City of West Linn
Transportation System Plan

West Linn, Oregon

Draft

January 20, 2016

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Transportation System Plan

West Linn, Oregon

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GLOSSARY OF TERMS

The following terms are applicable only to the West Linn Transportation System Plan and shall be construed as defined herein.

Access Management: Refers to measures regulating access to streets, roads and highways from public roads and private driveways. Measures may include but are not limited to restrictions on the type and amount of access to roadways, and use of physical controls such as signals and channelization including raised medians, to reduce impacts of approach road traffic on the main facility.

Accessway: Refers to a walkway that provides pedestrian and or bicycle passage either between streets or from a street to a building or other destination such as a school, park, or transit stop.

Alternative Modes: Transportation alternatives other than single-occupant automobiles such as rail, transit, bicycles and walking.

American Association of State Highway Transportation Officials (AASHTO): The American Association of State Highway and Transportation Officials (AASHTO) is a standards setting body which publishes specifications, test protocols and guidelines which are used in highway design and construction throughout the United States.

Americans with Disabilities Act (ADA): A civil rights law that prohibits discrimination against individuals with disabilities in all areas of public life, including jobs, schools, transportation, and all public and private places that are open to the general public.

Arterial (Street): A street designated in the functional class system as providing the highest amount of connectivity and mostly uninterrupted traffic flow through an urban area.

Arterial Corridor Management (ACM): a series of measures intended to improve access and circulation along arterial corridors.

Average Annual Daily Traffic (AADT): A measure used primarily in transportation planning and traffic engineering that represents the total volume of vehicular traffic on a highway or roadway for a year divided by 365 days.

Average Daily Traffic (ADT): This is the measurement of the average number of vehicles passing a certain point each day on a highway, road or street.

Bicycle Facility: Any facility provided for the benefit of bicycle travel, including bikeways and parking facilities.

Bicycle Network: A system of connected bikeways that provide access to and from local and regional destinations.

Bicycle Boulevard: Lower-order, lower-volume streets with various treatments to promote safe and convenient bicycle travel. Usually accommodates bicyclists and motorists in the same travel lanes, often with no specific vehicle or bike lane delineation. Assigns higher priority to through bicyclists, with secondary priority assigned to motorists. Also includes treatments to slow vehicle traffic to enhance the bicycling environment.

Bike Lane: Area within street right-of-way designated specifically for bicycle use.

Capital Improvement Plan (CIP): A community planning and fiscal management tool used to coordinate the location, timing and financing of capital improvements over a multi-year period.

Capacity: The maximum number of vehicles or individuals that can traverse a given segment of a transportation facility with prevailing roadway and traffic conditions.

Central Business District (CBD): This is the traditional downtown area, and is usually characterized by slow traffic speeds, on-street parking and a compact grid system.

Citizen Advisory Committee (CAC): An advisory committee consisting of volunteer citizens from the community they represent.

Collector (Street): A street designated in the functional class system that provides connectivity between local and neighborhood streets with the arterial streets serving the urban area. Usually shorter in distance than arterials, designed with lower traffic speeds and has more traffic control devices than the arterial classification.

Congestion Mitigation/Air Quality (CMAQ): A program within the federal ISTEA and TEA-21 regulations that address congestion and transportation-related air pollution.

Crosswalk: Portion of a roadway designated for pedestrian crossing and can be either marked or unmarked. Unmarked crosswalks are the national extension of the shoulder, curb line or sidewalk.

Cycle Track: An exclusive bike facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane. A cycle track is physically separated from motor traffic and distinct from the sidewalk.

Demand Management: Refers to actions which are designed to change travel behavior in order to improve performance of transportation facilities and to reduce need for additional road capacity. Methods may include subsidizing transit for the journey to work trip, charging for parking, starting a van or car pool system, or instituting flexible work hours.

Department of Environmental Quality (DEQ): A regulatory agency whose job is to protect the quality of Oregon's environment.

Department of Land Conservation and Development (DLCD): A public agency that helps communities and citizens plan for, protect and improve the built and natural systems that provide a high quality of life.

Driveway (DWY): A short road leading from a public road to a private business or residence.

Eastbound (EB): Leading or traveling toward the east.

Employee Commute Options (ECO): rules that were passed by the Oregon Legislature in 1993 (and revised in February 2007) to help protect the health of Portland area residents from air pollution and to ensure that the area complied with the Federal Clean Air Act

Fiscal Year (FY): A year as reckoned for taxing or accounting purposes.

Geographic Information Systems (GIS): A system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data.

Grade: A measure of the steepness of a roadway, bikeway or walkway, usually expressed in a percentage form of the ratio between vertical rise to horizontal distance, (e.g. a 5% grade means that the facility rises 5 feet in height over a 100 feet in length.)

Grade Separation: The vertical separation of conflicting travelways.

Green Street: A street designed to reduce or redirect stormwater runoff quantity and/or to improve stormwater runoff quality. Green street design generally involves using rain gardens, vegetated swales and/or pervious materials (porous pavement or permeable paving) as an alternative to conventional stormwater facilities.

High-capacity Transit (HCT): A form of public transit distinguished from local service transit such as bus lines by higher speeds, fewer stops, more passengers, and more frequent service.

Highway Design Manual (HDM): A manual that provides uniform standards and procedures for the design of new roadways and the major reconstruction, rehabilitation, restoration, and resurfacing of existing roadways.

High Occupancy Vehicle (HOV): A vehicle containing two or more occupants, generally a driver and one or more passengers.

Impervious Surfaces: Hard surfaces that do not allow water to soak into the ground, increasing the amount of stormwater running into the drainage system.

Intelligent Transportation Systems (ITS): the application of advanced technologies and proven management techniques to relieve congestion, enhance safety, provide services to travelers and assist transportation system operators in implementing suitable traffic management strategies.

Level of Service (LOS): A qualitative measure describing the perception of operation conditions within a traffic steam by motorists and or passengers. An LOS rating of "A" to "F" describes the traffic flow on streets and at intersections, ranging from LOS A, representing virtually free flow conditions and no impedance to LOS F representing forced flow conditions and congestion.

Local (Street): A street designated in the functional class system that's primary purpose is to provide access to land use as opposed to enhancing mobility. These streets typically have low volumes and are very short in relation to collectors and arterials.

Manual on Uniform Traffic Control Devices (MUTCD): A document issued by the Federal Highway Administration (FHWA) of the United States Department of Transportation (USDOT) to specify the standards by which traffic signs, road surface markings, and signals are designed, installed, and used.

Metropolitan Planning Organization (MPO): An organization in each federally recognized urbanized area (population over 50,000) designated by the Governor which has the responsibility for planning, programming and coordinating the distribution of federal transportation resources.

Metropolitan Transportation Improvement Program (MTIP): The list of projects selected by Metro to receive regional funding assistance.

Multi-Modal: Involving several modes of transportation including bus, rail, bicycle, motor vehicle etc.

Multi-Use Path: Off-street route (typically recreationally focused) that can be used by several transportation modes, including bicycles, pedestrians and other non-motorized modes (i.e. skateboards, roller blades, etc.)

National Highway System (NHS): The National Highway System is interconnected urban and rural principal arterial and highways that serve major population centers, ports, airports and other major travel destinations, meet national defense requirements and serve interstate and interregional travel.

Neighborhood Route (Street): A street designated in the functional class system that's primary purpose is to provide access to land use, but provides more mobility than a local street. These streets typically have moderate volumes and are shorter in relation to collectors and arterials.

Neighborhood Traffic Management (NTM): Traffic control devices typically used in residential neighborhoods to slow traffic or possibly reduce the volume of traffic.

Northbound (NB): Traveling or leading toward the north.

Oregon Administrative Rules (OAR): The official compilation of rules and regulations having the force of law in the U.S. state of Oregon. It is the regulatory and administrative corollary to Oregon Revised Statutes, and is published pursuant to ORS 183.360 (3).

Oregon Department of Transportation (ODOT): ODOT is a public agency that helps provide a safe, efficient transportation system that supports economic opportunity and livable communities

throughout Oregon. ODOT owns and operates three roadways (I-205, Highway 43, 10th Street) that are located in West Linn or provide access to the city. There are street design and operational standards for these roadways which supersede West Linn's street design and operational standards.

Oregon Highway Plan (OHP): The document that establishes long range policies and investment strategies for the state highway system in Oregon.

Oregon Revised Statutes (ORS): The codified body of statutory law governing the U.S. state of Oregon, as enacted by the Oregon Legislative Assembly, and occasionally by citizen initiative. The statutes are subordinate to the Oregon Constitution.

Peak Period or Peak Hour: The period of the day with the highest number of travelers. This is normally between 4:00 p.m. to 6:00 p.m. on weekdays.

Pedestrian Connection: A continuous, unobstructed, reasonability direct route between two points that is intended and suitable for pedestrian use. These connections could include sidewalks, walkways, accessways, stairways and pedestrian bridges.

Pedestrian District: A comprehensive plan designation or implementing land use regulation, such as an overlay zone, that establishes requirements to provide a safe and convenient pedestrian environment an area planned for a mix of uses likely to support a relatively high level of pedestrian activity.

Pedestrian Facility: A facility provided for the benefit of pedestrian travel, including walkways, crosswalks, signs, signals and benches.

Pedestrian Scale: Site and building design elements that are oriented to the pedestrian and are dimensionally less than those sites designed to accommodate automobile traffic.

Regional Transportation Functional Plan (RTFP): A planning document that contains policies and guidelines to help local jurisdictions implement the policies in the Regional Transportation Plan (RTP) and its modal plans, include those for active transportation, freight movement and high capacity transit.

Regional Transportation Plan (RTP): The transportation plan for the Portland Metro region.

Right-Of-Way (ROW or R/W): A general term denoting publicly-owned land or property upon which public facilities and infrastructure is placed.

Safety Priority Index System (SPIS): An indexing system used by Oregon Department of Transportation to prioritize safety improvements based on crash frequency and severity on state facilities.

Safe Routes to School (SRTS): Federal, state, and local programs that create safe, convenient, and fun opportunities for children to bicycle and walk to and from schools.

Shared Roadway: Roadways where bicyclists and autos share the same travel lane. May include a wider outside lane and/or bicycle boulevard treatment (priority to through bikes on local streets).

Single-Occupancy Vehicle or Single-Occupant Vehicle (SOV): A vehicle containing only a single occupant, the driver.

Southbound (SB): Traveling or leading toward the south.

Special Transportation Area (STA): An ODOT designation that allows state facilities that run through downtown business districts to have alternate mobility standards in an effort to accommodate other special needs (such as pedestrian, transit, business, etc.) in an area.

Statewide Transportation Improvement Plan (STIP): The capital improvement program that identifies founding and schedule of statewide projects.

System Development Charge (SDC): Fees that are collected when new development occurs in the city and are used to fund a portion of new streets, sanitary sewers, parks and water.

Technical Advisory Committee (TAC): An advisory committee consisting of state, county, and city staff that review and provide feedback on technical memorandums.

Technical Memorandum (TM): A document that is specifically targeted to technically capable persons, such as practicing engineers or engineering managers, who are interested in the technical details of the project or task.

Traffic Control Devices: Signs, signals or other fixtures placed on or adjacent to a travelway that regulates, warns or guides traffic. Can be either permanent or temporary.

Transportation Advisory Board (TAB): A standing advisory board made of up volunteers that comment on transportation issues within the City.

Transportation Analysis Zone (TAZ): A geographic sub-area used to assess travel demands using a travel demand forecasting model. Often defined by the transportation network and US Census blocks.

Transportation Demand Management (TDM): A policy tool as well as any action that removes single-occupant vehicle trips from the roadway network during peak travel demand periods.

Transportation and Growth Management (TGM): A program of the Oregon Department of Transportation (ODOT) that supports community efforts to expand transportation choices. By linking land use and transportation planning, TGM works in partnership with local governments to create vibrant, livable places in which people can walk, bike, take transit or drive where they want to go.

Transportation Management Area (TMA): A Transportation Management Area is an area designated by the Secretary of Transportation, having an urbanized area population of over 200,000, or upon special request from the Governor and the MPO designated for the area.

Transportation Planning Rule (TPR): A series of Oregon Administrative Rules intended to coordinate land use and transportation planning efforts to ensure that the planned transportation system supports a pattern of travel and land use in urban areas that will avoid the air pollution, traffic and livability problems faced by other large urban areas of the country through measures designed to increase transportation choices and make more efficient use of the existing transportation system.

Transportation System Management (TSM): Management strategies such as signal improvements, traffic signal coordination, traffic calming, access management, local street connectivity, and intelligent transportation systems

Transportation System Management and Operations (TSMO): An integrated program to optimize the performance of existing multimodal infrastructure through implementation of systems, services, and projects to preserve capacity and improve the security, safety, and reliability of our transportation system.

Transportation System Plan (TSP): Is a comprehensive plan that is developed to provide a coordinated, seamless integration of continuity between modes at the local level as well as integration with the regional transportation system.

Two-Way Stop Control (TWSC): An intersection, where one or more approaches is stop controlled and must yield the right-of-way to one or more approaches that are not stop controlled.

Urban Area: The area immediately surrounding an incorporated city or rural community that is urban in character, regardless of size.

Urban Growth Boundary (UGB): A regional boundary, set in an attempt to control urban sprawl by mandating that the area inside the boundary be used for higher density urban development and the area outside be used for lower density development.

Vehicle Miles Traveled (VMT): The cumulative distance a vehicle travels, regardless of number of occupants.

Volume to Capacity Ratio (V/C): A measure that reflects mobility and quality of travel of a roadways or a section of a roadways. It compares roadway demand (vehicle volumes) with roadway supply (carrying capacity).

Westbound (WB): Leading or traveling toward the west.

Chapter 1 Introduction

INTRODUCTION

The city of West Linn adopted their first Transportation System Plan (TSP) in 2000. The plan was updated in 2008 to address growth in West Linn and its surrounding communities as well as changes to state highway facility plans in the area. The purpose of the 2016 TSP is to address regulatory changes that have occurred in the region since 2008 and project a 20-year horizon for transportation planning. An important feature of this update to the TSP is the establishment of a set of performance measures that will be used to evaluate the future success of programs and projects. The programs and projects in both the planned and financially-constrained elements of this Plan were selected and prioritized based on the performance objectives and input from stakeholders. This approach will ensure that future programs and projects reflect community values and make the most efficient use of available resources.

This update of the TSP is consistent with the Metro 2040 Regional Transportation Plan (RTP) and the 2012 Regional Transportation Functional Plan (RTFP). The TSP fulfills the Transportation Planning Rule (TPR) requirements for comprehensive transportation planning in Oregon cities, and presents the investments and priorities for the Pedestrian, Bicycle, Transit, and Motor Vehicle systems along with new transportation programs to correct existing shortfalls and enhance critical services. The TSP also supports *Goal 12: Transportation* of the city of West Linn's Comprehensive Plan and the adopted vision for West Linn, *Imagine West Linn*. The goals, policies and performance measures presented in **Chapter 2** of this TSP are consistent with the goals articulated within the Comprehensive Plan and the Vision.

TSP ORGANIZATION AND METHODOLOGY

The update of the TSP began with a review of local and statewide plans and policies that guide land use and transportation planning in the City. The project team then developed goals and targets for approval by the Planning Commission and City Council. **Chapter 2** presents these along with the evaluation criteria used to evaluate and prioritize projects and programs and to monitor progress of the transportation system towards the vision of a connected community and goals over time. **Chapters 3 through 8** summarize existing conditions and present the transportation system improvement projects identified by the project team to mitigate deficiencies and enhance the multi-modal aspects of the City's transportation system. These chapters include plans for each mode of travel, with a prioritized list of projects for each mode. **Chapter 9** summarizes the existing and potential future funding sources to finance the identified transportation system improvements.

The modal plan maps and text presented in this TSP reflect projects completed since adoption of the 2008 TSP. In addition, the project team updated the document to address changes to state and regional policies and planning requirements and new priorities identified by the City. Input from the community, staff, the City's Transportation Advisory Board, Planning Commission, and City Council was instrumental in shaping the purpose and content of this document.

TSP UPDATE PROCESS

The TSP Update process focused on documenting the existing transportation system; identifying gaps and deficiencies based on its current and future forecasted performance; identifying projects, policies, and programs to address gaps and deficiencies; prioritizing the projects and programs; developing a revenue forecast for future years; and, establishing a fiscally constrained set of projects and programs the City anticipates implementing by the horizon year, 2040. Public involvement was integral to the TSP Update process and is discussed in greater detail below. The culmination of the TSP Update process is this document, which presents the projects, policies, and programs identified to address the existing and anticipated gaps and deficiencies in the City's transportation system. Exhibit 1 shows the public involvement and workflow overview of the TSP Update process. The background documents shown on Exhibit 1 and technical data for this update of the TSP are contained in a separate Technical Appendix.

COMMITTEES

The project team developed the West Linn TSP in close coordination with city staff and key representatives from surrounding communities. Two formal committees participated in the plan development:

- Technical Advisory Committee (TAC) - Agency staff from the Oregon Department of Transportation (ODOT), Metro, TriMet, adjacent cities, and the city of West Linn, participated in reviewing the technical methods and findings of the study. The focus of this group was on consistency with the plans and past decisions in adjoining jurisdictions, and consensus on new recommendations.
- Citizens Advisory Committee (CAC) - Residents of West Linn that serve on the Transportation Advisory Board (TAB) reviewed preliminary findings and provided input for plan development during regular meetings.

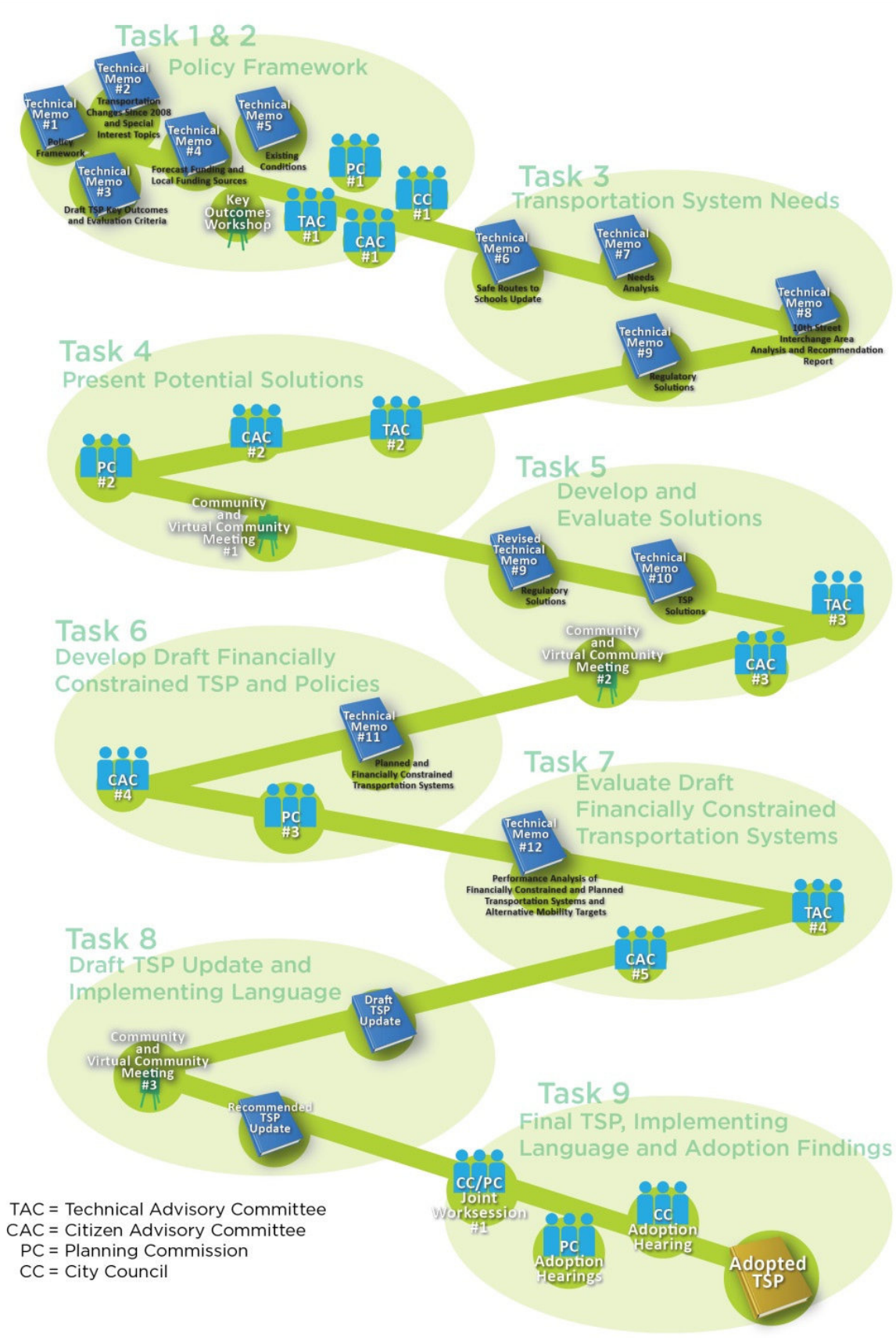
PUBLIC INVOLVEMENT

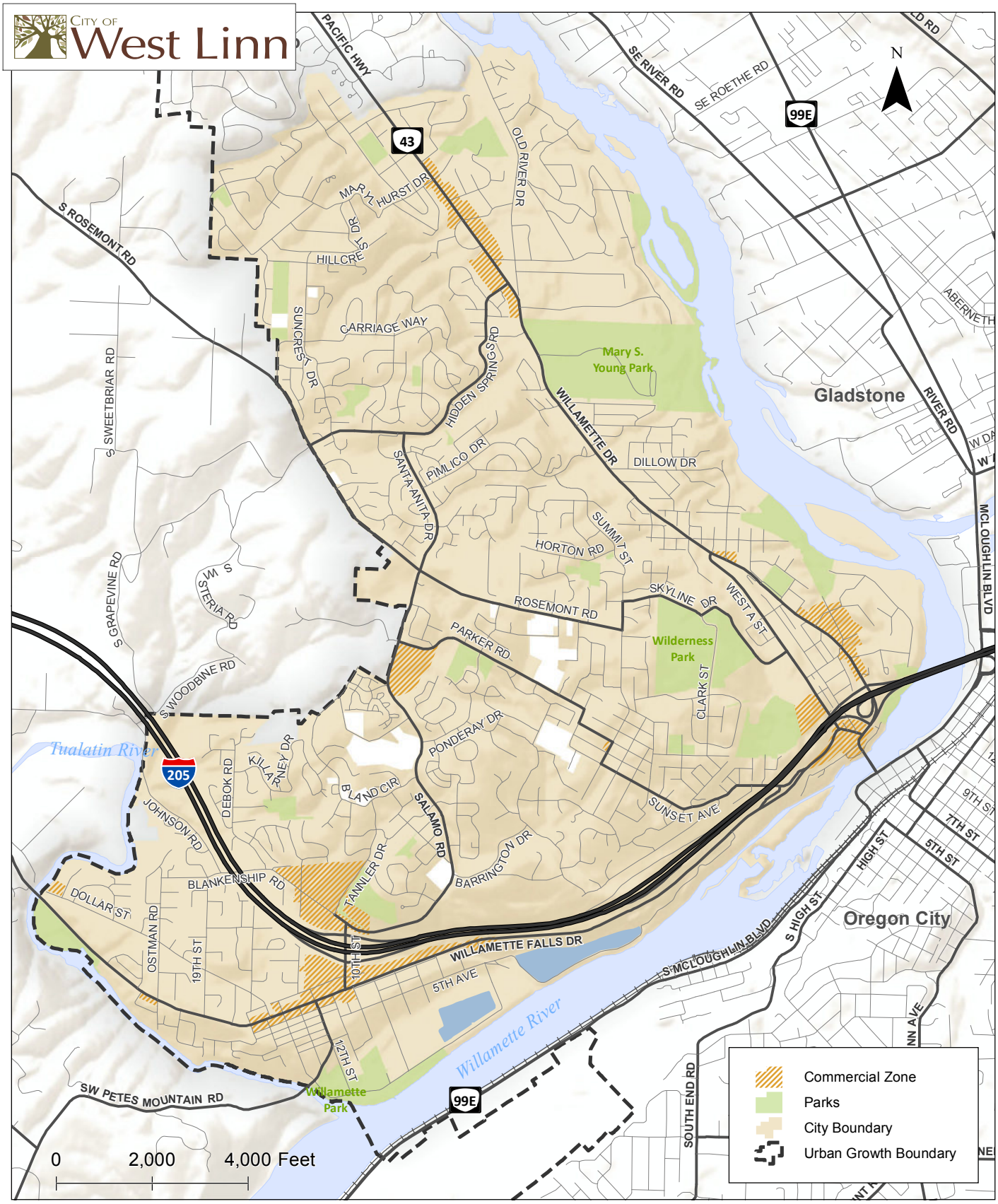
Public Involvement in the TSP Update process consisted of periodic TAC and CAC meetings, continuous web-based communications, and three community-wide public open houses (including online public open houses) to gather input on community concerns related to transportation. The project team gathered public comments received at these meetings as well as through e-mail to enhance this document.

PLAN AREA

West Linn is located within the northwest corner of Clackamas County and at the center of the Metro Service District. The City's current boundaries are generally defined by Lake Oswego to the northwest, the Tualatin River to the south, and the Willamette River to the east. Figure 1 illustrates the study area for this update of the TSP.

Exhibit 1: Public Involvement and Workflow of TSP Update Process





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Study Area
West Linn, Oregon

Figure
1

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TRANSPORTATION ENGINEERING/PLANNING

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

LAND USE

Metro provided land use data for West Linn. The data includes base year 2010 and forecast year 2040 population, household, and employment (retail, service, and other) estimates for West Linn by Transportation Analysis Zone (TAZ). There are 11 TAZs within West Linn. Table 1 summarizes the TAZ data for base year 2010 and forecast year 2040 conditions and shows that Metro anticipates less than a 1 percent growth in population and households over the next 30 years and more than a 2 percent growth in employment. Figure 2 and Figure 3 illustrates this information graphically.

Table 1: West Linn Land Use Summary

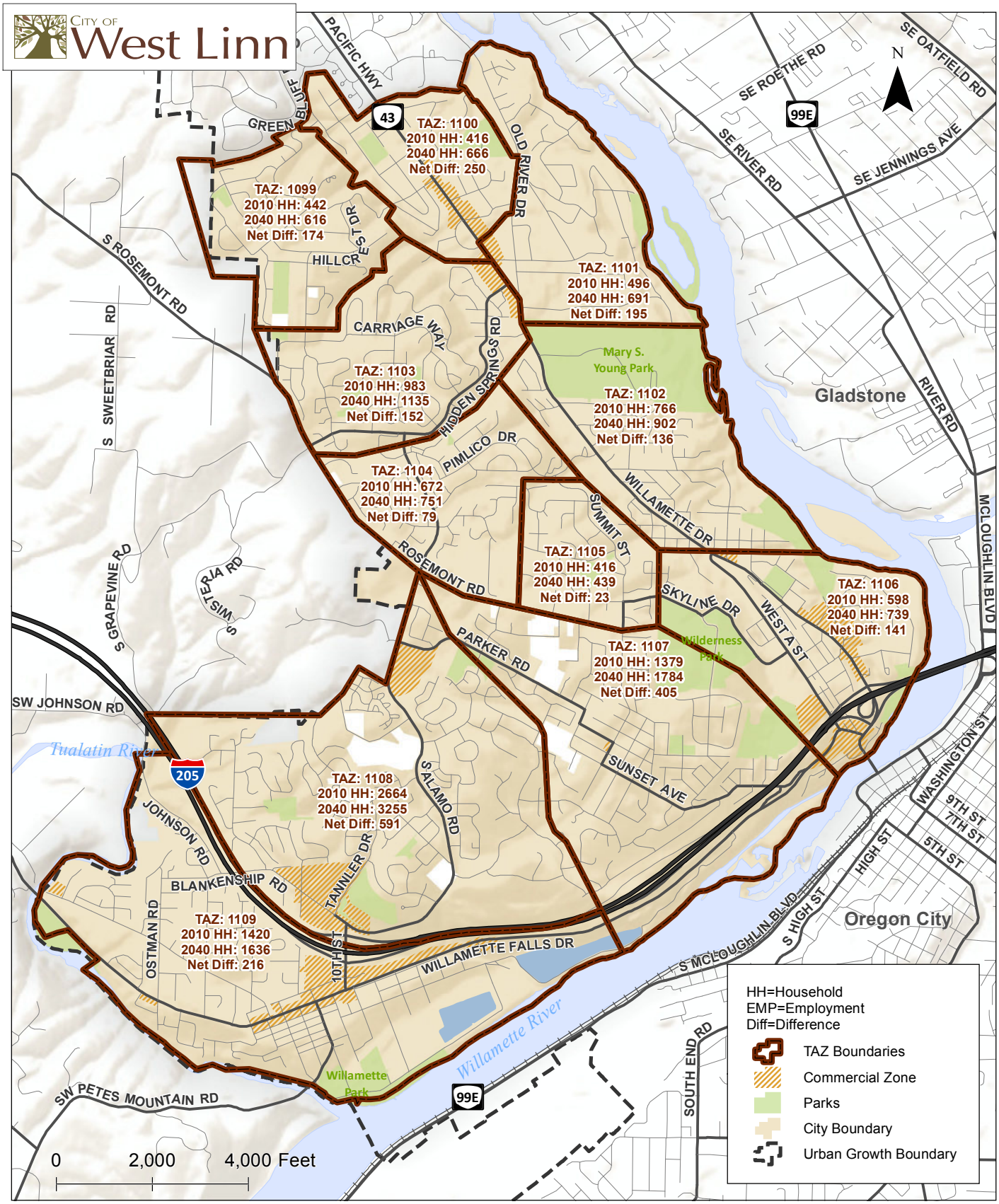
Land Use	2010	2040	Change	Percent Change
Population	25,458	31,471	+6,013	+23.6%
Households	10,252	12,620	+2,368	+23.1%
Employment	4,253	6,913	+2,660	+62.5%

As land uses change in proportion to each other (i.e. there is a significant increase in employment relative to household growth), there will be a shift in the overall operation of the transportation system. Retail land uses generate a higher number of trips per acre of land than residential and other land uses. The location and design of retail land uses in a community can greatly affect transportation system operation. Additionally, if a community is homogeneous in land use character (i.e. all employment or all residential), the transportation system must support significant trips coming to or from the community rather than within the community. Typically, there should be a mix of residential, commercial, and employment type land uses so that some residents may work and shop locally, reducing the need for residents to travel long distances.

Table 1 data indicates that Metro expects significant growth, particularly in the form of employment-based land uses, in West Linn in coming decades. This forecast predicts a continuation of the predominately residential development pattern that currently exists in West Linn.

This TSP assesses safety, completeness, and effectiveness of the existing multimodal transportation system and how well it will serve future transportation system needs to the year 2040. Several projects from the 2008 TSP are logical to carry forward, while others are financially unviable. Many “new” projects were added from sources such as the West Linn Trails Master Plan, other regional bicycle and pedestrian plans, neighborhood plans, and new needs for the future.

The TSP identifies discrete transportation investments to the year 2040 based on the current and future needs of the pedestrian, bicycle, motor-vehicle, public transit and other transportation systems in the City. Where possible, these investments rely on coordinated land use and transportation decision making to maximize their effectiveness.



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Metro Projected Changes in Households by Transportation Analysis Zone (TAZ) from 2010 to 2040, West Linn, Oregon

Figure **2**

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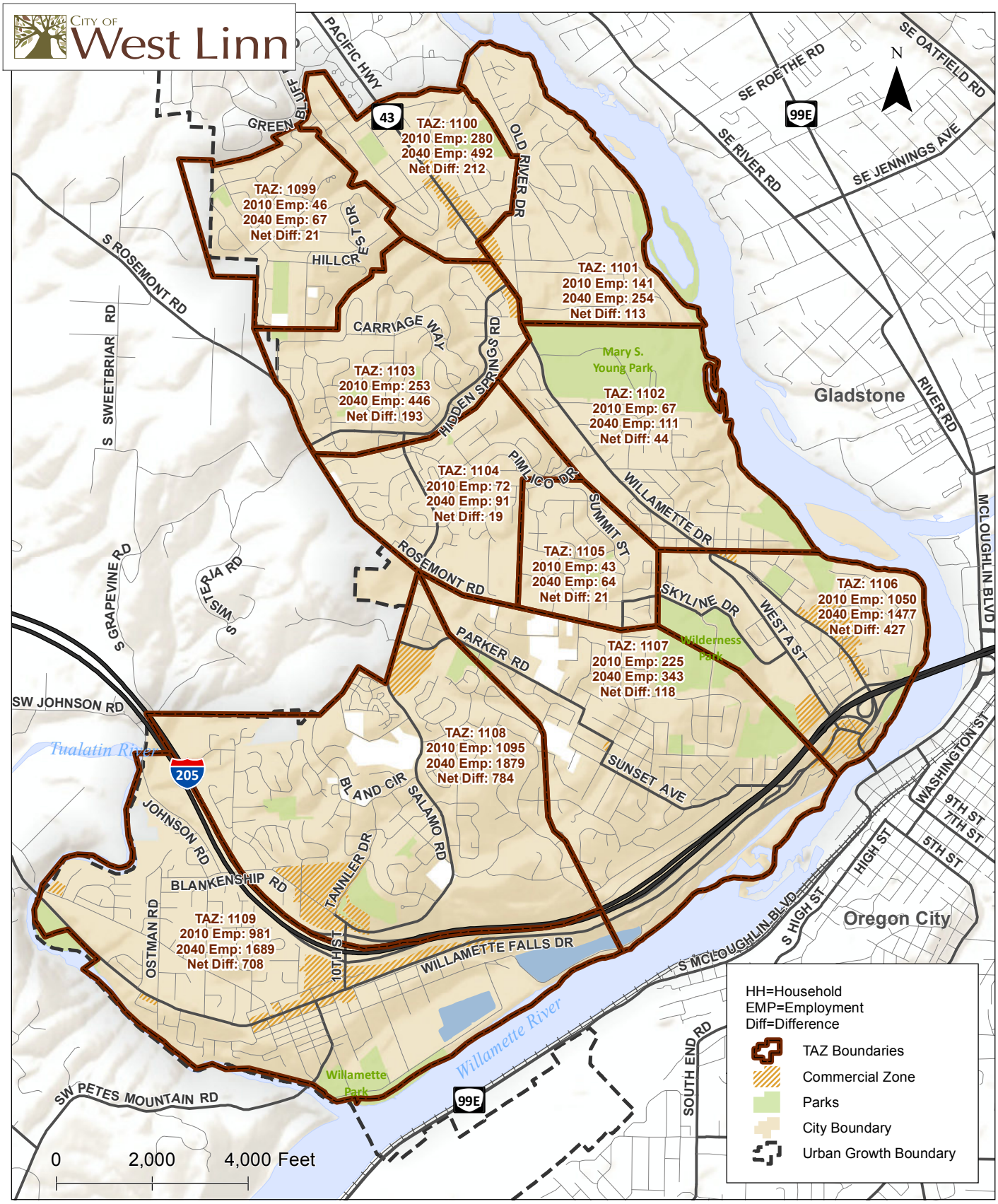
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA



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Metro Projected Changes in Employment by Transportation Analysis Zone (TAZ) from 2010 to 2040, West Linn, Oregon

Figure **3**

Kittelson & Associates, Inc.
Transportation Engineering/Planning

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

H:\profile\17817 - West Linn Transportation System Plan\gis\TSP\Portrait Letter Version\03 TAZ_Employees.mxd - jsommerville - 11:46 AM 1/13/2016

Preliminary cost estimates for the list of TSP programs and projects exceed what the City can fund with existing or forecasted revenue. Dwindling public revenues and increased construction, operational and maintenance costs for transportation improvements further limits the City's ability to complete the full range of needed improvements. Therefore, the TSP includes a “fiscally constrained” plan, which identifies the top priority projects that can be completed within the 25-year planning horizon based on the projected available funding. These projects address existing and projected deficiencies in the transportation system per local, regional, and state standards and targets. Additional information related to the fiscally constrained plan is included throughout the TSP.

Chapter 2 Goals, Targets, and Evaluation Criteria

GOALS, TARGETS, AND EVALUATION CRITERIA

The project team developed transportation goals and targets for West Linn in consideration of the goals and desired outcomes expressed within various transportation-related plans developed for the city, the region, and the state. The project team used many of these goals and targets to identify and evaluate transportation system needs, develop solutions, and to identify priorities (e.g., projects, programs) to enable the City to plan for, and consistently work towards, achieving the vision of a connected community.

GOALS AND TARGETS

Goals and targets for the West Linn TSP combine the existing policies and desired outcomes from recently adopted transportation-related plans at the state, regional and local level. The goals and targets include the following:

1. Safety
2. Mobility, Access and the Environment
3. Equity
4. Maintenance

Goal 1. Safety

Reduce transportation related fatalities and injuries for all transportation modes.

Targets

1A. Vision Zero – No fatal injury collisions by mode and reduce the total number of severe injury collisions by mode.

1B. Reduce the total number of high collision locations by 2040.

Goal 2. Mobility, Access, and the Environment

Improve peoples' access to jobs, schools, health care and other regular needs in ways that improve health, reduce pollution and retain money in the local economy.

Targets

2A. Reduce single-occupant vehicle miles traveled (VMT) per capita as compared to 2010 so that total VMT remains steady or declines as growth occurs.

2B. Achieve forty to forty-five percent non-single-occupant vehicle (SOV) trip mode share in 2040 industrial and employment areas and neighborhoods, and forty-five to fifty-five percent in 2040 town centers, main streets, and corridors as shown on the Metro 2040 Growth Concept Map by 2040.

2C. Improve freight travel time reliability.

2D. Increase the percentage of people that can access key destinations via a 20-minute walk, bike or public transit ride by forty percent by 2040.

2E. Active Safe Routes to School (SRTS) Programs in place in all West Linn elementary and middle schools.

2F. A good quality pedestrian network and low stress bicycle network connecting all residents to key destinations.

2G. Increase the number of green street facilities by 2040.

Goal 3. Equity

Develop transportation facilities that are accessible to all members of the community.

Targets

3A. By 2040, increase walking, bicycle and public transit access, for transportation disadvantaged populations, to key destinations, by forty percent.

3B. Ensure transportation services (and impacts) are equitably distributed to all segments of the population.

Goal 4. Maintenance

Maintain, protect and improve the existing transportation system.

Targets

4A. Increase the average local road pavement condition index (PCI) to 70 by 2040.

4B. Reduce the number of transportation facilities in "distressed" condition by five percent by 2040.

PROJECT SELECTION AND PRIORITIZATION

This chapter describes how the City selected projects for the TSP and prioritized based on the evaluation criteria for ranking of projects. Key elements of the prioritization process rely on a measurable set of evaluation criteria that are reflective of the City's transportation goals and policies where progress toward implementing these goals and policies can be tracked.

The following outlines the steps used to identify projects included in the TSP.

1. Identify projects based on the existing conditions and needs analyses performed for each travel mode.
2. Assign planning-level cost estimates to each project.

3. Prioritize the projects based on a scoring system. Each project has a score as described below in the Evaluation Criteria.
4. Classify the projects as high, medium, or low priority based on the outcomes of the prioritization and review with the CAC, Planning Commission, and City Council to calibrate and finalize each project or program's priority.

Evaluation Criteria

Applicable targets identified above were used to develop evaluation criteria to help prioritize projects for the TSP. Based on feedback from the TAC and CAC, two additional evaluation criteria, Concurrency and Fiscal Efficiency, were added. These criteria reflect whether a project is currently identified as a priority in an existing transportation plan (such as the City's Trails Master Plan and the Regional Active Transportation Plan) and if the project is considered to be fiscally efficient as defined by the Metro Regional Transportation Plan.

The project team assigned each target a score based on feedback regarding priorities as expressed by the TAC and CAC. The total points available for a project or program in the TSP for each criterion are as follows:

- Safety – 22 points (two targets valued at 11 points each)
- Mobility, Access and the Environment – 20 points (four targets valued from 3 to 8 points each)
- Equity – 6 points (one target)
- Concurrency – 12 points (based on four different plans valued from 2 to 4 points each)
- Fiscal Efficiency – 4 points (based on project type valued from 1 to 4 points each)

Table 2 defines the scoring methodology used and the resources used to assess the score (e.g., crash history, forecast travel information, GIS maps, land use characteristics, and demographic data).

