
4. CONSTRUCT CONTRACTION JOINT IN CENTER OF DRIVEWAY WHEN DRIVEWAY WIDTH EXCEEDS 15'.
5. NO LIP AT GUTTER IF USED AS SIDEWALK ACCESS RAMP.
6. SEE SIDEWALK DETAILS FOR RESTRICTIONS AND SPECIFICATIONS NOT SHOWN.
7. THE 50:1 CROSS-SLOPE OF SIDEWALK IS MEASURED FROM HORIZONTAL. THE 12:1 SLOPE OF SIDEWALK TRANSITION TO DRIVEWAY/ALLEY IS RELATIVE TO THE RUNNING SLOPE OF THE SIDEWALK. THE SLOPE OF THE APRON IS MEASURED RELATIVE TO HORIZONTAL.
8. IF W2 IS 6', TRANSITION TO STANDARD SIDEWALK WIDTH SHALL BE ACCOMPLISHED WITHIN THE APPROACH (SIM. TO TD-208R).
9. JOINTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH APWA DRAWING NO. 210.
10. FORMS, CONCRETE, NOTIFICATION, INSPECTION AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS.

CITY OF THE DALLES

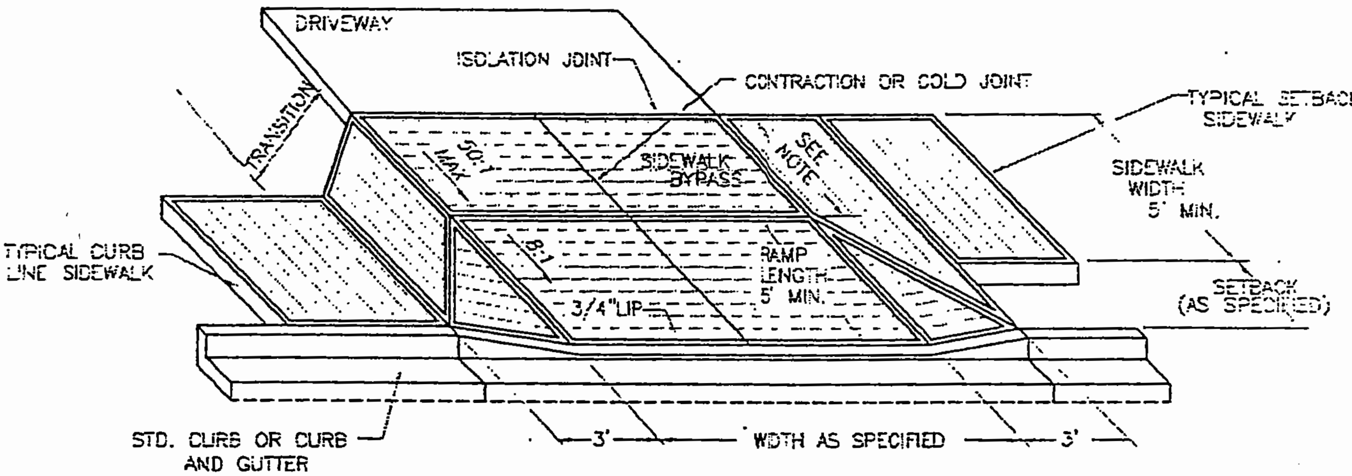
OPTIONAL
RESIDENTIAL DRIVEWAY APPROACH
WITH DEPRESSED CURBLINE SIDEWALK

DATE:	DRAWING NO.
JULY 1998	TD-208RO

FILENAME: TD0056.DWG



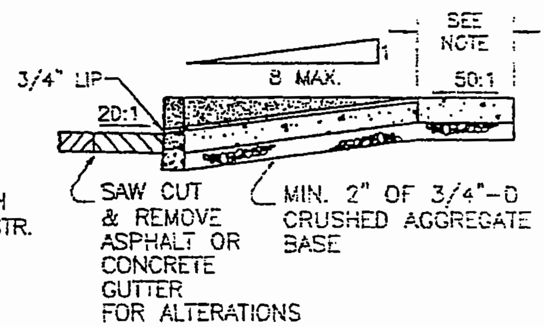
DRIVEWAY APPROACH FOR SET-BACK SIDEWALK



DRIVEWAY APPROACH FOR CURB LINE AND PARTIALLY SET-BACK SIDEWALKS

NOTES:

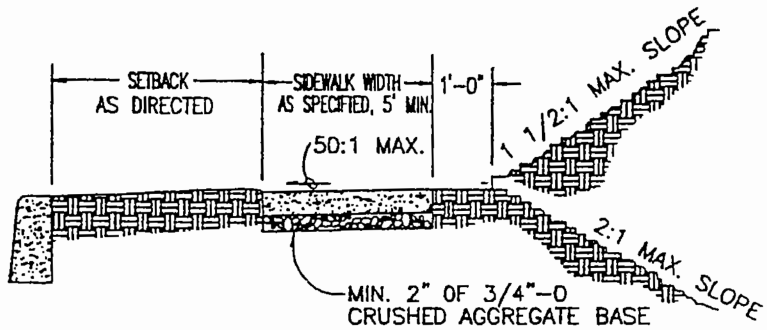
1. RESIDENTIAL DRIVEWAYS AND SIDEWALK SECTIONS THROUGH DRIVEWAYS SHALL HAVE A MINIMUM NOMINAL THICKNESS OF 6". CONCRETE STRENGTH SHALL BE 3300 PSI.
2. BYPASS WIDTH SHALL MEET ADA AND STATE REQUIREMENTS. WIDTH SHALL BE 3' MIN. FOR ALTERATIONS AND 4' MIN. FOR NEW CONSTR.
3. PLACE EXPANSION JOINTS WHERE NEW CONCRETE MEETS OLD FOR ALTERATIONS.
4. CONSTRUCT CONTRACTION JOINT IN CENTER OF DRIVEWAY WHEN DRIVEWAY WIDTH EXCEEDS 15'.
5. NO LIP AT GUTTER IF USED AS SIDEWALK ACCESS RAMP.
6. SEE SIDEWALK DETAILS FOR RESTRICTIONS AND SPECIFICATIONS NOT SHOWN.
7. THE 50:1 CROSS-SLOPE OF SIDEWALK IS MEASURED FROM HORIZONTAL. THE 12:1 SLOPE OF SIDEWALK TRANSITION TO DRIVEWAY/ALLEY IS RELATIVE TO THE RUNNING SLOPE OF THE SIDEWALK. THE SLOPE OF THE APRON IS MEASURED RELATIVE TO HORIZONTAL.
8. JOINTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH APWA DRAWING NO. 210.
9. FORMS, CONCRETE, NOTIFICATION, INSPECTION AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS.



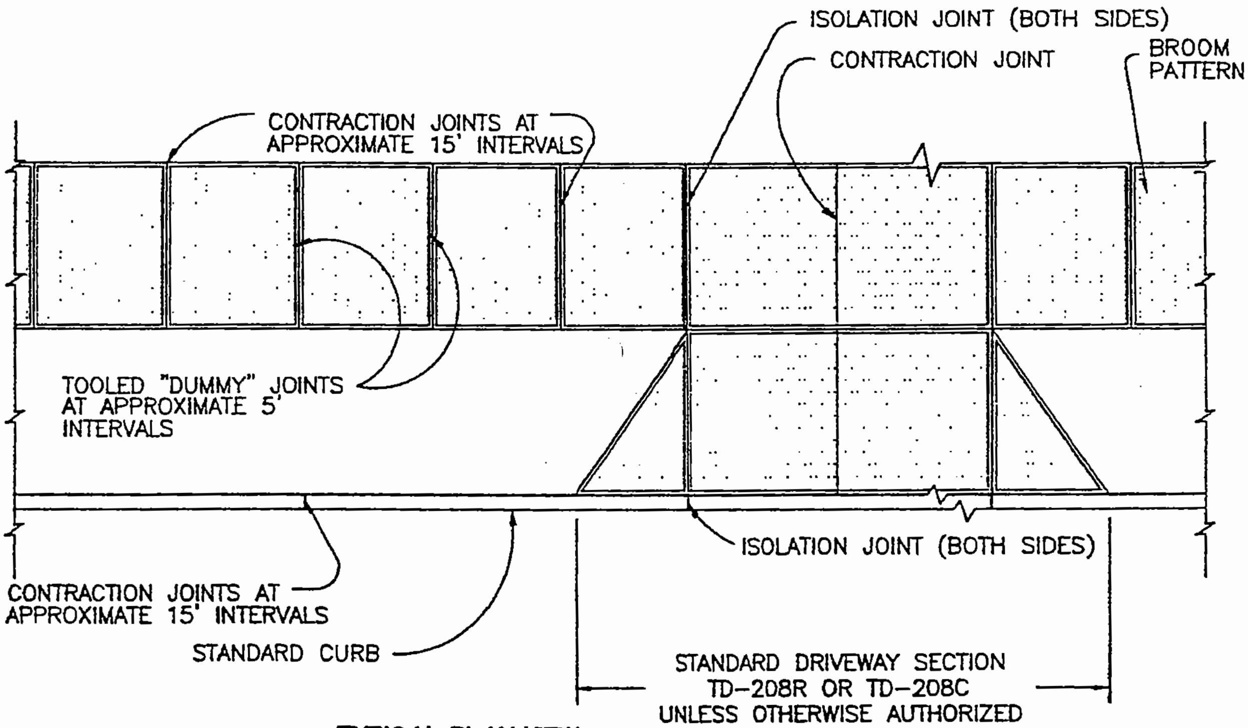
TYPICAL SECTION THROUGH DRIVEWAY RAMP

CITY OF THE DALLES	
STANDARD RESIDENTIAL DRIVEWAY APPROACHES FOR SETBALK OR BYPASS SIDEWALK	
DATE: JULY 1998	DRAWING NO. TD-208R

FILENAME: TD0057R.DWG



TYPICAL SETBACK TYPE CROSS SECTION



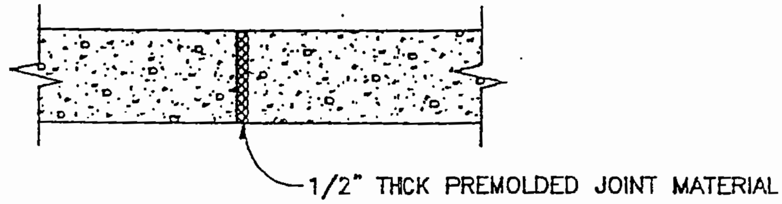
TYPICAL PLAN VIEW

NOTE:

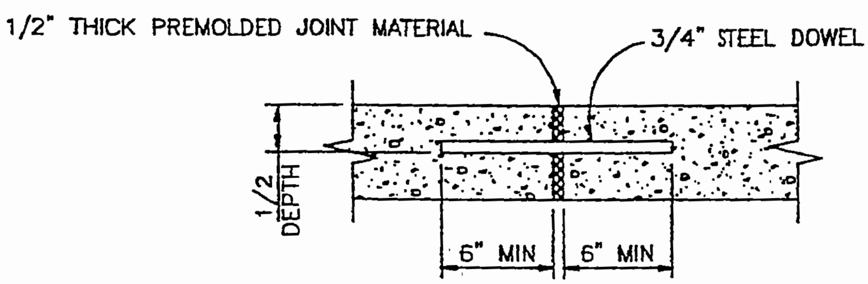
1. SIDEWALKS 8 FEET AND WIDER SHALL HAVE A LONGITUDINAL CONTRACTION JOINT AT THE MIDPOINT.
2. CONCRETE DEPTH FOR STANDARD SIDEWALKS SHALL BE NOMINAL 4" MIN.; THICKNESS IN DRIVEWAY SHALL BE 6" IN RESIDENTIAL AND 8" IN COMMERCIAL OR ALLEY APPROACHES.
3. INSTALL 3" PVC WEEPHOLE PIPES IN SIDEWALKS IN LOCATIONS AS DIRECTED BY THE ENGINEERS. PLACE CONTRACTION JOINT OVER THE TOP OF THE PIPE.
4. INSTALL ISOLATION JOINTS AT APPROXIMATELY 45' INTERVALS.
5. JOINTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH APWA DRAWING NO. 210.
6. FORMS, CONCRETE, NOTIFICATION, INSPECTION AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS.

CITY OF THE DALLES	
SETBACK SIDEWALK	
DATE: AUG 1998	DRAWING NO. TD-205S

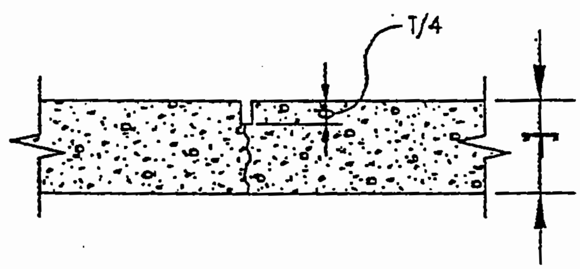
FILENAME: TD0005S.DWG



TYPICAL ISOLATION (EXPANSION) JOINT



TYPICAL ISOLATION (EXPANSION) JOINT WITH DOWEL



TYPICAL CONTRACTION JOINT

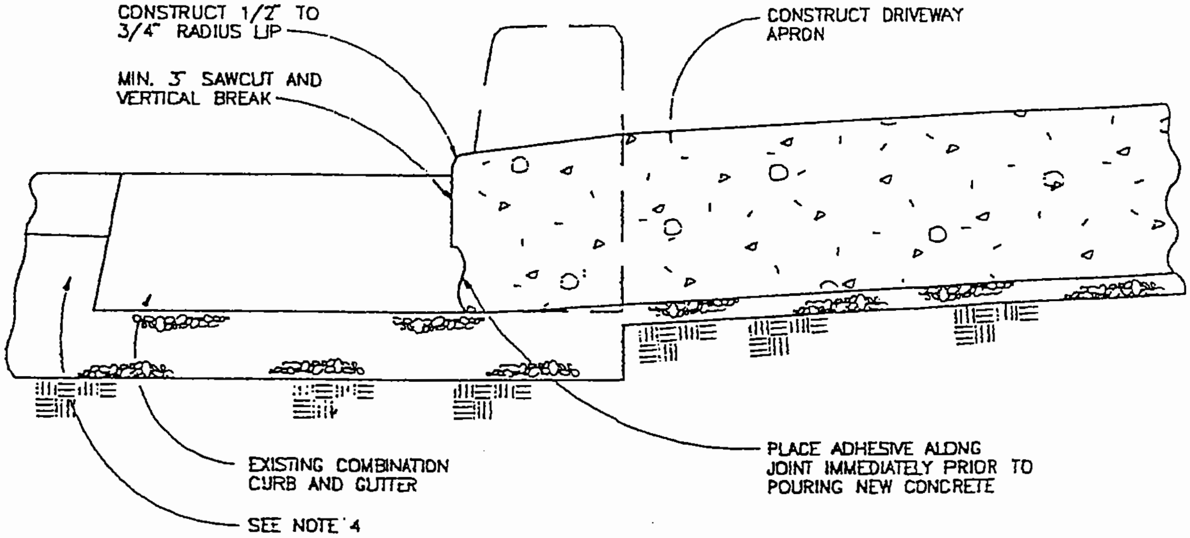
NOTE:
ALL JOINTS TO BE TOOLED WITH 1/2" RADIUS UNLESS SAWCUT

CITY OF THE DALLES

CONCRETE PAVEMENT JOINTS

DATE:	DRAWING NO.
SEPT 1998	TD-210

FILENAME: TD0051.DWG



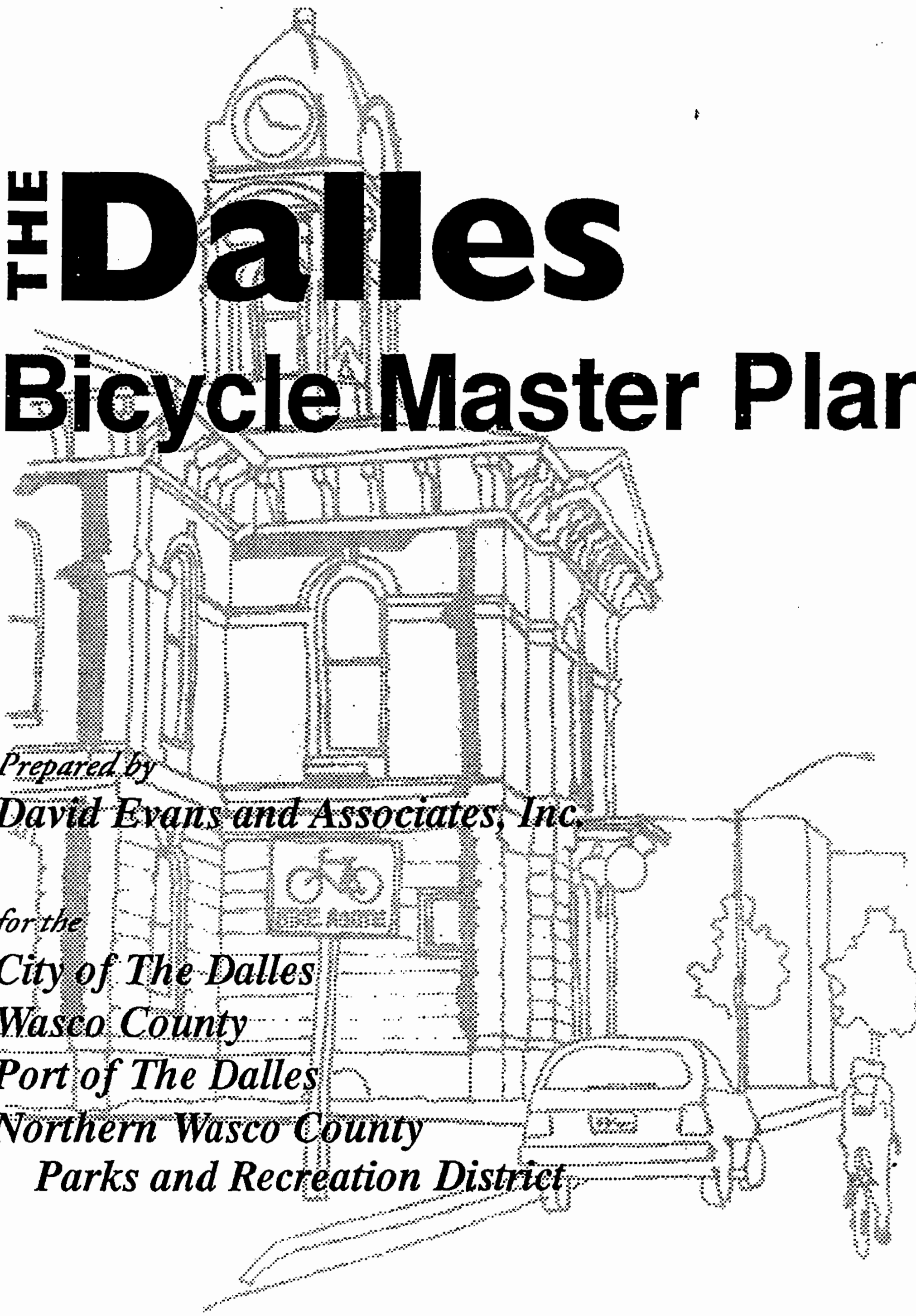
NOTES:

1. SAWCUT THROUGH GUTTER PLATE SHALL BE MADE AS CLOSE TO CURB FACE AS POSSIBLE.
2. COMPLETE CURB AND GUTTER SHALL NOT BE REMOVED UNLESS DIRECTED BY THE ENGINEER.
3. WHEN STRAIGHT CURBS ARE REMOVED, A MINIMUM OF 2 FEET OF PAVEMENT FROM THE FACE OF CURB SHOULD BE REMOVED AND REPLACED.
4. WHEN ENTIRE GUTTER PLATE IS REMOVED THE EXISTING PAVEMENT SHALL BE CUT BACK AND A 6" MONOLITHIC CONCRETE BENCH SHALL BE CONSTRUCTED WITH THE NEW GUTTER TO PROVIDE SUPPORT UNDER PAVEMENT. (SEE VALLEY GUTTER DETAILS).

APWA OREGON CHAPTER	
CURB KNOCKOUT FOR DRIVEWAYS	
DATE: MAY 1992	DRAWING NO. 211

FILENAME: APWA0010.DWG

THE Dalles
Bicycle Master Plan



Prepared by

David Evans and Associates, Inc.

for the

City of The Dalles
Wasco County
Port of The Dalles
Northern Wasco County
Parks and Recreation District

June 1993

ACKNOWLEDGMENTS

Preparation of The Dalles Bicycle Master Plan began in 1989 as a cooperative effort by Wasco County, the City of The Dalles, and the Northern Wasco County Parks and Recreation District. The Bicycle Master Plan is a natural outgrowth of and complement to The Dalles Riverfront Plan which was completed in October of 1989.

The dedicated members of The Dalles Bicycle Advisory Committee which met regularly to ride their bikes over all of the proposed routes and assemble recommendations for The Dalles Bicycle Master Plan include:

Kimberly Jacobsen	Wasco County Planning & Economic Dev. Director
Chuck Langley	Chairman
Randy Skov	Vice Chairman
Dan Boldt	Wasco County Road Department
Karl Cozad	N. Wasco Co. Parks and Recreation District Director
Boyd Jacobsen	Interested Citizen
Dennis Kramer	Wasco County Road Department
Ed Schmidt	Wasco County Juvenile Department Director
Katy Young	Interested Citizen

The Dalles Bicycle Master Plan was prepared by Karen Swirsky and Nils Eddy of David Evans and Associates, Inc., a professional services consulting firm with offices in Oregon, Washington, California, and Arizona. Karen is also a member of the Oregon State Bicycle Advisory Committee.

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SUMMARY

Background

Bicycle planning is a part of the overall transportation planning undertaken by all levels of government. This document provides The Dalles with a comprehensive, bicycle-specific transportation plan that aims to promote bicycle use.

Bicycles are an attractive option to an automobile-dominated system that has reached the limits of our ability to sustain it and threatens community livability. Various new transportation guidelines at the State and Federal levels provide further impetus to bicycle planning as a means to lessen energy demands, reduce pollution, and make options available to those who do not drive an automobile (about half the population). Notable among these guidelines are the State Transportation Planning Rule and the Federal Intermodal Surface Transportation Efficiency Act.

The Dalles has much to offer bicyclists. Although bicycle use is currently low, the potential for substantial increase is high due to the compact community and existing road system. Also, the surrounding rural areas and Columbia River frontage have great recreational potential.

Previous bicycle planning efforts have pointed to the need for a safe, continuous east-west route, for better access to the Columbia River, and for improved facilities on many existing roads. The Riverfront Plan stresses how bicycling can contribute to a more prosperous, accessible and livable area.

Highlights

Priorities

A successful bicycle program must embrace not only facilities construction but also maintenance, community awareness, education, and enforcement. The most appropriate agency to maintain a strong and active bicycle program should be determined. A staff Bicycle Coordinator should be the focal point for program efforts, and an appointed Bicycle Advisory Committee should oversee all efforts.

Bicycle system priorities

- Bike path along Columbia River and creeks.
- Bike lanes on arterials and collectors.
- Shoulder bikeways on highways.
- Shared roadways on residential streets.
- Direct routes that minimize travel distances between residential areas and employers, businesses, schools, and recreational sites.
- Elimination of hazards, including speeds or amounts of automobile traffic that discourage local bicycle travel.
- Convenient and secure parking at destinations.
- Regular sweeping, patching and maintenance.
- Active education and enforcement programs.
- Bicycle Coordinator and Bicycle Advisory Committee to coordinate efforts.

Adoption and Implementation

In order for this Bicycle Master Plan to be effective both for obtaining funds and improving bicycle use, it must be formally adopted into the Transportation Element of The Dalles Comprehensive Plan. The prioritized list of bikeway projects should be placed on the Transportation Improvement Plan and appropriate projects included on the Six-Year Capital Improvement Plans in order to improve the chances for obtaining State and Federal funding.

The bicycle plan will be implemented through the codes, ordinances and standards that are the working documents referenced by planners, engineers and developers. These documents should reflect the needs of bicyclists so that bicycle facilities are routinely considered during project application, review, approval, and design.

The entire bikeway system of about 37 mi will take many years to complete. By scheduling 2 to 3 mi each year, the system can be finished in about 15 years. This should keep pace with a gradual conversion from an automobile-dominated system to one that incorporates more cycling and walking for short-range trips.

Funding

Bicycle facilities and programs can be funded through a broad combination of local, state, federal and private sources. By State law, bikeways must be created whenever City, County, State or Federal roads are built or reconstructed. Arterials and collectors require bike lanes. The Dalles should ensure that any road project in the area is built to bikeway standards for the street classification and that costs are included as a normal part of the project.

Standards

The Oregon Bicycle Plan contains detailed standards based on the AASHTO Guide. It contains many excellent and comprehensive recommendations for all types of bikeways and situations. Prominent features are a hierarchical system of bikeways tied into the existing road grid, bicycle parking requirements, and a focus on maintenance.

Projects

Existing roads, with relatively minor improvements, can change character from poor bikeways to good ones. Often, this is a simple matter of overcoming a few obstacles such as dangerous intersection design, or giving riders more space through striping of bike lanes. Several highly needed bikeway projects are identified (see summary below), along with other useful and less expensive spot improvements.

Trails along the Columbia River and its drainages, as described in the Riverfront Plan, present an excellent opportunity for the community to develop an off-road bikeway framework. A multi-use trail, offering walking and bicycling paths, nature observation, and pleasant scenery, could be a recreational centerpiece for the community as well as an important part of the non-motorized transportation system.

Project summary

Facility Type	Length, mi	Projects
Bike Path	9.2	3
Bike Lane	11.7	14
Shoulder Bikeway	3.2	5
Shared Roadway	13.7	6

INTRODUCTION

Purpose

This document provides a bicycle-specific planning guide to the City of The Dalles and Northern Wasco County. It is intended to meet the needs of the residents and to pursue the vision of the Oregon Bikeway and Pedestrian Program:

> *Oregonians envision the day when they will be able to bicycle safely, conveniently and pleasurably to all destinations within five miles of their homes. All streets and roads will be "bicycle friendly" and well-designed to accommodate both motorized and nonmotorized modes of transportation.*

Goals

The Bicycle Master Plan has fourprimary goals:

- Integrate bicycle planning into the community's overall transportation planning.
- Provide and maintain a comprehensive system for safe and convenient bicycle access to all destinations within the City.
- Promote bicycling as a viable form of transportation for all ages and trip purposes.
- Increase bicycle use within the City every year until 10 percent of all trips are made by bicycle.

Each of these goals—integration, provision, promotion, and use—is consistent with The Dalles' vision of a prosperous and liveable community.

Highlights

- This document addresses the unique characteristics of The Dalles in providing a comprehensive and bicycle-specific plan.
- A Bicycle Advisory Committee shall coordinate the Plan.
- The area poses numerous challenges to cycling but shows great potential as well.

Objectives

Objectives to meet the goals are:

Integration

- Adopt the goals and policies of this Plan by the City Council as part of the City's Transportation Plan. (This will be needed to satisfy the State's Transportation Planning Rule.)
- Adopt implementing ordinances, codes and standards necessary to carry out the Plan.
- Appoint a Bicycle Coordinator and Bicycle Advisory Committee, possibly in conjunction with Wasco County.
- Develop dependable funding sources and actively seek additional sources.
- Encourage land uses that give priority to pedestrians and bicyclists.
- Integrate with the proposed Riverfront Trail in The Dalles Riverfront Plan.

Provision

- Improve access and mobility by identifying routes that penetrate barriers, avoid bottlenecks and obstacles, and minimize travel distances.
- Designate and develop bikeways connecting neighborhood, school, commercial, industrial and recreational centers.

- Eliminate hazards, including speeds or amounts of automobile traffic that discourage local bicycle travel.
- Provide convenient and secure parking and commuter facilities at destinations.
- Conduct regular sweeping, patching and maintenance.
- Review project scheduling and implementation annually and amend the project list as needed to respond to changes in funding opportunities, demographics and development.

Promotion

- Enhance the quality of the bicycling experience by identifying attractive routes with desired amenities and support services.
- Provide guidance to educational and enforcement agencies to enhance cyclists' safety and effectiveness.
- Maintain public awareness and support of the Plan.

Use

- Establish benchmarks to measure progress.
- Collect and analyze data annually to increase bicycle usage and to improve the system's safety and efficiency.

Authority

The Dalles Bicycle Master Plan is in accordance with the City's Comprehensive Plan, the Riverfront Plan, and the State Transportation Planning Rule, all of which require city-wide bicycle planning.

A broad range of planning, public works, enforcement, and promotional activities are described in the Bicycle Master Plan. To coordinate these efforts, there shall be a Bicycle Advisory Committee. The Committee shall be perpetual with the responsibility of monitoring the continuing achievement of thePlan.

The Committee should primarily include cyclists, but should also include other concerned persons such as law enforcement personnel, city and county administrative personnel, and persons with route maintenance and design expertise.

Challenges

In recent years there has been an increased interest in bicycling as healthy, clean, cost-effective transportation in urban settings. Various new transportation policies, plans and standards at the State and Federal levels provide futher impetus to bicycle planning as a means to lessen energy demands, reduce pollution, and make options available to those who do not drive an automobile.

The development of a quality bikeway system is a prerequisite to promoting bicycling. The Dalles has much to offer cyclists despite a lack of bicycle-specific facilities. Although bicycle use is low, the potential of bicycling in the area is high.

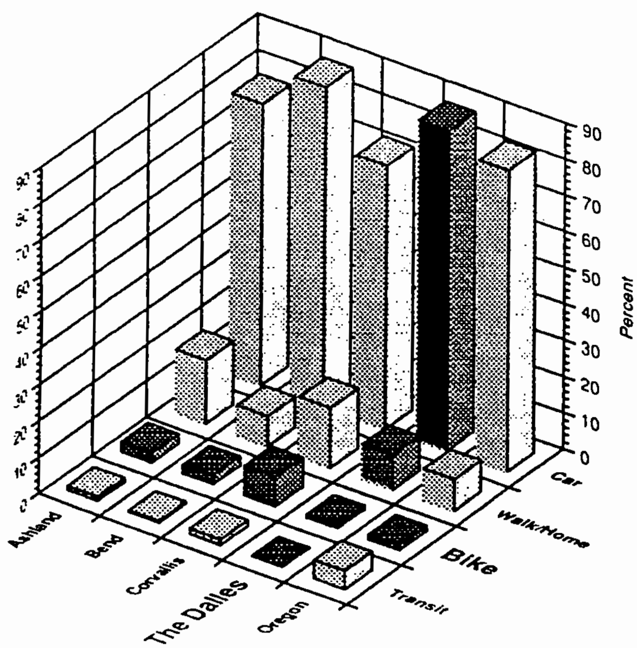
The Dalles faces some challenges in developing a bikeway system:

- The city is located in a topographically difficult area for cycling because of fairly steep hills and abrupt cliffs, which limit available and reasonable routes for cycling. The Columbia River Gorge is also noted for its high winds which can affect The Dalles.
- The street layout and width does not present ideal conditions for convenient and safe bicycle routing, nor for the most part in providing separated bike lanes without taking space from motorists. Thus, nearly all the local routes are currently shared roadways. Sixth St. (U.S. 30) from the Chenowith bridge to Webber St. (about 1.5

mi) is the only striped, signed bike route in The Dalles.

- Clearly designated bike routes connecting neighborhoods, schools, commercial, industrial and recreational centers do not exist.
- Very few bicycle parking racks and other facilities exist.
- The City has been cut off from recreational and transportation access to and along the Columbia River by construction of Bonneville Dam, the railroad, and the I-84 Freeway.
- The transportation system is dominated by the automobile (see Figure 1). In particular, single-occupancy automobile use ranks in the top third among cities in Oregon at 70.7%.

