Oregon
Kate Brown, Governor

Department of Land Conservation and Development
635 Capitol Street NE, Suite 150
Salem, Oregon 97301-2540
Phone: 503-373-0050
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www.oregon.gov/LCD

NOTICE OF ADOPTED CHANGE TO A COMPREHENSIVE PLAN OR LAND USE REGULATION

Date:	April 06, 2016
Jurisdiction:	City of West Linn
Local file no.:	MISC 12-03
DLCD file no.:	003-15

The Department of Land Conservation and Development (DLCD) received the attached notice of adopted amendment to a comprehensive plan or land use regulation on 04/04/2016. A copy of the adopted amendment is available for review at the DLCD office in Salem and the local government office.

Notice of the proposed amendment was submitted to DLCD 40 days prior to the first evidentiary hearing.

Appeal Procedures

Eligibility to appeal this amendment is governed by ORS 197.612, ORS 197.620, and ORS 197.830. Under ORS 197.830(9), a notice of intent to appeal a land use decision to LUBA must be filed no later than 21 days after the date the decision sought to be reviewed became final. If you have questions about the date the decision became final, please contact the jurisdiction that adopted the amendment.

A notice of intent to appeal must be served upon the local government and others who received written notice of the final decision from the local government. The notice of intent to appeal must be served and filed in the form and manner prescribed by LUBA, (OAR chapter 661, division 10).

If the amendment is not appealed, it will be deemed acknowledged as set forth in ORS 197.625(1)(a). Please call LUBA at 503-373-1265, if you have questions about appeal procedures.

DLCD Contact

If you have questions about this notice, please contact DLCD's Plan Amendment Specialist at 503-934-0017 or plan.amendments@state.or.us

DLCD FORM 2

NOTICE OF ADOPTED CHANGE TO A COMPREHENSIVE PLAN OR LAND USE REGULATION

FOR DLCD USE

File No.: 003-15 {24016}

Received: 4/4/2016

Local governments are required to send notice of an adopted change to a comprehensive plan or land use regulation **no more than 20 days after the adoption**. (*See* OAR 660-018-0040). The rules require that the notice include a completed copy of this form. **This notice form is not for submittal of a completed periodic review task or a plan amendment reviewed in the manner of periodic review.** Use Form 4 for an adopted urban growth boundary including over 50 acres by a city with a population greater than 2,500 within the UGB or an urban growth boundary amendment over 100 acres adopted by a metropolitan service district. Use Form 5 for an adopted urban reserve designation, or amendment to add over 50 acres, by a city with a population greater than 2,500 within the UGB. Use Form 6 with submittal of an adopted periodic review task.

Jurisdiction: City of West Linn

Local file no.: **MISC-12-03**

Date of adoption: 3-28-2016 Date sent: 4-4-2016

Was Notice of a Proposed Change (Form 1) submitted to DLCD?

Yes: Date (use the date of last revision if a revised Form 1was submitted): 9-11-2015

No

Is the adopted change different from what was described in the Notice of Proposed Change? Yes No

If yes, describe how the adoption differs from the proposal:

The original proposal contained Comprehensive Plan policy amendments, as well as Community Development Code text amendments. All policy and code amendments were removed during the legislative hearing process and the final adoption was just the 2016 West Linn Transportation System Plan.

Local contact (name and title): John Boyd, AICP, Interim Community Development Director

Phone: 503-723-2524 E-mail: jboyd@westlinnoregon.gov

Street address: 22500 Salamo Road City: West Linn Zip: 97068-

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PLEASE COMPLETE ALL OF THE FOLLOWING SECTIONS THAT APPLY

<u>For a change to comprehensive plan text</u>:

Identify the sections of the plan that were added or amended and which statewide planning goals those sections implement, if any:

The 2016 West Linn Transportation Plan was adopted as a supporting document to the West Linn Comprehensive Plan and will implement Oregon Statewide Planning Goal 12.

<u>For a change to a comprehensive plan map</u>:

Identify the former and new map designations and the area affected:

Change from to acres. A goal exception was required for this change.

Change from to acres. A goal exception was required for this change.

Change from to acres. A goal exception was required for this change.

Change from to acres. A goal exception was required for this change.

Location of affected property (T, R, Sec., TL and address):

The subject property is entirely within an urban growth boundary

The subject property is partially within an urban growth boundary

If the comprehensive plan map change is a UGB amendment including less than 50 acres and/or by a city with a population less than 2,500 in the urban area, indicate the number of acres of the former rural plan designation, by type, included in the boundary.

Exclusive Farm Use – Acres:	Non-resource – Acres:
Forest – Acres:	Marginal Lands – Acres:
Rural Residential – Acres:	Natural Resource/Coastal/Open Space – Acres:
Rural Commercial or Industrial – Acres:	Other: – Acres:

If the comprehensive plan map change is an urban reserve amendment including less than 50 acres, or establishment or amendment of an urban reserve by a city with a population less than 2,500 in the urban area, indicate the number of acres, by plan designation, included in the boundary.

Exclusive Farm Use – Acres:	Non-resource – Acres:
Forest – Acres:	Marginal Lands – Acres:
Rural Residential – Acres:	Natural Resource/Coastal/Open Space – Acres:
Rural Commercial or Industrial – Acres:	Other: – Acres:

For a change to the text of an ordinance or code:
Identify the sections of the ordinance or code that were added or amended by title and number:

For a change to a zoning map:
Identify the former and new base zone designations and the area affected:

Change from	to	Acres:
Change from	to	Acres:
Change from	to	Acres:
Change from	to	Acres:

Identify additions to or removal from an overlay zone designation and the area affected:

Overlay zone designation: Acres added: Acres removed:

Location of affected property (T, R, Sec., TL and address):

List affected state or federal agencies, local governments and special districts: Clackamas County, Oregon Department of Transportation, City of Lake Oswego, City of Oregon City, Tualatin Valley Fire & Rescue, and Metro

Identify supplemental information that is included because it may be useful to inform DLCD or members of the public of the effect of the actual change that has been submitted with this Notice of Adopted Change, if any. If the submittal, including supplementary materials, exceeds 100 pages, include a summary of the amendment briefly describing its purpose and requirements.

The City of West Linn adopted their first Transportation Plan (TSP) in 2000. The TSP was updated in 2008 to address growth in West Linn and surrounding communities, as well as changes to state highway facility plans in the area. The purpose of the 2016 TSP update was to adopt a 20-year transportation plan and needed projects and to also ensure compliance and consistency with state and regional transportation plans and policies that have been adopted since 2008.

ORDINANCE NO. 1646

AN ORDINANCE ADOPTING THE TRANSPORTATION SYSTEM PLAN

WHEREAS, the City's current Transportation System Plan ("TSP") was last updated in 2008;

WHEREAS, the Oregon Department of Transportation ("ODOT") received Transportation and Growth Management grants that were utilized to develop the proposed 2016 TSP; and

WHEREAS, the proposed TSP addresses changed circumstances, regulatory requirements, and includes updated technical data; and

WHEREAS, the proposed TSP provides a comprehensive assessment of the City's transportation system that includes all modes of transportation and identifies current deficiencies; and

WHEREAS, the proposed TSP is consistent with the Statewide planning rules and Metro; and

WHEREAS, the proposed TSP is classified as a Supporting Document to the West Linn Comprehensive Plan; and

WHEREAS, Community Development Code (CDC) Chapter 98 provides the approval criteria for legislative amendments; and

WHEREAS, the Transportation Advisory Board reviewed the proposed TSP; and

WHEREAS, the Planning Commission held public hearings and unanimously recommended approval of the TSP at its February 17, 2016, meeting; and

WHEREAS, the update to the Highway 43 Plan is still pending, which will be incorporated into the TSP after its completion,

WHEREAS, it is beneficial to delay the effective date of the TSP to allow time for the completion of the Highway 43 Plan and any necessary CDC and Comprehensive Plan amendments;

NOW, THEREFORE, THE CITY OF WEST LINN ORDAINS AS FOLLOWS:

SECTION 1. Transportation System Plan. The 2016 City of West Linn Transportation System Plan, attached as Exhibit A, is adopted as a supporting document to the West Linn Comprehensive Plan and the new plan governing transportation system policy.

SECTION 2. Effective Date. This ordinance shall take effect on the 180th day after its passage.

The foregoing ordinance was first read by title only in accordance with Chapter VIII, Section 33(c) of the City Charter on the 28th day of March, 2016, and duly PASSED and ADOPTED this 28th day of March, 2016.

RUSSELL B. AXELROD, MAYOR

ATTEST:

Kathy Mollusky

KATHY MOLLUSKY, CITY RECORDER

APPROVED AS TO FORM:

CITY ATTORNEY

City of West Linn, Oregon

WEST LINN TRANSPORTATION SYSTEM PLAN

March 28, 2016

Prepared for:

City of West Linn
22500 Salamo Road
West Linn, OR 97068
503.656.4211

Prepared by:

Kittelson & Associates, Inc.
610 SW Alder Street, Suite 700
Portland, OR 97205
503.228.5230

City of West Linn

City of West Linn
Transportation System Plan

West Linn, Oregon

March 28, 2016

City of West Linn
Transportation System Plan

West Linn, Oregon

Prepared For:
City of West Linn
22500 Salamo Rd.
West Linn, OR 97068
(503) 657-0331

Prepared By:
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Project Manager: Susan Wright, PE
Deputy Project Manager: Matt Bell
Project Principal: Marc Butorac, PE, PTOE

March 28, 2016

ACKNOWLEDGEMENTS

The production of the 2016 West Linn Transportation System Plan (TSP) has been the collective effort of the following people:

City Council Members

- Mayor Russell Axelrod
- Council President Thomas Frank
- Councilor Jenni Tan
- Councilor Brenda Perry
- Councilor Bob Martin

Planning Commission Members

- Ryerson Schwark
- Lorie Griffith
- Jim Farrell
- Jesse Knight
- Michael Babbitt
- Charles Mathews
- Gary Walvatne
- Tom Neff
- Chris Myers

Citizens Advisory Committee (CAC) Members

- Joyce Jackson
- Riad Alharithi
- Kim Bria
- Kris Kachirisky
- Dave Kleinke
- Kimberly Steele
- Craig Bell

Technical Advisory Committee (TAC) Members

- Laura Terway, Oregon City
- Amanda Owings, Lake Oswego
- Larry Conrad, Clackamas County
- John Mermin, Metro
- Tom Mills, TriMet
- Jennifer Donnelly, Department of Land Conservation and Development
- Khoi Le, West Linn

Project Management Team (PMT) Members

- Zach Pelz, West Linn
- John Boyd, West Linn
- Lance Calvert, West Linn
- Gail Curtis, Oregon Department of Transportation
- Susan Wright, Kittelson & Associates
- Matt Bell, Kittelson & Associates
- Ribeka Toda, Kittelson & Associates
- DJ Heffernan, DJ Heffernan Company

This project is partially funded by a grant from the Transportation and Growth Management (TGM) Program, a joint program of the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development. This TGM grant is financed, in part, by federal Moving Ahead for Progress in the 21st Century (MAP-21), city of West Linn, and the state of Oregon funds. The contents of this document do not necessarily reflect views or policies of the state of 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, 10^{th} 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.

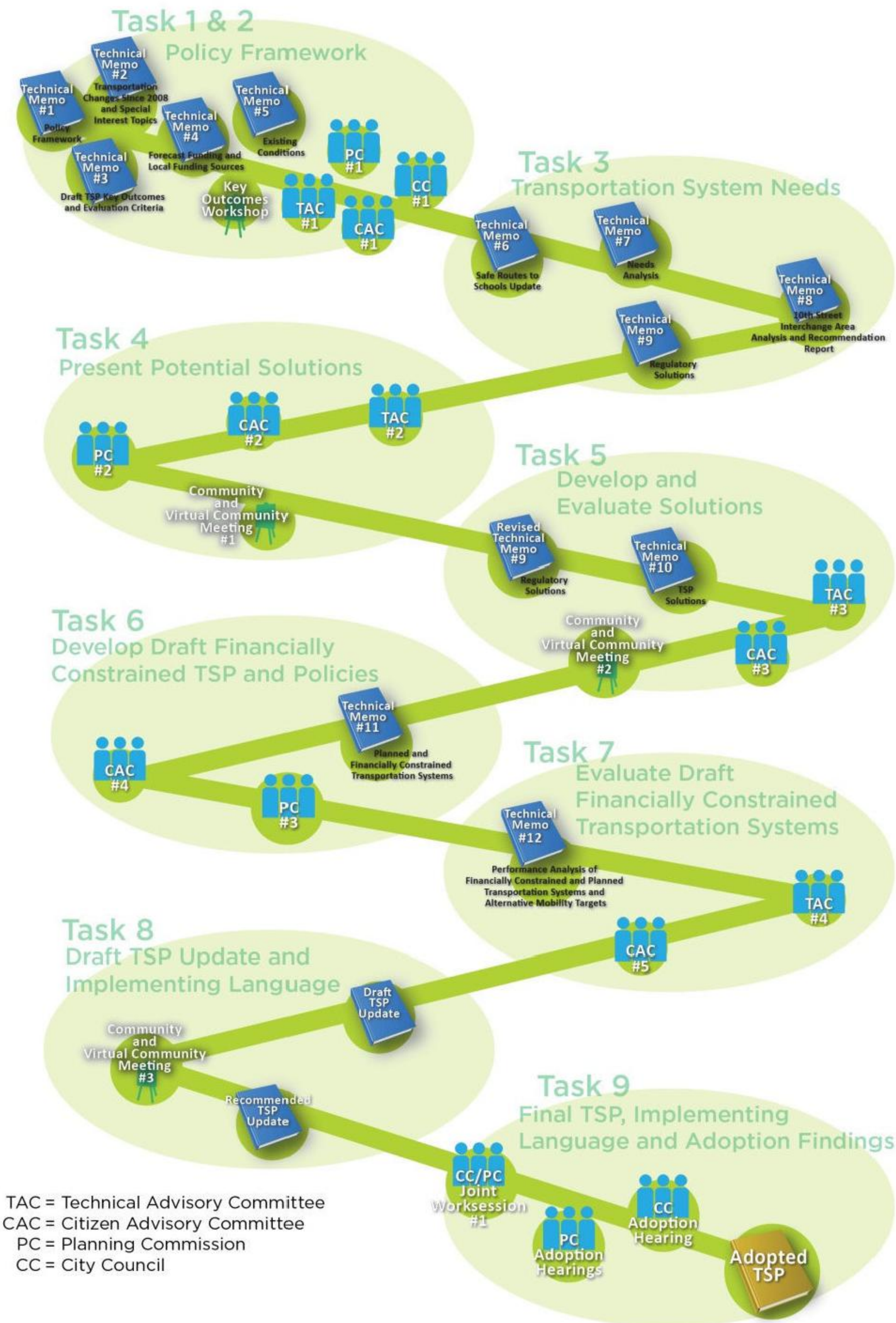
PUBLIC INVOLVEMENT

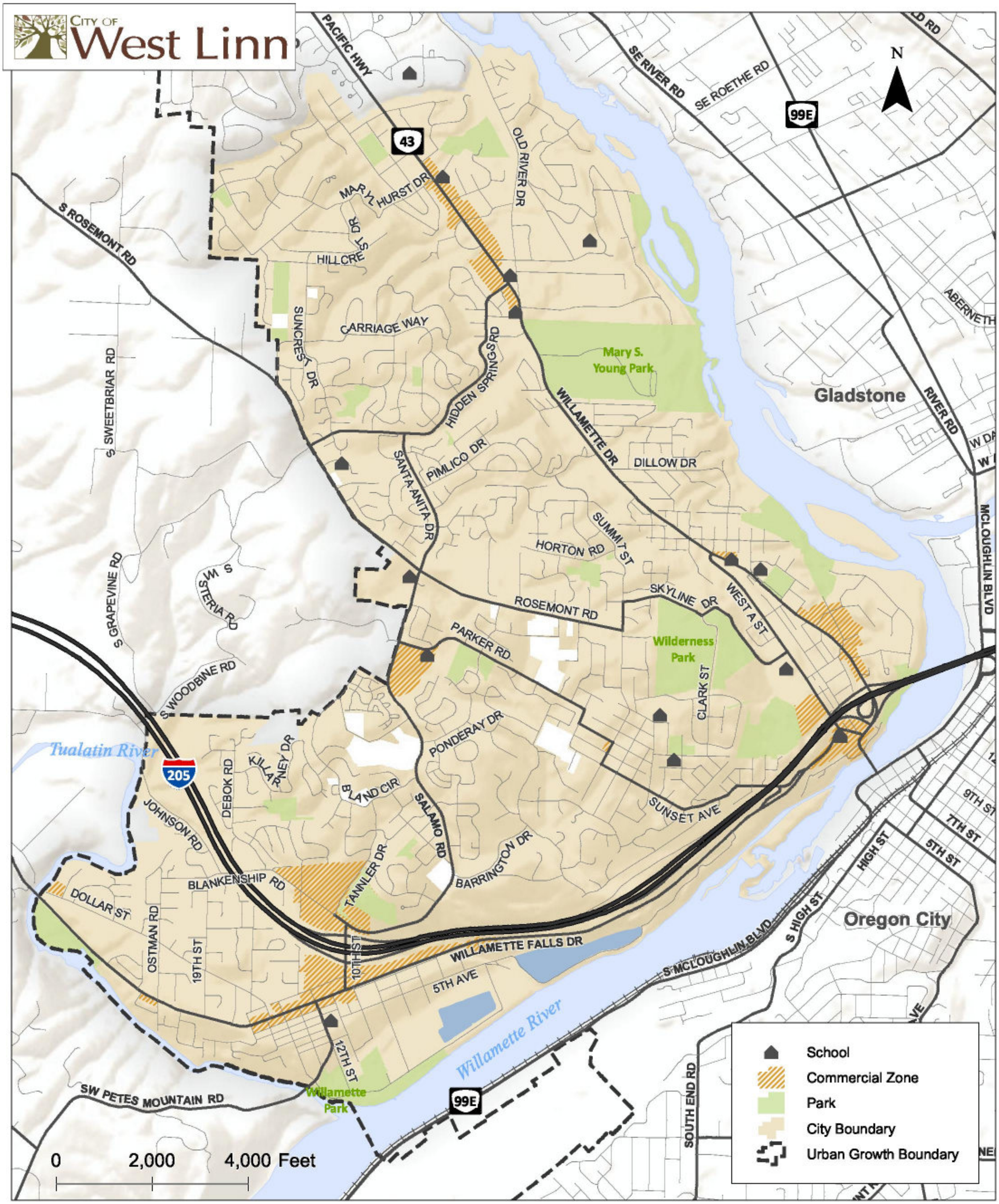
Public Involvement in the TSP Update process consisted of periodic TAC and CAC meetings, continuous web-based communications, and three community-wide public open houses (including online public open houses) to gather input on community concerns related to transportation. The project team gathered public 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





This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Study Area
West Linn, Oregon

Figure
1

H:\projfile\17817 - West Linn Transportation System Plan\gis\TSP\Portrait Letter Version\01 Study Area.mxd - mbell - 11:28 AM 3/17/2016

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: USGS, ESRI, TANA, AND

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

H:\projfile\17817 - West Linn Transportation System Plan\gis\TSP\Portrait Letter Version\02 TAZ_Households.mxd - mbell - 11:29 AM 3/17/2016

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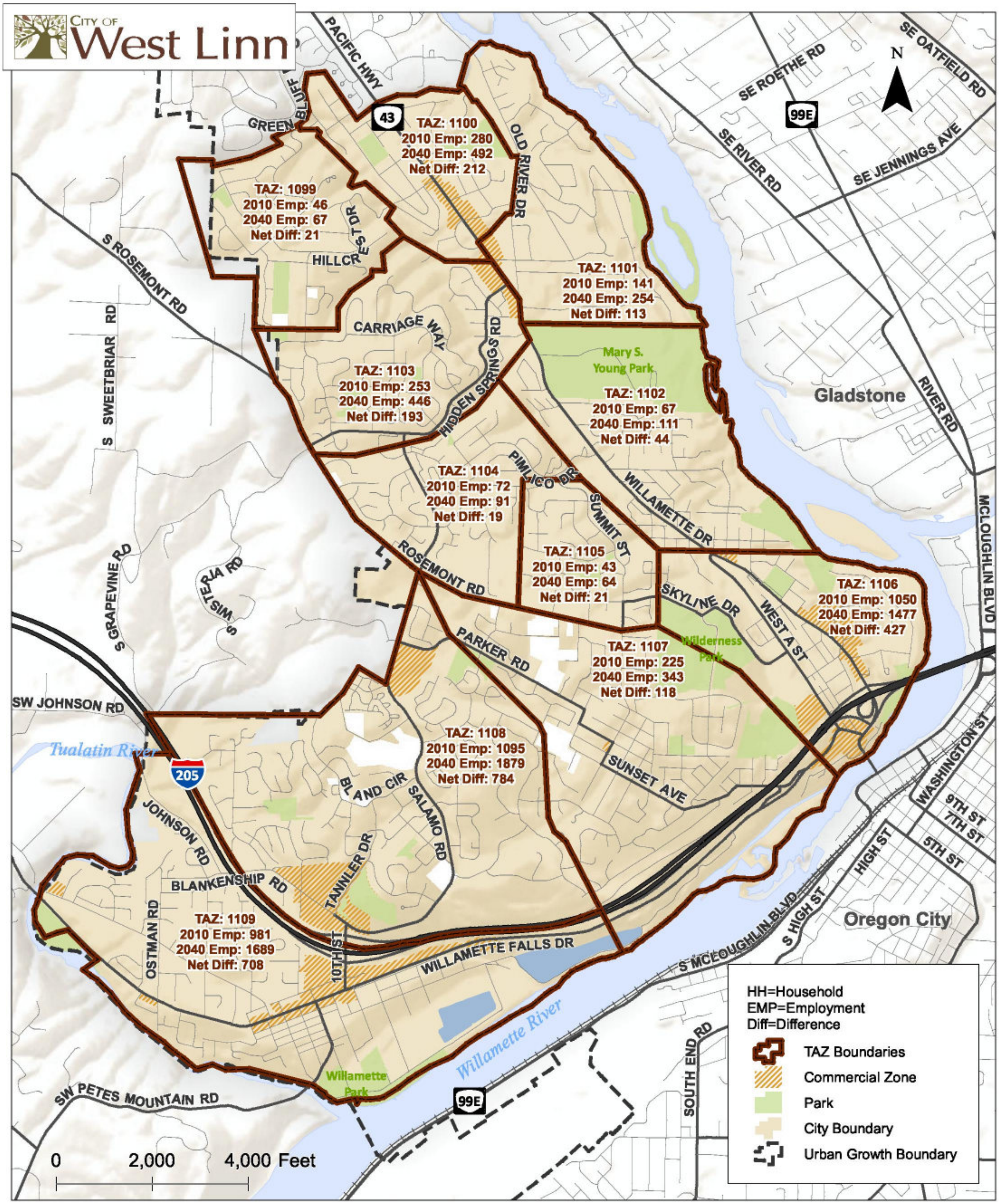

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Metro Projected Changes in Employment by Transportation Analysis Zone (TAZ) from 2010 to 2040, West Linn, Oregon

Figure 3

H:\proj\file\17817 - West Linn Transportation System Plan\gis\TSP\Portrait Letter Version\03 TAZ_Employees.mxd - mbell - 11:29 AM 3/17/2016

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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: USGS, ESRI, TANA, AND

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

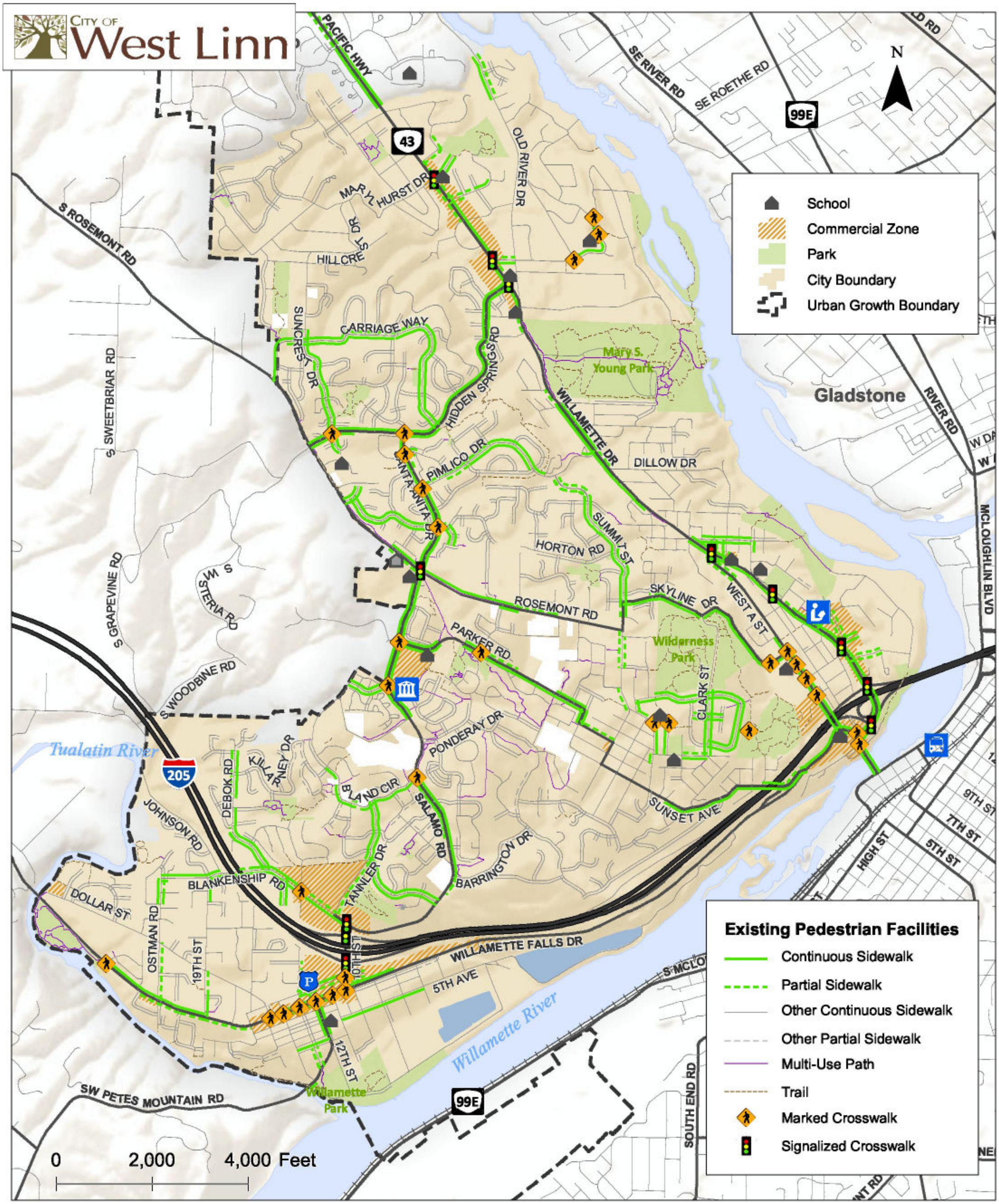
The pedestrian system within West Linn consists of sidewalks, multi-use paths and trails as well as marked and unmarked, and signalized and unsignalized pedestrian crossings. These facilities provide residents with the ability to access local transit service as well as local retail, commercial, recreational, 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

H:\proj\file\17817 - West Linn Transportation System Plan\gis\TSP\Portrait Letter Version\04 Pedestrian Facilities.mxd - mbell - 11:30 AM 3/17/2016

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

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

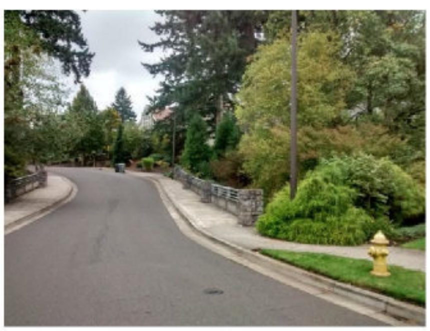
The West Linn-Wilsonville School District (WLWV) operates five primary schools, one middle school, one high school, and one charter school in West Linn. WLWV has developed safe routes to school plans for each of its five primary schools, including Bolton, Cedar Oaks, Sunset, Trillium Creek, and Willamette. 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.

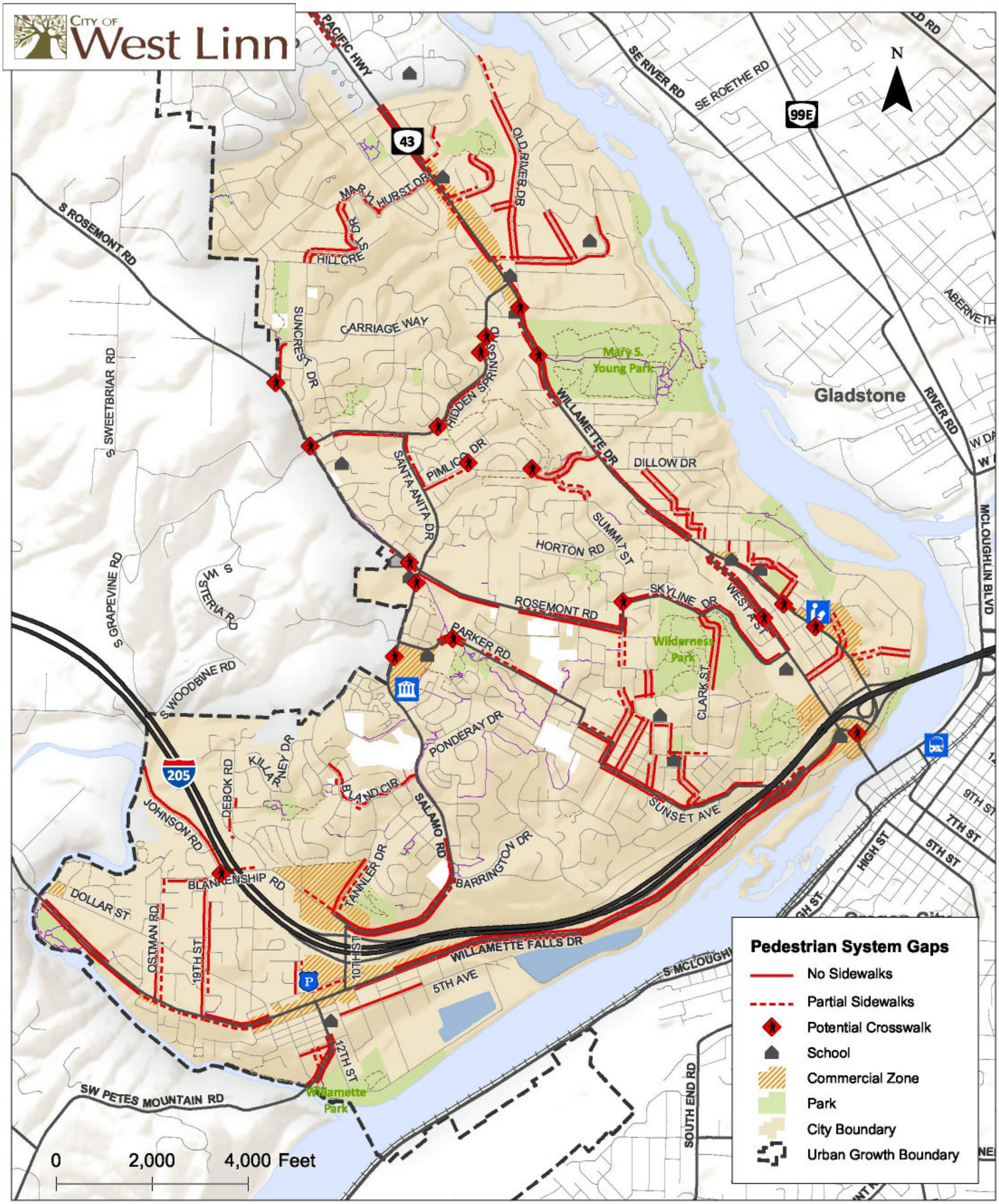
Sidewalks

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**

H:\projfile\17817 - West Linn Transportation System Plan\gis\TSP\Portrait Letter Version\05 Pedestrian Needs.mxd - mbell - 8:12 AM 3/21/2016

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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: USGS, ESRI, TANA, AND

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

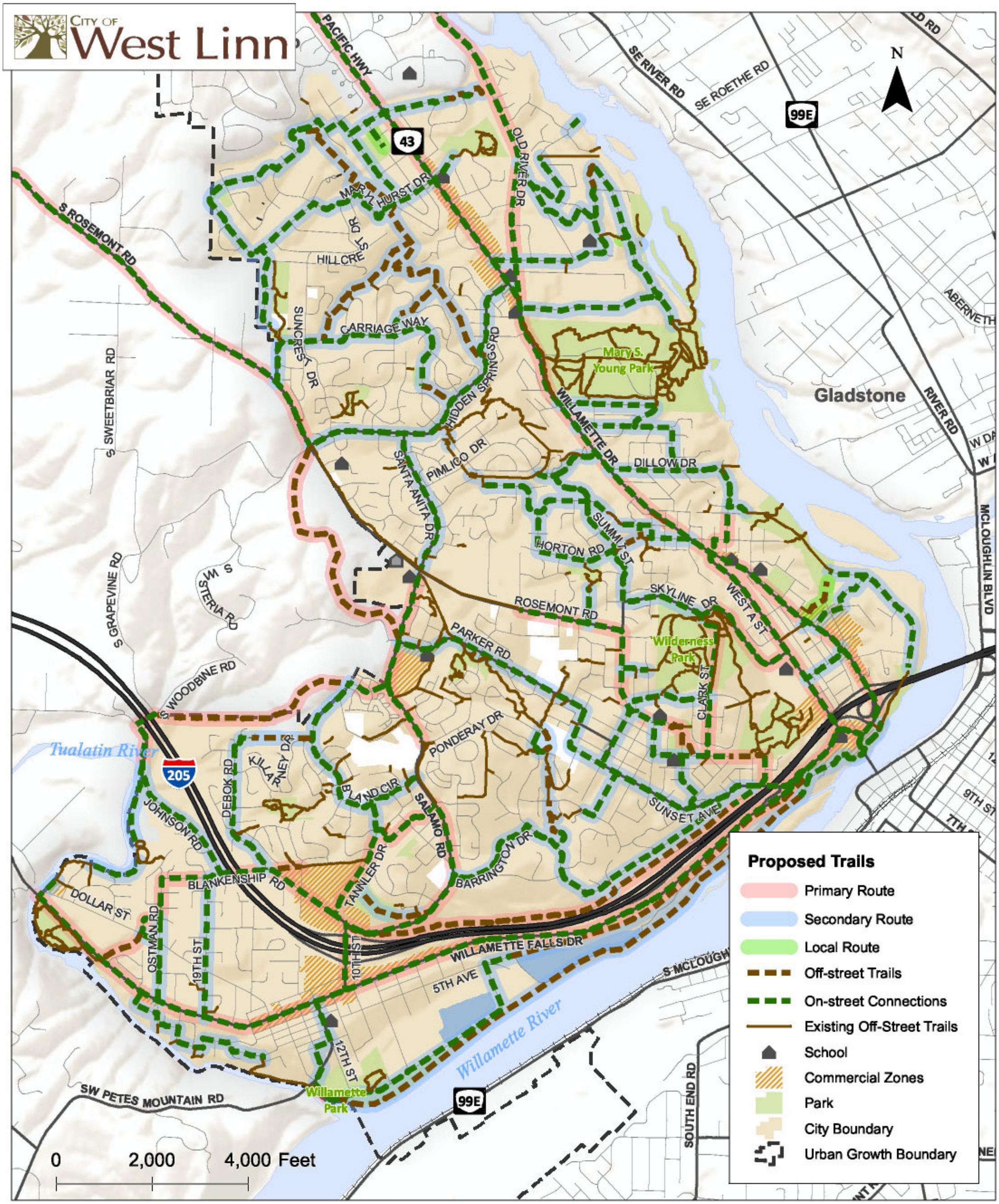
Multi-use paths and trails are designated pathways for both bicyclists and pedestrians. Paved, bi-directional multi-use paths can be part of a park and recreational system and/or can be adjacent to roadways where the topography, right-of-way, or other issues don't allow for sidewalks and on-street bike 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 previously adopted 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 including connections to County routes and facilities outside of the city limits. 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**

H:\projfile\17817 - West Linn Transportation System Plan\gis\TSP\Portrait Letter Version\06 Trails Master Plan.mxd - mbell - 11:41 AM 3/17/2016

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Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: USGS, ESRI, TANA, AND

- 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.