Table 2: Project and Program Evaluation Criteria and Scoring Methodology

Criteria	Target	Resources for determining score	Scoring methodology
Safety: Reduce transportation-related fatalities and injuries for all transportation modes	1A: Vision Zero – No fatal injury collisions by mode and reduce the total number of severe injury collisions by mode.	Severe injury and fatal crash locations are roadway segments with at least one collision that resulted in a severe injury (classified as Injury A by ODOT) or a fatality	11 points if the project/program is likely to result in no fatal injury collisions by mode and reduce the total number of severe injury collisions by mode
	1B: Reduce the total number of high collision locations by 2040	High collision locations are roadway segments with a relatively high number of crashes within a certain roadway segment between 2009 and 2014	11 points if the project/program is likely to reduce crashes at high collision roadway segments over a 5-year period following project/program implementation

Criteria	Target	Resources for determining score	Scoring methodology
Mobility, Access and the Environment: Improve people's access to jobs, schools, health care and other regular needs in ways that improve health, reduce pollution and retain money in the local economy	2A: Reduce single-occupant vehicle miles traveled (VMT) per capita as compared to 2010 so that total VMT remains steady or declines as growth occurs	Metro Travel Demand Model	3 points if the project/program is likely to reduce VMT
	2B: Achieve forty to forty-five percent non-single-occupant vehicle (SOV) trip mode share in 2040 industrial and employment areas and neighborhoods, and forty-five to fifty-five percent in 2040 town centers, main streets, and corridors as shown on the Metro 2040 Growth Concept Map by 2040	Location of commercial zones in West Linn, located along Highway 43, Willamette Falls Drive, and Salamo Road.	8 points if the project/program supports direct access to these commercial zones for non-single-occupancy vehicle modes
	2D: Increase the percentage of people that can access key destinations via a 20-minute walk, bike or public transit ride by forty percent by 2040	20-minute walking radius: 1 mile 20-minute biking radius: 2 miles 20-minute transit radius: 0.25 miles (walking to nearest transit stop)	6 points if the project/program increases the number of people that can access schools (6 points), parks (4 points) and open spaces (2 points) within a 20-minute walk, bike or bus ride.
	2F: A good quality pedestrian network and low stress bicycle network connecting all residents to key destinations.	Evaluation of existing pedestrian and bicycle facilities along city roadways	3 points if the project/program improves the quality of a bicycle or pedestrian facility that is currently rated below "good," to good or better
Equity: Develop transportation facilities that are accessible to all members of the community	3A: By 2040, increase walking, bicycle, and public transit access, for transportation disadvantaged populations, to key destinations, by forty percent	20-minute walking radius: 1 mile 20-minute biking radius: 2 miles 20-minute transit radius: 0.25 miles (walking to nearest transit stop)	6 points if the project/program increases the number of persons considered transportation disadvantaged (elderly, youth, and transit riders), that can access schools, parks and open spaces, and employment and commercial areas within a 20-minute walk, bike or bus ride
Concurrency	Project or program is identified in local or regional adopted plan	City of West Linn Trails Master Plan	4 points if the project/program is identified in the Trails Master Plan as a top tier project, 2 points for other tiers.
		Metro Regional Trails and Greenways Plan and Active Transportation Plan (ATP)	2 points if the project/program is in the Regional ATP
		West Linn – Wilsonville School District (WLWV) Safe Routes to School (SRTS) Plans	4 points if the project/program is part of a WLWV SRTS Plan
		2008 City of West Linn Transportation System Plan	2 points if the project/program is in the 2008 TSP Action Plan (High Priority Project)
Fiscal Efficiency	Project or program is one of the following: TSMO, transit, bike and/or pedestrian improvements, land use strategies, or connectivity improvements.	2016 City of West Linn Transportation System Plan	4 points if the project is TSMO, 4 points if the project is a transit, bike and/or pedestrian improvement, 2 points if the project is a land use strategy, 1 point if the project is a connectivity improvement

Chapter 3 Pedestrian Plan

PEDESTRIAN PLAN

Pedestrian facilities are the elements of the transportation system that enable people to walk safely and efficiently between neighborhoods, commercial areas, employment areas, and transit stops. These include facilities for pedestrian movement along key roadways (e.g., sidewalks, multi-use paths and trails) as well as for safe roadway crossing locations (e.g., crosswalks, crossing beacons and pedestrian refuge islands). Each facility plays an important role in developing a comprehensive pedestrian network.

EXISTING CONDITIONS

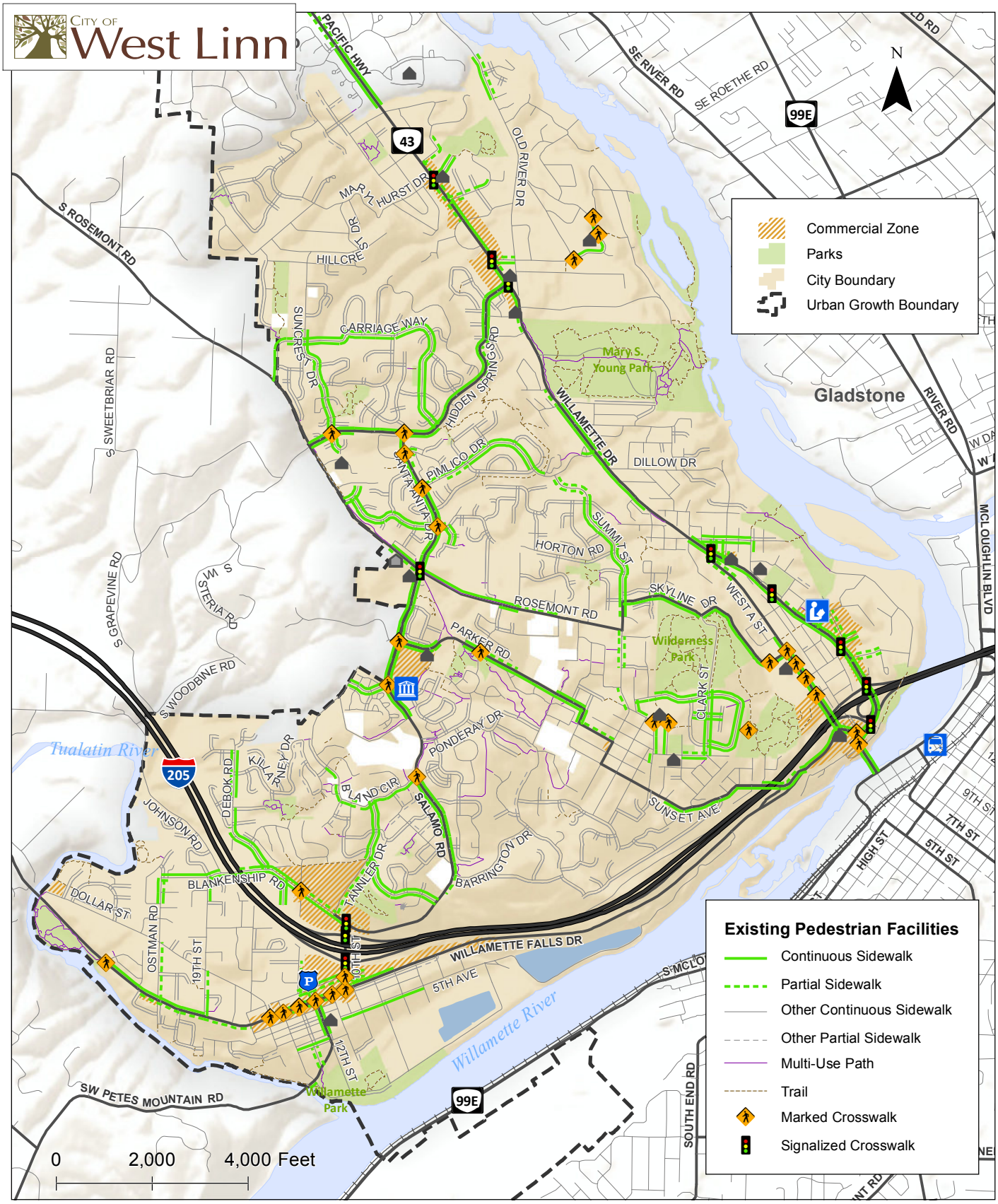
The pedestrian system within West Linn consists of sidewalks, multi-use paths and trails as well as marked and unmarked, and signalized and unsignalized pedestrian crossings. These facilities provide residents with the ability to access local transit service as well as local retail, commercial, recreational, and other land uses by foot. Safe and convenient pedestrian facilities are essential to a vibrant community and economy within West Linn.

Pedestrian Facilities

Figure 4 shows the existing pedestrian facilities within West Linn and the location of major activity centers (e.g., schools, parks, commercial zones, the adult community center, library, and City Hall). Figure 4 shows that continuous sidewalks are currently provided along a majority of arterial and collector streets within the city as well as many neighborhood routes and local streets. Marked crosswalks are also provided at several major intersections (signalized and unsignalized). In general, the existing pedestrian facilities are adequate in the commercial zones and inadequate near schools and parks. The City would like to provide at least one continuous sidewalk connection between activity centers and along arterial and collector roadways to provide safe and convenient non-motorized travel options. There are locations where the existing pedestrian facilities could be improved to provide greater connectivity throughout the city.

Pedestrian Activity

Table 3 shows the pedestrian crossing volumes observed at the study intersections during the weekday evening peak hour. The volumes indicate the relative difference in pedestrian activity within the commercial zones along Highway 43 (Willamette Drive), Willamette Falls Drive and Salamo Road and near schools along Willamette Drive and Rosemont Road as compared to other locations around the city.



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Existing Pedestrian Facilities West Linn, Oregon

Figure **4**

Kittelson & Associates, Inc.
Transportation Engineering/Planning

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

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Table 3: Pedestrian Crossing Volumes at Study Intersections (Weekday Evening Peak Hour)

Map ID	Intersection	North/South Pedestrian Volume	East/West Pedestrian Volume	Count Year
1	Highway 43 / Arbor Drive	2	0	2006
2	Highway 43 / Marylhurst Drive-Lazy River Way	7	3	2006
3	Highway 43 / Walling Way	3	0	2006
4	Highway 43 / Cedaroak Drive	11	1	**2014**
5	Highway 43 / Hidden Springs Drive	15	1	**2014**
6	Highway 43 / Jolie Pointe Road	1	0	2006
7	Highway 43 / Pimlico Drive	1	1	2006
8	Highway 43 / West "A" Street	1	3	2006
9	Highway 43 / Holmes Street	2	1	2006
10	Highway 43 / Lewis Street-Webb Street	0	1	2006
11	Highway 43 / Burns Street	0	0	2006
12	Highway 43 / Hood Street-McKillican Street	0	1	2006
13	Highway 43 / I-205 SB Ramps	0	4	**2014**
14	Highway 43 / I-205 NB Ramps	0	0	**2014**
15	Highway 43 / Willamette Falls Drive	0	0	**2014**
16	Willamette Falls Drive / Sunset Avenue	0	4	2006
17	Rosemont Road / Carriage Way	0	0	2006
18	Rosemont Road / Hidden Springs Road	1	9	**2014**
19	Rosemont Road / Salamo Road	17	18	2006
20	Rosemont Road / Summit Street	0	0	2006
21	Sunset Avenue / Cornwall Street	0	2	2006
22	Salamo Road / Bland Circle	0	0	2006
23	Salamo Road / Barrington Drive	0	0	2006
24	Salamo Road / Parker Road	16	30	**2014**
25	Blankenship Road / Tannler Drive	3	0	**2014**
26	10th Street / Blankenship-Salamo Road	0	0	**2014**
27	10th Street / I-205 SB Ramp	0	12	**2014**
28	10th Street / I-205 NB Ramp	0	3	**2014**
29	10th Street / 8th Avenue	8	5	**2014**
30	10th Street / Willamette Falls Drive	0	0	**2014**
31	Willamette Falls Drive / 12th Street	29	15	**2014**
32	Willamette Falls Drive / Dollar Street E	2	1	2006
33	Willamette Falls Drive / 19th Street	0	0	2006
34	Willamette Falls Drive / Ostman Road	0	0	**2014**
35	Willamette Falls Drive / Dollar Street W	1	0	2006

As shown in Table 3, the highest pedestrian crossing volumes were observed at the study intersections located along Highway 43 and at the Rosemont Road/Salamo Road, Salamo Road/Parker Road, and Willamette Falls Drive/12th Street intersections.

PEDESTRIAN SYSTEM NEEDS

While pedestrian facilities currently exist along many city streets, there are many more streets where these facilities are needed to improve pedestrian access. The following provides a summary of the pedestrian system needs within West Linn and is based on information provided in previous planning documents as well as a review of the transportation system. As described below, the most common overall need is to provide a safe and interconnected system that enables walking as a convenient mode of travel, especially for trips less than one-half mile.

Access

The transportation system should provide access to all essential destinations in the city, such as transit centers, park-and-rides, bus stops, schools, parks, public facilities, and commercial areas. The transportation system should also provide access to other networks, such as Metro's Regional Pedestrian Network, Metro's Regional Trails and Greenways Networks and Clackamas County's Principal Active Transportation (PAT) routes as documented in the County's Active Transportation Plan (ATP).

Essential Destinations

- **Transit Facilities and Services:** Two fixed-route bus lines serve multiple transit stops (TriMet Line 35 and Line 154), as well as a park-and-ride near the intersection of Highway 43 and Cedar Oak Drive and the Oregon City Transit Center.
- **Schools:** There are five primary, one middle, and one high school in West Linn. Most of these schools have limited pedestrian connectivity or include significant gaps in the pedestrian and bicycle network.
- **Parks**: There are numerous parks in West Linn. The most heavily used parks in 2015 are Mary S. Young Park, Hammerle, Willamette, Fields Bridge, Marylhurst, and Tanner Creek.
- **Public Facilities** (library, community center, city hall): There are several public facilities in West Linn, including City Hall, the adult community center, and the library.
- **Commercial Areas**: There are four main commercial areas in West Linn which are located near the Willamette Drive/I-205 interchange, the 10th Street/I-205 interchange, the Salamo Road/Parker Road intersection, and along Willamette Drive toward the north end of the City.

Several projects are included in the pedestrian plan that will improve pedestrian access and circulation to essential destinations within West Linn.

Metro's Regional Pedestrian Network

Metro's Regional Pedestrian Network consists of pedestrian parkways, regional pedestrian corridors, local pedestrian corridors, and regional pedestrian districts. The components of the Regional Pedestrian Network located within West Linn are defined below:

- **Pedestrian parkways** are high quality and high priority routes for pedestrian activity. They are generally major urban streets that provide frequent and/or almost frequent transit service. They can also be regional trails. The following are the existing and proposed pedestrian parkways within West Linn:
  - Existing pedestrian parkways: Willamette Drive
  - Proposed pedestrian parkways: I-205 Multi-Use Path, which is also identified in the Metro Regional Trails and Greenways network
- **Regional pedestrian corridors** are any major or minor arterial or regional trail that is not designated as a pedestrian parkway. The following are the existing and proposed regional pedestrian corridors within West Linn:
  - Existing regional pedestrian corridors: Old River Drive, which is also identified as the Willamette River Greenway in the Metro Regional Trails and Greenways network and parts of the Salamo Trail
  - Proposed regional pedestrian corridors: the Rosemont Trail, which is also identified in the Metro Regional Trails and Greenways network, and filling gaps in the Salamo Trail and the Riverside Loop Trail
- **Local pedestrian corridors** include any street or trail that is not a regional pedestrian corridor.
- **Pedestrian Districts** are areas with a concentration of transit, commercial, cultural, educational, institutional, and/or recreational destinations where pedestrian travel is intended to be attractive, comfortable and safe. Within West Linn these areas include the four main commercial areas described above.

Several projects are included in the pedestrian plan that will improve pedestrian access and circulation to Metro's Regional Pedestrian Network.

Clackamas County Principal Active Transportation Routes

The Clackamas County Active Transportation Plan identifies Principal Active Transportation (PAT) routes that connect key destinations for transit, shopping and employment centers within the County. Within West Linn, the County identified Route 6a (Willamette Drive/Old River Drive/Road) as a Visionary PAT (V-PAT) Route, which means that it is a long-term project. Route 6a offers a scenic route along the Willamette River south of George Rogers Park. When combined with improved facilities on Willamette Drive, this route would provide a direct connection between Lake Oswego and West Linn as well as access to employment, parks and shopping. Several projects are included in the pedestrian plan that will improve pedestrian access and circulation to the County's PAT routes.

Safe Routes to School Plans

The West Linn-Wilsonville School District (WLWV) operates five primary schools, one middle school, one high school, and one charter school in West Linn. WLWV has developed safe routes to school plans

for each of its five primary schools, including Bolton, Cedar Oaks, Sunset, Trillium Creek, and Willamette. WLWV has not developed SRTS plans for the charter school, middle school, or high school. Several projects are included in the pedestrian plan that will improve conditions along the safe routes to school routes.

Connectivity

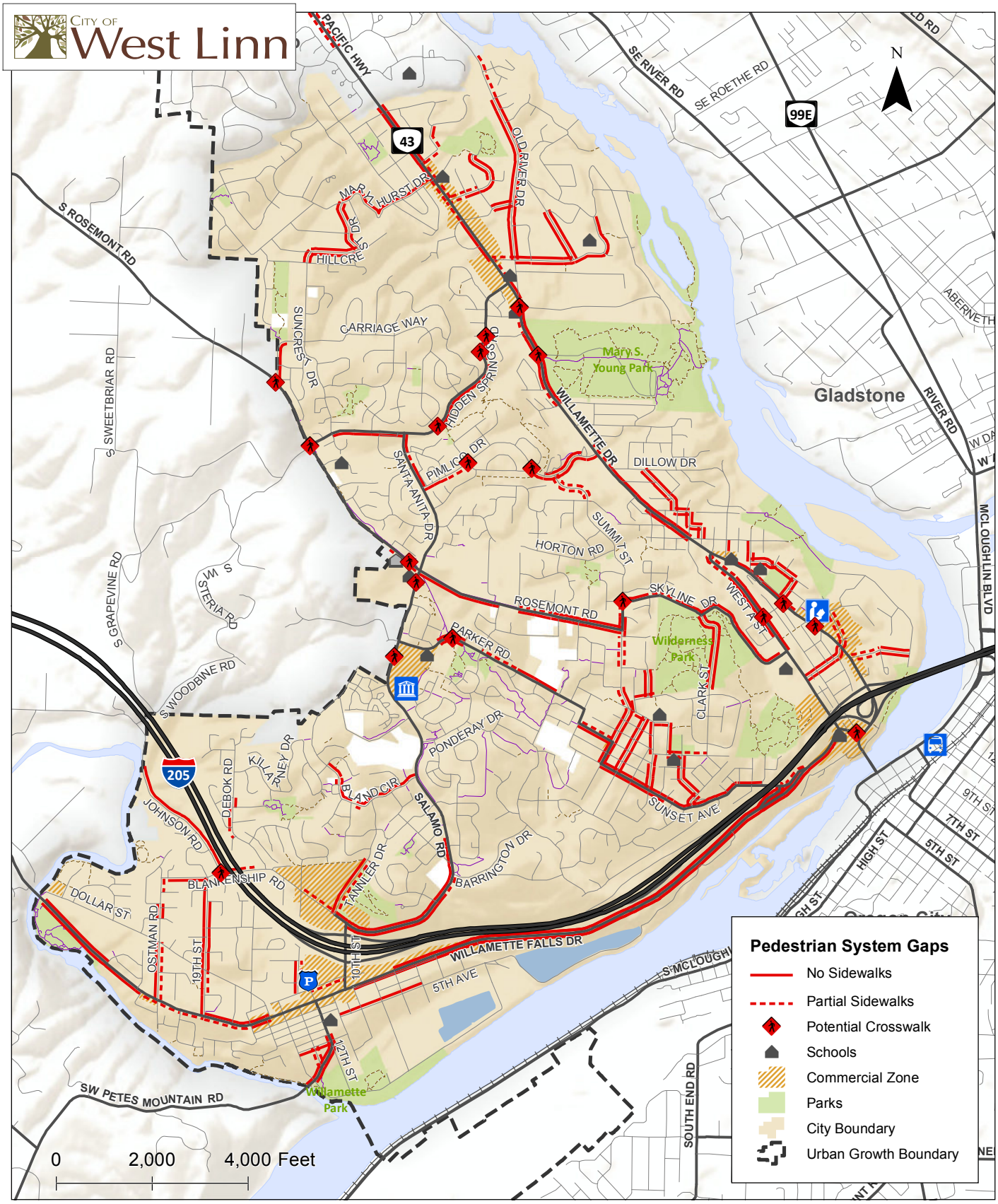
A well-connected pedestrian system provides continuous sidewalks and other pedestrian facilities between essential destinations, such as residential neighborhoods, schools, parks, and commercial areas. Strategies to improve pedestrian connectivity include identifying, prioritizing, and ultimately constructing new sidewalks, multi-use paths and trails, pedestrian crossings, and connections between neighborhoods. The following provides a summary of pedestrian system connectivity needs.

Sidewalks

Sidewalks are the fundamental building block of a pedestrian system. Sidewalks enable people to comfortably, conveniently, and safely walk from place to place. They also provide an important means of mobility for people with disabilities and families with strollers, and others who may not be able to travel on an unimproved roadside surface. Sidewalks also serve to effectively communicate to pedestrians, the routes that are intended to be used for safe public access. Sidewalks are usually constructed from concrete and provide an area separated from the roadway by a curb, landscaping, and/or on-street parking. Sidewalks are widely used in urban and suburban settings. The images below show sidewalks in a variety of settings.

Examples of sidewalks

Several of the arterial and collector streets in West Linn need sidewalks and other pedestrian facilities to improve connectivity. Figure 5 illustrates the gaps in the pedestrian system. As shown, there is a need for sidewalks along several of the arterial and collector streets and several of the neighborhood routes and local streets identified as safe routes to school (SRTS) or commercial streets. While Figure 5 shows the need for sidewalks along *both* sides of all arterial, collector, SRTS, and commercial streets, it may be more feasible and/or cost effective to construct sidewalks on one side of the street particularly when dealing with steep slopes. Marylhurst Drive, Hidden Springs Road, Pimlico Drive, and Skyline Drive for example, have significant grade and topography issues that may limit the ability to construct sidewalks on one or both sides of the street.



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Pedestrian System Gaps
West Linn, Oregon

Figure **5**

Kittelson & Associates, Inc.
Transportation Engineering/Planning

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

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Pedestrian Crossings

Pedestrian crossings enable pedestrians to safely cross streets, railroad tracks, and other transportation facilities. Planning for appropriate pedestrian crossings requires the community to balance vehicular mobility needs with providing crossing locations that accommodate desired walking routes.

The state of Oregon considers all roadway intersections legal crossing locations for pedestrians regardless of whether a painted crosswalk exists. At these locations, drivers are required to yield to pedestrians to allow them to cross. Driver compliance to yielding is often inconsistent and pedestrians often have difficulty crossing higher volume and higher speed roadways. There are several different types of pedestrian crossing treatments that can be used in West Linn, where each of these is acceptable under a different range of considerations. The images below show pedestrian crossings in a variety of settings.

Examples of marked pedestrian crossings

Pedestrian crossings along the City's arterial and collector streets are limited to major intersections and a few key mid-block crossing locations. There are currently eight pedestrian crossings along Willamette Drive at signalized intersections that include pedestrian push buttons and pedestrian signal heads. However, there are several additional locations along Willamette Drive as well as other arterial and collector streets within the city where marked pedestrian crossings would improve connectivity and provide access to schools, parks, the library, and other essential destinations within the city.

Figure 5 illustrates potential crossing locations. The City should identify a standard methodology for crossing improvements, such as the National Cooperative Highway Research Program (NCHRP) Report 562, which will help identify appropriate crossing treatments based on pedestrian crossing volumes, traffic volume, travel speed, and a variety of other criteria. Any new pedestrian crossings located on Willamette Drive will need to meet ODOT crossing guidelines and be evaluated by ODOT based on specific criteria to ensure the crossing is appropriate.

Multi-Use Paths and Trails

Multi-use paths and trails are designated pathways for both bicyclists and pedestrians. Paved, bi-directional multi-use paths can be part of a park and recreational system and/or can be adjacent to roadways where the topography, right-of-way, or other issues don't allow for sidewalks and on-street bike facilities. Intersections of multi-use paths and roadways require crossing treatments that are well

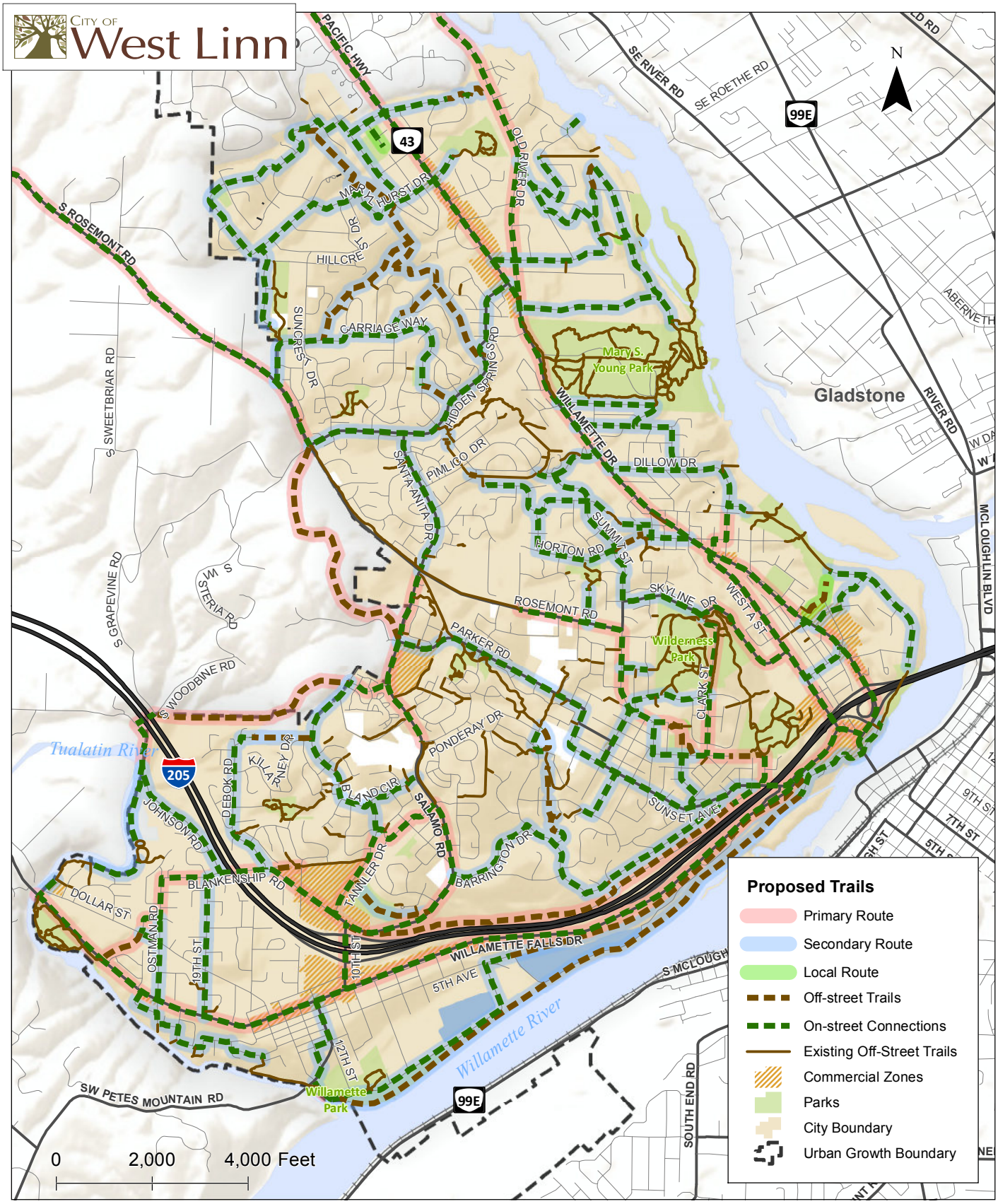
marked and highly visible to vehicles and trail users. Multi-use paths can create longer-distance links within and between communities, provide regional connections, and play an integral role in recreation, commuting, and accessibility for residents due to their broad appeal to users of all ages and skill levels. Where appropriate, the city of West Linn may use multi-use paths in lieu of sidewalks and bike facilities. The city of West Linn 2013 Comprehensive Trails Master Plan outlines local and regional trail needs and includes proposed paths along the Willamette River waterfront, and paths leading to and from Wilderness Park to the north and west.

Examples of multi-use paths and trails

There is currently a city-wide network of regional and local multi-use paths and trails in the city, including segments along Rosemont Road, Willamette Drive, Willamette Falls Drive, and within parks. Continuous multi-use paths are more comfortable for both pedestrians and bicyclists than sidewalks or on-street bike facilities and increasing the lengths of these short segments would create a more robust network to augment the sidewalk and bike lane network on roadways. The City's Trails Master Plan includes multi-use paths and trails and on-street facilities to provide connections to the trails. Figure 6 illustrates the City's Trails Master Plan. The on-street segments of the Trails Master Plan are included in the pedestrian improvement projects identified below. On-street segments can be varied in design depending upon the type of street and volume of traffic.

Neighborhood Connections

Connections between cul-de-sacs and adjacent roadways can significantly reduce travel distances for pedestrians, thereby encouraging more pedestrian trips. The Transportation Planning Rule (TPR) requires cities to identify such connections in developed areas as part of a bicycle and pedestrian circulation plan. Appropriate improvements should provide for more direct, convenient, and safe bicycle or pedestrian travel within and between residential areas and neighborhood activity centers. Although there are many locations in West Linn where cul-de-sac lengths are excessive and routes from local roads to collectors are not very direct, short-cuts are not always possible due to terrain or necessary trail length. The following identifies four possible locations for the construction of new pedestrian access ways or shortcuts:



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West Linn Trails Master Plan
West Linn, Oregon

Figure
6

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Kittelson & Associates, Inc.
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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

- Wisteria Road to Bland Circle: This connection would join two residential areas, creating a circular connection from Tannler Drive to Bland Circle, to Wisteria Road, and down to Blankenship Road. A road connection was shown in the Tannler Basin Master Plan at this location, to be built when development occurs. Pedestrian and bicycle access should be part of that connection. This plan advocates completing the connection when development occurs, as the length of the path makes it economically infeasible for the City to pursue in advance of development.
- Sinclair Street to Holly Street: Sinclair Street dead ends in two locations. In order to walk west to Willamette Drive, one must walk east to River Road and then back to Willamette Drive. A connection at this location would be a mildly sloped trail, with dedicated right-of-way needed along lot lines. The trail at this location would be approximately 300 feet long.
- Rosepark Drive to Rosemont Road: Rosepark Drive is a long cul-de-sac. A connection from the end of the cul-de-sac to Rosemont Road would provide shorter, more direct access for travel southeast on Rosemont Road. Right-of-way is not available for this connection and would have to be dedicated along lot lines.
- Hillcrest Court to Marylhurst Drive: A connection from Hillcrest Court to Marylhurst Drive would reduce the walking distance to Willamette Drive for residents of Hillcrest Court and other residents west of Hillcrest. There is a significant slope at this location and right-of way is not available.

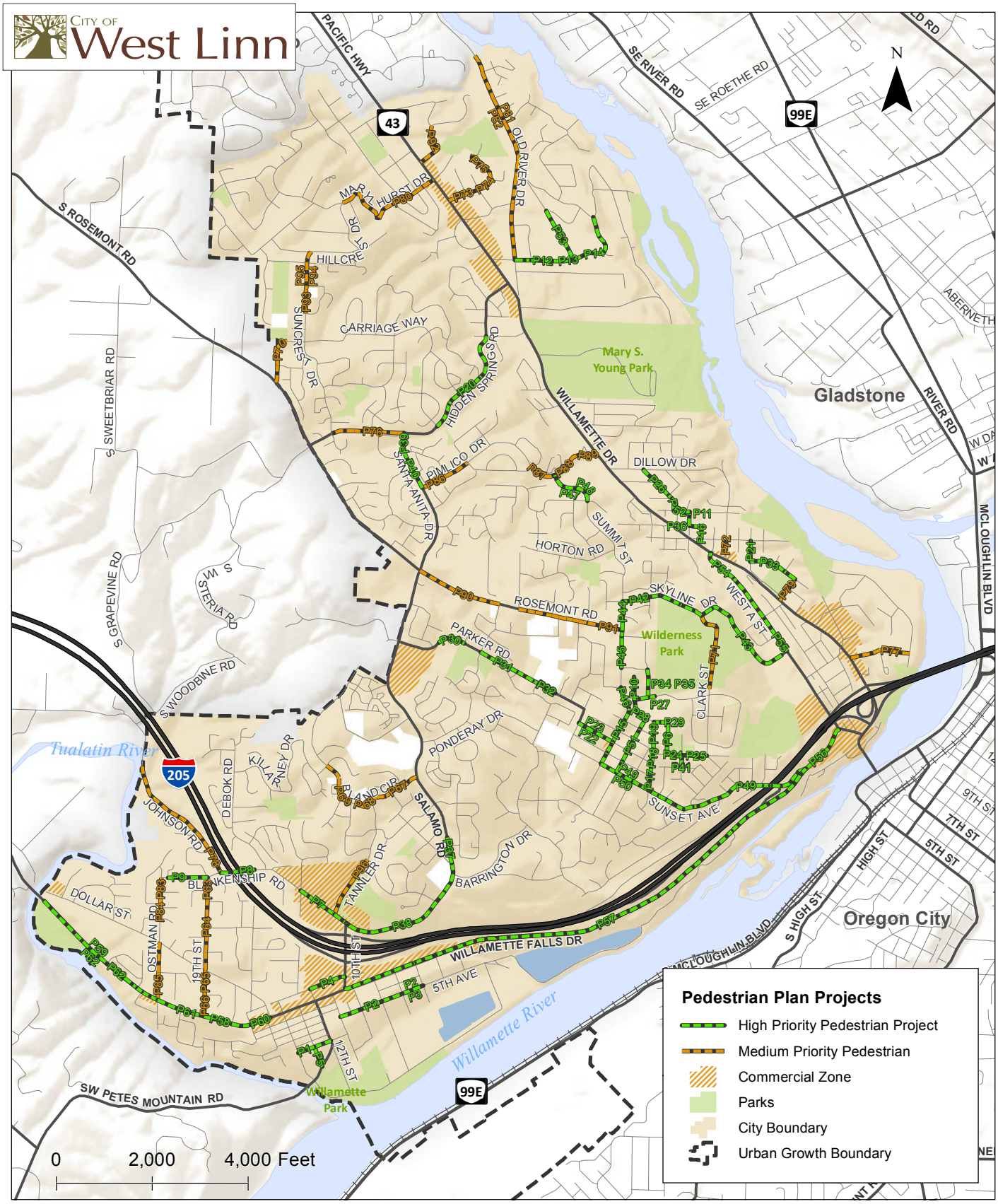
STRATEGIES

In order to address these pedestrian system needs, several strategies were identified, including:

- Provide continuous pedestrian facilities along all arterial and collector streets and neighborhood routes identified as parts of the Safe Routes to School (SRTS) network or commercial streets.
- Provide access to essential destinations, such as transit stops and services, schools, parks, and commercial areas and the local community center, library, and City Hall.
- Provide access to Metro's Regional Pedestrian Network, Trails and Greenway Network, and Clackamas County's Principal Active Transportation Routes.
- Prioritize pedestrian improvements along streets that provide the greatest benefit to the transportation system.

PEDESTRIAN PLAN

Table 4 summarizes and Figure 7 shows the pedestrian system improvement projects identified for the TSP. The cost estimates shown in Table 4 were developed using average unit costs for transportation improvements and therefore, should be considered planning level estimates. More detailed cost estimates will be required as projects are pursued.