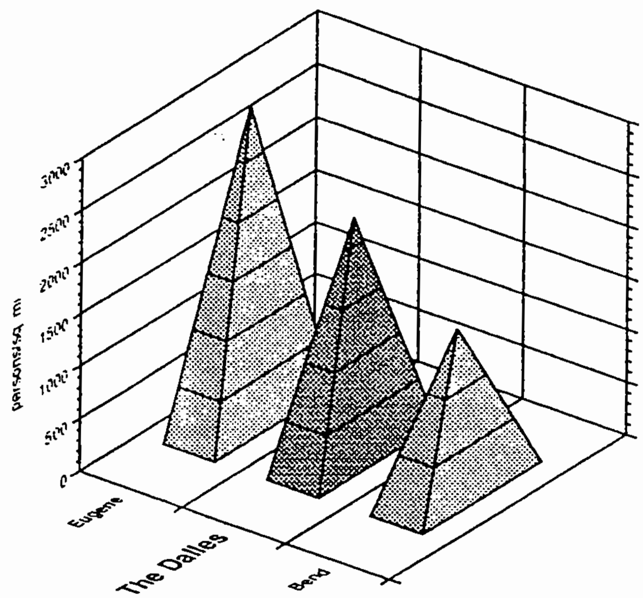
Figure 1. Transportation in The Dalles is dominated by automobiles



Source: 1990 Journey-to-Work data

Despite these negatives, there are strong opportunities for improving the cycling environment and increasing ridership. The restrictive topography has also limited sprawl, so that urban destinations are always close. Indeed, The Dalles has a moderate density, compared to some other popular cycling cities (see Figure 2), which makes cycling attractive.

Figure 2. The Dalles has moderate density



Source: 1990 Census data

...just as an ecological system is healthiest when it displays great diversity and differentiation, so too is a transportation system most healthy and robust when diverse modal options are available to those moving people and goods. A transportation system dependent on only one or two modes of transport is far more susceptible to disruption and system failure.

Transportation coordinator and author
Michael Replogle

The City wraps around a bend in the Columbia River, providing a strong community identity. A central downtown is within easy bicycling distance of the adjacent residential neighborhoods (see Figure 3). Scenic, historical and recreational attractions bring visitors and contribute to the community's vitality. A mild climate generally favorable to cycling is due to the river's moderating influence and the low elevation.

Organization

The following chapters delve into the range of bicycling issues and recommend actions to create a comprehensive bikeway system. Additional information is included in the Appendices, and a foldout map of the bikeway system is attached.

Chapter 2 provides background information, including a review of applicable documents.

Chapter 3 summarizes proposed bikeway projects.

Chapter 4 discusses how to implement a bicycle program.

Chapter 5 details the suitability criteria used to select bicycle routes.

Chapter 6 describes bikeway standards.

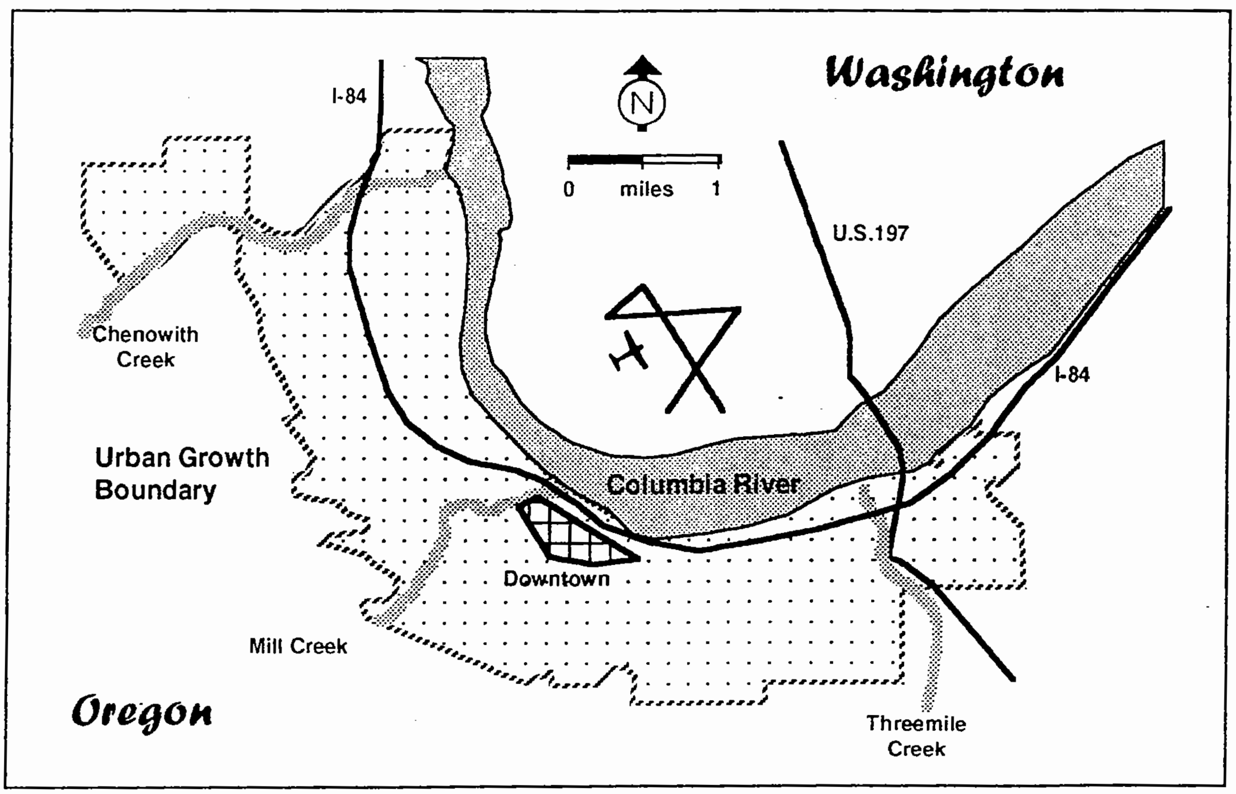
Chapter 7 discusses supplementary facilities.

Chapter 8 deals with education.

Chapter 9 deals with law enforcement.

Chapter 10 covers operation amd maintenance issues.

Figure 3. The Dalles area



PLANNING BACKGROUND

Bicycle planning is an integral part of the overall transportation planning undertaken by local, State and Federal government. Transportation agencies are unique in their ability to determine the nature of the roads and how bicycles fit in.

Municipal planning undertaken by The Dalles has identified local bicycle needs, established priorities, and put forth solutions as described below.

State and Federal transportation planning has also acknowledged the bicycle as an attractive option for urban travel. Various new transportation policies, plans and standards have been created that draw on a wealth of bicycle-related experience. The relevant documents are summarized below.

- Existing plans establish the need and desire for an improved bicycle system.
- State and Federal guidelines provide standards and funding sources.
- The Riverfront Plan features several multiuse paths that could form the backbone of a city-wide bikeway system.
- The Dalles Bicycle Master Plan Task Force has coordinated research and provided an avenue for public participation.

Bicycle Planning in The Dalles

Several planning efforts in The Dalles specifically endorse improved bicycle conditions. Together, they provide a clear statement that the community would like a safe and functional bikeway network and decreased dependence on the automobile.

Riverfront Plan

The Dalles Riverfront Plan, adopted in October 1989, is the community's vision for a 9-mile length of the Columbia River. Given the importance of the River in the area's past and future, the Plan touches on nearly all aspects of the community, including transportation. The Plan recommends:

- A City-County bikeway plan and system to provide safe, pleasant ways to ride from home to schools, parks, other community facilities, business areas, and the riverfront.
- The Riverfront Trail and greenway trails along Mill and Chenowith Creeks, for bicycling and walking to and from neighborhoods, parks, schools, other community facilities and business areas throughout the community.
- Coordinated transportation and recreation planning among local agencies to develop bikeways and trails.
- Incorporation of bikeways into public and semi-public capital improvements and routine construction, improvement and maintenance of sidewalks, streets, utilities and other corridors.
- Subdivision and site plan regulations and review that encourage incorporation of trails, bikeways and walkways for transporatation.

The Riverfront Plan also identified:

- Bicycle lanes on:

  E. 2nd St.
  W. 6th St./3rd Pl./4th St.
  W. 10th St.
  U.S. 197
  Brewery Grade and overpass

Cherry Heights Rd.
Court St. (S. of 4th)
Hostetler St.
Old Dufur Rd./Fremont St.
Scenic Dr.
Washington St. (N. of 4th)
Webber St.

The Riverfront Trail would serve as a centerpiece of a bikeway system. Besides the aesthetic attractions, there are over 1,300 people presently employed near the Riverfront from The Dalles Dam on the east to the Mountain Fir Chip Mill on the west. To this will be added additional employees in the Port Industrial Center plus many recreational users as the Interpretive (Discovery) Center is built.

Bicycle Master Plan Task Force

The Bicycle Master Plan Task Force first met in March 1990 to develop a bicycle plan in accordance with the Riverfront Plan and with the State of Oregon Bicycle Master Plan. They reviewed the efforts of other communities, discussed options, examined routes, surveyed riders, held a public hearing, and made a list of recommendations that are the foundation of this plan.

A rider survey, extensive route evaluations, and other efforts of the Task Force are summarized below.

The written ***rider survey,*** conducted in August 1990, received 81 responses. The results are summarized in Appendix A. Some of the results are:

- The respondants are predominantly male (70%), over 16 years of age (90%), and recreational or fitness riders (87%).
- Over 64% ride more than 10 mi per week with 17% riding over 50 mi per week.
- Many (88%) feel that signed bike routes are a good idea and would encourage them to ride more often (69%).
- The only existing bike lane (on W. 6th St.) is rated only 5.5 for safety (10 being very dangerous). The street is rated 7.2 without the bike lane.
- The most important factor in choosing a route is traffic volume, with surface material and width being of second highest importance. Directness of route does not rate as highly.
- Respondant comments tend to focus on poor road maintenance and conflicts with cars (especially due to narrow streets).

This survey provides a snapshot of a subset of existing cyclists. While not representative of all cyclists, much less of the average citizen, the survey provides useful information from a group that knows the local riding conditions. They reiterate the primary concerns expressed by cyclists in many communities about inadequate maintenance, poor bike lane design, and discomfort with high traffic levels on shared roadways.

The ***route evaluations*** are aimed at identifying primary routes to be signed and secondary routes to be included only on a map. The signing is intended to help cyclists find the primary routes and to alert motorists to expect cyclists on the roadway. In most cases, existing conditions (road surface, intersections, traffic volume, lane width, etc.) are used to determine the safest routes. Elevation gain (or 'energy output'), directness, continuity, and destinations are also considered. The Task Force is well aware of the tradeoffs involved in choosing one route over another and that not everyone will agree with the choices.

The resulting recommendations from the Task Force are a system of primary and secondary routes that provide several options for east-west and north-south travel. While occasionally devious, these routes are a useful synthesis of the committee's experience with local streets.

The Committee also studied plans from other communities, and members attended State-sponsored conferences for bicycle advisory committees. This research broadened their perspective by seeing how other communities have responded to similar needs and how the State plays a key role in providing guidance and funding. The critical contribution of maintenance, education and law enforcement in creating a safe and attractive environment for cyclists became apparent to the Committee, and these concerns are incorporated into the Plan.

Community Profile

A community profile, *Pioneering The Dalles: Exploring the Trail to 2020,* was produced in January 1993. This included an analysis of the community and an "attitudes and values" survey.

The analysis pointed out how highway development and increased use of the automobile caused the City to grow away from the river. Reestablishment of the river connection is a high priority. A *bikeway and pedestrian plan* to provide safe access throughout the community is seen as a way to support planned growth and to encourage economic development. Gradual population growth between 1% and 2% is predicted.

A survey of 1500 randomly-selected households in The Dalles was conducted to help guide community development. A supplemental survey of high school students was also conducted. A variety of questions were asked to determine community values and priorities. Several questions touched upon transportation and access:

- Bicycle and pedestrian pathways are important to The Dalles (77% of households and 69% of students agreed).
- The city should place more emphasis on paving and maintaining streets (63% of households and 70% of students agreed).
- More and better access to the river will benefit residents and visitors (79% of households and 72% of students agreed).
- The Dalles should implement the Riverfront Master Plan (74% of households and 69% of students agreed).
- There is a need for public transportation in The Dalles (58% of households and 59% of students agreed).

The survey indicates that improvements in bicycle facilities as well as other nonmotorized modes are a high priority among residents.

Prior Planning

Bicycle planning in The Dalles dates back to at least 1976 when C. Dennis Kramer, Wasco County Surveyor, wrote *A Guide for Bikeway Development in The Dalles and Vicinity,* a 14-page document with map attachment. It argued for the need to service and promote bicycling, summarized the facility design standards available at the time, and recommended a system of developed bicycle routes not much different from the ones chosen by the Task Force in 1990.

The City of The Dalles Comprehensive Plan, December 1982, recognizes the bicycle as a desirable mode of transportation, establishes basic standards, and directs that bikeways be considered.

Existing Road System and Constraints

The Dalles is craddled between the south shore of the Columbia River and the nearby hills (see Figure 4). Urban destinations are scattered throughout the area, and several roads lead into the surrounding country. There are few east-west through routes, and the north-south routes are hilly. Two major east-west highways, I-84 (Columbia River Hwy.) and U.S. 30 (Mosier-The Dalles Hwy.) traverse the city. U.S. 197 (The Dalles-California Hwy.) passes through the east end of the city and provides the only nearby river crossing.

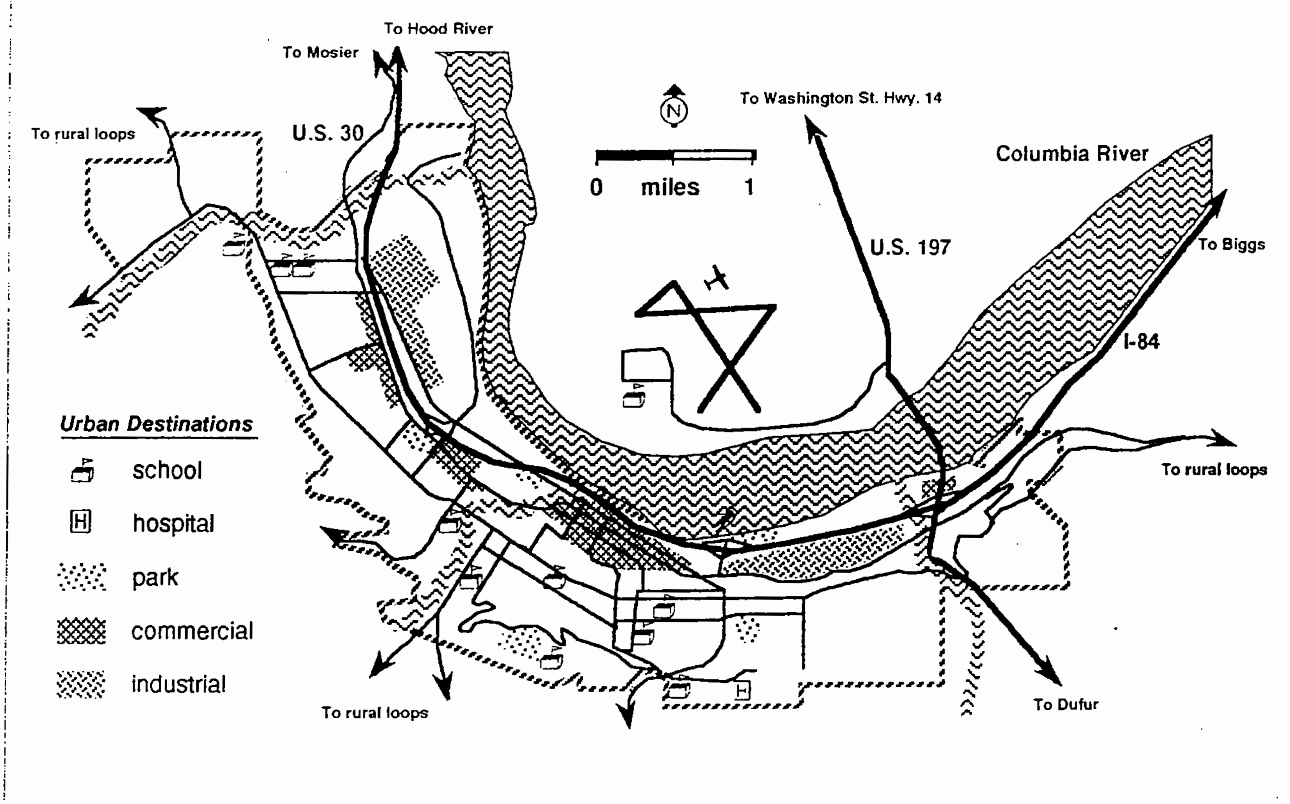
Roadway Classifications

The Dalles Transportation Plan is being updated. The existing functional classification map of the urban area shows the following arterials and collectors:

East-west trending urban arterials:

- 2nd-3rd St. couplet (U.S. 30)
- 6th St. (U.S. 30) (the only bike lane is along this street)
- Chenowith Rd./10th St./Old Dufur Rd./ Fremont St.
- Seven Mile Hill Rd.
- Hostetler St.

Figure 4. The Dalles area



East-west trending urban collectors:

1st St.
4th St.
9th St. (east of Dry Hollow)
12th St. (east of Kelly)
13th St. (west of Kelly)
Scenic Dr.
19th St.

North-south trending urban arterials:

Cherry Heights Rd.
Mt. Hood St. (south of 10th)/Mill Creek Rd.
Skyline Rd.
Union St. (north of 10th)
Court St. (north of 10th)
Washington/7th/Kelly
Brewery Grade/Dry Hollow Rd.

North-south trending urban collectors:

Snipes St.
Walnut St.
Webber St.
Trevitt St.
Liberty St. (1st to 2nd)
Union St. (10th to 13th)
Federal St. (2nd to 4th)
Laughlin St. (2nd to 4th)
Jefferson St. (2nd to 4th)
Madison St. (1st to 4th)
Quinton St. (north of 12th)
Thompson St.
Richmond St.

Except for a section of bike lane on W. 6th St., all these facilities are shared roadways with a few short segments of shoulder bikeway (refer to Chapter 6: Bikeway Design Standards for definitions of bikeway types).

Bicycle Counts

The limited bicycle data that are available show mixed bicycle use in The Dalles. Journey-to-work data, which includes only work trips made by those over 17 years of age, is a meager 0.9%. However, a 1990 bicycle count at W. 6th St. (along the U.S. 30 bike lane) yielded an ADT (average daily traffic) of about 40. Pedestrian counts taken in 1992 showed many streets exceeding 100 ADT, which implies that bicycle use is probably over 20 ADT at those locations (based on experience in other communities). While not high, these numbers show that bicycle use continues despite obstacles and little encouragement.

Central City

The central city is built on a tight grid (approximately 300 ft) with ample sidewalks. Curb-to-curb width varies but 38 ft is typical. Most streets allow parking on both sides (even Liberty St. which is only 32-ft wide). There is some diagonal parking downtown. The major physical impediments to bicycling (and walking) are the hills to the south, Mill Creek which has limited east-west crossings, and U.S. 30 which is difficult to cross.

Bicycle travel is complicated by inconsistent street widths, extensive on-street parking, traffic congestion on the main through routes, little space allocation to bicycles, and scarce bicycle parking.

Access to the river is limited due to the multiple barriers of I-84 and the parallel railroad tracks.

State and Federal Bicycle Planning

Oregon is fortunate in having a long-standing and supportive state program. Oregon was one of the first states to appoint a bicycle program manager and to establish a dependable funding source. Much of what Oregon pioneered is now reflected in new Federal legislation that applies to all states. The following sources provide the framework from which local bicycle programs are designed.

State Policies

Oregon has long led the way in bicycle planning in the U.S. It provides cities with clear and strong directions about bicycle provisions.

- **Bicycle Program**

Oregon has had a State-wide program for over 20 years that is supported by the 1971 "Oregon Bicycle Law" that mandates a minimum 1% gas-tax expenditure on bicycle and pedestrian facilities (refer to *Chapter 4: Implementation*). The Oregon Bicycle Plan (1992) describes how the program "serves the needs of bicyclists within the State by supporting bicycling as a form of transportation and recreation that enhances the livability of Oregon." The Oregon Bicycle Plan provides extensive information about the program, facility standards, and design issues that are directly applicable to The Dalles.

- **Transportation Planning Rule**

The Oregon Transportation Planning Rule (1991), OAR Chapter 660, Division 12, implements Statewide Planning Goal 12 (Transportation). The rule requires cities and counties to plan for non-automotive choices, including bicycling and walking, through various measures. The Rule states:

1. Local governments shall adopt land use or subdivision regulations for urban areas and rural communities to require:

   a. *Bicycle parking facilities* as part of new multi-family residential developments of four units or more, new retail, office and institutional developments, and all transfer stations and park-and-ride lots.

   b. *Facilities providing safe and convenient pedestrian and bicycle access* within and from new subdivisions, planned developments, shopping centers and industrial parks to nearby residential areas, transit stops, and neighborhood activity centers, such as schools, parks and shopping. This shall include:

      - Sidewalks along urban arterials and collectors.
      - Bikeways along arterials and major collectors.
      - Where appropriate, separate bike or pedestrian ways to minimize travel distances within and between the areas and developments listed above.

   c. Routes shall be:

      - Reasonably free from hazards, particularly types or levels of automobile traffic which would interfere with or discourage pedestrian or cycle travel for short trips.
      - Provide a direct route of travel between destinations.
      - Meet travel needs of cyclists and pedestrians considering destination and length of trip.

2. Local governments shall identify improvements to facilitate bicycle and pedestrian trips to meet local travel needs in developed areas. Appropriate improvements should provide for more direct, convenient and safer bicycle or pedestrian travel within and

between residential areas and neighborhood activity centers (i.e., schools, shopping, transit stops). Specific measures include, for example, constructing walkways between cul-de-sacs and adjacent roads, providing walkways between buildings, and providing direct access between adjacent uses.

The Rule has a goal of no increase in metropolitan automobile trips in the first 10 years, a reduction of 10% in 20 years, and a reduction of 20% in 30 years.

- **Oregon Transportation Plan**

Oregon has also created a 20-year Transportation Plan in 1992 to meet the requirements of Goal 12 and the ISTEA. The Plan stresses that people must have choices and that transportation systems must support land-use plans. This includes improved circulation systems for bicycles and pedestrians whereby housing, daycare, schools, commercial areas and employment can be reached easily and safely.

- **Model Bicycle Ordinances**

The Oregon Chapter of the American Planning Association developed the Model Bicycle Ordinances (1993) to recommend specific ordinances for use by Oregon municipalities when implementing bicycle plans. These are designed to meet the requirements of the Transportation Planning Rule.

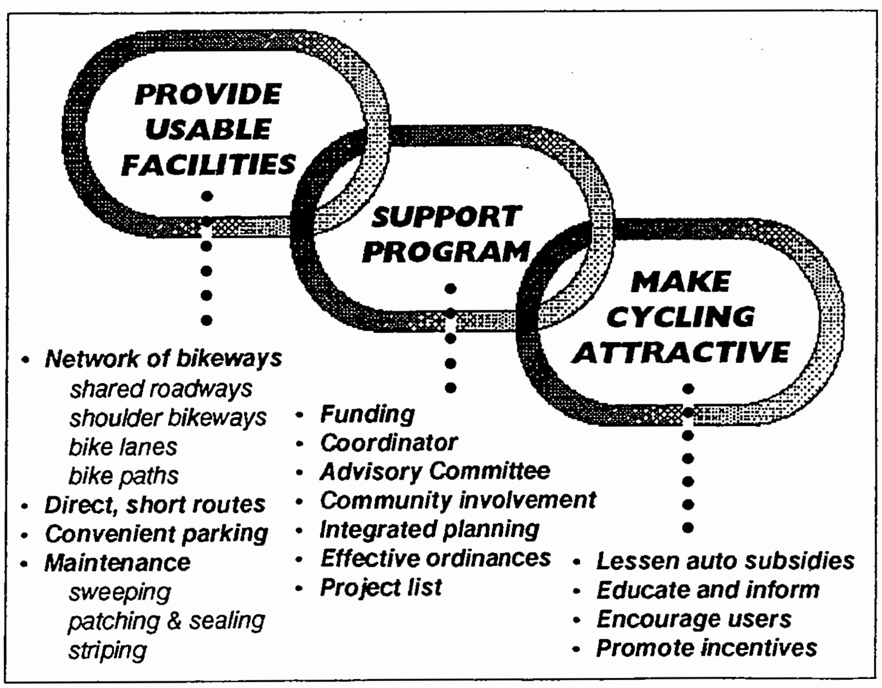
Federal Policies

The Federal government has recently taken a strong stand in promoting bicycles as an alternative to automobiles.

- **National Bicycling and Walking Study**

The Federal Highway Administration conducted the National Bicycling and Walking Study to explore various issues and present existing data in a way that local agencies can use. Many studies have been completed, and the results provide useful insight into the benefits of bicycle transportation and the means required to promote bicycle use. For example, successful bicycle programs have been found to address three basic goals: provide usable facilities, establish program support, and make cycling attractive (see Figure 5).

Figure 5. Essential links in a bicycle program



- ISTEA

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 set new Federal policy. It establishes bicycling and walking as legitimate forms of transportation and provides support to the widespread development of bicycle and pedestrian facilities. States and metropolitan areas are required to develop multimodal transportation systems that maximize mobility while minimizing fuel consumption and pollution.

ISTEA stresses a wide range of transportation options rather than just highways and automobiles. It requires States to staff a bicycle and pedestrian coordinator, requires metropolitan areas to plan for bicycles, and makes available funds to the States for a variety of bicycle projects.

Because the Federal highway classification system is being revised and new funding categories developed, The Dalles will need to keep close watch on how these changes will affect bikeway projects. The funding aspects of ISTEA are discussed in *Chapter 4: Implementation.*

- Facility Standards

Local bicycle plans depend heavily on two Federal documents:

- *Guide for the Development of Bicycle Facilities (1991), American Association of State Highway and Transportation Officials, Washington, D.C.* establishes national standards for the planning, design and operation of bicycle facilities. The AASHTO Guide recognizes that bicycle planning must be conducted in conjunction with planning for other transportation modes and should be consistent with overall community goals. It breaks down the planning process into three steps: inventory of existing conditions, analysis of improvements, and selection of facilities. It was adopted and supplemented by the Oregon Bicycle Plan.
- *Manual on Uniform Traffic Control Devices (1988), Federal Highway Administration, Washington, D.C.* the MUTCD establishes basic national standards for the signing and marking of bikeways. It, too, was adopted and supplemented by the Oregon Bicycle Plan.

RECOMMENDATIONS

Introduction

Bikeways are the basic framework of a bicycle system, but they must be accompanied by other facility improvements such as parking, site access, changing areas at employers, and rest rooms in public areas. The bikeways themselves need not be expensive, compared to other road projects. Many of the projects described below are simple adjustments of the right-of-way space.

As discussed in later chapters, well-designed facilities are only one aspect of a successful bicycle system. People must be shown how to use the facilities safely and efficiently and be encouraged to do so. Transportation planning then becomes linked to other municipal functions such as land-use planning, redevelopment, education, law enforcement, and taxation.

The considerable work of the Bicycle Master Plan Task Force was used as a foundation for the bikeway recommendations described in this chapter. Their knowledge of the local area and its residents is invaluable. To this was added bicycle planning techniques that have been successfully applied in other communities and strategies employed to meet the Oregon Transportation Planning Rule.

The resulting recommendations are more extensive than those originally proposed by the Task Force two years ago. There are several good reasons for this:

- Residents in The Dalles have shown a desire to return to the freedom of access and mobility that only bicycling and walking can provide.
- The State-mandated reduction in automobile use can only be achieved by, among other things, an agressive promotion of bicycling for short-range trips.
- Recent changes in federal and state guidelines increase the emphasis on enhanced bicycle facilities, especially on major roads.
- New funding opportunities require a long-range bicycle plan that is integrated with a community's transportation planning.
- The signing of bike routes without other improvements has been shown to have neglible effect on bicycling's safety and promotion.

> - With minor improvements, the present roadway system provides direct and cost-effective routes suitable for bicycling.
> - Arterials and collectors with high traffic loads should have bike lanes; other high-traffic roads should have shoulder bikeways.
> - Multi-use paths along the Columbia River and its drainages will provide enhanced facilities when tied into the roadway system.

Considerations

The criteria considered in choosing routes is described in *Chapter 5: Suitability Criteria*. Additional considerations used to determine the type of bikeway are described below. Funding strategies are discussed in *Chapter 4: Implementation*.

Categorization of Bikeways as Class I, II or III has given way to a more descriptive classification scheme that includes bike paths, bike lanes, shoulder bikeways, and shared roadways. Each of these bikeway types has specific application and design criteria (refer to *Chapter 6: Bikeway Standards*).

Traffic is a primary consideration in facility designation and ADT (average daily trips) of all vehicles is the unit of measure. For the purposes of this Plan, traffic is estimated as light, medium, heavy, and very heavy per Table 1. The appropriate bikeway type considering the traffic volume is given in the table.

Table 1. Traffic volume and bikeways

Traffic Volume	Average Daily Traffic (ADT)	Appropriate Bikeway
Light	Less than 2,000	Shared roadway or shoulder bikeway
Medium	2,000-5,000	Bike lane considered
Heavy	5,000-10,000	Bike lane
Very heavy	More than 10,000	Bike lane

The appropriate bikeway on a medium traffic street must be judged on a case-by-case basis. Some Oregon cities in which cycling is encouraged, such as Eugene and Corvallis, use an ADT of 3000 for striping a bike lane. However, a road with good shoulders or wide travel lanes may offer comfortable cycling if other conditions are suitable, such as moderate speeds and limited truck traffic. Excessive curb cuts may also argue against bike lanes.

Even on a medium-traffic street, bike lanes should be considered because traffic may reach the heavy level in the near future. When the traffic volume exceeds 5000 ADT, bike lanes should be considered mandatory.

Project Summary

In The Dalles, the road grid is contained by the hills to the south and the Columbia River to the north. It is interrupted by the railroad tracks to the north. U.S. 30 and 197 are the prominent corridors; such *highways should typically offer shoulder bikeways in rural settings and bike lanes in urban areas.*

All roadways in The Dalles are open to bicycles and should be designed, constructed and maintained with bicyclists' needs in mind. In particular, designated arterials and collectors are natural bicycle routes because they generally provide for the most direct and unimpeded path to destinations. *As arterials and collectors are built to full standards or become congested, bike lanes should be added.* Some arterials and collectors, due to their particular characteristics, have been identified as the most desirable bicycle routes and should receive special consideration for increased maintenance and for improvement projects as noted.

The river and its drainages present the opportunity to create a system of separated bike paths that interconnect many urban destinations. *This system could form the backbone of a bikeway system* if properly designed and adequately connected to arterials and collectors. It would attract not only recreational riders and local commuters, but would provide a safe training ground for new cyclists.

To serve recreational riders, the urban system should have links to popular rural routes and destinations in the region. These destinations include the Columbia River, Riverfront Park, Sorosis Park, and rural roads in all directions. Access and parking at schools, employers and commercial businesses also need attention.

At present traffic levels many streets, including some arterials and collectors, function adequately as shared roadways. Recommendations for shared roadways involve primarily spot improvements (modified grates, outside lane width, etc.) and maintenance. However, these routes should be monitored for *upgrade to bike lanes when traffic levels increase.*

The bikeway projects are organized by type. Table 2 summarizes the projects and their relative priorities. More detailed descriptions are given below. Priorities are judged to be high, medium or low:

Table 2. Bikeway project summary

Project	From-To	Miles	Cost	Priority
	Bike Paths (9.2 mi)			
Chenowith Creek Trail	W. 6th to W. 10th	1.1	$180,000	Low
Mill Creek Trail	W. 2nd to W. 13th to Cherry Heights	1.1	$150,000	High
Riverfront Trail	W. to E. urban boundaries	7.0	$980,000	High
	Bike Lanes (11.7 mi)			
W. 2nd St. (U.S. 30)	Webber to Lincoln	0.9	$16,000	High
W. 6th St. (U.S. 30)	Chenowith Creek to Cherry Hts	1.9	$1,300	High
W. 6th St. (U.S. 30)	Cherry Heights to 3rd	0.6	$11,000	Low
W. 10th St./Chenowith	Cherry Heights ~~Chenowith Creek~~ to Murray Dr.	2.6	$48,000	High
E. 19th St.	Dry Hollow to Thompson	0.9	$16,000	Low
Brewery Grade overpass	Riverfront Park to E. 2nd	0.3	$5,400	High
Cherry Heights Rd.	6th to 10th	0.2	$3,600	Medium
Chenowith Loop	6th to 10th	0.6	$75,000	High
Dry Hollow Rd.	9th to 19th	0.8	$14,000	Medium
Hostetler St.	6th to 10th	0.6	$125,000	Low
Kelly Ave. & 16th Place	7th to Dry Hollow	0.8	$11,000	Medium
Mt. Hood St.	10th to Skyline	0.5	$9,000	Medium
Snipes St.	6th to 10th	0.5	$70,000	High
Webber St.	River Rd. to 10th	0.5	$9,400	High
	Shoulder Bikeways (3.2 mi)			
E. 2nd St. (U.S.30)	Taylor to U.S. 197	1.3	$150,000	High
U.S. 197	E. 2nd to Fremont	0.5	$55,000	Low
Columbia View Dr.	U.S. 197 to Summit Ridge	0.5	$40,000	Low
Fremont St.	Old Dufur to U.S. 197	0.2	$25,000	High
Old Dufur Rd.	Thompson to Richmond	0.7	$90,000	Low
	Shared Roadways (4.2 mi listed, 13.7 mi total)			
W. 10th St.	Cherry Heights to Union	0.8	resurface	Medium
E. 10th St.	F St. to Lewis	0.5	widen	Low
Brewery Grade	2nd to 9th	0.2	wide uphill	High
Laughlin St.	7th to 12th	0.3	resurface	Low
Liberty St.	2nd to 6th	0.2	resurface	Low
Scenic Dr. and Trevitt	10th to Kelly	2.2	fix grates	High

Costs are estimates for comparison. They do not include administration, mobilization, special grading and fill operations, or major contingencies. See text for complete project descriptions.