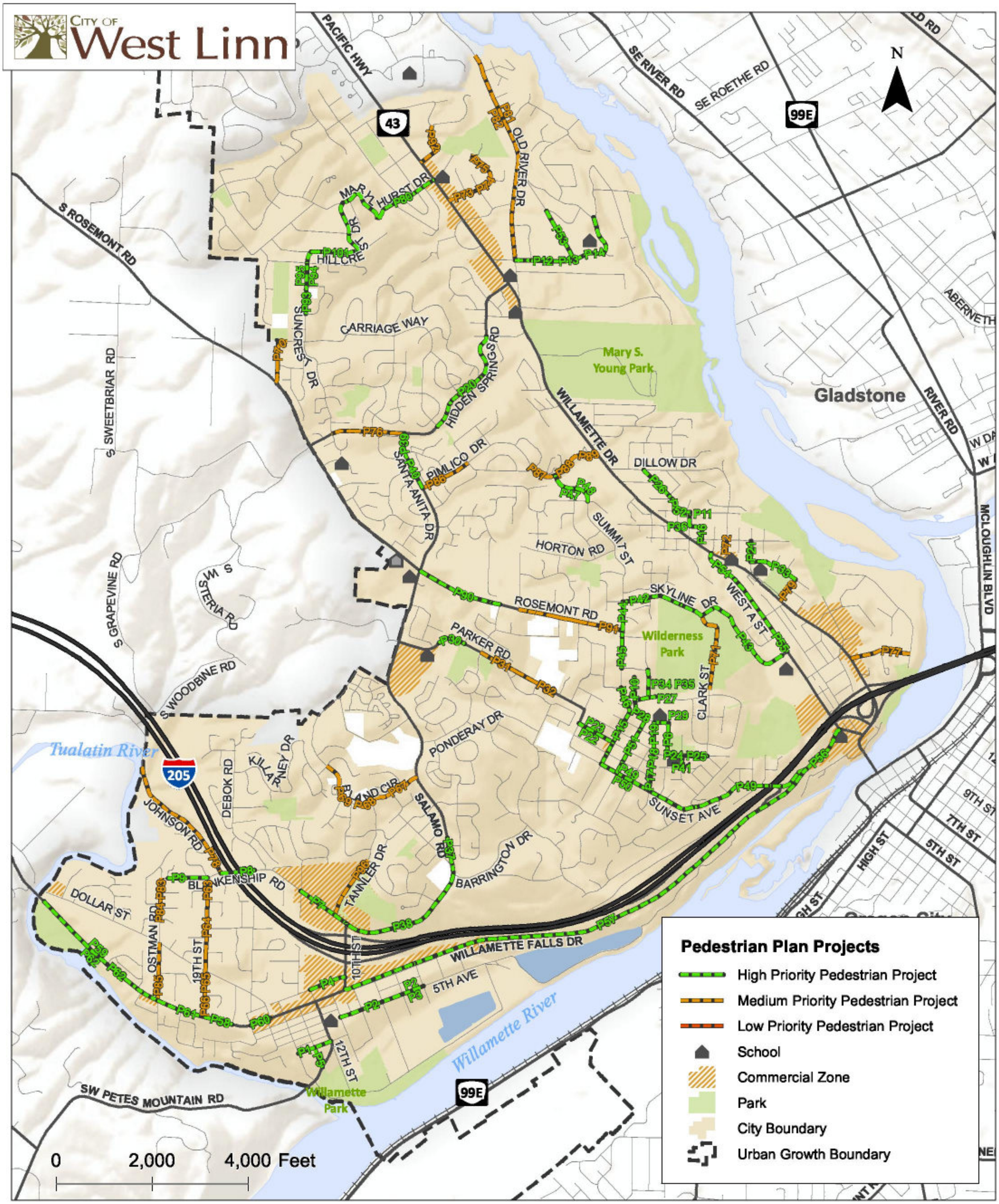
STRATEGIES

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

H:\projfile\17817 - West Linn Transportation System Plan\gis\TSP\Portrait Letter Version\07 Pedestrian Plan.mxd - mbell - 8:14 AM 3/21/2016

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
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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

Map ID	Location	Type	Project Description	Priority	Cost ($1,000)
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
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	Medium	$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	Medium	$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

Map ID	Location	Type	Project Description	Priority	Cost ($1,000)
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
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

Map ID	Location	Type	Project Description	Priority	Cost ($1,000)
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
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)	High	$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	High	$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

Map ID	Location	Type	Project Description	Priority	Cost ($1,000)
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)	High	$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 Drive	High	$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	High	$135
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			Intentionally left blank.		
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
P101	Hillcrest Drive	Sidewalks	Install sidewalks on one side of the roadway from Suncrest Drive to Marylhurst Drive	High	$300
P102	Willamette Falls Drive	Interim	Improve pedestrian crossing at Fields Bridge Park	High	$20
P103	Hidden Springs Road	Interim	Improve pedestrian crossing at Suncrest Drive	High	$20
P104	Citywide	Study	Develop citywide policy and methodology to address pedestrian crossing improvements	High	$50
				Total High Priority Project Costs	$13,110
				Total Medium Priority Project Costs	$6,435
				Total Low Priority Project Costs	$660
				Total Project Costs	**$20,205**

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

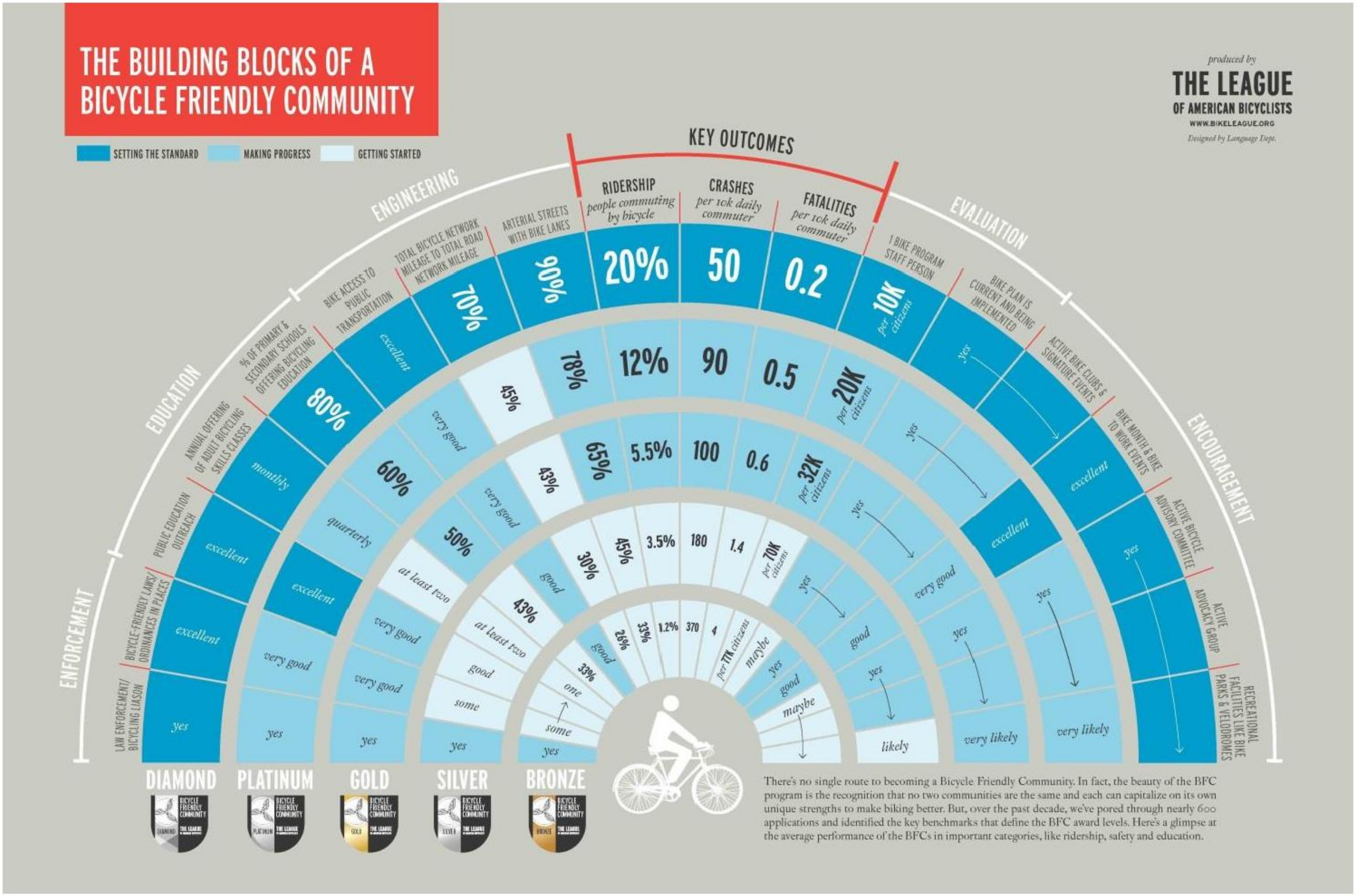
The bicycle system within the city of West Linn consists of on-street bike lanes, shared roadways (where bicycles share the travel lane with motor vehicles), as well as off-street bicycle facilities, such as multi-use paths and bicycle parking. These types of facilities provide residents with the ability 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.

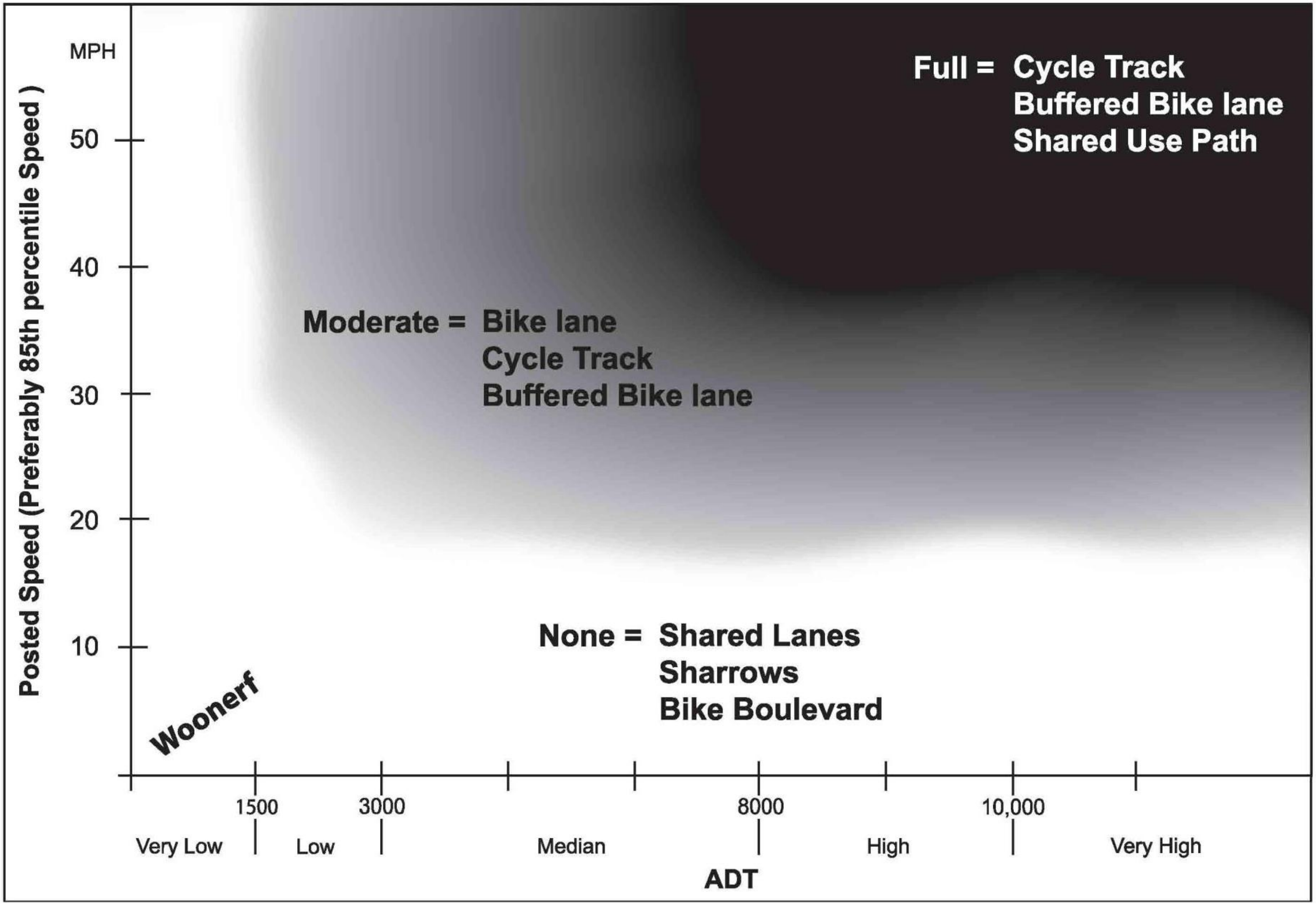
Exhibit 2: The League of American Bicyclists - The Building Blocks of a Bicycle Friendly Community

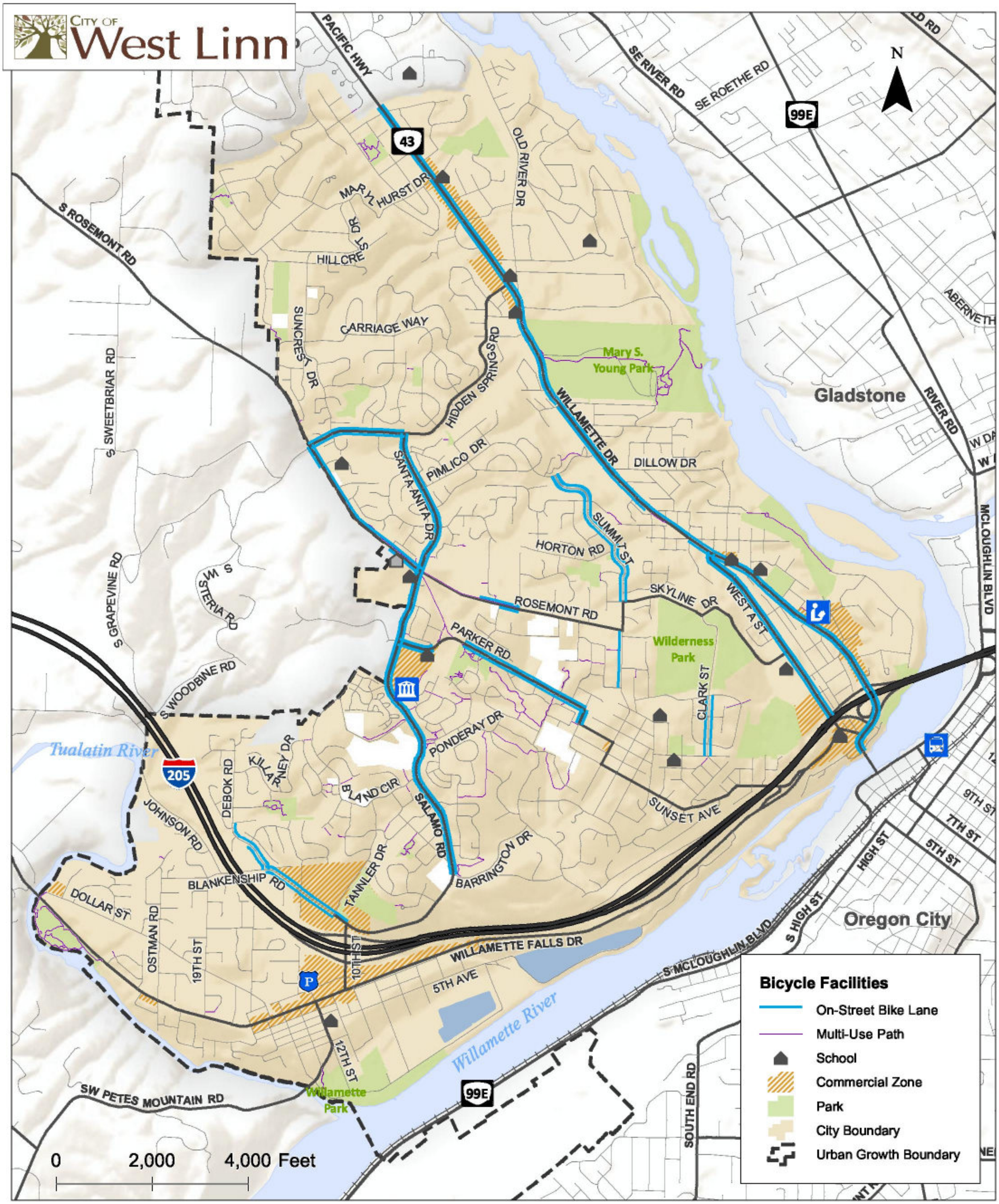


	Diamond	Platinum	Gold	Silver	Bronze
Law enforcement/bicycling liason	yes	yes	yes	yes	yes
Bicycle-friendly laws/ordinances in places	excellent	very good	very good	some	some
Public education outreach	excellent	excellent	very good	good	one
Annual offering of adult bicycling skills classes	monthly	quarterly	at least two	at least two	33%
% of primary & secondary schools offering bicycling education	80%	60%	50%	43%	good
Bike access to public transportation	excellent	very good	very good	good	26%
Total bicycle network mileage to total road network mileage	70%	45%	43%	30%	33%
Arterial streets with bike lanes	90%	78%	65%	45%	
Ridership	20%	12%	5.5%	3.5%	1.2%
Crashes	50	90	100	180	370
Fatalities	0.2	0.5	0.6	1.4	4
1 bike program staff person	10K per citizens	20K per citizens	32K per citizens	70K per citizens	71K per citizens
Bike plan is current and being implemented	yes	yes	yes	yes	maybe
Active bike clubs & signature events	excellent	very good	good	good	
Bike month & bike to work events	excellent	excellent	yes	yes	maybe
Active bicycle advisory committee	yes	yes	yes	likely	
Active advocacy group				very likely	
Recreational facilities like bike parks & velodromes				very likely	

There's no single route to becoming a Bicycle Friendly Community. In fact, the beauty of the BFC program is the recognition that no two communities are the same and each can capitalize on its own unique strengths to make biking better. But, over the past decade, we've pored through nearly 600 applications and identified the key benchmarks that define the BFC award levels. Here's a glimpse at the average performance of the BFCs in important categories, like ridership, safety and education.

Exhibit 3: Bicycle Facility Design Guidance





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Existing Bicycle Facilities
West Linn, Oregon

Figure
8

H:\proj\file\17817 - West Linn Transportation System Plan\gis\TSP\Portrait Letter Version\08 Bicycle Facilities.mxd - mbell - 11:46 AM 3/17/2016

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

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

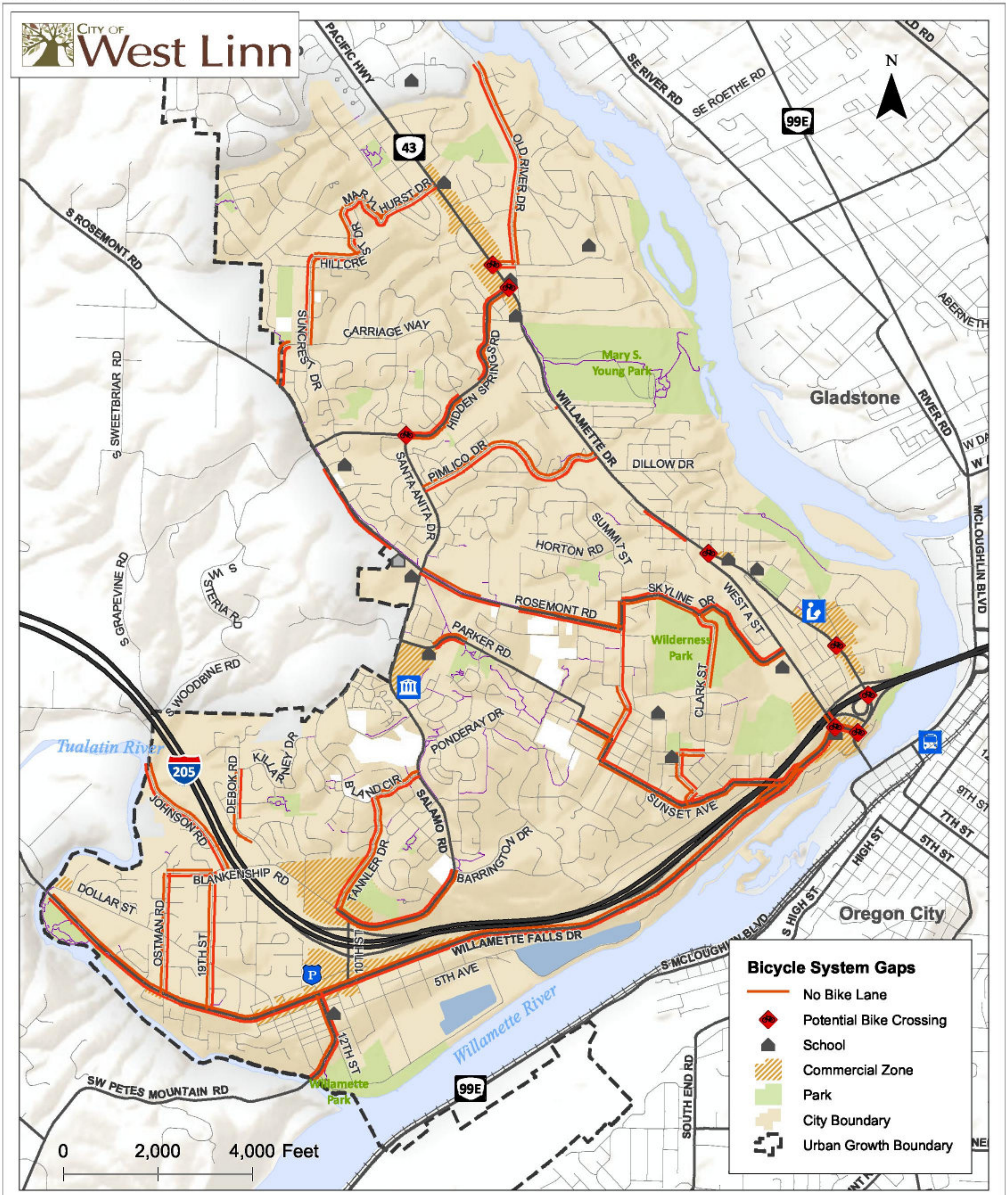
Bike lanes are on-street facilities that provide designated space for bicycles separated from vehicles by pavement markings. Bike lanes are generally used on collector and arterial streets with adequate space to accommodate the bike lane width where vehicular travel volumes and speeds make it difficult 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

H:\projfile\17817 - West Linn Transportation System Plan\gis\TSP\Portrait Letter Version\09 Bicycle Needs.mxd - mbell - 11:47 AM 3/17/2016

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

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

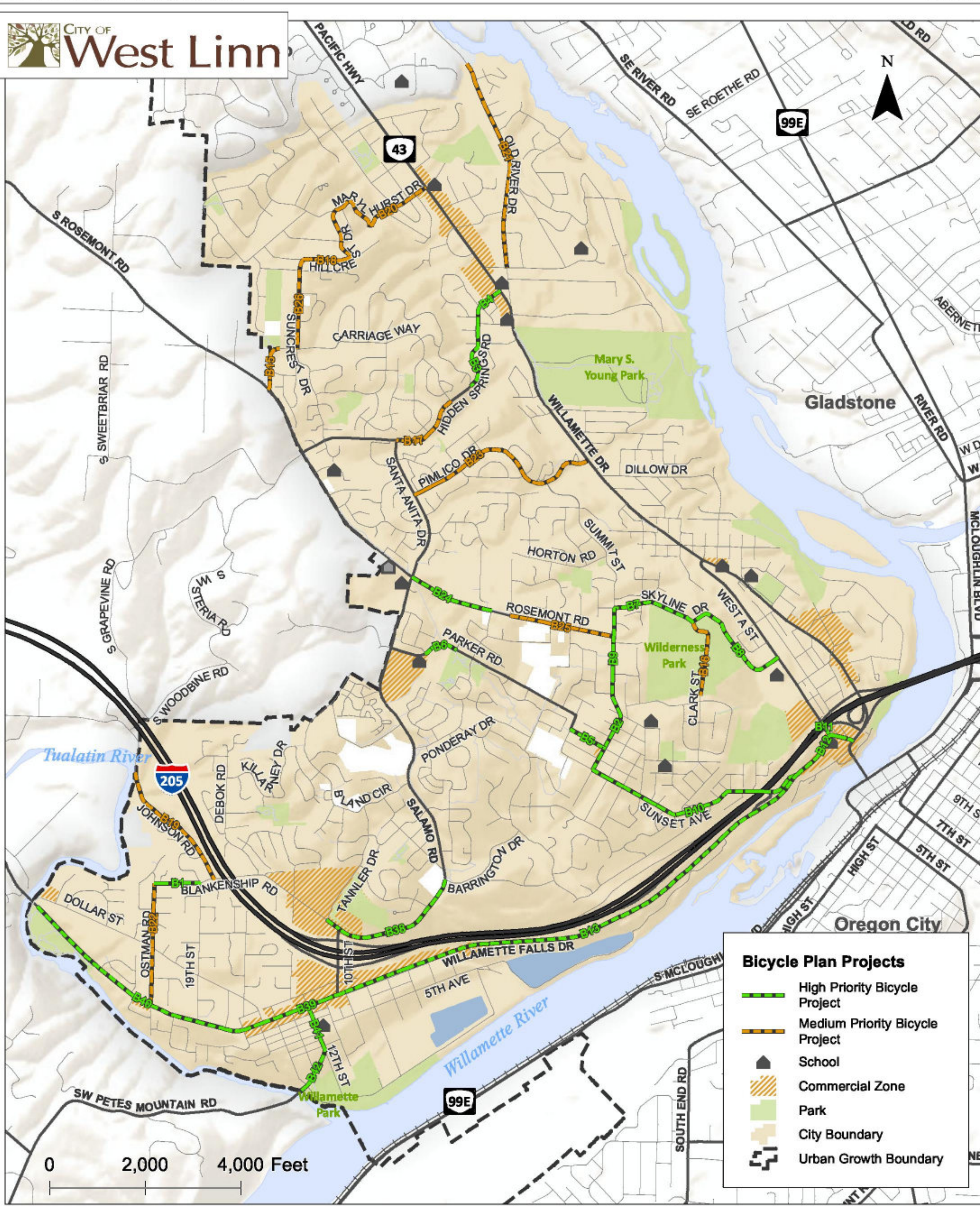
Table 6 summarizes and Figure 10 shows the bicycle system improvement projects identified for the TSP. The cost estimates shown in Table 6 were developed using average unit costs for transportation improvements and therefore, should be considered planning level estimates. More detailed cost estimates 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			Intentionally left blank.		
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)
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
B24	Rosemont Road	Bike Lanes	Install bike lanes on both sides of the roadway from Santa Anita Drive to Wild Rose Drive	High	$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			Intentionally left blank.		
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
B38	Salamo Road	Cycle Track	Install two-way cycle track on north side of the roadway from Tannler Drive to Barrington Drive	High	$400
B39	Willamette Falls Drive	Cycle Track	Install cycle tracks on both sides of the roadway from 14th Street to 10th Street	Medium	$200
B40	Willamette Falls Drive	Cycle Track	Install cycle tracks on both sides of the roadway from city limits at Tualatin River bridge to 14th Street	High	$900
B41	12th Street	Bike Lanes	Install bike lanes on both sides of the roadway from Tualatin Avenue to Willamette Falls Drive	High	$100
B42	Tualatin Avenue	Bike Lanes	Install bike lanes on both sides of the roadway from city limits at Tualatin River bridge to 12th Street	High	$100
				Total High Priority Project Costs	$7,365
				Total Medium Priority Project Costs	$3,765
				Total Low Priority Project Costs	$275
				Total Project Costs	**$11,405**

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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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: USGS, ESRI, TANA, AND

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

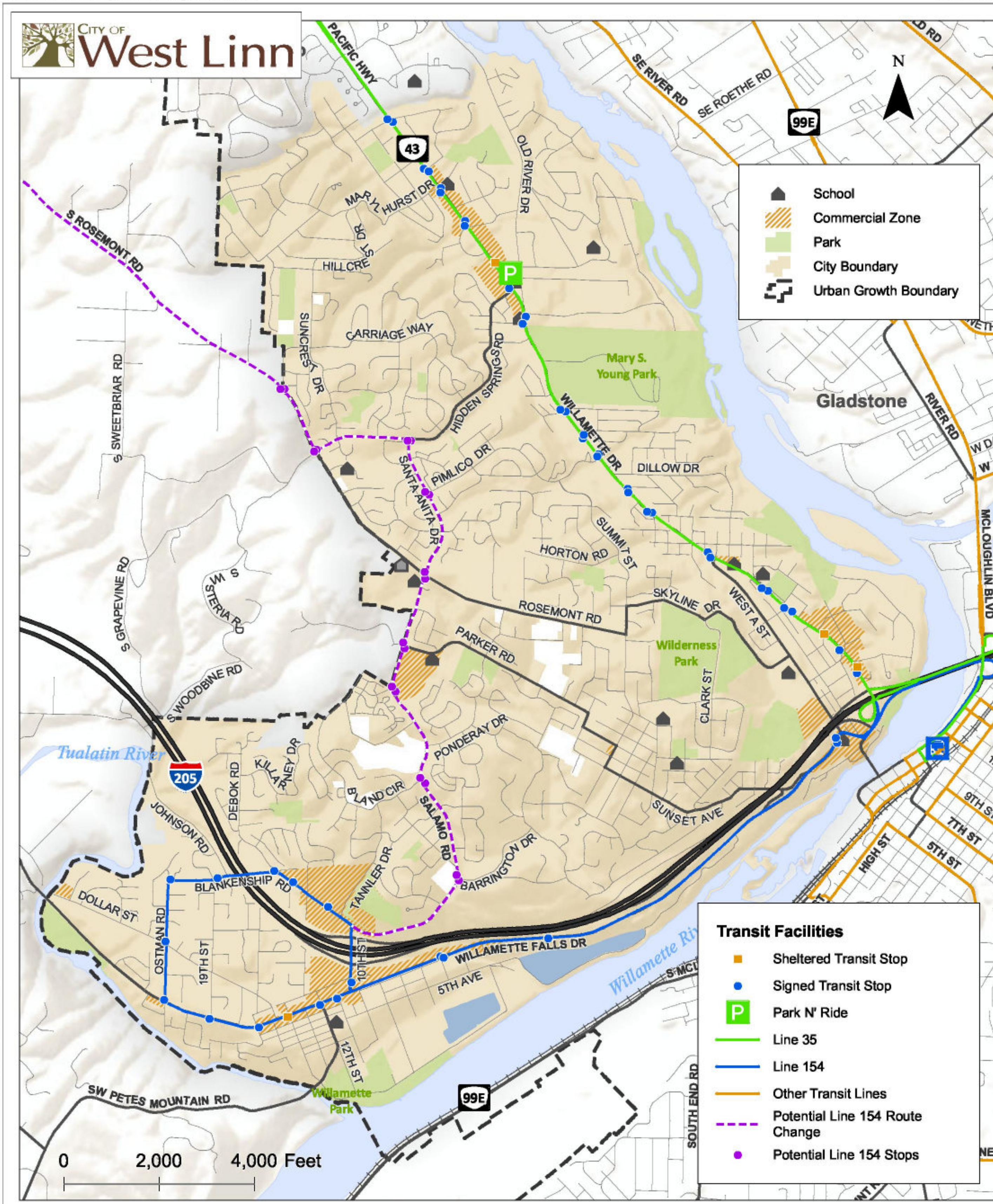
TriMet's LIFT Paratransit service is a shared-ride transportation service for residents who are unable to use regular fixed-route services due to disabilities or disabling health conditions. The service is offered within three-fourths of a mile beyond the outermost portions of TriMet's fixed-route bus 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

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Kittelson & Associates, Inc.
Transportation Engineering/Planning

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Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: USGS, ESRI, TANA, AND

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

	Roadway Classifications		
Traffic Calming Measures	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

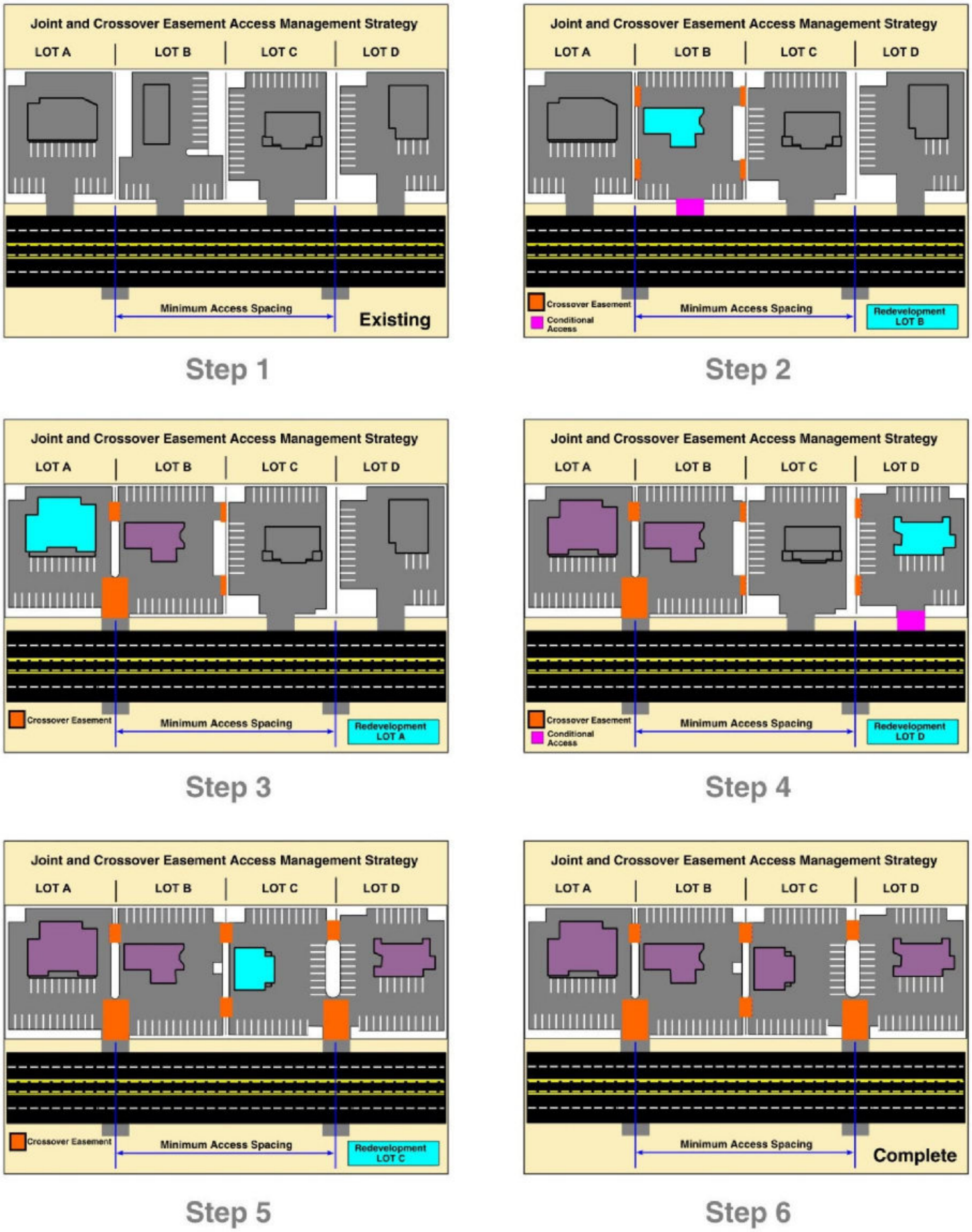
From an operational perspective, access management measures limit the number of redundant access points along roadways. This enhances roadway capacity, improves safety, and benefits circulation. The City should complement access spacing enforcement with provision of alternative access points. Purchasing 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.

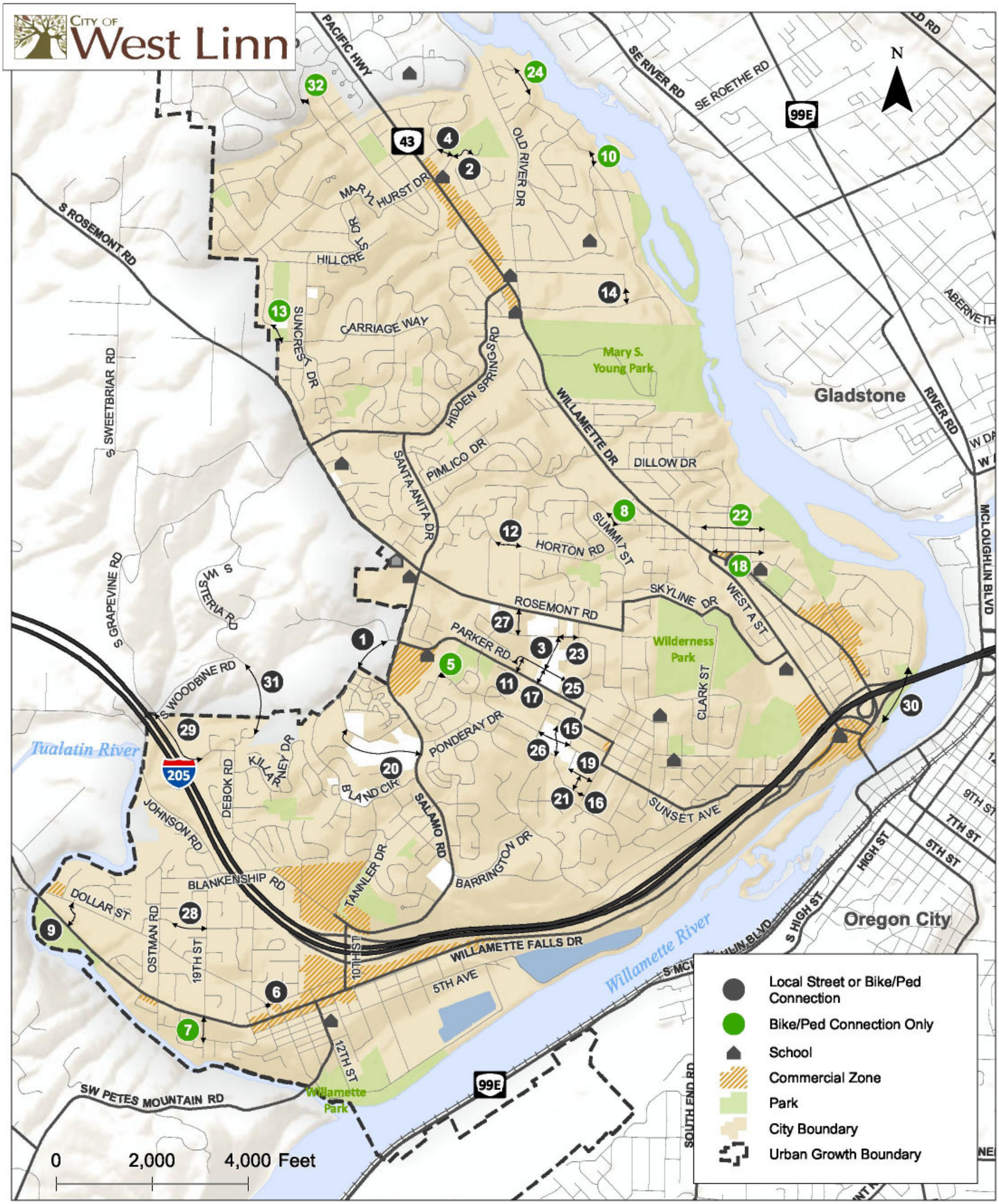
Topography and environmental conditions limit connectivity in several areas of the city of West Linn. The area to the west of Highway 43 is particularly challenging because of the steep terrain and the existing built-out nature of that area. Given that there are limited opportunities for new streets 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	Bike/Ped	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

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: USGS, ESRI, TANA, AND

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.

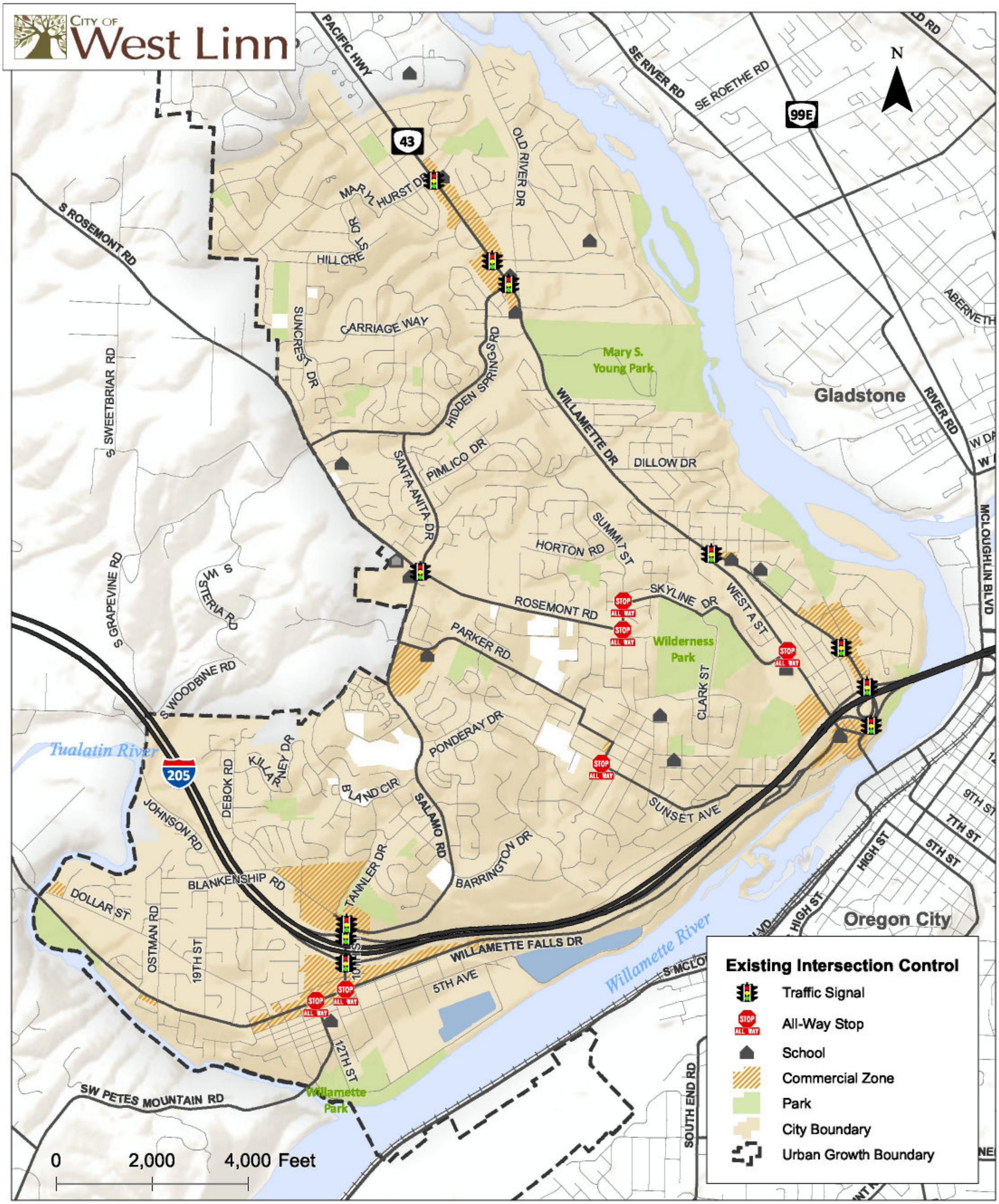
Table 18: Existing Study Area Roadway Characteristics by Functional Classification

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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Existing 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: USGS, ESRI, TANA, AND

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.