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Pedestrian Plan Projects
West Linn, Oregon

Figure **7**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

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Table 4: Pedestrian Plan Improvement Projects

Map ID	Location	Type	Project Description	Priority	Cost ($1,000)
P1	4th Avenue	Sidewalks	Install sidewalks on the south side of the roadway from 14th Street to 12th Street	High	$100
P2	5th Avenue	Sidewalks	Install sidewalks on the north side of the roadway from 11th Street to 7th Street	High	$250
P3	5th Avenue	Sidewalks	Install sidewalks on the south side of the roadway from 25 feet west of 8th Street to 150 feet east of 8th Street	High	$25
P4	8th Avenue	Sidewalks	Install sidewalks on the south side of the roadway from 12th Street to 400 feet east of 12th Street	High	$55
P5	13th Street	Sidewalks	Install sidewalks on the east side of the roadway from 100 feet north of Tualatin Avenue to Tualatin Avenue	High	$15
P6	Bittner Street	Sidewalks	Install sidewalks on the east side of the roadway from Oxford Street to Long Street	High	$180
P7	Blankenship Road	Sidewalks	Install sidewalks on the north side of the roadway from 10th Street to approximately 50 feet east of the Willamette Corporate Center driveway	High	$65
P8	Blankenship Road	Sidewalks	Install sidewalks on the north side of the roadway from approximately 400 feet west of Debok Road to Johnson Road	High	$90
P9	Blankenship Road	Sidewalks	Install sidewalks on the south side of the roadway from 19th Street to approximately 175 feet east of Ostman Road	High	$110
P10	Bonnet Drive	Sidewalks	Install sidewalks on the west side of the roadway from Oregon City Boulevard to Oxford Street	High	$50
P11	Caufield Street	Sidewalks	Install sidewalks on both sides of the roadway from Tompkins Street to Randall Street	High	$80
P12	Cedar Oak Drive	Sidewalks	Install sidewalks on both sides of the roadway from Old River Drive to 200 feet west of Trillium Drive	High	$140
P13	Cedar Oak Drive	Sidewalks	Install sidewalks on the north side of the roadway from 200 feet west of Trillium Drive to Trillium Drive	High	$25
P14	Cedar Oak Drive	Sidewalks	Install sidewalks on the south/east side of the roadway from Trillium Drive to Elmran Drive	High	$200
P15	Cornwall Street	Sidewalks	Install sidewalks on both sides of the roadway from Oxford Street to Sunset Avenue	High	$355
P16	Davenport Street	Sidewalks	Install sidewalks on both sides of the roadway from Randall Street to Buck Street	High	$65
P17	Exeter Street	Sidewalks	Install sidewalks on the both sides of the roadway from Lancaster Street to Sunset Avenue	High	$150
P18	Exeter Street	Sidewalks	Install sidewalks on the east side of the roadway from Long Street to Lancaster Avenue	High	$25
P19	Exeter Street	Sidewalks	Install sidewalks on the west side of the roadway from Oxford Street to Long Street	High	$90
P20	Hidden Springs Road	Sidewalks	Install sidewalks on the south side of the roadway from Carriage Way to Cottonwood Court	High	$145
P21	Holmes Street	Sidewalks	Install sidewalks on the west side of the roadway from Buck Street to Perrin Street	High	$60
P22	Lancaster Street	Sidewalks	Install sidewalks on the south side of the roadway from Parker Road to Cornwall Street	High	$110
P23	Lancaster Street	Sidewalks	Install sidewalks on the north side of the roadway from approximately 175 feet east of Parker Road to Cornwall Street	High	$90
P24	Long Street	Sidewalks	Install sidewalks on both sides of the roadway from Bittner Street to Simpson Street	High	$90
P25	Long Street	Sidewalks	Install sidewalks on the north side of the roadway from 125 feet east of Simpson Street to 250 feet east of Simpson Street	High	$115

Map ID	Location	Type	Project Description	Priority	Cost ($1,000)
P26	Lowry Drive/Barclay Street	Sidewalks	Install sidewalks on both sides of the roadway from Dillow Drive to Tompkins Street	High	$305
P27	Oregon City Boulevard	Sidewalks	Install sidewalks on the north side of the roadway from Bonnet Drive to 350 feet east of Prospect Street	High	$135
P28	Oxford Street	Sidewalks	Install sidewalks on the south side of the roadway from Bonnet Drive to Sussex Street	High	$35
P29	Oxford Street	Sidewalks	Install sidewalks on the south side of the roadway from Exeter Street to Bittner Street	High	$50
P30	Parker Road	Sidewalks	Install sidewalks on both sides of the roadway from approximately 125 feet east of Noble Lane to approximately 100 feet west of Dillon Lane	High	$155
P31	Parker Road	Sidewalks	Install sidewalks on the north side of the roadway from approximately 150 feet east of Wild Rose Drive to 475 feet east of Wild Rose Drive	High	$75
P32	Parker Road	Sidewalks	Install sidewalks on the north side of the roadway from approximately 150 west of Damon Drive to 75 feet west of Chinook Court	High	$70
P33	Perrin Street	Sidewalks	Install sidewalks on both sides of the roadway from Holmes Street to Lewis Street	High	$290
P34	Prospect Street	Sidewalks	Install sidewalks on the east side of the roadway from Knox Street to Oregon City Boulevard	High	$135
P35	Prospect Street	Sidewalks	Install sidewalks on the west side of the roadway from 125 feet south of Knox Street to Oregon City Boulevard	High	$115
P36	Randall Street	Sidewalks	Install sidewalks on both sides of the roadway from Caufield Street to Davenport Street	High	$65
P37	Salamo Road	Sidewalks	Install sidewalks on the west side of the roadway from approximately 750 feet south of Remington Drive to Barrington Drive	High	$70
P38	Salamo Road	Sidewalks	Install sidewalks on the north side of the roadway from Barrington Drive to 10th Street	High	$380
P39	Santa Anita Drive	Sidewalks	Install sidewalks on the east side of the roadway from Hidden Springs Road to Clubhouse Circle	High	$40
P40	Santa Anita Drive	Sidewalks	Install sidewalks on the east side of the roadway from approximately 250 feet south of Clubhouse Circle to Pimlico Drive	High	$50
P41	Simpson Street	Sidewalks	Install sidewalks on both sides of the roadway from Long Street to Charman Street	High	$415
P42	Skyline Drive	Sidewalks	Install sidewalks on the north side of the roadway from Summit Street to approximately 150 feet west of Firwood Drive	High	$55
P43	Skyline Drive	Sidewalks	Install sidewalks on the north side of the roadway from approximately 100 feet east of Firwood Drive to approximately 150 feet west of West A Street	High	$450
P44	Summit Street	Sidewalks	Install sidewalks on the west side of the roadway from approximately 150 feet south of Skyline Drive to Rosemont Road	High	$40
P45	Summit Street	Sidewalks	Install sidewalks on the west side of the roadway from approximately 150 feet south of Rosemont Road to Oxford Street	High	$90
P46	Summit Street	Sidewalks	Install sidewalks on the east side of the roadway from Gloria Drive to Oxford Street	High	$230
P47	Summit Street	Sidewalks	Install sidewalks on both sides of the roadway from Pimlico Drive to 150 feet south of Pimlico Drive	High	$25
P48	Summit Street	Sidewalks	Fill in the 65-foot gap in the sidewalk on the north side of roadway at approximately 350 feet south of Pimlico Drive	High	$5

Map ID	Location	Type	Project Description	Priority	Cost ($1,000)
P49	Sunset Avenue	Sidewalks	Install sidewalks on the north side of the roadway from Cornwall Street to Willamette Falls Drive	High	$595
P50	Sunset Avenue	Sidewalks	Install sidewalks on the south side of the roadway from Cornwall Street to approximately 150 feet west of Spring Rock Circle	High	$210
P51	Sussex Street	Sidewalks	Install sidewalks on both sides of the roadway from Oxford Street to Sunset Avenue	High	$350
P52	Tompkins Street	Sidewalks	Install sidewalks on both sides of the roadway from Lowry Drive to Caufield Street	High	$90
P53	Trillium Drive	Sidewalks	Install sidewalks on both sides of the roadway from Glen Terrace to 700 feet south of Glen Terrace	High	$320
P54	West A Street	Sidewalks	Install sidewalks on both sides of the roadway from approximately 250 feet east of Willamette Drive to Terrace Drive	High	$350
P55	West A Street	Sidewalks	Install sidewalks on the north side of the roadway from Terrace Drive to Skyline Drive	High	$35
P56	Willamette Falls Drive	Sidewalks	Install sidewalks on the south side of the roadway from West A Street to Sunset Avenue	High	$300
P57	Willamette Falls Drive	Sidewalks	Install sidewalks on the south side of the roadway from Sunset Avenue to 10th Street	High	$2,565
P58	Willamette Falls Drive	Sidewalks	Install sidewalks on the north side of the roadway from Dollar Street (east) to 19th Street	High	$195
P59	Willamette Falls Drive	Sidewalks	Install sidewalks on the north side of the roadway from Epperly Way to West City Limits	High	$290
P60	Willamette Falls Drive	Sidewalks	Install sidewalks on the south side of the roadway from 16th Street to 200 feet west of 16th Street	High	$25
P61	Willamette Falls Drive	Sidewalks	Install sidewalks on the south side of the roadway from approximately 500-feet east of 19th Street to approximately 150-feet west of 19th Street and from approximately 200-feet east of Ostman Road to Ostman Road	High	$185
P62	Willamette Falls Drive	Sidewalks	Install sidewalks on the south side of the roadway from Ostman Road to West City Limits	High	$465
P63	19th Street	Sidewalks	Install sidewalks on the west side of the roadway from Blankenship Road to Nova Court	Medium	$135
P64	19th Street	Sidewalks	Install sidewalks on both sides of the roadway from Nova Court to Dollar Street	Medium	$195
P65	19th Street	Sidewalks	Install sidewalks on both sides of the roadway from Dollar Street to High Touch Court	Medium	$140
P66	19th Street	Sidewalks	Install sidewalks on the west side of the roadway from High Touch Street to Dollar Street	Medium	$60
P67	Bland Circle	Sidewalks	Install sidewalks on the north side of the roadway from Salamo Road to Tannler Drive	Medium	$95
P68	Bland Circle	Sidewalks	Install sidewalks on the north side of the roadway from Tannler Drive to approximately 100 feet east of Falcon Drive	Medium	$55
P69	Bland Circle	Sidewalks	Install sidewalks on the north side of the roadway from Falcon Drive to approximately 400 feet north of Fircrest Drive	Medium	$230
P70	Carriage Way	Sidewalks	Install sidewalks on the north-west side of the roadway from approximately 350 feet west of Suncrest Drive to Rosemont Road	Medium	$265
P71	Clark Street	Sidewalks	Install sidewalks on both sides of the roadway from Skyline Drive to approximately 150 feet north of Windsor Boulevard	Medium	$475
P72	Failing Street	Sidewalks	Install sidewalks on the east side of the roadway from approximately 200-feet north of Highway 43 to Buck Street	Medium	$65

Map ID	Location	Type	Project Description	Priority	Cost ($1,000)
P73	Fairview Way	Sidewalks	Install sidewalks on both sides of the roadway from approximately 200-feet east of Highway 43 to approximately 100-west of Rose Way	Medium	$135
P74	Fairview Way	Sidewalks	Install sidewalks on the south side of the roadway from approximately 100-feet west of Rose Way to Chippewa Court	Medium	$55
P75	Fairview Way	Sidewalks	Install sidewalks on both sides of the roadway from Chippewa Court to the roadway terminus	Medium	$175
P76	Hidden Springs Road	Sidewalks	Install sidewalks on the south side of the roadway from Suncrest Drive to Santa Anita Drive (Maintain existing curb line)	Medium	$80
P77	Holly Street	Sidewalks	Install sidewalks on both sides of the roadway from approximately 150-feet east of Highway 43 to River Street	Medium	$620
P78	Johnson Road	Sidewalks	Install sidewalks on west side of the roadway from Blankenship Road to Western City Limits	Medium	$390
P79	Lewis Street	Sidewalks	Install sidewalks on both sides of the roadway from Highway 43 to Perkins Street	Medium	$305
P80	Marylhurst Drive	Sidewalks	Install sidewalks on one side of the roadway from Willamette Drive to Hillcrest Drive (East)	Medium	$340
P81	Old River Drive	Sidewalks	Install sidewalks on the east side of the roadway from approximately 100 feet north of Riverside Court to Cedar Oak Drive	Medium	$550
P82	Old River Drive	Sidewalks	Install sidewalks on the west side of the roadway from approximately 200 feet north of Riverside Court to Cedar Oak Drive	Medium	$475
P83	Ostman Road	Sidewalks	Install sidewalks on the east side of the roadway from Blankenship Road to Michael Drive	Medium	$55
P84	Ostman Road	Sidewalks	Install sidewalks on both sides of the roadway from Michael Drive to Fields Drive-Short Street	Medium	$85
P85	Ostman Road	Sidewalks	Install sidewalks on both sides of the roadway from Dollar Street to Willamette Falls Drive	Medium	$330
P86	Pimlico Drive	Sidewalks	Install sidewalks on the south side of the roadway from Santa Anita Drive to approximately 100 feet west of Palomino Way (west)	Medium	$95
P87	Pimlico Drive	Sidewalks	Install sidewalks on the south side of the roadway from Palomino Way (east) to Pimlico Terrace	Medium	25
P88	Pimlico Drive	Sidewalks	Install sidewalks on both sides of the roadway from Pimlico Terrace to Treetop Lane	Medium	$165
P89	Pimlico Drive	Sidewalks	Install sidewalks on the south side of the roadway from Treetop Lane to Willamette Drive	Medium	$30
P90	Rosemont Road	Sidewalks	Install sidewalks on the south side of the roadway from Santa Anita Drive to Wild Rose Drive	Medium	$250
P91	Rosemont Road	Sidewalks	Install sidewalks on both sides of the roadway from Shannon Lane to Summit Street	Medium	$540
P92	Shady Hollow Way	Sidewalks	Install sidewalks on the south side of the roadway from approximately 150-feet east of Highway 43 to Arbor Drive	Medium	$230
P93	Suncrest Drive	Sidewalks	Install sidewalks on the east side of the roadway from approximately 250 feet south of Ridgebrook Drive (north) to Ridgebrook Drive (north)	Medium	$70
P94	Suncrest Drive	Sidewalks	Install sidewalks on the east side of the roadway from approximately 150 feet north of Ridgebrook Drive (north) to Hillcrest Road	Medium	$135
P95	Suncrest Drive	Sidewalks	Install sidewalks on the west side of the roadway from approximately 250 feet north of Ridgebrook Drive (north) to Hillcrest Drive	Medium	$135

Map ID	Location	Type	Project Description	Priority	Cost ($1,000)
P96	Tannler Drive	Sidewalks	Install sidewalks on both sides of the roadway from Blankenship Road to Greene Street	Medium	$235
P97	Clark Street	Interim	Install a mixed use shoulder on one side of the roadway from Skyline Drive to approximately 150 feet north of Windsor Boulevard	Low	$185
P98	Johnson Road	Interim	Install a mixed use shoulder on one side of the roadway from Blankenship Road to Western City Limits	Low	$305
P99	Marylhurst Drive	Interim	Install a mixed use shoulder on one side of the roadway from Willamette Drive to Hillcrest Drive (East)	Low	$455
P100	Old River Drive	Interim	Install a mixed-use shoulder on the east side of the roadway from the northern City limits to Cedar Oak Drive	Low	$475
				Total High Priority Project Costs	$11,935
				Total Medium Priority Project Costs	$7,220
				Total Low Priority Project Costs	$1,420
				Total Project Costs	**$20,575**

Additional pedestrian improvement projects along the Highway 43 and 10th Street corridors are included with the motor vehicle projects.

Chapter 4 Bicycle Plan

BICYCLE PLAN

Bicycle facilities are the elements of the transportation system that enable bicyclists to travel safely and efficiently on the transportation system. Both public infrastructure (shared-use pavement marking and signs, on-street bike lanes, cycle tracks, and shared-use paths (also known as multi-use paths)) and "on-site" facilities (secure parking, changing rooms, and showers at worksites) are important to providing a comprehensive bicycle system. The city of West Linn has a goal to become a "Platinum Level" Bicycle Friendly Community as distinguished by the League of American Bicyclists. Exhibit 2 illustrates The Building Blocks of a Bicycle Friendly Community from the League of American Bicyclists.

EXISTING CONDITIONS

The bicycle system within the city of West Linn consists of on-street bike lanes, shared roadways (where bicycles share the travel lane with motor vehicles), as well as off-street bicycle facilities, such as multi-use paths and bicycle parking. These types of facilities provide residents with the ability to access transit as well as commercial, recreational, and other land uses located within West Linn and neighboring cities by bike. Safe and convenient bicycle facilities are essential to a vibrant community and economy within West Linn.

Bicycle Facilities

Figure 8 shows the existing bicycle facilities within the city of West Linn and the location of commercial zones and other activity areas. As shown on Figure 8, on-street bike lanes are currently provided along arterial roadways: Willamette Drive, 10th Street and Salamo Road. Also, limited or no bicycle facilities are provided along several of the collector and neighborhood route streets. In many cases, such as Marylhurst Drive, Hidden Springs Road, Pimlico Drive, Skyline Drive, and the south end of Salamo Road, the slope of the roadway limits the feasibility or need for on-street bike lanes.

Roads with no bike lanes or intermittent bike lanes require bicyclists to share the travel lane with motor vehicles or use the shoulder, if available. In many cases, this is not a desirable option for bicyclists due to narrow widths or uneven pavement conditions. The City should provide adequate bicycle facilities to allow for safe travel between neighborhoods and activity areas. Local streets are generally not required to provide bicycle facilities, since streets with low vehicle volumes (under 3,000 average daily traffic) and slow speeds (25 miles per hour or less) are considered safe environments for shared vehicle and bicycle use of the travel lanes. The end of this chapter summarizes deficiencies in the city's bicycle system. Exhibit 3 provides design guidance for the selection of bicycle facilities on city streets.

Exhibit 2: The League of American Bicyclists - The Building Blocks of a Bicycle Friendly Community

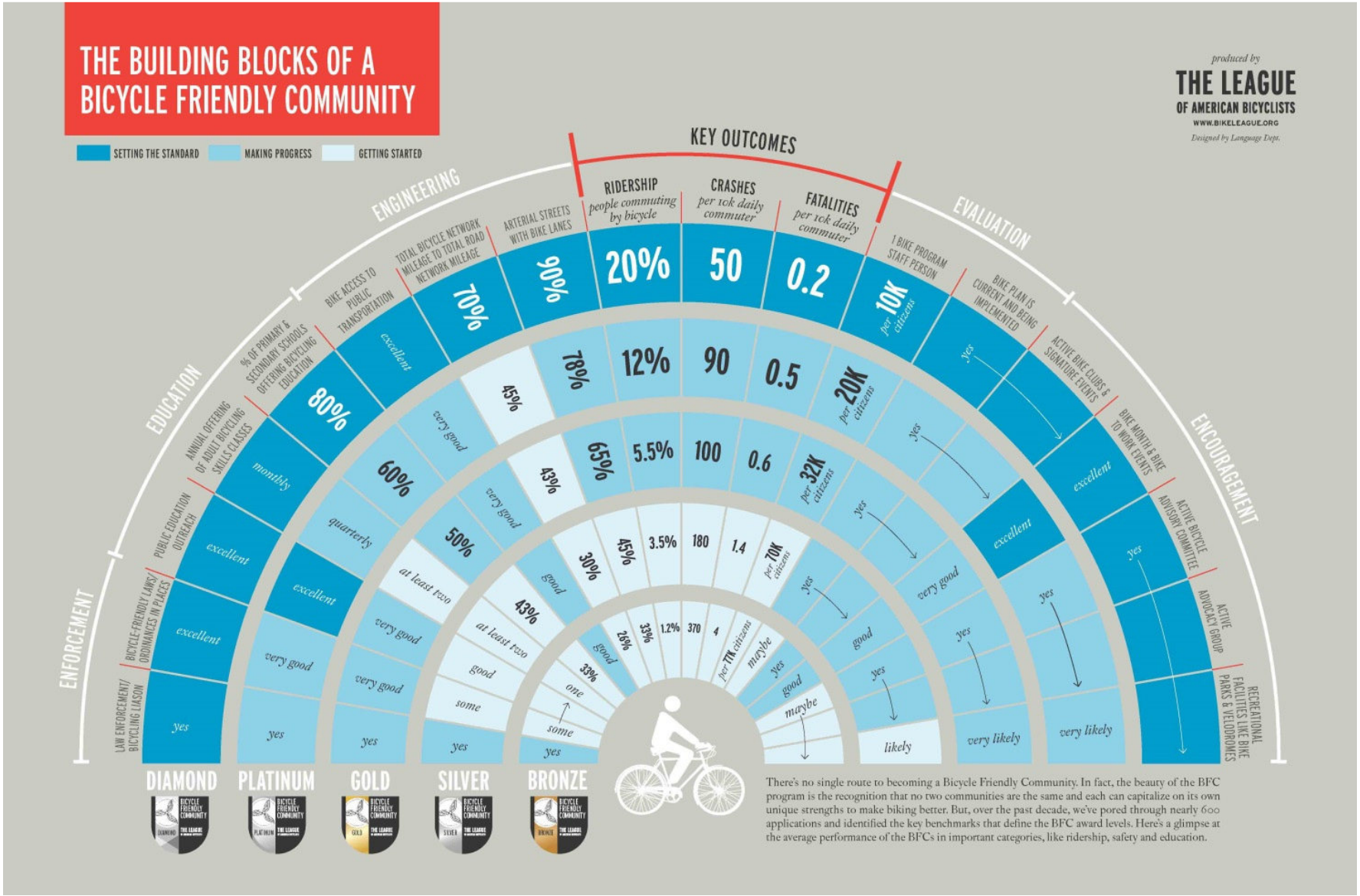
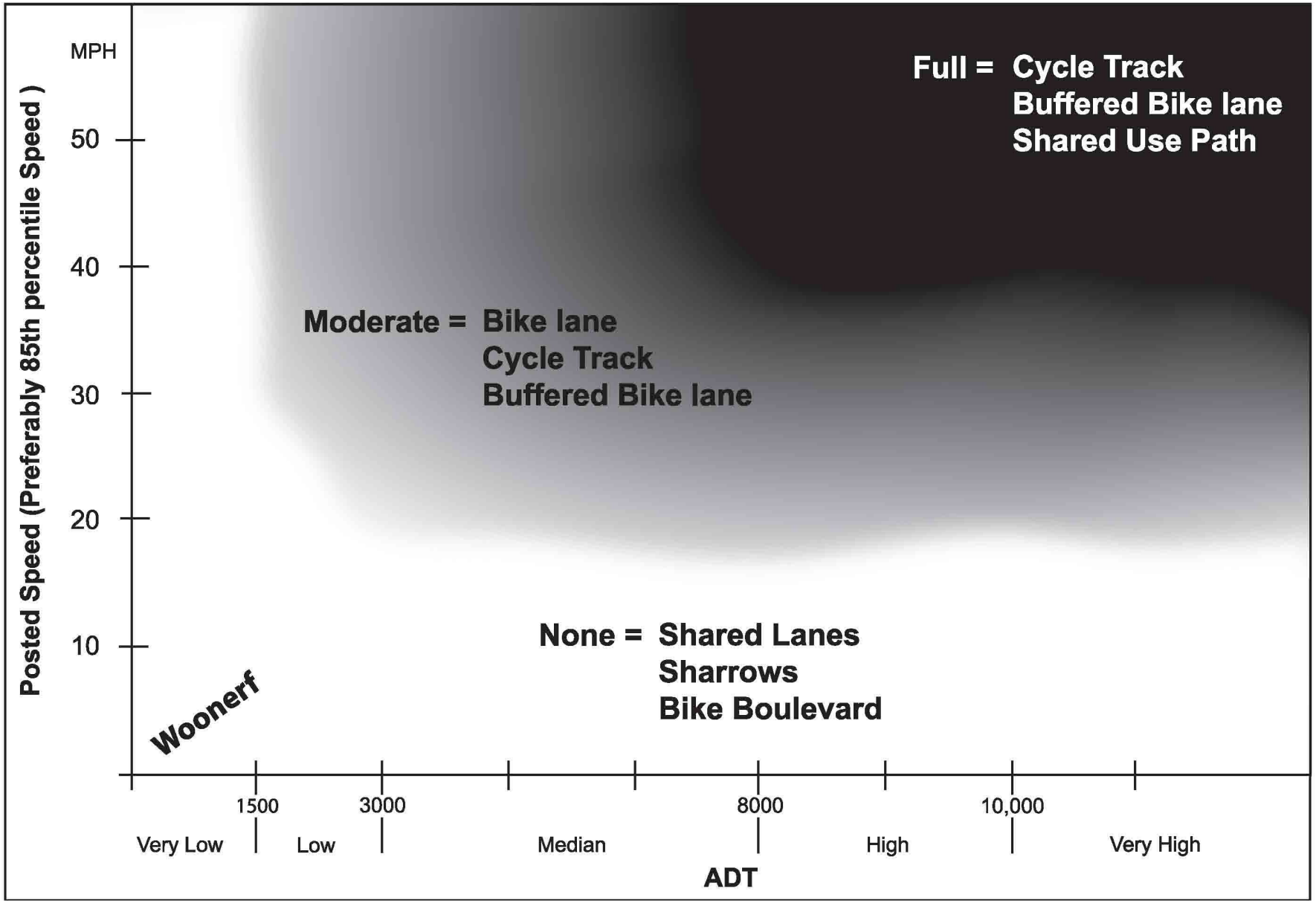
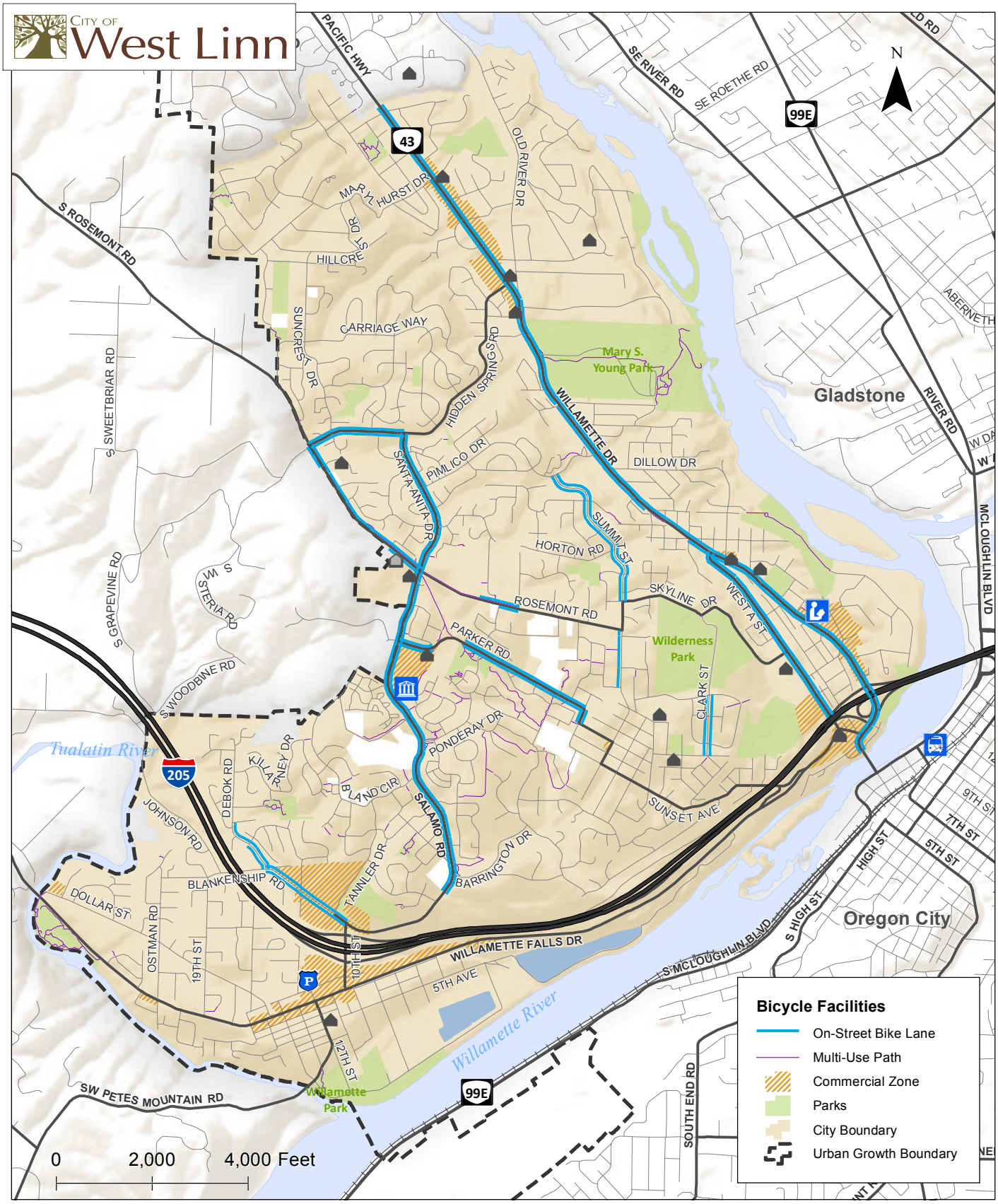


Exhibit 3: Bicycle Facility Design Guidance





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Existing Bicycle Facilities
West Linn, Oregon

Figure
8

H:\profile\17817 - West Linn Transportation System Plan\gis\TSP\Portrait Letter Version\08 Bicycle Facilities.mxd - jsommerville - 11:47 AM 1/13/2016

Kittelson & Associates, Inc.
Transportation Engineering/Planning

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

Bicycle Activity

Table 5 shows the bicycle crossing volumes observed at the study intersections during the weekday evening peak hour. The volumes indicate the relative difference in bicycle activity along major corridors within the city, such as Willamette Drive, Willamette Falls Drive, and Blankenship Road.

Table 5: Bicycle Crossing Volumes at Study Intersections

Map ID	Intersection	North/South Bicycle Volume	East/West Bicycle Volume	Count Year
1	Highway 43 / Arbor Drive	0	2	2006
2	Highway 43 / Marylhurst Drive-Lazy River Way	0	0	2006
3	Highway 43 / Walling Way	1	0	2006
4	Highway 43 / Cedaroak Drive	4	1	**2014**
5	Highway 43 / Hidden Springs Road	4	0	**2014**
6	Highway 43 / Jolie Pointe Drive	0	0	2006
7	Highway 43 / Pimlico Drive	1	0	2006
8	Highway 43 / West "A" Street	0	0	2006
9	Highway 43 / Holmes Street	0	0	2006
10	Highway 43 / Lewis Street-Webb Street	0	1	2006
11	Highway 43 / Burns Street	0	0	2006
12	Highway 43 / Hood Street-McKillican Street	1	0	2006
13	Highway 43 / I-205 SB Ramps	3	1	**2014**
14	Highway 43 / I-205 NB Ramps	6	0	**2014**
15	Highway 43 / Willamette Falls Drive	1	1	**2014**
16	Willamette Falls Drive / Sunset Avenue	2	0	2006
17	Rosemont Road / Carriage Way	0	0	2006
18	Rosemont Road / Hidden Springs Road	0	0	**2014**
19	Rosemont Road / Salamo Road	1	1	2006
0	Rosemont Road / Summit Street	1	1	2006
21	Sunset Avenue / Cornwall Street	0	0	2006
22	Salamo Road / Bland Circle	0	0	2006
23	Salamo Road / Barrington Drive	0	0	2006
24	Salamo Road / Parker Road	1	0	**2014**
25	Blankenship Road / Tannler Drive	0	10	**2014**
26	10th Street / Blankenship-Salamo Road	0	0	**2014**
27	10th Street / I-205 SB Ramp	0	0	**2014**
28	10th Street / I-205 NB Ramp	1	0	**2014**
29	10th Street / 8th Avenue	1	0	**2014**
30	10th Street / Willamette Falls Drive	0	1	**2014**
31	Willamette Falls Drive / 12th Street	0	3	**2014**
32	Willamette Falls Drive / Dollar Street E	0	1	**2014**
33	Willamette Falls Drive / 19th Street	0	1	2006
34	Willamette Falls Drive / Ostman Road	0	0	2006
35	Willamette Falls Drive / Dollar Street W	0	0	2006

As shown in Table 5, the highest bicycle crossing volumes were observed at the study intersections located along Highway 43 and at the Blankenship Road/Tannler Drive intersection.

BICYCLE SYSTEM NEEDS

Bicycle facilities, such as on-street bike lanes, cycle tracks, shared roadway pavement markings, multi-use paths, bicycle crossings, bicycle parking, and wayfinding signage are essential elements of the City's bicycle system. While these facilities are currently provided along many city streets, there are many more streets where these facilities are needed to improve access and connectivity within the city, consistent with the RTFP. The following provides a summary of the bicycle system needs within West Linn and is based on information from previous planning documents and a review of the transportation system.

As described below, the most common overall need is to provide a safe and interconnected system that provides the opportunity to consider biking as a mode of travel, especially for trips up to three miles in length. Because of the length of the trip, bicycle lanes, cycle tracks, and multi-use paths and trails both provide good accommodations for these trips. Many shorter bicycle trips can also be made on roadways with shared use pavement markings or local streets without additional accommodations for bicycles or via connections to arterials and collectors with bicycle facilities.

The bicycle system needs are categorized into two areas: Connectivity and Access. The Connectivity component creates a continuous web of on-street bicycle lanes, cycle tracks, and off-street facilities and amenities such as bicycle parking and wayfinding signs, while the Access component ensures that the bicycle network provides access to key destinations within the city, including transit facilities and to major attractors such as schools and parks. Both of these categories are described below.

Access

The transportation system should provide access to all essential destinations in the city, such as transit centers, park-and-rides, bus stops, schools, parks, public facilities, and commercial areas. The transportation system should also provide access to other networks, such as Metro's Regional Bicycle Network.

Essential Destinations

- **Transit Facilities and Services:** Two fixed-route bus lines serve multiple transit stops (TriMet Line 35 and Line 154) as well as a park-and-ride near the intersection of Highway 43 and Cedar Oak Drive and the Oregon City Transit Center.
- **Schools:** Providing bicycle access to schools can offer multimodal commute options for students.
- **Parks**: There are numerous parks in West Linn. The three main parks are Mary S. Young Park, Wilderness Park, and Willamette Park.
- **Public Facilities**: There are several public facilities in West Linn, including City Hall, the adult community center, and the library.

- **Commercial Areas**: There are four main commercial areas in West Linn which are located near the Willamette Drive/I-205 interchange, the 10th Street/I-205 interchange, the Salamo Road/Parker Road intersection, and along Willamette Drive toward the north end of the City.

Several projects are included in the bicycle plan that will improve bicycle access and circulation to essential destinations within West Linn.

Metro's Regional Bicycle Network

Metro's Regional Bike Network consists of bicycle parkways, regional bikeways, local bikeways, and regional bicycle districts. This network includes the trails identified in the Metro Regional Trails and Greenways network. The components of the Regional Bicycle Network are defined below:

- **Regional Bicycle Parkways** connect to and through every urban center, many regional destinations, and to most employment and industrial areas, regional parks, and natural areas. Bicycle Parkways serve higher volumes of bicyclists and provide important connections to destinations. The following are the existing and proposed bicycle parkways within West Linn:
  - Existing bicycle parkways: Willamette Drive, Pimlico Drive, Santa Anita Drive, parts of Salamo Trail and parts of 10th Street
  - Proposed bicycle parkways: I-205 Multi-Use Trail
- **Regional Bikeways** provide for travel to and within the Central City, Regional Centers, and Town Centers. Regional Bikeways can be any type of facility, including multi-use paths, off-street trails, separate on-street bike lanes, and bicycle boulevards. Within West Linn these routes include the Rosemont Trail (Rosemont Road, Skyline Drive, Summit Street, Cornwall Street, Sunset Avenue) and the Willamette River Greenway trail.
  - Existing regional bikeways: Old River Drive, Willamette River Drive, Blankenship Road, parts of the Willamette River Greenway, the Rosemont Trail, and 10th Street
  - Proposed regional bikeways: Filling gaps in the Willamette River Greenway, the Salamo Trail and the Rosemont Trail
- **Local Bikeways** include any street or trail that is not a regional bicycle corridor.
- **Bicycle Districts** are areas with a concentration of transit, commercial, cultural, educational, institutional, and/or recreational destinations where bicycle travel is intended to be attractive, comfortable and safe.

Access to the Regional Pedestrian and Bicycle Networks is mostly made on local streets, which generally provide limited facilities within West Linn. As such, there is limited access to most of the corridors identified above. Access to these corridors is critical to providing regional pedestrian and bicycle systems that serve the needs of West Linn residents. Several projects are included in the bicycle plan that will improve bicycle access and circulation to Metro's Regional Bicycle Network.

Connectivity

A well-connected bicycle system provides continuous bike lanes and other bicycle facilities between essential destinations such as residential neighborhoods, schools, parks, libraries, and commercial areas. Strategies to improve bicycle connectivity include identifying, prioritizing, and ultimately constructing new on-street bicycle lanes, cycle tracks, shared-use pavement markings, bicycle crossings, multi-use paths and trails, and bicycle parking.

Bicycle connectivity was evaluated along several major roadways within West Linn following the methodology identified in ODOT's APM for Bicycle Level of Traffic Stress (LTS). As applied by ODOT, this methodology classifies four levels of traffic stress that a bicyclist can experience on the roadway, ranging from LTS 1 (little traffic stress) to LTS 4 (high traffic stress). A road segment with a LTS 1 generally has low traffic speeds and low volumes and is suitable for all bicyclists, including children. A road segment with a LTS 4 generally has high speeds, high volumes and is perceived as unsafe by most adults. LTS 2 is considered appealing to a majority of the bike-riding population and therefore, is the desired target on most roadways. The results of the analysis indicate that some roadways are suitable as shared use facilities, while others require on-street bike lanes or separated bicycle facilities in order to accommodate a majority of riders. These findings were used to identify many of the planned improvement projects.

Shared-Use Streets

Shared-use pavement markings, or sharrows, are pavement markings that are used where space does not allow for a bike lane and/or where vehicular travel speeds and volumes allow bicyclists to comfortably and conveniently "share the road" with motorists. Sharrows remind motorists of the presence of bicycles and indicate to bicyclists where to safely ride within the roadway.

Examples of shared use streets

Arterials and collectors designated to include bicycle facilities do not fully address bicycle travel needs in and around the city. Bicycle trips can and should be accommodated on lower traffic volume streets that offer parallel or alternative routes to collectors and arterials. Many trips occur on local streets that connect to parks, schools, and commercial areas. There is a need for designated routes that accommodate these trips. These facilities could be considered a "shared" facility or could have a specific designation such as a "bike boulevard" where treatments are applied to the roadway to enhance the bicycle environment and/or make additional connections to bicycle destinations. There are

several low volume collector roadways where shared roadway pavement markings could be used after engineering review to improve access and circulation for bicyclists, including:

- Clark Street between Skyline Drive and Windsor Terrace;
- Dollar Street between the West City Limit and Willamette Falls Drive; and,
- Old River Drive between the North City Limit and Willamette Drive.

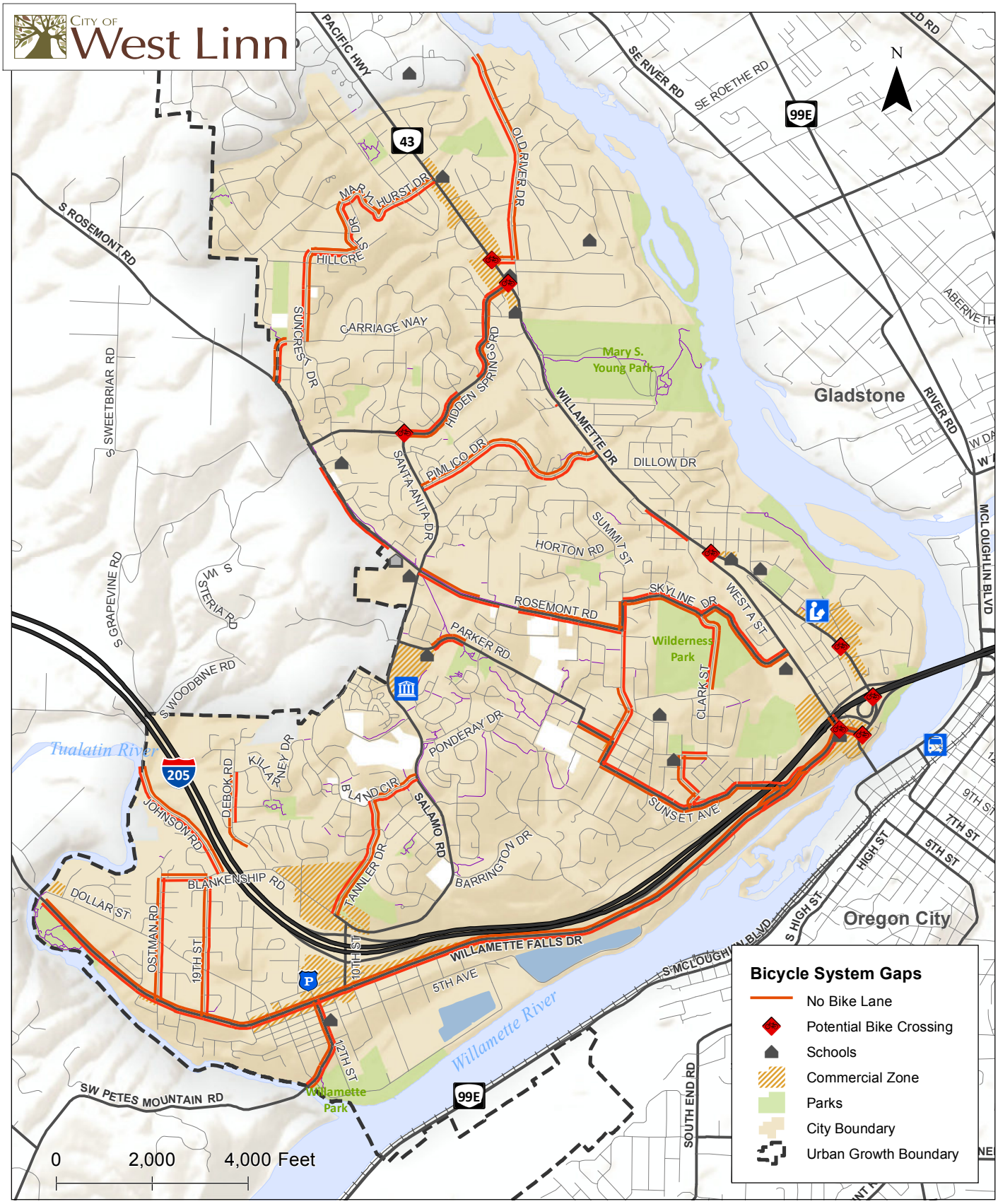
On-street Bicycle Lanes

Bike lanes are on-street facilities that provide designated space for bicycles separated from vehicles by pavement markings. Bike lanes are generally used on collector and arterial streets with adequate space to accommodate the bike lane width where vehicular travel volumes and speeds make it difficult for drivers and bicyclists to "share the road." A bike lane can consist of white striping with a bicycle symbol, or it can be filled with a solid paint color, usually green.

Examples of on-street bike lanes

Several of the arterial and collector streets within West Linn need new on-street bike lanes and/or other bicycle facilities to improve connectivity. Figure 9 illustrates the bicycle system gaps. As shown, there are two prominent north/south roadways that currently provide bike lanes in the city – Willamette Drive and Salamo Road. However, these facilities are not well connected to other facilities that could allow for travel to other areas within the city, particularly to the east and west. Figure 9 also shows there are no bicycle facilities on Skyline Drive, Sunset Avenue, and many other arterial streets, or on Ostman Road, Blankenship Road, Tannler Drive, Pimlico Drive, and many other collector streets.