- High—removes significant barrier, eliminates hazard, provides important link, or greatly improves access. May be difficult to accomplish immediately due to magnitude of the task and funding constraints, but should be pursued.
- Medium—less critical element of bikeway system that can await future improvements, often in conjunction with an arterial or collector that will be reconstructed. Also includes projects that will improve overall conditions and attract cyclists.
- Low—completes a final segment of the bikeway system that has low current use or need for improvement.

Bike Paths

Separated paths work best along routes with few intersections. Three such opportunities along waterways exist in The Dalles, totalling about 9.2 mi in the urban area and 12.2 mi total.

1. Chenowith Creek Trail (1.1 mi)

   Proposed recreational trail along Chenowith Creek from Riverfront Trail to 10th St. with a crossing of 6th St.

2a. Mill Creek Trail—W. 2nd to W. 10th (0.7 mi)

   Proposed recreational trail along west bank of Mill Creek with several potential access points from residential streets.

2b. Mill Creek Trail—W. 10th to W. 13th to Cherry Heights (0.4 mi)

   Proposed extension to recreational trail along Mill Creek toCherry Heights and 13th along N. Boundary Cemetary.

3. Riverfront Trail (approx. 7 mi in urban area and 3 mi outside)

   Proposed recreational trail along Columbia River. Access points at Chenowith Creek, Webber St., and Riverfront Park.

Bike Lanes

Preferential lanes on high-volume streets are the backbone of a bikeway system. Bike lanes on arterials and collectors provide cyclists with direct and inviting routes to all city destinations, as they do for automobiles. The following streets are candidates for lanes. The total length is about 11.7 mi.

4. W. 2nd St. (U.S. 30)— Webber to Lincoln (0.9)

   Arterial, commercial, very heavy traffic, 35 mph, 12-14 ft lanes (54-64 ft width), shoulder good but generally has excessive debris, little on-street parking. Destinations: swimming pool and north end of Mill Creek. Link to Webber. Recommend striping 6-ft bike lanes. Cost: about $16,000.

5a. W. 6th St. (U.S. 30)—Chenowith Creek to Cherry Heights (1.9 mi)

   Arterial, commercial, heavy traffic, 35 mph. Existing bike lane both directions, signed, striped (the only one in the city). Destinations: commercial uses and Kramer Field. Link to Webber and industrial area. Recommend better maintenance and debris removal. Intersections at Webber and Cherry Heights are confusing to cyclists and motorists. Bike lane appears to end and become a right turn lane for cars. Recommend bike lane striping to left of turn lane to stop bar (Webber to Cherry Heights is 64-ft wide with no parking). See Chapter 8 of the Oregon Bicycle Plan for basic turn-lane configurations. Cost: about $1300.

5b. W. 6th St. (U.S. 30)—Cherry Heights to West 3rd & Lincoln (0.6 mi)

   Arterial, commercial, heavy traffic, 25 mph, 12-ft lanes, heavy on-street parking, road surface good, old style storm sewer drains should be replaced. Width (42 ft) will not allow a bike lane without elimination of on-street parking on one side. Bridge crossing Mill Creek narrow and in disrepair. Destinations: commercial uses. Direct route from west-side commercial area to downtown; access to dead-end road along Mill Creek and potential trail. Recommend striping 6-ft bike lanes (discontinued at bridge) with parking on one side (6-11-11-6-8 ft). Cost: about $11,000.

6a. W. 10th St.—~~Chenowith Creek~~ Murray Dr. to Cherry Heights (2.1 mi)

Arterial, residential, medium traffic, 35 mph, wide lanes with good paved shoulder (44-ft pavement). Destinations: County Shops, Nursing Home, Kramer Field, and St. Mary's Academy. Link to Chenowith Rd. Recommend striping 6-ft bike lanes. Cost: about $38,000.

6b. Chenowith Rd.—W. 10th to Murray Dr. (0.5 mi)

Arterial, residential, medium traffic (24-ft pavement). Continuation of W. 10th St. to subdivision and rural recreational routes. Recommend striping 6-ft bike lanes as street is widened. Cost: about $10,000.

7. E. 19th St.—Dry Hollow to Thompson (0.9 mi)

Collector, residential and commercial, dead ends east of hospital. Destinations: Dry Hollow School and hospital. Eventual link to Thompson. Recommend striping 6-ft bike lanes when street is extended. Cost: about $16,000.

8. Brewery Grade overpass—Riverfront Park to E. 2nd (U.S. 30) (0.3 mi)

Arterial, heavy traffic, bridge spanning railroad yards and I-84, 30-ft width plus sidewalk. Destinations: Riverfront Park and proposed Riverfront Trail. Recommend striping 5-ft bike lanes (10-ft travel lanes). Cost: about $5400.

9. Cherry Heights Rd.—6th to 10th (0.2 mi)

Arterial, commercial, heavy traffic, 35 mph, wide lanes and paved shoulder (44-ft width), little on-street parking. Destinations: commercial uses. North-south connector leading to residential area and recreation riding route south of town; nearby 9th St. crossing of Mill Creek. Recommend striping 6-ft bike lanes and center turn lane (6-11-10-11-6 ft). Cost: about $3600.

10. Chenowith Loop—6th to 10th (0.6 mi)

Commercial and residential, medium traffic, 35 mph slowing to 20 mph past schools, 12-ft lanes with paved shoulder except between 6th and 7th, little on-street parking. Destinations: Wahtonka High School and Chenowith School. Connection between 6th and 10th. Recommend constructing 6-ft bike lanes. Cost: about $75,000.

11. Dry Hollow Rd.—9th to 19th (0.8 mi)

Arterial, residential with commercial area at 12th Street, 25 mph, heavy traffic, medium on-street parking 9th to 14th and no on-street parking from 14th to 19th, 4-way stops at 10th and 12th, 52-ft wide up to 14th, 42-ft wide to 19th, hill. North-south connector to residential areas, schools, hospital, Scenic Dr., and recreational rides south of town. Recommend striping 5-ft bike lanes and center turn lane (5-11-10-11-5 ft). Cost: about $14,000.

12. Hostetler St.—6th to 10th (0.6 mi)

    Arterial, commercial and residential, medium traffic, narrow. Destinations: Wahtonka High School and Chenowith School. Connection between 6th and 10th. Recommend 6-ft bike lanes when road is reconstructed. Cost: about $125,000.

13. Kelly Ave. and 16th Place—7th to Dry Hollow (0.8 mi)

    Arterial, residential with commercial area from 10th to 12th, 25 mph, medium to heavy traffic, medium on-street parking, 10-12 ft lanes with paved shoulder, variable width (28 to 44 ft), hill. North-south connector to residential areas, schools, hospital, Scenic Dr., and recreational rides south of town. Bike lanes possible except north of 9th if on-street parking removed. Recommend striping 6-ft bike lanes south of 10th (0.6 mi). Cost: about $11,000.

14. Mt Hood St.—10th to Skyline (0.5 mi)

    Arterial, residential, medium traffic, 25 mph, 13-ft lanes with good shoulder (42-ft pavement to 21st). Light on-street parking. Hill southbound. Link to Skyline Rd, Mill Creek Rd., and recreational rides south of town. Recommend 6-ft bike lanes with parking on one side (6-11-11-6-8 ft). Cost: about $9000.

15. Snipes St.—6th to 10th (0.5 mi)

    Collector, commercial and residential, light traffic, 35 mph, 12-ft lanes with paved shoulder except between 9th and 10th, little on-street parking. Destinations: commercial uses. Connection between 6th and 10th. Recommend construction of 6-ft bike lanes. Cost: about $70,000.

16a Webber St.—River Rd. to 2nd (0.2 mi)

Collector, industrial, heavy traffic, 35 mph, RR Crossing with tracks at 90 degree angle representing only minor hazard to bicyclists, wide lanes (44-ft pavement), good surface, no on-street parking. Destinations: industrial uses and proposed Riverfront Trail. Link to industrial uses and River Rd. Recommend striping 6-ft bike lanes. Cost: about $3600.

16b Webber St.—2nd to 6th (0.1 mi)

Collector, commercial, heavy traffic, 35 mph, 12-ft lanes with paved shoulder (44-ft pavement), no on-street parking. North-south connector between 2nd and 6th and to proposed Riverfront Trail. Recommend striping 6-ft bike lanes. Cost: about $1800.

16c. Webber St.—6th to 10th (0.2 mi)

Collector, commercial, light traffic, 25 mph, wide lanes with little on-street parking except during ball games at Kramer Field. Destinations: Kramer Field and nursing home. Connection between 6th and 10th. Recommend striping 6-ft bike lanes with possible event parking (convertible signs). Cost: about $4000.

Shoulder Bikeways

A paved shoulder is a typical bicycle facility on rural highways and minor urban arterials. It provides a margin of safety for both motorists and bicyclists. as well as increasing road life. There are several such routes in The Dalles, totalling about 3.2 mi.

17. E. 2nd St. (U.S. 30)—Taylor to U.S. 197 (1.3 mi)

    Arterial, commercial, heavy traffic, 40 mph, 12-14 ft lanes (nominal 38-ft width), shoulder condition fair and narrow (1-4 ft), rocks and other debris on shoulder, minimal access from driveways, westbound shoulder is better but still needs more frequent cleaning. Link to Old Mill District, Columbia View Heights, and rural recreation rides. Recommend maintenance and widening of shoulder to 5 ft. Cost: about $150,000.

18. U.S. 197—E. 2nd to Fremont (0.5 mi)

    Connect commercial area of Old Mill District with residential areas of Columbia View Heights and Old Dufur Rd. area on east side. Recommend maintenance and widening of shoulder to 5 ft. Cost: about $55,000.

19. Columbia View Dr.—U.S. 197 to Summit Ridge (0.5 mi)

    Residential, hill. Connection to U.S. 197 and Fremont for residents of Columbia View Heights. Recommend shoulder bikeway with 5-ft shoulder uphill. Cost: about $40,000.

20. Fremont St.—Old Dufur Rd. to U.S. 197 (0.2 mi)

    Arterial, residential, medium traffic, 35 mph, hill, narrow lanes (10 ft), no shoulder, curves with poor visibility. Link to Columbia View Heights and U.S. 197. Recommend shoulder bikeway with 5-ft shoulder uphill. Cost: about $25,000.

21. Old Dufur Rd.—Thompson to Richmond (0.7 mi)

    Arterial, residential, medium traffic, 35 mph, 10-12 ft lane width, poor shoulder condition (not paved), pavement condition poor, no on-street parking. Good scenic view and important east-west residential connection route. Link to Fremont St. and Columbia View Heights. Recommend resurface of road and paving 4-ft shoulders. Cost: about $90,000.

Shared Roadways

Most residential streets and low-traffic rural roads are adequate with shared lanes. This may also be acceptable on congested downtown streets where traffic speeds are low and there is adequate outside lane width. The following shared roadways, totalling about 13.7 mi, are considered to be of special importance to a bicycle system.

22. 1st St.—Liberty to Taylor (0.6 mi)

    Collector, commercial. Destinations: transit station and Visitor's Center.

23. 2nd St. (U.S. 30)—Taylor to Lincoln (0.7 mi)

    Arterial, commercial, very heavy traffic, 20 mph, heavy on-street parking, 40-ft pavement. One-way westbound through downtown. Destinations: downtown and commercial uses. Link to transit, swimming pool, north end of Mill Creek.

24. 3rd St. (U.S. 30)—Lincoln to Taylor (0.7 mi)

    Arterial, commercial, very heavy traffic, 20 mph, 12-ft lanes (40-ft pavement), heavy on-street parking. One-way eastbound through downtown. Destinations: downtown and commercial uses. Link to transit; direct route to east side of town and connection to Brewery Grade overpass to Riverfront Park and proposed Riverfront Trail.

25. 4th St.—3rd to 9th (0.9 mi)

Collector, commercial, residential, medium traffic, 36-ft width (30-ft Madison to 9th), hill. Connector between H St. and downtown.

26. E. 7th St.—Washington to Kelly (0.2 mi)

Arterial, commercial, residential, heavy traffic, 25 mph, 12-ft lanes (40-ft width), medium on-street parking, hill. Destinations: commercial uses and library. Connector between Washington and Kelly.

27a. E. 8th St.—Laughlin to H St. (0.3 mi)

Residential, 25 mph, light traffic, medium on-street parking. Part of one east-west residential route which connects to Dry Hollow Rd. (see 26b and c); BIKE ROUTE, directional and destination signs are needed because of the many turns.

27b. H St.—8th to 9th (0.05 mi)

Residential, 25 mph, light traffic, low on-street parking. 8th Street does not go through to Dry Hollow so one possible route jogs up to 9th.

27c. E. 9th Street—H St. to Dry Hollow (0.4 mi)

Residential, 25 mph, light to medium traffic, medium on-street parking. Alternate to 10th as an east-west route to Dry Hollow Rd. Intersection at Dry Hollow is awkward because Brewery Grade approaches at a sharp angle from below the hill.

28a. W. 10th St.—Cherry Heights to Washington (0.9 mi)

Arterial, residential, medium to heavy traffic, 25 mph, medium on-street parking (36 to 40-ft pavement). Bike lanes could only be possible with elimination of parking on one or both sides. Road surface very rough to Union. Destinations: St. Mary's Academy and High School. Recommend resurfacing Cherry Heights to Union (0.8 mi).

28b. E. 10th St.—Washington to Dry Hollow (0.9 mi)

Arterial, residential, medium traffic, 25 mph, width narrows to 25 ft with parking on one side between F St. and Lewis. Link to Old Dufur Rd. Although it is possible for cyclists to avoid this narrow section by jogging over to 9th or 12th, neither of these options is as direct as 10th. If removing on-street parking entirely from the 0.5-mi section is impractical, it is recommended that it be widened to 36 ft or made one-way to cars (east bound) and two-way to bicycles (still with parking on one side only).

28c. E. 10th St.—Dry Hollow to Thompson (0.5 mi)

Arterial, residential, light to medium traffic, 25 mph, good lane width (36 ft) and surface, light on-street parking. Link to Old Dufur Rd.

29a. Washington St.—10th to 11th (0.05 mi)

Arterial, residential, light traffic, 25 mph, school zone. 10th narrows (26 ft) east of Washington, so a jog one block south to wider 12th was examined (see 28b and c); BIKE ROUTE, directional and destination signs are needed because of the many turns.

29b. E. 11th St.—Washington to Federal (0.05 mi)

Residential, light traffic, 25 mph, heavy on-street parking. Possible east-west route along 10th jogs to 12th via Washington, 11th, and Federal to avoid hill on Washington.

29c. Federal St.—11th to 12th (0.05 mi)

Residential, light traffic, 25 mph, hill, light on-street parking.

30. 12th St.—Mt Hood to Thompson (2.1 mi)

Collector, residential, light to medium traffic, 25 mph, hills, medium on-street parking. Good width (36 ft) and road surface. Parallel alternate to 10th street with more elevation gain. Stop signs at Trevitt, Union, Washington, Kelly, and Dry Hollow. Destinations: High School, Jr. High School, J. G. Wilson School, and Quinton Ballpark.

31. W. 13th St.—Irvine to Emerson (0.6 mi)

Residential, light traffic, 24-ft wide. Link to Chenowith Middle School from 10th.

32. Brewery Grade—2nd to 9th (0.2 mi)

Arterial, commercial and residential, 25 mph, heavy traffic, no on-street parking, 12-ft lanes, 3-ft shoulders, good surface, sidewalk, hill, encroaching trees. Link to 2nd St. and downtown. Recommend shared roadway downhill (14 ft) and shoulder bikeway (11-ft lane, 5-ft shoulder) uphill. Also maintain landscaping.

33. Court St.—2nd to 10th (0.4 mi)

Arterial, commercial and residential, medium traffic and on-street parking, 56-ft wide. Destinations: downtown, city offices, library, and high school.

34. Laughlin St.—7th to 12th (0.3 mi)

Residential, 25 mph, light traffic, medium on-street parking, 10-12 ft lanes, hill, rough surface. Low-traffic alternative to Kelly to connect downtown commercial district with 12th St. east-west route. Recommend improvement of road surface.

35a. Liberty St.—2nd to 6th (0.2 mi)

Commercial and residential, 25 mph, light traffic, medium on-street parking, 8-12 ft lanes, hill. Part of low traffic north-south route from 2nd to 10th. Part of one possible north-south route via Liberty and Pentland (see 35b and c); BIKE ROUTE, directional and destination signs are needed because of the many turns. Recommend improvement of road surface.

35b. W. 6th St.—Liberty to Pentland (0.1 mi)

Residential, 25 mph, low traffic, medium on-street parking. Part of one possible north-south route via Liberty and Pentland.

35c. Pentland St.—6th to 10th (0.2 mi)

Residential, 25 mph, low traffic, medium on-street parking, slight hill.

36. Scenic Dr., Trevitt—10th & Trevitt to Kelly Ave (2.2 mi)

Collector, residential, light to medium traffic, 25 mph, lane width (30-36 ft) and surface condition good. Steep hills, strenuous ride. Several hazardous sewer grates. Destinations: Col. Wright School, Sorosis Park, scenic overlook, and Oregon Baptist College. Recommend fix of sewer grates.

37. Thompson St.—10th to 12th (0.1 mi)

    Collector, residential, light traffic, 25 mph, hill, 12-14 ft lane width, gravel shoulder. Link to Old Dufur, 10th and 12th east-west routes. If E. 19th is put through, Thompson north of 12th should be brought up to standard.

38. Union St.—1st to 12th (0.6 mi)

    Arterial, commercial and residential, heavy traffic and on-street parking, 36-40 ft wide. Destinations: downtown, city offices, park, and high school.

39. Walnut St.—6th to 10th (0.2 mi)

    Collector, commercial, light traffic, 25 mph, 24-40 ft wide. Destinations: Kramer Field. Connection between 6th and 10th.

40. Washington St.—2nd to 6th (0.2 mi)

    Arterial, commercial, heavy traffic, 20 mph, 12-ft lanes (56-ft width), heavy on-street parking. Destinations: commercial uses and library. North-south connector between commercial and residential areas.

Additional shared roadways that leave the urban area as primarily recreational routes include:

U.S. 30 (N. of Chenowith Creek)
Sevenmile Hill Rd.
Chenowith Rd.
Cherry Heights Rd. (S. of 10th)
Mill Creek Rd.
Skyline Rd.
Dry Hollow Rd. (S. of 19th)
Three Mile Rd.
Lower Eight Mile Rd.
Columbia View Dr. (E. of Summit Ridge)
U.S. 197
Fifteen Mile Rd.

IMPLEMENTATION

Introduction

Many well-intended bicycle plans have languished in the files of agencies for lack of implementation. Any of several things may have gone wrong. The government agencies empowered to implement the plan may have not had the skills or interest. Enthusiastic politicians may have failed to gain public support. Competition for funding may not have been successful.

The following discussion deals with techniques for working within agencies, gaining the community's support and securing funding. Neglect of any of these can seriously harm a bicycle program.

Plan Adoption

In order for this Bicycle Master Plan to be effective both for obtaining funds and improving the bicycle use in The Dalles, it must be formally adopted into the Transportation Element of the City of The Dalles. The Goals and Policy section of the Comprehensive Plan should be updated to include the goals and policies included in this Bicycle Master Plan (refer to *Chapter 1: Introduction*), and the proposed bikeway system included in the Transportation Plan. It should be noted that this action will also bring the City into conformance with the bicycle requirements of the Transportation Planning Rule.

The prioritized list of bikeway projects should be placed on the Transportation Improvement Plan and appropriate projects included on the Capital Improvement Plan in order to improve the chances for obtaining State and Federal funding.

Codes, ordinances and standards used in The Dalles should be modified to reflect the contents of the Bicycle Master Plan. In this way bicycle facilities can be routinely considered during development application, review, approval, and design. A set of model ordinances developed by the Oregon Chapter of the American Planning Association is included in Appendix B.

- Adopt the Bicycle Master Plan into the City's Comprehensive Plan and Transportation Element, and incorporate implementing ordinances.
- Assign a Bicycle Coordinator and Bicycle Advisory Committee to guide implementation.
- A variety of local, state and federal funding sources are available (projects should be on the local Capital Improvement List).

Responsibility for Implementation

A bicycle program touches many disciplines such as planning, engineering, public relations, recreation, education and law. It is often difficult to know where to assign responsibility to overall program implementation.

Bicycle programs in Oregon are found in various municipal and county departments including planning, public works, parks and recreation, police, and others. With so many interests involved, coordination and communications become highly important. Indeed, programs are often directed by an individual called a Bicycle Coordinator. Also, a bicycle advisory committee comprised of public representatives and department staff (often from several agencies) also contribute.

Bicycle Coordinator

The primary responsibility of the Coordinator is to maintain a strong and active bicycle program. Even the best of plans need knowledgeable staff to oversee implementation and see to it that projects are completed. An agency spokesperson for bicycling matters is also important.

The Federal government recognized these needs in the new Transportation Act when it required States to staff a bicycle coordinator. Oregon's Bicycle Program is a part of the Department of Transportation.

The most appropriate agency in The Dalles to guide a bicycle program should be determined. Responsibilities of that agency and the assigned individual include:

- Coordinate the use and implementation of the Bicycle Master Plan among the different agencies, groups and special interests in The Dalles.
- Assure that Public Works and other government agencies plan for and apply the specifics of the Bicycle Master Plan; strive to institutionalize the consideration of bicycles into everyday government work.
- Review and update policy, planning and regulatory documents.
- Help train planners, engineers and staff in bicycle transportation planning.
- Ensure that transportation consultants hired by the City consider bicycle planning.
- Be cognizant of the Cities' bicycle funding, including the minimum 1% bicycle funds, and plan the allocation of those funds within the constraints of the budget.
- Apply for grants from the State Department of Transportation and other appropriate agencies to fund projects.
- Work with the maintenance departments of the City, County and State to correct problems, improve bicycling conditions, and maintain bicycle system quality.
- Research and recommend short and long-term projects to the City, County and State.
- Recommend bicycle facility designs to the Public Works Departments and to private developers.
- Assist the Planning Department in land-use decisions and planning that affect bicycle facilities or use.
- Monitor and analyze accident and enforcement data.
- Work with local businesses and government agencies to encourage bicycle races, rides, workshops and other events that promote bicycle use and safety.
- Help businesses with bicycle commuter and wellness programs.
- Keep abreast of current bicycle issues, facility designs, standards and practices both locally and globally.
- Be a point-of-contact on bicycling matters to citizens, government agencies and media.
- Establish and maintain contacts with community, business and government organizations and keep them appraised of bicycle issues.
- Respond to inquires and requests, both public and government, on bicycle matters.
- Report findings and recommendations to government agencies as requested.
- Work to improve the status of bicycling in the community and with government agencies.
- Keep the Department Directors appraised of the program's activities and needs.

The responsible individual should be knowledgeable of bicycling issues, roadway design, local government and the project development process. It is expected that these duties would be only a part of the individual's job. In all likelihood, existing staff would need to be trained in some bicycling matters.

The importance of these functions in a developing community bicycle program cannot be overstated. Successful programs are multi-faceted efforts in planning, design, implementation, and community relations. There are many bicycle issues little understood by today's planners, engineers and developers who have been educated and employed in an automobile-dominated culture. Mistakes and oversights can be very long lasting and damaging. Until the community establishes a tradition of bicycling, it is essential that a dedicated Coordinator be utilized.

Bicycle Advisory Committee

An advisory committee comprised of public and agency members, including the Bicycle Coordinator, is an excellent means of gathering public input and maintaining continuity in the bicycle program. The committee should:

- Develop exclusive bicycle lanes as well as shared facilities, and provide signing to identify the most convenient routes for cyclists and to alert motorists of the likely presence of cyclists.
- Provide guidance for road maintenance personnel regarding need for replacement or repair of signs and roadways, the need for sweeping of cycling routes, and consultation with authorities on new roadways.
- Promote development of routes that provide safe, convenient alternative transportation for people employed both in town and along the Columbia Riverfront to conserve energy, help eliminate auto pollution, and provide a healthful alternative to motor vehicle transportation.
- Enhance recreational cycling by defining recreational sites, historical locations, and access to the adjacent countryside, and by pointing out the most convenient and safest routes, both within the city and to outlying areas.
- Promote improvement of present cycling routes and the development of additional routes that provide a safe, attractive experience which avoid conflict with motor vehicles, and which have desired amenities and support services. The Riverfront Trail and its connecting Mill Creek and Chenowith Greenways plus a new interchange and underpass accessing the Riverfront are examples of such routes.
- Provide and plan for facilities such as bicycle racks, storage lockers, and public rest rooms at convenient locations which would encourage alternative bicycle transportation and provide secure, convenient storage facilities.
- Provide educational materials and opportunities to the community.
- Provide maps to guide both locals and tourists through town and to specific city, scenic, historic, and adjacent countryside locations.
- Be alert for problem traffic situations which might develop in the routes suggested, and recommend needed changes or improvements.
- Provide support, education materials, and assistance to law enforcement personnel in citing violations by cyclists and motorists, and in the use of bicycles for patrol.
- Seek Federal and State grants to develop bikeways and trailways throughout the area.

Public Participation

When it comes to transportation, it is often difficult to translate the planning and engineering principles into terms that the average citizen can grasp. Collectors, ADT's, mixed-use zoning and such are the jargon of the agencies and do not communicate to the public. This is unfortunate because the public must support successful efforts.

Lack of consensus has been the undoing of many plans. This usually happens when some interests have been left out of the planning process or when information has been flawed, withheld, or poorly presented.

Consensus can be easier to achieve when benchmarks are used to establish realistic expectations and a way to judge progress. Benchmarks not only give a basis on which to have constructive discussions, but they tend to keep the focus on long-term goals. They should be modified as the planning process progresses. When it is time for a final hearing on the bicycle plan, approval should be quick because all questions have already been addressed.

Useful benchmarks for bicycle use relate to the ratio of total trips taken by bicycle, the miles of bikeways created, and the number of bike racks installed. For example, The Dalles might use the following benchmarks:

- The trips within the three communities taken by bicycle will increase 1 percent a year until at least 10 percent is reached.
- At least 2-3 miles of bikeways will be added each year until all destinations can be reached by safe and convenient routes built to adopted standards.
- All public destinations, including government offices, community service centers, commercial businesses, places of employment, and recreational facilities, will have adequate bicycle parking within 10 years.

Funding Sources and Strategy

Bicycle facilities and programs can be funded through a broad combination of local, state, federal and private sources:

- Local: road construction and maintenance budget, the general fund, system development charges, and joint projects with utilities and other agencies.
- State: highway projects, 1% Bicycle Fund distribution, matching Local Assistance Grants, and support from other agencies.
- Federal: surface transportation, maintenance and air quality programs.
- Other: donations, grants, development costs, and miscellaneous.

By State law, bikeways must be created whenever City, County, State or Federal roads are built or reconstructed. Arterials and collectors require bike lanes. The Dalles should ensure that any road project in the area is built to bikeway standards for the street classification and that costs are included as a normal part of the project. Similarly, resurfacing of an arterial or collector is an excellent time to restripe for bike lanes at little additional cost. Bikeway maintenance should also be funded along with routine roadway maintenance.

Bikeways may be constructed or improved as a part of roadway repairs. For example, routine resurfacing of a shared roadway may be expanded to include new shoulder bikeways. In such cases, additional funding may be sought for the portion of the project that includes the bikeway improvements. Special projects such as separated bike paths, shoulders added to a road in good condition, and restriping for bike lanes also require unique funding.

It is advantageous to develop a consistent funding source for critical projects and maintenance, and to actively seek additional sources for the remaining projects. Available money should be leveraged to the greatest extent possible by using it for matching grants and joint projects.

> *Footpaths and bicycle trails, including curb cuts or ramps as part of the project, shall be provided wherever a highway, road or street is being constructed, reconstructed or relocated.*
>
> *—ORS 366.514*

Local Government Funding

Bike lanes and shoulder bikeways, which make up the majority of a bikeway system, are usually placed within the standard roadway width and so add negligible cost to the road department's budget. As new arterials and collectors are constructed or old ones are reconstructed to current standards, bikeways are simply incorporated into the project designs. In this way, a bikeway system can develop incrementally over time in step with the road system for minimal cost.

In private developments, bicycle facilities are made a condition of approval, just as are the roads and parking lots. In some cases, system development charges can be imposed or, if the impact of a development on adjacent streets is not immediate, the developer may participate in future improvements through a Local Improvement District (LID).

Availability of funds may limit alternatives and delay projects, but lack of funds should not be an excuse for poorly designed, constructed or maintained facilities. The initial investment in a properly done facility will be more than offset by its durability, utility, attractiveness and safety. Some communities earmark up to 10% of their road construction budget for bicycle projects because they realize that the return to the community will be manyfold.

When a bicycle project steps beyond the normal road standards, other local government funding may be needed. Examples of expenses outside the normal road budget are construction of a separated path, widening a road to accommodate a bikeway, and building a bikeway to higher standards than required. Parks, recreation, tourism, transit and planning departments are often supporters of such projects and may have funds available. The general fund can also be tapped for special projects.

In all bikeway construction projects, it is important to coordinate with other road work so as to keep expenses— administration, material unit costs, mobilization, traffic control—to a minimum by sharing them with larger road projects. For example, a shoulder widening effort to accommodate bicycles along a popular route might be prohibitively expensive unless done at the same time as a scheduled pavement overlay; this can reduce bicycle-related costs by as much as half.

The Dalles should consider whether it wants to continue supporting automobile use far beyond what other forms of transportation, including bicycles, enjoy. Many cities have looked towards various user tolls, taxes and fees to cover automotive-related costs and provide more funds for other modes. Gas taxes and "wheel taxes" are the most common methods.

When considering this type of funding, it is important to remember that a shift from automobile use to bicycles, even of a few percent, translates into fewer dollars spent for road construction, maintenance, and repair.

State Funding

The principle state funding resource is the State Highway Fund that is gathered from weight-mile taxes, fuel taxes, licensing and registration fees, and truck load violations. The Fund totaled $455M in FY 1991, of which $176M was distributed to cities and counties for roadways and $279M went to DOT. By law, at least 1% of the DOT moneys (after small deductions) must be used for qualifying bicycle and pedestrian expenditures.

The law also states that bikeways and footpaths must be established as part of all highway projects except under special circumstances. These moneys, called the 1% Bicycle Fund, can only be spent on bikeway construction projects within a publicly owned road or highway right-of-way. The 1% Bicycle Fund should total about $3.16M in FY 1993. Eligible expenditures include administration, development, construction, and maintenance of bicycle and pedestrian facilities within the road right-of-way.

The majority of 1% Funds are used by communities for bicycle program administration and engineering efforts, or as leverage to obtain matching grant funds. When used for construction projects, the funds should only be directed towards those expenses that exceed what would be routinely included. For example, simply providing basic road space for bicyclists is routine, but retrofitting lanes on a street, developing feeder routes and adding grade-separated crossings is beyond ordinary and qualify as legitimate bicycle expenses.