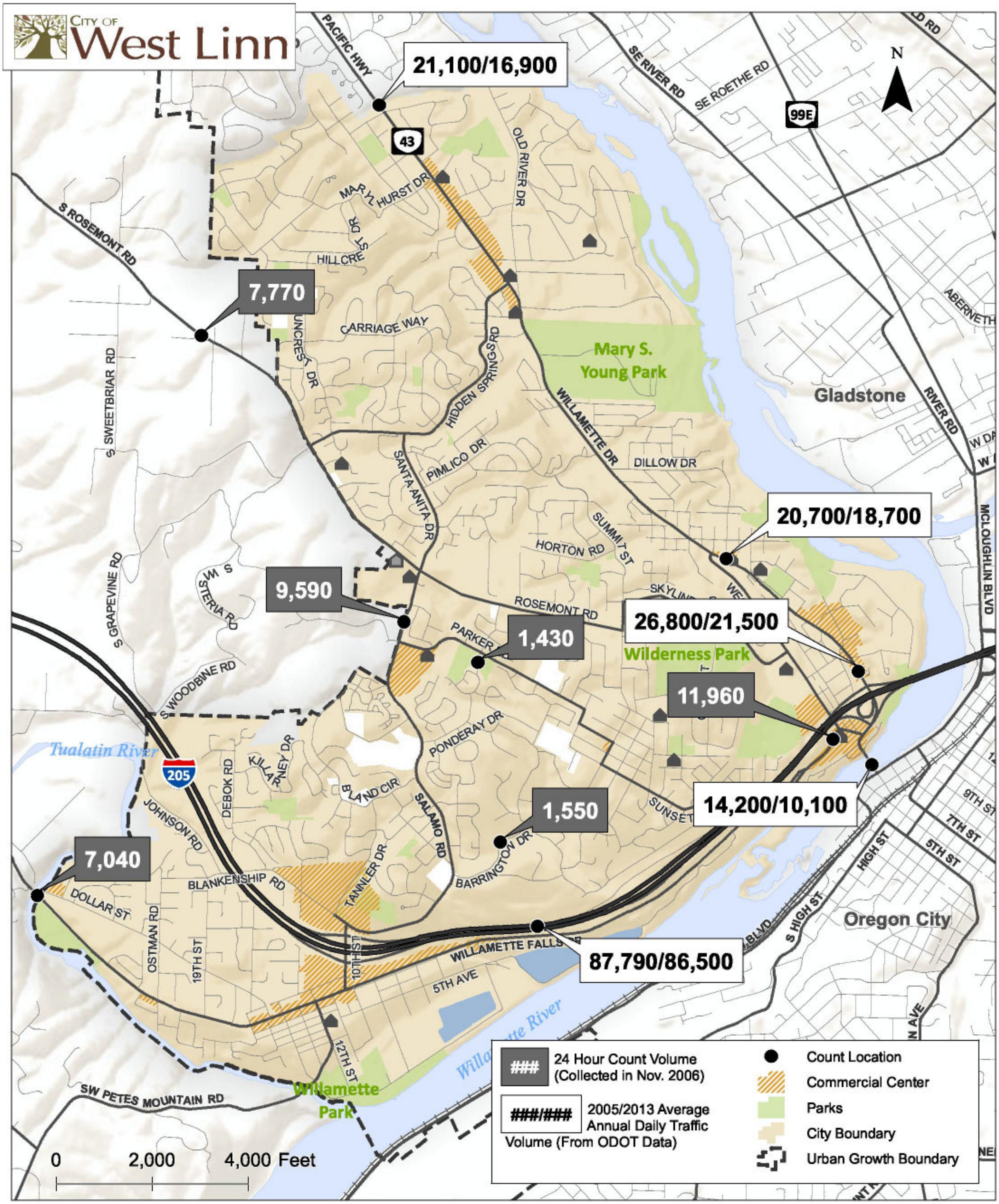
Designated Street Parking

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

H:\projfile\17817 - West Linn Transportation System Plan\gis\TSP\Portrait Letter Version\14 Average Daily Traffic Volumes.mxd - mbell - 11:51 AM 3/17/2016

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: USGS, ESRI, TANA, AND

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

	Crash Type						Severity		
Location	Angle	Turn	Rear-End	Side Swipe	Fixed Object	Ped/ Bike	PDO*	Injury	Total
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.

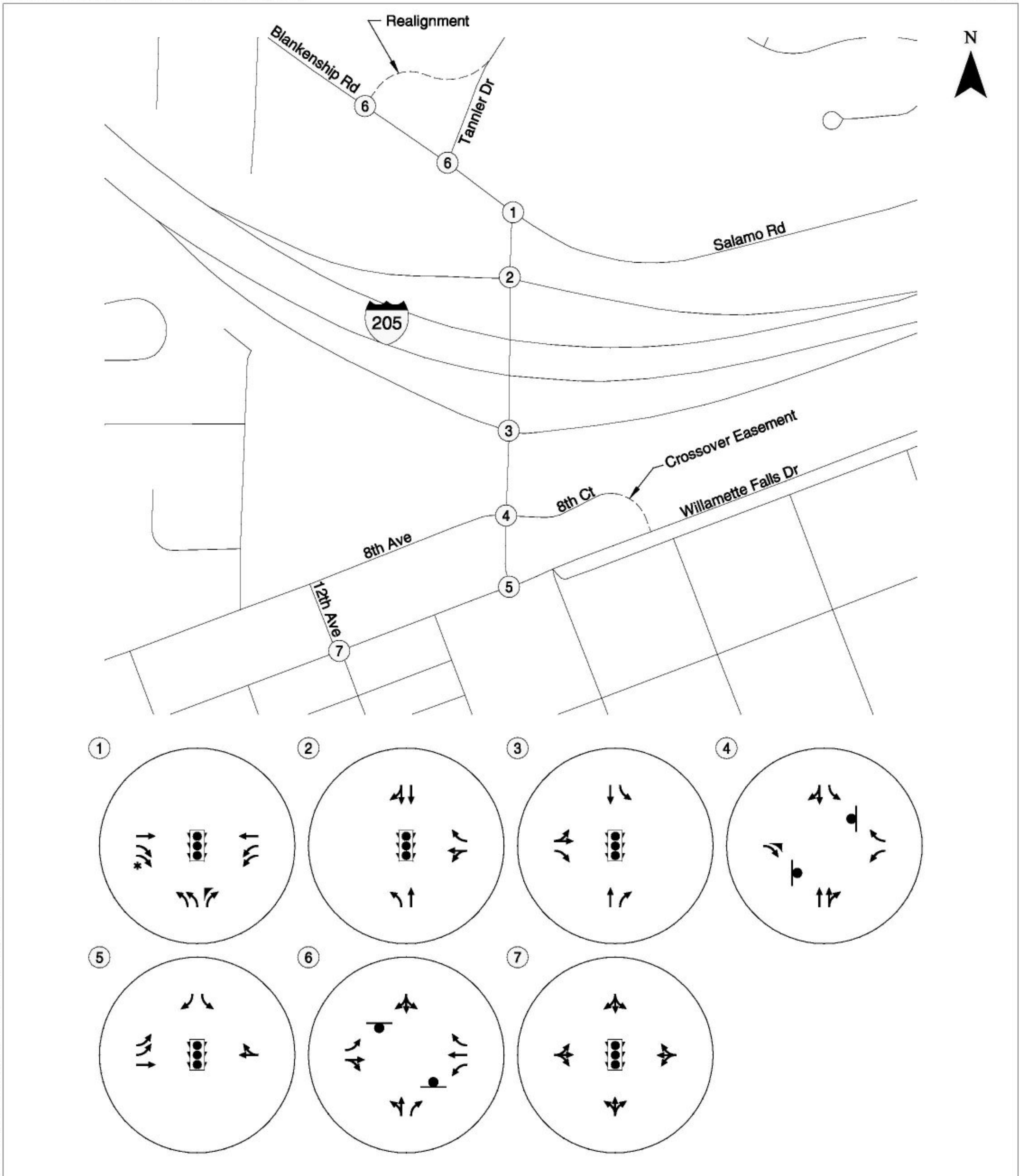
The following provides a summary of the improvements identified by the City and ODOT for the 10th Street Interchange Area.

- 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

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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	$800
M2	Tannler Street Realignment	Realign Tannler Street at Blankenship Road to align with the driveway located approximately 350 feet west	Medium	$900
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	$20
M5	Willamette Falls Drive/Ostman Road	Install all-way stop-control when warranted.	Medium	$20
M6	8th Avenue	Modify Dollar Street connection to reconnect to 8th Avenue, and provide alternative route for local trips.	Low	$90
M7	8th Avenue	Upgrade from 10th Street to 14th Street	Low	$300
M8	Fairview Way	Extend Fairview Way to Lazy River Drive	Low	$400
M9	Willamette Falls Drive	Upgrade from Tualatin River bridge to Dollar Street	Medium	$1,000
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	$300
M12	Rosemont Road/ Carriage Way	Install a center median on Rosemont Road to allow two-stage left turns from Carriage Way	Low	$1,500
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	$300
M15	Territorial Drive	Extend Territorial Drive to River Street	Low	$300
M16	Willamette Falls Drive/19th Street	Install all way stop control when warranted	Low	$20
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	**$4,540**
			TOTAL Low Priority Costs	**$4,930**
			TOTAL Program Costs (25 years)	**$15,160**

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).

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Motor Vehicle Plan Projects West Linn, Oregon

Figure 16

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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: USGS, ESRI, TANA, AND

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

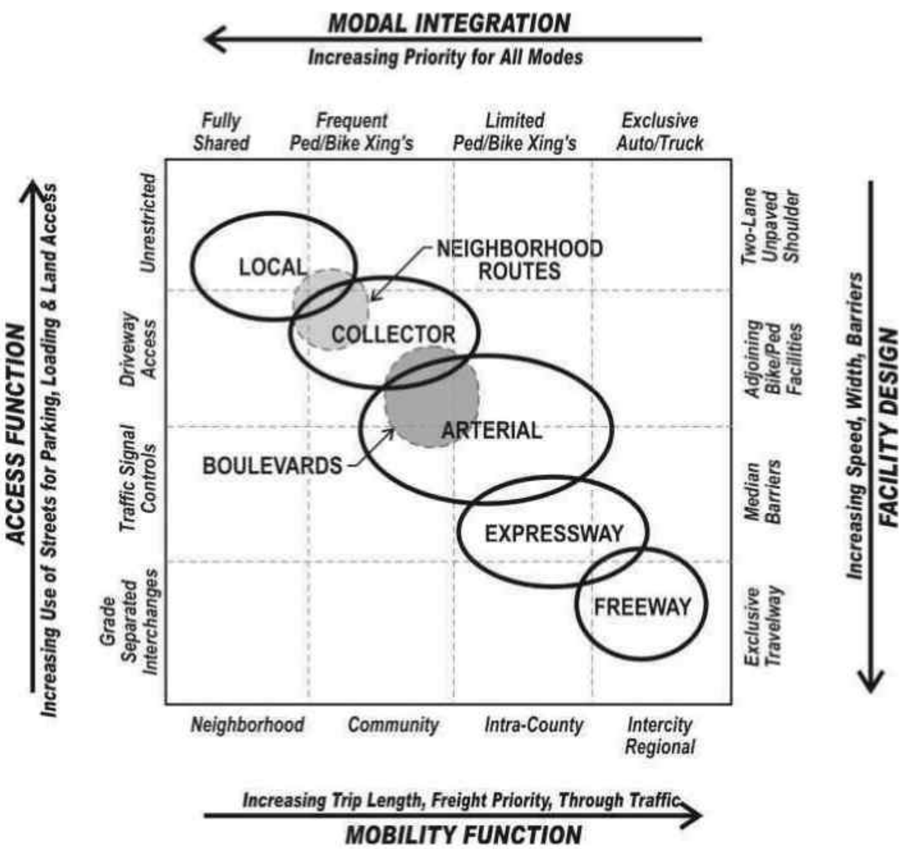


Exhibit 5 shows that as street classes progress from local to collector to arterial to freeway (top left corner to bottom right corner) the following occurs:

- 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.

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Roadway Functional Classification West Linn, Oregon

Figure 17

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

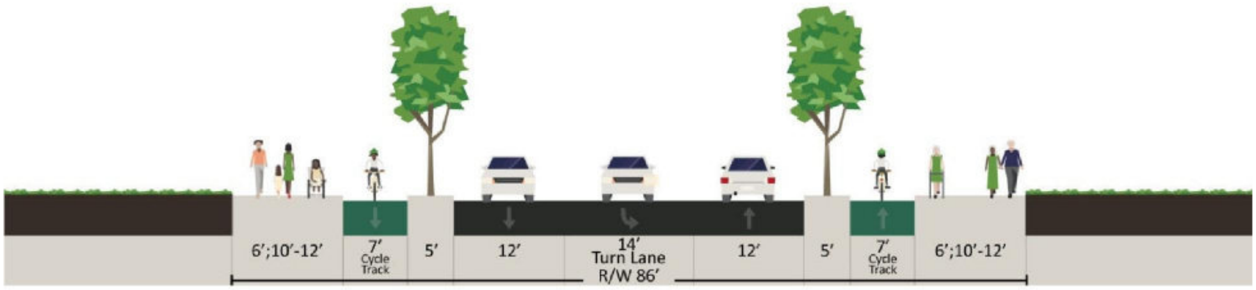
The design characteristics of streets in the city of West Linn need to meet the function and demand for each facility type. The actual design of a roadway can vary from segment to segment due to adjacent land uses and demands. The objective was to define a system that allows standardization of key characteristics 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.

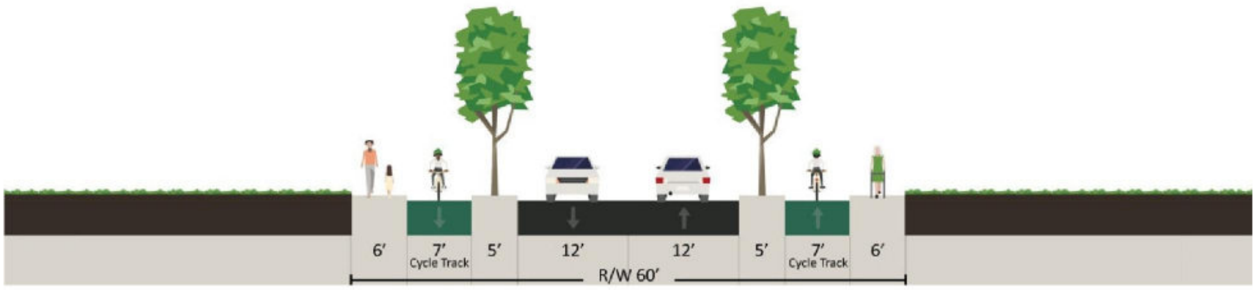
Table 26: City of West Linn Roadway Cross Section Standards

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

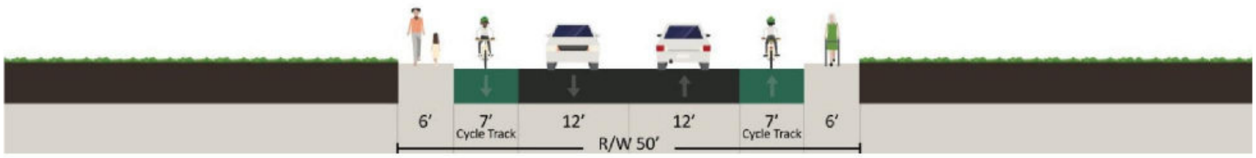
Exhibit 6: Minor Arterial Cross Sections



Minor Arterial with Median/Center Lane



Minor Arterial without Median/Center Lane



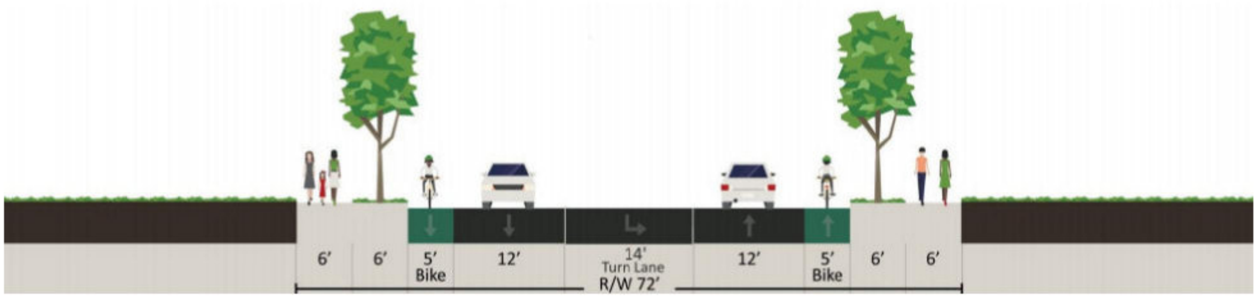
Minor Arterial Constrained

Table 27: Minor Arterial Cross Section Standards

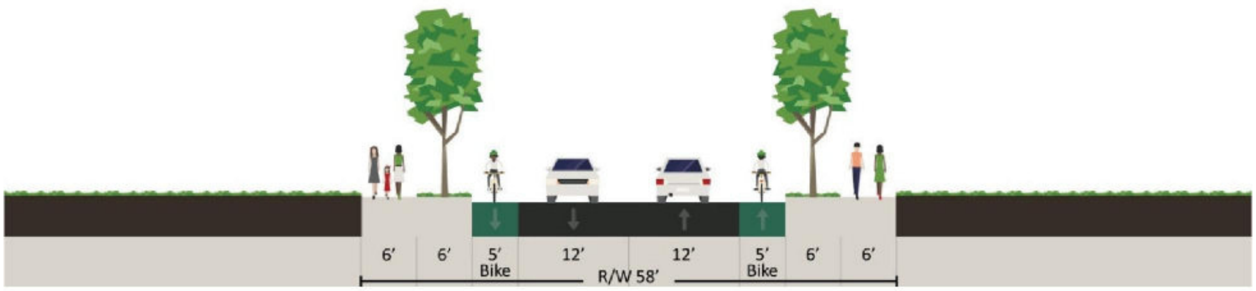
Standards[4]	Minor Arterial
Vehicle Lane Widths	11-12 feet
On-Street Parking	Limited[1]
Cycle Tracks[4]	7 feet[2]
Sidewalks	6 feet, 10-12 feet in commercial zones
Landscape Strips[4]	5-6 feet[2]
Median/Turn Lane Widths	14 feet[3]
Neighborhood Traffic Management	Not Appropriate

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.

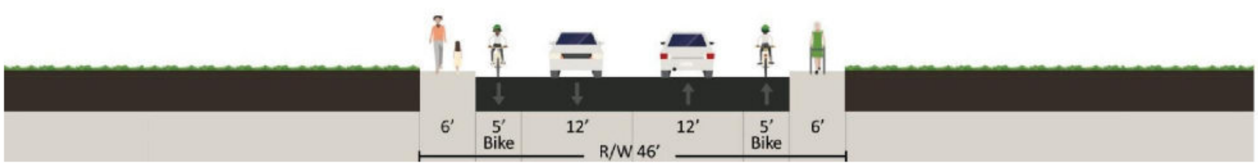
Exhibit 7: Collector Cross Sections



Collector with Median/Center Lane



Collector without Median/Center Lane



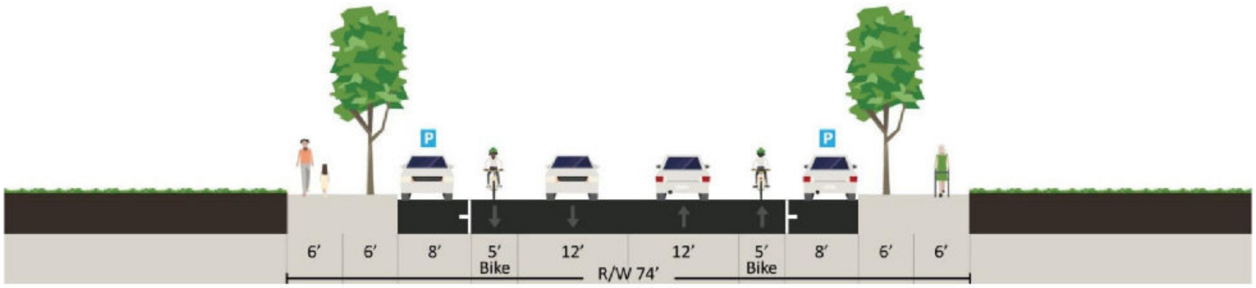
Collector Constrained

Table 28: Collector Cross Section Standards

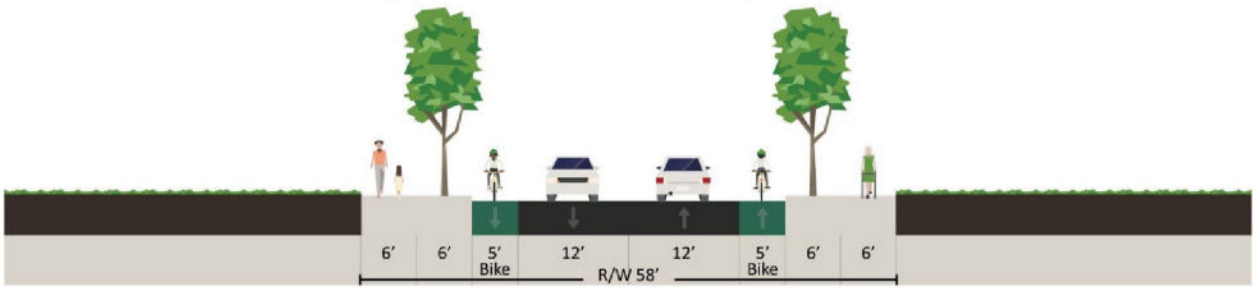
Standards[5]	Collector
Vehicle Lane Widths	10-12 feet
On-Street Parking	Optional (7-8 feet)[1]
Bike Lanes	5-6 feet[2,3]
Sidewalks	6 feet, 8 feet in commercial zones
Landscape Strips	5-6 feet[3]
Median/Turn Lane Widths	10-14 feet[4]
Neighborhood Traffic Management	Not Appropriate

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.

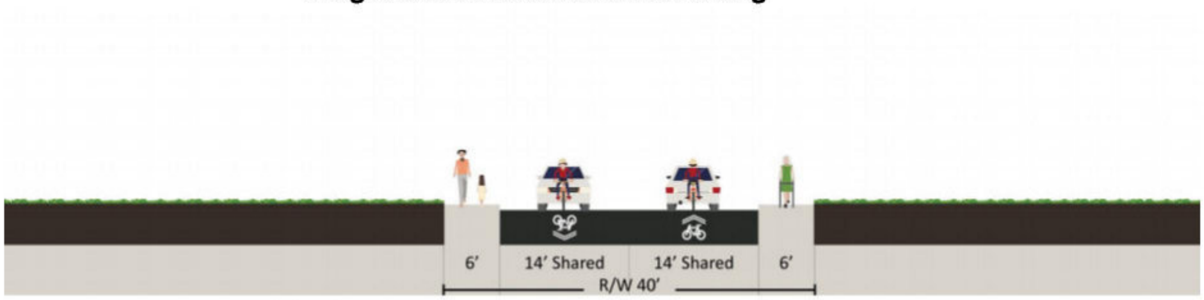
Exhibit 8: Neighborhood Route Cross Sections



Neighborhood Route with Parking & Bike Lane



Neighborhood Route without Parking



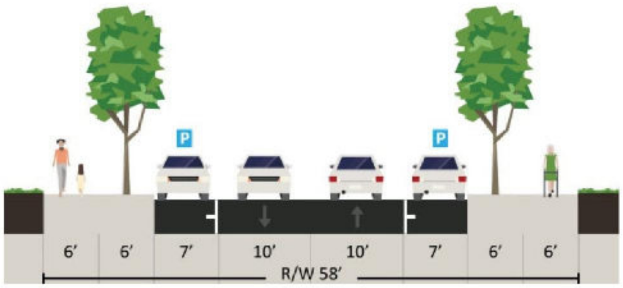
Neighborhood Route Constrained without Bike Lane

Table 29: Neighborhood Route Cross Section Standards

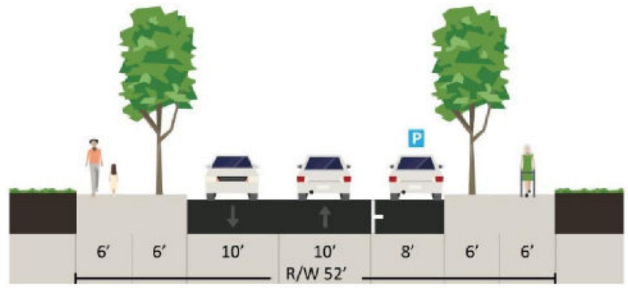
Standards[4]	Neighborhood Routes
Vehicle Lane Widths	10-12 feet
On-Street Parking	Optional (7-8 feet)[1]
Bike Lanes	5 feet[2]
Sidewalks	6 feet, 8 feet in commercial zones
Landscape Strips	6 feet[3]
Median/Turn Lane Widths	None
Neighborhood Traffic Management	At the discretion of the City Engineer

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.

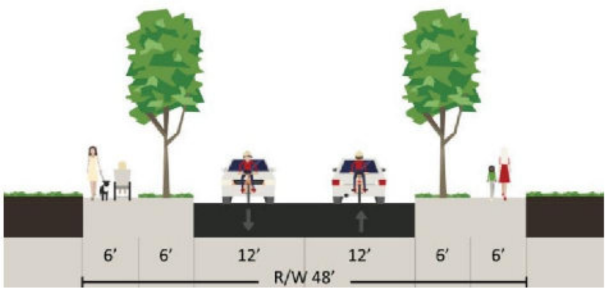
Exhibit 9: Local Street Cross Sections



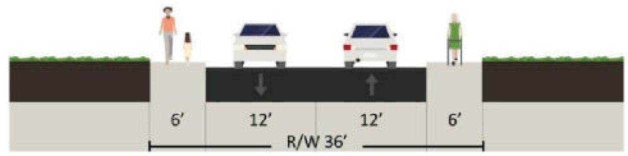
34-foot Local (Parking on Both Sides)



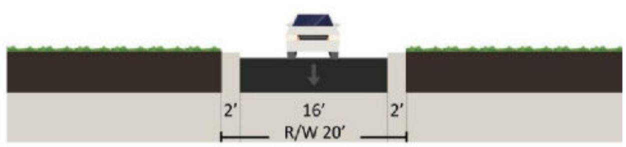
28-foot Local (Parking on One Side)



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.

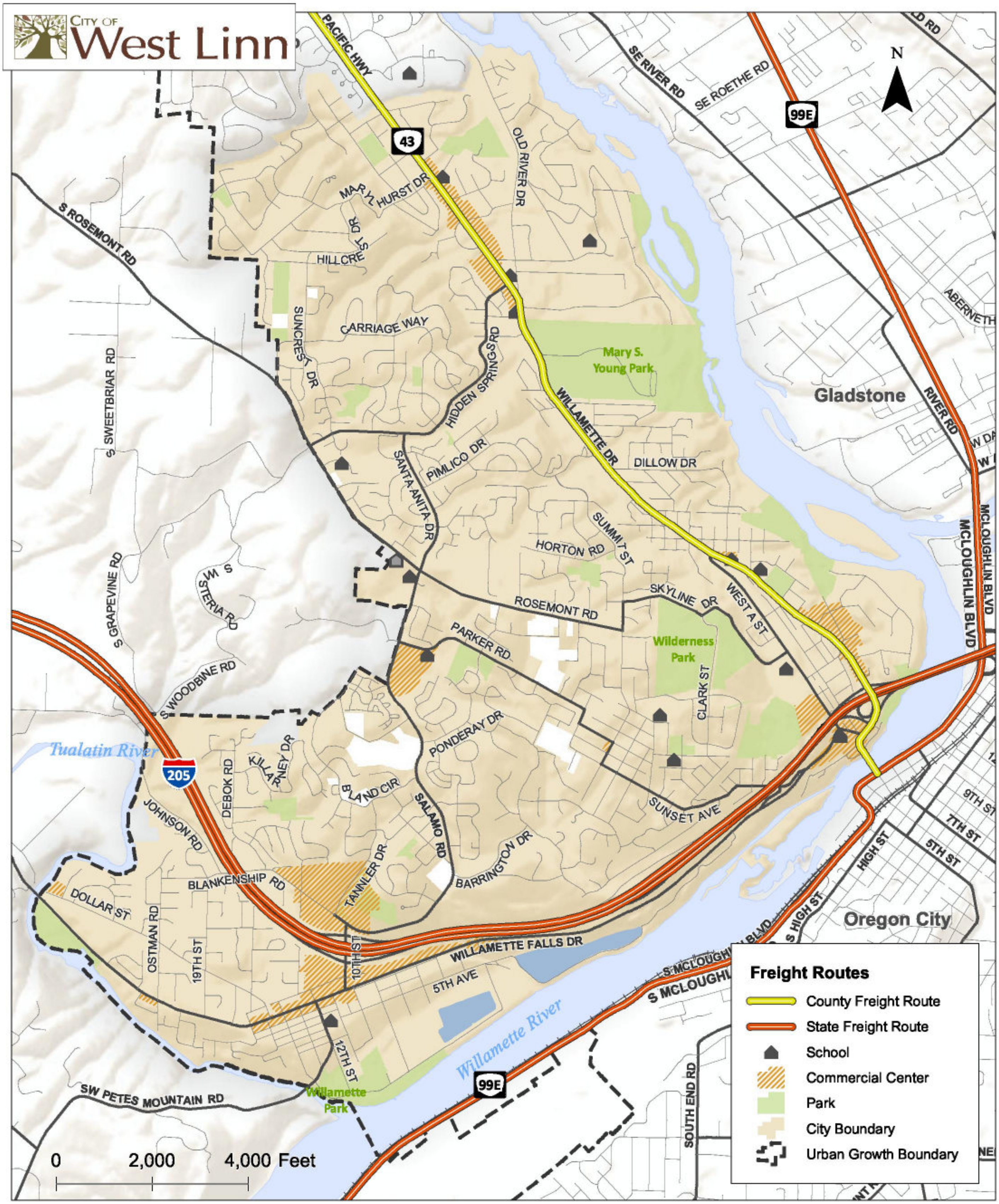
PIPELINE

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

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

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 $48.4 million over the 25-year period, including $26.2 million in high priority, $15.7 million in medium priority, and $6.5 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 $28.4 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**
Pedestrian	$13,110,000	$6,435,000	$660,000	**$20,205,000**
Bike	$7,365,000	$3,765,000	$275,000	**$11,405,000**
Transit	$0	$485,000	$0	**$485,000**
Motor Vehicle	$5,690,000	$4,540,000	$4,930,000	**$15,160,000**
Total Planned System	**$26,165,000**	**$15,660,000**	**$6,540,000**	**$48,365,000**
		Available Funding		
			Available Funding	$20,000,000
			Funding Gap	**$28,365,000**

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]

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[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 $26.2 million).

There is a $6.2 million funding gap for the City to complete the full list of high priority projects over the 25-year horizon. Approximately $6.2 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.

---

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

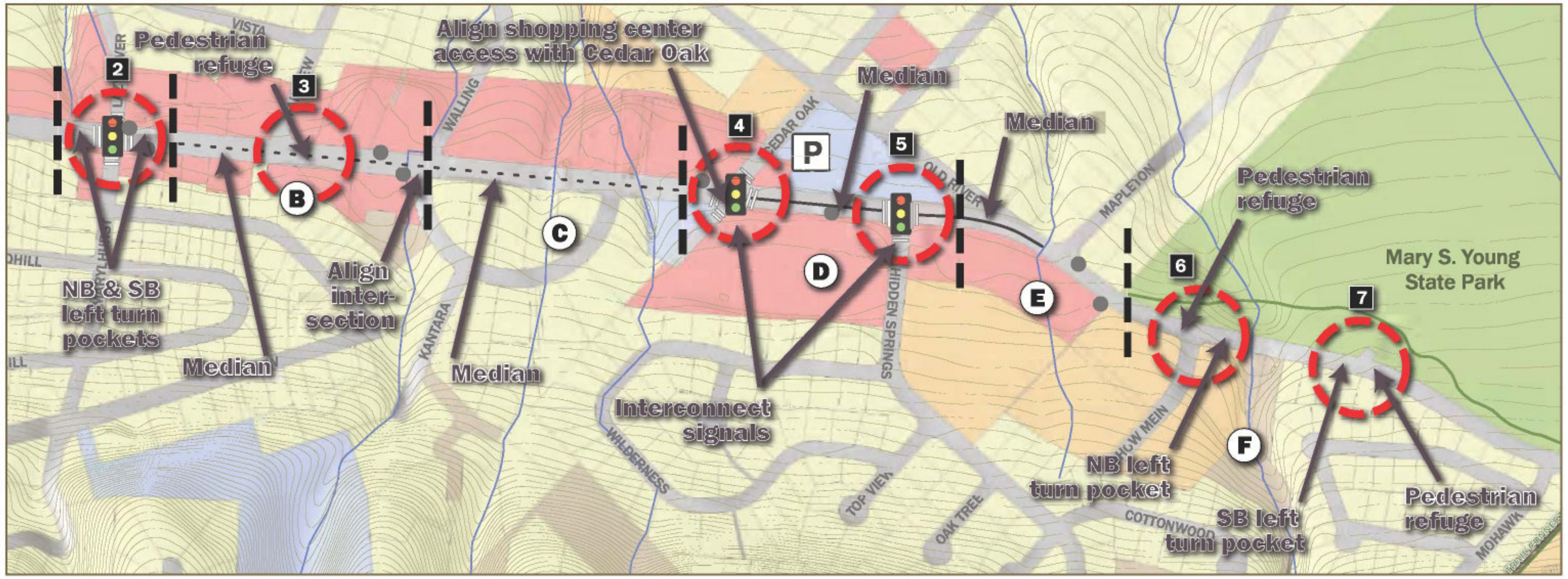
The fourth goal of the TSP is to maintain, protect and improve the existing transportation system. The City currently prioritizes roadway maintenance projects based on a Pavement Condition Index (PCI). Although the project team did not use pavement conditions to identify or prioritize projects for the 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

West Linn OR 43
Conceptual Design Plan



Final Report

January 4, 2008

City of West Linn, Oregon

WEST LINN TRANSPORTATION SYSTEM PLAN

Technical Appendix

March 28, 2016

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City of West Linn

City of West Linn Transportation System Plan Technical Appendix

West Linn, Oregon

March 28, 2016

City of West Linn
Transportation System Plan
Technical Appendix

West Linn, Oregon

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Project No. 17817.0

March 28, 2016

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The production of this Technical Appendix for the 2016 West Linn Transportation System Plan (TSP) has been the collective effort of the following people:

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CONTENTS

Appendix A
Historical Background Documents

Appendix A - Section 1
Technical Memoranda

CITY OF West Linn

Date: November 12, 2014

To: Project Management Team

From: Zach Pelz, Associate Planner and Gail Curtis, Senior Planner, ODOT

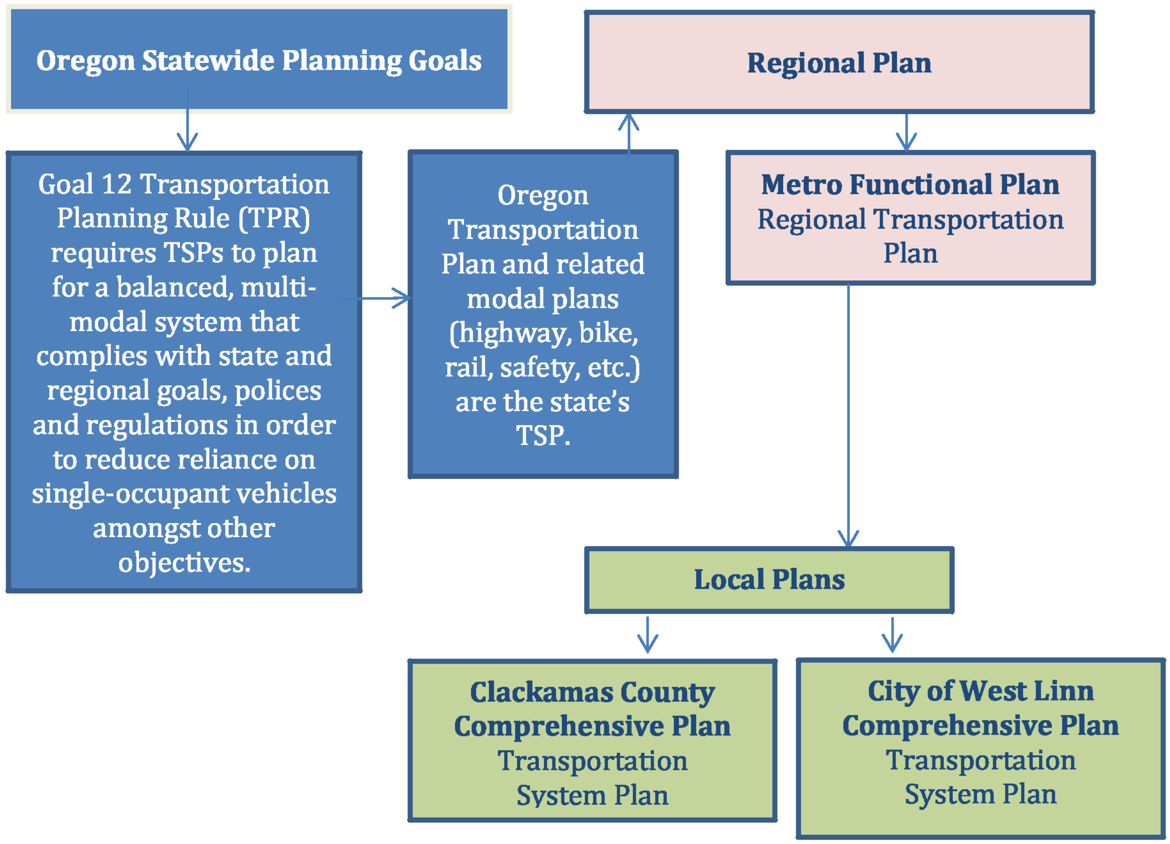
Subject: Draft City of West Linn Transportation System Plan Policy Framework, Tech Memo 1

This memorandum outlines the applicable policy and regulation for the City of West Linn Transportation System Plan (TSP) update. The TSP is being carried out by the City of West Linn with consultant assistance between fall, 2014 and fall, 2015. The policy framework has been prepared for the Project Management Team, Planning Commission, City Council, partner agencies and interested citizens.

The first section of the attached report describes the relationship of the applicable policies. The next section is the City of West Linn's current transportation and land use policies; followed by the Metro regional policies and regulations. The Metro policies and regulations are the primary driver behind the City's TSP update. They include specific regulatory actions and targets that the City must comply with. This section is followed by agency and service provider policies and lastly, the Oregon Planning Guidelines that are the statewide goals from which the regional and local policy flow.

Oregon's Transportation System Planning

Integration and Consistency



The TSP update is mandated as part of Oregon's Transportation Planning Rule (TPR) and must be consistent with adopted state and regional transportation and land use plans and policies.

The TSP policy framework will influence the selection of solutions and investments included in the TSP. While the State of Oregon's statewide planning and Portland Metro regional planning provide a strong policy and regulatory framework, the most relevant policy is the adopted, local policy which is expressed by the City of West Linn Comprehensive Plan and Imagine West Linn.[1] The TSP update is expected to result in new or modified City policy and implementing regulations in order to be in compliance with regional policy. Since the regional transportation and land use policies and regulations have been deemed consistent with state policy, regional policy becomes the focus of compliance for the TSP update.

Below is an overview the City policies relevant to the TSP.

[1] Adopted February 1994 and updated September 2008.

West Linn Comprehensive Plan

The West Linn Comprehensive Plan guides local land use decisions by establishing policies that implement Statewide Planning Goals and regional policy. Goal 12, the City's comprehensive plan transportation goal, identifies policies and actions the City will pursue to implement the TSP and the transportation-related guidance established in the State Planning Guidelines. This goal and related implementing regulations express how the City has chosen to become "consistent" with the relevant state and regional policies and regulations. A review of missing or incomplete City policies and implementing regulations will be identified as part of the TSP update.