While the city of West Linn street standards include bicycle facilities along both sides of arterial and collector streets, it may not be feasible or cost effective to construct on-street bike lanes along both sides of all streets. Some streets may be suitable for bikes to share the roadway while others could have a parallel multi-use path that could accommodate two directions of bicycle travel. Marylhurst Drive, Hidden Springs Road, Pimlico Drive, and Skyline Drive, for example, all have significant grade and topography issues that may limit the ability to construct on-street bike lanes or other bicycle facilities.



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Bicycle System Gaps
West Linn, Oregon

Figure **9**

Kittelson & Associates, Inc.
Transportation Engineering/Planning

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

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Cycle Tracks

Cycle tracks, or protected bikeways, are exclusive bikeways separated from vehicle travel lanes, parking lanes and sidewalks. Cycle tracks can be one- or two-way and can be at the street level, sidewalk level, or somewhere in between. If at the street level, cycle tracks can be separated from the vehicle travel lane by raised medians, on-street parking, or bollards. If at the sidewalk level, a curb or landscape strip separates them from the vehicle travel lane, while different pavement color/texture separates the cycle track from the sidewalk. By separating bicyclists from motor vehicles, cycle tracks can offer a higher level of security than bike lanes and are attractive to a wider spectrum of the public.

Bicycle Crossings

Bicycle crossing treatments connect bike facilities at high traffic intersections, trailheads or other bike routes. Planning for appropriate bicycle crossings requires the community to balance vehicular mobility needs with providing crossing locations that accommodate the desired routes of bicyclists.

Intersections can be potentially unsafe locations in the bicycle network, as there are more conflict points with right- and left-turning vehicles and cross street traffic. There are various configurations for right-turn lanes, and the desired configuration is to have the right-turn lane to the right of the bike lane, with right-turning vehicles yielding to through bicyclists as they cross the bike lane. The following summarizes the intersections that need improvements to the crossing configurations for bike lanes approaching the intersection:

- 10th Street at Blankenship-Salamo Road
- 10th Street at I-205 NB Ramps
- 10th Street at Willamette Falls Drive
- Santa Anita Drive/Hidden Springs Road
- Willamette Drive at Cedar Oaks Drive
- Willamette Drive at Hidden Springs Road
- Willamette Drive at West A-Elliot Street
- Willamette Drive at McKillican Street
- Willamette Drive at I-205 SB ramp
- Willamette Drive at Willamette Falls Drive
- Broadway Street at Willamette Falls Drive
- West A Street at Willamette Falls Drive

Installation of cycle tracks with protected intersections is also a way to improve bicycle safety at intersections and appeal to a wider spectrum of the public.

Bicycle Parking

The availability of bicycle parking is an important component of a well-designed bicycle system. Lack of proper storage facilities discourages potential riders from traveling by bicycle. Bike racks should be located at significant activity generators including schools, parks, and commercial areas. Racks should be placed in highly-visible locations and within convenient proximity to main building entrances. Bike racks should be designed to provide two points of contact to the bicycle (i.e., so the user can lock both the wheel and the frame to the rack). Bike lockers or other storage facilities would be helpful at locations where long-term parking is expected, such as major employment centers. The attractiveness of bicycle parking may also be improved by providing covered parking and/or secured facilities where

bicycles may be locked away. The City currently does not require bicycle parking at existing commercial uses or near transit stops. However, Chapter 48.150 of the West Linn Community Development Code does include provisions for bicycle facilities and parking associated with private development, including a potential reduction in vehicle parking requirements based on provision of bicycle parking.

Examples of bicycle parking

On-Site Facilities

Bicyclists also benefit from facilities that are located on-site within key employment, commercial and institutional locations. These facilities can include indoor and/or outdoor secure bicycle parking, open or covered U-shaped racks, showers/changing rooms, and storage lockers for clothing and gear. The city of West Linn can use incentives to encourage or require developers to include these types of facilities in new buildings.

STRATEGIES

In order to address these bicycle system needs, several strategies were identified. Strategies for bicycle facilities include:

- Provide continuous bicycle facilities along all arterial and collector streets as well as neighborhood routes identified as SRTS or commercial streets.
- Provide access to essential destinations, such as transit stops and services, schools, parks, and commercial areas as well as the local community center, library, and City Hall.
- Provide access to Metro's Regional Bicycle, Trails and Greenway Network, and Clackamas County's Principal Active Transportation Routes.
- Prioritize bicycle improvements along streets that provide the greatest benefit to the transportation system.

BICYCLE PLAN

Table 6 summarizes and Figure 10 shows the bicycle system improvement projects identified for the TSP. The cost estimates shown in Table 6 were developed using average unit costs for transportation

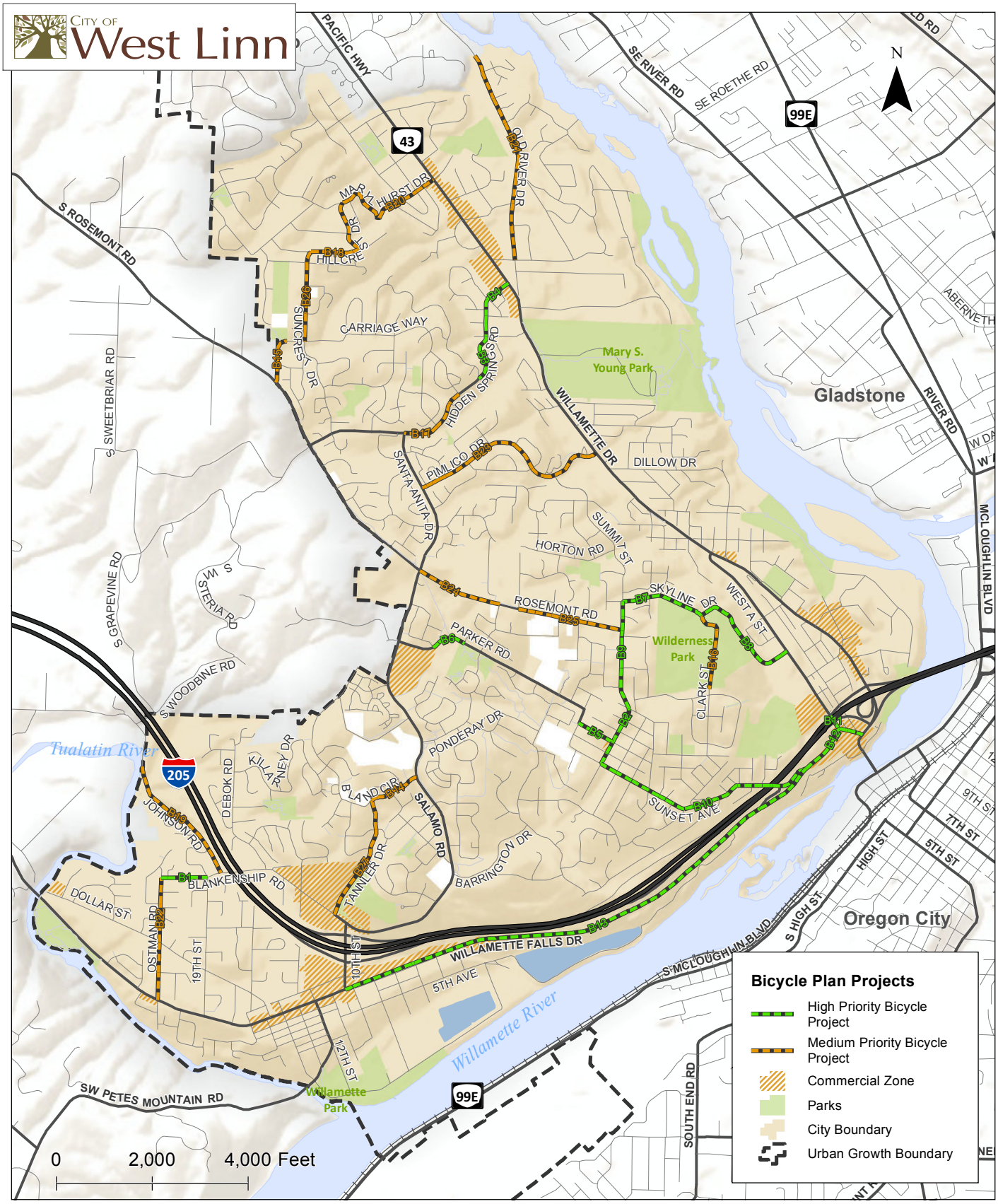
improvements and therefore, should be considered planning level estimates. More detailed cost estimates will be required as projects are pursued.

Table 6: Bicycle Plan Improvement Projects

Map ID	Location	Type	Project Description	Priority	Cost ($1,000)
B1	Blankenship Road	Bike Lanes	Install bike lanes on both sides of the roadway from 19th Street to Ostman Road	High	$60
B2	Cornwall Street	Bike Lanes	Install bike lanes on both sides of the roadway from Sunset Avenue to Oxford Street	High	$140
B3	Hidden Springs Road	Bike Lanes	Install bike lanes on both sides of the roadway from Bluegrass Way to Cottonwood Court	High	$220
B4	Hidden Springs Road	Bike Lanes	Install bike lanes on the north side of the roadway from approximately 350 feet south of Cottonwood Court to Willamette Drive and shared use pavement markings and/or signs on the south side of the roadway	High	$120
B5	Lancaster Street	Bike Lanes	Install bike lanes on both sides of the roadway from Parker Road to Cornwall Street	High	$115
B6	Parker Road	Bike Lanes	Install bike lanes on both sides of the roadway from approximately 125 feet east of Noble Lane to approximately 100 feet west of Dillon Lane	High	$120
B7	Skyline Drive	Bike Lanes	Install bike lanes on both sides of the roadway from Summit Street to Firwood Drive (Striping Only)	High	$10
B8	Skyline Drive	Bike Lanes	Install bike lanes on both sides of the roadway from Firwood Drive to West A Street	High	$700
B9	Summit Street	Bike Lanes	Install bike lanes on both sides of the roadway from Skyline Drive to Oxford Street	High	$320
B10	Sunset Avenue	Bike Lanes	Install bike lanes on both sides of the roadway from Cornwall Street to Willamette Falls Drive	High	$680
B11	West A Street	Bike Lanes	Install bike lanes on both sides of the roadway from I-205 Bridge to Willamette Falls Drive (Striping only)	High	$5
B12	Willamette Falls Drive	Cycle Tracks	Install cycle tracks on both sides of the roadway from Willamette Drive to Sunset Avenue	High	$235
B13	Willamette Falls Drive	Cycle Tracks	Install cycle tracks on both sides of the roadway from Sunset Avenue to 10th Street	High	$2,945
B14	Bland Circle	Bike Lanes	Install bike lanes on both sides of the roadway from Salamo Road to Tannler Drive	Medium	$230
B15	Carriage Way	Bike Lanes	Install bike lanes on both sides from approximately 350 feet west of Suncrest Drive to Rosemont Road (Striping only)	Medium	$15
B16	Clark Street	Bike Lanes	Install bike lanes on both sides of the roadway from Skyline Drive to approximately 150 feet north of Windsor Boulevard	Medium	$375
B17	Hidden Springs Road	Bike Lanes	Install bike lanes on both sides of the roadway from Santa Anita Drive to Bluegrass Way (Striping only)	Medium	$30
B18	Hillcrest Drive	Bike Lanes	Install bike lanes on both sides of the roadway from Marylhurst Drive to Suncrest Drive	Medium	$445
B19	Johnson Road	Bike Lanes	Install bike lanes on both sides of the roadway from Blankenship Road to Western City Limits	Medium	$605
B20	Marylhurst Drive	Bike Lanes	Install bike lanes on both sides of the roadway from Willamette Drive to Hillcrest Drive	Medium	$530
B21	Old River Drive	Bike Lanes	Install bike lanes on both sides from the northern City limits to Cedar Oak Drive	Medium	$945
B22	Ostman Road	Bike Lanes	Install bike lanes on both sides of the roadway from Blankenship Road to Willamette Falls Drive	Medium	$180
B23	Pimlico Drive	Bike Lanes	Install bike lanes on both sides of the roadway from Santa Anita Drive to Willamette Drive (Striping Only)	Medium	$65

Map ID	Location	Type	Project Description	Priority	Cost ($1,000)
B24	Rosemont Road	Bike Lanes	Install bike lanes on both sides of the roadway from Santa Anita Drive to Wild Rose Drive	Medium	$195
B25	Rosemont Road	Bike Lanes	Install bike lanes on both sides of the roadway from Shannon Lane to Summit Street	Medium	$345
B26	Suncrest Drive	Bike Lanes	Install bike lanes on both sides of the roadway from Carriage Way to Hillcrest Drive	Medium	$30
B27	Tannler Drive	Bike Lanes	Modify the existing striping to include bike lanes on both sides of the roadway from Blankenship Road to the northern terminus	Medium	$5
B28	Clark Street	Interim Bicycle	Install shared use pavement marking on both sides of the roadway from Skyline Drive to approximately 150 feet north of Windsor Boulevard to Windsor Boulevard	Low	$20
B29	Hidden Springs Road	Interim Bicycle	Install shared use pavement markings and/or signs on the south side of the roadway from Bluegrass Way to Cottonwood Court	Low	$20
B30	Johnson Road	Interim Bicycle	Install shared-use pavement markings and/or signs on both sides of the roadway	Low	$30
B31	Lancaster Street	Interim Bicycle	Install shared-use pavement markings and/or signs on both sides of the roadway from Parker Road to Cornwall Street	Low	$10
B32	Marylhurst Drive	Interim Bicycle	Install shared-use pavement markings and/or signs on both sides of the roadway	Low	$45
B33	Old River Drive	Interim Bicycle	install shared used pavement markings and /or signs on both sides of the roadway from the northern City limits to Cedar Oak Drive	Low	$35
B34	Pimlico Drive	Interim Bicycle	Install shared use pavement markings and/or signs on both sides of the roadway from Santa Anita Drive to Willamette Drive	Low	$45
B35	Skyline Drive	Interim Bicycle	Install shared-use pavement markings and/or signs on both sides of the roadway from Firwood Drive to West A Street	Low	$35
B36	Suncrest Drive	Interim Bicycle	Install shared use pavement markings and/or signs on both sides of the roadway from Carriage Way to Hillcrest Drive	Low	$20
B37	Willamette Falls Drive	Interim Bicycle	Reconfigure the roadway cross section to a three-lane cross section to provide space for sidewalks on the south side of the roadway and bike lanes on both sides of the roadway	Low	$15
				Total High Priority Project Costs	$5,670
				Total Medium Priority Project Costs	$3,995
				Total Low Priority Project Costs	$275
				Total Project Costs	**$9,940**

Additional bicycle improvement projects along the Highway 43 and 10th Street corridors are included with the motor vehicle projects.



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Bicycle Plan Projects
West Linn, Oregon

Figure **10**

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

Chapter 5 Transit Plan

TRANSIT PLAN

Public transit can provide important connections to destinations for people that do not or cannot drive or bike and can provide an additional option for all transportation system users for certain trips. Public transit links to walking, bicycling, or driving trips: users can walk to and from transit stops and their homes, shopping or work places, people can drive to park-and-ride locations to access a bus, or people can bring their bikes on transit vehicles and bicycle from a transit stop to their final destination.

Providing transit service in smaller cities is generally led by a local or regional transit agency, and is dependent on having land uses and densities that can support service. The City can plan for transit-supportive land use patterns and support future transit viability by designing and building streets that will comfortably accommodate transit stops and include the right-of-way that could allow for transit stops to be located as close as possible to important destinations in the city. At a minimum, a transit stop should be well-signed and have a comfortable space to wait. Benches and shelter from the weather can improve user comfort, and including bike parking near bus stops allows people the option to leave their bike at one trip-end instead of bringing it with them on the bus.

The city of West Linn can support potential future transit service by including easy and safe walking and bicycling network connections between key roadways and neighborhoods. The following provides a summary of the types of solutions identified below to address transit needs along select corridors.

EXISTING CONDITIONS

The transit system within the city of West Linn consists of fixed-route and paratransit services as well as regional transit centers, transit stops, and park-and-rides. Frequent morning and evening peak hour service along Highway 43 provides residents with the ability to use public transit for daily commuting, while less frequent mid-day, and weekend service provides residents with the ability to use public transit to access retail and recreational areas located throughout Clackamas County and the region.

Transit Service Providers

Transit service is provided in West Linn by the Tri-County Metropolitan Transportation District of Oregon (TriMet), which provides transit service for the Portland Metro area including Clackamas, Multnomah and Washington Counties. Other service providers include the West Linn School District, and Marylhurst University.

Fixed-Route Service

TriMet operates two fixed-route bus lines within West Linn: Line 35 and Line 154. Line 35 (Macadam/Greeley) travels through West Linn along Highway 43, connecting the Oregon City Transit Center with the Lake Oswego Transit Center, the Portland City Center, the Rose Quarter Transit Center and the University of Portland. Line 154 (Willamette) travels along Willamette Falls Drive between the Oregon City Transit Center and the southwest area of West Linn. Table 7 summarizes the average headways and hours of service for Lines 35 and 154.

Table 7: Transit Service Route Weekday Peak Period Level of Service

Transit Route	Average Headways (Minutes)			Hours of Service (Hours)
	AM	Midday	PM	
#35 To Oregon City Transit Center	23	31	23	19 Hours (6:09 a.m. to 1:10 a.m.)
#35 To University of Portland	18	34	24	19 Hours (4:47 a.m. to 11:46 p.m.)
#154 To Willamette	37	70	70	12 Hours (6:33 a.m. to 6:55 p.m.)
#154 To Oregon City Transit Center	37	70	70	12 Hours (6:33 a.m. to 6:55 p.m.)

Note: Average Headways and Hours of Service reflect the following stop locations:

- Line 35 to Oregon City Transit Center: Willamette Drive & McKillican Stop ID 6339
- Line 35 to University of Portland: Willamette Drive & Burns – Stop ID 6306
- Line 154 to Willamette and to Oregon City Transit Center: Blankenship & Tannler Drive – Stop ID 9297

Figure 11 illustrates existing transit routes and stops. There are four stops with bus shelters: two near the Bolton Area shopping center, one near the Robinwood Shopping Center, and one in the Willamette Falls Drive Commercial Design District. Transit service is not provided within convenient walking distance for most of the city west of Highway 43. This includes the shopping center on Salamo Road and several area schools. There is one park-and-ride in West Linn located at the Emmanuel United Presbyterian Church on Highway 43. The park-and-ride has 80 spaces and is served by TriMet Line 35.

Paratransit Service

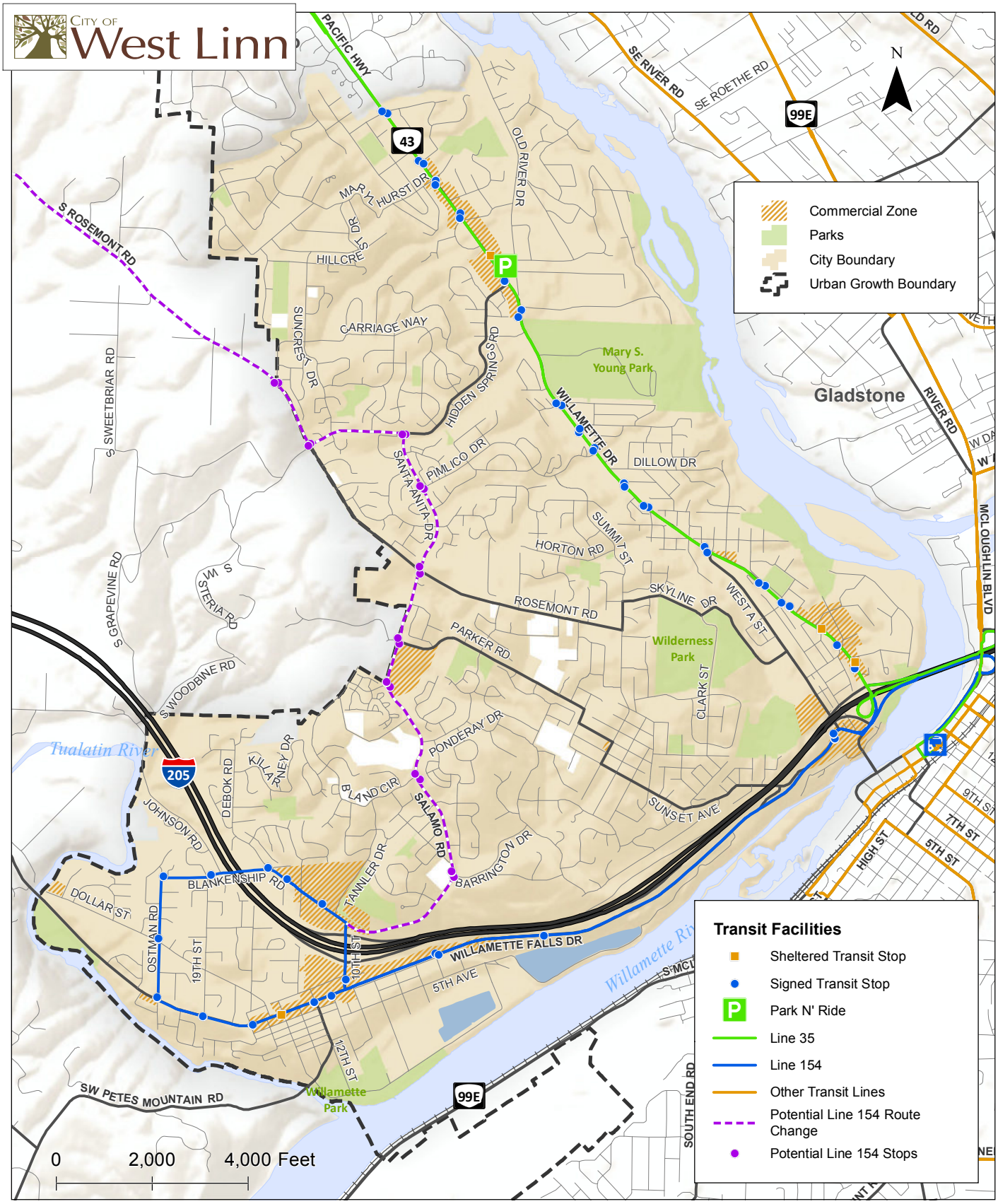
TriMet's LIFT Paratransit service is a shared-ride transportation service for residents who are unable to use regular fixed-route services due to disabilities or disabling health conditions. The service is offered within three-fourths of a mile beyond the outermost portions of TriMet's fixed-route bus and light-rail lines. Service is not offered outside of TriMet's service district. LIFT is available from 4:30 a.m. to 2:30 a.m. seven days a week. See http://trimet.org/lift/ for detailed information and trip planning.

School Bus Service

The West Linn-Wilsonville School District provides school bus service within the West Linn area. Elementary school students living more than one mile from school are eligible for bus service, as are middle and high school students living more than one-and-a-half miles from their schools. School buses operate on all arterial and collector streets and many local streets. Safe bus stop approaches and waiting areas are a concern, as are walkways to schools within the radii not served by buses.

Shuttle Service

Mary's Woods, in partnership with TriMet, provides a free shuttle service between Mary's Woods and the Youth Villages Christie Campus, Marylhurst University, the Lake Oswego Adult Community Center, and transit centers in Lake Oswego and Oregon City. Service is provided to people of all ages, Monday through Friday from 6:45 a.m. to 6:00 p.m. There are currently no fixed stops in West Linn, but Mary's Woods residents are occasionally dropped off at desired locations along the route, such as supermarkets and other locations within West Linn.



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Existing Transit Facilities
West Linn, Oregon

Figure **11**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

Kittelson & Associates, Inc.
Transportation Engineering/Planning

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Clackamas County Social Services runs a program called "Transportation Reaching People". They provide transportation for elderly, disabled, or rural County residents to medical appointments, shopping, and errands. Volunteers with personal cars provide the service. Oregon City Pioneer Center provides services to West Linn residents. They have a lift-equipped bus that provides door-to-door service to doctors, shopping, and recreational opportunities.

TRANSIT SYSTEM NEEDS

Fixed-Routes

Trimet Line 35 provides connections to the Lake Oswego Transit Center, from which there are three additional bus lines that provide connections to downtown Portland, the Tigard Transit Center (which connects to the Westside Express Service (WES) Commuter Rail line), and the Tualatin Park & Ride. To access the Tualatin City Center, Tualatin Transit Center, or Wilsonville, riders must transfer at the Tualatin Park & Ride. Travel from West Linn to the Tualatin Transit Center requires either a 90 minute trip with one transfer in downtown Portland or a 70- to 80-minute trip with two transfers including Lake Oswego and one other location in either Beaverton or Tigard. More efficient services are needed to access major employment centers and transit centers in Tualatin and Wilsonville. In addition, many West Linn residents feel the City is not well served by public transit. With only one major trunk line and the access provided along Willamette Falls Drive, residents perceive that they are not able to easily move within or out of the city on public transit. Transit service is hampered by topography and a lack of east-west routes.

Transit Stops

Amenities at transit stops such as bus benches and bus shelters enhance a transit system and make it more user-friendly. Steps that can make this mode as comfortable and accommodating as possible may help encourage ridership. TriMet generally limits placement of bus shelters to locations with 50 or more weekday boardings on a routes with frequent service and 35 or more weekday boardings on routes with headways greater than 17 minutes. There are currently two stops (Stop 6319: Willamette Drive and Hidden Springs Road and Stop 6339: Willamette Drive and McKillican Road) that meet this threshold but do not currently have shelters. Due to low ridership levels at other stops, the City may need to directly fund the installation of bus benches, bus shelters and other amenities.

Park-and-Ride

Park-and-ride facilities provide parking for people who wish to transfer from their personal vehicle to public transportation or carpools/vanpools. Park-and-rides are frequently located near major intersections, at commercial zones, or on express and commuter bus routes. It is Oregon state policy to encourage the development and use of park-and-ride facilities at appropriate urban and rural locations adjacent to or within the highway right-of-way. Park-and-ride facilities can provide an efficient method to provide transit service to low density areas, connecting people to jobs, and providing an alternate mode to complete long-distance commutes.

Park-and-ride facilities may be either shared-use, such as at a school or shopping center, or exclusive-use. Shared-use facilities are generally designated and maintained through agreements reached between the local public transit agency or rideshare program operator and the property owner. Shared lots can save the expense of building a new parking lot, increase the utilization of existing spaces, and avoid utilization of developable land for surface parking. In the case of shopping centers, the presence of a shared-use park-and-ride has frequently been shown to be mutually beneficial, as park-and-riders tend to patronize the businesses in the center.

The City has indicated the potential for a second park-and-ride facility on Highway 43 within the Bolton area due to high use at the existing facility. A park-and-ride in this location could serve TriMet Line 35, which travels north and south along Highway 43 between the Oregon City Transit Center and the Portland City Center. The City has also indicated the potential for a new park-and-ride facility within the 10th Street interchange area. A park-and-ride in this location could serve TriMet Line 154, which travels east and west along Willamette Falls Drive between the Oregon City Transit Center and the Willamette Area. A park-and-ride in this location could also serve a potential shuttle service between the Oregon City Transit Center and the Bridgeport Village Center.

Transit Investment Priorities

The Transit Investment Priorities (TIP) process guides TriMet's investments in bus and rail service. TriMet develops the TIP with input from riders, jurisdictional and community partners, and the general public. The TIP addresses short-term issues and the region's long-term transportation and livability goals. The TIP process helps local governments look for ways to get the most out of TriMet's investments in transit service with their own investments in such things as sidewalks and safe street crossings, and supports their vision for the future. It also shares TriMet's planning process and future plans so that local governments can know how to take advantage of the current and future service they provide. The priorities identified in TriMet's TIP for Fiscal Year 2015 include:

- Making transit better for riders by improving current service, improving the quality of the rider experience through technology information and amenities, enhancing safety, ensuring riders' security, and improving and expanding existing services.
- Planning for the future of transit through service enhancement plans, making new community connections, improving access to transit stops, making fares affordable, and building partners for priorities identified in the region's High Capacity Transit Plan.

The Service Enhancement Plans for the Southwest region include potential changes in the fixed-route services to West Linn, including:

- New Frequent Service between Downtown Portland, Southwest Portland, Lake Oswego, West Linn, and Oregon City on Line 35-Macadam.
- Change Line 154-Willamette route to serve Salamo Road connecting the Willamette Town Center with the West Linn City Hall and the Lake Oswego Transit Center. Serve weekday peak hours only.

The potential change in service to Line 154 would improve service to the Willamette, Savanna Oak, Parker Crest, Rosemont Summit, and Hidden Springs neighborhoods in West Linn as well as several essential destinations, including City Hall, the Adult Community Center, and the commercial zone located in the southwest corner of the Salamo Road/Parker Road intersection. According to the hierarchy, local service expansion routes in West Linn receive the lowest priority for regional transit funds. However, the City could meet local transit needs through alternatives to fixed-route expansion such as local shuttle services, vanpools, or phasing local service capital projects within the West Linn service area in partnership with TriMet.

Regional High Capacity Transit

High capacity transit is characterized by exclusive right-of-way and routes with fewer transit stops. In July 2009, Metro adopted the Regional High Capacity Transit (HCT) System Plan. The HCT Plan identifies corridors where new HCT is desired over the next 30 years and prioritizes corridors for implementation, based on a set of evaluation criteria consistent with the goals of the RTP and 2040 Growth Concept. Metro decides the location of any final HCT corridor through a corridor refinement plan and/or alternatives analysis, and through a series of local and regional actions described in the plan.

The HCT plan identifies one Next Phase Regional Priority Corridor along the segment of I-205 that travels through West Linn. HCT Corridor 28 will provide service between the Clackamas Town Center, the Oregon City Transit Center, and Washington Square via I-205 and Highway 217. Other HCT Corridors within the area include two Next Phase Regional Priority Corridors in Oregon City. HCT Corridor 8 will provide service between the Clackamas Town Center and the Oregon City Transit Center via I-205 and HCT Corridor 9 will provide service between Park Avenue and the Oregon City Transit Center via McLoughlin Boulevard (OR 99E). Next Phase Regional Priority Corridors are corridors where future HCT investment may be viable if recommended planning and policy actions are implemented. The city of West Linn should work with TriMet to ensure that local transit service continues to provide access to the Oregon City Transit Center and other transit centers where HCT routes are being considered.

Transportation Disadvantaged

The primary transportation disadvantaged populations in West Linn are those too old or too young to drive. Therefore, the City should prioritize access to schools and other essential destinations to serve these populations. As the population continues to age, the needs of the elderly and disabled are likely to increase. The Mary's Wood Shuttle serves the residents of the Mary's Woods at Marylhurst, a senior community to the north of West Linn. It is operated by Mary's Woods at Marylhurst in partnership with TriMet Ride Connection and consists of a single route from Mary's Woods to Lake Oswego. TriMet Ride Connection may consider rerouting the service route to serve the residents of the Adult Community Center in West Linn at the intersection of Santa Anita Drive and Rosemont Road. The city of West Linn should continue to support the Clackamas County Transportation Consortium services to the elderly and ADA-eligible residents, and other services currently being provided. Also, because needs are expected to increase, West Linn should work with existing providers to assess future needs and develop ways to best meet them.

Some inexpensive ways in which the city of West Linn can assist in promoting the services currently offered to the elderly and disabled are to post notices on their public bulletin boards, and to use meetings with the public to make notices and fliers available.

STRATEGIES

Providing transit service in smaller cities is generally led by a local or regional transit agency, and is dependent on having land uses and densities that can support service. The City can plan for transit-supportive land use patterns and support future transit viability by designing and building streets that will comfortably accommodate transit stops and include the right-of-way that could allow for transit stops to be located as close as possible to important destinations in the city. At a minimum, a transit stop should be well-signed and have a comfortable space to wait. Benches and shelter from the weather can improve user comfort, and including bike parking near bus stops allows people the option to leave their bike at one trip-end instead of bring it on the bus.

TRANSIT PLAN

The city of West Linn can support potential future transit service by including easy and safe walking and bicycling network connections between key roadways and neighborhoods, providing amenities at bus stops, and providing and planning for park-and-ride locations. Table 8 summarizes the transit plan identified for West Linn. The cost estimates shown in Table 8 were developed based on information provided in the previous TSP and direction from city staff and therefore, should be considered planning level estimates. More detailed cost estimates will be required as projects are pursued.

Table 8: Transit Plan

Project/ Program Number	Name	Agency Responsible	Description	Priority	Cost ($1,000)
T1	Provide Transit Amenities at Major Transit Stops	West Linn/ TriMet	Provide shelters, information kiosks, etc. along key transit routes in West Linn with land use development (50 or more weekday boardings are required by TriMet to warrant a shelter on a route with frequent service, such as Highway 43; 35 or more weekday boardings are required on a route with headways greater than 17 minutes).	Medium	$80
T2	Improve Pedestrian Connections to Transit Facilities	West Linn/ TriMet	Construct sidewalks, crosswalks, etc. adjacent to transit routes and facilities (i.e. park-and-ride lots, bus stops, etc.). Within one-quarter mile of bus stops, focus on enhancing pedestrian access. Give priority to pedestrian and bicycle projects near transit stops. Give priority to improvements within the Willamette Falls Drive Design District.	Medium	See Corridor Projects

Project/ Program Number	Name	Agency Responsible	Description	Priority	Cost ($1,000)
T3	Increase Density Adjacent to Transit	West Linn	Direct growth to increase housing density along transit lines in the city of West Linn in an effort to support more frequent transit service and other regional transit service goals. This will include educational and outreach efforts along with amendments to the zoning ordinance, comprehensive plans, neighborhood plans, and other plans. Should be done in conjunction with land use project LU2 listed in Table 13.	Medium	$150
T4	Provide More Local Service/ Coordinate with TriMet on Route 154 changes	West Linn/ TriMet	Coordinate with TriMet on proposed changes to Route 154 to Salamo Road and Hidden Springs Drive.	Medium	$15
T5	Increase Park-and-Ride Capacity	West Linn/ TriMet	Work with TriMet and local property owners to identify additional locations for park-and-ride lots	Medium	$150
T6	Identify Park-and-Ride Lot Location near the 10th Street Interchange	West Linn/ TriMet	Work with TriMet to perform a feasibility analysis to identify future park-and-ride locations near the 10th Street Interchange to support future transit or shuttle service between Oregon City and Tualatin and/or high-capacity transit in the I-205 corridor	Medium	$30
T7	Implement Employee Commute Options Program	West Linn	Work with larger employers to develop of employee commute options program	Medium	See TDM1 and TDM2
T8	Support TriMet's marketing efforts	West Linn/ Trimet	Support TriMet's marketing efforts	Medium	See TDM1 and 2
T9	Feasibility analysis for development of local public transit shuttle	West Linn	Conduct a feasibility analysis of development of local public transit shuttle	Medium	$30
T10	Feasibility analysis for development of commuter shuttle	West Linn	Conduct a feasibility analysis of development of commuter shuttle	Medium	$30
			TOTAL Medium Priority Costs		**$485**
			TOTAL Program Costs (25 years)		**$485**

Chapter 6 Transportation System Management and Operations

TRANSPORTATION SYSTEM MANAGEMENT AND OPERATIONS (TSMO) PLAN

TSMO is a set of integrated transportation solutions intended to improve the performance of existing transportation infrastructure. Transportation Demand Management (TDM) and Transportation System Management (TSM) strategies are two complementary approaches to managing transportation and maximizing the existing system. TDM addresses *demand* on the system: the number of vehicles traveling on the roadways each day. TDM measures include any method intended to shift travel demand from single-occupant vehicles to non-auto modes or carpooling, travel at less congested times of the day, etc. TSM addresses the *supply* of the system: using strategies to improve system efficiency without increasing roadway widths or building new roads. TSM measures are focused on improving operations by enhancing capacity during peak times, typically with advanced technologies to improve traffic operations.

Successful implementation of TSMO strategies relies on the participation of a variety of public and private entities. Strategies can be implemented by the city, a neighborhood, or particular employer. In addition, they can be categorized as policies, programs, or physical infrastructure investments. Table 9 provides a summary of potential measures that can be implemented within West Linn and which entities are generally in the position to implement each one. As the city continues to grow and redevelop over the next 10 to 20 years, the City can review applicability of these strategies. Additional information on potential strategy implementation for the most feasible strategies for West Linn are discussed below.

Table 9: Transportation System Management and Operations Strategies

TSMO Strategy	TDM or TSM?	Type of Investment	City	TMA	Developers	Transit Provider	Employers	State
Parking management	TSM/TDM	Policy	P		S	S	S	
Limited/flexible parking requirements	TDM	Policy	P		S		S	
Access management	TSM/TDM	Policy/ Infrastructure	P					P
Connectivity standards	TSM/TDM	Policy/ Infrastructure	P		S			P
Congestion pricing	TSM/TDM	Policy/ Infrastructure	P					P
Alternative Work Schedules	TDM	Program/Policy	S				P	
Frequent transit service	TDM	Program	S			P		
Free or subsidized transit passes	TDM	Program	S				P	
Preferential carpool parking	TDM	Program	S				P	
Carpool match services	TDM	Program	S	P			S	
Parking cash out	TDM	Program		S		S	P	
Carsharing program support	TDM	Program	P	S	P	P	P	
Bicycle facilities	TDM	Infrastructure	P		S		S	S
Pedestrian Facilities	TDM	Infrastructure	P		S			
Regional ITS	TSM	Infrastructure	S					

TSMO Strategy	TDM or TSM?	Type of Investment	City	TMA	Developers	Transit Provider	Employers	State
Regional traffic management	TSM	Infrastructure	S					
Advanced signal systems	TSM	Infrastructure	S			S		
Real time traveler data	TSM	Infrastructure	S					P
Arterial corridor management	TSM	Infrastructure	S					

TMA: Transportation Management Association – A TMA does not currently exist in the city of West Linn
P: Primary role
S: Secondary/Support role

TRANSPORTATION SYSTEM MANAGEMENT (TSM)

Transportation System Management (TSM) focuses on low cost strategies within existing transportation infrastructure to enhance operational performance. Finding ways to better manage transportation while maximizing urban mobility and treating all modes of travel as a coordinated system is a priority. TSM strategies include signal improvements, traffic signal coordination, traffic calming, access management, local street connectivity, and intelligent transportation systems (ITS). Traffic signal coordination and systems typically provide the most significant tangible benefits to the traveling public. The primary focus of TSM measures are region-wide improvements, however there are a number of TSM measures that the City could use in a smaller scale environment. The following sections discuss TSM measures that could be appropriate for the city of West Linn. The following sections provides an overview of a broad range of TSMO measures that are being planned and implemented by Metro, ODOT, and Clackamas County and identifies and explains additional TSM techniques that are most applicable to the city of West Linn.

Signal Systems Improvements

Signal retiming and optimization offer a relatively low cost option to increase system efficiency. Retiming and optimization refers to updating timing plans to better match prevailing traffic conditions and coordinating signals. Timing optimization can be applied to existing systems or may include upgrading signal technology, such as signal communication infrastructure, signal controllers, or cabinets. Signal retiming can reduce travel times and be especially beneficial to improving travel time reliability. In locations with relatively high pedestrian use, signal retiming can facilitate pedestrian movements through intersections by increasing minimum green times to give pedestrians enough time to cross during each cycle, eliminating the need to push pedestrian crossing buttons. Signals can also include bicycle detectors to facilitate bicycle movements.

Signal upgrades often come at a higher cost and usually require greater coordination between jurisdictions. However, upgrading signals provides an opportunity to incorporate advanced signal systems to further improve the efficiency of a transportation network. Strategies include coordinated signal operations across jurisdictions, centralized traffic signal control, adaptive or active signal control, and transit and/or freight signal priority. These advanced signal systems can reduce delay, travel time, and the number of stops for transit, freight, and other vehicles. In addition, these systems may help reduce vehicle emissions and improve travel time reliability.

Transit signal priority systems use sensors to detect approaching transit vehicles and alter signal timing to improve transit performance. This improves transit travel times, reliability of transit travel times, and overall transit attractiveness. The city of Portland has the only system of bus priority in the region, which is applied on most of the major arterial corridors throughout the city.

Adaptive or active signal control systems improve the efficiency of signal operations by actively changing the allotment of green time for vehicle movements and reducing the average delay for vehicles. Adaptive or active signal control systems require several vehicle detectors at intersections in order to adequately detect traffic flows, in addition to hardware and software upgrades.