The Bikeway and Pedestrian Program Office allocates funds and assists municipalities in developing and implementing bicycle plans. It identifies worthy bikeway projects and reviews state highway construction plans to ensure that bicycle facilities are incorporated. A portion of the 1% Bicycle Fund is distributed to the cities and counties by two means:

- An annual sum proportional to population. Because 1% in any given year may be too low to be useful, this money can be accumulated in a special reserve fund for up to ten years. The Dalles received $4244 for 1991 and $25,093 during the previous 10 years, while Wasco County received $9,644 for 1991 and $57,625 for 10 years.
- Local assistance grants, called Category 4 money, that are awarded annually to selected applications. The applications can be made for:
  - Construction projects with 80% state grants up to $50,000 (most of the bike lane striping projects in *Chapter 3: Recommendations* are below $62,500 and so could be financed at an 80/20 match).
  - Bicycle plan development with 50% state grants up to $20,000 (which is how this plan was funded).
  - Bicycle map development with 50% state grants up to $10,000 (for example, a map for distribution to the public showing route suitability).

Applications should be submitted annually by September 1 and grants are awarded later in the year. Proposed construction projects are reviewed in the field and rated according to criteria developed by the State Bicycle Advisory Committee that include:

- Service population
- Linkages
- Standards
- Problem corrected
- Cost and relation to other projects

Category 4 projects represent about 10% of the total 1% Bicycle Funds. After receiving a grant, the recipient must wait a year to be eligible for the next one.

Bikeways may also be funded as Category 1 and 3 projects on state right-of-ways, like U.S. 30 and 197:

- Category 1 refers to the construction of bikeways associated with new, reconstructed or relocated highways. The cost is typically a small fraction of the overall project.
- Category 3 refers to bikeway projects within State Highway right-of-ways such as bike paths and shoulder widening for bikes. Category 3 projects represent about 50% of the State's 1% Bicycle Funds. Improvements to State routes are eligible for this category.

Category 1 and 3 projects are included in the State's 6-Year Transportation Improvement Program. Proposed projects are submitted to the DOT Region Engineer who evaluates the proposal and considers it for inclusion in the next preliminary 6-Year Program. Category 3 projects are then reviewed by the State Bicycle Advisory Committee before recommendations are passed on to the DOT.

Finally, Category 2 covers the maintenance of existing state bikeways and represents about 7.5% of the State's 1% Bicycle Funds. This activity strives to give cyclists a smooth and clean surface by periodic repair and sweeping of state bikeways such as the TransAmerica Route through Oregon. It also replaces damaged and obsolete signs.

The Oregon Traffic Safety Division helps fund educational and safety programs such as Portland's Community Traffic Safety Initiative and the State-sponsored Smart Cycling courses. Other potential State funding sources for community infrastructure improvements, including possibly bikeways, are the Oregon Community Development Block Grant Program and the Oregon Special Works Fund.

Federal Funding

The National Transportation Policy is to promote the increased use of bicycling, to accommodate bicycle and pedestrian needs in designing transportation facilities for urban and suburban areas, and to increase pedestrian safety. Federal-aid money is available for bicycle facilities as part of a normal federal-aid highway construction project at the same financial match ratio as the other highway work. Bikeway projects independent of other construction projects, as well as nonconstruction projects related to bicycle use, can be funded with an 80% federal share as provided in 23 USC, Section 217. Such projects must be principally for transportation rather than recreation, however.

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 authorizes expenditures of $151 billion over 6 years and has opened up new funding opportunities for bicycle projects. There are several programs in the ISTEA for which bicycle facilities and programs are eligible:

- The National Highway System (NHS), which includes former FAP and FAS designations, provided Oregon with $34.5M in FY 1992. Eligible projects areas include bicycles and safety. Half to all of this system will be transferred to the Surface Transportation Program.
- The Surface Transportation Program (STP) provides funds ($64.5M to Oregon in FY 1992) for a variety of uses including bicycles and safety. The funds are distributed by population (50%), statewide (30%), for safety and railroad crossings (10%), and for enhancements (10%). The Transportation

Enhancement Activities (TEAs) include bicycle facilities, conversion of abandoned railway corridors to bicycle trails, and recreational projects. "Enhancements" are improvements independent of new construction or reconstruction (which already require bicycle facilities) such as wide curb lanes and shoulders on rural roads. Oregon's TEA share is $38M for FY 1992-7 is over $6M per year.

- The Congestion Mitigation and Air Quality Improvement (CMAQ) Program gave Oregon $4.4M in FY 1992 for use primarily in nonattainment areas under the Clean Air Act (there are currently none in Central and Eastern Oregon). The Program encourages states to invest in bicycle facilities and programs.
- The Interstate Maintenance Program stresses cost-effective ways of extending pavement life and prevents new construction to increase capacity for single-occupancy vehicles. Oregon received $35.1M in FY 1992.

Most of the projects listed in *Chapter 3: Recommendations* could potentially be funded through the above programs. To be eligible for these funds, a construction project should be in the local CIP or on the State's 6-year TIP.

The State allocates the funds through its regional offices—Region 4 in the case of The Dalles. Contact Mark DeVoney, Region Planner, or Kelly Hanslovan, Alternative Transportation Coordinator, Oregon State Highway Division, P.O. Box 5309, Bend, OR 97708, 503-388-6180. The funding request must come from a City or County government. Proposed projects generally require some local matching funds, which can include Bicycle Funds or grants. Local or State funding must be reasonably available during the time period of the proposed project.

In addition, the Land and Water Conservation Fund (Public Law 88-578) money is available for the acquisition of lands and waters or for the development of public outdoor recreation facilities, such as the proposed river and creek trails. These funds, like the ISTEA funds, must be applied for by an eligible agency such as a City, County, or Park District.

Other Funding

Bikeway facilities and programs are a community investment shared by all sectors—private, business and government. Each can contribute in many ways, including land dedications, donations of engineering and public relations talent, special grants, sponsorship of fund-raising events, and so on.

Developers can also choose to include extra bikeway projects, beyond what is required, in their project designs. Businesses can voluntarily construct showers and offer incentives for their bicycling employees. These sources should be actively sought and nurtured.

There are other means for obtaining materials, funds or right-of-ways that are up to the inventiveness of the City. Some methods that have been used in other cities include:

- Environmental impact mitigation
- Street vacation moneys
- Enforcement of franchise agreements for railroad crossings
- Utility tax for public works
- Utility easements
- Tax-deductible gifts in the form of signs, equipment and trail segments

Facility Costs

Estimated costs for typical bicycle facilities are given in Table 3. These figures include engineering, installation, minor contingencies, striping and signing. They do not include administration, special grading and fill operations, unusual construction (e.g., bridges and tunnels) or land acquisition.

Separated bike paths tend to cost more than indicated because of special design considerations (bridges, intersections, fences, drainage, etc.) not usually encountered on other bikeway projects.

All bicycle projects are markedly cheaper than equivalent automotive projects because bicycles are smaller, lighter, and travel at a lower speed. For example, construction costs for a new four-lane urban arterial may run about two million dollars per mile, with the bike lanes representing only about 10%. Nor do on-road bikeways benefit only cyclists—the space is also used by turning vehicles, as emergency parking, and as a buffer for pedestrians.

Priorities

Bicycle projects should be planned and scheduled with the same care given to all roadway projects. Projects should be given priority ratings (refer to *Section 3: Recommendations*) and incorporated into the City's maintenance and capital improvement lists. This not only establishes continuity in the bicycle program, but it establishes eligibility for ISTEA funding.

The entire bikeway system of about 37 mi will take many years to complete. By scheduling 2 to 3 mi each year, the system can be finished in about 15 years. This should keep pace with a gradual conversion from an automobile-dominated system to one that incorporates more cycling and walking for short-range trips.

As opportunities arise for unscheduled improvements, such as during other roadway construction, consideration should be given to including bikeway work. Road improvements may be triggered by adjacent development, increased traffic levels, or preservation overlays. In any case, bikeway improvements should be included because they are much more cost effective when included with other road work than when retrofitted latter.

Occasionally, a project may be judged impractical for the moment due to nontechnical reasons such as neighborhood resistance. Nevertheless, the long-term goal should be completion of all projects because a fragmented system will not serve the community's transportation needs.

Table 3. Bikeway facility costs

Facility	Description	Cost
Striping	4-in. stripe on existing roadway	$0.55/linear ft
Sign	Typical sign	$100 each
Traffic signal	Intersection	$70,000/pole
Pedestrian signal	Crosswalk	$2500/unit
Pedestrian/ bicycle bridge	10-ft wide	$5600/linear ft
Sweeping	Once a month at 5 mph	$40/hr
Repair	10-ft wide path, seal every 5 years	$0.70/linear ft
Repair	10-ft wide path, resurface every 10 years	$5/linear ft
Shoulder bikeway	4-ft wide on both sides to highway standards (4-in asphalt/9-in aggregrate) with 4-in stripe	$24/linear ft
Bike lane	5-ft wide on both sides to highway standards (4-in asphalt/9-in aggregrate) with curbs and 8-in stripe	$40/linear ft
Bike path	10-ft wide (2-in asphalt/4-in aggregrate) with clearing and preparation, no fences	$15/linear ft (see text)
Bike path	10-ft wide (3-in asphalt/6-in aggregrate) with clearing and preparation, no fences	$22/linear ft (see text)
Bike path	12-ft wide (3-in asphalt/6-in aggregrate) with clearing and preparation, no fences	$28/linear ft (see text)
Bike path	10-ft wide (5-in concrete/3-in aggregrate) with clearing and preparation, no fences	$31/linear ft (see text)
Parking	Short-term	$50/bike
Parking	Long-term and sheltered for 10 bikes	$300/bike

SUITABILITY CRITERIA

Roads as Bikeways

The Dalles area contains numerous origins and destinations. Consequently, a functional bicycle network needs to connect all areas with some type of safe and convenient bikeway. This means an interconnected grid of bikeways that includes major thoroughfares for the most heavily traveled routes, smaller branches leading away from the major routes, and a fine grid of minor bikeways reaching out to all destinations. High-use areas near 'attractors' (retail businesses, employers, schools, parks) require special attention through careful treatment of access and conflicts with other modes.

This type of network is well served by the existing road grid. Highways and major arterials and collectors are the bikeway trunks, minor arterials and collectors become the bikeway branches, and small neighborhood streets fan out from there. In essence, all roads are considered bikeways, even in the absence of any special design treatments. By Oregon law, bicycles are vehicles and share the roads with other vehicles such as cars and trucks. Bicyclists have the same rights and responsibilities as other road users.

However, roadways differ greatly in what they offer cyclists. The primary consideration for most roads has been automobile use. Bicyclists' particular needs have often been neglected. The problem is how to fit bicycling into the automobile-dominated transportation system.

Suitability criteria are tools whereby roadways can be evaluated as to how well they suit cyclist's needs, how they might be improved, and the most feasible design. The criteria below are among those considered in the development of The Dalles Bicycle Master Plan.

- Cyclist's needs are well served by the existing road grid.
- The best route and type of bikeway are influenced by a multitude of factors involving physical, aesthetic and other considerations.

Overview

Route selection is inherently complex because of the wide range of user preferences and abilities, as well as the many alignment, design and traffic factors. After gathering cyclists' inputs, assessing the various aspects of the transportation system, and attempting to minimize hazards, one is often left with confusing and conflicting choices.

Numerous physical subfactors enter into the considerations, including road and lane widths, shoulders, alignment, pavement, traffic controls, turning movements, automobile parking, bicycle parking, sight distance, grade, intersections, and the volume, speed, and mix of traffic.

Add to this the different types of riders—children, novices, commuters, shoppers, tourists, and racers—anyone of which may use any of the four bikeway types, and the equation becomes complicated indeed. The typology of bicyclists must consider such factors as trip purpose, average trip length, operating speed, skill, knowledge of traffic rules, age, experience, and so on. A given person may fall into more than one category.

Some of these factors are discussed below. At the end of the chapter, a formula is provided for computing the physical suitability of a roadway for cycling.

Factors

Use

Demand analysis is often used by transportation planners. They measure and forecast demand and build facilities accordingly. The process feeds on itself. The more facilities that are built, the more demand that is created. "Build it and they will come" is the popular refrain of those who see demand analysis as a tool to increase automobile use. The results have been impressive. While other modes continue to decline, automobile miles per capita have steadily increased about 2 percent a year for 30 years.

Some bicycle facility standards found in the U.S. are based on minimum levels of bicycle use, much in the same way automotive facilities are gauged. Unfortunately, the increasingly high levels of automobile use have squeezed cyclists out of the picture. If a location has little existing usage, the conclusion should not only be that demand is lacking but that some impediment may exist that discourages use.

Furthermore, criterion which cite bicycles per day as a minimum standard usurps a community's right to define its own needs. The correct minimum level of usage is whatever the community believes is appropriate, given its needs and constraints.

Usage data are important and should be gathered routinely. But such data are more a tool to measure progress than an indicator of need. The proper approach is to establish goals, such as increasing ridership a certain amount each year, and then gathering data to see if the goals are being achieved by current practices.

Width

Width is the fundamental physical requirement of a bikeway. Experience has shown which minimum widths work best and that substandard facilities are selfdefeating. If a facility cannot provide adequate width, alternatives need to be explored. See *Chapter 6: Bikeway Standards* for dimensional layouts and lane striping recommendations.

Most streets and roads in The Dalles were originally surveyed with adequate right-of-way to accommodate multiple uses. Unfortunately, in some cases the available roadway width has been almost entirely given over to the space-eating automobile. Wide through lanes, turn lanes and on-street parking may leave little room for dedicated bikeways without expensive roadway widening. Various solutions can be explored to provide width for a bikeway:

- Reduce inside travel lane width to provide more width in the outside lane.
- Reduce the number of lanes from 4 to 3 with a center turn lane.
- Remove parking on one or both sides or decrease the width of the parking spaces.
- In hilly areas, shift the center line so that the slow, uphill cyclist has ample room.

Often, all that is needed to improve cyclist's comfort is a few extra feet that can be easily obtained by inexpensive restriping.

Connectivity

Continuity, directness and destination are the basic elements of connectivity.

A continuous, logical route is desired by cyclists. This is true of motorists, too, and we have gone to great lengths to provide an elaborate, well-signed system that leads the motorist to most any destination. Bicycle facilities should be no less carefully thought out.

Cyclists have a very strong desire to maintain the forward momentum their efforts have created. They also naturally desire to minimize their own delay and are usually more comfortable on the move. A facility with numerous full stops or abrupt turns is likely to be unacceptable. In most locations, design treatments can maximize the cyclists' ability to maintain momentum. Only where such treatments are infeasible does an alternate route become important.

Out-of-direction travel can be discouraging to a cyclist, especially if they have a 'utilitarian' purpose (commuting, shopping or on personal business). It is not as important to the recreational bicyclist, but is still a consideration. For the utilitarian cyclist, connectivity is desired along the lines which define the minimum distance or "minimum energy" path from origin to destination; little deviation is tolerated. A busy street that would be shunned by the recreational cyclist may be the choice of the utilitarian cyclist because of its directness.

For trips of up to 0.5 mi, utilitarian cyclists may object to diversions as short as one block; however, for trips in the 1 to 2 mi range, this much diversion will generally be acceptable. Cyclists on longer utilitarian trips will generally not perceive a nearby alternate route to be beneficial if its extra length is significant.

The recreational cyclist is more willing to accept a longer or more strenuous path to avoid unpleasant environmental conditions or hazardous situations. This is providing, of course, that the detour is not out of scale with trip length and perceived severity of the conditions avoided.

Closely related to continuity is destination. The ability to get from one human activity point to another is essential to the fulfillment of the purpose of a utilitarian bicycle trip. If bicycle facilities are to serve such trips, they cannot simply be placed where it is easy to provide bicycle facilities; they must be located to provide convenient, direct access to centers of activity. For this reason, the existing road grid serves cyclists well.

Safety

Bicycle safety encompasses a wide range of topics, including facility design, rider skill, knowledge of laws and traffic principles, enforcement, and bicycling equipment and clothing. Traditional methods of accessing traffic safety rely primarily on extensive accident records. While this works well for automobiles, it is not very useful to improve cycling conditions because most bicycle accidents are not reported and those that are reported are recorded in a system developed for automobiles.

Programmatic aspects of safety deal primariy with providing suitable bikeways and encouraging their proper use. Safety evaluation of a bikeway is really a study of existing or potential conflicts. Once identified, conflicts can be minimized through use of established design standards.

Often the existence of a large volume of cars adjacent to a bicycle facility is taken to be an inherently unsafe situation. This is generally not true. High traffic volume is a hazard only if there is close and continual conflict between vehicles and bicycles.

Potential conflicts can best be categorized into four conditions: parallel, right-turning, left-turning and crossing conflicts. Each of these conflicts should be evaluated separately and combined for a final safety ranking.

Parallel conflicts are caused by two conditions: close proximity of auto and bike travel, and large speed differential between the two. Bicycles and motor vehicles can successfully mix in the traffic stream if speeds of the two types of vehicles are compatible, as is usually the case on residential streets with low speed limits. A cyclist on level terrain and in negligible wind conditions typically averages about 12 mph, slower than motor vehicles sharing the facility but not significantly so. On higher-speed arterials, wide outside lanes or bike lanes are necessary.

Right-turning conflicts are primarily caused by excessive curb cuts, poor intersection design and narrow outside lanes. Older arterials and collectors, especially in areas of automotive-oriented strip development, have far too many driveways. Newer developments can minimize these. An unchannelized intersection presents relatively minor problems for cyclists; a wide-radius corner poses a problem; a double-right turn lane presents unacceptable hazards. When evaluating this conflict, consideration must be given to costs of corrective measures. Often, careful striping of a bike lane to clearly define the road space and to allow the through cyclist to merge left is all that is needed.

Left-turning conflicts occur because a bicycle has low visibility and is often observed after initiation of the vehicle's turning movement. This is particularly true at high-volume intersections where bicycle visibility is further masked by other vehicles. Thus, left-turn conflicts are caused by the turning volume, its opposing through volume, merging traffic and the type of intersection control. Intersections with left-turn phase signalization present few hazards. Close consideration must be given to signalized intersections without separate turn phasing as well as major unsignalized intersections and driveways on major streets.

Crossing conflicts are caused both by traffic volume and the width of the cross street. Any location which controls crossing vehicles by signals or STOP or YIELD signs is relatively safe. Locations where controls confront the cyclist's path are more hazardous, since this situation implies a higher level of motor vehicle cross traffic. In any case, major bikeways should be on through streets that involve few stops. Separated paths should have few street crossings, and where streets must be crossed, the facility should be well marked, have good sight distance, and conform to normal intersection design.

Grades

Grades not only influence a cyclist's route selection, they also affect operational safety. A slow or hard-braking bicycle is less stable, and a fast-moving bicycle needs more room to maneuver. Cyclists may accept out-of-direction travel as well as less safe and attractive conditions to avoid excessively steep grades.

However, some moderate grades can add interest and challenge for recreational bikeways. In hilly areas, even the utilitarian cyclist is resigned to coping with the natural terrain. Where the traffic engineer can help is to provide sight distances and maneuvering room appropriate to the expected speed, especially on turns and at intersections.

Sight Distance

Sight distance is dependent on design speed and profile gradient. Bikeways on or adjacent to roadways usually have adequate sight distances since motor vehicle speeds are equal to or greater than bicycle speeds. An exception to this is where on-street parking is allowed too close to an intersection. The ASSHTO guide defines appropriate sight distances for separated bike paths.

Pavement Quality

Bicycles are sensitive to pavement irregularities that may go unnoticed by the motorist, partly because bicycle tires are smaller and partly because the bicycle is usually traveling near the edge of the road where cracks, debris, storm grates and pavement unravelling are common. The quality of the road surface will have a significant impact on usage of a facility. Ride quality as well as tire damage can be involved. High surface quality is an essential part of the bikeway design.

Attractiveness

Given the close interaction between the cyclist and the environment, the attractiveness of that environment should be evaluated. This quality has two imports:

- The utilitarian cyclist considers attractiveness nice so long as it coincides with the directness of the trip. In contrast, the recreational cyclist will tend to seek out attractive bikeways. Attractiveness primarily concerns view, sound and smell.
- Elements related to attractiveness such as air quality, noise levels and truck traffic can be quantified. Elements that must be evaluated but cannot be quantified may include imageability.

Imageability

A route that employs clearly defined major streets has this quality. Bikeway markers, destination signs and descriptive route maps improve the imageability of the route, which is a subjective criterion enhancing a bikeway rather than a standard.

Air Quality

Air quality is a potentially important suitability criterion since air pollution has serious implications for persons involved in physical exercise such as bike riding. Exercise increases lung intake of a pollutant and causes irritation to the eyes and muscus membranes. Most irritation is short-lived but can inhibit people from cycling. Sources of localized pollution, especially truck traffic and industrial uses involving chemicals, should be considered in bikeway alignment.

Smog exists as a dispersed area phenomenon and so, while it is an overall health concern, its presence is not meaningful as a criterion for bikeway selection in a given area.

Noise

Traffic noise, particularly that caused by trucks, is more an amenity factor than a safety criterion. But the presence of heavy vehicles discourages bicycling and is definitely a negative factor in the suitability of a bikeway. This is generally not a concern in The Dalles.

Aerodynamic Impact

Aside from the noise impact caused by heavy vehicles, a direct safety concern is the affect the aerodynamic force from these vehicles place on the cyclist. At certain speeds a truck can create enough aerodynamic force to spill a cyclist. Truck traffic traveling at 30-40 mph 2-4 feet away from the cyclist exerts a moderate effect on the cyclist that can be magnified in a crosswind. A truck traveling at 50 mph exerts enough of a side force on a cyclist 4 feet away to spill the cyclist. The same can occur when the truck is traveling 60 mph and the cyclist is up to 6 feet from the truck. When vehicular speeds exceed these tolerance limits a separation should be provided, usually in the form of a buffer strip or physical barrier.

Funding

There are several programs and major sources of bikeway funding that provide all or part of the monies necessary for construction. Refer to *Chapter 4, Implementation*, for a listing of sources.

Competing Uses

Certain aspects of locating a bikeway relate to the non-user public rather than the quality of service to the cyclist:

- Aside from the safety concerns a shared bikeway presents, social conflicts may also exist. The removal of on-street parking or a travel lane may be technically feasible and even desirable from a traffic engineering standpoint, yet be opposed by adjacent businesses or residences. In these situations, the planner may choose to rely on elected officials for decision making after providing them with a studied evaluation of the alternatives.

- Conflict may occur whenever there is a clear difference in apparent lifestyle between the cyclists and the residents whose homes they pass. The conflict may be ethnic, it may be socio-economic, or it may be one of mores. If the planner is aware of this type of conflict, he should attempt to deal with it in the planning process through public participation rather than struggling with adverse reaction when his plans are made public.

- A type of competing use occurs when one agency has responsibility for bicycle planning and another (such as a water or utility district) has responsibility and control over a right-of-way ideal for biking but used for other purposes. Often these other agencies may have no interest in aiding bikeway development and may in fact have sound reasons, such as added maintenance and insurance costs, for opposing bicycle usage of the right-of-way. These situations can be negotiated. The objective should be to maximize the public's benefit rather than that of the specific agency. In these cases, solutions should be investigated as with any other alternative. Any special costs associated with these facilities on the competing right-of-way should be reconciled.

Security

Cyclists or residents may have real or imagined fear of crime generation with the implementation of a bikeway:

- Bicyclists' concerns for security of their persons and property are genuine and well-founded. An obvious response to concern for property is provisions of effective bicycle parking facilities at all destinations. Parking standards are discussed in *Chapter 7: Supplementary Facilities.*
- Personal security of bicyclists is of greater concern. A number of design considerations can help minimize this concern. For instance, a bicycle path passing through a park area would preferably be located in an open meadow rather than a secluded wooded area. An overpass treatment open to view is preferable to an underpass treatment in shadow. When an underpass is necessary, its sight distance properties should allow cyclists to see, prior to entering, if anyone is loitering there.
- The possibility of street crime should not preclude building a bicycle facility, particularly when there appears to be real potential for use. But it is good reason to use prudent judgement in locating and designing the bicycle facility so as to minimize crime potential.

Other Issues

Two aspects of bikeways that were hotly debated until recent years are separated versus on-road facilities, and bicyclist versus pedestrian needs. Two other issues that reappear in every city are on-street car parking versus bike lanes and the perceived carelessness of bicycle riders.

Integration and separation. Proponents of separated facilities cite a more pleasant riding environment and (unsubstantiated) safety benefits, while the on-road facility advocates point out the cheaper costs of on-road bikeways and the need to treat bicycles as legitimate vehicles.

Experience has found that a functional bicycle system involves a variety of facility types that must be integrated with the other modes including pedestrians. No single approach works best for all roads or even all roads of a particular type. Where separated bike paths or lanes are used, it is important is to avoid using them to restrict cyclists from regular streets. The referenced documents reflect this in their application guidelines.

Bicycling and walking. Bicycling and walking (as well as other nonmotorized modes such as wheelchairs and roller skates) often have different participants, needs and facilities. It is important to keep their unique requirements in mind so as to avoid conflicts. In general, though, improving the pedestrian environment also benefits cycling and vice versa. Bicycling and pedestrian concerns are often allied and can be dealt with simultaneously.

For example, sidewalks, by providing pedestrians with safe access, also help reduce bicycle-pedestrian conflicts; adequate crossings of arterials benefit both pedestrians and bicyclists; narrow travel lanes that reduce motor vehicle speed create safer and more pleasant conditions for all nonmotorized modes (providing they have their own space).

Whereas bicycle issues are well addressed in the State Bicycle Plan, one must look harder to find pedestrian-oriented guidelines in Oregon. Ashland, Eugene and Portland have taken the lead in establishing pedestrian-friendly areas. Oregon's Bikeway and Pedestrian Program Office has been rechartered to include pedestrian transportation and is developing pedestrian policies and guidelines.

On-street parking. On-street parking occurs in both residential and commercial areas, especially in older districts that were never designed to handle the number of vehicles in use today. However, the Census Bureau reports that only 10% of households do not have off-street parking, and that only 5% of homeowners and 19% of renters have to use public streets. The resistance to losing on-street parking is often more a matter of convenience and status-quo than necessity.

These kinds of interrelated problems point out the necessity of careful, integrated planning that covers an entire neighborhood, if not the entire city. Solutions that maintain access while creating a pleasant environment can be found. The right of all travelers, including bicyclists and pedestrians, to have safe use of public right-of-ways for transportation should take precedence over motorists' desire to store cars there.

Carelessness. Oregon accident statistics do not indicate that bicyclists are a particularly careless group. The blame for accidents involving bicycles and cars are about evenly divided between bicyclists and motorists. The accidents span all age groups as well. It is important to treat all roadway users equally, both in planning considerations and in law enforcement. This will help overcome cyclist's inferiority complex which prompts erratic behavior, and it will encourage them to obey traffic laws.

Cyclist's behavior will also improve as facility improvements become more widespread. Some of the perceived recklessness of cyclists is a logical response to a traffic system that often does not accommodate them. Narrow outside lanes, intersections designed to expedite only car movement, signals that are not sensitive to bicycles, buildings oriented towards car access, walls of parked cars, and many other aspects of an auto-oriented system cause some cyclists to, reasonably enough, look for shortcuts.

Suitability Formula

The previous discussion may not be of great help to planners and engineers who want objective criteria on which to base decisions. To help provide consistent, bicycle-specific data for an entire road network, a formula (see Table 4)was devised that has been successfully used in Florida and Tennessee (W. Davis and M. Horowitz, *Assessing Roadway Conditions for Bicycle Suitability*, paper presented at Conférence Vélo Mondiale, Montreal, Canada, Sept. 1992).

The formula evaluates the physical characteristics of roadways that affect cycling. By using primarily existing data, it provides a cost-effective way to assess route suitability and to isolate deficiencies.

The Dalles should consider using this formula to categorize its bike routes. The resulting suitability rating index (SRI) should be calibrated by 'handlebar surveys' to suit local conditions. Note that when street conditions change significantly or when a bike route turns onto a different street, a new SRI calculation should begin.

Besides its usefulness to access road conditions, the data can also be transferred to a color-coded map to show the best streets for cycling. This type of suitability map is useful to cyclists in choosing routes.

Table 4. Suitability Rating Index

$$\frac{ADT}{L\bullet 2500} + \frac{S}{35} + \frac{14-W}{2} + PF + LF = SRI$$

where:

ADT	=	average daily traffic
L	=	number of travel lanes
S	=	speed limit (mph)
W	=	outside lane width (feet) (W>14, factor = 0)
PF	=	pavement factors
LF	=	location factors

Pavement Factors:

Cracking	0.50
Patching	0.25
Weathering	0.25
Potholes	0.75
Rough edge	0.75
Curb & gutter	0.25
Rough RR crossing	0.50
Drainage grates	0.75

Location Factors:

Typical Section	
Angle parking	0.75
Parallel parking	0.50
Right-turn lanes	0.25
Physical median	-0.25
Center-turn lane	-0.25
Paved shoulder	-0.75
Roadway alignment	
Severe grades	0.50
Moderate grades	0.25
Frequent curves	0.25
Restricted sight distance	0.50
Roadway environment	
Numerous drives	0.50
Numerous stops	0.75
Industrial land use	0.50
Commercial land use	0.25

BIKEWAY STANDARDS

Oregon Bicycle Plan

- Bicycles are vehicles that use the roads, and facilities must allow bicyclists to act like other vehicles and blend into the traffic flow.
- Oregon bikeway designs are based on AASHTO standards.
- Design applications are detailed in the Oregon Bicycle Plan.
- There are four basic bikeway types: bike path, bike lane, shoulder bikeway, and shared roadway.

Bikeway standards are basic guidelines used for design, construction, signing, and striping purposes. The Oregon Bikeway and Pedestrian Program has developed standards, based on over two decades of experience, for the wide range of urban and rural applications that occur in the state. The standards are based on the *Guide for Development of Bicycle Facilities* (1991), published by the American Association of State Highway and Transportation Officials (AASHTO), to which Oregon contributed many ideas.

The Oregon Bicycle Plan covers many applications for all types of bikeways and situations (summarized in Table 5). It is much more than a. plan, in that it provides comprehensive discussions of design considerations, examples of good and bad practices, a glossary of bicycle terms, and expanded guidelines for separated bike paths, retrofit bike lanes, shoulder widening, interchange areas, maintenance activities, and exceptions to AASHTO standards. It is a valuable reference source for planners, engineers and maintenance personnel.

The Dalles should refer to the Oregon Bicycle Plan—in particular, *Chapter 8: Design Practices and Standards*, *Chapter 9: Signing and Striping*, and *Chapter 10: Operation and Maintenance*.

Table 5. Bikeway types

Bikeway Type	Description	Application	Width
Shared Roadway	Bicyclists share the normal vehicle lanes with motorists	City residental streets and low-traffic rural roads	14-ft desirable 12-ft min. 15-ft max.
Shoulder Bikeway	Smooth, paved shoulder with 4-in. stripe	Highways and minor arterials and collectors	6-ft desirable 4-ft min. uncurbed 5-ft min. curbed
Bike Lane	Preferential lane on roadway with 8-in. stripe, signs and pavement markings	Arterials and collectors as well as other high-volume routes	6-ft desirable 4-ft min. uncurbed 5-ft min. curbed
Bike Path	Separated from roadway by open space or barriers and closed to motorized traffic	Along busy highways, through roadless corridors, and in urban areas with extensive traffic control	Normally two-way 12-ft desirable 10-ft min. 8-ft if one-way

Application to The Dalles

The planning and route studies described earlier provide the information on the corridor, type of bikeway and the anticipated level of service. The majority of the bikeways proposed for The Dalles area are on-road facilities, with the highway or street dictating the geometric design such as alignment, grades and drainage.

There is a wide range of facility improvements which can enhance bicycle transportation in The Dalles. Improvements can be simple and involve minimal design consideration (e.g., changing drainage grate inlets) or they can involve a detailed design (e.g., providing a bicycle path). The controlling feature of the design of every bicycle facility is its location (i.e., whether it is on the roadway or on an independent alignment).

Roadway improvements such as bicycle lanes depend on the roadway's design. On the other hand, bicycle paths such as the Riverfront Trail are located on independent alignments. Consequently, their design depends on many factors, including the performance capabilities of the bicyclist and the bicycle.

Improvements in The Dalles area for motor vehicles through appropriate planning and design can enhance bicycle travel and, in any event should avoid adverse impacts on bicycling. The Dalles' overall goals for transportation improvements should, whenever possible, include the enhancement of bicycling. Public involvement in the form of public meetings or hearings and an ongoing Bicycle Coordinator and Bicycle Advisory Committee will help develop a widely accepted plan.