Key City of West Linn Comprehensive Plan policies for the TSP Update include:

- Goal 12, Policy 1: Protect the entire rights-of-way of existing City streets for present and future public use;
- Policy 2: Design and construct transportation facilities to meet the requirements of the Americans with Disabilities Act;
- Policy 3: Require in-fill development in older neighborhoods to contribute to needed transportation facilities within their neighborhoods to the extent allowed by law;
- Policy 4: Improve traffic safety through a comprehensive program of engineering, education and enforcement;
- Policy 5: Take a more aggressive and proactive role in assuring federal, state, and regional decision makers consider West Linn's needs for improvements to I-205;
- Policy 6: Recognize the Metro designation of green corridors and their function to provide interurban connectivity. If future annexations include a green corridor, control access to the green corridor to maintain the function, capacity, and level of service of the facility and to enhance safety and minimize development pressures on rural reserves;
- Policy 8: Pursue an interconnected street system that provides connections between development and neighborhoods;
- Streets Policy 1: Establish and maintain transportation performance measures;
- Streets Policy 2: Protect neighborhoods from excessive through traffic;
- Streets Policy 6: Strive to maintain a safe and efficient transportation system by developing street standards, access management policies, incorporating traffic calming measures, and by making street maintenance a priority;
- Streets Policy 9: Develop neighborhood and local connections as identified in the West Linn TSP, to provide adequate circulation in and out of the neighborhoods;
- Streets Policy 10: Limit the use of cul-de-sacs and closed street systems;

- Streets Policy 11: Participate in regional discussions and planning for rail service or other modes of transportation that encourages regional transportation;
- Streets Policy 12: Seek funding and prioritize improvements that address: improvements for pedestrians and transit riders; improvements at high accident locations; street maintenance improvements; neighborhood traffic calming; and, improvements for bicyclists;
- Bicycle Policy 2: Promote a comprehensive network of bike paths, lanes, and routes that: connects the four commercial centers in Willamette, Bolton, Robinwood, and Tanner Basin; integrates with regional bicycle routes that traverse West Linn; provides connections to schools, recreation facilities, community centers, and transit facilities;
- Bicycle Policy 3: Stripe and sign bike lanes on all arterial and collector streets consistent with the TSP;
- Bicycle Policy 4: Require new commercial, industrial, and institutional development to provide on-site facilities for bicycle parking and storage; design new streets and retrofit older streets to enhance safety for bicyclists using the roadways;
- Pedestrian Policy 1: Promote a comprehensive network of pedestrian paths, lanes, and routes that connects the City's commercial centers, provides connections to schools, recreation facilities, community centers, and transit facilities; use off-street pedestrian short-cut pathways to provide routes where physical constraints or existing development preclude the construction of streets with sidewalks; provide safe, secure and desirable walkway routes, with a preferred spacing of no more than 330 feet; eliminate gaps in the existing walkway network and provide pedestrian linkages between neighborhoods;
- Pedestrian Policy 4: Promote safe pedestrian crossings;
- Pedestrian Policy 5: Where parks and recreation trails are coterminous with sidewalks, their design shall be enhanced to serve both transportation and recreational purposes;
- Pedestrian Policy 6: Construct sidewalks on all new streets in West Linn and review they City's walkway standards periodically to ensure consistency with regional, State and Federal standards;
- Pedestrian Policy 7: The City will enforce regulations requiring developers to include pedestrian facilities and walkway connections within proposed developments and to adjacent land uses and right-of-way in accordance with adopted policies and standards. Developer agreements for the provision of walkways will be implemented and enforced as needed;
- Transit Policy 1: Encourage expanded bus service along existing routes and new transit service to areas that currently are not served by transit;
- Transit Policy 4: Prioritize transit improvements that would increase overall mobility;
- Transit Policy 5: Promote a transit network that connects the City's commercial centers;

- Transit Policy 6: Establish that fixed route transit will use arterial and collector streets in West Linn;
- Transit Policy 7: Encourage the provision of regional transit service between West Linn and other suburban communities in the Metro Area;
- Transit Policy 8: Encourage the development of modes of mass transit for those residents of the City who must commute to jobs outside the City limits;
- Transit Policy 9: Work with TriMet to implement special needs transportation in accordance with the ADA;
- Transit Policy 10: Improve pedestrian and bike accessibility along major transit routes and to transit stations;
- Transit Policy 11: Support a public transit system that is accessible to the largest number of people by:
    - Locating transit oriented development around transit stations, along major transit routes, and in the designated town center areas;
    - Evaluating more intense and mixed-use zoning designations in areas around transit stations, along major transit routes, in the designated Town Centers, the OR 43 Corridor and along designated Main Street areas identified in the Metro 2040 Growth Concept Plan. Future proposed land use changes or rezoning that may result in increased residential densities, additional employment opportunities, or commercial activity should be located in these areas. The City will ensure that development is built consistently with the density allowed by zoning, while protecting the liability of existing neighborhoods;
    - Encourage the provision of housing for the elderly and moderate income families to be located in close proximity to public transit;
    - Coordinate with TriMet to ensure that transit opportunities are provided to employees at major employment; and,
    - Ensure that transit oriented public facilities are located along the primary transit network as defined in the RTP.
- Water Transportation Policy 1: Promote the continued use of the Willamette River and the Willamette Falls Locks for water transportation;
- Freight and Goods Movement Policy 2: Discourage non-local freight trips on Highway 43 through West Linn;
- Freight and Goods Movement Policy 3: Promote the river and locks as important elements of the City's transportation system for transporting goods as well as recreational use;
- Transportation Demand Management Policy 1: Encourage employers in West Linn to implement transportation demand management (TDM) measures to reduce commuter traffic and meet regional air quality and vehicle miles traveled (VMT) reductions;

- Transportation Demand Management Policy 2: Work with Metro area partners to provide marketing, technical and program assistance to major employers to Employee Commute Options program compliance;
- Transportation Demand Management Policy 3: Develop and implement a local TDM program that compliments, expands and improves access to regional transit pass subsidies, emergency rides home, and carpool/vanpool matching database to major employers;
- Transportation Demand Management Policy 4: Reduce VMT through mixed used development in planned centers and regulations that encourage home based businesses that are compatible with residential areas

Imagine West Linn Vision

The *Imagine West Linn Vision* was developed to talk about what may happen in West Linn if the City does nothing; what could happen with some planning and foresight; and how the City could achieve its desired future. This document provides the following principles to help guide decision-making:

- Sense of Community.
    - Assure that decisions account for their impact on the sense of community;
    - Continue to develop parks, natural areas, walkways, bike paths and greenways;
    - Assure neighborhoods, schools, City parks, neighborhood centers and the Willamette Falls Commercial Area are connected by safe pedestrian and bicycle pathways through the implementation of the Trails Master Plan;
    - Develop wide sidewalks with pedestrian amenities;
    - Pursue the creation of a local jitney transit system that maintains 15-minute headways and provides transportation to local destinations and connections to the regional transit system;
    - Encourage ride sharing and carpools by pairing up commuters and assist in-need persons with transportation to and from after school events and senior programs.
- Land Use and Quality of Life.
    - Adopt land use policies that allow for flexibility in housing types to meet the needs of the elderly and provide for affordable housing that is close to needed services and encourages modes of transportation beyond the single occupancy vehicle;
    - Plan for mixed-use development and increased development densities along transit corridors;
    - Implement the recommendations of the 10th Street Corridor Task Force, adopted as part of the 2008 TSP;
    - Continue requiring the dedication of trail corridors in an aggressive fashion. Trails along the Willamette and Tualatin River should be a priority;

  - Work with the School District to maintain the presence of neighborhood schools and encourage new schools to be built near population centers in which they are intended to serve and where possible, along transit lines.

- Transportation.
  - Implement green street technology as a means of slowing stormwater runoff and improving water quality in area streams;
  - Continue to make improvements in the planning and design of streets, trails and buildings to promote alternative modes of transportation and to reduce the miles traveled by automobile;
  - Coordinate with ODOT in the implementation of the Highway 43 Conceptual Design Plan;
  - Encourage the expansion of transit in West Linn and advocate for West Linn's interest in transit connections to Milwaukie and Lake Oswego as those communities pursue enhanced bus, light rail and/or street car service;
  - Support a transit link with the proposed Willamette Valley high-speed rail line station in Oregon City;
  - Plan for the provision of convenience services and public meeting places within easy walking distance of all West Linn residences;
  - Promote street connections where possible;
  - Reduce vehicle miles traveled through mixed-use development in planned centers.

2008 West Linn Transportation Systems Plan

The 2008 West Linn Transportation System Plan (TSP) is a supplemental document to the City's Comprehensive Plan and includes additional guidance for transportation-related decision-making. The TSP includes a master plan (complete list of identified project needs) and action plan (fiscally constrained list of prioritized transportation project) for bicycle, pedestrian, motor vehicle, public transit, and freight modes of travel as well as more detailed plans for the Highway 43 Corridor (Highway 43 Concept Plan) and the 10th Street/I-205 Interchange area.

The TSP fiscally constrained project list includes 13 pedestrian projects (included in the Highway 43 Concept Plan), two bicycle lane projects, and 20 motor vehicle projects. The TSP also directs the City to make investments that: improve transit service and amenities at major stops, increase density adjacent to public transit, provide more local transit service and that decrease transit vehicle headways. The Highway 43 Concept Plan recommends streetscape and performance improvements for vehicles, pedestrians and bicycles – including raised bicycle lanes, continuous sidewalks, a center median, left turn lanes, and improved pedestrian crossings and planter strips in a variety of configurations from Arbor Drive to Willamette Falls Drive.

The City has completed more recent transportation planning work not reflected in the current TSP. This work includes a parking management plan for the Willamette Commercial Area and Land Use Visioning for the Highway 43 and Willamette Falls Drive Corridor. The Willamette Area Parking Management Plan identified opportunities for low-cost solutions to current and short term parking needs in this area, including; wayfinding and improved parking for special events; discussions with local business owners about possibilities for shared parking; and, working with employers to encourage employees to park away from the prime parking spaces on Willamette Falls Drive.

The Highway 43 and Willamette Falls Drive Vision work was completed in 2012, and revealed public support for higher density mixed-use centers on Highway 43 and Willamette Falls Drive that would support frequent public transit, walking and bicycling and that were connected by safe and convenient bicycle, pedestrian and motor vehicle corridors. (City of West Linn, 2008)

City of West Linn Capital Improvement Plan

The Capital Improvement Plan (CIP) establishes guidance and planning for West Linn's investments in capital infrastructure for a six-year period. At the foundation of the CIP are the City's master plan documents (Parks, Library, Water, Sewer, Storm, Transportation), which are an extension of the City's Comprehensive Plan. Projects within the CIP are prioritized and matched with projections of future revenues. While the inclusion of projects in the CIP does not necessarily reflect a budgeted spending commitment, they are considered a priority based on anticipated future revenues. Below is a list of funded and unfunded transportation-related projects included in the 2014-2019 CIP:

- <u>Parks fund.</u> West Linn's Parks and Recreation Department strives to promote a healthy community through safe, attractive, and well-maintained parks, facilities, trails, and open spaces. The City has more than 600 acres of park land, approximately 150 acres of it is developed. The City's parks vary from active-oriented parks with opportunities for sports, picnicking, and playing on playgrounds, to passive-oriented parks with walking, biking, and wildlife-watching possibilities.

  The Parks and Recration Fund is a special revenue fund used to account for the maintenance and operation of the City's parks and open spaces, recreation activities and special events in the community. Principal sources of revenue include an allocation of the City's permanent property tax rate, a monthly maintenance fee charged to all residents, and program fees.

  Capital improvements for the Parks and Recreation Department are based on citizen input, maintenance needs, approved site master plans, and the 2007 Parks, Recreation and Open Space Master plan. The Master Plan addresses the park, facility and service needs ot the community into the future. Specific projects are vetted through public involvement and the land use process to create individual site master plans.

  - *Funded* - $10,000 annually ($60,000 total) for accessibility upgrades that provide access in park areas and facilities for people with disabilities;
  - *Unfunded* - City-wide trail improvements (amount to be determined at a later date);

  - *Unfunded* - $450,000 in Fiscal Year 2017, 2018, and 2019 ($1,350,000 total) for Regional Trail System improvements;
  - *Funded* - $231,000 in FY 2014 and $100,000 in FY 2015 for construction of the Willamette River Trail.
- Streets fund. West Linn's Transportation System includes over 215 lane miles of streets, 120 miles of sidewalk and approximately 700 acres of right-of-way that must be constantly maintained and upgraded to safely and efficiently serve pedestrians, bicyclists, and motor vehicles. Revenue for the Street fund comes from gas taxes, street maintenance fees, franchise fees, and occasional grant funding.
  - *Unfunded* - $5.23 million in FY 2019 for 10th Street/I-205 Corridor Improvements;
  - *Funded* - $673,000 between FY 2014 and FY 2019 for various sidewalk and bike improvement projects;
  - *Funded* - $47,000 annually ($282,000 total) between FY 2014 and 2019 for street crack sealing;
  - *Funded* - $3.77 million between FY 2014 and 2019 for pavement maintenance;
  - *Funded* - $158,000 between FY 2014 and 2019 for annual striping and marking of roadways;
  - *Funded* - $1.369 million between FY 2014 and 2019 for slurry sealing;
  - *Funded* - $1.3 million between FY 2014 and 2019 for TSP action plan projects, including a signal at the Rosemont Road/Salamo Road intersection.;
  - *Unfunded* - $6.62 million between FY 2016 and 2019 for TSP action plan projects;
  - *Funded* - $200,000 in FY 2014 to update the City's TSP. (City of West Linn, 2014)

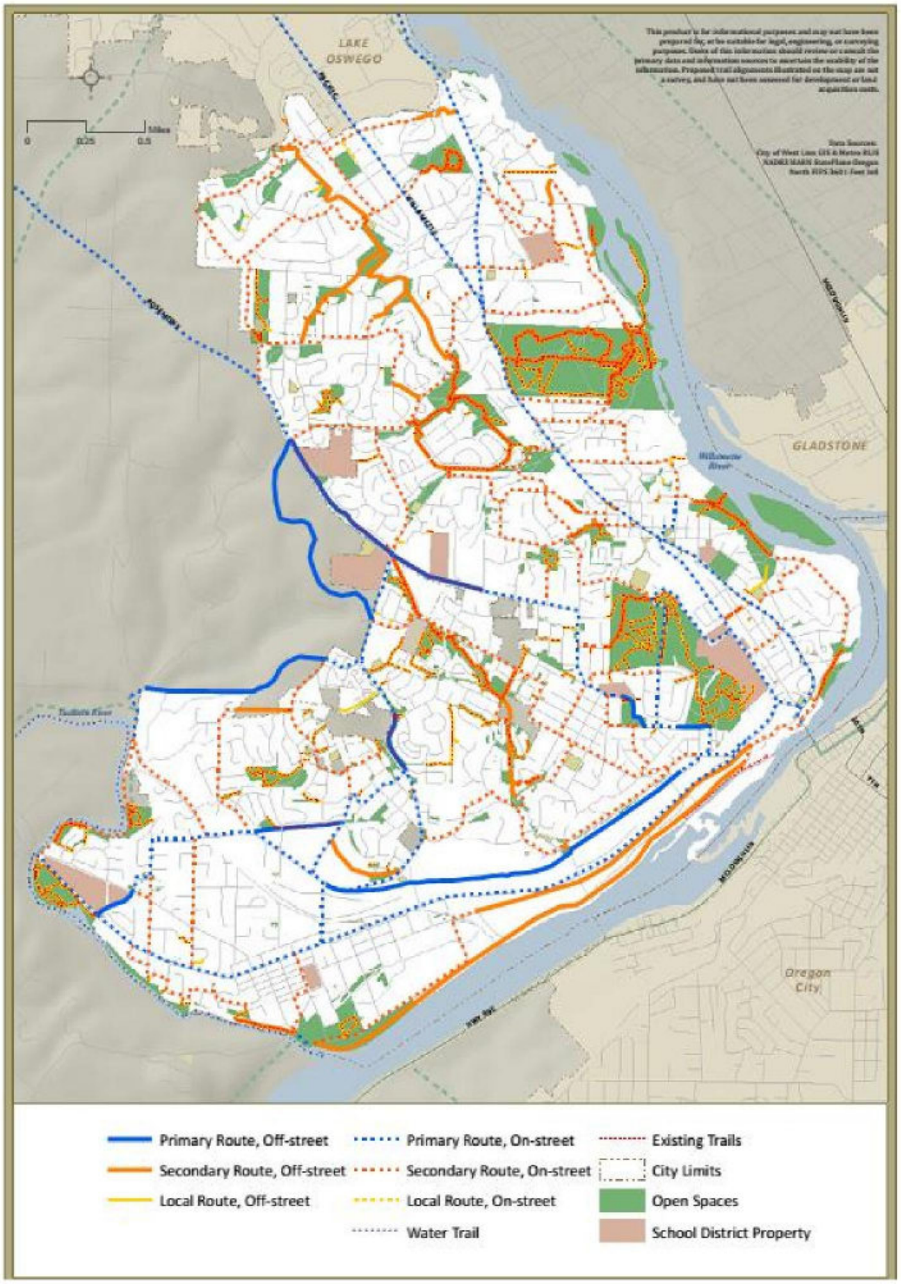
City of West Linn 2013 Trails System Master Plan

Over the past three decades, West Linn residents have expressed a desire for a city-wide system of trails as part of the development of various adopted parks and recreation plans. The West Linn Trails System Master Plan (TMP) is the next step in advancing the policies and recommendations from past planning efforts. The intent of the TMP is to guide development of a consistent system of trails for multiple users in the City of West Linn, while incorporating and respecting the distinct settings and experiences that residents value. The TMP recommends the following relevant actions:

- Conceptual Trail System. The TMP resulted in the creation of a conceptual trails system, consisting of primary, secondary and local routes, which when completed, will provide a total of 87.5 miles of on- and off-street trail routes. The conceptual plan proposes 44.6 miles of on-street trails, designed almost exclusively as primary and secondary routes;
- Coordinate with the Transportation System Plan. The on-street recommendations from the Trails Plan should serve as the basis for the analysis regarding non-motorized modes in the

TSP. Additionally, design guidelines should be coordinated between on- and off-street facilities;

- Route prioritization. Generally, alignments under public ownership should receive the highest priority for development while alignments not under public ownership receive the lowest priority;
- Design guidelines for on-street facilities:
  - Except in cases of high-demand, all facilities should be designed as shared pedestrian and bicycle travel ways;
  - The design of public street and trail intersections should allow for safe crossing of pedestrians and cyclists and meet accessibility guidelines;
  - Trails should be designed to minimize curb cuts;
  - Trails should be designed to respond to adjacent land uses and access (e.g., routes adjacent to higher density development with a mix of land uses may merit wider than the minimum travel width to accommodate the higher volume of users);
  - Depending on the available width of the right-of-way, other facility design modifications should be considered such as reducing automobile travel lanes, on-street parking and other traffic calming techniques;
  - Trails signage should include the posted speed limit on shared routes, as well as striping, painted markings or surface material change that cautions trail users of approaching stops, intersections, curves and other situations where speed should be reduced.
- Education and awareness. The City can help achieve its goal of increasing walking and biking through increased public education that promotes use of the trail system as an alternative to driving. Additionally, signage and wayfinding will help users find trails and navigate confusing intersections or road crossings.
- Trail monitoring and maintenance. Trail users should have an easy and accessible resource to report trail issues or provide comments such as an online form monitored by park and public works staff. (City of West Linn, 2013)



2014 City of West Linn Economic Opportunities Analysis (TBD)

This plan is currently under development with an anticipated completion date of spring 2015.

City of West Linn Arch Bridge Master Plan (TBD)

This plan is currently under development with an anticipated completion date of summer 2015.

City of West Linn Pavement Management Program Budget Options Report, June 2011

This report 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's street network. In 2011, the overall pavement condition index (PCI) was 62 (on a scale of 0-100), down from 65 in 2009. At the current funding level, the citywide PCI is anticipated to be at 54 in 2016. As streets fall below a PCI of 50 (poor condition) they will require more extensive treatment – such as thick overlays and full reconstructions – that are more expensive than slurry seals and thin overlays that could be applied to roadways in better condition.

The report presents four budget scenarios, ranging from the current projected funding level – of $300,000 over the next five years – to $18.7 million over five years (the amount required to bring the street network into Good condition).

In 2013, the West Linn City Council voted to increase the City's street maintenance fee on all residential users by 75 percent; with a 5 percent increase over the next four fiscal years. The City Council is currently considering whether to raise the street fee for non-residential users. (City of West Linn, 2011)

Metro Regional Transportation Plan Compliance

Metro 2014 Regional Transportation Plan (RTP) Update

Between 2010 and 2040, the region is expected to host nearly 1 million new residents. Where these people live and work and how they get around will have a significant impact on the livability of the region. Implicit in the 2040 Regional Growth Concept (the Regional Comprehensive Plan, which provides direction for the RTP) is the understanding that compact development is more sustainable, more livable and more fiscally responsible than low-density sprawl, and will help reduce the region's carbon footprint. In coming decades, the region will also need to find ways to accommodate a population that is older, more culturally diverse and do so with declining state and federal revenues.

Table 1.1

Forecasted Growth in Employment by County[6]

County	2010	2040	Increase
Portland Central City and Neighborhoods	374,342	531,209	156,867 (42%)
East Multnomah County	44,822	95,501	50,679 (113%)
Multnomah County	419,164	626,710	207,546 (50%)
Clackamas County	137,946	227,483	89,537 (65%)
Washington County	232,019	422,236	190,217 (82%)
Three-county sub-total	789,129	1,276,429	487,300 (38%)
Clark County (Wash.)	127,267	237,411	110,144 (87%)
Four-county total	**916,396**	**1,513,840**	**597,444 (65%)**

Source: Metro

Table 1.7

Share of Residents Commuting to another County for Work: 2000 and 2012

County	2000	2012
Clackamas County	51%	47%
Clark County	35%	32%
Multnomah County	22%	18%
Washington County	32%	30%

Table 1.6

Forecasted Population Growth by County (2010-2040)

County	2010	2040	Increase
Multnomah County			
Portland Central City and Neighborhoods	583,776	832,378	248,602 (43%)
East Multnomah County	151,847	195,614	43,767 (29%)
Clackamas County	401,757	616,309	214,552 (53%)
Washington County	503,656	719,026	215,370 (43%)
Three-county sub-total	1,641,036	2,363,327	722,291 (44%)
Clark County (Wash.)	425,363	620,193	194,830 (46%)
Four-county total	**2,066,399**	**2,983,520**	**917,121 (44%)**

Source: Metro 2040 Regional forecast

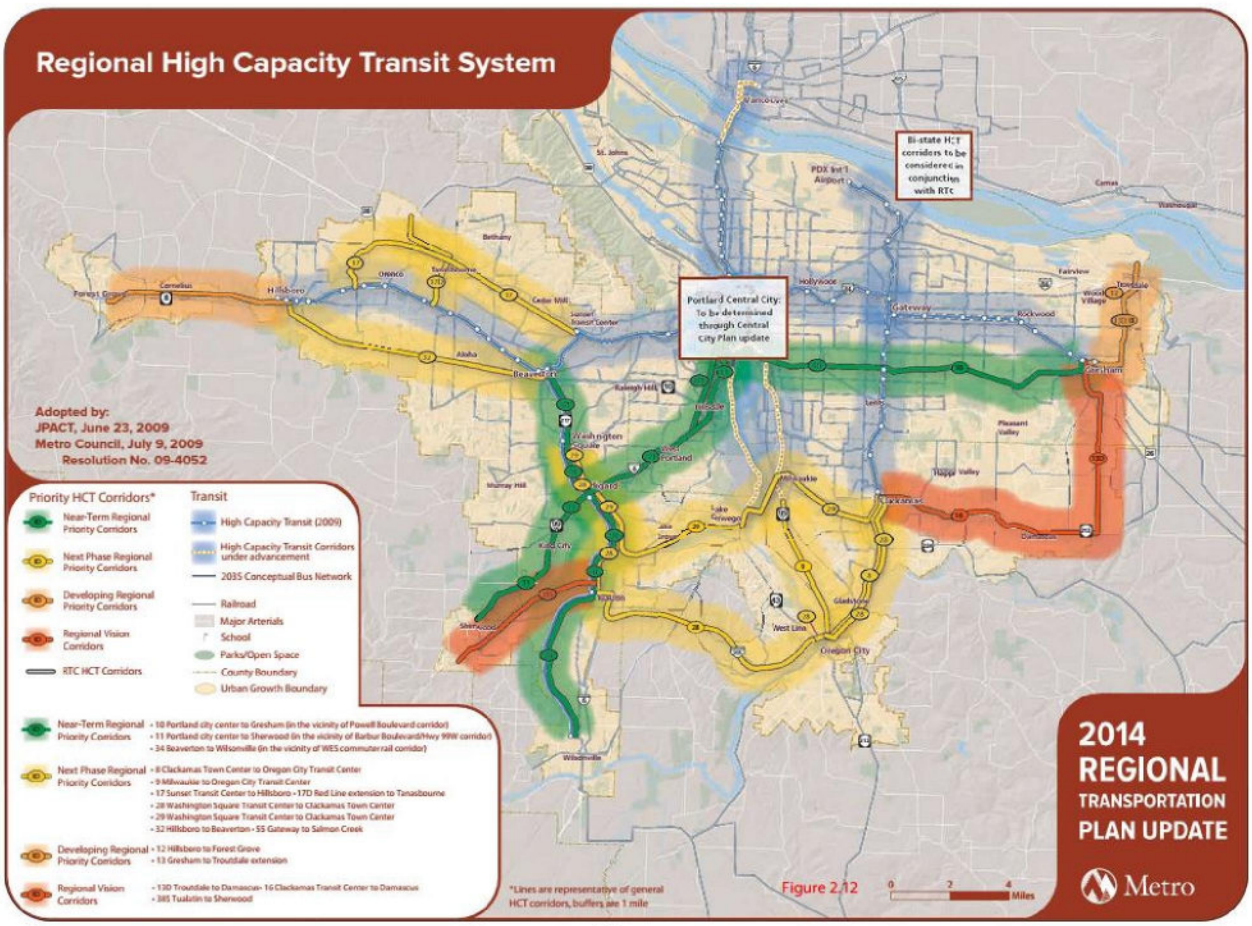
Table 2.12
Priority infrastructure investment strategies

	Developed Areas	Developing Areas	Undeveloped Areas
Stage of Development	Built-out areas with most new housing and jobs accommodated through infill, redevelopment and brownfields development.	Redevelopable and developable areas, with most new housing and jobs being accommodated through infill, redevelopment, and greenfield development.	More recent additions to the urban growth boundary, with most new housing and jobs accommodated through greenfield development.
Infrastructure Investment Strategies	Operations, maintenance and preservation of existing transportation assets. Managing the existing transportation system to optimize performance for all modes of travel. Leveraging infill, redevelopment and use of brownfields. Addressing bottlenecks and improving system connectivity to address barriers and safety deficiencies. Providing a multi-modal urban transportation system. Completing local street connections needed to complement the arterial street network.	Operations, maintenance and preservation of existing transportation assets. Preserving right-of-way for future transportation system. Managing the existing transportation system to optimize performance for all modes of travel. Leveraging infill, redevelopment and use of brownfields Providing a multi-modal urban transportation system. Focusing on bottlenecks and improving system connectivity to address barriers and safety deficiencies. Completing local street connections needed to complement the arterial network.	Operations, maintenance and preservation of existing transportation assets. Preserving right-of-way for future transportation system. Providing a multi-modal urban transportation system. Managing new transportation system investments to optimize performance for all modes of travel. Focusing on bottlenecks and improving system connectivity to address barriers and safety deficiencies. Completing local street connections needed to complement the arterial street network.

The 2014 RTP establishes the following priorities:

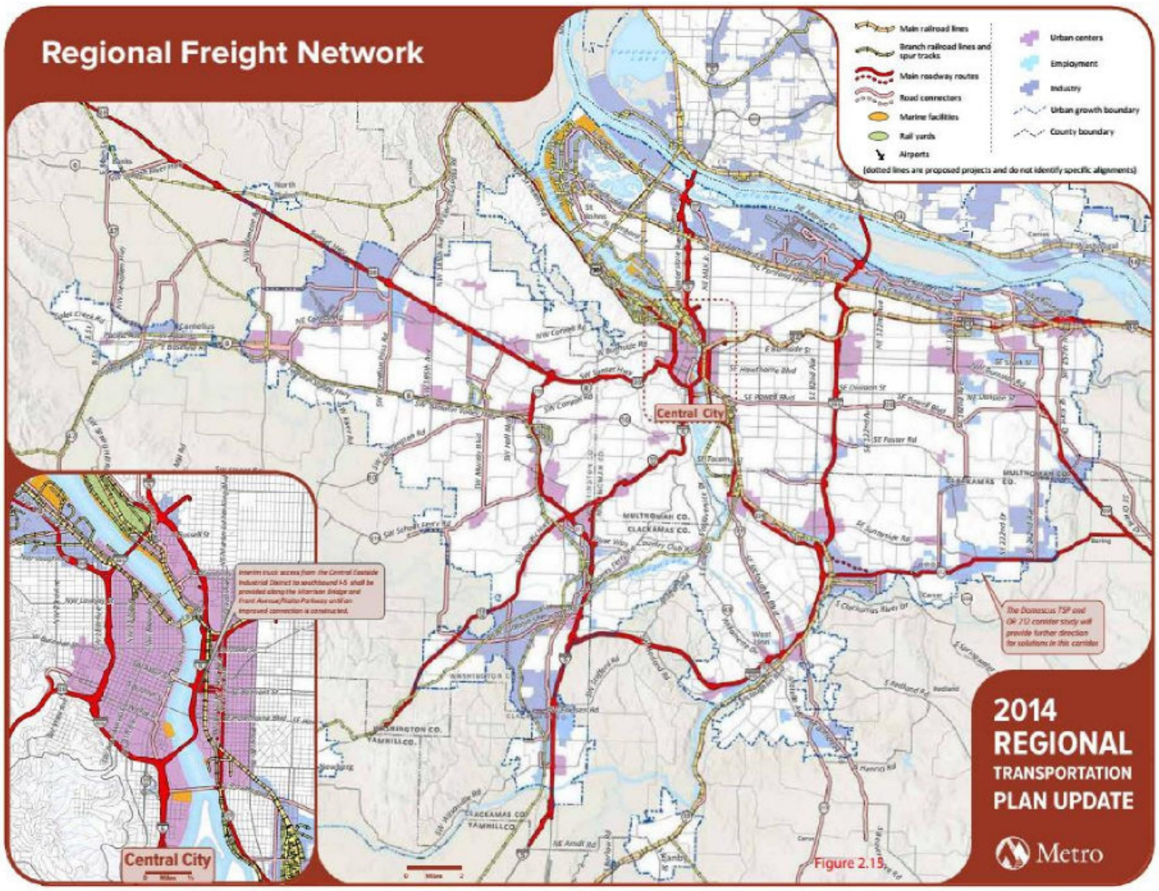
- Build a well-connected network of complete streets that prioritize safe and convenient pedestrian and bicycle access;
- Improve local and collector street connectivity
    - Local streets should be spaced no more than 530-feet in new residential and mixed-use areas;
    - Cul-de-sacs should be limited to 200-feet in length;
    - Encourage local traffic to use local and collector streets to minimize local travel on regional arterial streets.

- Maximize system operations by implementing management strategies prior to building new motor vehicle capacity, where appropriate.
- Transit:
  - Build the total network and transit supportive land uses to leverage investments. Provide frequent, reliable bus and rail service during all times of the day, every day of the week. Improve the environment where people walk to and from transit facilities. Emphasize walking and biking to transit and deemphasize driving to transit.
  - Expand high capacity transit:
    - Expand regional and local frequent service transit;
    - Improve local service transit;
    - Support expanded commuter rail and intercity transit service to neighboring communities;
    - Improve pedestrian and bicycle access to transit.
    - West Linn is adjacent to two "Next-phase Regional Priority Corridors" from the Metro Regional High Capacity Transit Plan. Project number 28 anticipates a connection between the Washington Square Transit Center and the Clackamas Town Center in the vicinity of I-205 and project number 9 is



an extension of the nearly completed Milwaukie Light Rail Line that would extend some form of High Capacity transit service from Milwaukie to the Oregon City Transit Center via Highway 99E.

- Regional Freight: Population and employment growth in the Portland Metropolitan region (917,000 new residents and 587,000 new workers) between 2010 and 2040 is anticipated to contribute to an additional $730 billion in traded sector goods and will significantly



increase the volume of local freight deliveries along regional and local freight routes. In addition, the Portland Metropolitan region has a higher than average dependency on traded sector industries; in particular, computer/electronic products, wholesale distribution services, metals, forestry, wood and paper. It is critical that the region prioritize improved freight system operations to reduce delay, increase freight reliability and provide cost-effective choices for shippers. I-205 serves as the sole freight route near West Linn.

- Active Transportation:
  - <u>Biking</u>
    - Make walking and biking the most convenient, safe and enjoyable transportation choices for short trips less than three miles (45 percent of all

trips in the region are less than three miles and 15 percent are less than 1 mile);

- Build an interconnected regional network of bicycle routes and districts integrated with transit and nature that prioritizes seamless, safe, convenient and comfortable access to urban centers and essential daily needs, including schools and jobs, for all ages and abilities;
- Build a green ribbon of bicycle parkways as part of the region's integrated mobility strategy (Highway 43, Salamo Rd., Stafford Rd., and Willamette Falls Drive are identified in the regional bicycle parkway network);
- Improve bike-transit connections;
- Ensure that the regional bicycle and pedestrian network equitably serves all people.

- Pedestrians
  - Make walking and biking the most convenient, safe and enjoyable transportation choice for short trips less than three miles;
  - Build a well-connected network of pedestrian routes, including safe street crossings, integrated with transit and nature that prioritize seamless, safe, convenient and comfortable access to urban centers and essential daily needs, including schools and jobs, for all ages and abilities;
  - Create walkable downtowns, centers, main streets and station communities that prioritize safe, convenient and comfortable pedestrian access for all ages and abilities;
  - Improve pedestrian access to transit;
  - Ensure that the regional pedestrian network equitably serves all people.
- Transportation System Management and Operations (TSMO)
  - Use advanced technologies, pricing strategies and other tools to actively manage the transportation system;
  - Provide comprehensive real-time traveler information to people and businesses;
  - Improve incident detection and clearance times on the region's transit, arterial and throughway networks;
  - Implement incentives and programs to increase awareness of travel options.

Table 2.9
Examples of TSMO strategies by investment area

Multimodal Traffic Management	Traffic Incident Management
• Traffic signal coordination • Transit signal priority treatment • Detection and countdown timers for bicycles and pedestrians	• Improve surveillance • Expand incident management teams and training
Traveler Information	**Transportation Demand Management**
• Real-time traveler information for freeways and arterials • Enhance traveler information tools	• Ridesharing • Collaborative marketing (e.g., Drive Less Save more campaign) • Individualized marketing (e.g. SmartTrips program) • Transportation Management Associations • Employer outreach

Metro 2035 Regional Transportation Functional Plan

The Regional Transportation Functional Plan implements the goals and policies established in the 2035 RTP (improved public health; safety and security for all; attraction of jobs and housing to downtowns, main streets, corridors and employment areas; creating vibrant, livable communities, sustaining the region's economic competitiveness and prosperity; efficient management to maximize use of the existing transportation system; completion of the transportation system for all modes of travel to expand transportation choices; increasing use of the transit, pedestrian and bicycle systems; ensuring equity and affordable transportation choices; improving freight reliability; reducing vehicle miles traveled and resulting emissions; and promoting environmental and fiscal stewardship and accountability) and sets minimum standards for local governments to adopt as part of their local TSP development.

Local implementation of the RTP will result in a more comprehensive approach for implementing the 2040 Growth Concept, help communities achieve their aspirations for growth and support current and future efforts to achieve the principal objectives of the RTP and address climate change. If a TSP is consistent with the RTFP, Metro shall deem it consistent with the RTP. (Metro, 2010)

Metro Active Transportation Plan

The Active Transportation Plan (ATP) identifies a vision, policies and actions to complete a seamless network of on- and off-street pathways and districts connecting the region integrating walking, biking, and public transit. The ATP strives to make it easier for people to walk and ride a bike and access transit to get to work, school, to parks and other destinations by updating the pedestrian and bicycle policies in the 2014 Regional Transportation Plan. Key ATP objectives priorities include:

- Complete the active transportation network
- Make it safe to walk and ride a bicycle for transportation
- Ensure that the regional active transportation network equitably serves all people
- Support populations that are already driving less by making it easier to drive less
- Increase levels of funding dedicated to active transportation projects and programs and develop a pipeline of projects
- Better integrate and connect transit, walking and bicycle networks
- Make walking and bicycling the most convenient, safe and enjoyable choices for short trips less than three miles
- Utilize data and analyses to guide transportation investments
- Include bicycle and walking improvement in roadway preservation projects whenever possible to make all streets in the region complete streets

Table 2: ATP target and current and potential active transportation mode shares for all trips within the 4-county area and the urban growth boundary

	Current: 2010 modeled mode share for all trips within the 4-county area and within the UGB on the existing transportation network	**ATP Target:** Triple 2010 modeled mode share for walking, bicycling and transit trips within the UGB	**2035 RTP Network:** modeled mode share for all trips within the 4-county area and within the UGB on the 2035 state Regional Transportation Plan network	**ATP Network:** modeled mode share for all trips within the 4-county area on the recommended ATP networks
Transit	3.8% (UGB 4.4%)	**13% (in UGB)**	4.9% (UGB 6.2%)	4.8% (UGB 6.1%)
Walking	8.9% (UGB 8.8%)	**27% (in UGB)**	9.6% (UGB 9.7%)	9.6% (UGB 9.7%)
Bicycling	2.8% (UGB 3.1%)	**9% (in UGB)**	3.1% (UGB 3.6%)	3.2% (UGB 3.7%)

Data: Metro, 2013 Transportation Model

Table 4: Number of serious and fatal crashes by mode, within Urban Growth Boundary, and 2040 Target

	All Modes	**Pedestrian/motor vehicle crash**	**Bicycle/motor vehicle crash**	**Motor vehicle crash**
2007-2011	496	63	35	398
2040 Target	248	31	17	199

Data: Metro State of Safety 2012 Report

Coordination

Clackamas County Transportation System Plan

Through the statewide planning program's TPR, the West Linn TSP update needs to be coordinated with the Clackamas County TSP. Consistency between the County TSP and City TSP is assumed if both plans are "consistent" with the RTP. Before explaining the RTP requirements that are applicable to both the City and County TSP, readers may be interested to know the direction the recently updated County TSP has taken to address what the County has identified as the most significant transportation-related challenges in coming decades:

- Limited funding that has not and will remain unable to keep pace with the mobility needs of the County.
- Reducing congestion. The County TSP recognizes the connection between land uses and transportation and the ability to decrease reliance on automobiles and reduce congestion through coordinated land use and transportation planning.
- Balancing the need for mobility (through movement of traffic) with the need for local movement and access to individual properties.
- Developing facilities that accommodate all travel modes will improve safety for users. The County TSP calls for a 50 percent reduction in fatal and serious injury crashes by 2022.
- Transportation infrastructure needs to be sensitive to the potential impacts to neighborhoods and to the natural environment in order to create and maintain livable communities, preserve air and water quality and conserve energy.

To address these challenges the county TSP includes the following policies and strategies – which may serve as a "window" for what West Linn wishes to address in the City's TSP update to have plan "consistency"; however, the County's TSP primarily applies to unincorporated areas.

- <u>Compliance and coordination</u> Support partnerships to promote and address multi-jurisdictional transportation needs:[2]
- <u>Road safety</u>[3]:
    - 50 percent reduction in fatal and serious injury crashes by 2022;
    - Address the top three crash cause factors of aggressive driving, young drivers (15-22) and roadway departure using education, emergency medical services, enforcement, engineering and evaluation;
    - Support actions that increase awareness and education about the safety of the transportation system for all users;
    - Support data-driven approaches to improve safety for all transportation users.

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[2] Consistent with Oregon Transportation Plan, Goal 7, Coordination, Communication and Cooperation
[3] Unique to Clackamas County TSP.