Traffic responsive control uses data collected from traffic detectors to change signal timing plans for intersections. The system uses data collected from the detectors to automatically select a timing plan best suited to current traffic conditions. This system is able to determine times when peak-hour timing plans begin or end, potentially reducing vehicle delays.

Truck signal priority systems use sensors to detect approaching heavy vehicles and alter signal timing to improve truck freight travel. While truck signal priority may improve travel times for trucks, its primary purpose is to improve the overall performance of intersection operations by clearing any trucks that would otherwise be stopped at the intersection and subsequently have to spend a longer time getting back up to speed. Implementing truck signal priority requires additional advanced detector loops, usually placed in pairs back from the approach to the intersection.

In order to support future ITS projects including traffic signal operations, the city of West Linn and Clackamas County should require the installation of three-inch conduit along arterial and selected collector roadways during roadway improvement projects where overhead electric is not available. ITS projects can require additional fiber optic cable to serve the new equipment along a roadway. A three-inch conduit would ensure adequate wiring capacity to accommodate future ITS projects.

Real-Time Traveler Information

Traveler information consists of collecting and disseminating real-time transportation system information to the traveling public. This includes information on traffic and road conditions, general public transportation and parking information, interruptions due to roadway incidents, roadway maintenance and construction, and weather conditions. Traveler information is collected from roadway sensors, traffic cameras, vehicle probes, and more recently, media access control (MAC) devices such as cell phones or laptops. Data from these sources are sent to a central system and subsequently disseminated to the public so that drivers track conditions specific to their cars and can provide historical and real-time traffic conditions for travelers.

When roadway travelers are supplied with information on their trips, they may be able to avoid heavy congestion by altering a travel path, delaying the start of a trip, or changing which mode they use. This can reduce overall delay and fuel emissions. Traveler information projects can be prioritized over increasing capacity on roadway, often with high project visibility among the public.

Real-Time Transit Information

Transit agencies or third-party sources can disseminate both schedule and system performance information to travelers through a variety of applications, such as in-vehicle, wayside, or in-terminal dynamic message signs, as well as the Internet or wireless devices. Coordination with regional or multimodal traveler information efforts can increase the availability of this transit schedule and system performance information. TriMet has implemented this through its Transit Tracker system.

These systems enhance passenger convenience and may increase transit attractiveness by encouraging travelers to consider transit as opposed to driving alone. They require cooperation and integration between agencies for disseminating the information.

Metro TSMO Plan

Metro's Regional TSMO Plan identifies TSM specific strategies for 24 mobility corridors in the region. The following strategies are identified for Mobility Corridor 10: Oregon City to Tualatin:

- **Freeway Management for I-205** – Expand freeway vehicle detection to provide comprehensive freeway traveler information including travel speed, travel times, volumes, forecasted information, incident conditions, and weather conditions. The TSMO Plan identifies this project for the 6- to 10-year time frame with costs of $650,000 and annual operating costs of $13,000.
- **Arterials Corridor Management for Willamette Falls Drive** – Improve corridor operations by expanding traveler information and upgrading traffic signal equipment and timing. Install upgraded traffic signal controllers, establish communications to the central traffic signal system, provide arterial detection (including bicycle detection where appropriate) and routinely update signal timing. Provide real-time and forecasted traveler information on arterial roadways including current roadway conditions, congestion information, travel times, incident information, construction work zones, current weather conditions and other events that may affect traffic conditions. The TSMO Plan identifies this project for a timeframe beyond 11 years with a cost of $1,600,000 and annual operating costs of $30,000.

Clackamas County Intelligent Transportation Systems (ITS)

ITS involves applying advanced technologies and proven management techniques to relieve congestion, enhance safety, provide services to travelers, and assist transportation system operators in implementing suitable traffic management strategies. ITS focuses on increasing existing transportation infrastructure efficiency, which enhances the overall system performance and reduces the need to add capacity (i.e. travel lanes). Providing services and information to travelers so they can (and will) make better travel decisions and to transportation system operators so they can better manage the system and improve system reliability increases efficiency.

Clackamas County has prepared an ITS plan for the urbanized area of the County. The plan identifies opportunities for regional coordination and funding and calls for Clackamas County to dedicate funding sources for projects. The Clackamas County ITS Plan[1] identifies ITS projects in West Linn located along I-205 and Highway 43. ODOT has completed the two projects located along I-205. The remaining projects along Highway 43 (and planned implementation schedules) are:

- CCTV cameras at three locations (11-20 years)
- Detector station (11-20 years)
- Incident management corridor (11-20 years)
- Transit priority corridor (and information display) (6-10 years)
- Fiber optic cable (11-20 years)

TSM Plan

Table 10 summarizes the West Linn TSM plan.

Table 10: Transportation System Management Projects and Programs

Project/Program Number	Name	Description	Priority	Cost ($1,000)
TSM1	Signal Retiming and Optimization	Update signal timing plans and coordinate signals to better match prevailing traffic conditions	Medium	$10/year
TSM2	Transit Signal Priority	ODOT corridors included with motor vehicle projects	Medium	-
TSM3	Adaptive or active signal control	ODOT corridors included with motor vehicle projects	Low	-
TSM4	Traffic responsive control	ODOT corridors included with motor vehicle projects	Low	-
TSM5	Truck signal priority	ODOT corridors included with motor vehicle projects	Low	-
			TOTAL Medium Priority Costs	**$250**
			TOTAL Program Costs (25 years)	**$250**

TRANSPORTATION DEMAND MANAGEMENT (TDM)

Transportation Demand Management (TDM) is a policy tool as well as a general term used to describe any action that removes single-occupant vehicle trips from the roadway network during peak travel demand periods. As growth in the city of West Linn occurs, the number of vehicle trips and travel demand in the area will also increase. The ability to change a user's travel behavior and provide alternative mode choices will help accommodate this potential growth in trips.

[1] Clackamas County ITS Plan, DKS Associates, Inc. and Zenn Associates, February 2003.

The following section provides more detail on programming and policy strategies that may be effective for managing transportation demand and increasing system efficiency in the city of West Linn, especially within the next 10 to 20 years.

Programming

Programming solutions can provide effective and low cost options for reducing transportation demand. Some of the most effective programming strategies can be employer-implemented and are aimed at encouraging non-single-occupancy vehicle (SOV) commuting. Examples of these strategies are discussed below.

Alternative Work Schedules

Employer supported alternative work schedules can reduce peak-period commute travel and help accommodate ridesharing and transit use. Examples of alternative work schedules include flextime, compressed work week, and staggered shifts. Flextime means that employees are allowed some flexibility in their daily work schedules. Flextime can reduce peak-period congestion and make ridesharing and transit use more feasible. One study found that flextime can save an average of seven minutes per day in commute time while another study found that flextime and telework together can reduce peak hour vehicle commute trips by 20 to 50 percent. (Victoria Transportation Planning Institute – VTPI). Compressed work week means that employees work fewer but longer days, such as four 10-hours days, or nine 9-hour days in a two week period. Compressed work weeks can reduce vehicle travel as participants make fewer commute trips; however, some studies have found that the reductions are minimal, in part, because participants make other trips during non-work days (VTPI). Staggered shifts means that shifts are staggered to reduce the number of employees arriving and leaving a worksite at one time. Staggered shifts can reduce peak-period congestions around large employment centers.

Carpool Match Services

Metro coordinates a rideshare/carpool program (see the DriveLessConnect.com website) that regional commuters can use to find other commuters with similar routes to work. The program allows commuters to connect and coordinate with others on locations, departure times, and driving responsibilities. Employers can also play a role in encouraging carpooling by sharing information about the system, providing preferential carpool parking, and allowing employees flexibility in workday schedules. Carpooling can have a significant impact on peak-period vehicle travel and congestion. One study found that carpool programs can attract five to fifteen percent of commute trips if they offer only information and encouragement and ten to thirty percent if they also offer financial incentives such as parking cash out or vanpool subsidies (VTPI).

Collaborative Marketing

Cities, employers, future transit service providers, and developers can collaborate on marketing to get the word out to residents about transportation options that provide an alternative to SOVs.

Policy

Policy solutions can be implemented by cities, counties, regions, or at the statewide level. Regional and state-level policies will affect transportation demand in West Linn, but local policies can also have an impact. Examples of these strategies are discussed below.

Limited and/or Flexible Parking Requirements

Cities set policies related to parking requirements for new development. In order to allow development that encourage multi-modal transportation, cities can set parking maximums and low minimums and/or allow for shared parking between uses. Cities can also provide developers the option to pay in-lieu fees instead of constructing additional parking. This option provides additional flexibility to developers that can increase the likelihood of development, especially on smaller lots where surface parking would cover a high portion of the total property.

Cities can also set policies that require parking provision to the rear of buildings, allowing buildings in commercial zones to directly front the street. This urban form creates a more appealing environment for walking and window-shopping. In-lieu parking fees support this type of development for parcels that do not have rear- or side-access points.

Parking Management

Parking plays a large role in transportation demand management, and effective parking resource management can encourage use of non-single-occupancy vehicle modes. Cities can tailor policies to charge for public parking in certain areas and impose time limits on street parking in retail centers. Cities can also monitor public parking supply and utilization in order to inform future parking strategy.

The TDM action plan includes:

- Support continued efforts by TriMet, Metro, ODOT, and Clackamas County to develop productive TDM measures that reduce commuter vehicle miles and peak hour trips.
- Encourage high speed communication development in all parts of the city (fiber optic, digital cable, DSL, etc). The objective would be to allow employers and residents the maximum opportunity to rely upon systems other than the transportation system for conducting business and activities during peak periods.
- Encourage developments that effectively mix land uses to reduce vehicle trip generation. These plans may include development linkages (particularly non-auto) that support greater use of alternative modes.
- Continue implementing motor vehicle parking ratios (minimum and maximum) for new development.
- Continue implementing building orientation and transit planning requirements for new development.

- Continue implementing street connectivity requirements.
- Require new employment development to install bicycle racks.
- Implement bicycle, pedestrian, motor vehicle and transit system improvements as presented in this TSP.

TDM Plan

Table 11 summarizes the West Linn TDM plan.

Table 11: Transportation Demand Management Program Strategies

Program/Project Number	Name	Description	Priority	Cost ($1,000)
TDM1	Carpool Match Services	Work with Metro to coordinate a rideshare/carpool program that regional commuters can use to find other commuters with similar routes to work	Low	$10/year
TDM2	Collaborative Marketing	Work with nearby cities, employers, transit service providers, and developers to collaborate on marketing for transportation options that provide an alternative to single-occupancy vehicles	Low	$10/year
TDM3	Limited and/or Flexible Parking Requirements	Refine the City's current parking policy to include parking maximums, minimums, shared parking provisions, fee in-lieu options, and other strategies to encourage multi-modal transportation	Low	$80
TDM4	Parking Management	Modify the City's current parking policy to impose time limits in commercial zones and allow for the potential to charge for parking	Low	$40
			TOTAL Low Priority Costs	**$620**
			TOTAL Program Costs (25 years)	**$620**

NEIGHBORHOOD TRAFFIC MANAGEMENT (NTM)

Neighborhood Traffic Management (NTM) is a term to describe traffic control devices typically used in residential neighborhoods to slow traffic or possibly reduce the volume of traffic. NTM is descriptively called traffic calming due to its ability to improve neighborhood livability. The city of West Linn currently utilizes a variety of NTM elements such as speed humps, raised pavement markings, medians, bulb-outs, etc.



Examples of NTM

The City has an established traffic safety committee (whose membership consists of city staff and a representative from the WLWV School District and Tualatin Valley Fire and Rescue), which meets on a monthly basis and oversees NTM issues among their other responsibilities. The committee has a set procedure for NTM implementation that starts with the identification of a perceived problem raised by concerned citizens, after which the committee conducts a speed/volume survey to identify if the problem exists. Once the committee identifies and classifies the problem, they discuss the various approaches to solving the problem. There are many different NTM options available to the committee. Typically, the committee starts with lower cost solutions, such as education and enforcement and if they deem that either of these solutions are not having the desired effect, the committee selects an engineering solution. The City and/or concerned citizens implement and fund the selected NTM solution. Often the city pays for the logistics of the NTM implementation and the citizens pay for the material costs.

The City should continue this effort with additional traffic calming measures (where applicable) and work with the community to find the traffic calming solution that best meets the needs of concerned citizens while maintaining roadway function. Table 12 lists common NTM applications that Tualatin Valley Fire and Rescue typically supports as long as minimum street criteria are met. Any NTM project should include coordination with emergency agency staff to ensure public safety is not compromised.

Table 12: Traffic Calming Measures by Roadway Functional Classification

Traffic Calming Measures	Roadway Classifications		
	Minor Arterial	Collector	Neighborhood Route/ Local Street
Curb Extensions	Supported	Supported	Traffic Calming measures are generally supported on lesser response routes that have connectivity (more than two accesses) and are accepted and field tested by Tualatin Valley Fire and Rescue.
Medians	Supported	Supported	
Pavement Texture	Supported	Supported	
Speed Hump	Not Supported	Not Supported	
Raised Crosswalk	Not Supported	Not Supported	
Speed Cushion (provides emergency pass-through with no vertical deflection)	Not Supported	Not Supported	
Choker	Not Supported	Not Supported	
Traffic Circle	Not Supported	Not Supported	
Diverter (with emergency vehicle pass through)	Not Supported	Supported	
Meandering Alignments	Not Supported	Not Supported	

Note: Traffic calming measures are supported with the qualification that they meet Tualatin Valley Fire and Rescue guidelines including minimum street width, emergency vehicle turning radius, and accessibility/connectivity.

LAND USE

The types and intensities of land uses are closely correlated with travel demand. Land use patterns in many areas of the city are suburban in nature and low density, with more moderate densities near I-205 in the south part of the city. In the future, the city is envisioned in the Comprehensive Plan to be a mixture of housing densities and areas of mixed use development (e.g., a mix of residential, retail,

commercial and/or office uses). Table 13 summarizes the land use strategies that best meet the goals and objectives of the TSP.

Table 13: Land Use Projects

Project Number	Name	Description	Priority	Cost ($1,000)
LU1	Commercial Nodes	Revise existing zoning map to include more commercial nodes where appropriate	Medium	$80
LU2	Mixed Use Development	Modify city policies and/or the development code to encourage mixed use development in commercial zones	Medium	$80
LU3	Alternative Mobility Standards	Work with ODOT to develop alternative mobility targets on Highway 43 and at I-205 interchange ramp terminals in order to accommodate higher density development patterns along the corridors	Medium	$25
			TOTAL Medium Priority Costs	**$185**
			TOTAL Program Costs (25 years)	**$185**

ACCESS MANAGEMENT

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

The City's access management policy maintains and enhances the integrity (capacity, safety, and level of service) of city streets. Numerous driveways or street intersections increase the number of conflicts and potential for collisions and decrease mobility and traffic flow. The city of West Linn, as with every city, needs a balance of streets that provide access with streets that serve mobility. The following identifies access management techniques and strategies that help to preserve transportation system investments while promoting safety and limiting congestion.

The following access management strategies would improve local access and mobility in the city of West Linn:

- Maintain city-wide access spacing standards according to a roadway's jurisdiction and functional classification;
- Work with ODOT to explore creating Special Transportation Area (STA) designations along Highway 43 that have alternative access spacing (and mobility) standards;
- Establish an approach for access consolidation over time to move in the direction of the standards at each opportunity.

- Work with land use development applications to consolidate driveways where feasible.
- Identify potential transportation improvement projects that provide left turn lanes where warranted for access onto cross streets.
- Construct raised medians to provide for right-in/right-out driveways as appropriate.

Access Spacing Standards

The following describes ODOT and city of West Linn access spacing standards.

ODOT Standards

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

Access management standards for approaches to state highways vary based on the classification of the highway and highway designation, type of area, and posted speed. The OHP classifies Highway 43 as a Statewide Highway from the northern City limits (Mile Point 8.04) to the I-205 NB Off-Ramp (Mile Point 11.29) and a District Highway from the I-205 NB Off-Ramp (Mile Point 11.29) to the southern City limits (Mile Point 11.43). Future developments along Highway 43 (new development, redevelopment, zone changes, and/or comprehensive plan amendments) will be required to meet the OHP access management policies and standards. Table 14 summarizes ODOT's current access management standards for private driveways on Highway 43 per the OHP as of June 30, 2014.

Table 14: Highway 43 Access Spacing Standards

Location	Speed (mph)	Highway Classification	Posted Speed (MPH)	Spacing Standards (Feet)1
MP 8.04 (City Limit) – MP 11.29 (I-205 NB Off-Ramp)	35	Statewide Highway	30 & 35	500
MP 11.29 (I-205 NB Off Ramp) – 11.43 (City Limit)	25	District Highway	30 & 35	350

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

Special Transportation Area

A Special Transportation Area (STA) is a designated district of compact development located on a state highway within an urban growth boundary where local access outweighs the considerations of highway mobility with exceptions that do not apply to OR 43. Movement within an STA is focused upon pedestrian, bicycle and transit modes. STAs look like traditional "Main Streets" and are generally located on both sides of a state highway. The primary objective of an STA is to provide access to and

circulation amongst community activities, businesses and residences and to accommodate pedestrian, bicycle and transit movement along and across the highway. Full block development and access via street connections and shared on-street parking are encouraged. Local auto, pedestrian, bicycle and transit movements to the area are generally as important as the through movement of traffic. Traffic speeds are slow, generally 25 miles per hour or lower. Local code provisions to ensure compact, transit-oriented development are required in order to establish STA areas.

STAs can be located on Statewide Highway and District Highways, such as Highway 43. While STAs may include some properties that are currently developed for auto dependent uses (i.e. drive-through restaurants, gas stations, car washes), areas where the predominant land use pattern is auto-dependent uses are generally not appropriate for STA designation. STAs that include properties developed for auto-dependent uses should include planning and zoning that provide for redevelopment of the properties over time to uses consistent with STA urban form. The Oregon Transportation Commission's approval is needed to establish an STA.

City Standards

Access management standards for approaches to city streets are also based on roadway functional classification. Table 15 identifies the City's standards as they relate to new development and redevelopment. In addition to the spacing standards below, access should be taken from lower classification streets whenever possible.

Table 15: City Street Access Spacing Standards

Roadway Functional Classification	Area	Traffic Signals (miles)[1]	Between Street Intersections (feet)	Between Street Intersections and Driveways (feet)	Driveways (feet)
Minor Arterial	Urban	½	500	150	300
Minor Arterial[2]	Commercial	¼	NA	NA	NA
Collector	All	¼	200	75	150
Neighborhood Route	All	¼	150	50	50
Local Residential Street	All	NA	150	35	NA[3]
Local Commercial Street	All	NA	150	50	50

1. Target spacing between traffic signals
2. No driveways shall be permitted on 10th Street between Blankenship Road and Willamette Falls Drive
3. Driveways should be clustered or spaced to maximize on-street parking

"Urban" refers to intersections outside designated commercial zones.
"Commercial" refers to the designated commercial zones.
"NA" = Not Applicable

Driveway Access Spacing Adjustments

Driveway access spacing adjustments may be provided to parcels whose highway/street frontage, topography, natural resources or physical barriers would otherwise preclude access that meets access spacing standards. Approval of an adjustment could impose conditions that: 1) the access may be closed at such time that reasonable access becomes available to a local public street and 2) the establishment of joint/cross access easements. The review authority may also require a given land

owner to work in cooperation with adjacent land owners to provide either joint access points, front and rear cross-over easements, or a rear access upon future redevelopment.

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

Access Consolidation through Management

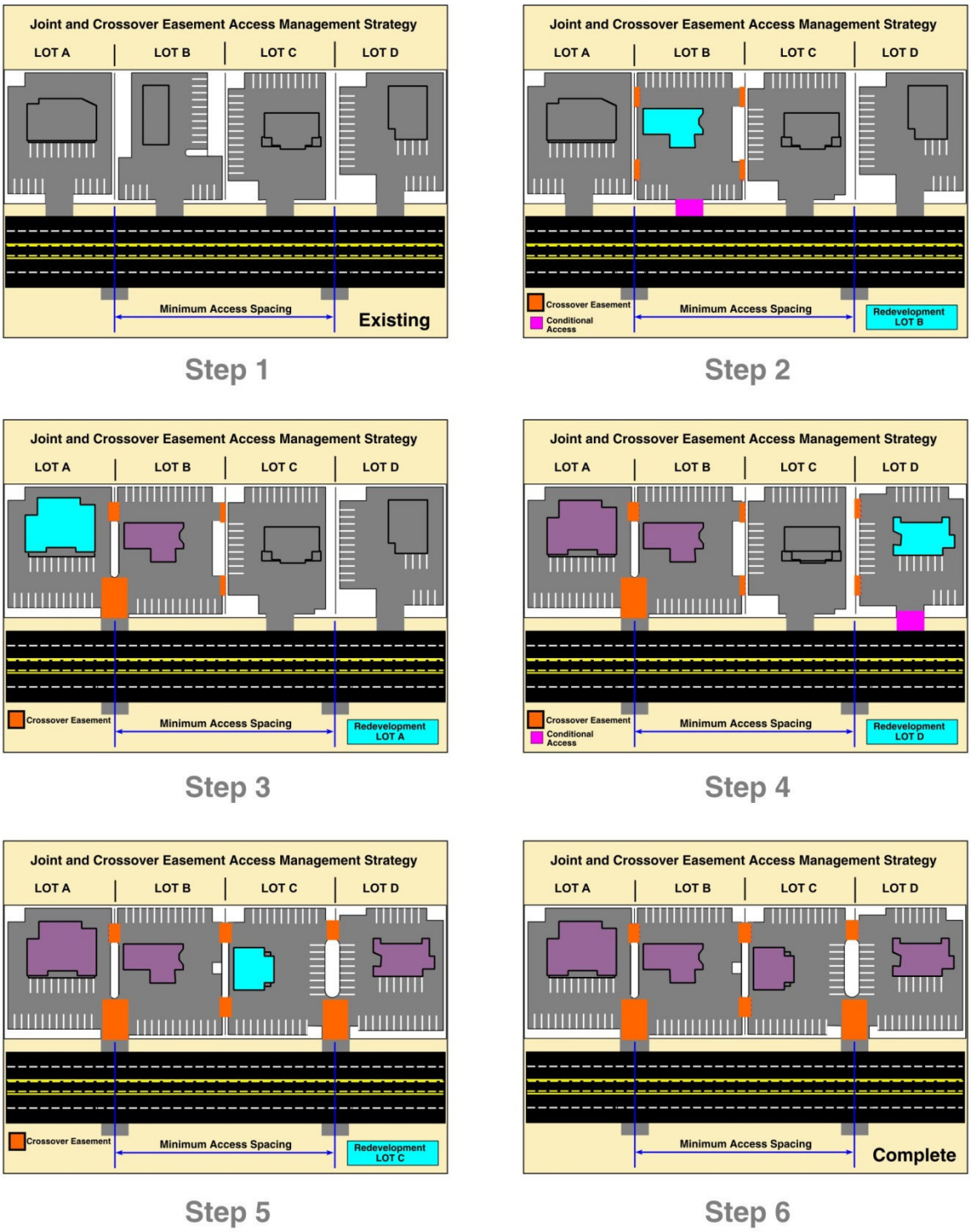
From an operational perspective, access management measures limit the number of redundant access points along roadways. This enhances roadway capacity, improves safety, and benefits circulation. The City should complement access spacing enforcement with provision of alternative access points. Purchasing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

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

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

Exhibit 4 illustrates the potential application of cross-over easements and access consolidation over time to achieve access management objectives. As illustrated in the exhibit, by using these guidelines, all driveways can eventually move in the overall direction of meeting driveway access spacing standards as development and redevelopment occur along a given street.

Exhibit 4: Application of an Example of Potential Driveway Consolidation



Access Management Plan

Table 16 summarizes the West Linn access management projects.

Table 16: Access Management Projects

Project Number	Name	Description	Priority	Cost ($1,000)
AM1	Access Spacing Standard Modifications	Modify city-wide access spacing standards according to a roadway's jurisdiction and functional classification	Low	$20
AM2	Special Transportation Area Designation	Pursue Special Transportation Area (STA) designations along Highway 43 within the commercial zones to allow alternative access spacing (and mobility) standards	Low	$15
AM3	Access Consolidation	Refine the City's approach for access consolidation to focus on incremental improvements that can occur over time	Low	$20
			TOTAL Low Priority Costs	**$55**
			TOTAL Program Costs (25 years)	**$55**

TRAFFIC SIGNAL SPACING

Traffic signals that are spaced too closely on a corridor can result in poor operating conditions and safety issues due to the lack of adequate storage for vehicle queuing. West Linn is nearly built-out, and there will not likely be many new roads constructed within the city. Currently a majority of the signalized intersections within the city are either along Highway 43 or are located at or near the two I-205 interchanges. However, as traffic volumes increase as a result of potential infill and regional growth, the need for new signals along the existing street system may be necessary to manage traffic flow. When this is the case, the City should evaluate traffic signal warrants to determine if a traffic signal is an appropriate solution. Traffic signals should only be implemented when deemed necessary by the City Engineer to enhance safety and promote mobility. ODOT identifies half mile as the desirable spacing of signalized intersections on regional and statewide highways but recognizes that shorter signal spacing may be appropriate due to a number of factors including existing road layout and land use patterns[2]. Signal spacing below these standards should be studied in detail to consider traffic signal coordination and the impacts of vehicle flow and queuing within the area. At that time adjacent signals and the spacing between them can be evaluated.

LOCAL STREET CONNECTIVITY

Much of the residential neighborhood development in West Linn has resulted in a network of cul-de-sacs and dead end streets. These streets can be desirable to residents because they can limit traffic

[2] MUTCD signal warrants must be met based on ODOT methodology and OAR 734-020-460 (1) A traffic signal shall not be installed unless one or more of the warrants identified in the MUTCD are met or will be met consistent with the requirements of OAR 734-020-0490. The satisfaction of a warrant or warrants, however, is not in itself justification for a traffic signal. Installation of a signal must be approved by the State Traffic Engineer on a regional or state highway.

speeds and volumes on local streets, but cul-de-sacs and dead end streets result in longer trip distances, increased reliance on arterials for local trips, and limited options for people to walk and bike to the places they want to go. By providing connectivity between neighborhoods, out-of-direction travel and vehicle miles traveled (VMT) will be reduced, congestion will be improved on roads such as Rosemont Road, Salamo Road, or Hidden Springs Road, accessibility is enhanced between various travel modes, and traffic levels become balanced among various streets. Additionally, improved connectivity will reduce public safety-response time.

The future street system needs to balance the benefits of providing a well-connected grid system with the topographical challenges in the city. Incremental improvements to the street system are planned to provide route choices for motorists, bicyclists and pedestrians while accounting for potential neighborhood impacts. The quality of the transportation system is enhanced by making connectivity improvements to the pedestrian and bicycle system separate from street connectivity.

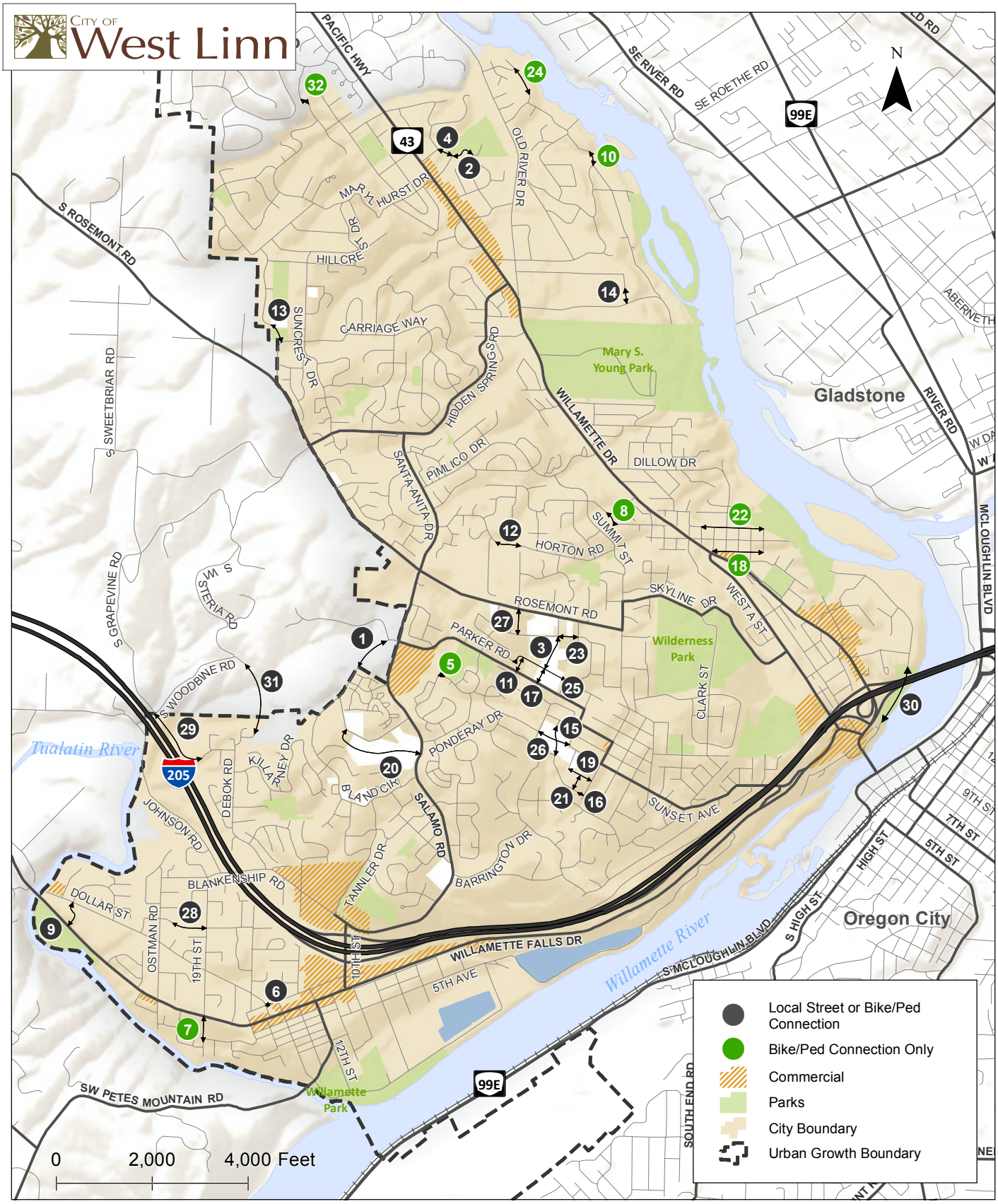
Topography and environmental conditions limit connectivity in several areas of the city of West Linn. The area to the west of Highway 43 is particularly challenging because of the steep terrain and the existing built-out nature of that area. Given that there are limited opportunities for new streets within the city, planned local street connectivity improvements are described below. Figure 12 illustrates the conceptual alignment of the potential connections. In limited cases, a short length of new road would be necessary for improved connectivity. In most cases, potential local street and neighborhood route connections represent streets to be constructed by future development and extension of existing stub end streets. Pedestrian connections from any cul-de-sac should be considered as future development and redevelopment occurs. The goal is to continue to improve connectivity for all modes of transportation. In each case, the specific alignments may be modified dependent upon future development review.

Table 17 summarizes the Local Street Connectivity Plan identified for West Linn.

Table 17: Local Street Connections by Priority

Project Number	Name	Type	Priority
LSC-1	Bland Circle extension to Parker Road	Local Street	Medium
LSC-2	Fairview Way extension to Lazy River Drive	Local Street	Medium
LSC-3	Maxfield Drive extension to Ridge Lane	Local Street	Medium
LSC-4	Shady Hollow Way extension to Lazy River Drive	Local Street	Medium
LSC-5	Wild Rose Loop extension to Chelan Drive	Bike/Ped	Medium
LSC-6	8th Avenue extension from 14th Street to Dollar Street	Local Street	Low
LSC-7	19th Street extension from Willamette Falls Drive to Swift Shore Drive	Bike/Ped	Low
LSC-8	Apollo Road extension to Randall Street	Bike/Ped	Low
LSC-9	Brandon Place extension from Dollar Street to Willamette Falls Drive	Local Street	Low
LSC-10	Calaroga Court extension to Nixon Avenue	Bike/Ped	Low
LSC-11	Damon Drive extension to Roxbury Drive extension	Local Street	Low

Project Number	Name	Type	Priority
LSC-12	Horton Road extension to Horton Road	Neighborhood Route	Low
LSC-13	Kapteyns Street to Carriage Way	Local Street	Low
LSC-14	Kenthorpe Way to Mapleton Drive	Local Street	Low
LSC-15	Landis Street extension from Stonegate Lane to Winkel Way	Local Street	Low
LSC-16	Landis Street extension to Cornwall Street	Local Street	Low
LSC-17	Maxfield Drive extension to Roxbury Drive extension	Local Street	Low
LSC-18	New east-west connection from Failing Street to Irving Street	Bike/Ped	Low
LSC-19	New east-west connection from Reed Street to Cornwall Street	Local Street	Low
LSC-20	New east-west connection from Weatherhill Road to Salamo Road	Local Street	Low
LSC-21	New north-south connection from the Landis Street extension to the new east-west connection	Local Street	Low
LSC-22	Randall Street extension from Elliot Street to Irving Street/Burnside Park	Bike/Ped	Low
LSC-23	Ridge Lane extension from Ireland Lane to Ridge Lane	Local Street	Low
LSC-24	Robin View Court extension to Old River Landing	Bike/Ped	Low
LSC-25	Roxbury Drive extension to Chinook Court	Local Street	Low
LSC-26	Sabo Lane extension from Beacon Hill Lane to Sunset Avenue	Local Street	Low
LSC-27	Shannon Lane extension from Rosemont Road to Ridge Lane	Local Street	Low
LSC-28	Short Street extension from Ostman Road to 19th Street	Local Street	Low
LSC-29	Tamarisk Drive extension to Grapevine Road	Local Street	Low
LSC-30	Territorial Drive extension to River Street	Alley	Low
LSC-31	Wisteria Road extension to Wisteria Court	Local Street	Low
LSC-32	Woodhurst Place extension to Upper Midhill Drive	Bike/Ped	Low



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Recommended Local Street Connectivity Projects West Linn, Oregon

Figure **12**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

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Transportation Engineering/Planning

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Chapter 7 Motor Vehicle Master Plan

MOTOR VEHICLE PLAN

The motor vehicle system within West Linn includes city streets, a state highway (Highway 43), and an interstate freeway (I-205). This chapter describes how the system has been developed and provides a detailed review of how it is used and operated.

EXISTING CONDITIONS

The motor vehicle system within West Linn serves a majority of all trips over multiple modes. In addition to motorists, pedestrians, bicyclists, and public transit riders all use the motor vehicle system to access areas locally and regionally. The following provides a summary of existing physical and operational characteristics of the motor vehicle system within West Linn.

Roadway Characteristics

Field inventories were conducted to identify and document the characteristics of major roadways within West Linn. The inventory data includes posted speed limits, street width, right-of-way width, number of lanes and lane width. The data also includes the geometry and lane configurations of several major intersections along with intersection controls. These characteristics define roadway capacity and operating speeds throughout the street system, which affects travel path choices for drivers in West Linn. The inventory data is summarized in Table 18. As shown, the majority of roadways in West Linn are posted at 25 mph. Arterial roadways such as Willamette Falls Drive, Salamo Road and Rosemont Road, as well as Highway 43 are posted at higher speeds ranging from 25 to 45 mph. Street widths vary significantly between roadways while right-of-way width is fairly consistent.

Intersection control types at study intersections are shown on Figure 13. Five of the eleven traffic signals in West Linn are located in I-205 interchange areas, five are located along Highway 43, and one is located at the Santa Anita Drive/Rosemont Road intersection. The intersection of Highway 43/Holmes Street has a pedestrian signal for Highway 43 traffic, but is stop-controlled on the side street. All-way stop controlled intersections are located at some intersections and the rest of the study intersections are two-way stop controlled.

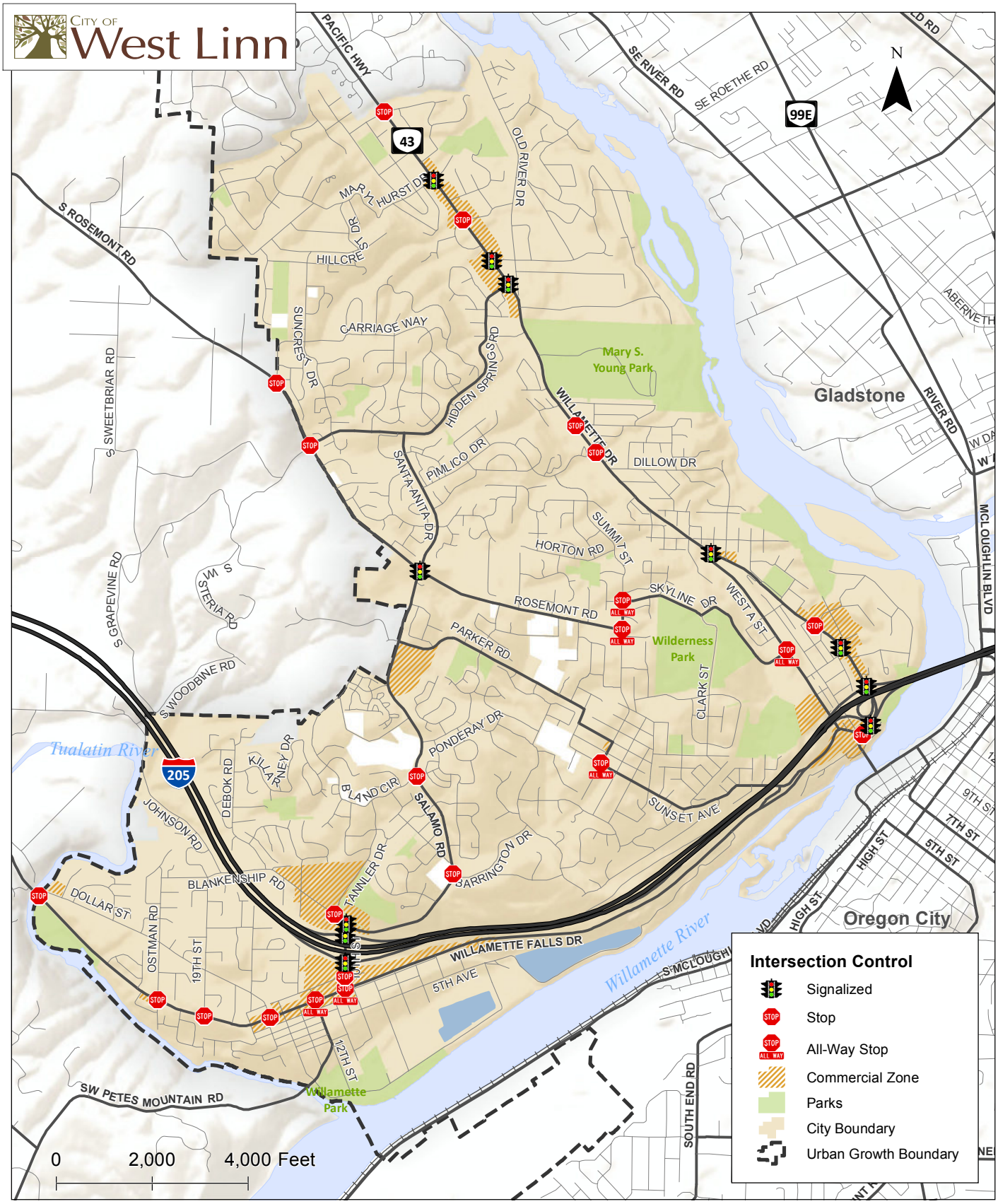
Table 18: Existing Study Area Roadway Characteristics by Functional Classification

Corridor	Posted Speed	Street Width [ft]	ROW Width [ft]	Number of Lanes	Lane Width [ft]
Major Arterial					
Highway 43 (Willamette Drive)	35	27-80	60	2-4	12
Minor Arterial					
10th Street	25	15-24	50	2-4	11
Rosemont Road (West of Salamo Road)	25-40	23-40	60	2	10
Salamo Road	25-40	32-55*	30	2	12
Santa Anita Drive	25	33-54*	50-84	2	12-15
Willamette Falls Drive	25-45	32-41	120	2	11-12
Collector					
12th Street	25	52-58	80	2	11

Corridor	Posted Speed	Street Width [ft]	ROW Width [ft]	Number of Lanes	Lane Width [ft]
Blankenship Road	25	25-46	60	2	10-14
Carriage Way (Rosemont Road to Suncrest Drive)	25	28-38	50	2	18
Cornwall Street	25	26-33	60	2	10-11
Hidden Springs Road	25	30-53	60	2	11
Hillcrest Drive	25	17-23	50	2	10
Johnson Road	25-40	22-42	60	2	10-12
Marylhurst Drive	25	27	50	2	10
Ostman Road	25	21-35	Varies	2	11-12
Parker Road	25-35	20-50*	60	2	10-12
Pimlico Drive	25	31-40	60	2	14-16
Rosemont Road (East of Salamo Road	25	23-40	60	2	10
Skyline Drive	25	28-36	50	2	12
Summit Street (Oxford Street to Skyline Drive)	25	24-45	60-70	2	10-11
Suncrest Drive	25	25-38	50	2	10
Sunset Avenue	25	26-29	60	2	10-11
Tualatin Avenue	25	25	60	2	11
West A Street	25	37-42	60	2	11
Neighborhood Route					
19th Street	25	20-32	30-60	2	10-12
Alpine Drive	25	32	56	2	12
Barrington Drive	25	34-44	Varies	2	12
Beacon Hill Drive	25	18-35	Varies	2	12
Bland Circle	25	30-34	60	2	10-16
Carriage Way (Suncrest Drive to Hidden Springs Road)	25	28-38	50	2	18
Cedaroak Drive	25	27-35	50	2	11
Clark Street	20-25	42-43	Varies	2	10
Debok Road	25	32-48	60	2	12-14
Horton Road	25	37-44*	50-55	2	16
Imperial Drive	25	37-45	Varies	2	10-12
Killarney Drive	25	38	50	2	12
Long Street	25	23-44	Varies	2	12-14
Old River Drive	25	20-25	60	2	11
Ponderay Drive	25	32	52	2	12
Simpson Street	25	23-44	50	2	10-11
Summit Street (Skyline Drive to Pimlico Drive)	25	38-44	50-60	2	10-12
Tannler Drive	25	32-44	40-50	2	12
Wild Rose Drive	25	32	56	2	12

*Street width includes traffic island.