Design Practices

To varying extents, bicycles will be ridden on all roadways and highways where they are permitted. All new highways, except those where bicyclists will be legally prohibited, should be designed and constructed under the assumption that they will be used by bicyclists. Bicycle-safe design practices, as described in this document, should be followed to avoid the necessity for costly retrofitting. Refer to the Oregon Bicycle Plan for more information, roadway cross-sections, and typical pavement markings.

Because most highways have not been designed with bicycle travel in mind, there are often many ways in which roadways should be improved to more safely accommodate bicycle traffic. Roadway conditions should be examined and, where necessary, safe drainage grates and railroad crossings, smooth pavements, and signals responsive to bicycles should be provided. In addition, the desirability of adding facilities such as bicycle lanes, bicycle routes, shoulder improvements, and wide curb lanes should be considered.

Design Speed

Design speed is a critical factor in providing for adequate horizontal curvature and stopping sight distance; it is also an element in assessing the feasibility of grades. A design speed of 20 mph is desireable for the correlations of bikeway features which provide safe and comfortable cycling. On grades which exceed 7%, a design speed of 30 mph is recommended as a safe minimum. On bikeways with "one-way" climbing grades exceeding +3% it is considered sufficient to use a design speed of 15 mph.

Stopping Sight Distance

Unexpected obstacles on a bikeway such as broken glass, broken pavement or other impediments may cause a cyclist causing to brake or swerve. To safely provide the cyclist with an opportunity to see and react, bicycle stopping sight distances have been studied and criteria compiled (refer to AASHTO Guide).

Generally, there is no problem in attaining adequate stopping sight distances for bicycle lanes because the roadway alignment usually has been designed to accommodate motor vehicle speeds that are equal to or greater than bicycle speeds. There are exceptions, however, especially where on-street parking is permitted. The stopping sight distance factor should be routinely checked in locating bikeways.

Grades

The Dalles area is hilly. A composite of studies establishing the most economical criteria which will meet acceptable energy demands recommends bicycle grades at up to 11% and grade distances up to 2000 ft. Sometimes, ramp and bridge approaches have steeper grades. Acceptable grades in such cases can be adjusted accordingly, but should not exceed 15%.

Drainage Grates

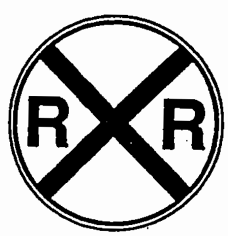
Drainage grate inlets and utility covers are potential problems to bicyclists. When a new roadway is designed, all such grates and covers should be kept out of bicyclists' expected path. On new construction where bicyclists will be permitted, curb inlets should be used wherever possible to completely eliminate exposure of bicyclists to grate inlets. It is important that grates and utility covers be adjusted flush with the surface, including after a roadway is resurfaced.

Parallel bar drainage grate inlets can trap the front wheel of a bicycle causing loss of steering control and, often, the bar spacing is such that they allow narrow bicycle wheels to drop into the grates, resulting in serious damage to the bicycle wheel and frame and/or injury to the bicyclist. These grates should be replaced with bicycle-safe and efficient ones. When this is not immediately possible, consideration should be given to welding steel cross straps or bars perpendicular to the parallel bars to provide a maximum safe opening between straps. This should be considered a temporary correction.

While identifying a grate with a pavement marking, as indicated in the Manual for Uniform Traffic Devices (MUTCD), would be acceptable in most situations, parallel bar grate inlets deserve special attention. Because of the serious consequences of a bicyclist missing the pavement marking in the dark or being forced over such a grate inlet by other traffic, these grates should be physically corrected, as described above, as soon as practicable after they are identified.

Railroad Crossings

Railroad-highway grade crossings should ideally be at a right angle to the rails. The greater the crossing deviates from this ideal crossing angle, the greater is the potential for a bicyclist's front wheel to be trapped in the flangeway. It is also important that the roadway approach be at the same elevation as the rails.



Consideration should be given to the materials of the crossing surface and to the flangeway depth and width. If the crossing angle is less than approximately 45 degrees, consideration should be given to widening the outside lane, shoulder, or bicycle lane to allow bicyclists adequate room to cross the tracks at a right angle. Where this is not possible, commercially available compressible flangeway fillers can enhance bicyclist safety. In some cases, abandoned tracks can be removed. Warning signs and pavement markings should be installed.

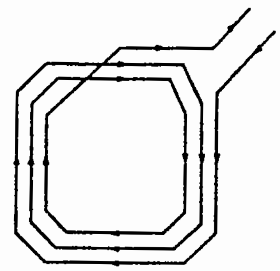
Pavements

Pavement surface irregularities can do more than cause an unpleasant ride. Gaps between pavement slabs or drop-offs at overlays parallel to the direction of travel can trap a bicycle wheel and cause loss of control; holes and bumps can cause bicyclists to swerve into the path of motor vehicle traffic. Thus, to the extent practicable, pavement surfaces should be free of irregularities and the edge of the pavement should be uniform in width. On older pavements it may be necessary to fill joints, adjust utility covers or, in extreme cases, overlay the pavement to make it suitable for bicycling. Tarred and graveled roadways are unsuitable for cycling. The loose gravel is not only extremely unstable for bicyclists but the added danger of passing cars spitting rocks pose a hazard.

Traffic Control Devices

At intersections, bicycles should be considered in the timing of the traffic signal cycle, as well as the traffic detection device. Normally, a bicyclist can cross an intersection under the same signal phasing arrangement as motor vehicles; however, on multi-lane streets special consideration should be given to ensure that short clearance intervals are not used. If necessary, an all-red clearance interval may be used.

To check the clearance interval, a bicyclist's speed of 10 mph and a perception/reaction/braking time of 2.5 seconds should be used. Detectors for traffic-actuated signals should be sensitive to bicycles and should be located in the bicyclist's expected path, including left turn lanes. Where programmed visibility signal heads are used, they should be checked to ensure that they are visible to bicyclists who are properly positioned on the road.



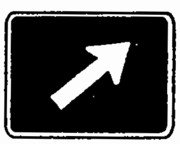
At signal-controlled intersections with high bicycle traffic, it may be desirable to have a staggered stop bar for automobiles where the bike lane stop is several feet in front. This gives bicycles a head start on a green light which makes crossing the intersection easier. Cars are not permitted to turn right on red, which is a good idea at any intersection with substantial pedestrian and bicycle traffic.

It is also desirable to avoid unnecessary stop signs along bike routes. If a stop is deemed necessary to slow down automobile traffic, as is often the case in residential areas or near schools, consideration should be given to employing traffic calming measures instead. There are various roadway designs, such as narrow lanes and restrictors, that slow traffic without stopping it. This also has the advantages of reduced noise and pollution from accelerating cars and of improved traffic flow.

Bike Routes

Signing bike routes was very popular 10 to 20 years ago among cities trying to instantly create a bicycle "system." Unfortunately, there was rarely anything done to improve cycling conditions or to logically connect routes. The signs became counterproductive, telling the cyclist nothing that they did not already know, often leading them onto obscure secondary streets away from destinations, and leading motorists to believe that bicycles did not belong on non-signed streets.

By today's bikeway standards, bike route signs are reserved for situations on shared roadways or shoulder bikeways where a preferred route is not obvious. Two common situations where bike route signs are employed are to lead cyclists on a popular route through a section that is difficult to follow, and to steer cyclists around a section of roadway that is poor for cycling when a better alternate route is close by. In both cases, the purpose is to maintain continuity in the bikeway system.



A bike route is simply an informational designation meant to make bicycle travel easier and in no way restricts bicycles from adjacent steets. The signs work best when accompanied with another sign giving useful information such as the name of the route (if it has one), direction of travel (if there is a change), destination, or distance to destination. Bicycle route signing cannot end at a barrier; information directing the bicyclists around the barrier must be provided.

Bike route signs should be used carefully and should not be a substitute for needed bikeway improvements. Where the bikeway system is developing, as in The Dalles, an interim map showing all proposed routes and their current suitability is useful to cyclists, even when the routes themselves are not signed.

Overall, the decision to provide bicycle routes in and around The Dalles has been based on a determination that it is advisable to encourage bicycle use on a particular road. The roadway width and condition along with factors such as the volume, speed and type of traffic; parking conditions; grade; and sight distance have been considered in determining a feasible bicycle route. Bicycle traffic should not be encouraged on a less direct alternate route unless the favorable factors outweigh the inconvenience to the bicyclist. Roadway improvements, such as safe drainage grates, railroad crossings, smooth pavements, maintenance schedules, and signals responsive to bicycles must always be considered before a roadway is identified as a bicycle route.

Wide Curb Lanes

On highway sections without bicycle lanes, a right lane wider than 12 ft can better accommodate both bicycles and motor vehicles in the same lane and thus is beneficial to both bicyclists and motorists. In many cases where there is a wide curb lane, motorists will not need to change lanes to pass a bicyclist.

Also, more maneuvering room is provided when drivers are exiting from driveways or in areas with limited sight distance. In general, a lane width of 14 ft of usable pavement width is desired. Usable pavement width would normally be from curb face to lane strip, or from edge line to lane stripe, but adjustments need to be made for drainage grates, parking, and longitudinal ridges between pavement and gutter sections. Widths greater than 14 ft can encourage the undesirable operation of two motor vehicles in one lane, especially in urban areas, and consideration should be given to striping as a bicycle lane when wider widths exist.

Shoulders

Wide curb lanes and bicycle lanes are usually preferred over shoulders for use by bicyclists. However, if it is intended that the bicyclists ride on shoulders, smooth paved shoulder surfaces must be provided. Pavement edge lines supplement surface texture in delineating the shoulder from the motor vehicle lanes. Rumble strips can be a deterrent to bicycling on shoulders and their benefits should be weighed against the probability that bicyclists will ride in the motor vehicle lanes to avoid them.

Shoulder width should be a minimum of 4 ft when intended to accommodate bicycle travel. Roads with shoulders less than 4 ft wide normally should not be signed as bikeways. If motor vehicle speeds exceed 35 mph , if the percentage of trucks, buses, and recreational vehicles is high, or if static obstructions exist at the right side, then additional width is desirable. Adding or improving shoulders can often be the best way to accommodate bicyclists in rural areas, and they are also a benefit to motor vehicle traffic. Where funding is limited, adding or improving shoulders on uphill sections first will give slow moving bicyclists needed maneuvering space and decrease conflicts with faster moving motor vehicle traffic.

Bike Lanes

Bike lanes separated by a stripe can be considered when it is desirable to delineate available road space for preferential use by bicyclists and motorists, and to provide for a more predictable movements by each. Bicycle lane markings can increase a bicyclist's confidence that motorists will not stray into their path of travel. Likewise, passing motorists are less likely to swerve to the left out of their lane to avoid bicyclists on their right, thereby improving overall traffic flow.

Bicycle lanes should always be one-way facilities and carry traffic in the same direction as adjacent motor vehicle traffic. Two-way bicycle lanes on one side of the roadway are unacceptable because they promote riding against the flow of motor vehicle traffic. Wrong-way riding is a major cause of bicycle accidents and violates the Rules of the Road stated in the Uniform Vehicle Code. Bicycle lanes on one-way streets should be on the right side of the street, except in areas where a bicycle lane on the left will decrease the number of conflicts (e.g., those caused by heavy bus traffic, awkward intersections, etc.).

Normal bike lane width is 6 ft. Under some conditions, a width as narrow as 4 ft is acceptable on uncurbed roadways and 5 ft on curbed roadways.

Bicycle lanes should always be placed between the parking lane and the motor vehicle lanes. Bicycle lanes between the curb and the parking lane create hazards for bicyclists from opening car doors and poor visibility at intersections and driveways, and they prohibit bicyclists from making left turns; therefore this placement should never be considered.

Where parking is permitted but a parking lane is not provided, the combination lane, intended for both motor vehicle parking and bicycle use, should be a minimum of 12 ft wide. However, if it is likely the combination lane will be used as an additional motor vehicle lane, it is preferable to designate separate parking and bicycle lanes. In both instances, if parking volume is substantial or turnover is high, an additional 1 or 2 ft of width is desirable for safe bicycle operation.

Angled vehicular parking prohibits the location of bicycle lanes. The backing up of vehicles and poor visibility until a vehicle is partially backed out promotes collisions with bicyclists.

Bicyclists do not generally ride near a curb because of the possibility of debris, of hitting a pedal on the curb, of an uneven longitudinal joint, or of a steeper cross-slope. If the longitudinal joint between the gutter pan and the roadway surface is uneven, a minimum of 4 ft should be provided between the joint and the motor vehicle lanes.

For a highway without a curb or gutter, bicycle lanes should be located between the motor vehicle lanes and the roadway shoulders. Bicycle lanes may have a minimum width of 4 ft, where the shoulder can provide additional maneuvering width. A width of 5 ft or greater is preferable; additional widths are desirable where substantial truck traffic is present, where prevailing winds are a factor, on grades, or where motor vehicle speeds exceed 35 mph.

Intersections

For bicycle lanes to work properly at intersections, care must be taken to provide both bicycles and motor vehicles with clear paths through the intersection and for turns according to established Rules of the Road. Bicyclists proceeding straight through and motorists turning right must cross paths. Striping and signing configurations which encourage these crossings in advance of the intersection, in a merging fashion, are preferable to those that force the crossing in the immediate vicinity of the intersection.

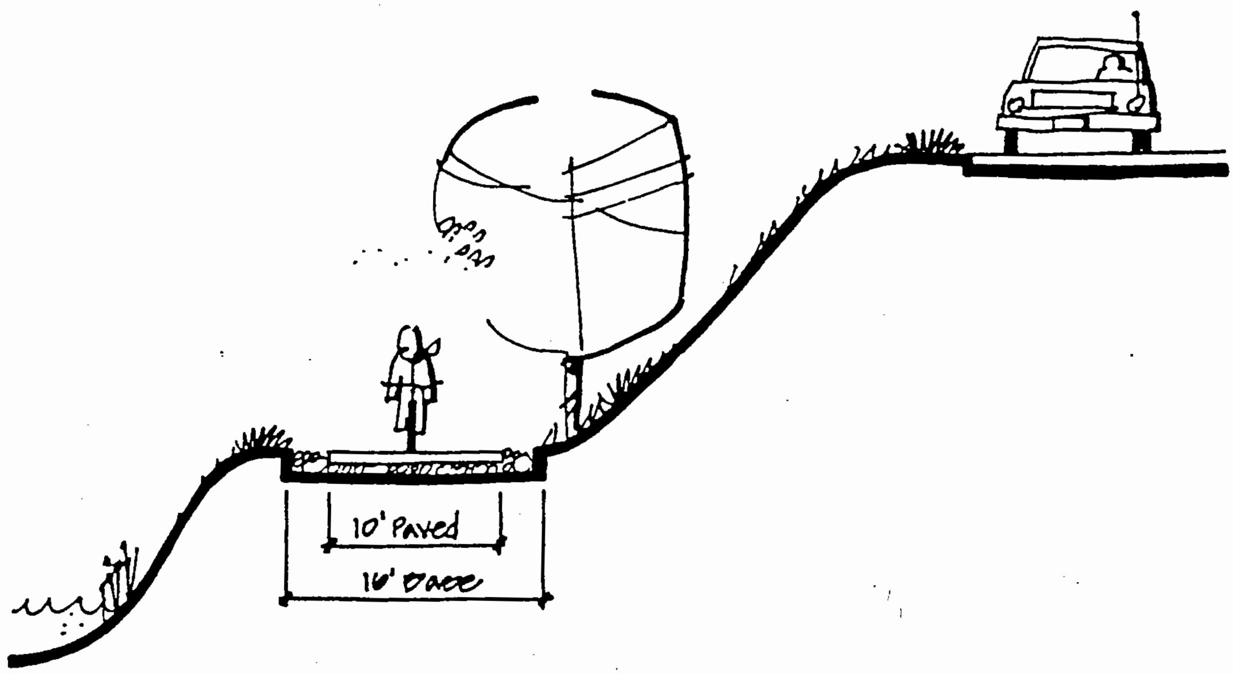
To a lesser extent, the same is true for left-turning bicyclists; however, in this maneuver, the vehicle code allows the bicyclist the option of making either a "vehicular style" left turn (where the bicyclist merges leftward to the same lane used for motor vehicle left turns) or a "pedestrian style" left turn (where the bicyclist proceeds straight through the intersection, turns left at the far side, then proceeds across the intersection again on the cross street). Where there are numerous left-turning bicyclists, a separate turning lane should be considered.

Adequate pavement surface, bicycle-safe grate inlets, safe railroad crossings, and traffic signals responsive to bicycles should always be provided on roadways where bicycle lanes are being designated. Raised pavement markings and raised barriers can cause steering difficulties for bicyclists and should not be used to delineate bicycle lanes.

Bicycle Paths

Bicycle paths are facilities on exclusive rights-of-way and with minimal cross flow by motor vehicles. Bicycle paths can serve a variety of purposes. They can provide a commuting bicyclist with a shortcut through a residential neighborhood (e.g., a connection between two cul-de-sac streets). Located in a park, they can provide an enjoyable recreational opportunity. Bicycle paths can be located along abandoned railroad rights-of-way, the banks of rivers, and other similar areas. Bicycle paths can also provide bicycle access to areas that are otherwise served only by limited-access highways closed to bicycles. The Dalles Riverfront Plan features several bike paths.

Bicycle paths can be thought of as extensions of the highway system that are intended for the exclusive or preferential use of bicycles in much the same way as freeways are intended for the exclusive or preferential use of motor vehicles. There are many similarities between design criteria for bicycle paths and those for highways (e.g., in determining horizontal alignment, sight distance requirements, signing, and markings). On the other hand, some criteria (e.g., horizontal and vertical clearance requirements, grades, and pavement structure) are dictated by operating characteristics of bicycles that are substantially different from those of motor vehicles. The designer should always be conscious of the similarities and the differences between bicycles and motor vehicles and of how these similarities and differences influence the design of bicycle paths.



Bike path design points...

The standard width for a bike path is 10 ft. Do not go below this width—it will come back to haunt you! Because the Riverfront and Creek Trails will attract many different users (walkers, joggers, bicyclists, skaters, baby strollers) 12 ft is recommended.

Clearance should be at least 3-ft (shy distance) on both sides and 10 ft overhead. Adequate sight distances at street crossings should be planned.

Because part of the proposed routes feature shrubs and trees, special care must be taken to protect the path from root damage. A deep aggregate base combined with root barriers where necessary are two recommended methods.

Signing at entrances and street crossings is important. For example:

SUPPLEMENTAL FACILITIES

The motorist benefits not only from roads leading to nearly any destination, but also from extensive signals, parking, signing, and special services. Motoring would not be nearly as popular without these added features.

Likewise, a complete bicycle system incorporates not only bikeways but also parking, commuter facilities, rest areas, and bicycle-oriented signing.

Parking Facilities

Just as omnipresent parking is essential to automobile use, convenient and secure bicycle parking is needed to promote that mode.

Any bicycle trip involves parking. The lack of secure and convenient parking is often the missing link in bicycle facilities and is a great deterrent to bicycle use. It is increasingly common for local governments to require bicycle parking in new developments just as they do for automobile parking (sample ordinances are included in the Appendix).

Bicycle parking falls into two basic categories of user need: commuter (or long term) and convenience (or short term). The minimum needs for each differ in their placement and protection, as shown in Table 7.

A basic guideline for capacity is that bicycle parking should be about 10% of motor vehicle parking. For example, a use that requires 35 motor vehicle parking spaces would require facilities for parking four bikes. Some uses, such as a public library or popular ice cream store, may require a higher ratio of bike parking to motor vehicle parking.

- Bicycles facilities are incomplete without parking, changing areas for commuters, and bicycle-oriented signs.
- Parking should be convenient and secure.

The primary design considerations are:

- Bicycle parking should be convenient and easy to find. Where necessary, a sign should be used to direct users to the parking facility.
- Each bicycle parking space should be at least 2 by 6 ft with a vertical clearance of 7 ft.
- An access aisle of at least 5 ft should be provided in each bicycle parking facility, and the facility should not interfere with the normal pedestrian flow.
- Facilities should be able to accommodate a wide range of bicycle shapes and sizes including tricycles and trailers if used locally. Finally, facilities should be simple to operate. If possible, signs depicting how to operate the facility should be posted.
- Parking facilities should offer security in the form of either a lockable enclosure in which the bicycle can be stored or a rack to which the bicycle can be locked. Structures that require a user-supplied lock should accommodate both cables and a U-shaped locks and should permit the frame and both wheels to be secured (avoid the need for removing the front wheel). Note: businesses may provide long-term, employee parking by allowing access to a secure room within a building, although additional short-term, customer parking may also be required.
- The rack should support the bicycle in a stable position without damage (for example, bent rims are common with racks that only support one wheel).

Table 7. Bicycle parking categories

Commuter (Long-Term) Parking	Convenience (Short-Term) Parking
• Employment areas • Schools and colleges • Multifamily dwellings • Public transit transfer stations	• Shopping centers • Hospitals and health care offices • Libraries and museums • Public service government agencies • Recreation and entertainment areas
• Weather-protected area that is covered and drained. • Securing device that supports the frame or handlebars rather than the wheels only. • Securing device that easily allows bicycles to be locked to it through the frame and both wheels. • Lighting consistent with automobile parking lighting.	• Device that allows the frame and both wheels to be secured by the bicyclist's own lock. • Parking location free of unnecessary conflicts with motor vehicles and pedestrians. • Well-lit location that is as closely situated to the most easily monitored access to an entry in order to reduce theft.
• Security ranks over convenience, although bicycle parking should be at least as conveniently located as automobile parking. • Bicycle parking should not conflict with motorized uses in a dangerous or congested manner.	• Weather-protected bicycle parking is not always necessary or cost effective for the short-term user. • Note that these locations are also a place of employment and should have some long-term parking.

- Long-term parking should be sheltered so that bicycles are not exposed to the sun, rain and snow.
- Care should be given in selecting the location to ensure that bicycles will not be damaged by motor vehicles.

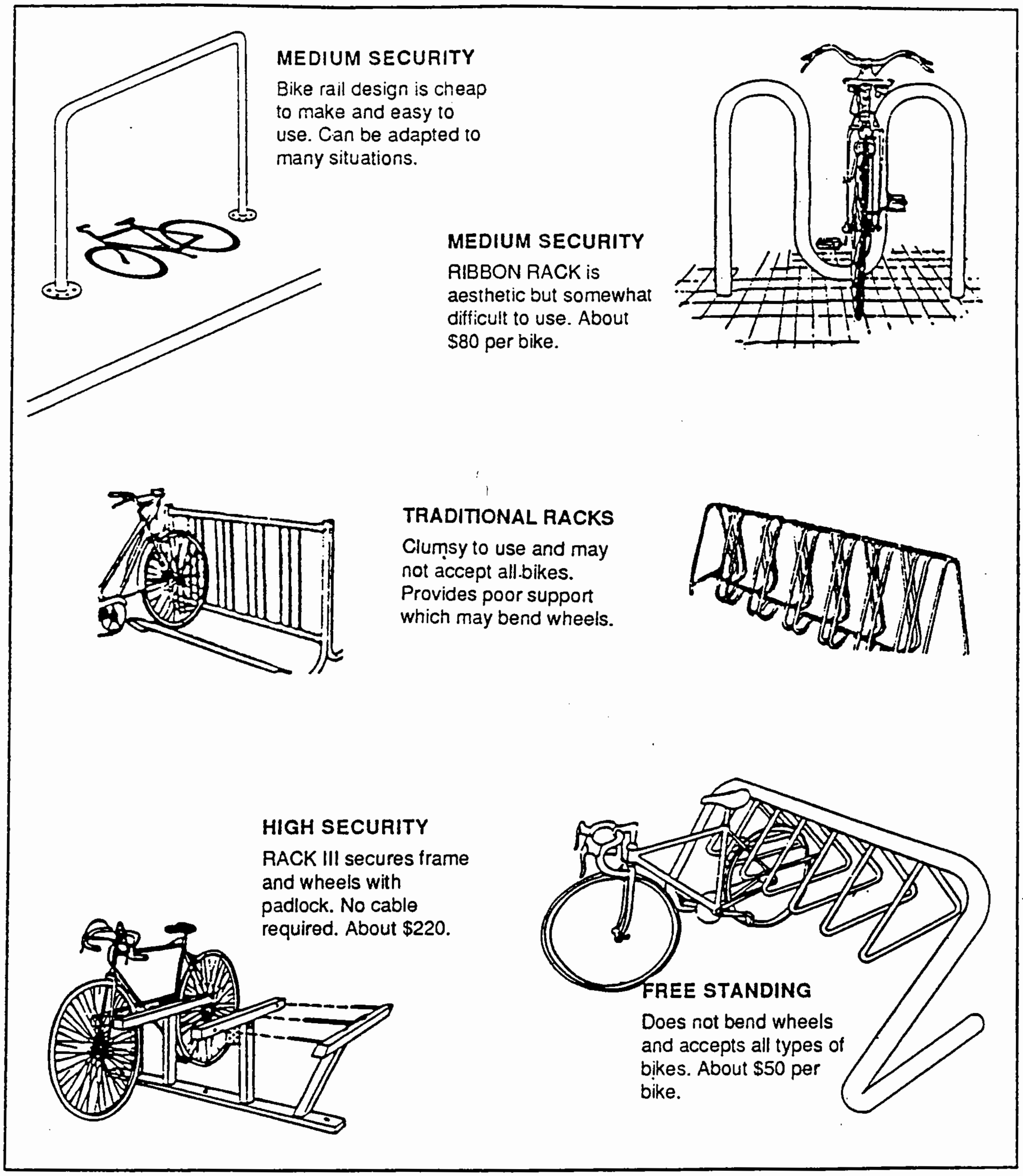
There are many acceptable designs in use throughout the State. Several such designs are shown in Figure 6. Others are noted in *Bicycle Parking Facilities*, Oregon Department of Transportation, Dec. 1992.

Bicycle parking should be provided in all types of new development (both public and private) and for changes in use, and for expansions and other remodeling that increase the required level of automobile parking.

Commuter Facilities

Besides parking, showers and changing rooms at large employers (at least 10,000 square feet and 25 employees) should be required in new construction or major remodelling to promote bicycle commuting. Many employers find that such facilities pay for themselves quickly in increased employee fitness and health, not to mention morale.

Figure 6. Typical bike racks



Signing

Signs serve three basic purposes: regulating usage, directing bicyclists along established routes, and warning them of unexpected conditions.

Because of a cyclist's lower line-of-sight, the bottom of the signs should be about 5 ft above the travel surface. If a secondary sign is mounted below another sign, it should be at least 4 ft above the travel surface. The signs should provide at least 2 ft lateral clearance from the edge of the bikeway. Standards for signing are contained in the Oregon Bicycle Plan and the MUTCD and are summarized below:

- *Regulatory Signs* are used to inform bicyclists, motorists and other users of traffic laws or regulations. Common regulatory signs are: R5-3 (MOTOR VEHICLES PROHIBITED), R1-1 (STOP, 18x18 in.) and R1-2 (YIELD, 24x24x24 in.).

- *Directional Signs* are used to guide bicyclists and other users along a route. The basic sign is D11-1 (BIKE ROUTE) and is used to designate popular or preferred routes along bikeways except for bike lanes which use sign R3-17 (RIGHT LANE, BIKE ONLY). It is placed at the beginning of a designated bike route and after all major intersections (Note: BEGIN and END signs are no longer used with D11-1). Because a bike route designation tells the cyclist that there are advantages to using the bikeway, care should be taken to assure its suitability.

Direction of travel signs are used at junctions and places where the bicycle route differs from the standard motor-vehicle route. Destination and distance information along heavily traveled bicycle routes are useful for orientation and to encourage use, although such signs should not duplicate existing road signs. Signs should be mounted under sign D11-1 and should be no more than 24 in. wide.

- *Warning Signs* are used to inform bicyclists and other users of potentially hazardous conditions such as turns and curves, intersections, stops, hills, slippery surfaces, and railroad tracks. A variety of signs may be used as described in the Oregon Bicycle Plan.

EDUCATION

Introduction

Bicycling means different things to people. Some see it as one answer to the problems besetting our automobile-dominated communities. Others see it as pleasant recreation. Some consider it an annoyance and a dangerous sport. To children, it may be a way to get around until they can drive a car. In some countries, bicycling is simply a part of daily life, little different than eating and sleeping. Education's role is to bring together these disparate views in a way that can promote cycling within the community.

A bicycle system is most evident in its facilities, which are the most visible and expensive element. Indeed, some transportation agencies have felt that their job was finished once the bicycle facilities were provided, and that it is was then up to the people to figure out how to use the facilities. This approach generally works with motorists because they must be a minimum age and pass a competence exam before they can drive. They also have the benefit of an extensive, highly structured road system complete with traffic control and directional devices.

Bicyclists, on the other hand, are practically unregulated, and a would-be cyclist may venture out on the roads with few skills and little judgement. This ignorance, combined with the fact that automobiles are the dominant form of transportation in our society, often keeps people from even considering bicycling as a choice. The result is that fine facilities may be misused or ignored and may even be perceived as unnecessary.

Getting people to use bicycle facilities and to use them safely requires follow-through in various programs that promote awareness,

- Education is necessary for effective and safe use of bicycle facilities.
- Promotion builds support and encourages potential users.
- There are many successful programs to offer guidance.

safety, skills and enforcement. Although these programs might be best handled by private or community groups instead of government agencies, it is important that they be encouraged and supported.

There are numerous strategies for pursuing education including information packages, training courses, commuter programs, special incentives, event sponsorship, and other promotional efforts.

Information Packages

A bicycle information packet is one tool that is easily and cheaply provided by the City. The contents should include a map, suggested routes (both recreational and commuter), local services, contacts, and perhaps riding safety tips. Its purpose is to help bicyclists choose appropriate routes for their skill level, to orient visitors and to encourage first-time riders. The State Bikeway Program Office has samples of both color and black & white maps using preferred symbols and styles.

Training Classes

The existence of good facilities is not enough to get many people out on their bicycles because they are afraid, and those who do ride often endanger themselves and others with unsafe behavior. Potential and unskilled bicyclists need to be shown how to ride safely and easily. Motorists, too, need to be taught how to interact with bicyclists. Numerous training courses and materials have been designed for all age groups, for example:

- Smart Cycling Class for Kids from the Oregon Bicycle Safety Education Program, Salem, OR.
- National Safe Kid's Campaign from the Children's National Medical Center, Washington, D.C.
- Sprocketman series from Bikecentennial, Missoula, MT.
- The Basics of Bicycling (BOBS) from the Bicycle Federation of America, Washington, D.C.
- Street Smarts from Bicycling Magazine, Rodale Press, Emmaus, PA.
- Effective Cycling from the League of American Wheelmen, Washington, D.C.

While some of these courses are highly structured and involve on-bike training, most of the materials can be presented in local school classrooms, the workplace, church, recreation departments, club and community events, skills fairs and rodeos, or at home. Palo Alto, California even has a traffic school for juveniles who violate bicycle laws.

Traffic education should be a regular part of school curriculum. Nationally, we spend about $200 on driver's education for each 16-year-old but only $1 worth of traffic-safety education before age 15.

A few communities have a Traffic Training Officer who visits each first grade class early in September to instill safety guidelines. If no such person is available locally due to budgetary and staffing limitations, a knowledgeable adult cyclist or school teacher could present the same information.

A simple informative brochure, understandable by the elementary school children should be given, such as the pamphlet "Say, you're not from this planet, are you?" available from the State Bicycle Safety Program. Additional information can be sent home to the parents, such as the brochure, "Prevent Bicycle Accidents—A Message for Parents." This is an efficient way to present information to the children and the parents.

Informative brochures and packets also are available to provide good information for school teachers. Additionally, posters are available which can be placed in conspicuous places in the school.

The state has a 20 minute video, "Bicycle Rules for the Road," which reviews state rules, and is ideal for kids ages 6-12, and is often used in connection with a "Bike Rodeo." Also, a video could be produced locally showing local areas, illustrating proper use of lanes, demonstrating intersection conflict and accidents, unpredictable maneuvers by young riders, errors of bicyclists and motorists, improper turning, disobedience at STOP sign or traffic signal, need for nighttime visibility, helmets, etc.

The young teenagers also should have their bicycling etiquette reinforced. A state available video, "Be Safe On Your Bike," is aimed at ages 12-15, and is also good for families, with emphasis placed on anticipating problems, visible hints of problems, and communicating properly with cars and pedestrians.