- Equity, health and sustainability[4]:
    - Support projects, such as pedestrian and bike connections to transit stops, that expand and improve transportation options for residents in areas with identified transportation disadvantaged populations;
    - Minimize transportation-related environmental degradation;
    - Increase and improve infrastructure needed to support alternative fuel vehicles;
    - Support programs that educate people about opportunities for bicycle, pedestrian and transit options.
- Intelligent Transportation Systems (ITS): Implement a wide range of ITS strategies.[5]
- Transportation Demand Management (TDM) policies[6]:
    - Implement TDM to increase efficient use of existing transportation infrastructure and minimize congestion and safety concerns by offering choices of mode, route, and time;
    - Support efforts to monitor and fund regional TDM programs;
    - Provide adequate bike and pedestrian facilities to employment areas to encourage commute trips by walking and biking;
    - Support programs that identify safe bicycle and pedestrian routes to connect neighborhoods and schools;
    - 45-55 percent non-drive-alone target for regional centers, station communities and corridors;
    - 40-45 percent non-drive-alone target for employment areas, industrial areas, neighborhoods and regionally significant industrial areas.
- Integration of land use and transportation:
    - Support an integrated approach to land use and transportation planning that encourages livable and sustainable communities, decreases average trip length and increases accessibility for all modes;
    - Reduce reliance on long commutes out of the County to employment destinations;

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[4] Consistent with Oregon Transportation Plan, Goal 4, Sustainability.

[5] Consistent with Portland Metro RTP, Policy 2.5.7 Transportation System Management and Operations (TSMO) Vision, (pg. 2-74) http://www.oregonmetro.gov/sites/default/files/2035_rtp_final_document_as_submitted_and_approved_by_dlcd_usdot_web_0.pdf

[6] TSP are required to have "localized TDM" as set forth by the Regional Transportation Functional Plan (RTFP) Title 2, Section 3.08.220. The non-drive alone targets shown under the sub-bullets above are set forth by the same section of Title 2 as achieved in part through the integration of land use and transportation and active transportation.

  - Recognize the importance of moving goods from rural businesses to distribution centers.
- Active transportation:
  - Create an environment that encourages people to walk and bike for recreational and for transportation purposes;
  - Coordinate with pedestrian, bike and trail master plans, and with special transportation plans of the County;
  - Inform property owners of their responsibilities for the maintenance of sidewalks and pedestrian pathways;
  - Identify low traffic volume streets that are appropriate for signing as bike routes to enhance safety and connectivity and to supplement the system of bikeways found on the major street system.
- Facilities:
  - Encourage the provision of facilities and services for bicyclists, including showers, lockers, bike racks on buses, bike repair and maintenance, and secure bicycle parking;
  - Establish and maintain wayfinding systems to facilitate bicycle travel.
- Multi-use paths: Support the acquisition and development of multi-use paths on abandoned public and private rights-of-way.
- Functional classification and design:
  - Design arterials and collectors to allow safe and convenient passage of buses, bikes and pedestrians;
  - Streets, allays, bikeways, pedestrian facilities, multi-use paths, trails and transit stops are allowed uses in all urban zoning districts.
- Project Development:
  - Consider TDM before adding new capacity, including strategies such as; access management, alternative or modified standards, ITS, operational improvements, parking standards, enhanced bicycle and pedestrian facilities, traffic calming and road diets.
- Access Standards: New development and redevelopment should be designed to place driveway accesses on streets with the lowest functional classification or the lowest traffic volume.
- Policies on improvements to serve development: Require right-of-way (ROW) dedication, on-site frontage improvements, and off-site improvements as necessary to safely handle expected traffic generated by the development.
- Performance Evaluation Measures:

Table 5-2a
PERFORMANCE EVALUATION MEASURES FOR THE URBAN AREA
Weekday Mid-day and Weekday PM Peak Periods

	Maximum Volume to Capacity (V/C) Ratio		
Federal and State Principal Arterial Street Segments and Intersections	**Mid-day One-Hour Peak**	**1st Hour, PM Peak**	**2nd Hour, PM Peak**
OR 99E from OR 224 interchange north to county line	0.99	1.1	0.99
I-205 I-5 OR 212 OR 224 OR 213	0.90	0.99	0.99
County Street Segments and Intersections by Metro Urban Design Type *See Comprehensive Plan Map IV–8*			
Regional Centers Town Centers Main Streets Station Communities	0.99	1.1	0.99
Corridors Neighborhoods Employment Areas Industrial Areas Intermodal Facilities	0.90	0.99	0.99

- Transit:
  - Identify existing transit deficiencies in the County, needed improvements, and additional park and ride lots necessary to increase the accessibility of transit services to all potential users;
  - Coordinate with transit agencies in all new residential, commercial and industrial developments to ensure integration of transit facilities and pedestrian access to transit facilities.
- Freight, rail, air, pipeline and water transportation:
  - Make freight investments that, in coordination with the County's economic development strategies, help retain and grow the County's job base and strengthen the County's overall economy;
  - Support expansion and maintenance needed to establish reliable, higher speed (110-125 mph) freight rail service and intercity rail passenger service in the Willamette Valley;
  - Support the continued operation and maintenance of the Willamette Falls Locks to facilitate water transportation on the Willamette River.

- Finance and funding:
  - Identify and pursue new, permanent funding mechanisms to construct and maintain County transportation facilities and to support programs and projects identified in the TSP;
  - Develop dedicated funding sources to implement active transportation projects;
  - Establish funding for bicycle, pedestrian and transit projects that serve the needs of transportation disadvantaged populations.
- Special transportation projects: Work with ODOT, Metro, Oregon City, West Linn to analyze and develop a solution to the transportation bottleneck on I-205 between Oregon City and the I-205/Stafford Road interchange. (Clackamas County, 2014)

Emerging Regional Policy

Climate Smart Communities Scenarios Project

The Climate Smart Communities Scenarios Project (Climate Smart), directed by the Oregon Legislature, seeks to reduce greenhouse gas emissions for the Portland Metropolitan Area by 20 percent (per capita light vehicle emissions) below 2005 levels, by the year 2035. Findings from the Phase II report indicate that this target can be achieved; however, additional investment will be necessary. Phase II of the Climate Smart work has narrowed the focus to three scenarios that can achieve targeted levels of GHG emissions reduction. In 2014, representatives from the State and across the Portland Metropolitan area will decide specifically how this target will be achieved and will have to decide how much should be invested in public transit, how much reliance is placed on technology and information, how much of the active transportation network should be completed by 2035, how local communities should manage parking, and how we should pay for our choices, to name just a few. (Metro, 2014)

Service Provider Coordination

TriMet Transit Investment Plan

TriMet's Transit Investment Plan guides future program and capital investment for the agency. The Plan calls for improving system safety and making transit use more convenient, reliable and easy to use. TriMet plans to continue to invest in high capacity transit services such as MAX light rail, commuter rail, bus rapid transit (BRT) and streetcar service within key regional corridors to connect regional centers. The Portland Streetcar Loop and South Corridor Phase 2 (Portland to Milwaukie) Light Rail Transit projects are examples of recently completed or nearly completed infrastructure investments that TriMet hopes will encourage greater use of the region's public transit system.

High-capacity transit projects currently under development include the Southwest and Powell-Division Corridors. In addition, TriMet is working with regional partners to improve public transit service in regionally significant corridors, such as AmberGlen/Tanasbourne, Forest Grove, Gresham and Oregon City. The Transit Investment Plan also calls for the expansion of frequent transit service (bus lines that run every 15 minutes or better, every day) and improved local service. (TriMet, 2014) Although the Columbia River Crossing and Lake Oswego to Portland Transit projects are now off the table for regional discussion, there is regional interest for transit improvements in these areas as well.

TIP Priority	FY2011 July 2010–June 2011 *Past fiscal year*	FY2012 July 2011–June 2012 *Current fiscal year*	FY2013 to FY2016 July 2011–June 2015 *Program of investments, pending improved revenue*
1. Build the Total Transit System Chapter 3	• Safety and Security Executive hired to lead agency effort to create a culture of safety • Completed revitalization projects along the Eastside MAX Blue Line, including safety and security improvements and station upgrades • TransitTracker by phone/text provides real-time bus and MAX arrivals to more than two million calls per month • Opened high-capacity, controlled access Bike & Rides at Gresham Central, Beaverton and Sunset Transit Centers, using ARRA funds • Stop IDs for use with TransitTracker displayed in more than 70 percent of bus stops • Installed amenities at 90 bus stops • Installed three TransitTracker digital displays at Gateway Transit Center • 38 third-party software applications providing customer information developed using open source TriMet data	• Implement Safety Management System to create a culture of safety • Purchase 55 new buses, providing automated stop announcements, air conditioning and low-floor boarding on 66 percent of fleet • Test four next-generation hybrid buses on Line 72-Killingsworth/82nd • Complete installation of new signs and stop name decals, and optimize bus stop spacing • Implement bus stop pavement enhancements at 30 locations	• Continue to sustain culture of safety through ongoing training, employee engagement, strategic data sharing and partnerships • Deploy 40 new buses annually to improve fleet reliability, convenience and efficiency • Develop and launch open source multi-modal trip planner to allow users to interactively explore and plan trips combining walking, biking and transit • Enhance financial stability through reduced costs and heightened revenues
2. Expand high-capacity transit Chapter 4	• Due to budget constraints, reduced frequency on MAX Blue, Green and Yellow lines during non-rush hours • Entered Final Design on Portland-Milwaukie Light Rail project • Opened new Civic Drive MAX Blue Line station for service • Opened redesigned Rockwood/E 188th Ave station	• Restore some service hours on crowded MAX trains to relieveover-crowding • Prepare for Portland Streetcar Loop opening	• Increase frequencies on existing lines to meet long-term policies and serve demand • Continue analysis and planning on HCT corridors including possible MAX Light Rail extensions (Southwest Corridor) and/or Bus Rapid Transit (Powell-Division, I-205)
3. Expand Frequent Service Chapter 5	• Due to budget constraints, made additional reductions in frequency during non-rush hours on Frequent Service lines • Frequent Service lines served 58 percent of bus riders on 48 percent of bus service	• Restore some service hours on crowded buses to relieveover-crowding	• Increase frequencies on existing lines to meet long-term policies and serve demand • When budget allows, restore service hours on Frequent Service lines to ensure 15-minute or better service all day, every day
4. Improve local service Chapter 6	• Due to budget constraints, discontinued two bus lines (Lines 27 and 157) and service on low-ridership portions of four bus lines • Reduced weekday frequency of service on 26 bus lines and reduced weekend frequency on 15 bus lines • Reduced span of service on 11 lines	• Restore some service hours on crowded buses to relieveover-crowding	• Continue leveraging regional flexible funds for access and amenity improvements, in coordination with jurisdictional partners • Evaluate and implement service restoration, improvements and/or extensions within available resources, based on ridership productivity potential, prior commitments and future development

Figure ES.1: *TIP Implementation Features*

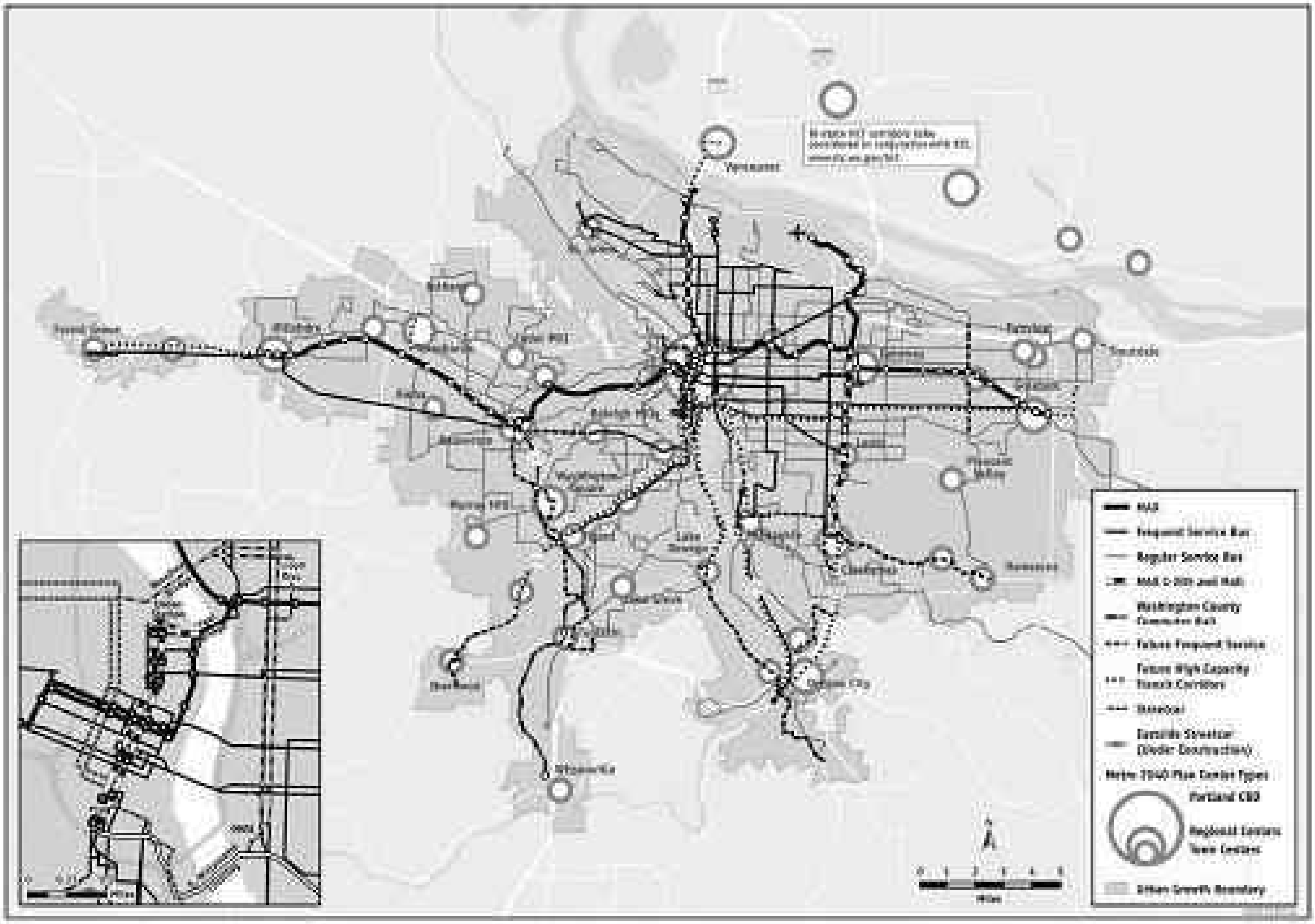


Figure ES.2: TriMet's Transit Investment Plan

Coordinated Transportation Plan for the Elderly and People with Disabilities (TriMet 2012)

TriMet's Coordinated Transportation Plan for the Elderly and People with Disabilities, "guides transportation investment toward a full range of options for elders and people with disabilities to foster independent and productive lives, to strengthen community connections, and strives for continual improvement of services through coordination, innovation and community involvement." The key objectives of the Plan include:

- Coordinate. Make the best use of service hours and vehicles; assure that services are coordinated and well organized. Assure that customer information is useful and widely provided throughout the region.
- Innovate. Increase options available to E&D customers by providing innovative, flexible attractive and cost-effective alternatives to standard fixed route buses, rail and paratransit. Expand outreach and education on how to use services.
- Involve the Community. Include elders and people with disabilities, social services staff, private non-profit providers, and other community partners in the dialogue and decisions about services. Advisory committees working on E&D issues should have over 50 percent representation of elders and people with disabilities.
- Improve the service foundation. Fixed route service frequencies and coverage in some suburban areas, as well as ways to get to the fixed routes, will need to be improved.
- Integrate land use and transportation decisions. Communicate the importance of land use and transportation for E&D transportation. Identify opportunities to influence land use decisions and eliminate environmental barriers to using transit.
- Improve Customer Convenience. Minimize physical and psychological impediments to using core transit services relative to other modes. Make the transit system easy to understand and use. Facilitate transfers between transit services with the use of wayfinding information and high-amenity transfer facilities.
- Improve Safety. Assure that real and perceived safety concerns are addressed at passenger waiting areas and on board transit vehicles. Utilize transit provider staff, volunteers and other riders to increase sense of security along with investments in physical infrastructure where appropriate. (TriMet, 2012)

TriMet Pedestrian Network Analysis

In a survey conducted by Metro in 2013, 80 percent of respondents said they desired to live and work in areas where they could walk, bicycle and take public transit. TriMet recommends the following strategies for local TSPs:

1. Word choice. Avoid calling walking, bicycling and public transit, "alternative modes of transportation." Everyone uses at least one of these modes as part of every trip.
2. The quality of pedestrian, bicycle facility and transit service matters. To encourage more trips by walking, bicycling and public transit, go beyond minimum design standards for

walking and bicycling facilities, and focus development and investments in key corridors where you want to see more frequent transit service, bicycling and pedestrian trips.

3. Analysis. Collect data that help identify meaningful and complete pedestrian, bicycle and transit needs.
4. Prioritize specific locations and areas where people walk, bicycle and take public transit. Develop a list of pedestrian and bicycle projects, based on where it is most important for more people to be able to access specific places by walking, cycling or transit. It is most cost-effective and efficient to make improvements where they are most needed and most effective at achieving policy goals.
5. Match ability and responsibility. Plans should be transparent and identify the responsible party. Plans should also identify, at the concept level, what steps are necessary to implement the plans.
6. Tie City's transit vision to actions, programs, and investments needed to make it feasible. When transit needs are stated in a TSP, include what is needed to support this type of service, e.g., proximity of X number of households and/or Y number of jobs to transit stops, streetscape and sidewalk investments, managed parking, etc. Include operating and capital costs associated with the type of service desired, so desires are tied to costs, especially if it isn't directly in the City's control.
7. Unbundle pedestrian and cycling needs from larger road projects. Pedestrian or bicycle improvements made now deliver substantial benefits immediately, even if long-term future plans may include roadway widening that could require rebuilding some of the improvements. Stand-alone pedestrian and bicycling projects are cost-effective and provide substantial benefits in the near term.
8. Strongly encourage broad participation. Invite a broad base of representative to help shape the plan. Ensure there is representation from communities of color and people of all income levels.
9. Conduct field visits and safety audits of select corridors on foot and bicycle. Computer modeling and GIS analysis do not give a full understanding of the needs of pedestrians and bicyclists of all ages and abilities. (TriMet, 2011)

State Plans

The Statewide Planning Goals define the State's planning objectives and priorities. The update of the City of West Linn's TSP will amend the City's comprehensive plan. As a part of the City comprehensive plan amendment, the TSP adoption will include a compliance report that explains how the TSP update complies with applicable state policies outlined below.

Oregon Statewide Planning Goals

- Goal 1 Citizen Involvement
- Goal 2 Land Use Planning
- Goal 5 Natural Resources, Scenic and Historic Areas, and Open Spaces
- Goal 6 Air, Water and Land Resources Quality
- Goal 7 Areas Subject to Natural Hazards
- Goal 9 Economic Development
- Goal 11 Public Facilities and Services
- Goal 12 Transportation – Administered through OAR 660, Division 12
- Goal 13 Energy Conservation
- Goal 14 Urbanization
- Goal 15 Willamette River

Oregon Transportation Planning Rule (OAR Chapter 660, Division 12)

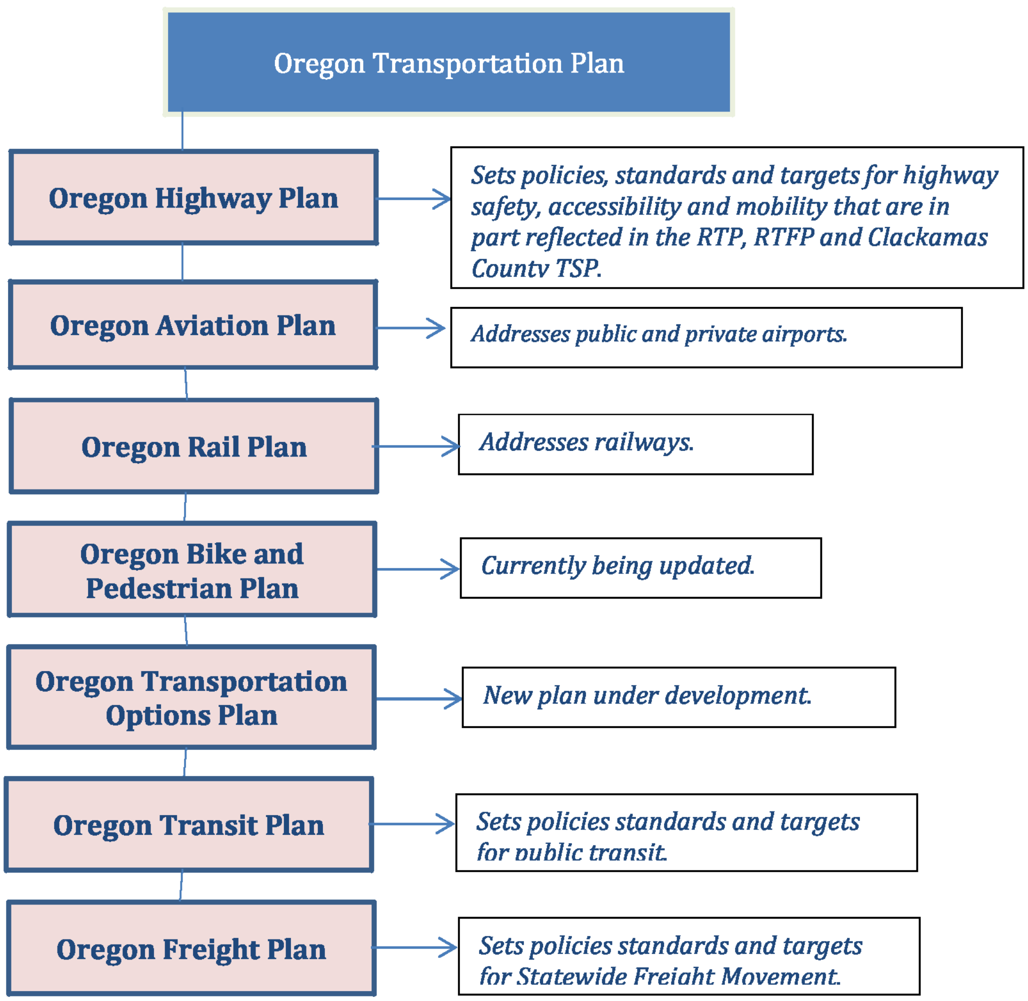
The Transportation Planning Rule (TPR) is the administrative rule that implements Goal 12, Transportation. Its purpose is to facilitate coordination between land use and transportation planning in order to provide a safe, convenient and economic transportation system. The TPR is the rule that requires the development of state, regional and local TSPs. The TPR also includes provisions that require certain land use decisions to take into account the impact of development on the existing and/or planned capacity of the transportation system. Transportation System Plans define the planned system.

The TPR encourages coordination between the type and location of various land uses and transportation planning for the purpose of promoting travel patterns that minimize air pollution and traffic congestion. To do this, the TPR emphasizes measures that increase transportation choices and which make more efficient use of existing transportation infrastructure. Coordinated land use and transportation planning is intended to improve livability and accessibility through the provision of transit service, where feasible, and by improving the performance of existing infrastructure (i.e., transportation system management and demand management).

The TPR strives to reduce the reliance on single occupant vehicle (SOV) trips through more effective planning for non-SOV modes, and through improved street connectivity. The TPR also encourages land use patterns in urban areas that make it more convenient for people to walk, bike and take public transit, as well as to use automobiles more efficiently.

In metropolitan areas, the TPR requires that TSPs be designed to achieve adopted standards for increasing transportation choices and reducing automobile reliance. The TPR anticipates that metropolitan areas will reduce automobile reliance by changing land use patterns and transportation choice so that walking, bicycling and public transit are convenient and that people will be likely to drive less than they do today. (State of Oregon, DLCD, 2014)

The **Oregon Transportation Plan** (OTP) is the state's TSP and overarching policy document along with the modal plans shown below that "nest" under it. The OTP is adopted by the Oregon Transportation Commission and similar in content to regional and local TSPs but differs in that it addresses the statewide transportation system and needs. The OTP takes into account the regional and local transportation needs for roadways, airports, marine ports, intermodal facilities, rail, bicycle and pedestrian facilities for a 20-year period and includes a financial forecast.



A chief purpose of the Oregon Transportation Plan is to provide a policy framework for the development of a safe, efficient and sustainable transportation system that improves the State's quality of life and economic vitality (Oregon Department of Transportation, 2006). The OTP is built around seven goals that all apply across the state and including to regional and local plans. The goal topics are listed below and the full goal text is shown in Appendix C.

- Mobility and Accessibility
- Management of the System
- Economic Vitality
- Sustainability
- Safety and Security
- Funding the Transportation System
- Coordination, Communication and Cooperation

The OTP identifies the following key initiatives necessary for its implementation. These same initiatives apply and are further refined in the Metro's RTP and specifically, the RTFP.

- Maintaining and maximizing assets;
- Optimizing the performance of the existing system through technology;
- Integrating transportation, land use, economic development and the environment;
- Integrating the transportation system across jurisdictions and modes;
- Creating sustainable funding;
- Investing in strategic capacity enhancements.

Oregon Highway Plan

The 1999 Oregon Highway Plan (OHP) establishes policies and investment priorities for the State's highway system over a 20-year planning horizon. The OHP strives to maintain and improve safe and efficient movement of people and goods, while supporting statewide, regional, and local economic growth and livability. The OHP is implemented through a number of policies and actions that guide management and investment decisions by defining a classification system for state highways, setting standards for mobility, employing access management techniques, supporting intermodal connections, encouraging public and private partnerships, addressing the relationship between the highway and land developments, and recognizing the responsibility to maintain and enhance environmental and scenic resources.

The following OHP policies are relevant to transportation planning in West Linn are shown in Appendix B.

Oregon Bike and Pedestrian Plan

The current working vision of the Oregon Bike and Pedestrian Plan states, "In Oregon, people of all ages, incomes, and abilities can get where they want to go on safe, well-connected biking and walking routes. People can access destinations in urban and rural areas and enjoy Oregon's scenic beauty by walking and biking on a transportation system that respects the needs of its users and their sense of safety. Bicycle and pedestrian networks are recognized as integral elements of the transportation system that contribute to our diverse and vibrant communities and the health and quality of life enjoyed by Oregonians."

The plan currently includes nine goals under development:

<u>Safety:</u> Eliminate bicycle and pedestrian fatalities and serious injuries and improve the sense of safety of those who bike and walk.

<u>Mobility and Efficiency:</u> Provide high quality biking and walking options for short and moderate distance trips as a means to improve mobility and efficiency of the transportation system.

<u>Accessibility and Connectivity:</u> Provide a complete bicycle and walking network that reliably and easily connects to destinations and other transportation modes.

<u>Community and Economic Vitality:</u> Improve people's ability to access jobs, businesses, and other destinations.

<u>Equity:</u> Provide opportunities and choices for people of all ages, abilities, and incomes in urban, suburban, and rural areas across the state to bike or use walking routes to reach their destinations and to access transportation options.

<u>Health:</u> Provide Oregonians with the opportunity to become more active and healthy by using biking and walking to meet their daily needs.

<u>Sustainability:</u> Help to meet federal, state and local sustainability and environmental goals by providing zero emission transportation options like biking and walking.

<u>Strategic Investment:</u> Recognize Oregon's strategic investments in biking and walking as important comonents of the transportation system that can help reduce the need for expanding motory ehicle capacity and reduce system costs.

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

APPENDIX A: Statewide Planning Goals

- Goal 1 Citizen Involvement – develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process
  - Cities shall develop a citizen involvement program, for land use planning efforts, that includes the following components:
    - Provide widespread citizen involvement
    - Assure effective two-way communication with citizens
    - Provide an opportunity for citizens to be involved in all phases of the planning process
    - Assure technical information is available in an understandable form
    - Assure that citizens will receive a response from policy-makers
    - Insure funding for the citizen involvement program
- Goal 2 Land Use Planning – establish a land use planning process and policy framework as a basis for all decisions and actions related to the use of land and to assure an adequate factual base for such decisions and actions.
- Goal 5 Natural Resources, Scenic and Historic Areas, and Open Spaces – protect natural resources and conserve scenic and historic areas and open spaces.
- Goal 6 Air, Water and Land Resources Quality – maintain and improve the quality of the air, water and land resources of the state.
- Goal 7 Areas Subject to Natural Hazards – protect people and property from natural hazards.
- Goal 8 Recreational Needs – to satisfy the recreational needs of the citizens of the state and visitors and, where appropriate, to provide for the siting of necessary recreational facilities including destination resorts.
- Goal 9 Economic Development – provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens. Comprehensive plans and policies shall contribute to a stable and healthy economy in all regions of the state.
- Goal 10 Housing – provide for the housing needs of citizens of the State. Plans shall encourage the availability of adequate numbers of needed housing units at price ranges and rent levels which are commensurate with the financial capabilities of Oregon households and allow for flexibility of housing location, type and density. "Needed housing units" means: housing types determined to meet the need shown for housing within an urban growth boundary at particular price ranges and rent levels. Needed housing units also includes government-assistance housing. For cities having populations larger than 2,400 people, needed housing units include (but are not limited to) attached and detached single-family housing, multiple-family housing, and manufactured homes, whether occupied by owners or renters.

- Goal 11 Public Facilities and Services – plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.
- Goal 12 Transportation – provide and encourage a safe, convenient and economic transportation system. A transportation plan shall:
  - Consider all modes of transportation including mass transit, air water, pipeline, rail, highway, bicycle and pedestrian
  - Be based upon an inventory of local, regional and state transportation needs
  - Consider the differences in social consequences that would result from utilizing differing combinations of transportation modes
  - Avoid principal reliance upon any one mode of transportation
  - Minimize adverse social, economic and environmental impacts and costs
  - Conserve energy
  - Meet the needs of the transportation disadvantaged by improving transportation services
  - Facilitate the flow of goods and services to strengthen the local and regional economy
  - Conform with local and regional comprehensive land use plans
  - Transportation system should be planned to use existing facilities and rights-of-way within the state provided that such use is not inconsistent with the environmental, energy, land use economic or social policies of the state
  - Population densities and peak house travel patterns of existing and planned development should be considered in the choice of transportation modes for trips taken by persons. While high density developments with concentrated trip origins and destinations should be designed to be principally served by mass transit, low density developments with dispersed origins and destinations should be principally served by the auto.
- Goal 13 Energy Conservation – to conserve energy. Land and uses developed on the land shall be managed and controlled so as to maximize the conservation of all forms of energy, based upon sound economic principles:
  - Priority in land use planning should be given to methods of analysis and implementation measures that will assure maximum efficiency in energy utilization.
  - Land uses should minimize the depletion of non-renewable sources of energy.
  - Land use planning should seek to recycle and re-use vacant land and those uses which are not energy efficient.
  - Land use planning should, to the maximum extent possible, combine increasing density gradients along high capacity transportation corridors to achieve greater energy efficiency.
- Goal 14 Urbanization – provide an orderly and efficient transition from rural to urban land use, accommodate urban population and urban employment inside urban growth boundaries, ensure efficient use of land, and provide livable communities. Land within urban growth boundaries shall be considered available for urban development consistent

with plans for the provision of urban facilities and services. Comprehensive Plans and implementing measures shall manage the use and division of urbanizable land to maintain its potential for planned urban development until appropriate public facilities and services are available or planned.

- Goal 15 Willamette River Greenway – protect, conserve, enhance and maintain the natural, scenic, historic, agricultural, economic and recreational qualities of lands along the Willamette River as the Willamette River Greenway. (State of Oregon, DLCD, 2014)

- Policy 1A – State Highway Classification System

  Interstate 205 (I-205) and Oregon Highway 43 (Hwy 43) are classified as state highways. I-205 is further sub-classified as an interstate highway, whose function is to provide connections to major cities and other states. Interstates are major freight routes with the objective of providing mobility. The key management objective for interstate highways is to provide safe and efficient high-speed continuous-flow operation in urban and rural areas.

  Hwy 43 is sub-classified as a district highway and is intended to function as a regional arterial roadway. District highways provide connections between small urbanized areas, rural centers and urban hubs, while also serving local access traffic. The key management objective for district highways in an urban setting is to provide for safe and efficient, moderate to low-speed operation for traffic flow and for pedestrian and bicycle movements.

- Policy 1B – Land Use and Transportation. Recognizes that land development and transportation networks greatly influence one another. Compact land development patterns that reduce dependence on the state highway system for local trips. This policy also recognizes the positive and negative impacts of state highways on a local economy and establishes a framework for developing solutions to local development in or near state highway interchanges.

- Policy 1C – State Highway Freight System

  This policy seeks to ensure that freight is able to move efficiently on the State's major trucking routes. The Freight policy balances the need to move goods with other uses of the highway system and recognizes the importance of maintaining efficient through movement on major truck and freight routes, such as I-205.

- Policy 1F – Highway Mobility Standards

  The OHP understands the unique context and policy choices (regional plan that prescribes minimum densities, mixed-use development and transportation options; primary reliance on high-capacity transit to provide additional capacity in the freeway corridors serving the central city; an air quality attainment/maintenance plan that relies heavily on reducing auto trips through land use) that have been made by cities in the Portland Metropolitan Region and has therefore established a process for alternate mobility standards.

  Cities and counties in the Portland Metropolitan Area (metro area) may adopt alternate mobility standards where it is clear that reduced mobility will lead to congestion that will not be alleviated by highway improvements. Alternative standards shall be clear and objective and shall be related to the ratio of volume to capacity (v/c) or another similar metric (e.g., corridor-average v/c, network-average v/c, and the ratio of average daily traffic and hour capacity (adt/c)). These standards are adopted as part of the regional transportation plan where it has been demonstrated that it is infeasible to meet the adopted highway mobility standards below:

MAXIMUM VOLUME TO CAPACITY RATIOS INSIDE METRO[A]		
Location	**Standard**	
	1st hour	2nd hour
Central City Regional Centers Town Centers Main Streets Station Communities	1.1	.99
Corridors[B] Industrial Areas Intermodal Facilities Employment Areas Inner Neighborhoods Outer Neighborhoods	0.99	.99
Banfield Freeway (from I-5 to I-205)[C]	1.1	.99
I-5 North[C] (from Marquam Bridge to Interstate Bridge)	1.1	.99
Highway 99E[C] (from Lincoln Street to Highway 224 Interchange)	1.1	.99
Sunset Highway[C] (from I-405 to Sylvan Interchange)	1.1	.99
Stadium Freeway[C] (from I-5 South to I-5 North)	1.1	.99
Other Principal Arterial Routes I-205[C] I-82 (east of I-205) I-5 (Marquam Bridge to Wilsonville)[C] Highway 217[C] US 26 (west of Sylvan) Highway 30 Tualatin Valley Highway (Cedar Hills Blvd to Brookwood Avenue)[C] Highway 224[C] Highway 47 Highway 213 242nd/US 26 in Gresham	.99	.99
Areas of Special ConcernD Beaverton Regional Center Highway 99W (I-5 to Tualatin Road)	1.0 .95	D

Table 7: Maximum Volume to Capacity Ratios Within Portland Metropolitan Region

Notes for Table 7: Maximum volume to capacity ratios for two hour peak operating Conditions through a 20-year horizon for state highway sections within the Portland Metropolitan area urban growth boundary. A) The volume to capacity ratios in the table are for the highest two consecutive hours of weekday Traffic volumes. This is calculated by dividing the traffic volume for the average weekly two-hour PM peak by twice the hourly capacity. B) Corridors that are also state highways are 99W, Sandy Boulevard, Powell Boulevard, 82nd Avenue, North Portland Road, North Denver Street, Lombard Street, Hall Boulevard, Farmington Road, Canyon Road, Beaverton-Hillsdale Highway, Tualatin Valley Highway (from Hall Boulevard to Cedar Hills Boulevard and from Brookwood Street to E Street in Forest Grove), Scholls Ferry Road, 99E (from Milwaukie to Oregon City and

Highway 43. C) Thresholds shown are for interim purposes only; refinement plans for these corridors are Required in Metro's Regional Transportation Plan and will include a recommended motor Vehicle performance policy for each corridor. D) Areas with this designation are planned for mixed use development, but are also characterized by physical, environmental or other constraints that limit the range of acceptable transportation solutions for addressing a level-of-service need, but where alternative routes for regional through traffic are provided. In these areas, substitute performance measures are allowed by OAR.660.012.0060(2)(d). Provisions for determining the alternative performance measures are included in Section 6.7.7 of the 2000 RTP. The OHP mobility standard for state highways in these areas applies until the alternative performance measures are adopted in local plans and approved by the Oregon Transportation Commission.

- Policy 1G – Major Improvements

  This policy establishes that the State will prioritize the maintenance of highway performance, improved safety and improved system efficiency before adding new capacity.

- Policy 2A – Partnerships

  Establish cooperative partnerships to make more efficient and effective use of limited resources in the development, operation and maintenance of the highway system. Consult with local and regional governments regarding the potential for local participation on major modernization projects considered for inclusion in the STIP. When major improvements to or replacement of an interchange are necessary, work in partnership with local and regional government regarding financial participation, right-of-way contributions, and other enhancements.

- Policy 2B – Off-system Improvements

  Provide State financial assistance to local jurisdictions to develop, enhance and maintain improvements on local transportation systems when they are a cost effective way to improve the operation of the state highway system if:

  - Benefits to the state system are greater than those that would be achieved by investing in system improvements;
  - Local jurisdictions adopt land use, access management and other policies and ordinances that assure the continued benefit of the off-system improvement to the state highway system;
  - Local jurisdictions provide advanced notice to ODOT of land use decisions that may impact the off-system improvement in such a way as to adversely impact the state highway system;
  - Local jurisdictions agree to a minimum maintenance level for the off-system improvement that will assure the continued benefit of the off-system improvement to the state highway system.

- Policy 2C – Interjurisdictional Transfers

  In cooperation with local jurisdictions, consider transfers that: simplify the management responsibilities of a roadway segment; reflect the appropriate functional classification of a particular roadway segment; lead to increased efficiencies in the operation and maintenance of a roadway segment or corridor.

- Policy 2E – Intelligent Transportation Systems

  Work with small cities to develop a toolbox of ITS applications that emphasize safety enhancements, traveler information, incident response, and congestion relief. Support ITS planning, development, and implementation in local TSPs.

- Policy 2F – Traffic Safety

  Establish a process to develop and implement the most cost-effective solutions to high priority safety problems. Traffic safety solutions may include: better traffic enforcement; educational materials and signage to change driving behavior; engineering improvements; constructing safe and convenient pedestrian and bicycle crossings; and, managing access to the state highway. The OHP encourages local governments to adopt a safety management system and to work with citizens to address safety concerns on the state highway system.

- Policy 3A – Classification and Spacing Standards

  The OHP provides flexibility in access spacing standards to local governments seeking to promote development along state highways through the use of Urban Business Areas (UBAs) and Special Transportation Areas (STAs).

- Policy 3B – Medians

  Manage and locate medians in a manner that enhances the efficiency and safety of the highways and that influence and support land use development patterns that are consistent with approved TSPs.

- Policy 3C – Interchange Access Management Areas

  Interchange Access Management Plans (IAMPs) are necessary to protect the function of interchanges and to provide safe and efficient operations between connecting roadways. Local comprehensive plans should identify improvements such as, channelization, medians and access control in interchange areas as well as sources of funding to ensure these areas provide the functionality necessary to support the state and local roadway system. The design of urban interchange areas must consider the need for transit and park and ride facilities and the impact of the interchange on pedestrian and bicycle traffic.

- Policy 4A – Efficiency of Freight Movement

  Balance the needs of long distance and through freight movements with local transportation needs on highway facilities in urban areas.

- Policy 4B – Alternative Passenger Modes

The OHP encourages alternative passenger transportation systems where travel demand, land use and other factors indicate the potential for their successful development as a means to help or maintain established performance standards.

A

Portland's MAX light rail transit helps relieve congestion in Interstate 84.

transportation service should be incorporated as one part of a larger corridor strategy that may include developing land use regulations that support high capacity transit and developing adequate collector-distributor roadway systems. This policy suggests the following additional measures:

- Encourage the use of alternative passenger modes to reduce local trips on the state highway system where limited highway facilities accommodate large numbers of intercity and local trips;
- Support the development of alternative intercity passenger services in congested transportation corridors through additional peak hour service, use of excess freight rail system capacity, and the provision of support facilities and services which help connect passengers to their destinations;

- Policy 4C – High-occupancy Vehicle Facilities

  Utilize HOV facilities to improve the efficiency of the highway system in locations where travel demand, land use, transit, and other factors are favorable to their effectiveness. HOV facilities should be promoted in corridors where they are supported in local or regional

TSPs, where current or projected demand will allow for efficient operations and where HOV facilities will function as part of the overall transportation system. This policy also encourages the use of HOV support facilities such as park and ride lots and preferential HOV parking.