Table 18 also lists the existing number of lanes on each roadway in West Linn. The majority of roadways in West Linn are two lanes, although additional turn lanes are provided at I-205 interchange areas and many arterial intersections along Highway 43, Salamo Road, and Blankenship Road. Local streets in the city of West Linn are two lane roadways.



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Intersection Control
West Linn, Oregon

Figure
13

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KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

Pavement Conditions

Capitol Assets & Pavement Services, Inc. was contracted by the city of West Linn Public Works Department to perform a visual inspection of all of the paved streets maintained by the city of West Linn. All 105.10 centerline miles of paved streets were evaluated in accordance with Metropolitan Transportation Commission (MTC) standards and the Streetsaver Online 9.0 database was updated to include projects scheduled for slurry sealing and paving during summer 2015. Based on the evaluation, the City's overall network Pavement Conditions Index (PCI) is currently a 69. This represents an increase from a network PCI of 65 in 2009. The PCI measures the condition of city streets on a scale of 0-100 with 100 being like new and 0 being completely failed.

The City Council approved an increase in the City's street fee in 2013 with 100 percent of the street fee increase dedicated to road repair. It is anticipated that with the additional funds, the PCI will improve over time. In addition, a higher PCI allows for more cost-effective treatments, such as slurry seals and thin overlays. As street deteriorate into poor conditions (PCI<50), they require more expensive treatment such as thick overlays and full reconstruction. Capitol Assets & Pavement Services, Inc. in coordination with the city of West Linn Public Works Department prepared a report that summarizes the current state of the city's street network, the likely state of the street network over the next five years, and what steps can be taken to improve the overall condition of the city street network.

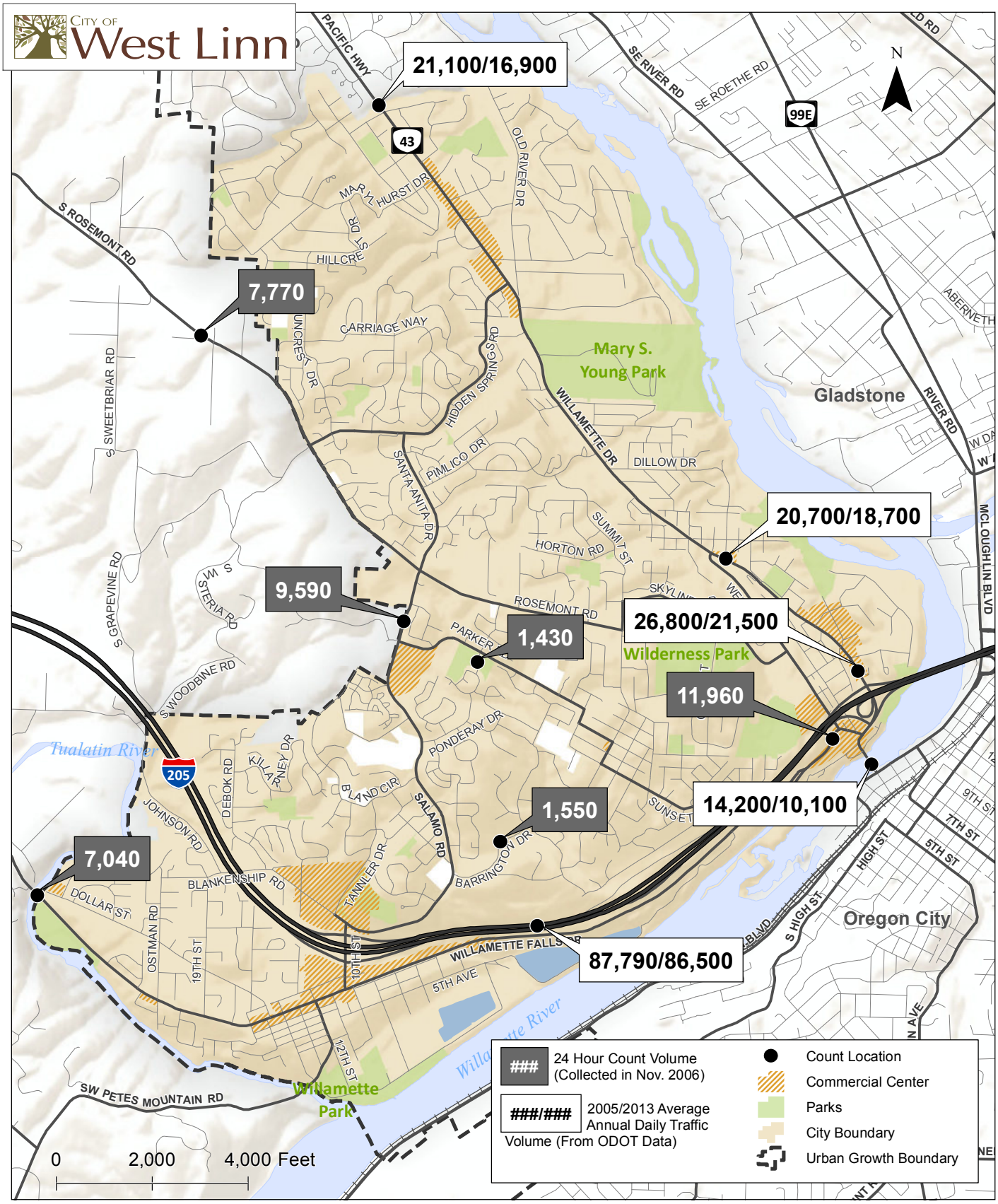
Designated Street Parking

An inventory of existing designated on-street parking was conducted on all arterial and collector roadways within West Linn. On-street parking is generally not provided on arterials in West Linn with the exception of angled and parallel parking accessed by frontage roads along Willamette Falls Drive between 10th Street and Dollar Street (East) and parallel parking along West A Street. Many of the collector streets in residential neighborhoods have on-street parking.

Motor Vehicle Volumes

Traffic counts were conducted at the study intersections on a typical midweek day during the weekday evening (3:30 p.m. to 6:30 p.m.) peak-time period. All the counts include the total number of vehicles that entered the intersections in 15-minute increments. The peak hour motor vehicle volumes were used to determine existing traffic operations at the thirty-four study intersections and along several major roadways within West Linn. The volumes were also used to forecast future traffic volumes and operations as described below.

Figure 14 shows average daily traffic volumes along several major roadways within the West Linn area. Historical traffic volumes at the study intersections are included in the TSP Technical Appendix.



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Average Daily Traffic Volumes (2006) West Linn, Oregon

Figure **14**

Kittelson & Associates, Inc.
Transportation Engineering/Planning

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

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Existing Operation Conditions

Level of Service (LOS) and Volume to Capacity (V/C) are frequently used as measures of effectiveness for intersection operation. LOS is determined based upon average approach delay at signalized intersections and critical movement delay at unsignalized intersections. LOS A, B, and C indicate conditions where traffic moves without significant delays, while LOS D and E indicate progressively worsening conditions and LOS F indicates conditions where average approach delay exceeds 80 seconds per vehicle entering a signalized intersection and where the critical movement delay exceeds 50 seconds per vehicle at an unsignalized intersection. Unsignalized intersections provide LOS for major and minor street turning movements. For this reason, LOS E and even LOS F can occur for a specific turning movement; however, the majority of traffic may not be delayed (in cases where major street traffic is not required to stop). LOS E or F conditions at unsignalized intersections generally provide a basis to study intersections further to determine availability of acceptable gaps, safety and traffic signal warrants.

V/C is determined by dividing the total volume at an intersection approach or movement by the maximum volume the intersection approach or movement can theoretically handle. For example, when a V/C is 0.80, the volume represents eighty percent of the intersection capacity. If the volume exceeds the capacity, queues will form and will lengthen until demand subsides below the available capacity. When the V/C approaches 1.0, intersection operation becomes unstable and small disruptions can cause traffic flow to break down. LOS and V/C are used as measures of effectiveness for study intersection performance. The minimum operational standard specified in the city of West Linn Comprehensive Plan (April 2006) is LOS D for all facilities except major arterials where the minimum is LOS E. The ODOT operating performance standards require intersections inside an Urban Growth Boundary and within the Portland Metropolitan Region to operate below the maximum V/C ratios shown in Table 19.

Table 19: ODOT Operating Standards

ODOT Highway Category	Location	Volume to Capacity Ratio (V/C)
Corridors	Highway 43 10th Street	0.99
Ramp Terminals for Freeway Interchange Ramps	I-205 ramp intersections	0.85

Source: Oregon Highway Plan, Oregon Department of Transportation, August 2012, Policy 1F.

The City has adopted Metro's 2040 Growth Concept Town Center and Main Street designations in concept only. Once boundaries have been established and adopted by the City, ODOT will allow a higher level of congestion (V/C=1.1) on their facilities. The weekday evening peak hour intersection volumes were used to determine the existing operating conditions at the study intersections based on the 2000 Highway Capacity Manual methodology for signalized and unsignalized intersections. Table 20 summarizes the existing weekday evening peak hour intersection operation at the study intersections using 2006 and 2015 traffic volumes. Intersections controlled by traffic signals operate within accepted standards along Highway 43 and at some locations on 10th Street. However, the intersection of 10th

Street / Blankenship-Salamo Road operates at capacity today, because of the close spacing with the freeway off-ramps and coordinated signal controls between those two adjacent intersections. Queues on the Salamo Road approach have been observed to extend over a quarter-mile uphill during peak periods and require several traffic cycles to clear.

The locations controlled by all-way stops generally operate within acceptable standards, as do those with stop sign controls on the minor street approach only. There are several exceptions along Highway 43 where the estimated delay for vehicles turning left onto the highway from the minor street is very significant, with an LOS F rating. These locations will be reviewed to determine if volumes and spacing are sufficient to justify installation of traffic signals or other higher capacity controls.

Table 20: Existing Weekday PM Peak Hour Intersection Level of Service (2006, 2015)

Intersection	Level of Service (LOS)	Delay (Sec)	Volume/ Capacity (V/C)	Mobility Standard		Standard Met?
				Agency	Maximum	
Signalized Intersections						
Highway 43/Marylhurst Dr	B	16.3	0.80	ODOT	V/C 0.99	Yes
Highway 43 / Cedaroak Dr	B	10.4	0.65	ODOT	V/C 0.99	Yes
Highway 43 / Hidden Springs Rd	C	25.0	0.83	ODOT	V/C 0.99	Yes
Highway 43 / West A St	B	12.5	0.74	ODOT	V/C 1.1	Yes
Highway 43 / Hood St-McKillican St	C	23.6	0.76	ODOT	V/C 1.1	Yes
Highway 43 / I-205 SB	C	26.5	0.85	ODOT	V/C 0.85	Yes
Highway 43 / I-205 NB	A	8.0	0.30	ODOT	V/C 0.85	Yes
Salamo Rd / Rosemont Rd				City	LOS D	Yes
10th St / Blankenship-Salamo Rd	B	18.2	0.53	ODOT	V/C 0.85	Yes
10th St / I-205 SB	C	30.9	0.53	ODOT	V/C 0.85	Yes
10th St / I-205 NB	B	13.6	0.53	ODOT	V/C 0.85	Yes
All-Way Stop Intersections						
Rosemont Rd / Summit St	A	9.2	0.37	City	LOS D	Yes
Sunset Ave / Cornwall St	A	7.6	0.15	City	LOS D	Yes
Willamette Falls Dr / 10th St	D	29.7	0.84	City	LOS D	Yes
Willamette Falls Dr / 12th St	F	>50.0	>1.0	City	LOS D	**No**
Two-Way Stop Intersections						
Highway 43 / Arbor Dr	B/**F**	>50.0	0.03 / 0.37	ODOT	V/C 0.99	Yes
Highway 43 / Walling Way	B/E	42.2	0.04 / 0.21	ODOT	V/C 0.99	Yes
Highway 43 / Jolie Pointe Rd	A/E	47.3	0.03 / 0.22	ODOT	V/C 0.99	Yes
Highway 43 / Pimlico Dr	B/**F**	>50.0	0.16 / **>1.0**	ODOT	V/C 0.99	**No**
Highway 43 / Holmes St	B/**F**	>50.0	0.02 / 0.65	ODOT	V/C 0.99	Yes
Highway 43 / Lewis St	B/E	40.0	0.01 / 0.15	ODOT	V/C 0.99	Yes
Highway 43 / Burns St	B/**F**	>50.0	0.23 / **>1.0**	ODOT	V/C 1.1	**No**
Highway 43 / Willamette Falls Dr	A/**F**	>50.0	0.21 / **>1.0**	ODOT	V/C 0.99	**No**
Willamette Falls Dr / Sunset Ave	A/B	13.6	0.29 / 0.31	City	LOS D	Yes
Rosemont Rd / Carriage Way	A/C	21.9	0.09 / 0.21	City	LOS D	Yes
Rosemont Rd / Hidden Springs Rd	A/C	18.6	0.10 / 0.14	City	LOS D	Yes
Salamo Rd / Bland Circle	A/B	38.3	0.00 / 0.09	City	LOS D	Yes
Salamo Rd / Barrington Dr	A/C	15.8	0.04 / 0.20	City	LOS D	Yes

Salamo Rd / Parker Rd	A/C	17.0	0.05 / 0.13	City	LOS D	Yes
Blankenship Road / Tannler Dr	A/C	16.6	0.08 / 0.18	City	LOS D	Yes
10th St / 8th Ave	A/**F**	>50.0	0.12 > **1.0**	City	LOS D	**No**
Willamette Falls Dr / Dollar St (East)	A/C	20.6	0.01 / 0.21	City	LOS D	Yes
Willamette Falls Dr / 19th St	A/B	13.0	0.01 / 0.04	City	LOS D	Yes
Willamette Falls Dr / Ostman Rd	A/C	23.6	0.03 / 0.06	City	LOS D	Yes
Willamette Falls Dr / Dollar St (West)	A/B	12.1	0.03 / 0.07	City	LOS D	Yes

LOS = Intersection Level of Service (Signal), Critical Movement Level of Service (TWSC).
Delay = Intersection Average vehicle delay (Signal), critical movement vehicle delay (TWSC).
V/C = Intersection V/C (Signal) critical movement V/C (TWSC).

Traffic Safety

Crash data were obtained from ODOT to identify any areas of traffic safety concern within West Linn. To identify potential focus areas for safety improvements in the TSP, crash patterns were evaluated at specific study intersections throughout the city. The evaluations were based on the five most recent years of crash data available at the time of analysis (January 1, 2009 to December 31, 2013). Crashes were evaluated based on their frequency, type (e.g., rear-end, angle, fixed object), severity (e.g., property damage only, injury and fatality), and whether a bicycle and/or pedestrian was involved. Table 21 summarizes the crashes experienced at study intersections, by crash type and by crash severity.

Table 21: Crash Data

Location	Crash Type						Severity		Total
	Angle	Turn	Rear-End	Side Swipe	Fixed Object	Ped/ Bike	PDO*	Injury	
HWY 43 & Cedar Oak Drive	-	1	3	-	-	-	2	2	4
HWY 43 & Hidden Springs Road	-	1	7	1	-	-	6	3	9
HWY 43 & I-205 SB Ramps	2	3	7	-	-	1	5	8	13
Willamette Falls Drive & 10th Street	-	2	2	-	-	-	4	0	4
10th Street & 8th Avenue	4	8	-	-	-	-	9	3	12
10th Street & Blankenship Road	-	-	1	-	-	-	1	-	1
10th Street & I-205 NB Ramps	-	1	4	-	-	-	2	3	5
10th Street & I-205 SB Ramps	-	1	2	-	-	-	2	1	3
Blankenship Road & Tannler Drive	1	2	1	-	1	-	2	3	5
HWY 43 & I-205 NB Ramps	-	1	2	-	2	-	2	3	5
HWY 43 & Willamette Falls Drive	-	3	2	-	-	-	4	1	5

* PDO = Property Damage Only

MOTOR VEHICLE NEEDS

System Connectivity

A well-connected motor vehicle system minimizes the need for out-of-direction travel while supporting efficient distribution of travel demand among multiple parallel roadways. The most common example of an efficient transportation network is the traditional grid system, with north-south and east-west

streets spaced at generally equal distances. While most of West Linn does not have a traditional grid system, there are a number of north-south and east-west streets that provide connectivity on a regional level as well as access within West Linn. The following sections highlight the needs associated with street system connectivity within West Linn.

Arterial Street Connectivity

Arterial streets within West Linn consist of major arterials and minor arterials. While there are several minor arterials located throughout the city, Willamette Drive is the only major arterial. Based on the RTP, arterials provide general travel mobility within the region and connect major commercial, residential, industrial, and institutional centers. Arterials are usually spaced about one mile apart and are designed to accommodate motor vehicle and truck traffic as well as pedestrians, bicyclists, and transit riders. West Linn exceeds this standard for arterial spacing due to the unique topography of the area and limited crossing opportunities of the rivers.

Few of the arterial streets meet the RTP's arterial spacing guidelines. Also, there is a need for an additional arterial connecting Rosemont Road to Willamette Drive approximately one mile north of Hidden Springs Road and an additional arterial connecting West Linn to rural Clackamas County approximately one mile west of Rosemont Road – this potential arterial could follow existing segments of Blankenship Road and Johnson Road. The other potential arterial, however, would have significant right-of-way and development costs as well as impacts to existing development and the natural environment. Given the significant constraints associated with this connection, the City should focus on opportunities to improve local street connectivity as well as maximize and improve the pedestrian, bicycle, and public transportation systems along existing arterials as described below.

Collector Street Connectivity

The RTP identifies collector streets as general access streets for neighborhood circulation and as support streets for the regional transportation network. Connectivity at this level is especially important for pedestrian and bicycle trips. The RTP recommends a maximum spacing of one-half mile for collectors in order to encourage local traffic to use them instead of higher order facilities. Few of the collector streets in the city meet the RTP's collector spacing guidelines due to topography. Also, there is a need for two additional collectors – one that extends north from Marylhurst Drive to the new arterial connection described above, following the existing segments of Marylhurst Drive, and one that connects Salamo Road to Parker Road, following the existing segments of Barrington Drive, Beacon Hill Drive, and Beacon Hill Court. Each of these potential connections would enhance the north-south and east-west connectivity within the city and reduce reliance on the arterial street system.

Local Street Connectivity

The city of West Linn's many cul-de-sacs, steep topography, and major facilities such as Willamette Drive and I-205 limit intercity connectivity. Therefore, many intercity trips are forced to travel along the few through streets that do connect across these barriers. By providing connectivity between neighborhoods, out-of-direction travel and vehicle miles traveled (VMT) will be reduced, accessibility

between various travel modes enhanced, and traffic levels among various streets balanced. With improved connectivity, public safety response times will be reduced.

The City could reduce some of the congestion on roads such as Rosemont Road, Salamo Road, and Hidden Springs Road through improved local street connectivity. Improved connectivity in the area east of Willamette Drive and in the Tanner Basin area would provide circulation to existing or future traffic signals that will result in less delay and better safety for access to the highway. Adding several short roadway connections within neighborhood areas would connect disjointed local streets and reduce out-of-direction travel for vehicles, pedestrians, and bicyclists.

Figure 12 shows the local street connectivity needs. In limited cases, a short length of new road would be necessary to improve connectivity. The arrows on Figure 12 represent connections and the general direction for the placement of the connection in existing configurations. In each case, the specific alignments may be modified dependent upon future development review. The criteria for providing local connections are based on the Metro RTFP requirements for new residential or mixed-use developments of five or more acres which involves construction of a new street(s):

- Every 530 feet, provide a full street connection for automobiles (local street or higher classification).
- Every 330 feet, if a full street connection is prevented, provide pedestrian and bicycle connections (may include paved roadway or trails)

The arrows on Figure 12 indicate local and neighborhood connections only, some of which are currently underway. Local connections for existing stub end streets, cul-de-sacs, or extended cul-de-sacs in the road network are, for the most part, not identified on this figure. Pedestrian and bicycle connections from any cul-de-sac should be considered as future development and redevelopment occurs. The goal is to continue to improve connectivity for all modes of transportation. The local street and pedestrian and bicycle connections identified in Figure 12 shall be considered with new development in order for a more efficient network to be created consistent with the RTFP guidelines.

Intersection Performance and Capacity Needs

The intersection performance and capacity needs described below are based on the analysis prepared as part of the 2008 TSP. This section identifies study area intersection deficiencies resulting from increases in vehicle volumes as forecasted by the 2040 financially constrained Metro RTP model for the 2040 base case scenario.

Intersection Capacity Analysis

The traffic operations analysis prepared as part of the previous update of the TSP found that many of the study intersections did not meet or were not expected to meet their respective mobility standards under existing (2015) and/or future (2030) traffic conditions. Based on the analysis, motorists are likely to experience high levels of congestion and delay at these intersections without additional

improvements to the existing transportation system. Table 22 summarizes the analysis results for future (2040) traffic conditions.

Table 22: 2040 Weekday PM Peak Hour Intersection Level of Service

Intersection	Level of Service (LOS)	Delay (Sec)	Volume/ Capacity (V/C)	Mobility Standard		Standard Met?
				Agency	Maximum	
Signalized Intersections						
Highway 43/Marylhurst Dr	C	26.7	0.94	ODOT	V/C 0.99	Yes
Highway 43 / Cedaroak Dr	B	18.3	0.82	ODOT	V/C 0.99	Yes
Highway 43 / Hidden Springs Rd	D	42.8	1.0	ODOT	V/C 0.99	**No**
Highway 43 / West A St	C	31.1	0.97	ODOT	V/C 1.1	Yes
Highway 43 / Hood St-McKillican St	E	62.7	1.07	ODOT	V/C 1.1	Yes
Highway 43 / I-205 SB	E	69.1	>1.0	ODOT	V/C 0.85	**No**
Highway 43 / I-205 NB	B	10.2	0.41	ODOT	V/C 0.85	Yes
Salamo Rd / Rosemont Rd				City	LOS D	Yes
10th St / Blankenship-Salamo Rd	C	21.5	0.59	ODOT	V/C 0.85	Yes
10th St / I-205 SB	D	36.3	0.65	ODOT	V/C 0.85	Yes
10th St / I-205 NB	B	18.6	0.63	ODOT	V/C 0.85	Yes
All-Way Stop Intersections						
Rosemont Rd / Summit St	B	12.2	0.57	City	LOS D	Yes
Sunset Ave / Cornwall St	A	7.8	0.16	City	LOS D	Yes
Willamette Falls Dr / 10th St	F	>50.0	>1.0	City	LOS D	**No**
Willamette Falls Dr / 12th St	F	>50.0	>1.0	City	LOS D	**No**
Two-Way Stop Intersections						
Highway 43 / Arbor Dr	B/F	>50.0	0.04/>1.0	ODOT	V/C 0.99	No
Highway 43 / Walling Way	B/F	>50.0	0.00/0.92	ODOT	V/C 0.99	Yes
Highway 43 / Jolie Pointe Rd	B/F	>50.0	0.12/>1.0	ODOT	V/C 0.99	**No**
Highway 43 / Pimlico Dr	C/F	>50.0	0.37/>1.0	ODOT	V/C 0.99	**No**
Highway 43 / Holmes St	B/F	>50.0	0.03/>1.0	ODOT	V/C 0.99	**No**
Highway 43 / Lewis St	B/F	>50.0	0.01/0.54	ODOT	V/C 0.99	Yes
Highway 43 / Burns St	D/F	>50.0	0.49/>1.0	ODOT	V/C 1.1	**No**
Highway 43 / Willamette Falls Dr	D/F	>50.0	0.77/>1.0	ODOT	V/C 0.99	**No**
Willamette Falls Dr / Sunset Ave	A/E	47.6	0.67/0.74	City	LOS D	**No**
Rosemont Rd / Carriage Way	A/F	>50.0	0.12/0.51	City	LOS D	**No**
Rosemont Rd / Hidden Springs Rd	B/F	>50.0	0.07/>1.0	City	LOS D	**No**
Salamo Rd / Bland Circle	A/D	34.6	0.02/0.60	City	LOS D	Yes
Salamo Rd / Barrington Dr	A/C	21.8	0.05/0.93	City	LOS D	Yes
Salamo Rd / Parker Rd	A/F	>50.0	0.13/0.79	City	LOS D	**No**
Blankenship Rd / Tannler Dr	B/F	>50.0	0.19/>1.0	City	LOS D	**No**
10th St / 8th Ave	B/F	>50.0	0.18/>1.0	ODOT	V/C 0.99	**No**
Willamette Falls Dr / Dollar St (East)	A/F	>50.0	0.15/0.74	City	LOS D	**No**
Willamette Falls Dr / 19th St	A/C	17.6	0.01/0.06	City	LOS D	Yes
Willamette Falls Dr / Ostman Rd	B/F	>50.0	0.01/0.23	City	LOS D	**No**
Willamette Falls Dr / Dollar St (West)	A/F	>50.0	0.13/0.71	City	LOS D	**No**

LOS = Intersection Level of Service (Signal), Critical Movement Level of Service (TWSC).
Delay = Intersection Average vehicle delay (Signal), critical movement vehicle delay (TWSC).
V/C = Intersection V/C (Signal) critical movement V/C (TWSC).

Traffic Signal Warrants

The City conducted traffic signal warrants for the unsignalized study intersections that were not expected to meet operational standards in the 2040 base case. Table 23 lists the intersections that were found to meet the traffic volume warrants for signalization under existing (2015) and base case (2040). On arterial streets, signals should generally be spaced at least 1,000 feet apart for efficient operation, but signalizing some of the intersections that meet signal warrants would result in shorter spacing. The City will conduct a detailed traffic engineering evaluation to evaluate site conditions, signal spacing, and all warrants before installing any traffic signals. The City should follow City and ODOT signal design and signal phasing guidelines for all new traffic signal installations. ODOT typically requires an 8-hour warrant to be met, along with other improvement considerations such as channelization prior to installing a signal. New signals on ODOT facilities are subject to state traffic engineer approval, and even if an intersection meets a signal warrant, it is not a guarantee for approval.

Table 23: Signal Warrant Analysis Results

Intersection	Warrant Met for Existing (2015)[1]?	Warrant Met for Future Base Case (2040)[2]?
Willamette Drive/Arbor Drive	No	No
Willamette Drive/Jolie Pointe Road	No	No
Willamette Drive/Pimlico Drive	No	Yes
Willamette Drive/Holmes Street	No	No
Willamette Drive/Burns Street	Yes	Yes
Willamette Drive/Willamette Falls Drive	Yes	Yes
Willamette Falls Drive/Sunset Avenue/Chestnut Street	No	Yes
Rosemont Road/Carriage Way	No	No
Rosemont Road/Hidden Springs Road	No	Yes
10th Street/8th Avenue-Court	No	Yes
Willamette Falls Drive / 10th Street	Yes	Yes
Salamo Road/Parker Road	No	No
Blankenship Road/Tannler Drive	No	Yes
Willamette Falls Drive/12th Street	No	Yes
Willamette Falls Drive/Dollar Street East	No	No
Willamette Falls Drive/Ostman Road	No	No
Willamette Falls Drive/Dollar Street West	No	No

1. Traffic volumes within West Linn are generally lower today than they were in 2006 and are projected to be lower in 2040 than they were projected to be in 2030. Therefore, use of the existing and projected future traffic volumes from the 2008 TSP to evaluate existing (2015) and future (2040) traffic conditions is a conservative estimate, and may overestimate vehicle demand.

Highway 43 Corridor

The city of West Linn, in coordination with ODOT, developed the West Linn OR 43 Conceptual Design Plan dated January 4, 2008 and adopted it as part of the 2008 TSP. The Plan identifies needs, deficiencies, and solutions (such as pedestrian crossings, street trees, landscaping, transit stops, and lighting to better support the needs of all roadway users and adjacent land uses) for the portion of Highway 43 between the north City limits and McKillican Street. Attachment “A” contains the 2008 OR 43 Conceptual Design Plan.

The 2008 OR 43 Conceptual Design Plan includes improvements such as adding left turn lanes to the median and traffic control in some locations to increase capacity. However, due to the stated constraints, several locations are not likely to meet performance standards and will require ODOT design exceptions. Table 24 summarizes projects identified in the current OR 43 Conceptual Design Plan. The City identified all projects associated with the OR 43 Plan as a high priority based on the project evaluation criteria with the exception of the Arbor Drive intersection, which is identified as medium priority. The City is currently refining the OR 43 Conceptual Design Plan in an effort to resolve discrepancies between the planned roadway cross section and available right-of-way width in the corridor and to improve safety for pedestrians and bicyclists. The final design of OR 43 is subject to ODOT approval.

Upon approval of the updated OR 43 Conceptual Design Plan, the 2008 OR 43 Conceptual Design Plan contained in Attachment "A" of this TSP will be replaced with the updated Plan. The City will also update all applicable sections of this TSP to reflect the findings of the updated Plan.

10th Street Interchange Area

The 10th Street Interchange Area consists of the segment of 10th Street located between Blankenship-Salamo Road and Willamette Falls Drive, the I-205 northbound and southbound on- and off-ramps, and three local street connections: 8th Avenue, 8th Court, and Tannler Drive. Several intersections located within the Interchange Area currently exceed their respective mobility standards during the weekday p.m. peak hour. Several more intersections currently experience significant queues that extend beyond striped storage lanes and disrupt traffic flow. Traffic volume projections included in Metro's current travel demand model indicate that these conditions are expected to continue in the future. To address the problem of the closely spaced intersections, the solutions listed below will, in part, be relied upon to improve operations rather than fully reconstructing the interchange as proposed in the 2008 TSP. Therefore, the City and ODOT identified several improvements to address the issues, such as widening along 10th Street to provide additional travel lanes and several intersection modifications.

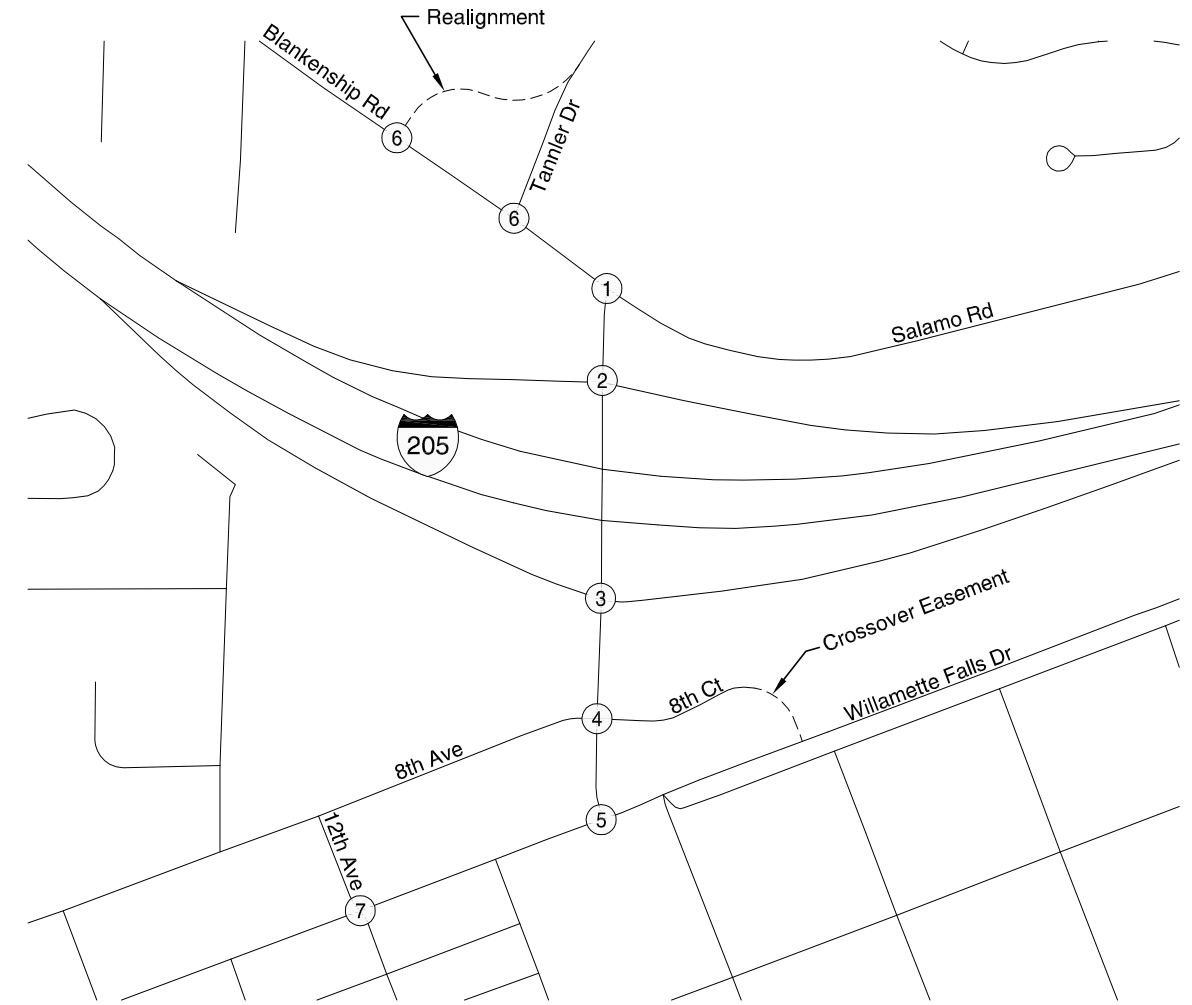
The following provides a summary of the improvements identified by the City and ODOT for the 10th Street Interchange Area.

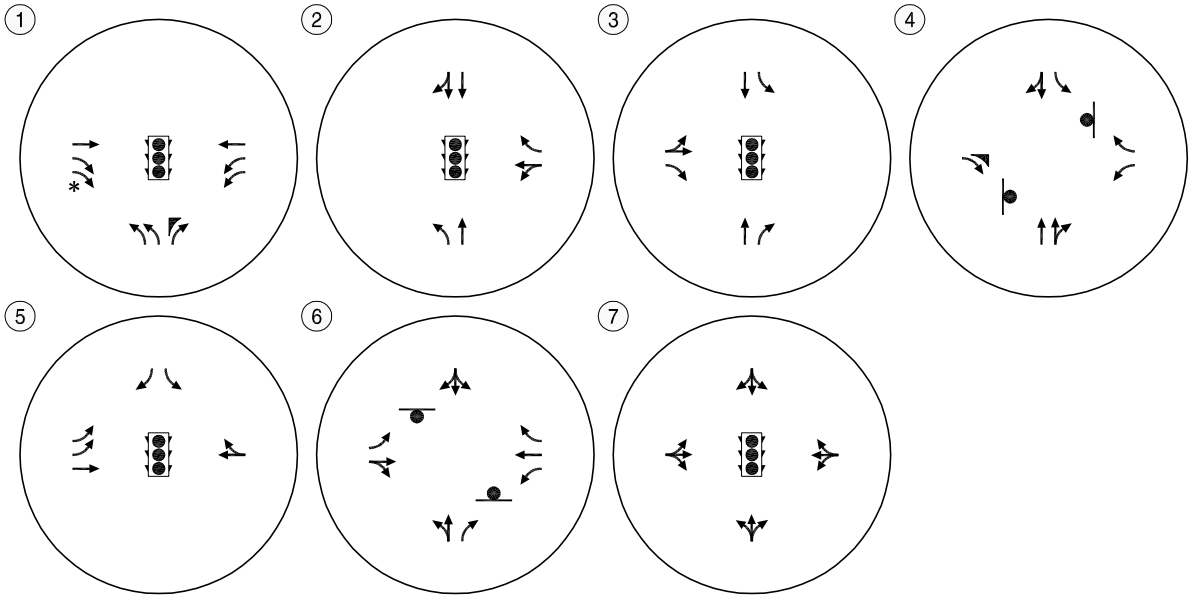
- Widen 10th Street between the I-205 NB Ramps and the I-205 SB Ramps to provide two through lanes in each direction.
    - This allows for one left-turn lane and one continuous through lane in both directions between the ramps (the left-turn lanes between the ramps would be side-by-side instead of back-to-back allowing for twice the amount of queue storage)[3].

[3] Widening of 10th Street under the I-205 bridges may be possible without complete bridge reconstruction through the use of retaining walls or minor modifications to the bridge structures.

- Widen 10th Street between the I-205 NB Ramps and Willamette Falls Drive to provide two lanes in each direction.
- Provide continuous sidewalks and bicycle facilities along 10th Street from Blankenship-Salamo Road to Willamette Falls Drive. The bicycle facilities should be designed to be low-stress and provide separation for bicycles from vehicles.
- Widen Blankenship-Salamo Road to provide dual left-turn lanes from Salamo Road and dual left-turn lanes from 10th street at the 10th Street/Blankenship-Salamo Road intersection.
- Add a second exclusive right turn lane to the eastbound approach to the 10th Street/Blankenship-Salamo Road intersection if necessary to address queuing; however, the need for this improvement would be eliminated by realigning Tannler Drive with the commercial driveway located approximately 350 feet west of its current alignment.
- Install channelization at the 10th Street/8th Avenue-Court intersection to restrict the eastbound left, eastbound-through, northbound left, and westbound-through movements.
    - The channelization would result in an increase in the southbound left-turn volume at the 12th Street/Willamette Falls Drive intersection and the eastbound left-turn volume at the 10th Street/Willamette Falls Drive intersection. Traffic signals are warranted at the intersections under existing traffic conditions with channelization at the 10th Street/8th Avenue-Court intersection.
- Install dual eastbound left-turn lanes at the 10th Street/Willamette Falls Drive intersection.
- Install traffic signals at 12th Street/Willamette Falls Drive and at 10th Street/Willamette Falls Drive intersections. Coordinate the traffic signals along 10th Street and Willamette Falls Drive to minimize queuing and delay at each approach to the I-205 Ramp terminals.
- During preliminary design of the 10th Street Corridor, further evaluate traffic operations, the feasibility of the signal coordination, and identify the project footprint.