The state also provides a brochure "Smart Cycling, Class for Kids," which is an instructor's guide in teaching 10 to 12-year olds good cycling skills, including bike handling, traffic awareness and positioning, and safe maneuvers. The highlight of this course in on-bike practice, as well as classroom instruction and exercises. The State Bicycle Safety Program offers instructor training for these courses. As of 1991, 50 people had been trained as instructors in 15 communities.

Each spring in the 1960's, one of the local service clubs held a bicycle rodeo at the Junior High School parking lot where the children received some educational information, had their bicycles checked for proper equipment and safety, and participated in bicycling skill drills. The Oregon Traffic Safety Commission has a brochure describing a "Bike Skills Fair" and how to organize and present such an event. It is typically held on a Saturday or a summer day, directed to kids aged 6 to 12. A pool of 15 organizers and volunteers can guide 30-60 kids through the skills fair in groups of about 10 or 12.

Some areas also have used such an event as an opportunity to stamp the parent's driver's license numbers into the metal on the crank of the children's bicycles as an aid in recovery of lost and stolen bicycles. This seems to be more effective than licensing in returning missing bicycles to their rightful owners. Advertising such a free service tends to increase the attendance at such an event.

Such an event could be organized by the Bicycle Advisory Committee or the Northern Wasco County Parks and Recreation Department, perhaps in conjunction with one of the service clubs. Good media coverage to advertise the event is vital if it is to reach an important segment of the youngsters.

Driver education courses in high school prepare students for driving vehicles safely. Defensive driving lessons learned there in addition to making the students better drivers and decreasing their involvement in accidents, provide an opportunity to emphasize bicycle safety. Many of these students have bicycles and are aware of problems from a bicyclist's point of view. This is the perfect time to encourage new drivers to establish proper, safe driving relationships with bicyclists.

The DMV has a publication, "Oregon Bicyclist's Manual," which tells all the rules both for the cyclists and the motor vehicle drivers riding on Oregon's highways.

Commuter Programs

People need advice on how to commute by bicycle because most of them have never done it and they do not know what it entails. By far the most popular means of getting people to try bicycle commuting are the various bike-to-work events sponsored throughout the country. Many such programs have been designed for beginning commuters and offer much the same information. Some of the better publications are listed below. In Central Oregon, Biking for a Better Community is a good source of information and sponsors a Bike Commute Week in late May to coincide with the Oregon Bike Commute Week and the National Bike Commute Day. In Portland, the Bicycle Transportation Alliance pursues similar events.

Bike Week Guide for Colorado Communities, Colorado Bicycle Program, Colorado Department of Highways, Denver, CO, May 1991.

> Boulder started a bike week in 1982. It progressed from a single-day event to one of the largest in the U.S. By 1991, the project had evolved into a state-wide Bike Week. It is a 7-day series of fun and educational events tailored to each community, with a Wednesday Bike-to-Work-Day being conducted at all locations. The Guide is a tool to help communities produce a Bike Week most beneficial to their citizens. It describes what is needed in the way of organization, skills, volunteers, budget, sponsors and media coverage. Suggested events include celebrity media events (commuting races, relays), rides of various types (century, family, seniors, church), parades, displays and bike-checkup stations.

Bike-to-Work Day Organization Manual, Jessica Denevan, for People Power and the Santa Cruz County Regional Transportation Commission, Santa Cruz, Calif., Feb. 1992. ($4 from County Bicycle Coordinator, 701 Ocean Street, Santa Cruz, CA 95060.)

Santa Cruz built on Boulder's experience in designing their own bike-to-work day which is in its fifth year. Participation grew dramatically and drew about 660 riders last year. The manual lead the reader through how to organize and implement an annual bike-to-work-day. There is much useful information on organization, budget, sponsors, choosing event sites, media, promotion, materials, volunteers, and employer and school participation. One unique aspect in 1991 was the use of bicycle trailers to haul all 3,800 pounds of food to the breakfast sites.

Bike Commute Week Planning Guide, Oregon Bicycle Safety Coordinator, Oregon Department of Transportation, 400 State Library Building, Salem, OR 97310, (503)378-3669.

Tuscon Area Bicycle Commuter Handbook, Alternate Modes Planner, Tucson Department of Transportation, Tucson, AZ, 1989.

Another Way to Work: The Employer's Handbook on Bicycle Commuting in the Delaware Valley, Bicycle Coalition of the Delaware Valley, Philadelphia, PA, 1983.

Bicycles Make Good Business Sense!, Bicycle Program Office, D.C. Department of Public Works, Washington, D.C., 1981.

Special Incentives

Many employers and government agencies have found ways to make it easier to bicycle and to reward those who do. Some tried and true carrot-and-stick techniques are:

- Stipends and Subsidies. The direct approach to encourage bicycling is to pay employees to do it. Stipends of about $25-$30 per month can be effective and have been used in California (for example, the Alza Corporation in Palo Alto pays its employees $1 for each day they ride to work). Reimbursing employees for business travel on bicycles (the City of Palo Alto pays its employees $0.07 per mile for business and travel), as is done for cars, is becoming increasingly common. Employees who commute by bicycle should also be included in any incentive programs offered to those who rideshare.

  The health benefits of cycling have been acknowledged by some employers who include it as part of company-sponsored wellness programs or offer insurance discounts to employees who commute by bicycle regularly. For example, the U.S. Forest Service allows employees to spend part of their working day in aerobic fitness activities that include bicycling.

  Another approach was taken by Emanuel Hospital in Portland that offered employees $4000 to buy homes in the local neighborhood--within walking distance of work. An even more direct subsidy would be to forego parking costs and give the money directly to employees.

- **Flex Time.** Allowing bicyclists to schedule their work day so as to avoid rush hour or darkness encourages some commuters.

- **Bicycles and Maintenance Provided.** Rather than give stipends, some employers have offered to pay for an employee's bicycle after a certain period of riding in regularly or to set up a credit program for its purchase (such as the City of Glendale, Arizona; City of Pasadena, California; and Food 4 Less Supermarkets, Inc. in La Habra, California). Arranging for service at a local shop is another perk. Another incentive that can be arranged by the employer is a special discount at a local bike shop for commuter accessories and clothing; if a bike shop can expect some business to develop, they are often willing to give a discount (locally, Sunnyside Sports in Bend, Oregon offers a 10% discount on commuting accessories).

- **Ride-Home Services.** For companies with a vehicle at their disposal, an offer to take the employee home if the weather turns bad, if they need to work late unexpectedly, or if they become ill can ease the fears of both the employee and the employer about bicycling or walking (such as done by Fleetwood Enterprises Inc. in Riverside, California).
- **Awards and Commendations.** Approval is a powerful incentive. By singling out employees who commute by bicycle or walking, others can be encouraged to try. Competitions can even be arranged between departments. The Jet Propulsion Laboratory Bicycle Club in Pasadena, California has one such program.
- **Company Motor and Nonmotor Pools.** People who occasionally need a car to do their work may still commute by bicycle if their company has a motorpool from which employees can reserve a vehicle a day ahead (for example, David Evans and Associates in Bend, Oregon). In fact, some cities (Ashland, Oregon and Seattle, Washington) have discovered that city-furnished bicycles are actually a more efficient and healthy way to conduct business such as road and building inspections. Numerous police departments have also added bicycles to their rolling stock.
- **Relaxed Dress Code.** Some offices have formal or informal dress codes that are not entirely compatible with a commuting bicyclist or walker. For example, wrinkle-free fabrics, comfortable shoes and minimum makeup should be approved.

Event Sponsorship

Rides are an excellent way to introduce people to bicycling. These can be easy, neighborhood rides for the family or longer distance tours for people wanting a challenge. The atmosphere should be friendly and supportive, with plenty of help and information available. Refreshments and even door prizes add to the festivities. Once they try it, many people get hooked on cycling for life. A local bicycle club or shop can help in staging events.

Promoting Bicycling

A clear understanding of transportation issues is fundamental to accepting the bicycle on the roads. Transportation planning has been so dominated by the automobile the past several decades that the basic needs of people—access, mobility, and low cost—are often overlooked. It is important to present all sides of the transportation equation:

- *Access* has become a prominent issued with the disabled, but the inability to reach many destinations is also a problem for the able-bodied public. Lack of sidewalks and bike lanes, building entrances across parking lots, drive-throughs, no stopping for right turns, and many other street features make access by means other than automobiles difficult.
- *Mobility* is what transportation planning is all about—moving people. The present system is so focused on moving automobiles that the half of the population which does not own a car (and the 10 percent that does not even have access to one) is left out of the planning. Many who do not drive become dependent on those who do, which ties people into a chauffeur role, generates more car trips, and limits personal options.

- *Low cost* transportation is a basic community need. Superior automobile access and mobility are beneficial, up to a point, for those who can afford it. But as moving people around becomes too expensive, discrimination occurs, the community's resources are taxed, and prosperity suffers. By all accounts, the line of reasonable cost has been passed. That this issue is not addressed more often is because few communities keep tack of the costs.

The cost of transportation bears closer examination. Perhaps the most overlooked aspect of transportation planning is automotive subsidies. Few people consider more than the costs of car ownership and operation, estimated by the American Automobile Association to be $3583 to $7505 per vehicle per year in 1991.

However, the costs to the community are rarely considered: direct costs (road construction, maintenance, and police and emergency services) and indirect costs (land consumption for parking and automobile-related activities, property damage, medical costs due to automobile pollution, and the oil subsidy) which amount to about $500 annually per vehicle. (Ref.: Mark E. Hanson, *Automobile Subsides and Land Use*, Journal of the American Planning Association, Vol. 58, No. 1, Winter 1992.)

Only a fraction of the direct costs are paid for out of user taxes and fees, the remaining coming from the general fund. This represents a considerable burden on the community, often from 30% to 60% of the local tax levy. The indirect costs are not usually accounted for but have been estimated to be as much as $3100 per capita.

In sum, the automobile is an amazingly expensive way to move people. It is now the single-most expensive consumer item (23% of spending), ranking above even shelter (20%) and food (19%). (Ref.: *Consumer Expenditure Survey*, 1988-89, Bureau of Labor Statistics.)

Many cities have looked towards various user tolls, taxes and fees to cover automotive-related costs, to provide more funds for competing forms of transportation such as bicycles, and to create motivation to change driving habits. Additional taxes and fees upset citizens until they realize the extent to which driving has been subsidized. Indeed, the overall costs of supporting a transportation system can be decreased substantially when trips are shifted to more efficient modes than the automobile.

ENFORCEMENT

Need

State motor vehicle law states: "Every person riding a bicycle or an animal upon a public way is subject to the provisions applicable to and has the same rights and duties as the driver of another vehicle..." (ORS 814.400). There are 32 other statutes pertaining to bicycles listed in the Oregon Bicycle Plan The DMV provides a brochure, "Bicycle Rules of the Road," that tells the rules for riding on Oregon's highways.

It is important to recognize that bicycles are vehicles and need to behave as such on the roadways. Most of the problems relating to bicycles—improper use, poor facilities, safety, etc.—are because someone is not treating them like the vehicles they are.

Law enforcement is a recognized aspect of efficient use of bikeways and of bicycle safety. Typical violations include running stop signs and traffic signals, riding the wrong way on a street, riding at night without light, drunk driving, and turning motorists not yielding to bicyclists. Most bicycle accidents that involve other vehicles are initiated by one of these illegal actions. Frequent violations deteriorate the trust between cyclists and motorists and can contribute to lack of support for bikeways.

Many communities have had difficulty in getting their police to enforce the vehicle code with cyclists (and motorists, too). This is partly due to inadequately trained officers who are not aware of the importance of citing bicyclists. Heavy criminal workloads also interfere and point to the need for more police staff.

Enforcement is not a cure-all for all problems relating to bicycling. However, it reinforces the attitude that bicycles are partners on the road. The long-term effects of consistent enforcement are smoother and more efficient traffic flow with reduced accidents.

- Bicycles are legally vehicles that must follow the same basic rules of the road as automobiles.
- Bicycle infractions are rarely enforced, and automobile infractions may go unpunished due to overworked police.
- It is important to support and fund police enforcement efforts.

Accident Causes

Eugene has a well developed bicycle network and has much experience in coping with numerous cyclists. In Eugene, disobedience at traffic signals cause about 44% of citations, not obeying a STOP sign 32%, and improper turns only 2 percent. Eugene's bicycle accident statistics showed failure to yield right-of-way and running a stop sign or traffic signal were two of the tree most frequent bicyclist errors causing accidents with motor vehicles.

In 1986, State bicycle/motor vehicle accident statistics showed 45% occurred at intersections, 26% were the result of bicycles or motor vehicles entering or leaving roadways at mid-block locations, 13% were caused by wrong-way riding, 8% were caused by the cyclist or motorist turning or swerving, and 8% were from miscellaneous causes. Figures in 1990 were similar. The 1990 report notes several things:

- Most cycling accidents do not involve motor vehicles.
- In bicycle-motor vehicle accidents, the blame is almost equally shared between cyclists and motorists.
- Young cyclists are most often responsible for accidents caused by disregard or ignorance of the law.

Locally, bicycle/vehicle accident statistics from 1985 to May 1991 show 18 injuries and 1 fatality. Of these. 7 were listed as of unknown cause. 2 as failure to yield, 4 as inattention, 1 disobeying stop sign, 1 failure to stop, 1 improper turn, 1 blocked vision, 1 careless driving, and 1 due to alcohol. It would help if these accidents were reported in more detail as those from the state statistics in order to be better able to evaluate and then suggest changes which might improve safety.

Selective enforcement should be emphasized along corridors where frequent bicycle activity or accidents are noted. In The Dalles these should include all of 10th St. from the west end of town to the High School, all of the commercial area of W. 6th St., and downtown.

Support

It is important that the police be encouraged and supported through adequate funding and the establishment of courses to train police in proper bicyclist behavior. Some cities have had success with traffic enforcement, especially in regards to car parking and bicycle violations, by using trainees and bicycle-mounted patrols.

Motivation

It is sometimes difficult for an officer who has been specially trained for police work to regard citing bicycle violators as a high priority item compared to dealing with criminal activities. The normal first reaction is that it is no fun citing kids, especially since contemporary police policy is generally directed toward improving the image of law enforcement with young people.

The task of bicycle safety enforcement can be eased considerably when the police are supported strongly by the community. It is also important to have active safety education programs directed toward bicyclists and motorists. constant engineering efforts geared toward reducing illogical or compromising situations. and coordination with the courts to assure understanding of enforcement goals in the light of judicial prerogatives.

The Oregon Traffic Safety Commission provides a 15 minute video, "Ride on By," for the law enforcement community. The narrator explains in detail why enforcement in the bicycle arena is so important. It helps overcome embarrassment about pulling over cyclists.

It is useful to bridge the gap between token enforcement and a strong effort by conducting a public awareness campaign, followed by a warning phase leading into total enforcement and citations. Newspaper, radio, and school educational programs could all be used effectively. Cities that have tried this technique have found they receive only a small number of complaints when the program is implemented.

Bicycle Equipment

Bicycles are *required* to have a white light visible from the front for a distance of 500 feet at night as well as a red reflector or lighting device or material, big enough and mounted so that it can be seen from all distances up to 600 feet to the rear when directly in front of motor vehicle headlights on low beam. These lighting requirements apply only when riding on a public way from sunset to sunrise or when people or vehicles cannot be clearly seen 500 feet ahead because of darkness or bad weather.

It is also a good idea to wear light-colored, reflective clothing at night. Commonly, most bikes do not have permanent lights as standard equipment and most riders avoid installing one for fear of vandalism. Some riders do carry a flashlight but the majority appear to ride in the dark, especially if the trip is short and made on dark, especially if the trip is short and made on local streets. New lights are small and are designed for quick removal to avoid theft or vandalism.

Nearly all bicycles are equipped originally with rear reflectors. However, wear and tear and oftentimes inferior reflector mountings or impact resistance take their toll. Checking of bicycles at schools found that about one half of the bicycles did not have rear reflectors. This is a dangerous degree of deficiency and parents should take a look at the family bicycles and make corrections as soon as possible.

The use of an annual bike rodeo with a maintenance check as part of the agenda could assist in improving equipment safety. A combination of preventive maintenance, common sense and enforcement should reduce the number of bicycles traveling with deficient equipment in violation of the law.

Bicycle Court

Enforcement presupposes a system of laws and adjudication. The courts are utilized for processing citations of older bicyclists. However, there is a problem with treating young cyclists. Oftentimes the young rider who violates the law requires an additional educational experience as well as a reprimand. The Bicycle Court concept was developed to provide this experience rather than to totally rely on regular traffic citations that are processed in the Municipal or Juvenile Court.

Bicycle Court is not a criminal court, nor a court of record. It is an educational experience for cyclists from 10 to 17 years of age. For children under 10 years old, a letter is sent to the parents explaining the violation and requesting parental assistance to prevent accidents rather than requiring an appearance in Bicycle Court.

The purpose of the Bicycle Court is to impress upon juvenile bicycle operators a proper regard for the rules of the traffic safety and the property of others. It is believed that the experience they receive in connection with appearance before the Bicycle Court will be of real value to them as they grow older and graduate from bicycles to automobiles.

If instituted locally, the judges of the Bicycle Court could be selected from the high school students by faculty and student body representatives based upon scholastic ability and leadership. Typically, three judges take part in each Saturday Court session and they are charged with judging their peers and classmates. Violators appear before the Court and are asked to recount the circumstances of the violation. Judges ask questions and a police officer or police cadet are in attendance to clarify the law relating to the violation.

If the judges determine that the violator is guilty, then an appropriate penalty is dispensed. Typically, these could include obtaining a bicycle license, correcting equipment deficiencies, having parents take away the bicycle for a specified number of days, copying the applicable section of the bicycle ordinance a given number of times, writing an essay on the subject of the violation, or being given a verbal reprimand.

The Bicycle Court appears to have been worthwhile in other localities. Less than 5 percent of the violators make repeat appearances. High school students selected to conduct the Bicycle Court also benefit from the experience by conducting court procedures and being involved with the maturing responsibility of judgment.

Another suggestion from some communities has been to form police bicycle patrols. The belief is expressed that police officers do not and need to be educated to broaden their perspective. It is suggested that this education could best be achieved by officers actually riding a bicycle. It would give bicycle routes more thorough enforcement than is currently available without causing problems in traffic flow.

Police bicyclists can also be effective in patrolling areas with burglary problems since a bicycle is quiet, unobtrusive and offers speed and flexibility not available by patrol cars in certain situations. Two local Oregon cities that have effectively used bicycle patrols are Redmond and Sisters. Seattle, Washington helped make bicycle patrol nationally known.

A bicycle patrol actually might be very useful when the Riverfront Trail is a reality. Patrol cars would have a difficult if not impossible time accessing the trail.

OPERATION AND MAINTENANCE

Maintenance Standards

It often seems easier to plan for and build a project than to maintain it. Yet, without the commitment to maintenance, bikeway projects can be a step backwards. Inevitable accumulations of debris along the road edges as well as surface deterioration renders bikeways unpleasant and dangerous. Unswept shoulders are one of the most common complaints from cyclists. Thick gravel, glass, rough overlays, and cracks force cyclists into the travel lane to find a smooth surface, which causes animosity in motorists who do not understand the dilemma.

A few of The Dalles' roads are in poor condition (see *Chapter 3: Recommendations*). The condition of other roads may vary due to seasonal sanding, flooding, and repair work. A regularly scheduled inspection and maintenance program is essential, and all road work should be performed with an understanding of how it affects cyclists. In particular, the following activities should be stressed.

Sweeping

Some road shoulders, primarily outside the downtown areas, are covered with gravel due to unpaved driveways and sanding of the roads during winter storms. Automobiles tend to sweep the debris into a thick layer on the shoulders.

Sweeping shoulders and bike lanes consistently is probably the single easiest step that can be taken to improve bicycling conditions. Although it may not be cost-effective to sweep every road frequently, several actions can improve the situation:

- Unmaintained bikeways are a major source of rider complaints and create safety problems.
- Regular sweeping of shoulders is the easiest and cheapest thing that can be done to improve cycling conditions.
- Maintainance should be included in the annual bikeway budget.

- Establish a seasonal, area-wide sweeping schedule and sweep high bicycle use areas after each major storm.
- Pave gravel driveways to the road right-of-way. This adds a small cost (about $200 plus material per driveway) to road construction and greatly benefits both bicyclists and residents.
- Publicize a phone number where cyclists can report glass and other hazards for immediate removal.

Vegetation Removal

Trees, shrubs, and other vegetation and their roots encroaching into and under the bikeway cause safety and maintenance problems: loss of clearance, reduced sight distance, debris, and pavement breakup. Pruning, mowing and leaf removal should be part of routine maintenance. New construction should employ 12-in root barriers where necessary.

Oiling and Chip Sealing

Attention should be given to maintaining the full pavement width and not allowing the edges to ravel or deteriorate. Because work that extends partially into the shoulder leave a dangerous, raised ridge, oiling and chip sealing should extend the full width or stop at the shoulder stripe. The preferred chip seal size is 3/8 in. to #10 or smaller for bike lanes and shoulder bikeways. All utility access points, manhole covers, and drainage grates should be raised to match the new surface within 0.75 in. All edges should be feathered to provide a smooth transition from the lane to other surfaces.

Overlays and Patching

Spot maintenance work can degrade bikeways if care is not taken. Where the work is in the bikeway, a smooth surface with feathered edges is important. Ideally, the work should extend the entire width of the bikeway to avoid discontinuities parallel to the bicycle travel. When a grader blade is used, the last pass may leave a rough tire track in the patch, so either a smooth tire should be used or the area should be rolled.

Even work confined to the travel lanes can cause problems because loose asphalt often ends up in the bikeway where it adheres to the existing surface and creates a rough spot. Work should be compacted sufficiently and loose materials should be swept away before they become a problem. Leaving the work of flattening a patch to passing vehicles is dangerous to cyclists.

Widening and Restriping

Improvement and periodic restriping of roads present a excellent opportunity to improve cycling conditions. Bikeways should be resurfaced, as a minimum, to the same width as the existing pavement and, where possible, should be widened to standard.

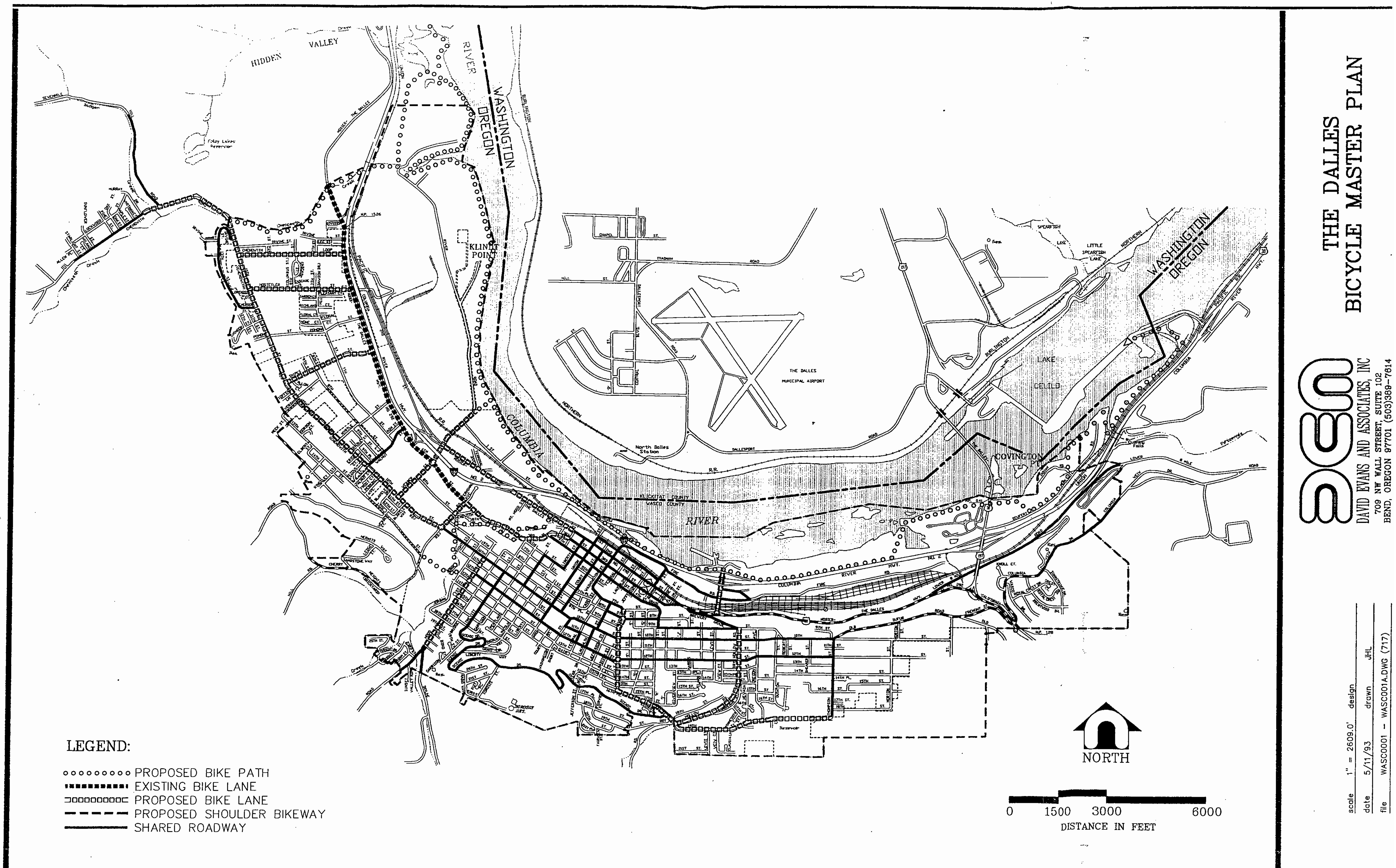
Wide travel lanes can often be restriped to 11 or 12 ft to provide wider shoulders for bicyclists with no loss in automobile safety and movement (indeed, 11-ft lanes in urban areas are now recommended by many authorities to reduce vehicle speed on overdesigned roads). An extra foot in shoulder width can mean a lot to bicyclists' safety and pleasure. Many existing gravel shoulders have sufficient width and base to support shoulder bikeways. Minor excavation and the addition of 3 to 4 in. of asphalt is often all that is required. Care should be taken to avoid a joint at the edge of the existing pavement by feathering the new asphalt or creating a clean saw cut at the transition.

Four-lane arterials and collectors without bike lanes can often benefit from restriping to two lanes with outside bike lanes and a center turn lane. This has proven to increase safety and convenience for all users—motorists, bicyclists and pedestrians—while maintaining vehicle capacity.

Responsibility

The agencies responsible for the control, maintenance, and policing of bicycle facilities should be established prior to construction. The costs involved with the operation and maintenance should be considered and budgeted for when planning a facility. The State dedicates about 7.5 percent of its bicycle budget to maintenance.

Neglected maintenance will render bicycle facilities unrideable, and the facilities will become a liability to the community. Regular inspections should be scheduled. Bicyclists should be encouraged to report bicycle paths and roadways needing maintenance. A central contact person with authority to authorize maintenance work should be designated to receive such reports.



HIDDEN VALLEY
WASHINGTON
OREGON
COLUMBIA
RIVER
KLINDT POINT
THE DALLES MUNICIPAL AIRPORT
North Dalles Station
KLICKITAT COUNTY
WASCO COUNTY
SPEARFISH LAKE
LITTLE SPEARFISH LAKE
LAKE CELILO
COVINGTON PT.
NORTH
0
1500
3000
6000
DISTANCE IN FEET
LEGEND:
PROPOSED BIKE PATH
EXISTING BIKE LANE
PROPOSED BIKE LANE
PROPOSED SHOULDER BIKEWAY
SHARED ROADWAY
THE DALLES
BICYCLE MASTER PLAN
DAVID EVANS AND ASSOCIATES, INC
709 NW WALL STREET, SUITE 102
BEND, OREGON 97701 (503)389-7614
scale 1" = 2609.0' design
date 5/11/93 drawn JHL
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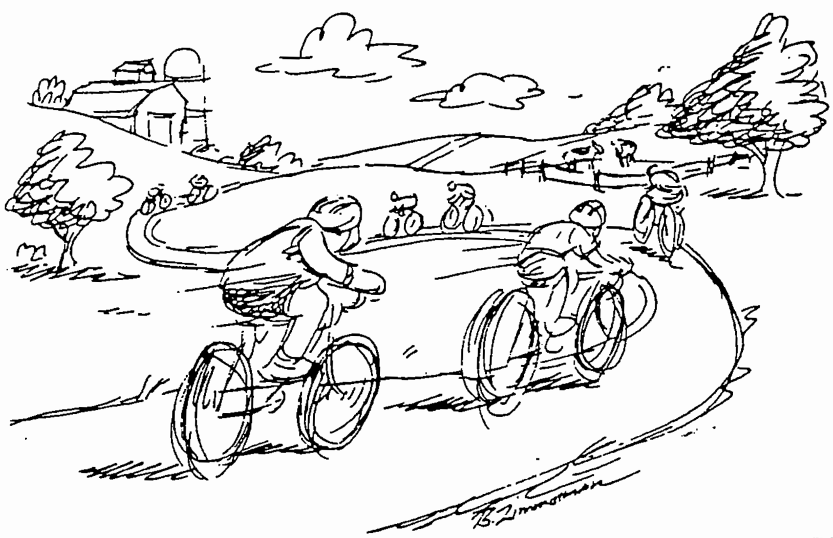
APPENDICES

A - Bike Survey Results

B - Model Bicycle Ordinances

Never doubt that a small group of thoughtful, committed citizens can change the world: Indeed, it's the only thing that ever has.

--Margaret Mead



August 16, 1990
Total Responses 81

BICYCLING SURVEY RESULTS

1. What type(s) of bicycling best describes you?

12	Commuter to/from work
7	Commuter to/from school
66	Recreational
16	Touring
44	Fitness

2. What type of bicycle do you ride?

4	1 speed	41	Mountain Bike
49	multi-geared	4	Other (specify) City bike, BMX 2-speed

3. How many times per week do you ride?

7	1	3	3-4	2	5-7
6	1-2	4	4	1	6
10	2	1	4-5	5	7
74	3	11	5	5	Other ("many", "21")

4. How many miles per week do you ride?
26 0 - 10 38 11 - 50 14 greater than 51

5. Do you feel that signed bike routes throughout The Dalles would be beneficial to riders? 71 Yes 4 No

6. If there were designated bike routes in The Dalles and surrounding area would you ride more often? 56 Yes 12 No

7. What specific barriers or difficulties to bicycling do you encounter?
See page 3.

8. How would you rate the W. 6th Street (west of Webber) bike lane for safety? Scale of 1 - 10. (10 = very dangerous)

2	1	4	6		
7	2	14	7		
6	3	8	8		
6	4	2	9		
17	5	2	10	1	9.56

   a. If you do not feel W. 6th is a safe route, what factors make it unsafe?
   See page 5

9. How safe would W. 6th Street be without a bike lane? (1 - 10 scale used in #8)

0	1	5	6	1	9.6
5	2	7	7	18	10
4	3	1	7-8		
2	4	10	8		
5	5	3	9		

10. How wide should a typical bike lane be along 10th Street west of Cherry Heights?

20 4 1/2 feet   48 6 feet   7 8 feet

11. When choosing a bike route, how important are the following factors in making your route selection?

(Scale: 1 = very important, 2 = important, 3 = considered,
4 = minimal consideration, 5 = not important)

	1	2	3	4	5
Width	20	27	13	9	4
Surface material	23	24	16	5	5
Terrain	15	14	29	8	6
Traffic volume	44	18	11	1	0
Parked cars	14	20	22	14	4
Driveways	4	7	17	30	15

12. Which of the following additional factors help determine your route? (1 - 5 scale used in #11)

	1	2	3	4	5
Safety	39	15	8	1	0
Difficulty of terrain (hills, etc.)	13	17	18	10	4
Directness of route	13	10	20	7	9
Attractiveness	13	13	17	11	6

[Lighting at Night]

13. Your age. See page 6.
14. Your sex See page 6.

7. What specific barriers or difficulties to bicycling do you encounter?

- Motorists whom are not aware of the goings on around them!
- Stop signs/lights - lack of clean, paved shoulder
- Gravel roads, roads without shoulders, bike lanes not kept clean/swept - glass ruins a bike lane.
- Car traffic - road width and surface
- Lack of safe space operating in traffic without established bike lane.
- Other drivers, I think that we should get the same rights as other people in cars.
- Hills - need flat areas for younger riders.
- Lack of local organized activities.
- Traffic - rough roads
- Lack of clean and clear shoulder space, lack of marked and signaled path areas.
- Bad roads, lots of gravel on W 6th bike lane
- Too many hills
- Glass on shoulders, shoulders are poorly maintained, W 3rd bridge is too narrow - sidewalk in poor condition - Kelly is dangerous.
- Rough (gravel road surfaces, glass on roads)
- Lack of highway shoulders. Lack of control over dogs. Drivers not being careful and giving bikes the right-of-way.
- No room for bicycles in downtown.
- Lack of shoulder width, or bike lane.
- Traffic and hills and wind.
- Narrow streets, hills, traffic.
- No bike lanes.
- No bike lanes, roads not wide enough, hills.
- Too narrow streets. Limited bicycle paths
- Too many cars parked, not enough room
- Guard rails
- Traffic, uneven road surfaces
- Slight curbs
- Narrow pavement - cracks, holes. Motorists who don't give any room
- Visibility
- Cross traffic, specifically egress/ingress perpendicular to travel route
- 6th Street Bridge, 6th & Terminal, and 6th & Webber
- Conflicts with cars -- "This road's not big enough for the two of us."
- Lack of designated bike parking downtown where bikes can be locked up.
- Finding good trails
- Traffic right-of-way -- Motorists jump out ahead so I wind up dashing across, in order to get where I need to be. We have to follow same right-of-way as cars!
- Many cyclists and drivers of cars do not know of or abide by bicycling safety rules, so I am always a bit nervous in traffic. Many unknowns.
- Disrespect from motorists, poorly marked bike routes in unsuitable locations.
- Dogs off leashes.