- Policy 4D – Transportation Demand Management

  Support the efficient use of the transportation system through investment in TDM strategies. Support strategies that reduce single-occupant vehicle travel during the peak commute periods and that improve the traffic flow on the state highway system.

- Policy 4E – Park and Ride Facilities

  Seek cost effective expansion of the capacity of the state highway system through the development of park and ride facilities at appropriate urban locations. The OHP recommends using surplus ODOT property for park and ride facilities where appropriate and providing park and ride facilities in urban areas that are safely accessible by pedestrians, bicyclists, and transit users when feasible.

- Policy 5A – Environmental Resources

  Maintain or improve the natural and built environment including air quality, fish passage and habitat, wildlife habitat and migration routes, sensitive habitats, vegetation, and water resources where affected by ODOT facilities. Additional guidance includes:

  - Use best management practices to minimize effects of construction, operations and maintenance impacts to the human and natural environment;
  - Attain and maintain air quality standards in highway plans, programs, projects and maintenance activities and ensure that air quality plans are implemented and budget money for these purposes as available. (Oregon Department of Transportation, 2014)

Oregon Access Management Rule (OAR 734-051-0155)

The Oregon Access Management Rule mimics much of the direction established in the Oregon Highway Plan and the Oregon Transportation Plan in its preference toward maintaining and improving highway performance and safety through improved system efficiency, prior to adding new capacity. This policy also directs the state to work with local agencies in developing interchange management plans where new or significant modifications to existing interchanges are desired. (Oregon Department of Transportation, 2014)

APPENDIX C: Oregon Transportation Plan Goals

Each Oregon Transportation Plan goal listed below has a set of related policies that can be seen at the following link under "Oregon Transportation Plan, Volume 1":
http://www.oregon.gov/ODOT/TD/TP/Pages/OTP.aspx

- Mobility and Accessibility: "Provide a balanced, efficient and integrated transportation system that ensures interconnected access to all areas of the state, the nation and the world. Promote transportation choices that are reliable, accessible and cost-effective."
- Management of the System: "Improve the efficiency of the transportation system by optimizing operations and management. Manage transportation assets to extend their life and reduce maintenance costs."
- Economic Vitality: "Expand and diversify Oregon's economy by transporting people, goods, services and information in safe, energy-efficient and environmentally sound ways. Provide Oregon with a competitive advantage by promoting an integrated freight system."
- Sustainability: "Meet present needs without compromising the ability of future generations to meet their daily needs from the joint perspective of the environment, economy and communities. Encourage conservation and communities that integrate land use and transportation choices."
- Safety and Security: "Build, operate and maintain the transportation system so that it is safe and secure. Take into account the needs of all users: operators, passengers, pedestrians and property owners."
- Funding the Transportation System: "Create sources of revenue that will support a viable transportation system today and in the future. Expand ways to fund the system that are fair and fiscally responsible."

Coordination, Communication and Cooperation: "Foster coordination, communication and cooperation between transportation users and providers so various means of transportation function as an integrated system. Work to help all parties align interests, remove barriers and offer innovative, equitable solutions."

The OTP identifies the following key initiatives necessary for its implementation:

- Maintaining and maximizing assets;
- Optimizing the performance of the existing system through technology;
- Integrating transportation, land use, economic development and the environment;
- Integrating the transportation system across jurisdictions and modes;
- Creating sustainable funding;
- Investing in strategic capacity enhancements.

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CITY OF
West Linn

Date: November 17, 2014

To: Project Management Team

From: Noah Brennan, Associate Engineer, EIT; Zach Pelz, Associate Planner

Subject: Draft Technical Memorandum No. 2: Transportation Changes Since 2008 and Special Interest Topics

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This memo documents changes to West Linn's transportation system that have occurred since the adoption of the 2008 Transportation System Plan (TSP). This memo also introduces topics of special interest that will be considered as part of the updated TSP.

Transportation Improvements Since 2008

Since 2008, a total of 39 transportation improvements have been completed as part of 32 discrete improvement projects (see Table 1 below). Of the 32 projects, 26 have been completed by private developers as improvements associated with land development, while six have been completed by the City as part of its Capital Improvement Program. A significant majority of the transportation improvements have been sidewalk infill projects, in addition to six bicycle infrastructure improvements and three new pedestrian crossings. The City is currently in the process of finalizing the installation of a new traffic signal at the intersection of Salamo and Rosemont Roads. The gray shaded projects in Table 1 represent projects identified in the 2008 TSP master plans. Many of the improvements are only portions of the complete project.

Figure 1 West Linn Pedestrian Plan (2008 TSP)

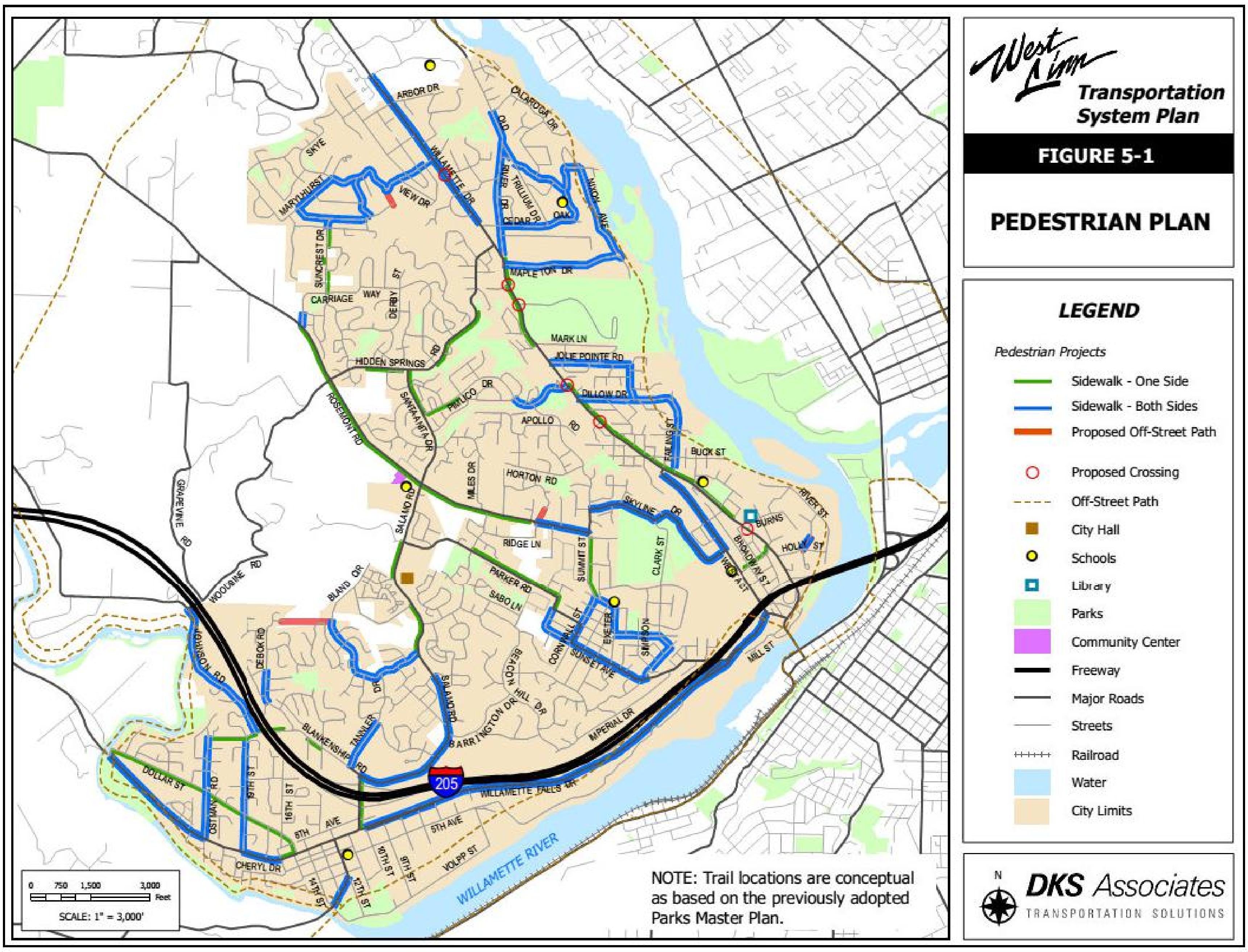

Figure 2 West Linn Bicycle Plan (2008 TSP)

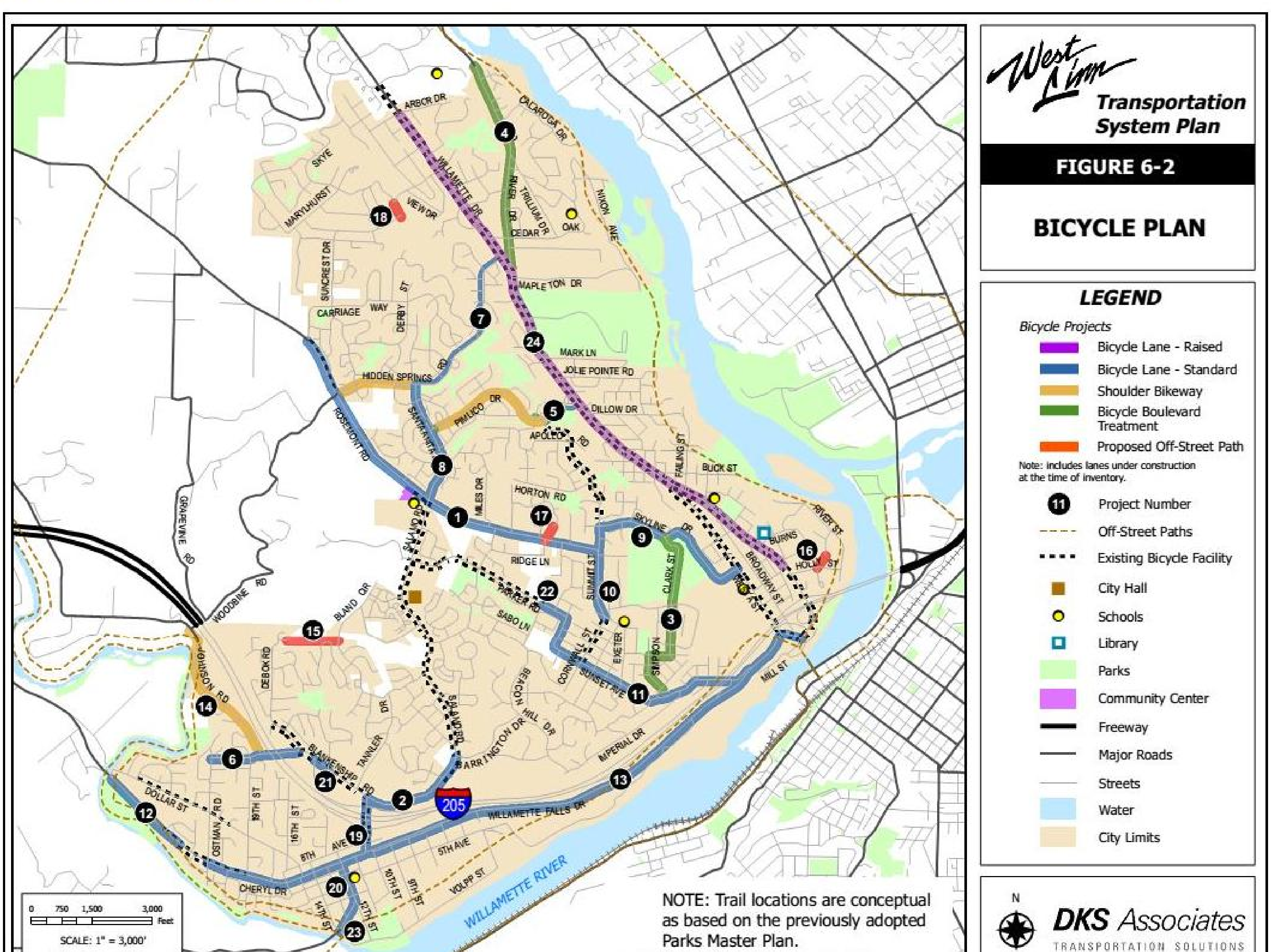

Table 1 Transportation System Changes Since 2008

Project No.	Project Title	Sidewalk infill	Bikeways	Traffic Signals	Project Description
PW-14-02	Road Program 2014		x		Widened Blankenship Rd to include bike lane between Johnson Rd and Debok Rd
PW-14-11	Holmes St Sidewalk Improvement	x	x		Extended Sidewalk along Holmes St to Bolton Primary School
PW-14-05	Bland Waterline Interconnect	x			Sidewalk along Salamo from Bland Circle to Weatherhill Rd
PW-13-14	Santa Anita & Rosemont Intersection			x	New Signal at intersection
PI-14-02	Harper Subdivision	x			Sidewalk, Gloria Dr and Summit St to Woodsprite Ct
PI-14-02	Weatherhill Subdivision	x			Creation of street and sidewalk on Satter St off of Weatherhill Rd, pedestrian path connecting to Bland Circle
PI-13-10	Sunbreak Subdivision	x			Street and sidewalk connection of Crestview Dr, Sunbreak Lane and Bland Circle, pedestrian crossing of Bland Circle, pedestrian path from Sunbreak Lane to Crestview lots
PI-13-09	Rosemont Subdivision	x			Sidewalk added on Rosemont frontage between 1473 and 1499 Rosemont Rd
PI-13-07	Benjamin Heights Partition	x			Sidewalk along frontages on NW side of Salamo Rd and Remington Dr intersection
PW-14-07	8th Ave Across from police department	x			Sidewalk from frontage of fire department on 8th Ave
PI-13-06	Police Station	x			Sidewalk along north side of 8th Ave and east side of 13th St
PI-13-03	Falcon Place	x			Sidewalk along Bland Circle across from Falcon Dr
PI-13-02	West Linn High School Parking Lot	x			Sidewalk added on Skyline Dr
PI-12-03	Chase Bank-Highway 43	x			Sidewalk improvements along Highway 43 Frontage
PI-12-01	Ostman Rd MIP	x			Sidewalk on west side of Ostman from Michael Dr to Royal Court, and first lot of North side of Michael Dr
PI-11-03	Suncrest Subdivision				Sidewalk on Suncrest Dr frontage 19638, 19650 & 19656 Suncrest Dr
PI-11-02	Teresa's Vineyard	x			Completion of Coeur d'Alene Dr, and sidewalk
PI-11-01	Trillium Creek Primary School-Rosemont Rd	x	x		Sidewalk improved and replaced along Rosemont Rd widening, bike lane added
PI-10-09	Marylhurst Heights Park	x			Paved path through park
PI-10-01	Debok Subdivision	x			Added Debok Ct. street and sidewalk off of Wisteria Rd
PW-09-10	Blankenship Sidewalk Improvement	x	x		2 Pedestrian crossings on Blankenship, and sidewalk and Bike lane on south side of Blankenship between Virginia Ln and Albertson's frontage.
PI-09-04	Cedar Oak School	x			Sidewalk improvement along school frontages on Cedaroak Dr
PI-09-03	Willamette Fire Station #59 Tualatin Valley Fire & Rescue	x			New sidewalk along 8th Ave frontage
PI-09-02	Willamette Fire Station #58 - Tualatin Valley Fire & Rescue	x			New sidewalk along Elliott St, Buck St, and Failing St
PI-09-01	Berlin Bear - ROW Work	x			Sidewalk replacement, no addition
PI-08-07	LDS West Linn Ward Church	x	x		Sidewalk along Rosemont Rd and Shannon Ln frontages, and sidewalk connection to Miles Dr from Rosemont Rd.
PI-08-06	Fairview Acres	x	x		75' of asphaltic-concrete sidewalk on Fairview Way
PI-08-04	Willamette Christian Church - Street and Storm	x			New sidewalk along west side of Salamo Rd along property frontage and ramp across what is now Brandywine Dr
PI-08-03	Willamette Village Site Work	x			Sidewalk along Willamette Dr (Highway 43)
PI-07-14	Bella Flats Subdivision	x			Sidewalk added along Elmran Dr
PI-07-10	Shannon Lane Partition	x			Sidewalk added along northern 2 lots of Shannon Lane
PI-07-05	Douglas Park Subdivision	x			Sidewalk added along Haskins Rd 700' SE and Rogue Way from Lois Ln to Haskins Rd

TSP Special Interest Topics

Next Steps for Old Willamette Area to Improve Parking Management

In 2013, the City of West Linn assembled a task force comprised of residents, business owners, and Citizen Advisory Board members to discuss issues related to parking in the City's Willamette Commercial District; which comprises an area immediately north and south of Willamette Falls Drive between 14th St and 10th Street, properties immediately north and south of 8th Avenue between 14th Street and 10th Street and properties east and west of 10th Street south of I-205.[t]. A staff parking analysis found, and the task force later agreed, that parking was currently adequately supplied during most times of the year, except during special events held in the Commercial district. The Task Force recommended five, relatively modest, strategies to address parking supply needs during special events, including:

- Identify areas for employee parking that are off of Willamette Falls Drive and ensure safe access to employers;
- Improve parking for special events;
- Assign a City staff liaison to meet with local business owners on a quarterly basis;
- Improve user information and marketing; and
- Provide enhanced parking enforcement as resources permit.

The TSP will decide how and when these strategies are funded and implemented.

Mode Share Targets for Key Destinations, Such as Employment and Shopping Areas and Schools, Based on City's Metro 2040 Design Types

Between 2006 and 2010, more than 76 percent of West Linn residents commuted to jobs outside of the City using a single-occupant vehicle. Because of the need to improve the efficiency of the region's transportation system, the Regional Transportation Functional Plan (RTFP) establishes a non-SOV target of between 40 and 55 percent for Regional and Town Centers, Corridors, and Industrial and Employment areas, by the year 2035. This means that by 2035, residents living in the Highway 43 Corridor in West Linn, the Bolton and Willamette Town Center areas, and in the Willamette Main Street Area, will be expected to drive alone at a rate 15 to 30 percent less than today.

Transit Supportive Land Uses

The Regional Transportation Plan (RTP) emphasizes a more balanced approach to transportation problem solving than the historically automobile-centric focus that has been the norm in the United States for the past five decades. Effective public transit, transit that is convenient and that encourages choice riders (riders who have a choice to use public transit or drive alone); however, relies on a minimum threshold of residential and employment density to make it economically viable for the transit provider. It is important to consider the land use and density requirements necessary to serve public transit when planning for these modes as solutions to regional transportation challenges.

The current literature suggests the following minimum densities necessary to support various levels of public transit:

Table 2 Minimum Land Densities Supporting Transit Service at Various Frequencies (

Transit Service	Minimum Residential Density	CDB Commercial/Office Density
Local bus, 1 bus/h	4.5 dwelling units/net acre	5-8 million ft^2
Local bus, 2 bus/h	7 dwelling units/net acre	8-20 million ft^2
Local bus, 6 bus/h	15 dwelling units/net acre	20-50 million ft^2
Light rail, 5-min peak headway	9 dwelling units/net acre in 20-100 mi^2 corridor	30-50 million ft^2 (20 million ft^2 if 100% at grade)
Rapid transit, 5-min peak headway	12 dwelling units/net acre in 100-150 mi^2 corridor	>50 million ft^2
Commuter rail, 20 trains/day	1-2 dwelling units/net acre	>100 million ft^2

Additionally, research suggests that the availability of public transit within walkable neighborhoods promotes fewer vehicle miles traveled per capita and more walking, biking and public transit use.

Table 3 Land Use Impacts on Vehicle Ownership (Portland 2009)

Land Use Type	Auto Ownership	Daily VMT	Mode Split				
	Per Household	Per Capita	Auto	Walk	Transit	Bike	Other
Good transit/Mixed use	0.93	9.8	58%	27%	12%	1.9%	1.5%
Good transit only	1.50	13.3	74%	15%	7.9%	1.4%	1.1%
Remainder of county	1.74	17.3	82%	10%	3.5%	1.6%	3.7%
Remainder of region	1.93	21.8	87%	6.1%	1.2%	0.8%	4.0%

Alternatives to Automobile Level of Service and Volume-to-Capacity Standards

Transportation systems can be evaluated in various ways that reflect different perspectives concerning uses, modes, land use, transport problems and solutions, how transport activity is measured, and the type of performance indicators used (Litman, 2011). Historically, transportation system plans have evaluated performance using Level-of-service or Volume to Capacity metrics.

Both metrics assume that travel and trips mean vehicle trips and improvements in system quality come about by increased vehicle mileage and speed (Litman, 2011).

Transportation system performance can however, be measured in other ways that place more emphasis on mobility and or accessibility. Mobility measurements consider automobiles as the most important since people and goods are moved primarily by automobile. A mobility perspective, however, recognizes that some people use non-automobile modes. Mobility can be measured through surveys to quantify person-miles and travel speeds in conjunction with traffic data to quantify average automobile and transit vehicle speeds. In recent years, techniques to evaluate bicycle and transit level-of-service have emerged (Litman, 2011).

Finally, transportation system performance can be measured from an accessibility perspective; where reaching goods, services, activities and destinations are the primary goal, regardless of travel mode. From this perspective, land use is as important as mobility in the quality of transportation, and different land use patterns favor different types of accessibility (Litman, 2011). From this perspective, transportation system performance can be evaluated based on the time, money, discomfort and risk required to reach opportunities (Litman, 2011).

Table 4 Various Transportation Performance Measurement Units (adapted from Litman, 2011)

Measurement unit	Description
Vehicle-mile	Reflects a traffic perspective that places high value on automobile travel
Passenger-mile	Reflects a mobility perspective that values automobile and transit travel, but gives less value to non-motorized modes because they tend to be used for short trips
Per-trip	Reflects an access perspective which gives equal value to automobile, transit, cycling, walking and telecommuting
Travel time	Reflects an access perspective with higher priority to walking, cycling and transit travel because they tend to represent a relatively large portion of travel time
Generalized costs	Reflect an access perspective

Outcomes-based, Performance-driven Planning at Metro

Cities and States across the US are facing a transportation dilemma: 1) transportation infrastructure is reaching the end of its useful life and requires significant maintenance and/or replacement, 2) transportation funding is becoming more and more scarce, 3) the cost to make transportation improvements is increasing rapidly, and 4) population in metropolitan areas is on the rise, placing more demand on transportation systems. For these reasons, and because citizens are becoming increasingly sensitive to government spending, transportation systems must work to become as efficient and effective as reasonably possible.

Metro's 2035 Regional Transportation Plan (RTP) identifies six outcomes that are at the core of future investment:

- Vibrant communities
- Economic prosperity
- Safe and reliable transportation
- Leadership on climate change
- Clean air and water
- Equity

The RTP performance targets are tied to a framework of economy, environment, and equity and set measurable targets to evaluate the region's future success. Table 5 presents a sample of regional performance targets.

Table 5 Sample Policy-level Performance Targets (Metro, 2010)

	Target
Economy	Congestion – by 2035, reduce vehicle hours of delay per person by 10 percent compared to 2005
	Freight reliability – by 2035, reduce vehicle hours of delay per truck trip by 10 percent compared to 2005
Environment	Active transportation – by 2035, triple walking, biking and transit mode share compared to 2005
	Clean air – by 2035, ensure zero percent population exposure to at-risk levels of air pollution
Equity	Access to daily needs – by 2035, increase by 50 percent the number of essential destinations accessible within 30 minutes by bicycling and public transit for low-income, minority, senior and disabled populations compared to 2005

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MEMORANDUM

Date:	April 23, 2015	Project #: 17817.0
To:	Zach Pelz, City of West Linn Gail Curtis, Oregon Department of Transportation	
From:	Susan Wright and Matthew Bell, Kittelson & Associates, Inc.	
Project:	West Linn Transportation System Plan (TSP) Update	
Subject:	Final Technical Memorandum #3: Performance Outcomes and Key Measures Workshop	

CONTEXT

The City of West Linn is updating its transportation system plan (TSP), a 20-year plan that identifies transportation needs and prioritizes projects and programs that will implement the City's transportation and land-use aspirations. As a part of the TSP update, the City wishes to evaluate the success of its TSP over time based on measurable targets. This approach is consistent with the regional requirement that TSPs include "performance measures for safety, vehicles miles traveled per capita, freight reliability, congestion, and walking, bicycling and transit mode shares to evaluate and monitor performance of the TSP."[1] Draft targets and measures have been developed for the technical and citizen advisory committees to review and comment.

The targets and measures included herein are based on existing policies and desired outcomes from recently adopted transportation-related plans at the State, Regional and Local level. This "outcomes based approach" more readily conveys the City's vision and progress towards achieving that vision, and is able to answer questions such as: *"Can residents and visitors more easily and safely get around the city? Are there more travel options in and to the city? What will the city look like in 20 years if the TSP succeeds?*

The draft TSP targets and performance measures in this document were developed with the following considerations in mind:

- The City's vision and relevant adopted policies;

[1] Section 3.08.230 Performance Targets and Standards, Chapter 3.08, Regional Transportation Function Plan, Exhibit E. to Ordinance No 10-1241B

- West Linn's lack of vacant undeveloped parcels and the predominantly single-family residential pattern of development;
- West Linn has low employment, which coupled with the relatively low-density configuration of residential land, increases trip distance;
- West Linn is hilly, which limits walking and biking for many;
- Key measures address topics that are important to the City and implement the evaluation requirements established in the Regional Transportation Function Plan (RTFP);
- Key measures rely upon data that can be collected and maintained by the City or the region;
- The City is in control or has major influence on the ability to make progress towards the targets;
- The quantity of targets are manageable for the City; and
- The targets balance City resources across all travel modes.

The following section includes agreed upon desired regional outcomes from the Regional Transportation Plan (RTP) and City policies. Together, the regional outcomes and City policies provide a basis for the draft performance measures. Technical Memorandum 1 (West Linn TSP Update Policy Framework) provides a complete list of applicable local, regional and state policy. Table 1 outlines the six desired outcomes that were adopted by the region in 2010 that serve to guide future urban planning and express shared regional values.

Table 1: Six Desired Regional Outcomes

Outcome		Description
1	Vibrant communities	People live, work and play in vibrant communities where their everyday needs are easily accessible.
2	Sustained economic competiveness and prosperity	Current and future residents benefit from the region's sustained economic competitiveness and prosperity.
3	Safe and reliable transportation choices	People have safe and reliable transportation choices that enhance their quality of life.
4	Leadership on climate change	The region is a leader on climate change and minimizing contributions to global warming.
5	Clean air, clean water and healthy ecosystems	Current and future generations enjoy clean air, clean water and healthy ecosystems.
6	Equity	Equity exists relative to the benefits and burdens of growth and change to the region's communities.

The adopted vision for West Linn, *Imagine West Linn*, was originally developed in 1994 and updated in 2008. *Imagine West Linn* defines the preferred future vision for the City in a proactive and constructive manner and establishes the following guiding principles:

Table 2: 2008 Imagine West Linn Guiding Principles

Guiding principle		Description
1	Sense of community	To create and sustain a spirit of community, openness and connectedness that ensures present and future needs are met.
2	Land use and quality of life	Shape the physical design of West Linn in a way that instills a sense of pride in the community.
3	Sustainability	Meet the present needs of West Linn's citizens without compromising the ability to meet the needs of future generations.
4	Cultural diversity, education and the arts	Celebrate the creative, innovative, and inspirational works of nature and humankind while exposing citizens to other cultures and viewpoints.
5	Community Institutions	Shape City government, the school district, and other local institutions in a manner that fosters trust, respect, courage, and cooperation from the community.

Chapter 12 of the West Linn Comprehensive Plan also includes transportation-related goals that will guide future transportation investments and decision-making:

Table 3: Goals from Chapter 12 (Transportation) of the West Linn Comprehensive Plan

Goal		Description
1	Mobility, access, safety, equity, neighborhood character, and affordability	Provide a transportation system that provides maximum mobility while encouraging modes other than the automobile; provides connectivity within and between neighborhoods; is convenient, safe, and efficient; maintains the cohesiveness of the City's neighborhoods; respects the community's priorities and affordability; respects the natural environment.
2	Cost-effective	Provide a cost-effective balanced transportation system, incorporating all modes of transportation (automobiles, bicycles, transit and other modes)
3	Accessible	Develop transportation facilities that are accessible to all members of the community and minimize out-of-direction travel.

Table 4 is a compilation of the transportation-related goals from; *Metro's Six Desired Outcomes* (Table 1), *Imagine West Linn* (Table 2), and *Goal 12 of the West Linn Comprehensive Plan* (Table 3). The Goals and Desired Outcomes proposed by the Project Management Team in Table 4 recognize the need to: focus on transportation-related issues; balance City resources across all travel modes; create targets that are manageable and which rely on data that can be collected, maintained and evaluated by the City; develop outcomes for which the City is in control of or has major influence over and reflect the other considerations listed on page 1 of this document.

Table 4: Goals and Desired Outcomes for TSP Update based on Desired Regional Outcomes, the Image West Linn Vision, and the West Linn Comprehensive Plan.

Goal		Desired Outcome
1	Safety	Reduce transportation-related fatalities and serious injuries across all modes.
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.
3	Equity	Develop transportation facilities that are accessible to all members of the community.
4	Maintenance	Deliver access and safety improvements cost effectively, and within available revenues.

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. Table 5 below, proposes: 1) a numerical target the City will strive to achieve by the planning horizon for this TSP (2040), 2) a baseline metric to compare future years to, 3) the transportation-related characteristic that is being measured; 4) the result that will determine whether or not progress has been made toward achieving each target; 5) a monitoring plan to monitor progress overtime; and, 6) the current baseline metric.

Table 5: Proposed Targets and Performance Measures for the West Linn TSP Update

SAFETY						
GOAL 1 Reduce transportation related fatalities and injuries for all transportation modes						
Target	Baseline	Measure	Success is…	Current TSP Projects that Advance Target	Monitoring Plan	Current Baseline Metric
Target 1A – Zero severe injury and fatal collisions by mode.	Number of severe injury and fatal collisions in 2013.	The number of severe injuries and fatalities for each mode over time.	A steady reduction each year in the number of severe injury and fatal collisions as compared to prior years.	• Intersection improvements with consideration for bicyclists and pedestrians • Pedestrian crossings near schools and high pedestrian traffic areas • Bicycle and pedestrian treatments at intersections (e.g., crossing islands, painted boxes and bike signals) • Bicycle and pedestrian facility improvements with emphasis on separated facilities on high-speed or high-volume roads • Traffic calming and greenways • Education and enforcement	• Document the measure on an annual basis based on a review of data maintained by ODOT. Successful progress towards the target includes a steady reduction each year in the number severe injury and fatal collisions compared to prior years.	• Number of severe injury crashes (2013) • Number of fatal crashes (2013) • Number of crashes involving pedestrians or bicyclists (2013)
Target 1B - Reduce total number of high collision locations to zero by 2040.	Number of locations in 2013 on the ODOT Safety Priority Index System (SPIS) List or where collision rate exceeds 1.0 crashes per million entering vehicles	Number of locations on the ODOT Safety Priority Index System (SPIS) List or where collision rate exceeds 1.0 crashes per million entering vehicles	A steady reduction each year in the number of locations on the ODOT Safety Priority Index System (SPIS) List or where collision rate exceeds 1.0 crashes per million entering vehicles	• Intersection improvements with consideration for bicyclists and pedestrians • Bicycle and pedestrian treatments at intersections (e.g., crossing islands, painted boxes and bike signals) • Bicycle and pedestrian facility improvements with emphasis on separated facilities • Traffic calming and greenways • Pedestrian crossings near schools and high pedestrian traffic areas	• Document the measure on an annual basis based on a review of data maintained by ODOT. Successful progress towards the target includes a steady reduction each year in the number of SPIS locations and locations with a crash rate above 1.0.	• Number of ODOT SPIS locations (2013) • Number of intersections with a crash rate above 1.0 crashes/MEV (2013)

MOBILITY, ACCESS and ENVIRONMENT						
GOAL 2 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.						
Target	Baseline	Measure	Success is...	Current TSP Projects that Advance Target	Monitoring Plan	Current Benchmark
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 VMT and VMT per capita on an average weekday	VMT and VMT per capita on an average weekday avg. weekday	A reduction in VMT per capita such that VMT remains steady or declines over time even as growth occurs.	• Transit queue jumps • Improved use of technology to improve user information • Park and ride lots with secure bike racks • Bicycle, pedestrian, and transit amenities Frequent bus service • Educational and incentive programs to encourage and facilitate shifts to carpool, bike, walk, transit, telecommuting	• Document the measure each time a new base year is created 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.	• Metro Travel Demand Model VMT and VMT per Capita (2010)
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 by 2040.	Non-SOV mode share in 2010 in 2040 industrial and employment areas, neighborhoods, town centers, main streets and corridors	Non-SOV mode share in 2040 investment areas	40-45 percent non-SOV mode share in industrial and employment areas and neighborhoods by 2040 *and* 45-55 percent non-SOV mode share in town centers, main streets and corridors by 2040	• Bicycle, pedestrian, and transit facility improvements • Bus rapid transit, such as transit priority • Educational and incentive programs to encourage shifts to carpool, bike, pedestrian, and transit • Bicycle, pedestrian, and transit amenities such as bus shelters and benches, signage, bike maps, bike parking	• Document the measure each time a new base year is created 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.	• Metro Travel Demand Model Non-SOV mode share in industrial and employment areas and neighborhoods (2010) • Metro Travel Demand Model Non-SOV mode share in town centers, main streets and corridors (2010)

Target 2C – Improve freight travel time reliability.	Travel time reliability for commercial heavy vehicles in 2010 on I-205 and OR 43	Degree of variability from mean commercial heavy vehicle travel time	Lower degree of variability from mean commercial heavy vehicle travel time compared to baseline on I-205 and OR 43	• Reduce peak-hour travel • Intersection operational improvements • Signal synchronization • Transit queue jumps • Improved use of technology to improve user information • Increase access to Oregon City transit and light rail transit to increase transit mode split	• Document the measure each time a new base year is created 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 OR 43	• Metro DTA model Travel Time Reliability on I-205 (2010) • Metro DTA model Travel Time Reliability on OR 43 (2010)
Target 2D - Increase the percentage of people that can access key destinations via a 20 minute walk, bike or public transit ride by 40 percent by 2040.	2010 percent of population within a 20 minute walk, bike or public transit ride of key destinations	The City's population that is within a 20 minute walk, bike or public transit ride of key destinations as a percentage of all West Linn residents	An increase at each TSP Update in the percent of the West Linn population within a 20 minute walk, bike or public transit ride of key destinations.	• Educational and incentive programs to encourage and facilitate shifts to carpool, bike, walk, transit, telecommuting • Bicycle and pedestrian facilities near major activity centers with emphasis on filling gaps in the network • Transit level of service improvements, such as service frequency, hours, and coverage • Implement the Oregon Highway 43 Conceptual Design Plan • ADA curb ramps • Developer incentives to support transit, walking and biking and off-peak travel	• Document the measure at each TSP Update 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.	• Percent of the population within a 20 minute walk, bike, or public transit ride of key destinations (2010)
Target 2E –Actuve Safe Routes to School (SRTS) Programs in place in all West Linn schools.	As of 2014, the five of primary schools have SRTS routes identified but no specific programs to encourage walking and biking to schools.	Number of schools with SRTS programs in place that conduct one or more activities per year to encourage walking and biking to school.	All schools in West Linn having SRTS programs that conduct one or more events per year to encourage walking and biking to school.	• • Pedestrian and bicycle projects that provide facilities and crossings and increase the safety of the SRTS routes.	• Document the measure at each TSP Update. Successful progress towards the target includes the identification of SRTS for each school, information being made 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.	• As of 2014, SRTS routes have been identified for the five primary schools. The number of programs/activities that occur per year to encourage walking and biking is unknown.

Target 2F – A good quality pedestrian network and low stress bicycle network connecting all residents to key destinations.	2014 network of "Good" quality pedestrian facilities (per the Qualitative MMLOS methodology) and LTS Level 2 bicycle facilities	Number of residential areas and key destinations that are not connected to the network of "Good" quality pedestrian facilities and LTS Level 2 or better bicycle facilities	All residential areas and key destinations connected to the network of "Good" quality pedestrian facilities and LTS Level 2 or better bicycle facilities	• Bicycle and pedestrian facilities in key destination areas with emphasis on filling gaps in the network • Bicycle/pedestrian separated facilities • Bicycle and pedestrian treatments at intersections (e.g. crossing islands, painted boxes, bike signals etc.) • Wider sidewalks buffered from automobile traffic • Traffic calming and greenways • Curb ramps	• Document the measure at each TSP Update. Successful progress towards the target includes an increase in the network of "Good" quality pedestrian facilities and LTS Level 2 or better bicycle facilities and a reduction in the number of residential areas and key destinations that are not connected to this network.	• 2014 "Good" quality pedestrian network • 2014 LTS 2 or better bicycle network • 2014 residential areas and key destinations not connected to the network.
Target 2G – Increase the number of green street facilities by 2040	2014 number of green street facilities in 2014	Total number of green street facilities in the City of West Linn	Number of green street facilities in West Linn in 2040 is higher than baseline.	• Update street standards to incorporate green streets. • Build green streets • Updated maintenance practices to reduce rate of run-off	• Document the measure at each TSP Update. Successful progress towards the target includes an increase in the number of green street facilities at each TSP Update.	• 2014 number of green street facilities

EQUITY						
GOAL 3 Deliver transportation improvements equitably						
Target	Baseline	Measure	Success is…	Potential TSP Projects that Advance Target	Monitoring Plan	Current Benchmark
Target 3A – By 2040 increase walking, bicycle and public transit access, for transportation disadvantaged populations, to key destinations, by 40 percent	2010 population of transportation disadvantaged persons in 20-minute neighborhoods	The percent of the City's transportation disadvantaged population that is within a 20 minute walk, bike or public transit ride of key destinations	An increase at each TSP Update in the percent of the transportation disadvantaged population within a 20 minute walk, bike or public transit ride of key destinations.	• Bicycle and pedestrian facility improvements near schools and other transportation disadvantaged destinations with emphasis on filling gaps in the network and ADA improvements • Transit improvements such as increased service on high ridership routes • Curb ramps • Rail transit	• Document the measure at each TSP Update 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.	• Percent of the transportation disadvantaged population within a 20 minute walk, bike, or public transit ride of key destinations (2010)
Target 3B - Ensure transportation services (and impacts) are equitably distributed to all segments of the population.	N/A	Number or percent of total projects in TSP financially-constrained list that are within or adjacent to areas of low income and/or minority populations	Number of projects, on 2040 TSP financially constrained project list, that are within or adjacent to areas of low income or minority populations is proportionate to the population in those areas relative to the City of West Linn as a whole	• Transit improvements such as increased frequent-service routes • Street or streetscape improvements • Bicycle and pedestrian improvements	• Document the measure at each TSP Update	• N/A

MAINTENANCE						
GOAL 4 Deliver access and safety improvements cost effectively, within available revenues, and responsively to the needs of all users of the transportation system						
Target	Baseline	Measure	Success is…	Current TSP Projects that Advance Target	Monitoring Plan	Current Benchmark
Target 4A - Increase the average local road pavement condition index (PCI) to 70 by 2040.	2014 PCI	The pavement condition index (PCI)	2040 average local road PCI is 70 or greater.	• Maintenance, repair and operation of local roadways • Road rehabilitation and reconstruction	• Document the measure annually. Successful progress towards the target includes an increase in the average local road PCI.	• 2014 average local road PCI.
Target 4B - Reduce the number of transportation facilities in "distressed" condition by 5 percent by 2040.	Number of transportation facilities in 2014, in distressed condition	Total number of transportation facilities designated as distressed. A distressed transportation facility includes any roadway with a PCI that is lower than 50.	Number of transportation facilities in distressed condition in 2040 is at least 5 percent below 2014 baseline	• Maintenance, repair and operation of local roadways • Bus replacements • Upgrades to transit facilities • Road rehabilitation and reconstruction	• Document the measure annually. Successful progress towards the target includes a reduction in the number of facilities in distressed condition.	• 2014 number of facilities in distressed condition.