The westbound approach to the 10th Street/8th Avenue-Court intersection is expected to operate at LOS F, but below capacity during the weekday p.m. peak hour under future traffic conditions with the planned improvements. Providing a crossover easement from 8th Court to Willamette Falls Drive for public ingress and egress will be necessary to provide relief to this intersection by providing alternative access and secondary emergency access. Figure 15 illustrates the planned lane configurations for the 10th Street Interchange Area. Additional right-of-way will be required to construct the improvements shown in Figure 15.





* Double right not required with realignment of Tannler Drive

- STOP SIGN
- TRAFFIC SIGNAL

10th Street Interchange Area - Year 2040 Assumed Lane Configurations & Traffic Control Devices
West Linn, OR

Figure 15

MOTOR VEHICLE PLAN

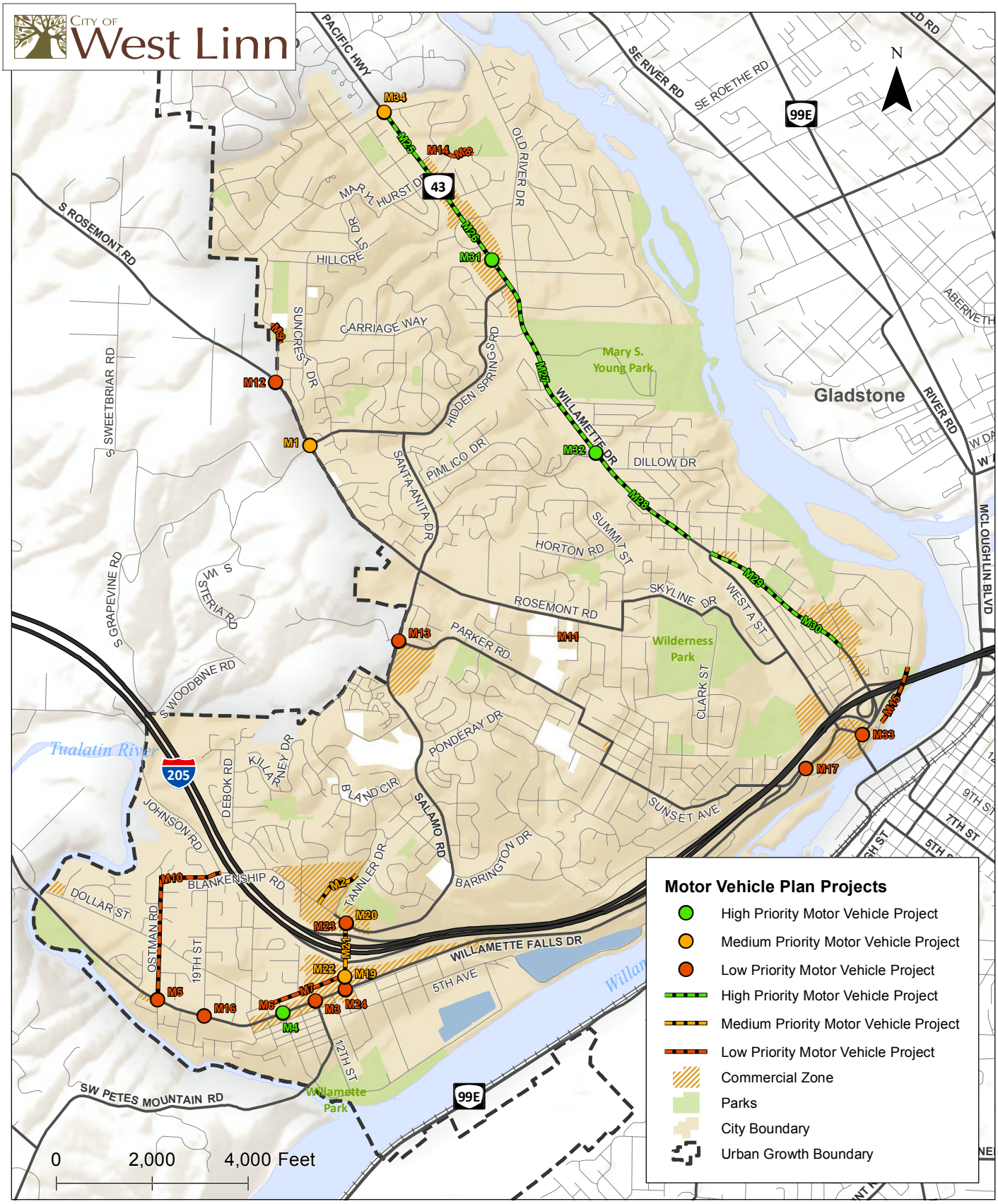
In addition to the Highway 43 and 10th Street corridor improvements identified above, Table 24 includes additional intersection and roadway projects throughout the city of West Linn. Figure 16 shows these projects. The cost estimates shown in Table 24 were developed based on information provided in the previous TSP and direction from city staff and therefore, should be considered planning level estimates. More detailed cost estimates will be required as projects are pursued.

Table 24: Motor Vehicle Plan Projects

Project Number	Location	Description	Priority	Cost ($1,000)
City of West Linn Facility Projects				
M1	Rosemont Road/ Hidden Springs Road	Install a traffic signal with northbound/southbound left turn lanes on Rosemont Road when warranted	Medium	$780
M2	Tannler Street Realignment	Realign Tannler Street at Blankenship Road to align with the driveway located approximately 350 feet west	Medium	$920
M3	Willamette Falls Drive/12th Street	Install a traffic signal when warranted	Medium	$300
M4	Willamette Falls Drive/14th Street	Install all way stop control when warranted	Medium	$10
M5	Willamette Falls Drive/Ostman Road	Widen Willamette Falls Drive with center median 500' on each side of intersection to allow for two-stage left turn from Ostman Road. Install all-way stop-control when warranted.	Medium	$1,335
M6	8th Avenue	Modify Dollar Street connection to reconnect to 8th Avenue, and provide alternative route for local trips.	Low	$1,035
M7	8th Avenue	Upgrade from 10th Street to Dollar Street	Low	$1,760
M8	Fairview Way	Extend Fairview Way to Lazy River Drive	Low	$395
M9	Kapteyns Street	Extend Kapteyns Street to Carriage Way	Low	$395
M10	Ostman Road/ Blankenship Road	Upgrade to current city standards from Johnson Road to Willamette Falls Drive	Low	$1,100
M11	Ridge Lane	Extend Ridge Lane to Ireland Lane	Low	$320
M12	Rosemont Road/ Carriage Way	Install a center median on Rosemont Road to allow two-stage left turns from Carriage Way	Low	$1,475
M13	Salamo Road/ Parker Road	Install a traffic signal when warranted	Low	$300
M14	Shady Hollow Way	Extend Shady Hollow Way to Lazy River Drive	Low	$265
M15	Territorial Drive	Extend Territorial Drive to River Street	Low	$360
M16	Willamette Falls Drive/19th Street	Install all way stop control when warranted	Low	$10
M17	Willamette Falls Drive/Sunset Avenue	Install a traffic signal when warranted	Low	$300
ODOT Facility Projects (10th Street Interchange)[1]				
M18	10th Street Preliminary Design	Prepare a preliminary design for the 10th Street interchange area improvement projects M19 – M24 shown in Figure 15.	High	$50
M19	8th Court	Establish a crossover easement from the 8th Court terminus to Willamette Falls Drive when development occurs to preserve ingress and egress for existing and future development and provide relief to the 8th Court/10th Street intersection and secondary emergency access.	Medium	$0 (to be completed by the developer)
M20	10th Street	Install dual eastbound left-turn lanes at the 10th Street/Willamette Falls Drive intersection.	Medium	$40[2]

M21	10th Street	Widen 10th Street between Blankenship-Salamo Road and Willamette Falls Drive to provide two lanes in each direction. This project includes completing sidewalks and enhanced bicycle facilities.	Medium	$875[2]
M22	10th Street/8th Avenue-Court	Install channelization at the intersection to restrict the eastbound left, eastbound-through, northbound left, and westbound-through movements.	Medium	$10[2]
M23	10th Street/ Blankenship Road	Widen Blankenship-Salamo Road to provide dual left-turn lanes at the westbound and northbound approaches to the intersection. Also, add a second exclusive right-turn lane at the eastbound approach to the intersection to address queuing.	Medium	$500[2]
M24	10th Street/ Willamette Falls Drive	Install a traffic signal when warranted	Medium	$75[2]
ODOT Facility Projects (OR 43 Conceptual Design Plan Improvements) [1]				
M25	North City Limit to Marylhurst Drive	Highway 43 Improvements including pedestrian and enhanced bicycle facilities per the OR 43 Conceptual Design Plan	High	$760[2]
M26	Marylhurst Drive to Hidden Springs Road	Highway 43 Improvements including pedestrian and enhanced bicycle facilities per the OR 43 Conceptual Design Plan	High	$1,090[2]
M27	Hidden Springs Road to Pimlico Drive	Highway 43 Improvements including pedestrian and enhanced bicycle facilities per the OR 43 Conceptual Design Plan	High	$1,400[2]
M28	Pimlico Drive to Buck Street	Highway 43 Improvements including pedestrian and enhanced bicycle facilities per the OR 43 Conceptual Design Plan	High	$865[2]
M29	West A Street to Webb Street	Highway 43 Improvements including pedestrian and enhanced bicycle facilities per the OR 43 Conceptual Design Plan	High	$535[2]
M30	Webb Street to Hood-McKillican Street	Highway 43 Improvements including pedestrian and enhanced bicycle facilities per the OR 43 Conceptual Design Plan	High	$495[2]
M31	Highway 43/Cedar Oak Drive	Modify per OR 43 Conceptual Design Plan	High	$130[2]
M32	Highway 43/Pimlico Drive	Add a traffic signal when warranted	High	$65[2]
M33	Highway 43/Willamette Falls Drive	Install a traffic signal when warranted. Coordinated with adjacent signal at I-205 NB Off Ramps	High	$300[2]
M34	Highway 43/Arbor Drive	Install left turn lanes on Highway 43 (cost included in Highway 43 segment cost, listed below)	Medium	$0
M35	Highway 43/Hidden Springs Road and Highway 43/I-205 SB	Conduct a refinement plan to address the projected 2040 unmet mobility standard at Highway 43/Hidden Springs Road and Highway 43/I-205 SB (See Table 22).	Low	$20
			TOTAL High Priority Costs	**$5,690**
			TOTAL Medium Priority Costs	**$4,845**
			TOTAL Low Priority Costs	**$7,735**
			TOTAL Program Costs (25 years)	**$18,270**

1. ODOT's financial participation in projects on state facilities determined through the STIP. The West Linn TSP does not obligate ODOT to financially participate in any of the project listed on their facilities.
2. This cost represents the estimated local City contribution to overall project cost (25 percent).



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Motor Vehicle Plan Projects
West Linn, Oregon

Figure **16**

H:\profile\17817 - West Linn Transportation System Plan\gis\TSP\Portrait Letter Version\16 Motor Vehicles.mxd - jsommerville - 11:48 AM 1/13/2016

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

FUNCTIONAL CLASSIFICATION PLAN

The functional classification system within West Linn serves numerous transportation needs. The schematic diagram in Exhibit 5 shows the relationship between facility design and mobility and accessibility outcomes for the regional transportation functional classification plan. As mobility increases (bottom axis), non-motor vehicle mode (top axis) provision decreases. Similarly, as access and the use of streets for parking and loading increases (left axis), the facility design (right axis) dictates slower speeds, narrower travel ways, and non-exclusive facilities. Assigning a functional classification to roadways establishes a hierarchy of suitable design and performance characteristics that balances access and mobility, facility design, and modal integration.

Exhibit 5: Relationship between access and mobility outcomes for various functional classifications

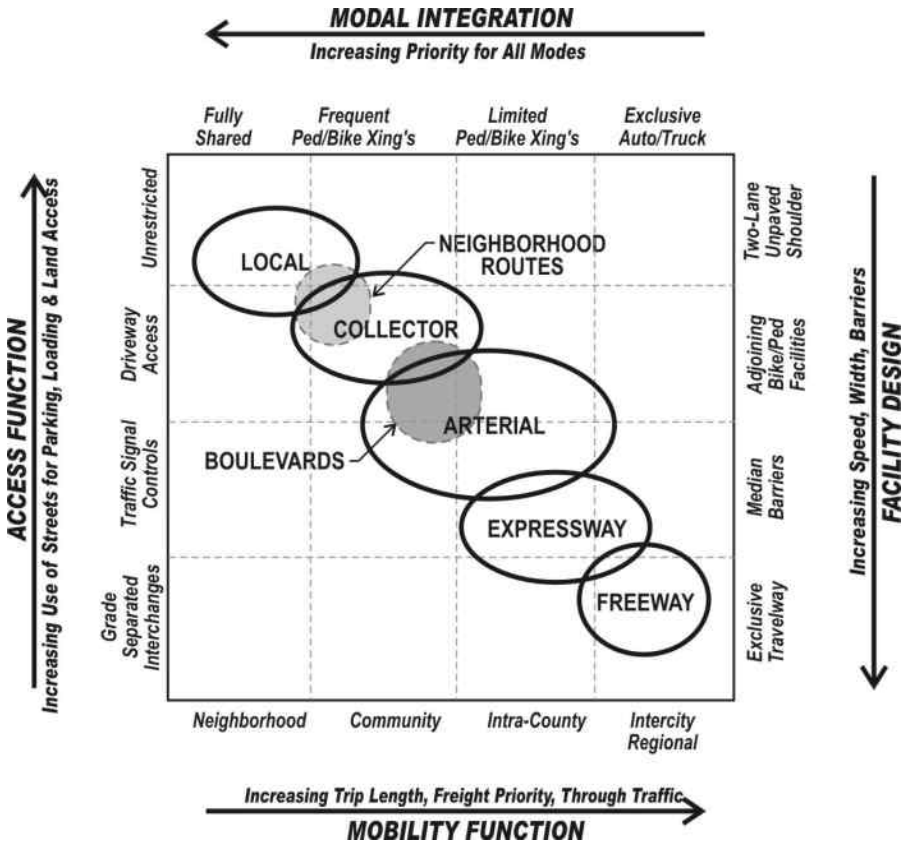


Exhibit 5 shows that as street classes progress from local to collector to arterial to freeway (top left corner to bottom right corner) the following occurs:

- Mobility Increases – Longer trips between destinations, greater proportion of freight traffic movement, and a higher proportion of through traffic.
- Pedestrian and Bicycle Mode Integration Decreases – The City requires adjoining sidewalks and bike facilities for the local, collector, and arterial classes; however, the intersection or mid-block crossings frequency for non-motorized vehicles steadily decreases with higher functional classes. The freeway facilities, for example, typically do not allow pedestrian and

bike facilities adjacent to the roadway and all crossings are grade-separated to enhance mobility and safety.

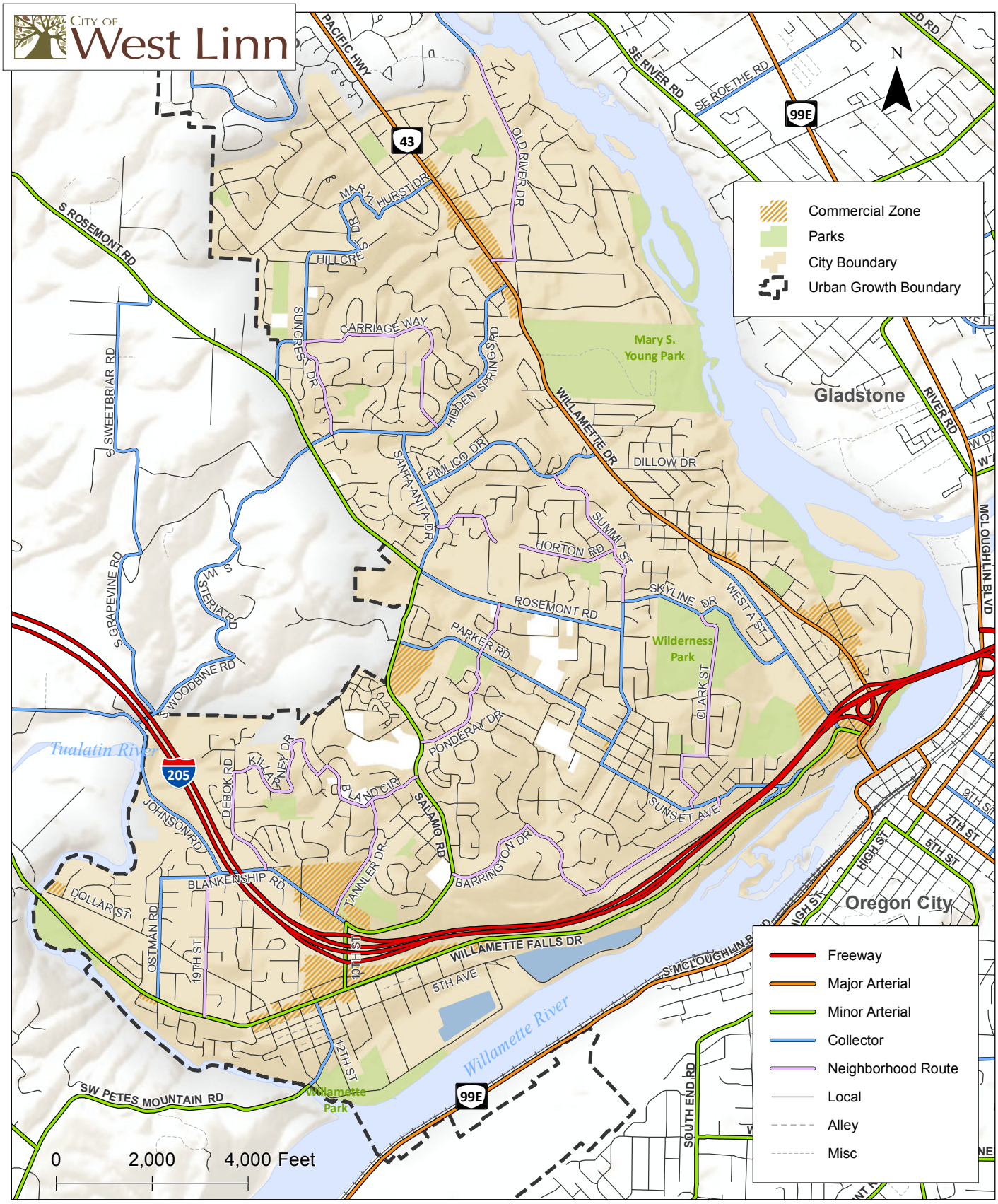
- Access Decreases – Shared uses for parking, loading, and direct land access is reduced. This occurs through parking regulation, access control and spacing standards (see opposite axis).
- Facility Design Standards Increase – Roadway design standards require increasingly wider, faster facilities leading to exclusive travelways for autos and trucks only. The opposite end of the spectrum is the most basic two-lane roadway with unpaved shoulders.

Neighborhood Routes fall between local and collector functional classifications. Although Exhibit 5 shows Boulevard and Expressway functional classifications, the City does not have these street types.

Figure 17 shows the West Linn functional classification system. Table 25 describes the West Linn functional classification hierarchy.

Table 25: West Linn Street Functional Classification Description

Classification	Description
Freeways	Freeways are state or interstate facilities that provide regional travel connections. These routes have the highest capacity and the most restrictive access requirements. Interstate 205 (I-205) is the only freeway facility within West Linn city limits. Two local freeway interchanges at 10th Street and at Highway 43 serve the entire city of West Linn. Interchanges are grade-separated facilities with arterial streets.
Major Arterial	Major arterials are typically state highways that provide the high level roadway capacity to local land uses. These routes connect over the longest distance and are less frequent than other arterial or collectors. These highways generally span several jurisdictions and often have statewide importance (as defined in the ODOT State Highway Classification). These facilities should provide for a high level of transit service and include transit priority measures to expedite bus travel. Highway 43 is the only major arterial within West Linn city limits. Neighborhood Traffic Management strategies are not appropriate on major arterials.
Minor Arterial	Minor arterials serve to interconnect and support the major arterial system. These streets link major commercial, residential, industrial and institutional areas. Minor arterial streets are typically spaced about one mile apart to assure accessibility and reduce traffic using collectors or local streets in lieu of a well-placed minor arterial street. Many of these routes connect to cities surrounding West Linn. Access control is a key feature of an arterial route. Minor arterials are typically multiple miles in length. Neighborhood Traffic Management strategies are not appropriate on minor arterials.
Collector	Collector streets provide both access and circulation within and between residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of a citywide circulation function and do not require as extensive access control. They also access (compared to arterials) and penetrate residential neighborhoods, distributing trips from the neighborhood and local street system. Collectors are typically greater than a half mile to one mile in length. Neighborhood Traffic Management strategies are not appropriate on collector streets.
Neighborhood Route	Neighborhood Routes are usually long relative to local streets and primarily provide connectivity to collectors or minor arterials. Since neighborhood routes have greater connectivity, they generally have more traffic than local streets and are used by residents in the area to access the neighborhood, but do not serve citywide/large area circulation. They are typically about a quarter to a half mile in total length. Traffic from cul-de-sacs and other local streets may drain onto neighborhood routes to gain access to collectors or arterials. Because traffic needs are greater than a local street, certain measures should be considered to retain the neighborhood character and livability of these streets. Neighborhood Traffic Management measures are sometimes appropriate to balance traffic and livability/character as determined by an engineering study.
Local	Local streets have the sole function of providing access to immediate adjacent land. Service to "through traffic movement" on local streets is deliberately discouraged by design. Similar to the neighborhood routes, Neighborhood Traffic Management measures are sometimes appropriate on a local street to balance traffic and livability/character as determined by an engineering study.



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Roadway Functional Classification
West Linn, Oregon

Figure **17**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

Kittelson & Associates, Inc.
Transportation Engineering/Planning

H:\profile\17817 - West Linn Transportation System Plan\gis\TSP\Portrait Letter Version\17 Functional Classifications.mxd - jsommerville - 11:48 AM 1/13/2016

The functional classification system shown on Figure 17 represents a significant change from previous TSPs. These changes were made to better align with the existing use and defined characteristics of the roadways. These changes primarily lower the roadway's classification from arterial to collector, collector to neighborhood route, and neighborhood route to local street. These changes will impact the design standards applied to the roadways, such as access spacing and the need for certain facilities, such as bicycle lanes.

The OHP identifies Highway 43 as a Statewide Highway for the majority of its length in West Linn and as a District Highway approximately between I-205 and Highway 99E. Statewide Highways often function as inter-urban and inter-regional connectors to larger urban areas, providing safe and efficient, high-speed, continuous flow operations. District Highways often function as county and city arterials or collectors and provide connections between small urbanized areas, rural centers and urban hubs, while also serving local access and traffic. ODOT's management objective for District Highways is to provide for safe and efficient, moderate-to high-speed continuous-flow operation in rural areas and moderate-to low-speed operation for traffic flow and pedestrian/bicycle movements in urban areas.

ROADWAY CROSS SECTION STANDARDS

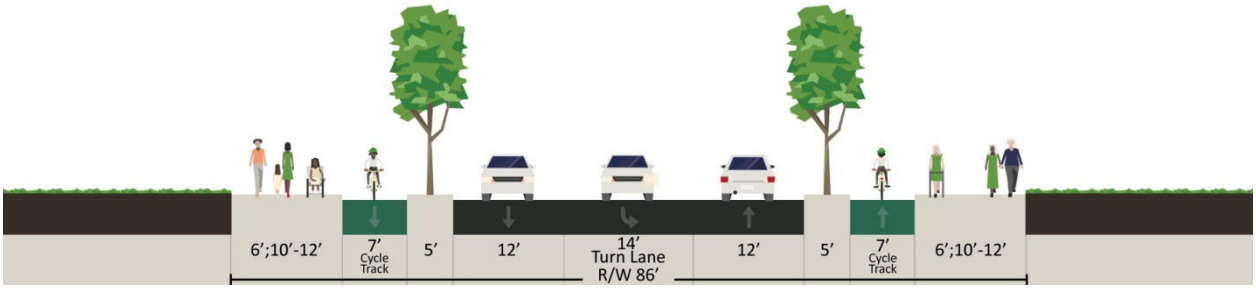
The design characteristics of streets in the city of West Linn need to meet the function and demand for each facility type. The actual design of a roadway can vary from segment to segment due to adjacent land uses and demands. The objective was to define a system that allows standardization of key characteristics to provide consistency, but also to provide criteria for application that provides some flexibility while meeting the design standards. Table 26 outlines the width requirements for different street elements for streets in the city of West Linn, except for major arterial (Highway 43) where cross sections are specified in the OR 43 Conceptual Design Plan. Exhibits 6 through 9 detail the cross section standards for each functional classification.

Unless prohibited by significant topographic conditions or modification recommended by the City Engineer responding to another environmental constraint, newly constructed streets shall meet the maximum standards indicated in the cross sections. When widening an existing street, the City may use lesser standards than the maximum to accommodate physical and existing development constraints where determined to be appropriate by the City Engineer. Examples of constrained street cross sections are shown for minor arterial and collector streets. These constrained cases may be applied where future daily volumes do not require center left-turn pockets or raised medians. In some locations "green streets" (those that utilize vegetation or pervious material to manage drainage) may be appropriate due to design limitations or adjacent land use. Green street elements (as described in the notes for the cross section exhibits) may be used, where appropriate as determined by the City Engineer.

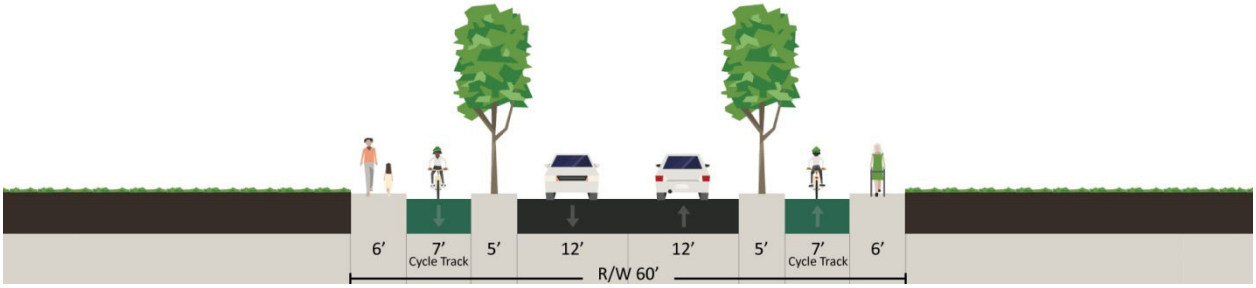
Table 26: City of West Linn Roadway Cross Section Standards

Street Element	Characteristic	Width/Options
Vehicle Lane Widths (Typical widths)	Minor Arterial	11-12 feet
	Collector	10-12 feet
	Neighborhood Route	10-12 feet
	Local	10-12 feet
On-Street Parking	Minor Arterial	Limited (in designated commercial zones)
	Collector	Optional (8 feet typical width)
	Neighborhood Route	Optional (8 feet typical width)
	Local	Optional (8 feet typical width)
Bicycle Lanes (Typical widths)	Arterial	5 feet
	Collector	5 feet
	Neighborhood Route	5 feet
Cycle Track	Minor Arterial (30 MPH or greater)	7 feet
	Collector (30 MPH or greater)	7 feet
Sidewalks (Typical widths)	Minor Arterial	6 feet, 10-12 feet in commercial zones
	Collector	6 feet, 8 feet in commercial zones
	Along Cycle Track	6 feet, 10-12 feet in commercial zones
	Neighborhood Route/Local	6 feet (4-5 feet in Willamette Historical District), 8 feet in commercial zones
Landscape Strips	Can be included on all streets	6 feet typical (5 feet for minor arterials)
Raised Medians	5-Lane	Optional
	3-Lane	Optional
	2-Lane	Consider if appropriate
Neighborhood Traffic Management	Arterials	None
	Collectors	None
	Neighborhood Route/Local	At the discretion of the City Engineer
Transit	Minor Arterial/Collector	Appropriate
	Neighborhood Route	Only in special circumstances
	Local	Not recommended

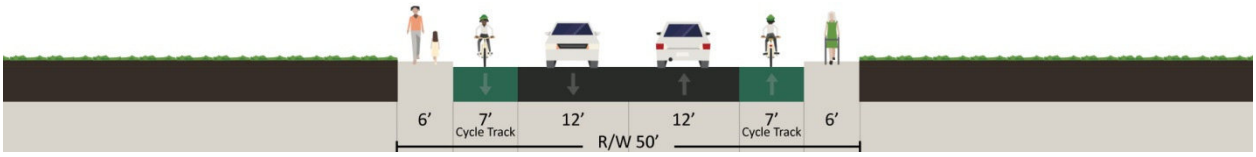
Exhibit 6: Minor Arterial Cross Sections



Minor Arterial with Median/Center Lane



Minor Arterial without Median/Center Lane



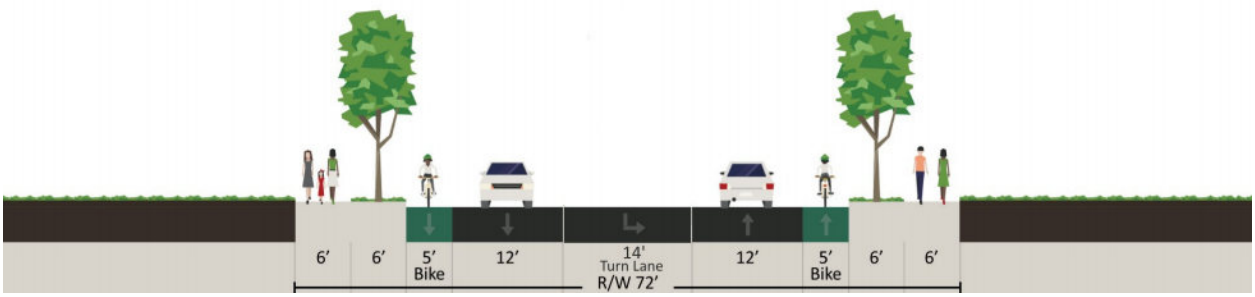
Minor Arterial Constrained

Table 27: Minor Arterial Cross Section Standards

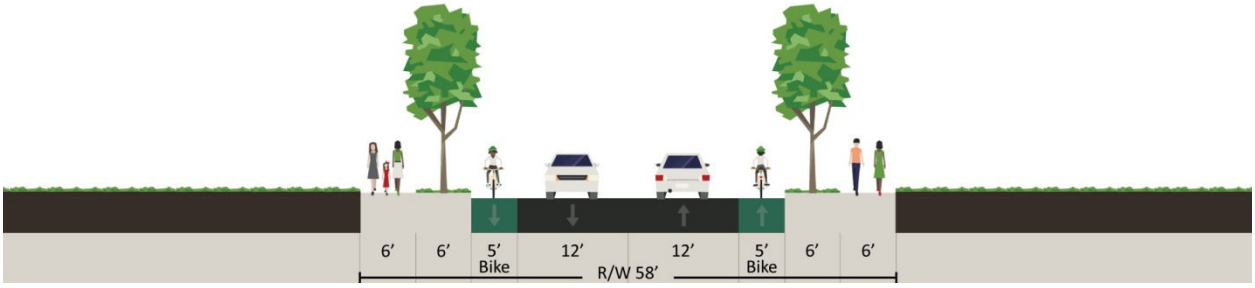
Standards[4]	Minor Arterial
Vehicle Lane Widths	11-12 feet
On-Street Parking	Limited[1]
Cycle Tracks[4]	7 feet[2]
Sidewalks	6 feet, 10-12 feet in commercial zones
Landscape Strips[4]	5-6 feet[2]
Median/Turn Lane Widths	14 feet[3]
Neighborhood Traffic Management	Not Appropriate

1. The only on-street parking on a minor arterial is on Willamette Falls Drive.
2. Landscape strips may be removed and/or bike lanes may be utilized in lieu of cycle tracks at the discretion of the City Engineer.
3. Center turn lane may be omitted where future traffic volumes are < 5,000 ADT as determined by City Engineer.
4. The City Engineer or Planning Director may recommend green street variations of each cross section. These variations may include replacing the standard landscape strip with a rain garden or swale, using pervious material for the sidewalk/cycle track, and in some cases providing a sidewalk on only one side of the street.

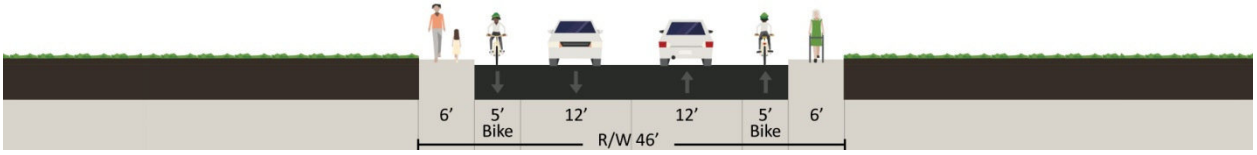
Exhibit 7: Collector Cross Sections



Collector with Median/Center Lane



Collector without Median/Center Lane



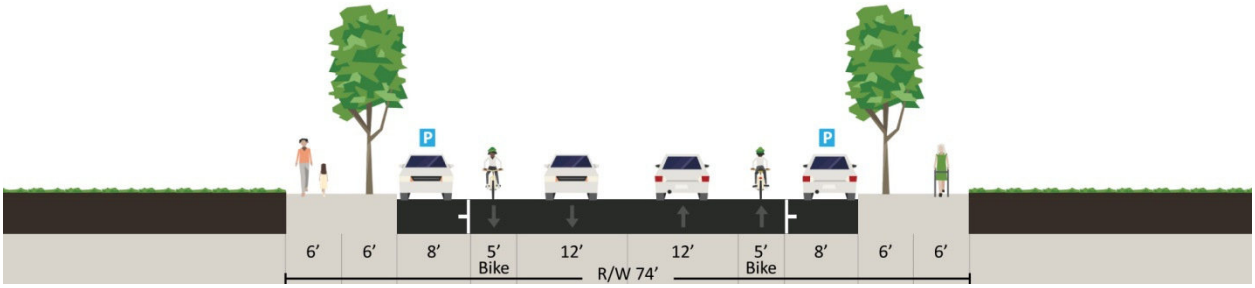
Collector Constrained

Table 28: Collector Cross Section Standards

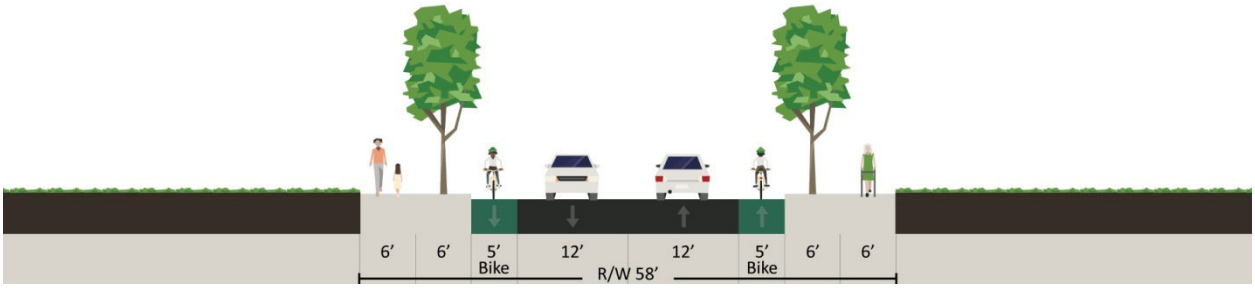
Standards[5]	Collector
Vehicle Lane Widths	10-12 feet
On-Street Parking	Optional (7-8 feet)[1]
Bike Lanes	5-6 feet[2,3]
Sidewalks	6 feet, 8 feet in commercial zones
Landscape Strips	5-6 feet[3]
Median/Turn Lane Widths	10-14 feet[4]
Neighborhood Traffic Management	Not Appropriate

1. Allowance of on-street parking shall be based upon the nature and intensity of adjacent development and physical constraints.
2. Bike lanes required where future traffic volumes > 3,000 ADT. When < 3,000 ADT, 14-foot wide travel lanes will be provided.
3. Cycle tracks may be required where speeds are > 30 mph in lieu of bike lanes at the discretion of the City Engineer. Landscape strips may be removed due to constraints at the discretion of the City Engineer.
4. Center turn lane may be omitted where future traffic volumes < 5,000 ADT as determined by the City Engineer.
5. The City Engineer or Planning Director may recommend green street variations of each cross section. These variations may include replacing the standard landscape strip with a rain garden or swale, using pervious material for the sidewalk/cycle track/bike lane, and in some cases providing a sidewalk on only one side of the street.

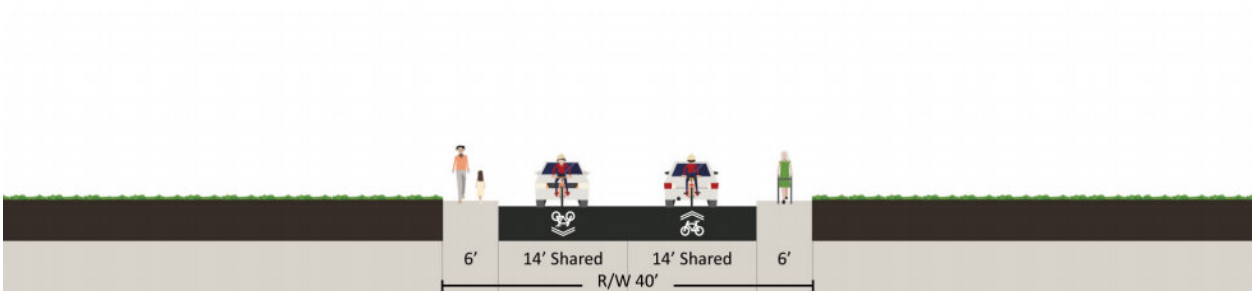
Exhibit 8: Neighborhood Route Cross Sections



Neighborhood Route with Parking & Bike Lane



Neighborhood Route without Parking



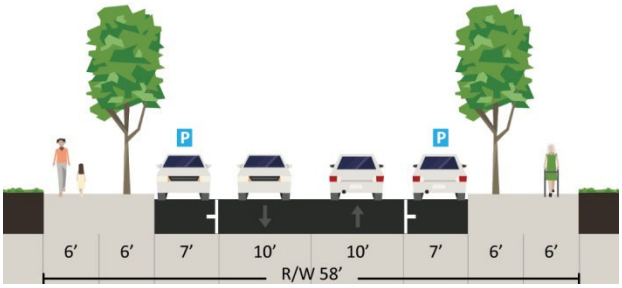
Neighborhood Route Constrained without Bike Lane

Table 29: Neighborhood Route Cross Section Standards

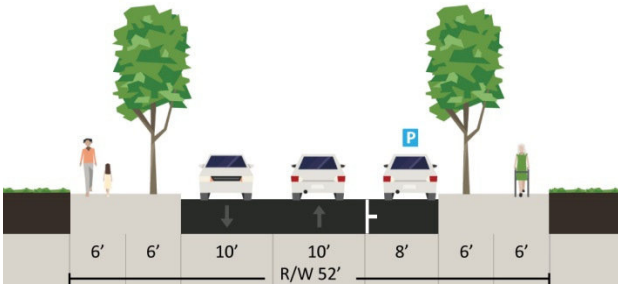
Standards[4]	Neighborhood Routes
Vehicle Lane Widths	10-12 feet
On-Street Parking	Optional (7-8 feet)[1]
Bike Lanes	5 feet[2]
Sidewalks	6 feet, 8 feet in commercial zones
Landscape Strips	6 feet[3]
Median/Turn Lane Widths	None
Neighborhood Traffic Management	At the discretion of the City Engineer

1. Allowance of on-street parking shall be based upon the nature and intensity of adjacent development and physical constraints.
2. Shared bikeway may be used when volumes < 3,000 ADT.
3. Landscape strips may be reduced and/or removed at the discretion of the City Engineer.
4. The City Engineer or Planning Director may recommend green street variations of each cross section. These variations may include replacing the standard landscape strip with a rain garden or swale, using pervious material for the sidewalk/bike lane, and in some cases providing a sidewalk on only one side of the street.