- Parked cars, inattentive drivers.
- Gravel left on streets too long in spring after snow and ice.
- Curbs and obnoxious drivers of cars.
- Narrow streets, roads. Need Columbia View Heights to downtown.
- Theft

4

8. How would you rate the W. 6th Street (west of Webber) bike lane for safety? Scale of 1 - 10. (10 = very dangerous)

   a. If you do not feel W. 6th is a safe route, what factors make it unsafe?

   - Unclean path -- too many driveways!
   - Traffic entering from parking lot accesses looking for cars, not bikes.
   - Traffic is the number one factor.
   - Curb parking & cross traffic.
   - The path is often unswept with glass and gravel along the path.
   - Large gravel on path.
   - Auto traffic crossing lane at whim. Parked car motorists opening car doors into bike lanes.
   - Glass on shoulders, shoulders are poorly maintained.
   - Cross traffic does not watch for bikes; gravel & pot holes; parking in bike lane.
   - Good except for intersections...Webber & 6th especially.
   - Competition with cars.
   - Too much congestion
   - Traffic - turn lane used incorrectly
   - Other riders
   - Too much business traffic from Cascade Square & Fred Meyer -- but it is unavoidable. Bikes should detour around, if necessary.
   - Difference in speed coupled with narrowness of shoulder creates hazard.
   - Too many cars, driveways. Rude drivers -- but usually it's o.k. Confusing lanes at 6th & Webber.
   - Traffic -- no physical bike lane separation.
   - It's a little too narrowed. Needs to be remarked.
   - Too many cars, rude drivers, gravel pits on roadside and on road!
   - Bike lane used by motorists.
   - Make it wider.
   - Not easy to see.
   - Right turn lanes and bike path is confusing.
   - Too much off and on traffic; very commercial.
   - Car traffic: (a) turning to other streets; (b) riding bike between parked cars and traffic.

BICYCLE SURVEY

AGE	MALE	FEMALE
5		
6		
7		
8		
9	1	1
10		
11	2	1
12		1
13	1	
14		
15		
16		
17	2	
18	1	
19	3	1
20		
21	1	1
22		
23		1
24	1	
25	1	1
26	1	
27	2	2
28	2	3
29		
30		
31		
32	1	1
33	3	
34	1	
35	3	1
36	1	
37	3	
38	3	2
39	2	1
40		1
41	1	4
42	3	
43	1	
44	1	1
45	4	
46	1	
47	2	
48	1	
49	1	
50	1	

AGE	MALE	FEMALE
51		
52		
53		
54	1	
55	1	
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		
67	1	
68		
69		
70		

THE DALLES LOCAL STREET MASTER PLAN

ADMINISTRATIVE DRAFT PLAN AND REPORT

Prepared for

THE CITY OF THE DALLES
and
OREGON DEPARTMENT OF TRANSPORTATION
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Executive Summary

Executive Summary

The purpose of this study is to develop a local street master plan and accompanying implementing ordinance language for The Dalles. The plan is a portion of the City's response to the requirements of the Transportation Planning Rule.

The following primary tasks were conducted, with the products from the tasks and subtasks assembled into the contents of this binder:

Task 1: <u>Advisory Committee Formation</u>

An advisory committee of project stakeholders was formed, including elected and appointed representatives from The Dalles, staff from The Dalles and Wasco County, and two local residents with backgrounds in law and real estate.

Task 2: <u>Public Involvement</u>

The stakeholders group met at the outset of the study to review the study's goals and objectives, and provide initial comments, requests and recommendations. A public workshop was conducted.

Task 3: <u>Evaluate and Map Existing Local Street Network</u>

A detailed field evaluation of the existing location, function and condition of the local street system was conducted and mapped. Information used in the evaluation included:

- Improved and unimproved local street right-of-way locations
- Vacant lands
- Areas constrained by existing development, steep slopes, wetlands, or other environmental constraints.

The mapping was developed using ArcView GIS software for compatibility with the City's existing GIS system.

Task 4: <u>Identify and Map Future Local Street Network</u>

Information was gathered from various sources, including other smaller Oregon cities, to review local street standards and develop potential standards for local street connectivity in The Dalles. This information was reviewed in light of the data collected in Task 3 to identify conceptual locations for additional local street connections throughout the City.

ArcView mapping prepared for this task included recommended new local street connections, existing rights-of-way that could be vacated, and unimproved City right-of-way proposed to be retained and improved with future development.

Existing standards for local street connectivity were reviewed and modified as appropriate. Screening criteria identifying conditions under which local street connectivity would not be necessary were developed.

Task 5: **Develop Implementation Tools**

Data was compiled concerning various ways to fund local street construction in Oregon. Proposed revisions and additions to the City's Land Use Development Ordinance were prepared to implement the recommendations in the Local Street Master Plan.

It is recommended that the City carry the Local Street Master Plan forward through the public review and adoption process, to provide a foundation for meeting the City's local street circulation needs.

Existing Local Street System

Existing Local Street System Evaluation

This task evaluated the City of The Dalles' existing local street system and documents data sources used by the Parametrix team to evaluate the local street system. This task is a component of the overall Local Street Master Plan, which is intended to address the City's local street planning needs and the associated State requirements as specified in OAR 660-12-045(e)(b) of the Transportation Planning Rule.

The focus of this task was evaluating the ability of the local street system to serve existing vehicular, bicycle and pedestrian travel. The local street master plan focuses on parcels zoned for residential or commercial development in the east and west ends of the City, which include the most developable land. No attempt was made to define local circulation needs for the industrial area north of I-84, as the industrial area is outside the scope of this project.

Local Street Circulation – Background and Context

Public streets serve a range of access and mobility needs, with facilities typically emphasizing either access or mobility. At one end of the access-mobility spectrum, freeways and expressways focus on mobility by moving high volumes of traffic at high speeds. Arterials and collectors combine mobility and access functions, with arterials generally emphasizing mobility over access and vice-versa for collectors. Local streets make up the majority of lane-miles in a city's transportation network, and function primarily as access routes connecting travel origins and destinations to the broader transportation network.

A well-connected local street network such as the downtown grid in The Dalles diffuses the traffic load by providing multiple connecting routes to any given destination. With increased connectivity, the need to construct ever-wider roadways with associated right-of-way needs and impacts to developed property can be reduced. Routes that are more direct tend to attract more traffic, but multiple connections provide nearby or parallel local routes offering comparable travel time. By spreading traffic around rather than concentrating it on a single route, multiple connections also help avoid excessive noise impacts on adjacent properties.

A well-connected local street system also benefits bicyclists and pedestrians. Shorter travel time and more direct access encourage additional bicycle and pedestrian travel. Multiple connections also offer pedestrians and bicyclists routes with less traffic and fewer potential conflicts with vehicles, creating a more pleasant travel environment.

Development of a Local Street Master Plan is an important step in the implementation of the City's Transportation System Plan (TSP). The City's TSP includes detailed analysis at the collector and arterial level of the transportation network, with recommendations for local street connectivity. The City's TSP includes intersection and roadway levels of service (LOS), descriptive measures based on the level of delay, which are used to describe transportation system's operational performance and indicate the need for improvements. The TSP reports that the City's major roadways and intersections are presently operating at level of service C or above, with no congested locations identified.

Local streets typically do not carry traffic volumes so high that traffic operations are an issue. Direct access and traffic speed are issues typically associated with the local street network, instead of traffic congestion and level of service. Intersection improvements used to address traffic concerns on arterials and collectors, such as traffic signals and turn lanes, are generally not appropriate measures for local streets.

With peak hour operations at level of service C or better, as reported in the City's TSP, it is unlikely that there is any appreciable level of diversion onto local streets created by drivers seeking to avoid congestion on arterial or collector roadways.

The City's draft TSP includes proposed street standards calling for a maximum of 600 feet between street connections, with minimum spacing on collectors and arterials of 75 to 300 feet (minimum spacing on local streets is typically not specifically regulated). These parameters and the evaluation of activity centers create the framework used to evaluate the adequacy of the existing local street network.

Existing Local Street System Characteristics

This section will be accompanied by illustrative maps upon incorporation into the Local Street Master Plan.

The Dalles benefits from a traditional grid system of local streets covering much of the central area of the City. Street spacing varies from 280 to 360 feet in the area bounded by Columbia River Highway on the north, Jordan Street on the west, 14th Street on the south and Mill Creek Market Road on the east. The grid system is not maintained south of 14th Street due to the steep bluff that precludes the construction of the downtown grid system, within existing platted right-of-way, to the northwest. Additionally, the historically platted grid system ends at the original Mission Land Claim line northwest of Mill Creek, arbitrarily cutting off and marking the edge of the grid pattern along this line.

In the east and northwest areas of the City, where there are more large underdeveloped parcels of land, the grid pattern is less consistent. The portion of the City northwest of the central grid (i.e. northwest of Mt. Hood Street), is a narrow area (less than 0.5 miles wide) with two primary land uses. Along the freeway, the area is generally large-scale commercial establishments such as strip malls and grocery stores. The remainder is mostly residential, with a few industrial sites and institutional uses such as churches, schools and playing fields with larger parcels that preclude a tight grid system. W. 6th Street and W. 10th Street are the only two streets that traverse the entire area longitudinally, although W. 7th Street and W. 8th Street traverse most of the length.

Including Terminal Avenue and Chenowith Loop Road, there are seven streets connecting W. 6th Street and W. 10th Street, ranging from about 800 to over 1,400 feet between connections. There are also a number of local streets terminating in a stub with no cul-de-sac or turnaround, particularly between Snipes Street and Hostetler Street. These stub streets range from approximately 400 to 600 feet in length.

From Dry Hollow Road east to US 197, a less dense local street grid system is in place, particularly west of Morton Street. While east/west local streets in this area generally conform to the City's draft street spacing guidelines, the number of north/south local street connections decreases with increasing distance east from the downtown grid. There are a number of larger parcels in this area with the potential to be subdivided in the future. A local street plan will provide a valuable tool for the review and approval of future development applications in this area.

In the higher southern portion of the City, south of the bluff, there has been no attempt made to maintain a traditional grid network. The local streets in this area are patterned after typical post-war residential subdivision development, with looping, curvilinear streets and more frequent cul-de-sacs.

Existing destinations throughout the City, such as schools, parks and shopping areas, were assessed to determine the need for and adequacy of local street access. Recommended new local street connections to serve these activity centers will be included in a subsequent technical memorandum. This section summarizes the destination locations in the framework of the existing local street network.

Evaluation of Unused Right-of-Way

This task of the Local Street Master Plan included an evaluation of existing platted but undeveloped local street right-of-way parcels. This evaluation is useful in determining potential vacation of specific segments and returning of land to the adjoining property owners. The City has faced a number of recent requests to vacate portions of platted local street right-of-way to provide developers or homeowners greater flexibility in designing subdivision layouts or single family home expansion plans. Lacking a local street plan, staff and policy makers have struggled with these requests.

The consultant team approached this task with a philosophy that existing right-of-way that could potentially serve local circulation functions in the future should be retained, and that candidates for vacation should be limited to segments which were either extraneous "slivers" or extensions of the City's grid system that would likely never be built due to topography, or the presence of rock formations, existing structures or land uses. None of the alleys in the City's existing grid that are already constructed are proposed to be vacated, as these alleys provide excellent alternative routes for pedestrians and bicyclists. The platted alleyways and streets in the cemetery west of Mill Creek are proposed for vacation, with the exception of the W. 13th Street right-of-way running through the cemetery. In addition, a few other segments with steep slopes or zoning constraints are recommended to be retained as public right-of-way to provide non-vehicular connections.

The mapping for the Local Street Master Plan includes locations where existing right-of-way is proposed to be vacated. These locations are briefly described below:

1. The cemetery between Cherry Heights Road and the creek adjacent to Jordan Street includes platted right-of-way, which is an historical extension of the downtown grid system. All right-of-way in the cemetery is proposed to be vacated, with the exception of W. 13th Street, which is proposed to be retained as a non-vehicular connection across the creek.
2. Adjacent to the intersection of Scenic Drive with Lincoln Street, there is unneeded right-of-way along the W. 17th Street alignment between Garrison Street and Pentland Street, and on Pentland Street between W. 16th Street and W. 17th Street.
3. Along Washington Street from E. 8th Place to the alleyway between W. 9th Street and W. 10th Street, where there is a small park and a rock outcrop.
4. At the northwest quadrant of the Scenic Drive/Terrace Drive intersection there is a sliver of unneeded right-of-way adjacent to Scenic Drive.
5. Along Jefferson Street between N. Terrace and E. Terrace, where the right-of-way crosses the bluff at the south side of the City and slope is estimated to be greater than 20%.
6. Adjacent to South Dufur Highway approximately 500 feet east of Thompson Street, where there is a small sliver of unneeded right-of-way adjacent to the roadway.

Data Sources

The primary data sources used to evaluate the City's local street network were the City's GIS base map and digitized ortho-photography files from the 1995 aerial photographs. USGS topographical maps were obtained and evaluated to identify areas with steep slopes or other topographical constraints. Information in the digital mapping and USGS topographic maps was verified in the field.

Local activity centers serving as trip destination points were identified using the City's digital GIS maps, printed street maps, USGS maps and digitized aerial photographs. Destinations identified include the hospital, various elementary and secondary schools, Columbia Gorge Community College, churches, athletic fields, parks and other recreational amenities, and the commercial shopping facilities area between W. 7th Street and I-84 in the northwest area of the City.

With only a few exceptions, multiple connecting streets adequately serve these trip attractors. The hospital is served primarily by a single access at Oregon Avenue. Additional access is desirable, and is addressed by proposed revisions to the City street network presented in the Local Street Network Plan. Additional connections to the hospital will involve utilizing existing un-built right-of-way as well as securing additional right-of-way in the vicinity of the athletic fields to the east of the hospital. The athletic fields near the hospital also have less than desirable access (Thompson Street is the only public street access). The shopping area north of W. 7th Street is served primarily by commercial driveways, with few public streets. Additional local public street access proposed in the Local Street Master Plan would benefit these attractors.

City staff also served as an important data source. Following review of the draft maps prepared by the consultant team, staff furnished comments and additional information about specific street links in the system. Staff identified unique circumstances for certain locations with platted right-of-way where streets normally would not be considered feasible. For example, rock outcroppings could be seen in some areas of the City on the aerial ortho photo files. The rock outcroppings were generally considered to be areas where local streets would not be constructed due to the prohibitive costs. However, staff knew of one rock bluff with platted right-of-way that may be leveled by the property owner to provide fill material for another nearby parcel of land.

The Dalles **Residential Street Standards** Matrix

Residential Street Type	**Volume (Ave. Daily Trips)**	**Speed (MPH)**	**Street Width (Feet)**	**Sidewalk/ Planter Strip (Includes Curb)**	**ROW (Feet)**
Alley		15	18 (no parking)	None	20-25
Lane (limited to 16 or fewer lots and/or 440 linear feet)	0-150	20	28 (8+12+8 non-striped)	11 feet each side	50
Neighborhood Street (requires traffic study)	150-500	25	32 (8+16+8 non-striped)	11 feet each side	54
Residential Street	500-1,000	25	36 (8+10+10+8 striped)	11 feet each side	58
Minor Collector (Residential)	1,000-3,000	25-30	38-40 (8+11/12+11/12+8 striped)	12.5 feet each side	64
Private Road			20 (no parking)	11 feet each side	42

Existing Constraints to Additional Local Street Connections

Constraints to additional local street connections were identified and analyzed as a component of The Dalles' Local Street Master Plan. This technical memorandum summarizes the data sources, analysis and results of the evaluation of constraints. In conformance with applicable sections of the Transportation Planning Rule, OAR 660-12-045(3)(b)(E)(i) through OAR 660-12-045(3)(b)(E)(iii), the evaluation focused on physical conditions making it unreasonable to provide new local street connections. These conditions include major transportation facilities, steep slopes, bodies of water or wetlands and existing buildings. Zoning constraints also were evaluated. The Local Street Master Plan focuses on areas zoned for residential and commercial use. Other zoning types (e.g. recreational and industrial) were considered to be constraints for new local streets. The constrained areas described below are illustrated in maps included in the Local Street Master Plan.

Data Sources and Application

This section summarizes the data sources used to identify constraints for the local street system in The Dalles. In addition to the City's Land Use Development Ordinance (LUDO), GIS database, digitized aerial photographs and Zoning Map, USGS digitized contour maps were reviewed. Analysis of these data sources was supplemented by field investigations.

City LUDO Requirements

The City recently adopted a revised Land Use Development Ordinance (LUDO). Section 10.060.F.2 of the new LUDO calls for a 12 percent maximum grade for local streets. This is a conservative standard in comparison with the American Association of Highway and Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets*. The widely used AASHTO reference identifies a maximum slope of 15 percent for local residential streets. Section 10.060.F of the City's LUDO allows the City Engineer to grant exceptions to the City's LUDO standards upon request where "topographical conditions present special circumstances," and "provided the safety and capacity of the street network is not adversely effected."

Based on qualitative field review, it appears that the areas where new local street connections are recommended would generally meet the City's 12% maximum slope requirement. In cases where the slope of a proposed new local street would exceed 12%, an assessment of safety and capacity would be necessary to meet the City's LUDO requirements.

GIS Database

The City's GIS database includes a steep slope layer. This qualitative layer was used as an indicator of slopes potentially in excess of the LUDO maximum 12% grade for local streets. While slopes were not measured, field visits were used to assess the feasibility of constructing additional local streets within the steep slope areas. The proposed new local street connections reflect the results of the field checks. Proposed local street alignments in these areas would undergo further review as part of the design review process.

The GIS database includes a symbol layer indicating rock outcrop locations. The added cost of constructing local streets through rock outcrops was assumed to be prohibitive. The only rock outcrops within the City limits appear in the southeast portion of the City, specifically the area bounded by E. 14th Street on the north, E. 18th Street on the south, Morton Street E. on the east and Richmond Street E. on the west. One new north/south local street is proposed in this area. There is an existing east/west right-of-way midway between E. 14th Street and E. 18th Street, which should be maintained. This right-of-way could provide a future non-vehicular connection if analysis in connection with a development proposal determines that the rock outcrop would prevent construction of a street.

Digitized Aerial Photography

Potential built environment constraints were identified with the City's recent digitized aerial photographs. The general locations for new local streets identified in the Local Street Master Plan avoid impacting existing buildings. Many of the proposed connections, particularly in the east end of the City, run through parcels currently occupied by one single-family residence. New local streets in these locations generally would be built as part of infill and redevelopment activities. The Local Street Master Plan is meant to guide future local street network improvements, not to disrupt existing residences and homeowners.

The digitized aerials were used to verify the location of schools, parks and other activity centers identified in the GIS system where additional access would be beneficial, and to identify athletic facilities, schools, churches and other large parcels of land where local streets would disrupt existing uses.

City Zoning Map

In conformance with the State Transportation Planning Rule (OAR 660-12-045(3)(b)), the Local Street Master Plan focuses on the City's residential and commercial areas. Based on the City's May 11, 1998 Zoning Map, the entire area north of I-84 was excluded from the Local Street Master Plan. Except for one General Commercial (GC) area on the north side of I-84 at the interchange with US 197, the area north of I-84 is zoned Industrial (I), Commercial/Light Industrial (CLI), Recreational Commercial (CR) and Parks & Open Space (P/OS).

A narrow strip of land zoned for Industrial use is located south of I-84 between the freeway and the Union Pacific Railroad, extending from W. Second Street on the west to approximately 2,000 feet east of the U.S. 197 interchange. Another narrow strip of Commercial/Light Industrial land (C/LI) approximately 4,200 feet long by 200 feet deep exists between Old Dufur Road and Columbia Highway. These two parcels as well as parcels zoned for Parks and Open Space use were excluded from evaluation.

USGS Topographic Data

Available topographic data from the United States Geographical Survey (USGS) was limited to 40-foot and 100-foot contour interval. Their use was limited to confirming the areas identified as steep slopes in the City's GIS database.

Summary of Constrained Areas

Based on the data sources described above, five general areas in the City have steep slopes that limit the ability to provide new local streets conforming to the 15% maximum slope. As illustrated in the Local Street Master Plan Street Constraints Map, these areas include the following:

1. The northwest area of the City along the western city limits. No new local street connections are proposed through this area, because they would cross the Urban Growth Boundary and the incorporated area of the City.
2. Between Jordan Street and Cherry Heights Road. This area includes steep slopes well in excess of 15% on either side of a stream corridor. A cemetery is located along the west side of the stream. Although no new local street connections are proposed through this area, it is recommended that the existing right-of-way running from W. 13th Street to the streambed from W. 13th Street be extended to intersect Cherry Heights Road to maintain the ability to provide a future pedestrian walkway connection.
3. Along the north side of Scenic Drive from Washington Street to Terrace Drive, and from Jefferson Street to Esther Way. This narrow strip is extremely steep, and additional local street connections would not be practical. Terrace Drive provides an existing local street connection, and additional connections are recommended immediately to the west between Liberty Street and Washington Street.
4. Immediately south of Columbia River Highway (US 30), from about 1,000 feet west of the eastern City limits to Dry Hollow Road. The area is steep, narrow (generally less than 300 feet wide) and zoned primarily for non-residential uses.

5. Along the southern City limits between Thompson Street and N.E. Lambert Street. While most of this area is outside both the Scenic Area Boundary and the Urban Growth Boundary (UGB), the portion between N. Richard Street and N.E. Lambert Street lies within the City limits. New local streets are proposed within the City limits adjacent to the steep slope area.

The following smaller areas also were identified as infeasible for new local street connections due to steep slopes:

1. Between W. 10th Street, W. 13th Street and Emerson Street W.
2. The area bounded by W. 10th Street and W. 13th Street between Gordon Court and Eric Court.
3. The rock-covered area at the intersection of W. 9th Street with Washington Street.
4. The area between 4th Street and E. 7th Street to the east of Federal Street.
5. The area bounded by Scenic Drive, E. 18th Street, Ester Way and Tarrace Drive.
6. North of Dry Hollow Road along the unimproved E. 18th Street right-of-way.
7. The southwest quadrant of the area bounded by Morton Street on the west, the unimproved E. 14th Street right-of-way on the north, Richmond Street E. on the east, and the unimproved E. 18th Street right-of-way on the south.

The accompanying map in the Local Streets Master Plan identifies the areas described in this summary, where additional local streets would be of limited value or impractical due to excessive cost and marginal benefit. The Local Streets Master Plan illustrates areas where staff would not need to require additional local streets, but it is not meant to prohibit local streets in these areas. Parcel ownership and land use may change, even on large parcels with established uses.

The Local Street Master Plan illustrates locations where additional streets serve a functional role given existing and reasonably foreseeable conditions. Like the City's overall Comprehensive Plan, the Local Street Master Plan is intended to be a fluid document. Periodic updates will be necessary to maintain its usefulness to city policy makers, staff, property owners and residents.

Future Local Street System

Screening Criteria

This section addresses potential screening criteria to identify areas where additional local street connections are unnecessary.

Context and Existing Ordinance Provisions

Adoption of the Transportation Planning Rule (TPR) formalized the transportation planning process for local jurisdictions in Oregon by requiring a local street plan to be developed as part of the transportation system plan (TSP). A local street plan typically includes quantitative standards for street spacing, or performance criteria specifying how frequently local street connections should to be provided. Street connectivity criteria also need to specify when a street connection is not necessary, which is the topic of this section. This section proposes criteria for exceptions from street connectivity requirements in The Dalles, and links the criteria to the appropriate elements of the City's Land Use Development Ordinance (LUDO). The proposed criteria were developed following review of the City's existing LUDO, ordinance language from other jurisdictions including the cities of Springfield, Eugene and Roseburg, TPR implementation guidelines from ODOT Region 3, and model ordinance materials from ODOT's Transportation Development Branch.

The Dalles LUDO already contains several provisions relating to local streets. The local street master plan is intended to increase both route and modal options on local streets, by increasing the number of local street connections in the City. There are many advantages associated with increased local street connectivity, while disadvantages are generally narrowly defined. For example, with a well-connected network of local streets there are fewer lots on cul-de-sacs. This perceived disadvantage applies only to potential residents of cul-de-sacs, while the benefits apply area wide. A sample of the advantages of increased local street connectivity include the following:

- *Reduced right-of-way needs and associated property impacts.* With more local street connections there are more streets to handle a given traffic load, meaning narrower streets can be used and still meet traffic and emergency vehicle access needs.
- *Reduced impervious surface.* This is a direct result of the ability to use narrower street widths.
- *Improved access for emergency vehicles.* A typical grid street pattern reduces the chance of emergency vehicles being cut off from their destination, because there are multiple ways to access a given location.
- *Reduced out of direction travel*. A well-connected local street network offers more direct routes to a wider range of destinations. Bicycle and pedestrian travel is enhanced with reduced out-of-direction travel.

- *Utility corridors are more efficient.* With a well-connected local street system there is less need to cut through residential properties to connect utility lines, which can instead follow the street.

Local street connectivity is addressed in three sections of the City's existing LUDO: Section 6.050, Access Management, Section 9.020, Land Division Standards, and Section 10.060, Street Improvements Required with Development. Specific code provisions and their relevance for the local street master plan are summarized below.

Section 6.050: Access Management

Article 6.050.030.B provides a framework for local street connectivity by requiring the street system of proposed development to be "designed to coordinate with existing, proposed, and planned streets outside the development," and allowing the approving authority to require public streets through a development site "to provide for the logical extension of an existing street network." The coordination referred to is detailed in Section 9.020, as described below.

Section 9.020.020.B: Blocks

This subsection of the Land Division Standards contains the city's existing connectivity standards. Block lengths on local streets are to be a minimum of 200 feet and maximum of 600 feet, unless topography or the location of existing adjoining streets justifies an exception. Blocks longer than 450 feet require a pedestrian/bicycle pathway at least 10 feet in width to be located near the middle of the block and established by right-of-way.

The exception process to allow block lengths less than or greater than the above requirements follow the access spacing variation justification in LUDO section 6.050.050, *Exceptions to Standards*, substituting block size for separation distance. However, section 6.050.050 specifically addresses access spacing, not block length, and it is unclear how the language would be applied to requests for block lengths <u>longer</u> than the maximum. The 600-foot maximum block length would result in frequent need for exceptions outside of the downtown area due to existing street patterns. It would appear that the existing exception language could <u>encourage</u> longer block lengths, because safety concerns associated with closely spaced access points (sight distance, stopping distance, left turn conflicts, etc.) would be reduced by making blocks longer. The amended LUDO language proposed in this memorandum is tailored directly to local street block sizes and connectivity.

Section 10.060: Street Requirements

Subsection E details the street system coordination referred to in Section 6.050.050 between new development and existing, planned and proposed development. New development is required to provide street stubs extending to abutting un-platted properties. Preferred design measures to minimize through traffic on local streets are listed, and include four-way stops, ‘T’ intersections, roundabouts and traffic calming measures.

Subsection J identifies a maximum 12% grade for local streets. Many jurisdictions allow greater local street grades; however, with the harsh winter climate along the Columbia Gorge frequently resulting in icy conditions on local roadways, a 12% maximum slope is appropriate for The Dalles.

Proposed Implementation Code Changes

Proposed changes to the City’s Land Use Development Ordinance to implement the material included in this section are included later in this document. The proposed changes strengthen requirements for local street connectivity, restrict the ability to construct private streets in lieu of public streets, and clarify when exceptions to connectivity requirements are allowed.

Performance Standards

This section reviews local street standards in The Dalles’ existing Land Use Development Ordinance (LUDO), including connectivity and street cross-sections. The City’s standards are compared to standards in other Oregon cities and TPR implementation policy guidelines prepared for ODOT and DLCD[1]. Revisions to local street connectivity standards and associated LUDO sections are proposed. As used in this document, performance criteria refer to the number of street connections necessary in a given distance. Standards refer to defined minimum and maximum allowable distances between street connections, and to street cross-section elements including pavement width.

Review of Existing LUDO

The City’s current LUDO includes low minimum and maximum dimensions for local street blocks (Section 9.020.020.2.a), in keeping with the pattern of small blocks extending outward from the traditional downtown grid. Street connectivity requirements for new development are addressed in the LUDO Section 10.060.E. Blocks within the central business district must be 300 feet by 220 feet, consistent with the historical platted street pattern. Local streets outside the CBD must be between 200 and 600 feet in width (depth), and between 300 and 600 feet in length. A midpoint pedestrian/bicycle throughway at least 10 feet wide is required if the block exceeds 450 feet in length or width. The requirement for pedestrian/bicycle pathways provides an additional benefit for non-motorized travelers. With block faces required to be 600 feet or less, the maximum distance to a connecting street would be no more than 1200 feet, or slightly less than the ¼ mile threshold frequently used in urban transportation planning as

[1] *Model Transportation Planning Rule Ordinances and Policies for Small Jurisdictions,* prepared by David Evans and Associates.

acceptable walking distance. Mid-block pedestrian/bicycle connections reduce walking distances further, and would help to enhance the attraction of walking or bicycling.

Chapter 10 of the LUDO addresses street improvements required with development. Street systems in new development are required to include stub streets to serve future phases of the development as well as abutting un-platted parcels. Design measures to restrict the potential for pass-through traffic are emphasized, including use of traffic calming design measures, three-way intersections, and all-way stop-controlled intersections.

Comparison of The Dalles Local Street Sections

A comparison of local street sections was developed using data collected from eight additional cities in Oregon, national standards from *A Policy on Geometric Design*, design guidelines prepared by ODOT Region 3, and the model TSP ordinances cited above. The purpose of comparing these street sections was to help assess the feasibility of requiring all local streets to be built in dedicated public right-of-way and constructed to City standards.

The Dalles local street system includes many privately owned and maintained facilities. Private local streets generally are not ideal for local governments, because of lack of control over construction standards and inspection. In addition, when maintenance or repair needs arise, private maintenance agreements can cause citizens to be surprised to learn that local government is not responsible for maintaining the streets serving their home.

The Dalles Local Street Master Plan includes recommended changes to the LUDO that would reduce the ability to construct private streets for new development. The purpose of the comparison of street standards was to consider if changes could be made to The Dalles' standards to reduce the land and construction costs associated with public local streets. By reducing public street costs, the City would be better positioned to require developers to construct local streets to City standards in dedicated public right-of-way.

As shown in Table 1, a range of local street widths is in use throughout the state. However, several fundamental points emerge from the information gathered. First, only three of the cities surveyed use a 36-foot local street section. The City of Roseburg's current 34-foot standard section is scheduled to be reduced to standard widths of 28 feet with parking on both sides, and 24 feet with parking on one side. The 36-foot width is more frequently used for two-lane minor collector roadways. A 28-foot local street width has been adopted by many jurisdictions in Oregon as the standard local street width, with 24 feet acceptable if parking is limited to one side only.