EVALUATION CRITERIA

Based on the goals, targets, and measures described above, the following evaluation criteria will be used to prioritize projects in the TSP based on how many and how well a project helps achieve the TSP targets. In addition to the above targets, two additional criteria were added which include whether a project is currently identified as a priority project 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 an to be fiscally efficient as defined by the Metro Regional Transportation Plan.

Each goal has a different number of targets from one target to four targets. The score for each target was determined in part based on the total number of points desired to be available for each goal. The maximum number of points available for each goal is 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)
- Priority Project in Other Plans – 12 points (based on four different plans valued from 2 to 4 points each)
- Fiscal Efficiency – 4 points

Table 6 defines the scoring methodology used and the resources used to assess the score such as crash history, forecast travel information, GIS maps, land use, and demographic data.

Table 6: Evaluation Criteria and Scoring Methodology

Goal	Target	Resources for determining score	Scoring methodology
Safety: Reduce transportation-related fatalities and injuries for all transportation modes	1A: Would likely reduce severe injury and fatal crashes at a location with known or perceived safety risks for that 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, as shown in Figure 1 of TM 9.	11 points if: the project or program is likely to reduce injury and fatal crashes at a location with a crash history on Figure 1 of TM 9 or another location known by the City
	1B: Would likely reduce the number of high collision locations	High collision locations are roadway segments with a relatively high number of crashes within a certain roadway segment between 2009 and 2014 as shown in Figure 10 of TM 7	11 points if: the project or program would likely reduce crashes at this segment over a 5 year period following project/program implementation
Mobility, Access and the Environment: Improve 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: Would likely reduce VMT		3 points if: the project/program would likely reduce vehicle miles traveled
	2B: Supports a compact urban form and would likely increase non-SOV modes of travel in 2040 Regional Investment Centers	Location of commercial centers 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 centers for non-single occupancy vehicle modes
	2D: Would allow more people to access schools, parks and open spaces, and employment and commercial areas within a 20-minute walk, bike or bus ride	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 within a 20-minute walk, bike and bus-shed of schools (6 points), parks (4 points) and open spaces (2 points)
	2F: Implementation would result in "good" or better level of quality bicycle or pedestrian facility	Figure 3-2: Pedestrian Facilities; Figure 3-3: Bicycle Facilities; Figure 3-4: Bicycle LTS	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: Deliver transportation improvements equitably	3A: Would allow more people, who are considered transportation disadvantaged (elderly, youth, and transit users), to access schools, parks and open spaces, and employment and commercial areas within a 20-minute walk, bike or bus ride	20 minute walking radius: 1 mile 20 minute biking radius: 2 miles 20 minute transit radius: 0.25 miles (walking to nearest transit stop) Figures 3-12, 3-14	6 points if: the project/program increases the number of persons considered transportation disadvantaged (elderly, youth, and transit riders), within a 20-minute walk, bike and bus-shed of schools, parks and open spaces, and employment and commercial areas
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	2 points if: the bike or pedestrian project is in the Regional ATP
		City of West Linn Safe Routes to School Plan	4 points if: the project is part of a SRTS Plan
		2008 TSP	2 points: if the project 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, traffic-calming, land use strategies, connectivity improvements, or motor vehicle capacity improvements		4 points if the project is TSMO 4 points if the project is a transit, bike, and/or pedestrian improvement 3 points if the project is traffic calming 2 points if the project is a land use strategy 1 point if the project is a connectivity improvement 0 points if the project is a motor-vehicle capacity improvement

Date: November 18, 2014

To: ODOT Project Management Team

From: Richard Seals, Chief Financial Officer

Zach Pelz, Associate Planner

Subject: Technical Memorandum No. 4: Forecast Funding/Local Funding Sources

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Purpose

This memorandum documents the City of West Linn's existing and expected sources of transportation revenues and expenses between 2014 and 2040. The City's 2014-2015 biennial budget and five year forecast provide the basis for the information herein.

Background

West Linn's economy is closely linked with the economy of the Portland Metropolitan Area, which is based on manufacturing, national and international trade, and service industries. Primarily a residential community, West Linn has a low level of industry and retail-based commercial activity. The City's population has grown steadily but has leveled off in recent years. In 1860, West Linn was home to just 225 residents, growing to 1,628 by 1920. The population grew to 2,923 in 1960, and by 1970, West Linn had grown to more than 7,000. The City's population has continued to grow each year. Currently, the City's population, as estimated by the Portland State Population Research Center is 25,250.

Fiscal Management Policies

The City's adopted budget includes a summary of our financial policies regarding revenues, operating budgets, management of capital assets, debt and financial reserves. Below is a summary of these policies.

Revenue Policy. The City relies on user charges to fund 100 percent of the direct costs associated with new development. System development charges (SDCs) fund street, water, sewer, storm water and park improvements necessary to serve a growing population. It is the City's policy to maximize the use of these fees in lieu of taxes and subsidies from other City funds, for services that are directly related to new construction.

Operating Budget Policy. It is the City's policy to adopt an operating budget that does not exceed available resources. Operating resources will be sufficient to support current operating expenditures, transfers, reserves, and contingencies. Additionally, recurring annual revenues will not be less than recurring annual operating expenditures.

Capital Asset Management Policy. The City adopts a Capital Improvement Plan (CIP) and updates it periodically. The CIP outlines the City's near-term capital investment priorities and provides details on future projects including, estimated costs, sources of financing, and a full description of (a) the need for the project and (b) the expected results if the project is approved and implemented. Operating expenditures are programmed into each capital project plan, including the cost of implementing the plan and all continuing labor, operating and capital outlay costs.

Debt Policy. Capital projects financed through the issuance of debt will not be financed for a period which (a) exceeds the expected useful life of the project and (b) is less than 30 percent of the expected useful life of the improvements.

Reserve Policy. The City establishes a contingency reserve to accommodate unanticipated expenditures of a nonrecurring nature. In accordance with local budget law, the contingency reserve must be equal to at least 10 percent of the Fund's annual operational expenditures.

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. The construction, operation, and maintenance of transportation projects 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 19 percent of the City's revenue is derived from intergovernmental revenue sharing. State gas tax and license fees are distributed to municipalities by the State of Oregon. 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. A portion is paid to cities annually on a per capita basis. Oregon gas taxes are collected as a fixed amount per gallon of gasoline served. The gas tax in Oregon was increased in 2011, from $0.24 per gallon to $0.30 per gallon. The tax does not vary with gas price changes, nor is there an adjustment for inflation. The net revenue collected from this source has gradually eroded as the cost to construct and repair transportation systems has increased and as new vehicles become increasingly fuel efficient.

Oregon vehicle registration fees are collected as a fixed amount at the time a vehicle is registered with the Department of Motor Vehicles. Vehicle registration fees in Oregon have recently increased to $172 per four year term for new light vehicles, and $86 per two year term for light vehicle renewals. There is no adjustment for inflation tied to registration fees. If revenues received from the state increase in future years, then the anticipated need for other revenue sources explained in this chapter (e.g. fees, etc.) can be decreased.

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 1 percent per year. The City expects that a 1 percent increase per year from this source is likely through 2040.

Roadway Maintenance Fee. Charges for water, sewer, surface water, park maintenance and street maintenance are charged 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 fee has increased, on average, five percent annually. In 2014, the City increased the residential street fee by 75 percent and is considering increasing the commercial street fee cap by 75 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, allows the City to maintain its current, yet mediocre, Pavement Condition Index of 61 (on a scale of 0-100). The City predicts that more than $2 million in street maintenance revenues will be available through the 2014-2015, biennium and that funding for street maintenance will be adequate 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 are receipted 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, street fund revenues collected from this source have increased by about 4.5 percent annually.

Prior to fiscal year 2009, franchise fee revenue from the City's electrical-power franchise agreement (approximately $500,000) was receipted to the Street fund. Because franchise fee revenue is discretionary, funds were reallocated 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 were allocated to another 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 are forecast to increase by two percent annually through 2040.

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

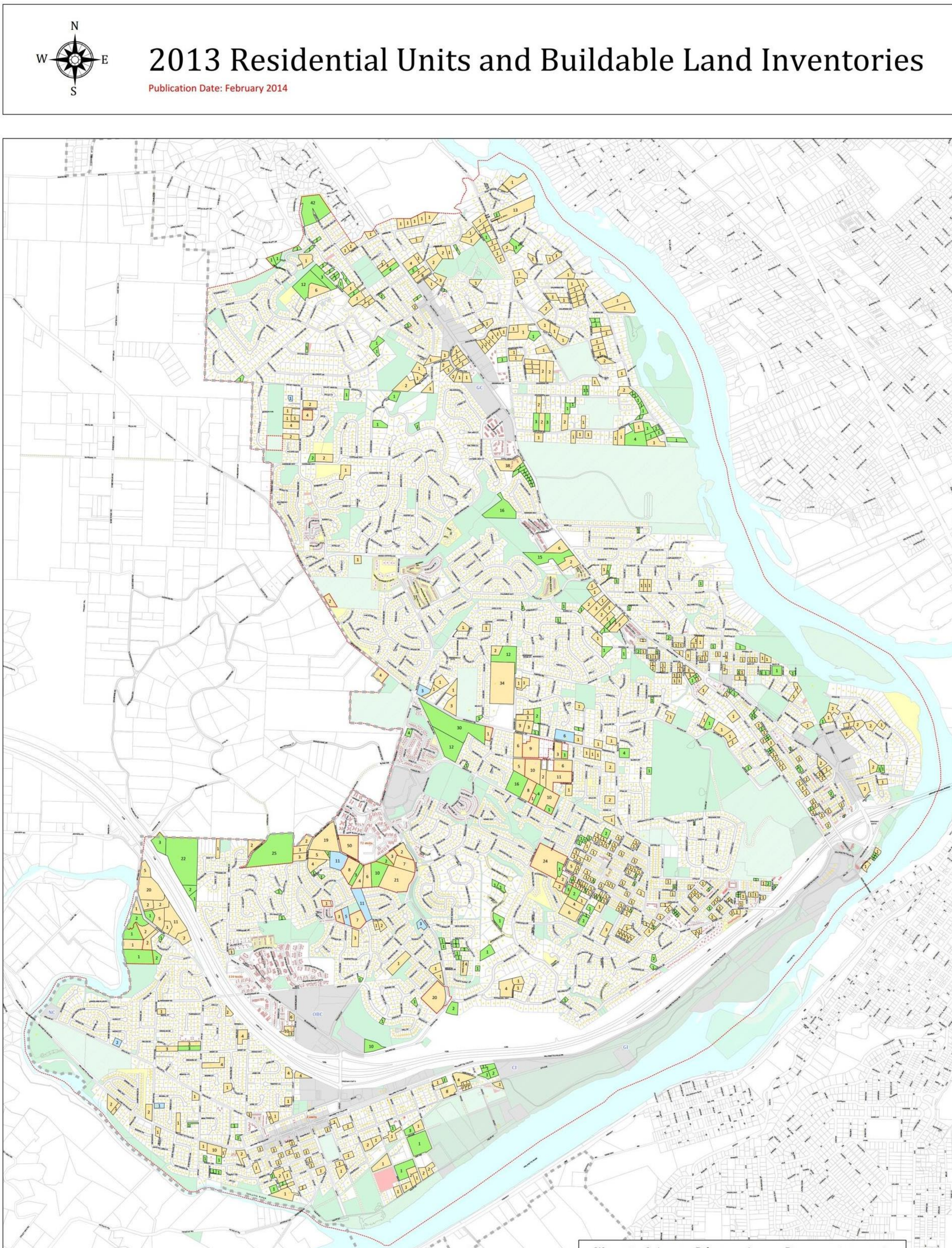
While the City of West Linn is expected to have relatively limited commercial development, household growth is projected to increase by approximately 1,532 units by the time the existing supply of buildable land is expended[1]. Based on current zoning allocations, future residential development is expected to be comprised of 24 percent multi-family and 76 percent single-family dwellings. The 2014-2015 biennial budget forecasts $457,000 in SDC improvements. The City's Finance Department assumes a 3 percent annual rate of growth to SDC revenues. When projected to the year 2040, SDC revenues total $9.18 million for street, bicycle and pedestrian projects. Total SDC revenues collected are reduced to $4.55 million if build-out occurs in 2029.

[1] Assuming the historic 1 percent rate of growth in households between 2001 and 2014, continues, the City will expend its current supply of buildable land around 2029 (14 years).

Figure 1 2013 Residential Units and Buildable Lands Inventory

2013 Residential Units and Buildable Land Inventories

Publication Date: February 2014



Map Legend

Exisiting Residential Units
Displayed by Current Land Use

- LDR - Low Density Residential
- MDR - Medium Density Residential
- MHDR - Medium-High Density Residential
- ANX - Is not annexed into the City of West Linn

For Unit Tracking purposes a property is considered "current" if a permit has been issued at the location as of December 31. 2013.

Buildable Land Inventory (as of 12/31/2013)
Land Type, Numbers Shown are Potential Additional Units

- Vacant
- Infill Potential
- Approved for Development

Buildable housing unit numbers are rough theoretical maximum estimates under current zoning and regulatory structure and are not intended to serve as a projection and are to be utilized for general long-range planning purposes only.

Other Property Shown on Map

- Commercial and Industrial Zoning
- City Owned Property
- Other Property, Public or Quasi-Public
- Other Property, Homeowners Assoc., etc.
- Other Vacant Lots, Undevelopable
- GIS Taxlot Base Map

Public/Quasi-Public and Homeowners Assoc. property shown on this map is based on Clackamas County Assessment and Taxation database from June 2013.

Other Map Elements

- West Linn City Limits
- Metro Urban Growth Boundary
- Roadways
- Unimproved Right-of-Way
- Rivers

West Linn
Certified Population
July 2013: 25,425
Certified Estimate
PSU Population
Research Center
December 15, 2013

GIS Taxlot Base Map Source: Clackamas County GIS
Inventories & Mapping: City of West Linn Planning and GIS

0 1,000 2,000 4,000 Feet

0 0.125 0.25 0.5 0.75 1 Miles

DEVTRACK_2013/APPROVEDDEVANDBUILDABLELAND_201402.MXD | AHA
1ST DRAFT: OCTOBER 15 2013, 2ND DRAFT: NOVEMBER 13, 2013, 3RD DRAFT: NOVEMBER 22, 2013,
4TH DRAFT: FEBUARY 7, 2014, FEBRUARY 20, 2014, FINAL FEBRUARY 28, 2014

West Linn GIS
GEOGRAPHIC INFORMATION SYSTEMS

Exactions. These are improvements that are obtained when development is permitted. Developers are required to improve their frontage and, in some cases, provide off-site improvements depending upon their level of traffic generation and the impact to the transportation system. Off-site mitigation measures can include, but are not limited to, Master Plan projects identified in the TSP. Based on the City's buildable lands inventory, completed in 2014, the map in Figure 1 illustrates parcels in the City with potential for development or redevelopment. 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. Unappropriated ending fund balance reserves are used 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 a City emergency is declared. 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 however, 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, these potential transportation funding sources are not accounted for in the City's 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 greater discretion on how the monies are spent which allows for greater focus on local priorities and innovative solutions to transportation challenges.

- *Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grants*. These monies are used to invest in road, rail, transit and port projects that promise to achieve critical national objectives. In 2014, $600 million in TIGER funds were awarded 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, 797 eligible grant applications were received 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.* The Oregon Department of Transportation (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. TGM grants may be used for transportation system planning or integrated land use and transportation planning. West Linn's 2014 TSP Update 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 transportation system of the U.S.; reduce environmental impacts of transportation; reduce the need for costly future public infrastructure investments; ensure efficient access to jobs, services, and centers of trade; and 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. It is anticipated that 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 in the vicinity of schools. Funding is available for a variety of programs and projects that encourage children and their parents to walk to school.

Table 1 Local Transportation Revenues, 2014

Revenue	FY 2014 Amount
State fuel tax and vehicle license fees	$1,414,000
Roadway maintenance fee	$1,319,000
Franchise fees	$120,000
SDC improvements and reimbursements (streets and bicycle/pedestrian SDC funds)	$345,000
Miscellaneous	$30,000
Total	**$3,228,000**

Funding Outlook

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 jump in a car and drive for necessary items. In the most recent community survey, 90 percent of the respondents agree that the City of West Linn should actively encourage economic development in existing commercial areas in the City (City of West Linn, 2014).

Table 1 summarizes the current and expected transportation revenues the City will collect between now and 2040.

Table 2 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[2]
Miscellaneous	$30,000	$1,131,000
Total	**$3,228,000**	**$129,514,000**

Table 2 provides a summary of the expenses expected to be associated with transportation related improvements through 2040. Accounting for personal, materials, and debt service, transfers to other funds and new equipment and vehicles, the City anticipates a balance of $44.825 million for transportation improvements between now and 2040.

Table 3 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

[2] Based on 2029 build-out.

	Equipment and Vehicles	$147,000	$1,541,000
Reserve		$162,000	$7,060,000
Total		**$3,162,000**	**$133,946,000**

Appendix

Roadway Capital Improvement Projects

The City of West Linn's Capital Improvement Plan (CIP) involves a process through which the City develops a multi-year plan for major capital expenditures that matches available resources with project needs. The CIP lists each proposed capital project, the estimated timeframe in which the project needs to be undertaken, the financial requirements for the project, and proposed methods of financing. It also attempts to identify and plan for all major capital needs, and addresses capital items that are different from those covered under the capital outlay category in each department's budget.

CIP improvements include construction and acquisition of new buildings, additions to or renovations of existing buildings, construction and reconstruction of streets, water and sanitary sewer improvements, drainage improvements, land purchases and major equipment purchases.

Table 3 provides a summary of the current CIP, which includes eight funded and four unfunded streets projects.

Table 4 Streets CIP Projects

Project Name	Source	Funded	Total (thousands of dollars)	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Median Island Restoration	Fees	Y	50	50					
Sidewalk Projects	Fees	Y	273	73		50	50	50	50
Street Crack Seal Program	Fees	Y	282	47	47	47	47	47	47
Street Pavement Maintenance Program	Fees	Y	3,770	550	720	625	625	625	625
Street Pavement Marking	Fees	Y	158	23	23	28	$28	28	28
Street Slurry Seal Program	Fees	Y	1,369	250	250	250	119	250	250
Transportation System Action Plan Projects	Fees	N	3,025			723	$45	767	790
10th St./I-205 Corridor Improvements	Grant	N	4,445						4,445
10th St./I-205 Corridor	SDC	N	785						785

Project Name	Source	Funded	Total (thousands of dollars)	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Improvements									
Transportation System Action Plan Projects	SDC	N	3,637			861	892	925	959
Transportation System Action Plan Projects	SDC	Y	1,300	450	50	200	200	200	200
Transportation System Plan	SDC	Y	200	200					
Subtotal			**19,294**	**1,643**	**1,090**	**2,784**	**2,706**	**2,892**	**8,179**

Fiscal Management Policies

Revenue policy

- SDCs shall be established to fund the costs of improvement to service additional increments to growth, such as street, water, sewer, surface water, and park and recreation facilities.
- The City will maximize user charges in lieu of ad valorem taxes and subsidies from other City funds, for services that can be identified and where costs are directly related to the level of service provided.
- Charges for providing utility services shall be sufficient to finance all operating, capital outlay and debt service expenses of the City's enterprise funds, including operating contingency and reserve requirements.
- User charges shall fund 100 percent of the direct cost of development review and building activities. User charges include land use, engineering inspection, building permit and building inspection fees.
- Park recreation programs shall be funded by user charges. Annual revenues raised by participant fees shall cover at least 100 percent of the program's cost with no assessment made for administration. No one shall be denied access to park recreation programs due to their lack of ability to pay for the full participant fee.
- Other reimbursable work performed by the City (labor, contracted services, equipment and other indirect expenses) shall be billed at actual or estimated actual cost, including indirect overhead.
- Charges for services shall accurately reflect the actual or estimated cost of providing a specific service. The cost of providing specific services shall be recalculated periodically,

and the fee adjusted accordingly. The City shall maintain a current schedule of fees, showing when the fees were last reviewed and/or recalculated.

Operating Budget Policy

- The City shall prepare, adopt and amend its operating budget in accordance with Oregon Local Budget Law.
- The City shall maintain a budget system to monitor expenditures and revenues on an ongoing basis, with thorough analysis and adjustment periodically if required.
- The City shall not adopt an operating budget that is greater than the amount of resources available to fund it. Current operating resources will be sufficient to support current operating expenditures, transfers, reserves, and contingencies.
- Annual recurring revenues (including interfund transfers) shall not be less than annual recurring operating expenditures (total annual budget, minus capital outlay, transfers, reserves, and contingencies).
- Unless otherwise authorized by City Council, general unrestricted revenues shall not be earmarked for specific programs, activities or services.
- Long-term debt or bond financing shall only be used for capital purposes and shall not be used to finance current operations.

Capital Asset Management Policy

- The City shall adopt a Capital Improvement Plan (CIP) and update it periodically. Prior to adopting a CIP, the City shall hold public meetings and a public hearing on the contents of the CIP. The document shall provide details on each capital project plan, its estimated costs, sources of financing and a full description, including a detailed statement identifying: (as) the needs, conditions and circumstances that have caused the project's creation and (b) the expected results if the project is approved and implemented.
- Operating expenditures shall be programmed into each capital project plan, including the cost of implementing the plan and all continuing labor, operating and capital outlay costs.

Debt Policy

- Capital project financed through the issuance of debt shall not be financed for a period which (a) exceeds the expected useful life of the project and (b) is less than 30 percent of the expected useful life of the improvements.
- The City shall use the most prudent methods of acquiring capital outlay items, including the use of lease-purchase agreements.
- The City shall maintain its bond rating at the highest level fiscally prudent, so that future borrowing costs are minimized and access to the credit market is preserved.

Reserve Policy

- The City shall establish a contingency reserve to provide for unanticipated expenditures of a nonrecurring nature to meet unexpected increases in service delivery costs. In accordance with local budget law n the State of Oregon, the contingency reserve must be an appropriated budget item, though funds may not be directly disbursed from the contingency reserve. Amounts must be reclassified into a spendable budget category through a supplemental budget process. Also, budget law does not allow for a contingency reserve to be budgeted in a debt service fund. The contingency reserve policy must be at least equal to 10 percent of the Fund's annual operational expenditures (which includes Personal Services and Materials and Services line items and excludes Debt Service, Transfers, and Capital Outlay line items) with 15 percent for Public Safety, Library, and Parks and Recreation Funds.
- The City shall maintain an unappropriated ending fund balance reserve to provide working capital for the post-budget period until sufficient revenues arrive to fund post-budget period operations. In accordance with local budget law in the State of Oregon, the unappropriated ending fund balance reserve is not appropriated and cannot be spent in the current year unless a state of emergency is declared by the City Manager. The unappropriated ending fund balance reserve policy must be at least equal to five percent of the Fund's annual operations expenditures (which includes Personal Services and Materials and Services lines items and excludes Debt Service, Transfers, and Capital Outlay items).

Table 5 Revenue and Expense Projections to FY40

City of West Linn

Street Fund

(amounts in thousands)

						Current Year	+ 1	+ 2	+ 3	+ 4	+ 5	+ 6	+ 7	+ 8
	ACTUALS							PROJECTED						
	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22
Resources														
Beginning fund balance	$124	$822	$929	$1,291	$1,797	$2,215	$2,186	$2,209	$1,609	$917	$398	$274	$209	$286
Fees - street maintenance fees (1)	714	778	792	870	904	1,319	1,472	1,546	1,623	1,704	1,789	1,878	1,972	2,071
Intergovernmental - gas tax (2)	1,018	1,013	1,204	1,372	1,385	1,414	1,428	1,442	1,456	1,471	1,486	1,501	1,516	1,531
SDC Reimbursement	3	63	202	157	135	120	122	124	126	129	132	135	138	141
Franchise fees	79	101	103	113	113	120	126	132	139	146	153	161	169	177
Miscellaneous	144	149	273	14	28	30	31	32	33	34	35	36	37	38
Interest	4	2	1	-	-	-	-	-	-	-	-	-	-	-
Debt proceeds	2,030	-	-	-	-	-	-	-	-	-	-	-	-	-
Total revenues	3,992	2,106	2,575	2,526	2,565	3,003	3,179	3,276	3,377	3,484	3,595	3,713	3,836	3,964
Total Resources	$4,116	$2,928	$3,504	$3,817	$4,362	$5,218	$5,365	$5,485	$4,986	$4,401	$3,993	$3,987	$4,045	$4,250
Requirements														
Personal services	$433	$410	$453	$490	$514	$582	$605	$629	$654	$680	$707	$735	$764	$795
Materials & services	511	488	433	433	527	498	526	$542	558	575	592	610	628	647
Debt service	-	150	151	152	152	152	152	152	152	152	152	152	152	152
Transfers to other funds	719	671	659	529	550	660	683	703	724	746	768	791	815	839
Capital outlay														
Street capital projects	1,631	280	517	382	237	993	1,040	1,850	1,850	1,850	1,500	1,400	1,400	1,500
Equipment and vehicle	-	-	-	34	167	147	150	-	131	-	-	90	-	90
Total expenditures	3,294	1,999	2,213	2,020	2,147	3,032	3,156	3,876	4,069	4,003	3,719	3,778	3,759	4,023
Ending Fund Balance														
Policy requirement (15%)	*142*	135	133	138	156	162	170	176	182	188	195	202	209	216
Over (under) Policy	680	794	1,158	1,659	2,059	2,024	2,039	1,433	735	210	79	7	77	11
Total ending fund balance	822	929	1,291	1,797	2,215	2,186	2,209	1,609	917	398	274	209	286	227
Total Requirements	$4,116	$2,928	$3,504	$3,817	$4,362	$5,218	$5,365	$5,485	$4,986	$4,401	$3,993	$3,987	$4,045	$4,250

	+ 9	+ 10	+ 11	+ 12	+ 13	+ 14	+ 15	+ 16	+ 17	+ 18	+ 19	+ 20	+ 21	+ 22	+ 23	+ 24	+ 25	+ 26
	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	FY36	FY37	FY38	FY39	FY40
Resources																		
Beginning fund balance	$227	$316	$275	$288	$278	$330	$366	$372	$323	$352	$386	$609	846	$1,193	$1,656	$2,244	$2,963	$3,820
Fees - street maintenance fees (1)	2,175	2,284	2,398	2,518	2,644	2,776	2,915	3,061	3,214	3,375	3,544	3,721	3,907	4,102	4,307	4,522	4,748	4,985
Intergovernmental - gas tax (2)	1,546	1,561	1,577	1,593	1,609	1,625	1,641	1,657	1,674	1,691	1,708	1,725	1,742	1,759	1,777	1,795	1,813	1,831
SDC Reimbursement	144	147	150	153	156	159	162	165	168	171	174	177	181	185	189	193	197	201
Franchise fees	186	195	205	215	226	237	249	261	274	288	302	317	333	350	368	386	405	425
Miscellaneous	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56
Interest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt proceeds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total revenues	4,098	4,237	4,383	4,535	4,694	4,859	5,032	5,212	5,401	5,599	5,805	6,020	6,246	6,482	6,730	6,988	7,258	7,540
Total Resources	$4,325	$4,553	$4,658	$4,823	$4,972	$5,189	$5,398	$5,584	$5,724	$5,951	$6,191	$6,629	$7,092	$7,675	$8,386	$9,232	$10,221	$11,360
Requirements																		
Personal services	$827	$860	$894	$930	$967	$1,006	$1,046	$1,088	$1,132	$1,177	$1,224	$1,273	$1,324	$1,377	$1,432	$1,489	$1,549	$1,611
Materials & services	666	686	707	728	750	773	796	820	845	870	896	923	951	980	1,009	1,039	1,070	1,102
Debt service	152	152	152	152	152	152	152	-	-	-	-	-	1	2	3	4	5	6
Transfers to other funds	864	890	917	945	973	1,002	1,032	1,063	1,095	1,128	1,162	1,197	1,233	1,270	1,308	1,347	1,387	1,429
Capital outlay																		
Street capital projects	1,500	1,600	1,700	1,700	1,800	1,800	2,000	2,200	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300
Equipment and vehicle	-	90	-	90	-	90	-	90	-	90	-	90	90	90	90	90	90	90
Total expenditures	4,009	4,278	4,370	4,545	4,642	4,823	5,026	5,261	5,372	5,565	5,582	5,783	5,899	6,019	6,142	6,269	6,401	6,538
Ending Fund Balance																		
Policy requirement (15%)	224	232	240	249	258	267	276	286	297	307	318	329	341	354	366	379	393	407
Over (under) Policy	92	43	48	29	72	99	96	37	55	79	291	517	852	1,302	1,878	2,584	3,427	4,415
Total ending fund balance	316	275	288	278	330	366	372	323	352	386	609	846	1,193	1,656	2,244	2,963	3,820	4,822
Total Requirements	$4,325	$4,553	$4,658	$4,823	$4,972	$5,189	$5,398	$5,584	$5,724	$5,951	$6,191	$6,629	$7,092	$7,675	$8,386	$9,232	$10,221	$11,360

(1) For FY14, 75% increase in Residential SMF and 0% increase in Commercial SMF. Increase of 5% for both Residential and Commercial for FY15 forward.

(2) No Local Gas Tax. State Gas Tax rate is fixed at .30 cents per gallon. Projected 1% increase annually.

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MEMORANDUM

Date: May 22, 2015 Project #: 17817.0

To: Zach Pelz, City of West Linn
Gail Curtis, Oregon Department of Transportation

From: Susan Wright and Matthew Bell, Kittelson & Associates, Inc.

Project: West Linn Transportation System Plan (TSP) Update

Subject: Final Technical Memorandum 5: Existing Conditions

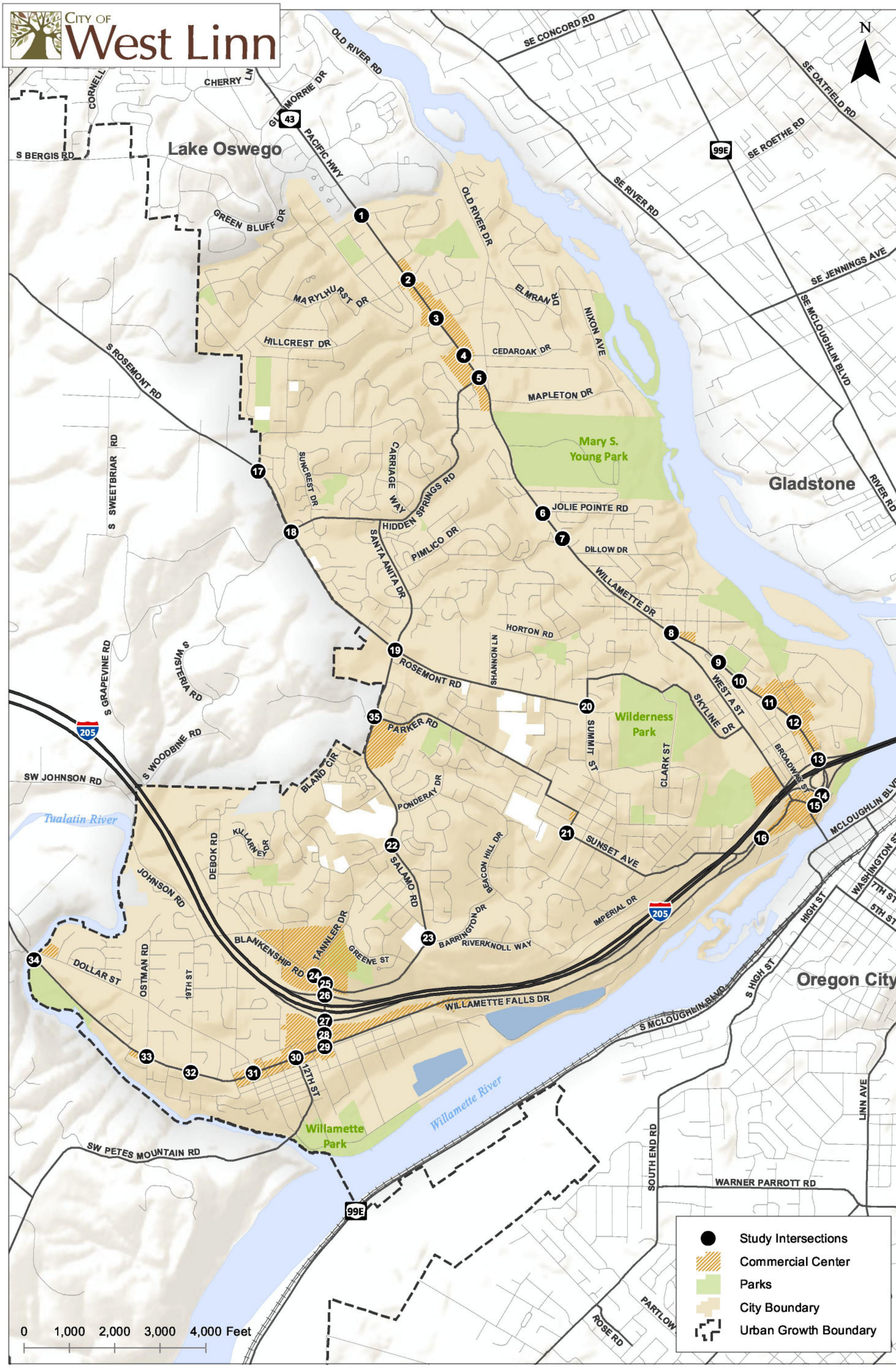
This memorandum documents existing transportation system conditions within the City of West Linn. The information presented in this memorandum is intended to serve as a basis for comparing future transportation system conditions, evaluating alternatives, and identifying potential solutions and improvements for the City's 2015 Transportation System Plan (TSP) update. The information is based on existing transportation inventories, previous studies conducted by the City, and field observations.

This memorandum includes information on the existing pedestrian, bicycle, transit, motor vehicle, and other travel modes within West Linn. Because findings locally and from around the region have shown that current traffic volumes at many intersections are the same or lower than in 2006, the motor vehicle section presents the results from the 2006 TSP update. Roadway and intersection volumes from the 2006 TSP update were also combined with more recent counts conducted in Fall 2014 at selected intersections to serve as the baseline for the evaluation of future transportation system conditions.

Thirty-five intersections were selected for focused operations analysis in the 2006 TSP update. The study intersections are identified in Figure 1. At each location, traffic data was gathered and analyzed to evaluate current conditions and performance for all modes of travel. The results are also compared to the most recently identified performance or design standards, as appropriate, and any elements that are found to be deficient are identified. More recent data was collected for other aspects of the transportation system including reported vehicle crashes, newly constructed facilities as described by the city and Metro GIS data, and reported traffic volumes on state and county facilities. The following sections describe the characteristics, usage, and performance of the existing transportation system within West Linn.

PEDESTRIAN SYSTEM

The pedestrian system within the City of West Linn consists of sidewalks, multi-use paths, and trails as well as marked and unmarked, signalized and unsignalized pedestrian crossings. These facilities provide



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Study Area
West Linn, Oregon

Figure
1

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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: USGS, ESRI, TANA, AND

local residents with the ability to access transit 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 the City.

In order to assess the adequacy of pedestrian facilities, GIS data was obtained from the city's GIS database and Metro's Regional Land Information System (RLIS). The GIS data was updated to reflect projects completed since the 2006 TSP update and recent aerial imagery of sidewalks and other pedestrian facilities along the city's arterial and collector streets. The data includes the location of existing sidewalks and crosswalks along the city's arterial and collector streets and many of the city's neighborhood route and local streets. The data also includes the location of existing activity centers such as schools, parks, and retail/commercial areas as well as the local community center, library, and City Hall. These activity centers were identified to determine possible pedestrian trip generators and to help prioritize potential improvements to the pedestrian system. Figure 2 shows the existing pedestrian facilities within the City of West Linn as well as the location of major activity centers.

As shown in Figure 2, sidewalks are currently provided along a majority of arterial and collector streets within the City as well as many neighborhood route 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 retail and commercial areas and inadequate near schools and parks. It is desirable 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.

Facility Connectivity

The existing sidewalk inventory shows that a basic system of walking facilities is provided along most of the major streets within the city; however, there are significant gaps in sidewalks or walkways in older neighborhoods. These older neighborhoods were developed when street standards did not require sidewalks on higher-classification roadways (collectors and arterials), or where topography constrained the ability to design an adequate sidewalk facility. As an example, the Willamette district generally has sidewalks on at least one side of the road along collectors and arterials (such as Dollar Street) but includes gaps in key locations along Willamette Falls Drive. The Robinwood neighborhood has no collector streets with sidewalks. An illustration of grade challenges is along Hidden Springs Road, where sidewalks are provided in the uphill direction only in its steepest sections. For many of these cases, it may be not feasible or desirable to construct sidewalks to fill in these gaps.

Given the issues identified above, the public involvement process for the previous TSP update engaged neighborhood representatives to identify locations within their neighborhoods that are the best candidates for filling in gaps in existing facilities, either as sidewalks or more improved walkways. Provisions were also made in the development code to allow for re-development with an appropriate choice of pedestrian facility types for a given neighborhood street.

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Pedestrian Facilities
West Linn, Oregon

Figure
2

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: USGS, ESRI, TANA, AND

This TSP update will build on the work conducted as part of the previous TSP and recommend a balanced approach toward filling gaps in the sidewalks along arterial and collector streets where physical terrain allows and providing adequate pedestrian facilities to accommodate pedestrian travel throughout the City.

Pedestrian Assessment

The Oregon Department of Transportation's (ODOT) Analysis Procedures Manual (APM) provides a methodology for evaluating pedestrian facilities along a roadway segment based on the physical characteristics of the roadway and adjacent intersections. The methodology uses the characteristics and applies a context-based subjective "Excellent/Good/Fair/Poor" rating to each roadway segment and intersection. For example, a roadway segment with one travel lane in each direction, bike lanes, sidewalks, and lighting would be rated "Good" or "Excellent" if it had also had landscape strips and medians (most of Salamo Road is rated "Excellent"). Many of the ratings are subjective, but if they are applied consistently throughout the study area, they could provide insight into pedestrian system conditions. Figure 3 illustrates the results of the pedestrian assessment. As shown, a majority of roadway segments are currently rated fair or better, with only a few short segments rated poor. These segments generally lack bicycle lanes/shoulders, landscape strips, sidewalks, and lighting and may or may not have two or more travel lanes in both directions. Although not shown on Figure 3, there is one intersection that is currently rated poor (the remaining intersections were rated fair or better). The following provides a summary of the roadway segments (and intersection) that are rated poor:

- Hidden Springs Road - The south side of Hidden Springs Road from Carriage Way to approximately 250-feet west of Cotton Wood Court. The installation of sidewalks and other pedestrian facilities on this segment may not be feasible due to steep grades.
- Rosemont Road - The south side of Rosemont Road from Salamo Road to Wild Rose Drive and the north side of Rosemont Road from Gregory Court to Summit Street. Sidewalks and other pedestrian facilities could be installed along these segments to improve pedestrian connectivity.
- Parker Road - The north side of Parker Road from Noble Lane to Dillon Lane. Sidewalks and other pedestrian facilities could be installed along this segment to improve pedestrian connectivity.
- Willamette Drive - The south side of Willamette Drive from Barlow Street to Caulfield Street. Sidewalks and other pedestrian facilities could be installed along this segment to improve pedestrian connectivity.
- Johnson Road - Both sides of Johnson Road from 19th Street to the City limits. Bicycle lanes/shoulders and/or sidewalks and other pedestrian facilities could be installed along this segment to improve pedestrian connectivity.

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Pedestrian Qualitative Multi-modal Level of Service (PQMMLOS) 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: USGS, ESRI, TANA, AND

H:\projfile\17817 - West Linn Transportation System Plan\gis\3 PQMMLOS.mxd - mbell - 4:54 PM 5/21/2015

- Dollar Street - The south side of Dollar Street from Ostman Road to the western roadway terminus. Bicycle lanes/shoulders and/or sidewalks and other pedestrian facilities could be installed along this segment to improve pedestrian connectivity.
- Willamette Falls Drive - The south side of Willamette Falls Drive from Ostman Road to the City limits and the north side of Willamette Falls Drive from Epperly Way to the City limits. Bicycle lanes/shoulders and/or sidewalks and other pedestrian facilities could be installed along these segments to improve pedestrian connectivity.
- Willamette Falls Drive - The south side of Willamette Falls Drive from Summit Street to West A Street. Sidewalks and other pedestrian facilities could be installed along this segment to improve pedestrian connectivity.
- Ostman Road - The west side of Ostman Road from Dollar Street to Willamette Falls Drive. Sidewalks and other pedestrian facilities could be installed along this segment to improve pedestrian connectivity.
- Blankenship Road – the north side of Blankenship Road from approximately 300-feet west of Debok Road to Johnson Road. The installation of sidewalks and other pedestrian facilities on this segment may not be feasible due to the existing I-205 bridge structure.
- Willamette Drive/Willamette Falls Drive – this intersection is unsignalized, lacks marked crosswalks, and crosses four lanes of traffic. Marked crosswalks and raised medians could be installed to improve pedestrian connectivity.