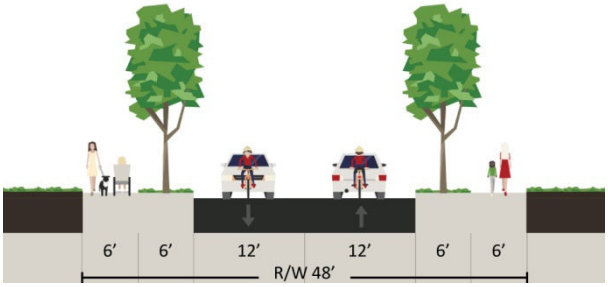
Exhibit 9: Local Street Cross Sections



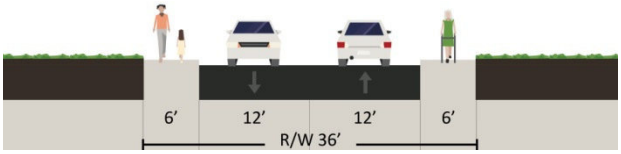
34-foot Local (Parking on Both Sides)



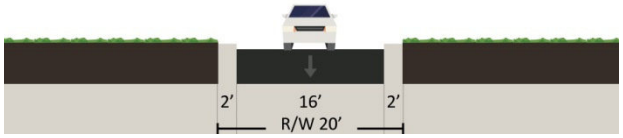
28-foot Local (Parking on One Side)



24-foot Local (No Parking)



Local Constrained



Alley

Table 30: Local Street Cross Section Standards

Standards[3]	Local Streets
Vehicle Lane Widths	10-12 feet
On-Street Parking	7-8 feet[1]
Sidewalks	6 feet (4-5 feet in Willamette Historical District)
Landscape Strips	6 feet[2]
Median/Turn Lane Widths	None
Neighborhood Traffic Management	At the discretion of the City Engineer

1. Allowance of on-street parking shall be based upon the nature and intensity of adjacent development and physical constraints.
2. Landscape strips may be reduced and/or removed at the discretion of the City Engineer.
3. The City Engineer or Planning Director may recommend green street variations of each cross section. These variations may include replacing the standard landscape strip with a rain garden or swale, using pervious material for the sidewalk, and in some cases providing a sidewalk on only one side of the street.

Chapter 8 Other Travel Modes

OTHER TRAVEL MODES

This chapter summarizes the availability and use of other travel modes in West Linn such as rail, interstate bus, air, water, freight and pipeline.

RAIL TRANSPORTATION

Existing Conditions

There are no railroads located within the West Linn city limits. The closest railroads include the Union Pacific Railroad located to the north in Lake Oswego and the Union Pacific Railroad located to the south in Oregon City. The closest regional passenger rail service is provided by Amtrak located at 1757 Washington Street in Oregon City (ORC). A this stop there is rail service between Oregon City and downtown Portland at Union Station (PDX). Amtrak travels between ORC and PDX Monday through Friday at 7:24 a.m., 11:15 a.m., and 5:54 p.m. and between PDX and ORC at 6:00 a.m., 6:05 p.m., and 9:30 p.m. Travel times vary from 21 to 41 minutes depending on time of day and direction. From the ORC stop, Amtrack Cascades rail line also provides passenger service north to Vancouver, British Columbia and south to Eugene.

Needs and Deficiencies

ODOT is currently studying ways to improve intercity passenger rail service between the Eugene-Springfield urban area and the Portland urban area. The study will help decide on a general passenger rail route and evaluate options for train frequency, trip time, and improving on-time performance. The preliminary plan identifies a preferred route that follows the Highway 99E corridor through Oregon City. Travel time to Union Station on existing rail transit service can be long for West Linn residents. If/when the new passenger rail service becomes a reality, West Linn residents will need access to the service by all appropriate travel modes.

Plan

West Linn will continue to support and promote regional improvements to the passenger rail system, and be involved in the coordination of these services and possible connecting transit services to best serve its residents. West Linn advocates for good connections and service for Amtrak and passenger rail in the region.

AIR TRANSPORTATION

Existing Conditions

There are no airports located within the West Linn city limits. The closest airports include the Portland International Airport (providing domestic and international air passenger service approximately 19 miles to the north via I-205) and general aviation airports including the Aurora State Airport located

approximately 15 miles to the south via Highway 99E and the Mulino Airport located approximately 14 miles to the south via I-205 and State Highway 213. Local airports open to the public for private aircraft in the area include Happy Valley, Oregon City, Mulino, and Canby.

Needs and Deficiencies

Access to the Portland Airport can be a challenge for West Linn residents due to congestion on I-205, the most direct and commonly used route to the airport. Transit service, which involves transferring in Portland, is a time-consuming and indirect way to access the Portland Airport. A typical trip from the West Linn park-and-ride to the Portland International Airport would take thirty minutes by vehicle (depending on traffic) or ninety minutes by public transit with a transfer in downtown Portland to the MAX Red Line.

Plan

West Linn will continue to support and promote regional improvements to the transit system that will enhance access to the Portland International Airport for West Linn residents.

WATER TRANSPORTATION

Existing Conditions

Although the eastern boundary of West Linn is defined by the Willamette River and the southwestern boundary is defined by the Tualatin River, these waterways are rarely used to support transportation. They are, however, used for recreational purposes. In addition to several single-family residential homes with private access points to the rivers, there are two public boat ramps, including the Bernert Landing boat ramp located at the intersection of 12th Street and Volpp Street where the Tualatin River meets the Willamette River and the Cedaroak boat ramp located at the end of Elmran Drive. The boat ramps offer river access for local residents as well as docking facilities and wildlife viewing. A public fishing dock is also located along Territorial Drive near the falls.

Needs and Deficiencies

The Willamette Falls Locks, operated by the U.S. Army Corps of Engineers (USACE), were part of the water-borne transportation system through West Linn. The locks are currently closed indefinitely by the U.S. Army Corps of Engineers due to needed gudgeon anchor repairs. All freight and recreational water travel has been eliminated during this closure. The locks and river do not currently provide transportation alternatives to West Linn residents. However, the City could work with the USACE to reopen the locks to provide for freight and recreational travel. The City could examine the potential for river taxis and ferries in the future along with tourism opportunities.

Plan

West Linn supports regional efforts to repair the locks based on the potential to reduce freight demands on I-205 and improve recreational and tourism opportunities along the Willamette River.

FREIGHT AND GOODS MOVEMENT

Existing Conditions

Efficient truck movement plays a vital role in the economical movement of raw materials and finished products. Designated truck routes provide for this efficient movement while at the same time maintaining neighborhood livability, public safety, and minimizing maintenance costs of the roadway system. Figure 18 illustrates the designated freight routes within West Linn. As shown, Clackamas County designates Willamette Drive as a County freight Route and ODOT designates I-205 as a State freight route.

Truck volumes were recorded at the study intersections during the weekday evening peak hour. Table 31 summarizes the truck volumes as a whole number and as percentage of total entering volume.

Table 31: Truck Volumes at Study Intersections (Weekday Evening Peak Hour)

Intersection	Intersection Truck Volume	Truck % of All Vehicular Traffic	Count Year
Highway 43 / Arbor Drive	26	1%	2006
Highway 43 / Walling Way	23	1%	2006
Highway 43 / Cedaroak Drive	31	2%	2006
Highway 43 / Hidden Springs Drive	23	1%	2006
Highway 43 / Jolie Pointe Drive	52	3%	2006
Highway 43 / Pimlico Drive	54	3%	2006
Highway 43 / West “A” Street	60	3%	2006
Highway 43 / Burns Street	39	2%	2006
Highway 43 / Hood Street-McKillican Street	42	2%	2006
Highway 43 / I-205 SB Ramps	75	4%	2014
Highway 43 / I-205 NB Ramps	86	5%	2014
Highway 43 / Willamette Falls Drive	49	2%	2014
Rosemont Road / Carriage Way	5	1%	2006
Rosemont Road / Hidden Springs Road	5	1%	2006
Rosemont Road / Salamo Road	30	2%	2006
Rosemont Road / Summit Street	1	0%	2006
Salamo Road / Bland Circle	24	3%	2006
Salamo Road / Barrington Drive	34	5%	2006
Salamo Road / Parker Road	7	1%	2006
Sunset Avenue / Cornwall Street	0	0%	2006

Blankenship Road / Tannler Drive	27	2%	2006
10th Street / Blankenship-Salamo Road	43	3%	2006
10th Street / I-205 SB Ramp	88	5%	2006
10th Street / I-205 NB Ramp	90	5%	2006
10th Street / 8th Avenue	30	2%	2006
10th Street / Willamette Falls Drive	27	2%	2006
Willamette Falls Drive / Sunset Avenue	38	2%	2006
Willamette Falls Drive / Dollar Street (East)	16	1%	2006
Willamette Falls Drive / 12th Street	24	2%	2006
Willamette Falls Drive / 19th Street	24	2%	2006
Willamette Falls Drive / Ostman Road	27	3%	2006
Willamette Falls Drive / Dollar Street (West)	22	2%	2006

Needs and Deficiencies

The considerable truck traffic on I-205 combined with the lack of truck climbing lanes and short merging distances between ramps, often results in conflicts between automobiles and truck traffic, and slows traffic flow near the Highway 43 (Willamette Drive)/I-205 interchange.

Plan

West Linn will encourage ODOT to monitor traffic and accident patterns along I-205, especially in the vicinity of the Highway 43 interchange and will encourage measures which reduce non-local freight trips on Highway 43 in West Linn.

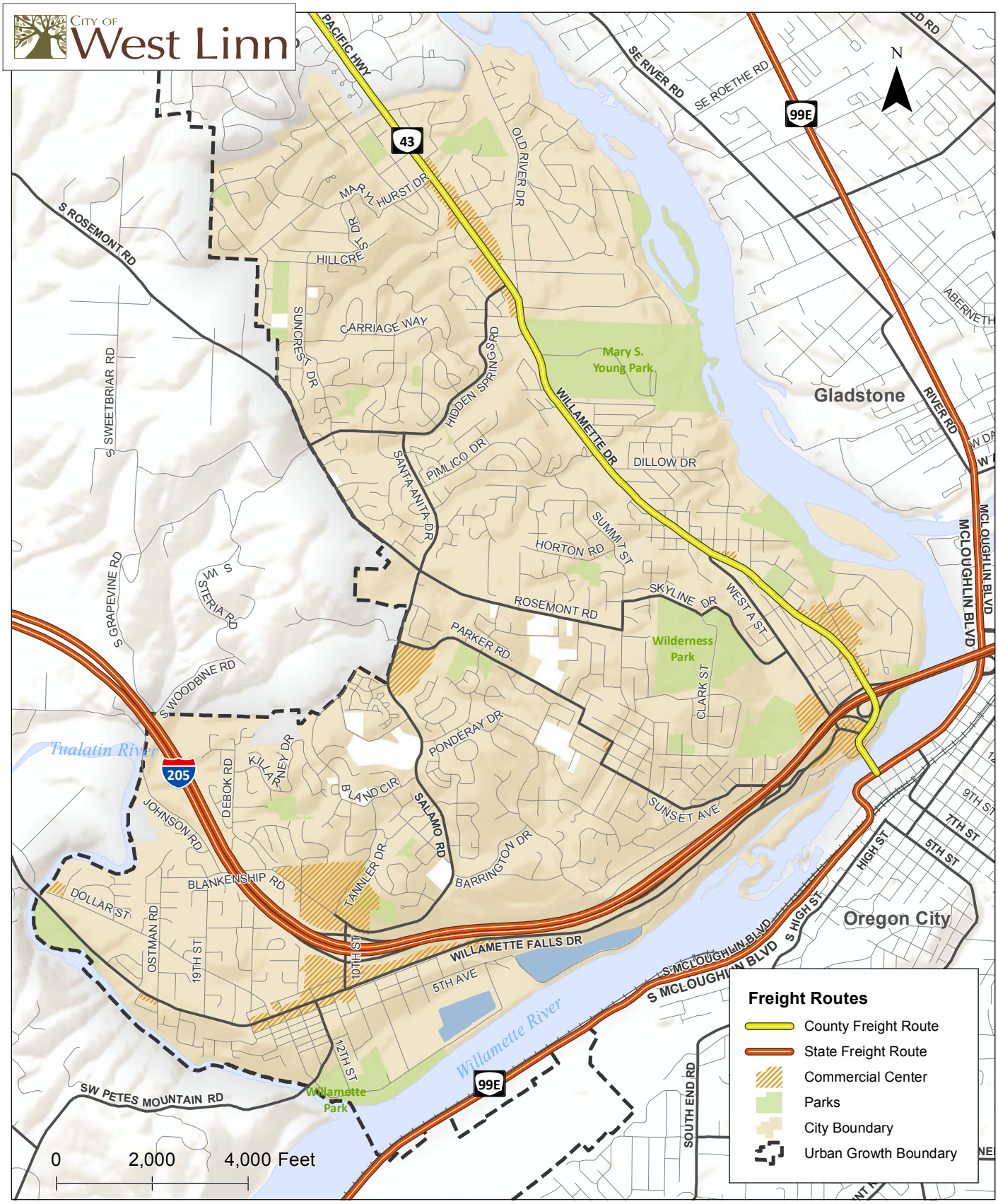
PIPELINE

Existing Conditions

There are no major pipelines located within the West Linn city limits. The closest major pipelines include the Northwest Natural pipelines located to the north in Lake Oswego and to the south in Oregon City. Local pipelines include those used in the West Linn Paper Company industrial complex, and pipelines from the Smurfit Paper Mill in Oregon City to settling ponds along the Willamette River in West Linn. A sewage force main that is part of the Tri-City Sewerage District facility crosses the Willamette River. Several Northwest Natural Gas mains run through West Linn. Also, the South Fork Water Board has a potable water pipeline across the Willamette River serving West Linn.

Needs and Deficiencies

There are currently no pipeline needs identified.



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Freight Routes
West Linn, Oregon

Figure **18**

H:\profile\17817 - West Linn Transportation System Plan\gis\TSP\Portrait Letter Version\18 Freight Routes.mxd - jsommerville - 11:48 AM 1/13/2016

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: Esri, USGS, NOAA

Chapter 9 Funding and Implementation

FUNDING, IMPLEMENTATION, AND MONITORING

The following documents the city of West Linn's existing and expected transportation revenue sources and expenses between 2014 and 2040 and describes planned system costs and financially constrained plan elements.

TRANSPORTATION FUNDING SOURCES

In large part, roadway funding is a user fee system; users of the system pay for infrastructure through motor vehicle fees (such as gas tax and registration fees), or transit fares. Transportation project construction, operation, and maintenance fees are derived from five main revenue sources: state gas tax and license fees; roadway maintenance fees; franchise fees; miscellaneous revenues; and, system development charges. Improved vehicle fuel efficiency and increasing transportation capital and maintenance costs have combined to significantly limit available revenues for transportation projects.

State Fuel Tax and Vehicle License Fee

Approximately nineteen percent of the City's revenue comes from intergovernmental revenue sharing. The state of Oregon distributes state gas tax and license fees to municipalities. By statute, the money must be used for any road-related purpose, with one percent dedicated to bicycle path development. The State of Oregon Highway Trust Fund collects taxes and fees on fuel, vehicle licenses, and permits, and pays a portion to cities annually on a per capita basis. Oregon gas taxes are collected as a fixed amount per gallon of gasoline served. In 2011, the State increased the gas tax from $0.24 per gallon to $0.30 per gallon. The tax does not vary with gas price changes, nor does it adjust for inflation. The net revenue collected from this source has gradually decreased as the cost to construct and repair transportation systems has increased and as new vehicles become increasingly fuel efficient.

The State collects Oregon vehicle registration fees as a fixed amount at the time a vehicle is registered with the Department of Motor Vehicles. The State recently increased vehicle registration fees in Oregon to $172 per four-year term for new light vehicles, and $86 per two-year term for light vehicle renewals. The State does not adjust for inflation with all registration fees. If revenues received from the state increase in future years, then the anticipated need for other revenue sources explained in this chapter (i.e. fees, etc.) may decrease. The City's 2014-2015, budget forecasts a total of $2.8 million in street fund revenues from shared revenue sources (fuel tax and vehicle license fee). Since 2009, these revenues have increased an average of one percent per year. The City expects that a one percent increase per year from this source is likely through 2040.

Roadway Maintenance Fee

The City charges for water, sewer, surface water, park maintenance, and street maintenance to all users in the city of West Linn. These fees are established through the City's fees and charges resolution which is updated annually. The City Council approves rates based on the cost to provide services. Since 2010, the City's street maintenance fee has increased, on average, five percent annually. In 2014, the City increased the residential street maintenance fee by seventy-five percent and in 2015, increased the commercial street maintenance fee cap by seventy-five percent as well.

The 2014-2015 budget includes a five percent Street Maintenance Fee rate increase in each year of the biennium. This increase, combined with the increase in the state fuel tax two years ago, allowed the City to improve its current Pavement Condition Index rating to 69 (on a scale of 100). The City predicts more than $2 million in street maintenance revenues through the 2014-2015 biennium and projects adequate street maintenance funding for the next five years.

Franchise and Miscellaneous Fees

The city of West Linn receives seven percent of its revenue from franchise fees for the use of public rights-of-way for utilities, solid waste and recycling collection, and similar purchases. Fees are paid for the right to this access. The City's Solid Waste franchise fees go to the Street fund on the rationale that garbage trucks impact street condition. The 2014-2015 budget anticipates a total of $248,000 in street fund revenues from franchisees. Since 2010, the City's street fund revenues from franchise fees have increased by nearly four and a half percent annually.

Prior to fiscal year 2009, franchise fee revenue from the City's electrical-power franchise agreement (approximately $500,000) went to the Street fund. Because franchise fee revenue is discretionary, the City reallocated the funds to another fund in fiscal year 2009. The City adopted a Roadway Maintenance Fee in 2008 to fill the funding gap that was created when the discretionary electrical-power franchise fee revenues no longer went to the Street fund. The Roadway Maintenance Fee currently generates $1.3 million per year with a planned five percent increase annually. Miscellaneous funds include interest, reimbursement charges, and other revenues. These revenues total $30,000 in FY 2014 and the City forecasts a two percent annual increase through 2040.

System Development Charges

Cities can use System Development Charges (SDC) to acquire needed property and improvements related to required capacity for growth as development occurs. For nearly the past two decades, new development has completed new streets in West Linn almost exclusively in conjunction with new development. The City uses street SDCs as a funding source for projects that add capacity to the transportation system. The City collects SDCs from new development based on the proposed land use and size, and is proportional to each land use's potential p.m. peak hour vehicle trip generation. The current SDC rate (updated July 2014) per p.m. peak hour trip is $7,292, which includes $4,846 towards improvements and $2,262 in reimbursements.

While Metro expects the city of West Linn to have relatively limited commercial development, household growth is projected to increase by more than 1,500 units by the time the existing supply of buildable land is expended[4]. Based on current zoning allocations, future residential development is expected to be twenty-four percent multi-family and seventy-six percent single-family dwellings. The

[4] Assuming the historic one percent rate of growth in households between 2001 and 2014, continues, the City will expend its current supply of buildable land around 2029.

2014-2015 biennial budget forecasts $457,000 in SDC improvements. The City's Finance Department assumes a three percent annual growth rate to SDC revenues. When projected to the year 2040, SDC revenues total $9.18 million for street, bicycle, and pedestrian projects. The City's total SDC revenues would reduce to $4.55 million if build-out occurs in 2029.

Exactions

These are improvements that the City obtains when issuing development permits. The City requires developers to improve their frontage and, in some cases, provide off-site improvements depending upon their level of traffic generation and transportation system impact. Off-site mitigation measures can include, but are not limited to, Master Plan projects identified in the TSP. Exactions resulting in transportation improvements are likely to occur during the development and redevelopment of these parcels.

Reserves

Reserves are the funds that are left over after all revenues and expenditures are projected for budget purposes. There are three types of reserves used for different purposes. Contingency reserves are for unexpected or unforeseen items which may arise during the course of a budget period which were not specifically identified when the budget was adopted. The City uses unappropriated ending fund balance reserves to carry funds forward for some future project, to cover the following year's operating costs until November property taxes arrive, or to be utilized if the City declares an emergency. Finally, debt covenant reserves vary by bond issue and depend upon specific covenants pledged when selling the bond issue in the market place. They typically come in the form of at least one year's annual debt service. The 2014-2015 budget includes $1.015 million in street fund reserves, $845,000 more than the required reserve policy minimum for this fund.

Grants and Loans

Historically, state and federal grants have been a key source of revenue for major transportation capital projects. Dwindling state and federal transportation revenues have limited the number of grant funded projects and have increased competition among state and local agencies. Because of the uncertainty in acquiring grant funds, the City does not include these potential transportation funding sources in the revenue forecast. Grant sources that are currently available for transportation-related projects include, but are not limited to:

- *Metro Regional Flexible Funds.* Every two years, the Metro Council and the Joint Policy Advisory Committee on Transportation select programs and projects for federal flexible funds. These funds come from three federal grant programs: the Surface Transportation Program, the Congestion Mitigation/Air Quality Program and the Transportation Alternatives Program. These programs allow Metro greater discretion on how to spend the funds, allowing for greater focus on local priorities and innovative solutions to transportation challenges.

- *Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grants*. TIGER grants are used to invest in road, rail, transit and port projects to achieve critical national objectives. In 2014, the federal government awarded $600 million in TIGER grants to projects nationwide. To highlight the high degree of competition for these funds and strong demand and need for additional transportation investments nationwide, in 2014, the program received 797 eligible grant applications requesting a total amount of more than $9 billion.
- *Transportation Infrastructure Finance and Innovation Act (TIFIA).* While not a grant, these funds provide federal credit assistance in the form of direct loans, loan guarantees, and standby lines of credit to finance surface transportation projects of national and regional significance. The goal of this program is to leverage federal funds by attracting substantial private and other non-federal co-investment in critical improvements to the nation's surface transportation system. Projects eligible to receive TIFIA funding include international bridges and tunnels; intercity passenger bus and rail facilities and vehicles; publicly owned freight rail facilities; private facilities that provide public benefit for highway users; and, service improvements on or adjacent to the National Highway System.
- *Transportation and Growth Management (TGM) Grant.* ODOT in cooperation with the Oregon Department of Land Conservation and Development (DLCD) sponsor an annual grant program that supports communities planning for streets and land use in a way that leads to more livable, economically vital, and sustainable communities and that increases opportunities for transit, walking, and bicycling. Cities may use TGM grants for transportation system planning or integrated land use and transportation planning. West Linn's 2016 update of the TSP is funded in major part through this program.
- *Transportation, Community and System Preservation Program (TCSP).* The TCSP program is a comprehensive initiative of research and grants to integrate transportation, community, and system preservation plans and practices that improve the efficiency of the U.S. transportation system; reduce environmental impacts of transportation; reduce the need for costly future public infrastructure investments; ensure efficient access to jobs, services, and centers of trade; examine community development patterns and identify strategies to encourage private sector development patterns and investments that support these goals.
- *Surface Transportation Environment and Planning Cooperative Research Program (STEP).* The general objective of the STEP is to improve understanding of the complex relationship between surface transportation, planning and the environment. Approximately $12.8 million will be available each year from this revenue source.
- *Safe Routes to Schools Program (SRTS).* SRTS encourages children to walk and bicycle to school; to make walking and bicycling to school safe and more appealing; and to facilitate the planning, development and implementation of projects that will improve safety, and reduce traffic, fuel consumption, and air pollution near schools. Funding is available for a variety of programs and projects that encourage children and their parents to walk to school.

FUNDING FORECAST

Other communities in the Portland Metropolitan region have been adding shopping and business opportunities in an effort to allow their citizens to have fulfilling lives without having to use a car and drive for necessary items and services. In the most recent community survey, ninety percent of the respondents agree that the city of West Linn should actively encourage economic development in existing commercial zones in the City (City of West Linn, 2014).

Table 32 summarizes the current and expected transportation revenues the City will collect between now and 2040.

Table 32: Forecasted Transportation Plan Revenues

Revenue	FY 2014 Amount	Estimated Through 2040
State gas tax and license fees	$1,414,000	$42,155,000
Roadway maintenance fee	$1,319,000	$75,251,000
Franchise fees	$120,000	$6,425,000
SDCs	$345,000	$4,552,000[5]
Miscellaneous	$30,000	$1,131,000
Total	**$3,228,000**	**$129,514,000**

Table 33 provides a summary of the expenses expected to be associated with transportation-related improvements through 2040.

Table 33: Forecasted Street Fund Expenses

Expenses		FY 2014 Amount	Estimated Through 2040
Personal Services		$582,000	$26,775,000
Materials and Services		$498,000	$20,289,000
Debt Service		$152,000	$2,280,000
Transfers to other Funds		$660,000	$26,311,000
Capital Outlay	Street Capital Projects	$993,000	$49,690,000
	Equipment and Vehicles	$147,000	$1,541,000
Reserve		$162,000	$7,060,000
Total		$3,162,000	$133,946,000

Table 33 shows approximately $49,690,000 forecast for street capital projects through 2040. Of this, approximately sixty percent will be needed for street maintenance projects, leaving forty percent, approximately $20 million, over the next 25 years for non-maintenance capital projects such as sidewalks, bike lanes, road widening, and traffic signals. The Cost Constrained Plan identifies the

[5] Based on 2029 build-out.

programs and projects that the City can complete over the next 25 years within an approximately $20 million budget.

PLANNED SYSTEM COSTS

Table 34 provides a summary of the full cost of the planned transportation system. The full cost of the planned system is approximately $50.4 million over the 25-year period, including $23.3 million in high priority, $17.0 million in medium priority, and $10.1 million in low priority projects. Based on the anticipated funds available for capital improvement projects ($20.0 million over the 25-year period), there is an approximately $30.4 million dollar gap between the full system needs and available funding.

Table 34: Planned Transportation System Cost Summary

Project Type	High Priority	Medium Priority	Low Priority	Total
Planned Transportation System				
TSMO[1]	$0	$250,000	$0	**$250,000**
TDM[1]	$0	$0	$620,000	**$620,000**
Land Use	$0	$185,000	$0	**$185,000**
Access Management	$0	$0	$55,000	**$55,000**
Bike/Ped	$17,605,000	$11,215,000	$1,695,000	**$30,515,000**
Transit	$0	$485,000	$0	**$485,000**
Motor Vehicle	$5,690,000	$4,845,000	$7,735,000	**$18,270,000**
Total Planned System	**$23,295,000**	**$16,980,000**	**$10,105,000**	**$50,380,000**
Available Funding				
			Available Funding	$20,000,000
			Funding Gap	**$30,380,000**

TSMO: Transportation System Management and Operations
TDM: Travel Demand Management
1. Includes annual costs occurred every year.

FINANCIALLY CONSTRAINED PLAN ELEMENTS

The Cost Constrained Plan identifies the projects and programs the City anticipates being able to fund in the 25-year horizon. The estimated amount of local funds available for capital projects over the next 25 years is approximately $20 million or roughly $800,000 per year on average.[6]

[6] This number does not include potential additional funding from state and federal grants and loans such as the Statewide Transportation Improvement Program (STIP), Metro Regional Flexible Funds, Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grants, Transportation Infrastructure Finance and Innovation Act (TIFIA), and Safe Routes to Schools Program (SRTS). Historically, state and federal grants have been a key source of revenue for major transportation capital projects. However, due to reduced state and federal transportation funding,

The Cost Constrained Plan assumes the City will fund only twenty-five percent of projects identified on ODOT facilities with the balance coming from federal grants, regional and/or ODOT funds. Based on this assumption, the Cost Constrained Plan includes most of the high priority projects (which total approximately $23.3 million).

There is a $3.3 million funding gap for the City to complete the full list of high priority projects over the 25-year horizon. Approximately $3.3 million of high priority projects require additional funding sources. It is possible that some of the high priority projects will be funded by development.

IMPLEMENTATION

The Transportation Planning Rule (TPR), as codified in Oregon Administrative Rules (OAR) 660-012-0020(2) requires that local jurisdictions identify and adopt land use regulations and code amendments needed to implement the TSP.

LAND USE AND REGULATORY ACTIONS

In addition to the strategies for financing and building TSP projects, the TSP also provides a policy framework for managing land use development and public infrastructure investments in a manner that advances local, state, and regional transportation goals. During the TSP Update process, the project team reviewed West Linn's land use plan policies and city codes and regulations to ensure the city is in compliance with state and regional transportation rules. These rules apply to all local governments statewide and additionally to cities and counties in the Portland Metropolitan Region.

The review found several areas where local policies and regulations were not in compliance, or where local policies did not provide sufficient support for city codes and regulations. The following summary lists the changes that the City should consider to city policies and regulations in response to this review.

Comprehensive Plan Policy Amendments

- Updating policies related to the I-205/10th Street Interchange.
- Adopting consistent language for West Linn's four mixed-use commercial zones and policies that support multi-modal transportation investment in these areas.
- Adopting policies to require transportation options programs for new large-scale development.
- Adding a policy that supports safe routes to schools.
- Adding a policy that supports the use of "green streets" in suitable locations.

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competition for these grants has greatly increased. Although it is likely that these funds will be used in whole or in part to fund at least some transportation improvements over the next 25 years, because of the uncertainty in acquiring grant funds, these funding sources are not accounted for in the City's revenue forecast.

- Adding a policy to use city land use review authority to address safety issues related to modal access in regulated corridors.
- Adding a policy that allows fee-in-lieu street improvement and sidewalk revenue to constructing frontage improvements in other areas of the city.

West Linn Community Development Code Amendments

- Modifying city regulations related to access control including relocating any existing access control regulation from the CDC to the Public Works Standards. City regulations would be modified to require a tentative street plan for land divisions that abut large undeveloped sites.
- Requiring easements for bicycle and pedestrian connections located in new mixed use or residential development of five acres or greater, where full street connections cannot be provided, with spacing of not more than 330 feet apart.
- Clarifying the decision criteria for the street improvement and sidewalk fee-in-lieu program.

West Linn Public Works Standards

- Add provisions that clarify the process and standards for constructing "green streets," including slope constraints, grade-constraints, and specific design specification resources.

In addition, the City has committed to continue working to address several issues related to the transportation plan that also affect other parts of the land use program

West Linn Future Planning Program

Issues that the City should address in a future planning program that specifically relate to the city's ability to comply with the State Transportation Planning Rule include:

- Establishing clear and objective development standards for all transportation modes in all city zoning districts.

TSP PERFORMANCE EVALUATION

The following sections describe how the project team evaluated the TSP with respect to the goals and their associated targets. The TSP includes a monitoring plan for each of the targets to ensure that the City makes progress toward achieving these targets and can quantify and evaluate the targets over time as they implement the TSP.

To ensure the effective use of local transportation resources, and as required by Title 3 of the RTFP, the City desires a tool to monitor progress toward achieving its stated goals. The tables below propose a numerical target the City should strive to achieve by the planning horizon for this TSP (2040), a baseline metric to compare future years to, and a monitoring plan to monitor progress over time.

Safety

The first goal of the TSP is to reduce transportation-related fatalities and injuries for all transportation modes. In order to ensure the TSP will help the City make progress toward meeting this goal, the project team identified two targets (1A and 1B). Table 35 provides a summary of the targets, including current benchmark data from the ODOT's crash database, the total number of projects included in the TSP and the Financially Constrained Plan that address a specific safety issue or will improve safety in general, and how the City will monitor its progress toward meeting the goal.

Table 35: Safety Targets

Target	Current Benchmark	2040 Financially Constrained Plan Performance	Monitoring Plan
Target 1A – Vision Zero – No fatal collisions by mode and reduce the total number of severe injury collisions by mode.	Number of severe injury crashes over five year period (**15 crashes**) Number of fatal crashes over five year period (**3 crashes**) Number of crashes involving pedestrians or bicyclists over five year period (**19 crashes**)	The TSP includes 11 projects to improve safety at existing locations of severe injury and fatal crashes. The Financially Constrained Plan includes 9 projects.	Document the measure on a regular basis based on a review of ODOT-maintained data. Successful progress towards the target includes a steady reduction each year in the number of severe injury and fatal collisions compared to prior years.
Target 1B - Reduce the total number of high collision locations by 2040.	Number of ODOT SPIS locations (**1 location**) Number of intersections with a crash rate above 1.0 crashes/MEV (**0 intersections**)	The TSP includes 48 projects that will improve safety for all roadway users. The Financially Constrained Plan includes 34 projects.	Document the measure on a regular basis based on a review of ODOT-maintained data. Successful progress towards the target ensuring that the number of SPIS locations is not more than one location and all locations maintain a crash rate less than 1.0.

Mobility, Access and Environment

The second goal of the TSP is to improve people's access to jobs, schools, health care and other regular needs in ways that improve health, reduce pollution and retain money in the local economy. In order to ensure the TSP will help the City make progress toward meeting this goal, the project team identified seven targets (2A through 2G). Table 36 provides a summary of the targets, including current benchmark data from Metro's Regional Travel Demand Model and other sources, the total number of projects included in the TSP and the Financially Constrained Plan that are intended to address a specific mobility, access, and/or environmental issue or will improve conditions in general, and how the city will monitor its progress toward meeting the goal.

Table 36: Mobility, Access and Environment Targets

Target	Current Benchmark	2040 Financially Constrained Plan Performance	Monitoring Plan
Target 2A - Reduce single-occupant vehicle miles traveled (VMT) per capita as compared to 2010 so that total VMT remains steady or declines as growth occurs.	2010 Metro Travel Demand Model VMT - **513,725 VMT** VMT per Capita produced from West Linn - **15.5 VMT per Capita**	2040 Metro Travel Demand Model VMT - **639,036 VMT** VMT per Capita produced from West Linn - **15.8 VMT per Capita** Note: The model is not sensitive enough to evaluate the impacts to VMT from pedestrian, bicycle, and transit projects included in the TSP Update. However, 128 projects in the TSP are anticipated to help reduce VMT. The Financially Constrained Plan includes 33 projects.	Document the measure each time Metro creates a new base year for the Metro Travel Demand Model. Successful progress towards the target includes a reduction in VMT per capita such that VMT remains steady or declines over time even as growth occurs.
Target 2B – Achieve 40-45% non-single occupant vehicle (SOV) trip mode share in 2040 industrial and employment areas and neighborhoods, and 45-55% in 2040 town centers, main streets, and corridors as shown on the Metro 2040 Growth Concept Map by 2040.	2010 Metro Travel Demand Model Non-SOV mode share in industrial and employment areas and neighborhoods - **49%**[1] 2010 Metro Travel Demand Model Non-SOV mode share in town centers, main streets and corridors - **49%** 2040 Metro Travel Demand Model Non-SOV mode share in industrial and employment areas and neighborhoods - **33%**[2] 2014 Metro Travel Demand Model Non-SOV mode share in town centers, main streets and corridors - **49%**	The project team evaluated projects based on this target. The TSP includes 45 projects that meet this target, and 19 are considered high priority. The model is not sensitive enough to evaluate the impacts to mode split from the pedestrian, bicycle, and transit projects included in the TSP that will have an impact on this measure. However, 45 projects in the TSP will help increase mode splits. The Financially Constrained Plan includes 19 projects.	Document the measure each time Metro creates a new base year for the Metro Travel Demand Model. Successful progress towards the target includes an increase in the non-SOV mode share in the 2040 investment areas over time even as growth occurs.
Target 2C – Improve freight travel time reliability.	There are currently no existing data available for this target.	The project team did not evaluate projects based on this target, but the City should consider this target for future projects as applicable.	Document the measure each time Metro creates a new base year for the Metro Travel Time Reliability (DTA) Model. Successful progress towards the target includes steady decline in the variability of travel time on I-205 and Highway 43.
Target 2D - Increase the percentage of people that can access key destinations via a 20-minute walk, bike or public transit ride by 40% by 2040.	Percent of the population within a 20-minute walk, bike, or public transit ride of key destinations - **100%**	The TSP includes 131 projects that further reduce walking, biking and transit times to key destinations. The Financially Constrained Plan includes 35 projects.	Document the measure at each update of the TSP based on current Metro Transportation Analysis Zone (TAZ) information. Successful progress towards the target includes steady increase in the percent of the population within a 20-minute walk, bike or public transit ride of key destinations.
Target 2E –Active Safe Routes to School (SRTS) Programs in place in all West Linn schools.	As of 2014, the West Linn-Wilsonville School District identified SRTS routes for the **five primary schools** in West Linn. The number of programs/ activities that occur per year to encourage walking and biking is unknown.	The TSP includes 26 projects that will improve conditions along the safe routes to school.	Document the measure at each update of the TSP. Successful progress towards the target includes SRTS identification for each school, information available to parents/students, and one or more events per year occur at each school that help disseminate the information and encourage walking and biking to school.

Target	Current Benchmark	2040 Financially Constrained Plan Performance	Monitoring Plan
Target 2F – A good quality pedestrian network and low stress bicycle network connecting all residents to key destinations.	2014 "Good" quality pedestrian network 2014 LTS 2 or better bicycle network	The TSP includes 101 projects that will improve Bicycle LTS and Pedestrian QMMLOS. The Financially Constrained Plan includes 25 projects.	Document the measure at each update of the TSP. Successful progress towards the target includes an increase in the network of "Good" quality pedestrian facilities and LTS Level 2 or better bicycle facilities.
Target 2G – Increase the number of green street facilities by 2040	There is currently no existing data available for this target.	The project team did not evaluate projects based on this target, but the City should consider this target during project development.	Document the measure at each update of the TSP. Successful progress towards the target includes an increase in the number of green street facilities between each update of the TSP.

1. Calculated based on citywide data.
2. Calculated based on TAZs 1102 and 1109

Equity

The third goal of the TSP is to deliver transportation improvements equitably. In order to ensure the TSP will help the City make progress toward meeting this goal, the project team identified two targets (3A and 3B). Table 37 provides a summary of the targets, including current benchmark data from and evaluation of US Census data, the total number of projects included in the TSP and the Financially Constrained Plan that address a specific equity issue or will improve conditions in general, and how the City will monitor its progress toward meeting the goal.

Table 37: Equity Targets

Target	Current Benchmark	2040 Financially Constrained Plan Performance	Monitoring Plan
Target 3A – By 2040, increase walking, bicycle and public transit access, for transportation disadvantaged populations, to key destinations, by 40%	Percent of transportation disadvantaged population within a 20-minute walk, bike, or public transit ride of key destinations (2010) - **100%**	The TSP includes 133 projects that will improve facilities, provide a more direct route and reduce travel time, or will increase the percent of the population in the 20-minute zone. The Financially Constrained Plan includes 35 projects.	Document the measure at each update of the TSP based on current census data information. Successful progress towards the target includes steady increase in the percent of the population within a 20-minute walk, bike or public transit ride of key destinations.
Target 3B - Ensure transportation services (and impacts) are equitably distributed to all segments of the population.	There are currently no existing data available for this target.	Of the 83 projects in the Financially Constrained Plan, a majority are located within census tracts with the highest concentrations of transportation disadvantaged.	Evaluate distribution of capital improvements at each update of the CIP. Document the measure at each update of the TSP.

Maintenance

The fourth goal of the TSP is to maintain, protect and improve the existing transportation system. The City currently prioritizes roadway maintenance projects based on a Pavement Condition Index (PCI). Although the project team did not use pavement conditions to identify or prioritize projects for the TSP, two maintenance related targets were identified (4A and 4B) to help the City track progress toward

meeting this goal. Table 38 provides a summary of the targets, including current benchmark data from the City's most recent Pavement Conditions Report and documents how the City will monitor its progress toward meeting the goal.

Table 38: Maintenance

Target	Current Benchmark	2040 Financially Constrained Plan Performance	Monitoring Plan
Target 4A - Increase the average local road pavement condition index (PCI) to 70 by 2040.	2014 average local road PCI	The project team did not evaluate projects based on this target, but the City should consider this target during project development.	Document the measure biannually. Successful progress towards the target includes an increase in the average local road PCI.
Target 4B - Reduce the number of transportation facilities in "distressed" condition by 5% by 2040.	2014 number of facilities in distressed condition.	The project team did not evaluate projects based on this target, but the City should consider this target during project development.	Document the measure biannually. Successful progress towards the target includes a reduction in the number of facilities in distressed condition.

Attachment A OR 43 Conceptual Design Plan