Narrower local streets are less expensive, require less land to be dedicated as public right-of-way and allow greater flexibility for subdivision layout, factors that are generally appealing to developers. Emergency service providers often resist narrower local streets due to the need to maintain access at all times. However, unless a residential area has rear access from private alleys, there are generally driveways every 50 to 100 feet, which provide set-up room for firefighting operations. In single-family residential zones that require two parking spaces per unit, as in The Dalles, on-street parking demand is generally low, providing room for traffic to pull to one side and allow emergency vehicles to pass. Shorter block lengths and connectivity requirements provide multiple access and egress routes. Multiple access options benefit emergency service providers and disperse traffic throughout the neighborhood, avoiding the need to concentrate residential traffic on one or two primary streets. The Dalles already has block length standards and connectivity requirements that support the ¼ mile walking distance rule of thumb. With multiple connections and short block lengths, the City should consider reducing local street widths.

The recommended local street performance standards later in this document reflect the City's existing block spacing standards and requirements for connectivity, and incorporate flexibility to meet these standards. Based on review of standards used in other jurisdictions, the recommendations also encourage raising the traffic volume thresholds for specific local street widths together with allowing narrower pavement widths. Additional connections will make distribute traffic across more access routes, making narrower street widths more practical. Adopting narrower local street widths together with higher volume thresholds would help ensure that the narrower 28-foot street width could be employed as the standard local street section, as is the case in many jurisdictions.

Table 1
Comparison of Federal/State/Local Street Standards

Source/Agency	**Local Street Traffic / Parking Lane Widths (ft)**	**Total Pavement Width (ft)**	**Notes**
AASHTO's *A Policy on Geometric Design*, 1990	7 / 11 / 7	25 ft	AASHTO minimum width for two-way local street is 16 feet (9 / 7)
ODOT Region 3 TSP Implementation Guidelines	16 / 6 6 / 16 / 6	24 ft 28 ft	Parking on one side only. Parking on both sides.
City of The Dalles	8 / 10 10 / 8 8 / 16 / 8 8 / 12 / 8	36 ft 32 ft 28 ft	Standard width; 500 to 1,000 daily trips 150 to 500 daily trips; requires traffic study Limited to 440 ft, < 150 daily trips; 20 mph

City of Eugene	7 / 14 / 7	28 ft	Parking on both sides
City of Springfield	n/a	28 ft	Parking on both sides
City of Happy Valley	7 / 14 / 7 7 / 16 / 7	28 ft 32 ft	< 750 daily trips 750 to 1,500 daily trips
City of Gresham	n/a n/a n/a	32 ft 28 ft 26 ft	Parking on both sides Parking on both sides Parking on both sides – queuing street
City of Roseburg	n/a n/a n/a	34 ft 28 ft 24 ft	Current standard Proposed standard – parking both sides Proposed standard – parking one side
City of Forest Grove	n/a n/a	28 ft 24 ft	Parking on both sides Parking on both sides – queuing street
City of Sandy	8 / 10 10 / 8	36 ft	Parking on both sides
City of Rainier	8 / 10 10 / 8	36 ft	Parking on both sides

Implementation Tools

Local Street Funding Alternatives

Implementation of the City of The Dalles Local Street Master Plan requires refining fiscal policies and identifying funding alternatives to pay for improvements to the City's local streets. This section of the Local Street Master Plan, describes and evaluates options available to the City to fund local street construction and maintenance. A telephone survey of local street funding sources used in other Oregon cities was conducted for this project, and is summarized at the end of this memorandum.

Context and Current Practice

The City typically requires developers to construct new local streets to City standards within new subdivisions. Frontage improvements for infill development or new residential development on only one side of an existing street present greater challenges related to consistency, functionality and equity. Still more challenging are issues such as funding additional local street connections in areas that are already developed, and upgrading substandard local streets already maintained by the City.

Local street patterns and regulatory standards evolve over time. As in many cities, The Dalles has a dense local street grid in the downtown core, with sidewalks and planter strips. As population growth pushed development into more topographically varied areas farther from downtown commercial and business activities, trip distances increased and the share of overall travel represented by pedestrian travel fell. At the same time, motor vehicle ownership increased steadily over the past several decades. Local street construction outside the urban core mirrors these and other factors, and consequently many local streets in The Dalles were not built to current standards.

Local Street Funding Issues

The Dalles faces potentially broad liabilities for funding local street maintenance and improvements. As the City grows, increased traffic will create the need for local street improvements such as intersection improvements, traffic control upgrades, and horizontal and vertical alignment enhancements. County roads within the City's Urban Growth Boundary transferred to the City will further increase the City's local street maintenance responsibilities. The City and County are developing an urban services agreement that will require the County to maintain such streets until they are improved to predetermined standards and accepted by the City.

A menu of funding options are discussed below, many of which are already in use. With the exception of new local streets built as part of new development, local street improvements of any appreciable size are likely to require several funding options to be packaged together.

Local Street Improvement Funding Sources and Opportunities

The City's Department of Public Works provided a breakdown of funding sources presently used for local street construction and maintenance in The Dalles. Funding sources include motor vehicle fees (including the gas tax and a state motor vehicle apportionment based on the City's population), utility fees, and Federal Aid Money. The City's motor vehicle fees for 1998/99 amounted to approximately $808,500, and included a three-cent local gas tax. Utility fees consist of a 2% Water and Sewer tax amounting to approximately $76,000 per year. State FAU exchange revenue accounts for approximately $169,500 of the City's yearly budget. Together these funding sources account for slightly over $1 million annually.

It should be noted that this amount is for both construction and maintenance, and is for the City's entire street system, not just local streets. Based on a 1993 pavement condition inventory conducted for the City, $1 million annually is less than required to maintain the entire street system adequately. In 1993 the City maintained nearly 63 miles of arterial, collector and local streets, including over three miles of unpaved gravel streets. Since 1993, the number of miles for which the City is responsible has grown while gas tax revenues remained static or declined, with revenue increases due to population growth offset by inflation. Overall, nearly 13 percent of all paved streets in the City were in poor or very poor condition in 1993, including about 15 percent of local streets. Almost 8 percent of paved local streets were in fair condition.

Also noteworthy is the potential for an increase in available gas tax revenue if a measure currently under consideration by the Oregon State Senate is passed and enacted. The bill includes a two-stage, six-cent increase. The latter four cents would be allocated entirely to cities and counties for the first two years (40% to cities, 60% to counties). After two years, it would revert to the existing distribution of 50% to ODOT, 30% to counties and 20% to cities.

With funding constrained, maintenance of local streets becomes a lower priority than collector and arterial roads, which have broader community benefits. The City has in the past participated in local street improvements when the improvement benefited a broader area. City participation in such public/private partnerships has been through contribution of materials, design expertise and labor in exchange for right-of-way donated by the owners of fronting properties. The City can also participate in local street improvements and extensions serving new development, when the scale of new development on the street fails to economically justify the cost of street improvements, and the improvement benefits a broader area. City participation in local street improvements is a policy issue that requires case-by-case consideration.

Other sources not currently used in The Dalles could help fund local street maintenance and improvements. These sources include development-related fees such as System Development Charges (SDC) and Traffic Impact Fees, developer requirements, local improvement districts (LIDs), and a street utility tax.

System Development Charges and Traffic Impact Fees

System Development Charges (SDC) are similar to traffic impact fees (TIF). Both are assessments levied on new development to fund street improvements, and both are used widely throughout the United States. To withstand legal challenge, these fees require a "rational nexus", which is a reasonable connection between the development generating the fee and the facilities built with the fee. In general, development contributing to the SDC or TIF needs to benefit from the projects funded by SDC and TIF expenditures. Improvements addressing capacity deficiencies existing at the time SDC or TIF programs are enacted are generally are not eligible for SDC and TIF expenditures. Many improvements address both existing deficiencies and future needs, and with an analysis of the proportionate needs created by existing and future traffic it is possible to combine TIF or SDC funds with other capital funds.

Typically, an SDC or TIF assessment is a standard dollar amount per unit of development (e.g. dollars per single family home or per 1,000 gsf of office space). The rate is based on analysis of the total improvements needed to accommodate future development and the projected capital cost of these improvements. SDC and TIF programs ordinances generally cover only a portion of the total cost of future improvement needs. Traffic impact fee and system development charge ordinances frequently restrict expenditures to arterials and major collectors. However, in some limited cases such funding programs can be used for local street projects if such expenditures are politically acceptable, the improvement is needed to accommodate future development, and the benefit broad enough to create a nexus between the funding program and the improvement. Most jurisdictions require projects funded with TIF and SDC revenues to be included in the City's adopted Capital Improvement Program (CIP). This requirement can be an additional hurdle for local street improvements, because improvement needs for collector and arterial roadways generally are higher priorities than street improvements.

Development Requirements

Improvement policies for right-of-way dedication and frontage road improvements pass the cost of local street improvements directly on to developers. In a broad sense, developer-funded improvements can be more cost-effective because developers are not required to meet the prevailing wage requirements applied to taxpayer-funded projects. Developers generally pass street improvement costs on to homebuyers . Under such policies, if new development abuts public street frontage improved to less than City standards, the developer can be required to provide roadway improvements along the frontage of the development. Required improvements can include paving, curb, gutter, sidewalk, street trees, sanitary sewer, water, and in some cases storm sewer.

The Dalles presently requires new development to improve abutting local street frontage to existing standards (Chapter 10 of the City's Land Use and Development Ordinance, or LUDO). Similar to many local jurisdictions, the City's LUDO includes two code sections that reduce the ability to rely on development for local street improvements. Section 10.060.C.1 of the LUDO states that “half-street improvements” are “generally not acceptable.” This clause is used to avoid requiring developers of smaller parcels to improve abutting streets to standards in areas where adjacent properties are fully developed, but the street does not reflect current standards. A second reason for discouraging half-street improvements is that it can be unclear whether a full street improvement is compatible with existing topography and land use on the opposite side of the street. This concern can be addressed by requiring conceptual plans for a full street improvement together with construction of half-street improvements. The conceptual plans allow planners to assess the compatibility of a fully improved street with existing or future development opposite the new development. A second commonly used code application allows for the possibility that a developer may opt out of required local street frontage improvements by signing a waiver of remonstrance against the future formation of a local improvement district (LID) for street improvements.

Local Improvement Districts

Local improvement districts can be formed to fund specific public improvements that benefit a defined group of property owners. Assessments based on the cost of the improvements are collected based on proportionate assessment of the properties in the assessment district. When a project provides system wide benefits, LIDs can be combined with other funding sources such as grants, SDC revenues, traffic impact fees and other capital project funds.

LIDs provide a means for “public/private partnerships”, which is generally positive, but there are also negative aspects to local improvement districts. Various statewide tax initiatives passed in the 1990s have made it more difficult to form local improvement districts. LIDs require a majority vote, which can result in individual property owners being assessed against their will, particularly when a single developer controls a majority of parcels in a given area and initiates a LID. LIDS require additional effort on the part of local staff for street design, contract administration and construction inspection services. LID improvements require paying contractors prevailing wages, which can increase the cost of the project considerably. Unless formation of an assessment district is imminent, waivers of remonstrance against formation of a LID also are problematic. Property ownership changes and waivers are forgotten. In addition, a waiver of remonstrance offers the property owner no indication of the potential cost of a future LID.

Grant Programs

There are various state and federal grant programs for street construction, many under the umbrella of the Transportation Efficiency Act of the 21st Century, or TEA-21. Existing grant programs such as CMAQ (Congestion Mitigation and Air Quality) from the

Intermodal Surface Transportation Efficiency Act (ISTEA), the TEA-21 precursor, include grants programs for local street improvements.

A strictly local approach to funding local street improvements with grants would be for the City to initiate a matching program, where the City matches funds raised by residents willing to assess themselves for local street improvements with special assessment districts. With overall transportation improvement funds constrained, this approach can be used to leverage available City funding and develop partnerships with affected residents. Similar to other assessment districts, special assessment districts need to address issues such as residents' willingness to pay, the "tyranny of the majority" and citywide geographic and demographic equity issues. None of the cities surveyed presently employ this funding tool.

Street Utility Tax

The cities of Medford and La Grande use a street utility tax, also called a street users fee or street utility fee, to fund street maintenance. Residents receive a monthly bill of a fixed amount similar to a water utility bill. The funds collected are used to maintain the street network, including local streets. The agreement between the City of The Dalles and Wasco County addressing maintenance responsibility for County streets within the City's Urban Services Boundary taken over by the City cites a street utility fee as a source that will be considered for funding street maintenance.

Local Street Funding in Other Cities

Telephone interviews[2] were conducted with representatives from the cities of La Grande, Reedsport, McMinnville, Tigard and Springfield to sample local street funding tools used in other jurisdictions. The interviews focused on funding new local streets, funding local street upgrades where the existing street does not meet current standards, and funding street improvements in areas of infill development.

City of La Grande

La Grande collects a street user fee from each household for street maintenance. A system development charge for new and upgraded streets is being considered. Presently, La Grande local street improvement requirements correspond to the type of partition. Minor partitions (three or fewer units) are not required to dedicate right-of-way or improve local street frontage, but are required to sign a waiver of remonstrance against future formation of a local improvement district. Major partitions (four or more units, corresponding to the definition of a "subdivision" in the Oregon Revised Statutes) are required to dedicate right-of-way and construct ½ street improvements to applicable

[2] Telephone interviews conducted June 11 through 16 with Kay Bork, City of Springfield; Brian Roger, City of Tigard; Jeff McIlvenna, City of Reedsport; Norm Paullus, City of LaGrande, and a planning counter representative at the City of McMinnville.

standards. As with most jurisdictions, local improvement districts are an unpopular option due to requirements for higher, noncompetitive interest rates and wages.

La Grande ranks local streets into five classes of improvement, from “natural” to fully improved. Any improvement that upgrades the street classification meets the requirement for street improvements to “applicable standards.” The City also contracts with the County for local street upgrades. The County charges $8/linear foot to upgrade gravel roads to chip rock with oil matting, providing a low-cost means of upgrading unpaved streets. La Grande also operates an exchange program with the County for local street construction, with the City providing raw materials in exchange for equipment and labor from the County. La Grande has been successful in obtaining CMAQ grant funding to upgrade some local streets from gravel to oil mat surfaces. The City also has a pavement management system, which is an effective tool for providing and presenting historical trends and other information to policymakers and elected officials. La Grande engineering staff includes members who are actively involved both in legislative committees addressing local infrastructure funding, and in the League of Oregon Cities. The League of Cities provides a forum to exchange ideas and lobby the legislature concerning local street funding and other infrastructure issues.

City of Reedsport

Reedsport requires developers to build all local streets within new subdivisions, and to complete ½-street improvements if development is on one side only. The state gas tax is their sole source of local street funding. In residential areas, frontage improvements are not required if the adjacent streets are not improved. Local improvement districts are an option to construct streets not meeting all aspects of applicable street standards. The City has used LID funding in the past to construct minimum paved sections for several local streets. To initiate a new LID the Council requires a petition demonstrating majority support to be submitted. No LID petitions have been submitted for several years.

City of McMinnville

McMinnville also requires developers to construct new streets within subdivisions. For infill development, or development where connecting local streets do not meet street standards, the City has used “property owner assessments” to finance street improvements. These assessment districts do not require a vote of affected owners. Two Council hearings are held, initially to introduce the planned improvements and funding mechanism, and second to present anticipated costs.

City of Tigard

Tigard is where the Supreme Court’s landmark Dolan decision originated. The Dolan decision has had a profound impact on the ability of many local governments to require property owners to dedicate right-of-way and improve adjacent streets. In Tigard, the developer builds all new local streets within new subdivisions. City Code requires the property owner to improve abutting streets to standard with infill development. For all infill development applications, city staff first conduct a “Dolan test” developed with input from the City Attorney to assess rational nexus and rough proportionality. If the test indicates an inadequate level of nexus or proportionality, the developer is offered the choice of improving the street(s) to standard per code requirements, or having the application denied.

City of Springfield

Springfield has an adopted street map including conceptual locations for local streets. Developers are required to build full streets unless the development is on one side of an existing street, in which case ½ street improvements are required. Local improvement districts are also used, with LID waivers a typical requirement of new development when street improvements on connecting streets are needed to meet applicable standards.

Summary of Funding Issues

Clearly, no single funding mechanism exists to fully fund the City’s local street improvement needs. A combination of fiscal policies and funding alternatives will be necessary to decrease the gap between local street improvement needs and available resources. In general, there are more options available to fund street improvements associated with new development, compared to the options to maintain or upgrade existing local streets in developed areas. Funding tools for maintenance and upgrades are available, such as grants and user fees. Outside funding sources such as grants typically require focused staff efforts in addition to typical demands, while new fees require political support both with elected officials and community members.

The City’s LUDO currently includes policies requiring developers to improve abutting roadways as part of land development, but also allows developers to opt out of improvements through waivers of remonstrance, which can create a potential obligation for future homeowners but can result in the local improvement being postponed, sometimes indefinitely. Local street improvements are further discouraged because half-street improvements are generally unacceptable. The options for maintaining and upgrading local streets in areas already developed are even fewer.

The following options appear to present the most promise for improving local streets in The Dalles. Funding options will generally need to be packaged, with different appropriate combinations based on the potential for new development, the willingness of property owners to accept assessments, the condition of existing roadways, etc. Amendments to the City’s LUDO are included in the following section.

1. **Aggressively apply Land Use Development Ordinance (LUDO) policies requiring abutting local street frontages to be improved.** The City’s LUDO generally requires connected streets, and by providing multiple access routes

narrower streets should be more acceptable to emergency service providers. The 36-foot local street standard could be eliminated. Many jurisdictions use 32 feet as the standard local street width, with 36-foot widths used for collector roadways. If the City pursues street improvement with small developments, in fairness it should also help the public to understand how local street improvements can affect the cost of housing. Staff also should be prepared to defend the City's actions from challenges based on the principle of rational nexus resulting form the Supreme Court's Dolan decision. For local streets, establishing a benefit for adjacent properties from abutting street improvements is relatively straightforward. However, quantifying this benefit and knowing in advance that it will stand up to a "Dolan test" is more ambiguous.

2. **Investigate public/private partnerships for local street improvement projects.** If the City pursues such neighborhood partnerships, only the most likely candidates for success should be pursued initially. These would be highly visible street improvement projects with relatively low costs and clear majority support. A range of "partnering" possibilities exists. For example, local improvement districts could be coupled with city funds where the improvement will benefit more than adjacent properties. Alternatively, the City could provide design and construction services if abutting property owners were to donate right-of-way and provide mutually accepted landscaping. Intergovernmental partnerships could also be pursued, as in the City of La Grande.

3. **Consider reducing street widths to reduce local street costs.** For example, with parking allowed on only one side, "lanes" could be considerably narrower compared to the existing 28-foot standard. Because single family residences generally provide at least two parking spaces per unit, local streets typically have a low demand for on-street parking. Consequently, some jurisdictions use 32 feet as the standard for local streets, with 26-foot or 28-foot "queuing" street widths acceptable for streets less than a specified maximum length or with more than one ingress route. Reducing local street widths may require extensive negotiations with emergency service providers, including actual tests in the field to see if fire trucks can maneuver along narrower local streets.

4. **Ease the volume guidelines for the local street designations in the LUDO**. For example, the volume range for a 28-foot "lane" could be increased from 150 vehicles per day to 500 vehicles per day if multiple access routes are available.

Proposed Implementation Code Amendments

This section summarizes changes to The Dalles existing Land Use Development Ordinance (LUDO) proposed to implement the Local Street Master Plan. Modifications are proposed to four chapters of the existing ordinance:

- Application Review Procedures (Chapter 3)
- General Regulations (Chapter 6)
- Land Divisions (Chapter 9)
- Improvements Required with Development (Chapter 10)

For each chapter, a brief overview is followed by proposed code language changes to support the Local Street Master Plan. Proposed language changes are intended to provide staff with a starting point for ordinance modification language, with further refinements to be developed through staff, public and official review.

The following formatting is used: *italic text* for existing LUDO language, ***italic bold text*** for additions to existing subsections, and ~~*italic strikethrough text*~~ for proposed deletions. When subsection elements are proposed for addition or deletion, renumbering of the remaining subsection elements is assumed.

Chapter 3 Proposed Revisions

Chapter 3 addresses application procedures governing development within the City. Proposed changes would require submission of a local area circulation plan for development applications for four or more single-family residences, residential planned unit developments, multifamily apartments or attached housing, mobile home residences, and other housing types not listed.

Section 3.030.030: Required Plans

Add new 3.030.030.A.14:

For development of three or more units in a residential zone on a parcel of land abutting one or more un-platted parcels, the applicant shall provide a conceptual local street circulation plan demonstrating that the subject parcel and each abutting un-platted parcel would be able to satisfy local street connectivity and block spacing requirements of this ordinance. The map shall indicate that alignments are conceptual, and that specific alignments will be developed through the land development application process.

Section 3.030.040: Review Criteria

Add new 3.030.040.A.4:

Meet local street standards, including standards for connectivity and access to abutting un-platted parcels.

Chapter 6 Proposed Revisions

Chapter 6 includes a wide array of technical and land use regulations. Street connectivity is addressed in Chapter 6, and in Chapter 10. The connectivity language in Chapter 10 is more relevant to local street planning and circulation. Changes recommended in Chapter 6 for the Local Street Master Plan would add street trees and necessary traffic calming measures to the description of full street improvements.

Section 6.110: Waiver of Right to Remonstrate

Revise the second sentence to read:

Full street improvements shall include paving, curb, gutter, sidewalk, ***street trees,*** *sanitary sewer, water, and where applicable, storm sewer and neighborhood traffic calming measures as described in Section 10.060.E.1(b).*

Chapter 9 Proposed Revisions

Section 9.020.020.B.2 of Chapter 9 includes the City's block spacing standards for local streets, which support non-motorized travel by requiring ¼ mile or less between local street intersections (¼ mile is generally considered to be acceptable walking distance in urban areas). Section 9.020.020.B.3 includes exception language for block sizes greater than or less than the standards in Section 9.020.020.B.2. The criteria for exceptions focus on preservation of safe access, and are appropriate for reduced block sizes, but are less appropriate for block sizes exceeding maximum requirements. The following changes are proposed to provide an alternative to the maximum block lengths if it can be shown that adequate connectivity exists in the surrounding area. The proposed changes would also provide separate exception criteria for additions to and reductions from local street block standards.

Section 9.020.020.B.2.a Block Size for Local Streets and Minor Collectors

Add 9.020.020.B.2.b to increase flexibility in meeting block size standards:

*Blocks on local streets and minor collectors in excess of 600 feet in length or width shall be allowed only if can be shown that the affected street provides an average of at least 8 connections per mile for the nearest mile in either direction, considering existing and approved development patterns****, or that the exception criteria in Section 10.060.E.1(c) are satisfied****.*

Section 9.020.020.B.3 Exceptions

Revise to read:

Block sizes may be reduced ~~or enlarged~~ in the same way separation distance between two access points may be reduced, per all of the requirements of Section 6.050.050: Exceptions to Standards, substituting block size for separation distance between access points. ***Exception criteria for exceeding the maximum block size on local streets are included in Section 10.060.E.1(c): Connectivity.***

Chapter 10 Proposed Revisions

Section 10.060 of the Land Divisions chapter addresses requirements for streets constructed as part of new development. Proposed modifications address street connectivity, street widths and conditions under which private streets may be constructed. The modifications are based on review of standards used in other jurisdictions, requirements under the State Transportation Planning Rule, implementation guidelines prepared for the TPR, standard references including *Residential Street Design and Traffic Control* by the Institute of Transportation Engineers, and existing development patterns in The Dalles.

The proposed ordinance changes include traffic volume thresholds for specific local street widths comparable to other smaller communities, and narrower pavement widths. Narrower local street widths can produce many benefits in residential neighborhoods, including potentially reduced traffic speeds, less attraction to pass-through traffic, a higher degree of comfort for pedestrians, bicyclists and residents, and increased flexibility for subdivision layout. Adopting narrower local street widths together with higher volume thresholds would help to ensure that the 28-foot street width could be employed as the standard local street section, as is the case in many smaller Oregon jurisdictions. Narrower streets would reduce the construction cost for streets in residential subdivisions, which would help support the proposal to prohibit private streets except under certain circumstances.

Recommendations for street widths and volume thresholds are included in the following ordinance language changes and proposed revisions to the Residential Street Standards Matrix. Local street connectivity is addressed in proposed text changes and in the proposed Local Street Master Plan Map (Figure 1). The map includes the following items:

1. General location of proposed new local streets.
2. Existing local street stubs.
3. Existing City streets.

4. Existing City right-of-way proposed to be vacated (primarily remnant strips from street or freeway projects, or remnants of the City's original platted block system where development is infeasible due to existing use, topography or geologic features).
5. Existing City Right-of-way that is unimproved but proposed for future improvement.

Section 10.060.E.1.b Connectivity

Revise subsection 10.060.E.1(b) as follows, and add new 10.060.E.1(c):

b. *~~Residential streets shall connect with surrounding streets~~* ***A public street connection shall be provided to any existing or approved public street or right-of-way stub adjacent to the development*** *to permit the convenient movement of traffic between neighborhoods ~~or~~* ***and*** *facilitate emergency access ~~or evacuation. Connections shall be designed to minimize pass through traffic on local streets.~~* ***To maintain reasonable traffic speeds on residential streets and discourage pass through traffic, judicious use of curved alignments, three-way intersections, all-way stops necessary to control traffic right-of-way, and local street traffic calming measures (such as traffic circles, speed humps, diverters and chokers) should be employed in the design. To promote acceptable traffic conditions in residential areas, the City will continue to strive to improve traffic signal coordination and intersection capacity on nearby collectors and arterials to discourage pass through traffic on local streets.***

c. Public street connections specified in 10.060.E.1.a-b are required unless it is demonstrated that a connection cannot be made because one or more of the following conditions exists:

(1) Physical conditions preclude development of a public street. Such conditions may include, but are not limited to, slopes in excess of 12 percent, wetlands or other bodies of water.

(2) Existing development physically precludes a public street connection now or in the future considering the potential for redevelopment.

(3) Existing public streets allow the development to satisfy the City's standards for connectivity and block sizes on local streets and minor collectors.

Section 10.060.I Private Streets

Private Streets. ***With the exception of alleys, p****~~P~~rivate streets~~, though discouraged in conjunction with land divisions, may be considered~~* ***are prohibited unless*** *all the following conditions are met:*

1. *Extension of a public street through the development site is not needed for continuation of the existing street network or for future service to adjacent properties****, or to otherwise meet the connectivity requirements in this chapter.***
2. *The development site remains in one ownership, or adequate mechanisms are established (such as a homeowners' association invested with the authority to enforce payment) to ensure that a private street installed with a land division will be adequately maintained.*
3. *Private streets are designed* ***and constructed*** *to the City standards* ***for public streets*** *contained in Section (J) below.*
4. ~~*Where a private street is installed in conjunction with a land division, construction standards consistent with City standards for public streets shall be utilized to protect the interests of future homeowners.*~~

Revised Residential Street Standards Matrix

Residential Street Type	Volume (Avg. Daily Trips)	Speed (MPH)	Street Width (Feet)	Sidewalk/ Planter Strip (includes Curb)	Right-of-way (Feet)
Alley		15	18 (no parking)	None	20-25
~~Lane (limited to 16 or fewer lots and /or 440 linear feet)~~	~~0 – 150~~	~~20~~	~~28 (8+12+8 non-striped)~~	~~11 feet each side~~	~~50~~
~~Neighborhood Street (requires traffic study)~~	~~150-500~~	~~25~~	~~32 (8+16+8 non-striped)~~	~~11 feet each side~~	~~54~~
~~Residential Street~~	~~500-1,000~~	~~25~~	~~36 (8+10+10+8) striped~~	~~11 feet each side~~	~~58~~
~~Minor Collector (Residential)~~	~~1,000 – 3,000~~	~~25 – 30~~	~~38 – 40 (8 + 11/12 + 11/12 + 8 striped)~~	~~12.5 feet each side~~	~~64~~
Residential Street	**0 – 500**	**25**	**24 (parking on one side)**	**11 feet each side** **5-ft. sidewalks**	**46**
Residential Street	**0 – 500**	**25**	**28 (parking on both sides)**	**11 feet each side** **5-ft. sidewalks**	**50**
Neighborhood Street	**0 – 1,000**	**25**	**32 (parking on both sides)**	**11 feet each side** **5-ft. sidewalks**	**54**
Neighborhood Collector	**1,000 – 3,000**	**25 – 30**	**36 (parking on both sides)**	**12 feet each side** **5.5-ft. sidewalks**	**60**
Private Road			20 (no parking)	11 feet each side **5-ft. sidewalks**	42

The Dalles Local Street Master Plan

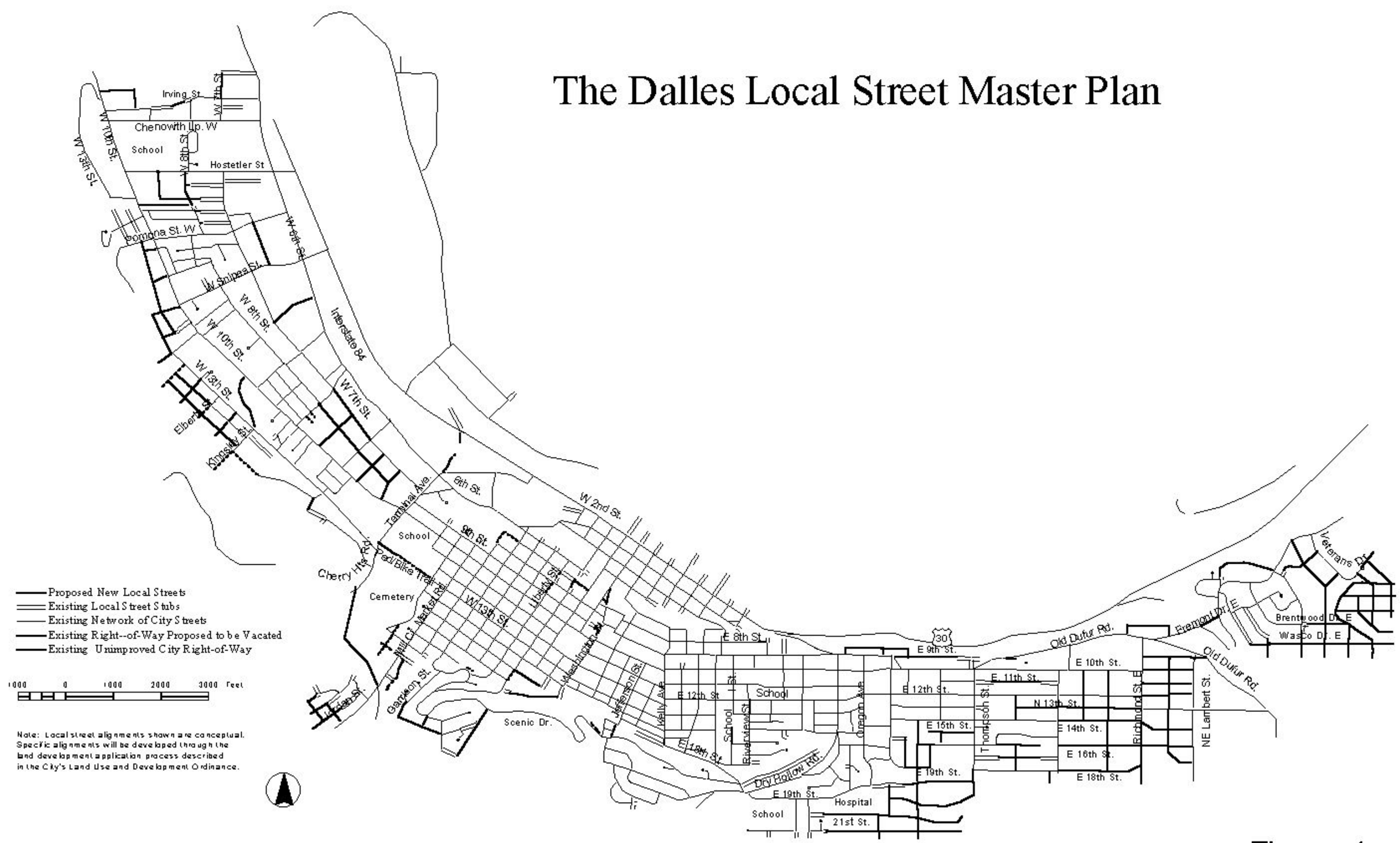

Figure 1