Attachment "A" contains a description of the roadway characteristics considered in the methodology as well as more detailed results of the findings.

Pedestrian Activity Levels

Pedestrian counts were conducted at all of the study intersections as part of the 2006 TSP update and at select location in 2014. All of the counts were conducted on a typical mid-weekday during the evening (3:30 to 6:30 p.m.) peak time period. All of the counts include the total number of pedestrians that entered the intersections in 15-minute increments. The peak hour pedestrian crossing volumes indicate the relative differences in pedestrian demand at the study intersections. Although the peak hour for vehicular traffic typically occurs from 4:00 to 5:00 p.m., the peak hour for pedestrian crossing volumes at intersections located near schools and other activity centers typically occurs earlier in the day. This was found at the Rosemont Road/Salamo Road and Highway 43/Cedaroak Drive intersections. Pedestrian crossing volumes at each study intersection are shown in Table 1.

Table 1: PM Peak Hour Pedestrian Crossing Volumes at Study Intersections

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 Road-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 1, the highest pedestrian crossing volumes were observed at intersections located near retail, recreational and educational land uses. Potential pedestrian crossing improvements should be prioritized at these locations to ensure safe and convenient access for pedestrians near businesses and schools.

Existing Deficiencies and Issues

The following provides a summary of the existing deficiencies and issues identified in the pedestrian system:

- Numerous gaps exist along sidewalks in key locations near retail and schools.
- Many sidewalks throughout the City are not ADA compliant and should be brought into compliance.
- Sidewalk widths for Highway 43 should be brought up to ODOT standards or where applicable, the standards identified in the West Linn Highway 43 Conceptual Design Plan, adopted December 10, 2007.
- Basic walkways should be provided in all neighborhoods.
- The TSP and SDC projects should be revised to show potential sidewalk improvements in locations that are feasible or desirable, based on discussions with citizens and business owners.
- The spacing and safety of pedestrian crossings on arterials and highways within the city should be reviewed to identify locations where enhancements are required.
- Identification of walkway/crossing needs should be done in conjunction with routes to major transit stops.

BICYCLE SYSTEM

The bicycle system within the City of West Linn consist of on-street bike lanes, shoulder bikeways and shared roadways as well as off-street bike facilities such as bicycle parking. These types of facilities provide residents with the ability to access transit as well as retail, 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 the City.

In order to assess the adequacy of bicycle facilities in West Linn, GIS data was obtained from the City's GIS database and Metro's RLIS. The GIS data was updated to reflect projects completed since the 2006 TSP update and recent aerial imagery of on-street bike lanes, shoulder bikeways, and other bicycle facilities along the City's arterial and collector streets. The data includes the location of existing bike lanes and streets with low, moderate, and high vehicle traffic. The data also includes the location of existing activity centers such as schools, parks, and retail/commercial areas as well as the local community center, library, and City Hall. These activity centers were identified to determine possible bicycle trip generators and to help prioritize potential improvements to the bicycle system. Figure 4 shows the existing bicycle facilities within the City of West Linn as well as the location of major activity centers.

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Bicycle Facilities
West Linn, Oregon

Figure
4

H:\projfile\17817 - West Linn Transportation System Plan\gis\4 Bicycle Facilities.mxd - mbell - 4:57 PM 5/21/2015

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Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: USGS, ESRI, TANA, AND

Bicycle Connectivity

The arterial roadway system in West Linn has basic bike lanes on a few major facilities, but most of the arterial streets have no designated bike facilities. Nearly all collector streets have no bike facilities at all. The only streets in the city with significant bike facilities are Highway 43, West A Avenue, and intermittent segments along Summit Street, Parker Road, and Willamette Falls Drive. In many cases, such as Hidden Springs Road, and the south end of Salamo Road, the slope of the roadway limits the feasibility or need for bike lanes on major arterials.

Roads with no bike lanes or intermittent bike lanes force 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. Adequate bicycle facilities should be provided to allow for safe travel between neighborhoods and activity centers. Local streets are generally not required to provide bike 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. Deficiencies in the City's bicycle network are summarized at the end of this section.

Bicycle Level of Traffic Stress

The APM provides a methodology for evaluating Bicycle Level of Traffic Stress (LTS). This methodology can be used to evaluate the existing bicycle infrastructure and environment within West Linn. As applied by ODOT, this method classifies four levels of traffic stress that a cyclist can experience on the roadway, ranging from LTS 1 (little traffic stress) to LTS 4 (high traffic stress).

A road segment with LTS 1 generally has low traffic speeds and low volumes and is suitable for all cyclists, including children. A road segment with 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 is the desired target on most roadways. Figure 5 illustrates the results of the LTS analysis. As shown, most of the segments are rated at LTS 2 or 3 with a few segments rated at LTS 4. The following are key observations from the LTS review for segments rated at LTS 3 or higher:

- Most of Parker Road is rated LTS 3, with the exception of the segment from Noble Lane to Dillan Lane, which is rated LTS 4.
- Most of Salamo Drive is rated LTS 3, with the exception of the segment located south of Barrington Drive, which is rated LTS 4.
- Willamette Falls Drive is rated LTS 3 from the west City limits to 16th Street and LTS 4 from 10th Street to Willamette Drive.
- Most of Highway 43 is rated LTS 3, with the exception the segment from White Tail Drive to Barlow Street, which is rated LTS 2, and the segment from Barlow Street to Caufield Street, which is rated LTS 1.

Bicycle Level of Traffic Stress (LTS)
West Linn, Oregon

Figure
5

H:\proj\file\17817 - West Linn Transportation System Plan\gis\5 Bicycle LTS.mxd - mbell - 4:59 PM 5/21/2015

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Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: USGS, ESRI, TANA, AND

- Rosemont Road from Carriage Way to Hidden Springs Road and from Bay Meadows Drive to Furlong Drive are rated LTS 4.
- Willamette Drive from Mill Street to the south City limits is rated LTS 4.

The installation of on-street bicycle lanes would improve bicycle connectivity along each of these segments.

Bicycle Activity Levels

Bicycle counts were conducted at the study intersections in 2006 as part of the previous TSP update. All of the counts were conducted on a typical mid-week day during the evening (3:30 to 6:30 p.m.) peak time period. All of the counts include the total number of bicyclists that entered the intersections in 15-minute increments. The peak hour bicycle volumes indicate low bicycle activity at the study intersections. Bicycle volumes at each study intersection are shown in Table 2. As shown, the only study intersection where more than three bicycles were observed during the three-hour count period was Rosemont Road/Salamo Road with a total of seven.

Table 2: 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 Road-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

Existing Deficiencies and Issues

The following provides a summary of the existing deficiencies and issues identified in the existing bicycle system:

- The overall system of bike lanes provides very limited connectivity between different areas of the city.
- There are few bike lanes on the city's collector streets.
- A basic bike route system should be developed along or parallel to all arterial routes in the city, where topography and other design constraints permit. Considerations should include Rosemont Road, and portions of Willamette Falls Drive.

TRANSIT SYSTEM

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 the counties of Clackamas, Multnomah and Washington. 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, including 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 3 summarizes the average headways and hours of service for Lines 35 and 154.

Table 3: 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 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

Existing transit routes and stops are illustrated on Figure 6. As shown, there are four stops with bus shelters: two near the Bolton Area shopping center, one near the Robinwood Shopping Center and one near the Willamette Historic Area Commercial District. Also, there is essentially no transit service available with convenient walking distance for most of the city west of Highway 43. This includes the shopping center on Salamo Road, and several of the area schools. There is one park-and-ride in West Linn located at the Highway 43/Cedaroak Drive intersection for commuters wishing to travel north on 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

School bus service is provided within the West Linn area by the West Linn-Wilsonville School District. 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 1.5 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.

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Transit Facilities
West Linn, Oregon

Figure
6

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Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: USGS, ESRI, TANA, AND

Shuttle Service

Mary's Woods provides a free shuttle service connecting the Marylhurst University campus with Lake Oswego and Oregon City. The Blue Line travels along Highway 43 connecting the Marie Rose Center at Marylhurst to the Lake Oswego Transit Center and Millennium Plaza in Lake Oswego. The Green Line travels through West Linn along Highway 43 connecting the Marie Rose Center to the Oregon City Transit Center and the Evangelical church in Oregon City. 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. Shuttle in the Woods is a pilot program supported by a two-year grant from TriMet. Service began November 11, 2013.

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.

Existing Deficiencies and Issues

The following provides a summary of the existing deficiencies and issues identified in the existing transit system:

- Marketing and awareness should be improved to attract higher ridership.
- Additional locations for park and ride lot facilities should be considered.
- Locations along Highway 43 where transit shelter enhancements would be most effective should be identified.

MOTOR VEHICLE SYSTEM

The motor vehicle system within the City of West Linn includes private streets, city streets, state highways, and an interstate freeway. This section describes how the system has been developed to date and provides a more detailed review of how it is used and operated.

Functional Classification

The functional classification system within West Linn is designed to serve numerous transportation needs. The schematic diagram in Exhibit 1 below reveals the relationship between facility design and mobility and accessibility outcomes. As mobility is increased (bottom axis), the provision for non-motor vehicle modes (top axis) is decreased. 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 1: Relationship between access and mobility outcomes for various functional classifications

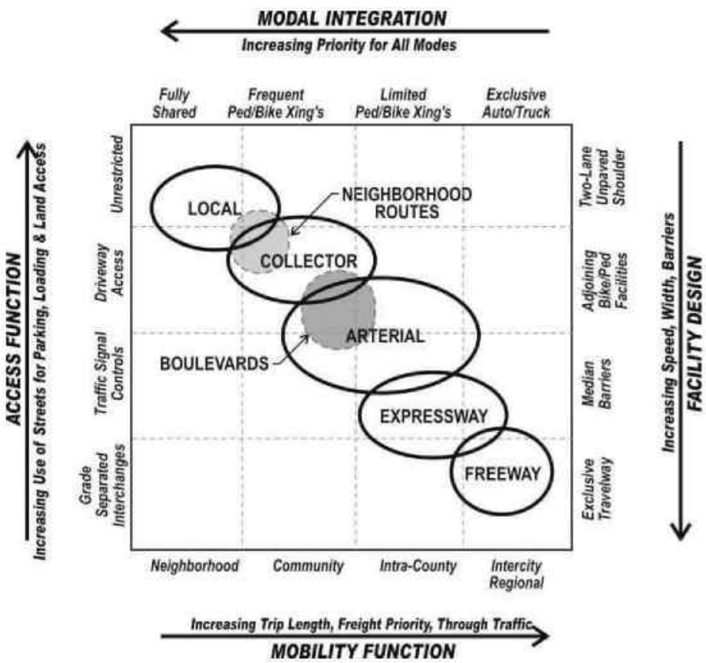

Exhibit 1 shows that as street classes progress from local to collector to arterial to freeway (top left corner to bottom right corner) the following occurs:

- Mobility Increases – Longer trips between destinations, greater proportion of freight traffic movement, and a higher proportion of through traffic.
- Integration of Pedestrian and Bicycle Modes Decreases – Provisions for adjoining sidewalks and bike facilities are required for the local, collector, and arterial classes; however, the frequency of intersection or mid-block crossings 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 – The 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 overlap the local and collector functional classifications, and Boulevards overlapping the collector and arterial classes.

The current West Linn functional classification system for roadway facilities is depicted in Figure 7. The existing arterial route from Parker Road to Sunset Avenue is a circuitous route from Parker Road to Lancaster Street to Cornwall Street to Sunset Avenue. ODOT's functional classification map West Linn (http://www.oregon.gov/ODOT/TD/TDATA/gis/docs/citymaps/West_Linn.pdf) shows a more direct route with Parker Road bypassing Lancaster Street and connecting directly to Sunset Avenue. However, the existing land use and road conditions support the route as shown in Figure 7. This pattern will continue until development provides the needed arterial standard street improvements. The West Linn functional classification hierarchy is described in Table 4.

Table 4: West Linn Street Functional Classification Description

Classification	Description
Principal Arterial	Typically state highways that provide the high level roadway capacity to local land uses. These routes connect over the longest distance (sometimes miles long) and are less frequent than other arterial or collectors. These highways generally span several jurisdictions and many times have statewide importance (as defined in the ODOT State Highway Classification).
Arterial	Arterials serve to interconnect and support the principal arterial highway system. These streets link major commercial, residential, industrial and institutional areas. Arterial streets are typically spaced about one mile apart to assure accessibility and reduce the incidence of traffic using collectors or local streets in lieu of a well placed arterial street. Many of these routes connect to cities surrounding West Linn.
Collector	Collectors provide both access and circulation within residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of a citywide circulation function, do not require as extensive control of access and penetrate residential neighborhoods, distributing trips from the neighborhood and local street system.
Neighborhood Route	Usually long relative to local streets and provide connectivity to collectors or arterials. Because neighborhood routes have greater connectivity, they generally have more traffic than local streets and are used by residents in the area to get into and out of 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 routes. Neighborhood traffic management measures are often appropriate (including devices such as speed humps, traffic circles and other devices). However, it should not be construed that neighborhood routes automatically get speed humps or any other measures. While these routes have special needs, neighborhood traffic management is only one means of retaining neighborhood character and vitality.
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

ODOT's map also shows the route from Parker Road to Sunset Avenue as an urban collector rather than an arterial. This discrepancy, along with several others identified between the ODOT and City functional classification maps are addressed in subsequent memorandums.

The Oregon Highway Plan 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. The 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.

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Functional Roadway Classifications
West Linn, Oregon

Figure
7

H:\projfile\17817 - West Linn Transportation System Plan\gis\7 Functional Classifications.mxd - mbell - 5:04 PM 5/21/2015

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Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: USGS, ESRI, TANA, AND

Roadway Jurisdiction

Roadways within West Linn are under the jurisdiction of ODOT and the City. Each jurisdiction is responsible for determining the functional classification of the roadways, defining major design and multimodal features, and approving construction and access permits. Coordination is required among the jurisdictions to ensure that the roadways are planned, operated, maintained, and improved to safely meet public needs. Roadway jurisdiction (ownership and maintenance responsibilities) of the various roadways in the City of West Linn is identified in Figure 8. As shown, Highway 43 and I-205 along with its entrance and exit ramps are under the jurisdiction of ODOT, while the city is responsible for all other roadways within city limits.

Roadway Connectivity

Interstate 205 (I-205), located in the southern section of West Linn, serves as a regional facility and the major route to the East Portland metropolitan area. Highway OR 43 functions as the major north-south arterial through West Linn and includes turn lanes at several intersections. Access to I-205 from Highway 43 is provided at their interchange on the east edge of West Linn. Access to I-205 in West Linn is also provided farther west at 10th Street.

Metro spacing standards require a street spacing of one mile for major arterials and 0.5 miles for minor arterials and collectors. As Highway 43 is the only major arterial in the city, there is a need for an additional north-south major arterial approximately one mile to the east and west of Highway. For minor arterials and collectors, there are a few key corridors, such as Willamette Falls Drive, Salamo Road, Rosemont Road, and Hidden Springs Road, that are continuous facilities. There are some corridors with connectivity issues, such as Parker Road, which runs a non-direct path to Sunset Avenue, and Rosemont Road, which ends at Summit Street due to Wilderness Park. The RTP acknowledges that existing developments and natural features may present challenges in meeting the street spacing standards. In the case of West Linn, the existing street network and the natural features such as the Willamette River, the creeks, and the parks pose challenges to meeting Metro's street spacing standards.

Roadway Characteristics

Field inventories were conducted in 2006 as part of the previous TSP update 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 with. 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 through the street system, which affects travel path choices for drivers in West Linn. The inventory data is summarized in Table 5. 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.

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Roadway Jurisdiction
West Linn, Oregon

Figure
8

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

Intersection control types at study intersections are shown on Figure 9. 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/Rosemont Road intersections. 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 four arterial intersections and the rest of the study intersections are two-way stop controlled.

Table 5: Existing Study Area Roadway Characteristics by Functional Classification

Corridor	Posted Speed	Street Width [ft]	ROW Width [ft]	Number of Lanes	Lane Width [ft]
Principal Arterial					
Highway 43 (Willamette Drive)	35	27-80	60	2-4	12
Arterial					
Hidden Springs Road	25	30-53	60	2	11
West A Street	25	37-42	60	2	11
Willamette Falls Drive	25-45	32-41	120	2	11-12
Rosemont Road	25-40	23-40	60	2	10
Santa Anita Drive	25	33-54*	50-84	2	12-15
Salamo Road	25-40	32-55*	30	2	12
Summit Street *(also Collector)*	25	24-45	60-70	2	10-11
Skyline Drive	25	28-36	50	2	12
Parker Road	25-35	20-50*	60	2	10-12
Cornwall Street	25	26-33	60	2	10-11
Sunset Avenue	25	26-29	60	2	10-11
10th Street	25	15-24	50	2-4	11
12th Street	25	52-58	80	2	11
Tualatin Avenue	25	25	60	2	11
Collector					
Marylhurst Drive	25	27	50	2	10
Hillcrest Drive	25	17-23	50	2	10
Suncrest Drive	25	25-38	50	2	10
Carriage Way	25	28-38	50	2	18
Cedaroak Drive *(also Neighborhood Route)*	25	27-35	50	2	11
Old River Road	25	20-25	60	2	11
Elmran Avenue	25	20	50	2	10
Nixon Avenue	25	18-25	40-50	2	10
Mapleton Drive		18-20	50	2	11
Jolie Pointe Road	25	18-37	60	2	9
Larson Avenue		22-30	50	2	14
Failing Street		24	60	2	12-14
Pimlico Drive	25	31-40	60	2	14-16
Clark Street		42-43		2	10
Long Street		23-44		2	12-14
Simpson Street		23-44	50	2	10-11
Bland Circle	25	30-34	60	2	10-16
Tannler Drive		32-44	40-50	2	12

Blankenship Road		25-46	60	2	10-14
Debok Road	25	32-48	60	2	12-14
Johnson Road	25-40	22-42	60	2	10-12
Dollar Street	25	28-34		2	11
Ostman Road	25	21-35		2	11-12
Burns Street	25	20-23	50	2	14
Hood Street	25	23-31	40	2	11
McKillican Street	25	40-42	60	2	12
Neighborhood Route					
Dillow Road	25	20-25	30-60	2	8-11
Broadway Street		20-43		2	10-12
Horton Road		37-44*	50-55	2	16
Exeter Street	25	18-32	60	2	10-11
Oxford Street	25	35	60	2	10-14
Barrington Drive		34-44		2	12
Beacon Hill Drive		18-35		2	12
Imperial Drive		37-45		2	10-12

*Street width includes traffic island.

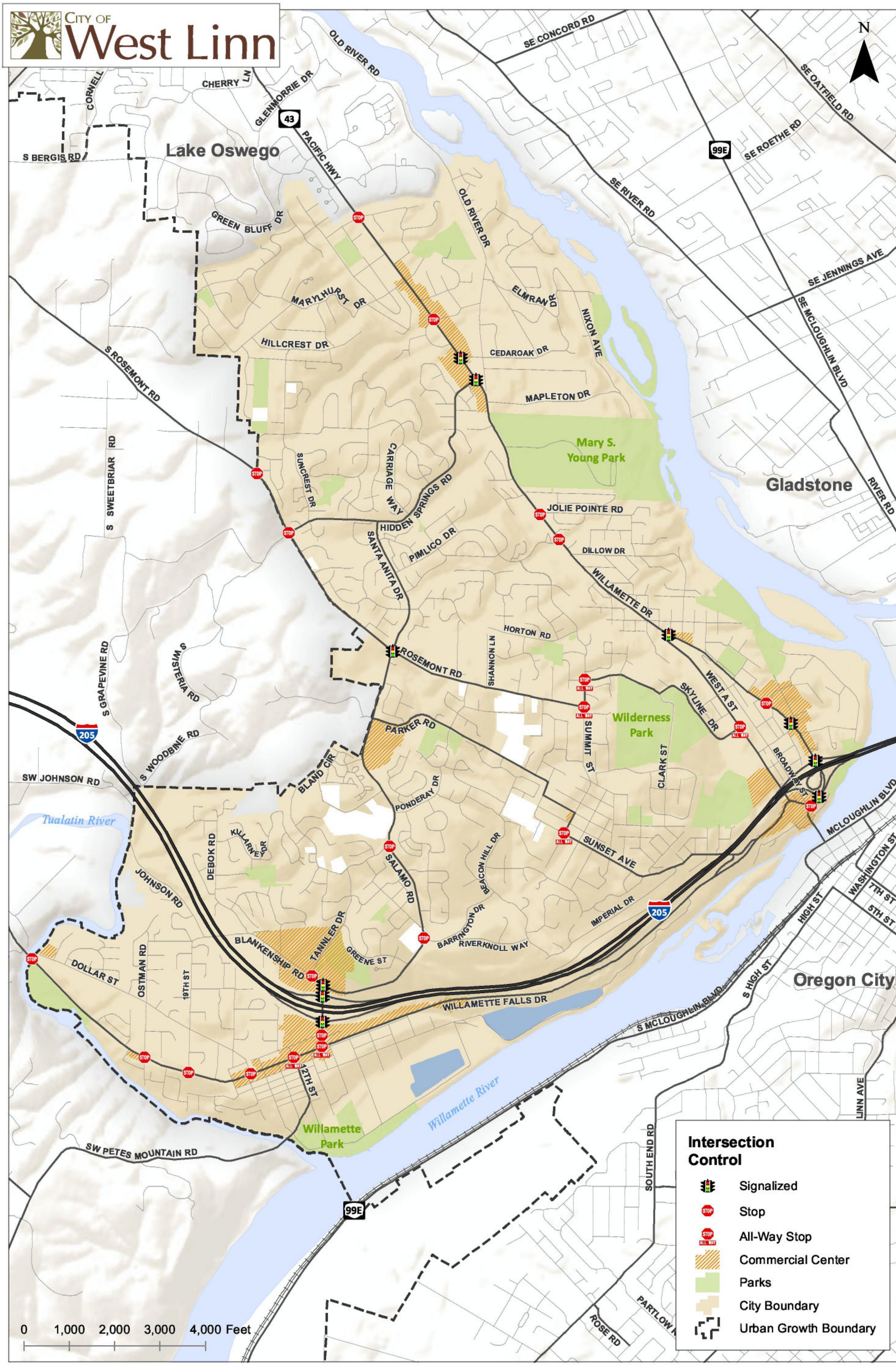
Table 5 also lists the existing number of lanes on each roadway in West Linn. The majority of roadways in West Linn are two lanes, although additional turn lanes are provided at I-205 interchange areas and many arterial intersections along Highway 43, Salamo Road, and Blankenship Road. Local streets in the City of West Linn are two lane roadways.

The key roadways in West Linn were measured at various locations to determine typical cross-section widths. Some streets within the study area have new sections intermixed with older sections resulting in ranges of roadway widths depending on location.

Pavement Conditions

Capitol Assets & Pavement Services, Inc. was contracted by the City of West Linn Public Works to perform a complete inspection of all of the City maintained streets in the City of West Linn over three years. All 100.8 centerline miles of streets were evaluated in accordance with Metropolitan Transportation Commission (MTC) standards, half in 2009, the other half in 2011. The Streetsaver Online 9.0 database was updated with the inspection data. Pavement inspections were completed in May 2011.

The City's overall network pavement conditions index (PCI) is currently a 59, on a scale of 0-100. That has decreased from a network PCI of 65 in 2009. The PCI measures the existing condition of City streets with 100 being like new and 0 being completely failed. To reverse this downward trend, the City Council approved an increase in the City's street fee in 2013 with 100% 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.



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Intersection Control
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: USGS, ESRI, TANA, AND

Capitol Assets & Pavement Services, Inc. in coordination with the City of West Linn Public Works 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 in 2006 as part of the previous TSP update. The inventory focused 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.

Access Management

Appropriate roadway access spacing is needed to ensure safety and smooth operations along a corridor. Typically, each parcel is allowed access to the adjacent roadway. However, when there are numerous roadway access points along a roadway, there may be a need to implement access management measures to control access to a roadway. Access management practices can include closure, consolidation or relocation of accesses.

The ODOT access management standards, as defined in OAR 734-051, call for minimum distances between access points on the same side of the highway. The standards vary depending on the highway classification and the posted speed on the roadway, as shown in Table 6. The ODOT spacing standards apply to the Highway 43 and the I-205 interchange areas.

Most segments of Highway 43 do not meet ODOT access spacing standards as a result of frequent roadway intersections or driveways located along the highway as it passes through residential areas.

Table 6: ODOT Access Management Standards (feet)

	Posted Speed (MPH)				
Facility	55 or greater	50	40,45	30,35	25 or less
Statewide Highway (ft)	1,320	1,100	800	500	350
District Highway (ft)	700	550	500	350	250

Source: Oregon Administrative Rules, Chapter 734, Division 51, Table 4 and Table 6

Access spacing standards identified in the 2008 West Linn TSP are summarized in Table 7.

Table 7: West Linn Spacing Standards (feet)

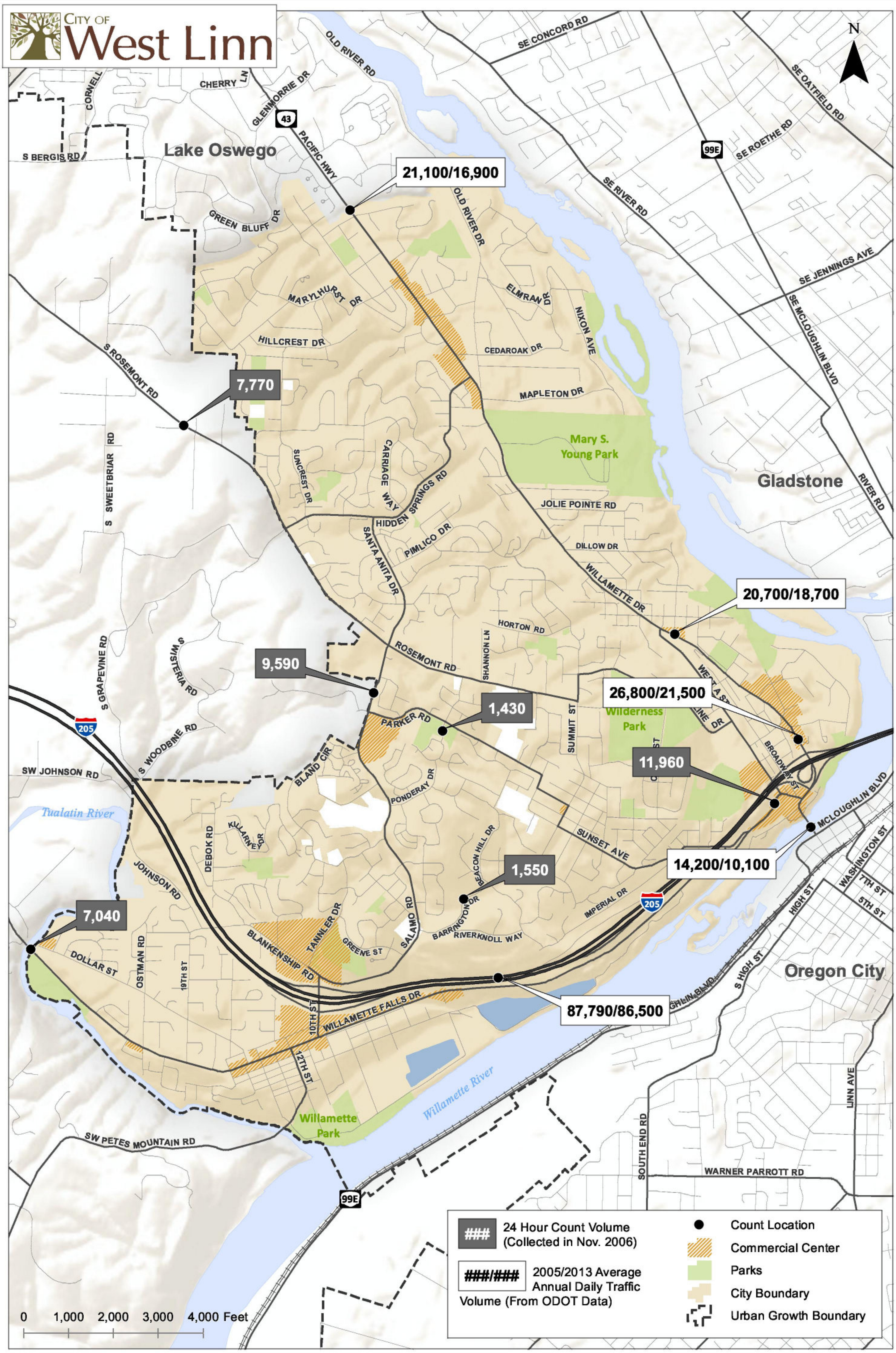
Facility	Access Requirements		
	Signal Spacing	Street	Driveway
Arterial (Urban Area)	2,650	600	300
Arterial (Opportunity Area)	1,320	NA	NA
Collector	1,320	200	150
Local Residential Street	NA	100	50
Local Commercial Street	NA	100	50

Motor Vehicle Volumes

Traffic counts were conducted at the study intersections in 2006 as part of the previous TSP update. All the counts were conducted on a typical midweek day during the weekday evening (3:30 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 in subsequent memorandums.

Figure 10 shows 24-hour traffic volumes along several major roadways within the West Linn area. While traffic volumes can vary from day to day and month to month based on weather, surrounding roadway conditions (such as construction), and holidays, traffic volumes within the West Linn area have generally gone down over the last several years. The following provides a summary of the traffic volumes changes based on data obtained from ODOT.

In order to better understand the overall trends of traffic volumes over the past ten years, traffic volume data were obtained from ODOT's Traffic Counting Program. Average Annual Daily Traffic (AADT) was obtained at select locations along Highway 43 and I-205; no data is available for Rosemont Road, Salamo Road, Wild Rose Drive, Barrington Drive, or Willamette Falls Drive. Chart 1 shows the traffic volume changes between 2004 and 2013.



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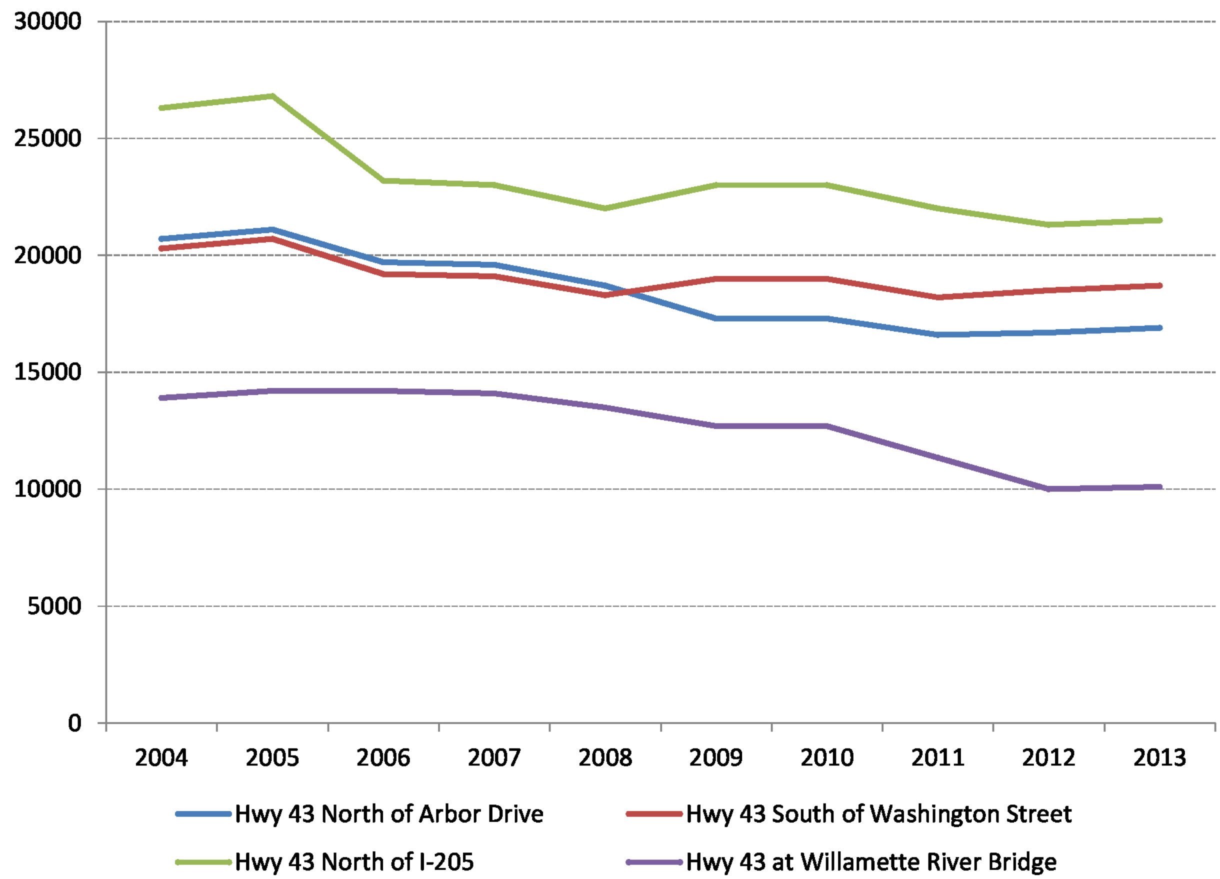
Average Daily Traffic Volumes (2006)
West Linn, Oregon

Figure
10

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: USGS, ESRI, TANA, AND

Chart 1: Traffic Volumes Changes



As shown in Chart 1, traffic volumes have generally decreased over the last several years, including from the time of the 2008 TSP update. The data for I-205 was omitted from the chart to make it legible, but that data shows a similar decrease in traffic volumes from 91,300 in 2005 to 86,500 in 2013. Additional data obtained from ODOT shows that traffic volumes along Highway 43 are not anticipated to return to 2004 levels until 2033 or beyond while traffic volumes along I-205 is not anticipated to return to 2004 levels much sooner.

Research conducted by ODOT in advance of this TSP update indicates the following:

1. Measured AADTs on Highway 43 have decreased an average of nine percent between 2006 and 2013.
2. Measured AADTs on I-205 have decreased an average of four percent near the 10th Street interchange and increased an average of six percent near the Highway 43 interchange between 2006 and 2013.
3. The difference in the peak hour counts taken from the 2006 TSP and the 2014 counts reveal:
    a. The 10th Street corridor has lost volume.

b. The Willamette Falls Drive corridor near 10th Street has lost volume.

c. Highway 43 has increased in volume but at an average rate near 25 percent less than what the TSP predicted. Unless a larger growth rate is assumed the volumes will be less than what the TSP predicted in 2030 and would not meet those volumes until sometime between 2030 and 2040.

d. I-205 volumes at 10th Street will not recover to the 2004 volume until 2033.

e. I-205 volumes at Highway 43 surpassed 2004 volumes in 2011.

Given that traffic volumes have generally decreased within the City of West Linn, with the exception of a few select intersections, the traffic operations shown in the 2006 TSP and summarized below, are assumed to reflect current conditions.

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 80 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 principal arterials (Highway 43) 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 8.

Table 8: 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 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 9 summarizes the weekday evening peak hour intersection operation at the study intersections based on 2006 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 / Salamo Road-Blankenship Drive 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 9: Weekday PM Peak Hour Intersection Level of Service

Intersection	Level of Service (LOS)	Delay (Sec)	Volume/Capacity (V/C)	Measure of Effectiveness (MOE)		MOE 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
10th St / Blankenship Dr	D	55.0	0.63	ODOT	v/c 0.85	Yes
10th St / I-205 SB	C	34.4	0.61	ODOT	v/c 0.85	Yes

10th St / I-205 NB	B	16.1	0.65	ODOT	v/c 0.85	Yes
All-Way Stop Intersections						
Salamo Rd / Rosemont Rd				City	LOS D	**Yes**
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	C	23.8	0.87	City	LOS D	Yes
Unsignalized Intersections						
Highway 43 / Arbor Dr	B/F	1.5	0.03 / 0.37	ODOT	v/c 0.99	Yes
Highway 43 / Walling Way	B/E	0.9	0.04 / 0.21	ODOT	v/c 0.99	Yes
Highway 43 / Jolie Pointe Rd	A/E	0.8	0.03 / 0.22	ODOT	v/c 0.99	Yes
Highway 43 / Pimlico Dr	B/F	7.9	0.16 / >1	ODOT	v/c 0.99	**No**
Highway 43 / Holmes St	B/F	2.7	0.02 / 0.65	ODOT	v/c 0.99	Yes
Highway 43 / Lewis St	B/E	0.6	0.01 / 0.15	ODOT	v/c 0.99	Yes
Highway 43 / Burns St	B/F	39.6	0.23 / >1	ODOT	v/c 1.1	**No**
Highway 43 / Willamette Falls Dr	A/F	73.5	0.21 / >1	ODOT	v/c 0.99	**No**
Willamette Falls Dr / Sunset Ave	B/F	98.2	0.22 / >1	City	LOS D	**No**
Rosemont Rd / Carriage Way	A/C	2.4	0.09 / 0.21	City	LOS D	Yes
Rosemont Rd / Hidden Springs Rd	A/C	3.1	0.10 / 0.14	City	LOS D	Yes
Salamo Rd / Bland Circle	A/B	0.8	0.00 / 0.09	City	LOS D	Yes
Salamo Rd / Barrington Dr	A/C	2.5	0.04 / 0.20	City	LOS D	Yes
Salamo Rd / Parker Rd	A/C	1.6	0.05 / 0.13	City	LOS D	Yes
Blankenship Road / Tannler Dr	A/F	8.0	0.13 / 0.52	City	LOS D	**No**
10th St / 8th Ave	A/F	10.1	0.13 / 0.73	City	LOS D	**No**
Willamette Falls Dr / 12th St	A/C	3.7	0.17 / 0.23	City	LOS D	**No**
Willamette Falls Dr / Dollar St (East)	A/C	1.3	0.01 / 0.21	City	LOS D	Yes
Willamette Falls Dr / 19th St	A/F	42.6	0.01 / 0.95	City	LOS D	**No**
Willamette Falls Dr / Ostman Rd	A/C	0.8	0.03 / 0.06	City	LOS D	Yes
Willamette Falls Dr / Dollar St (West)	A/B	1.0	0.03 / 0.07	City	LOS D	Yes

Notes:
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).
MOE = Measure of Effectiveness

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 (i.e., property damage only, injury and fatality), and whether a bicycle and/or pedestrian was involved. Table 10 summarizes the crashes experienced at study intersections, by crash type and by crash severity.

Table 10: 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

Truck Freight

Efficient truck movement plays a vital role in the economical movement of raw materials and finished products. The designation of through truck routes provides for this efficient movement while at the same time maintaining neighborhood livability, public safety, and minimizing maintenance costs of the roadway system. The only state-designated truck route in West Linn is I-205.

Traffic counts were conducted at the study intersections in 2006 as part of the previous TSP update. All the counts were conducted on a typical mid-week day during weekday evening (3:30 to 6:30 p.m.) peak time period. All of the counts include the total number of trucks that entered the intersection as a percentage of total vehicles. Truck percentages at study intersections are listed in Table 11. Freight routes are shown on Figure 11.

Table 11: PM Peak Hour Truck Volumes at Study Intersections

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 Ave / Cornwall St	0	0%	2006
Blankenship Rd / Tannler Dr	27	2%	2006
10th St / Blankenship Road	43	3%	2006
10th St / I-205 SB Ramp	88	5%	2006
10th St / I-205 NB Ramp	90	5%	2006
10th St / 8th Ave	30	2%	2006
10th St / Willamette Falls Dr	27	2%	2006
Willamette Falls Drive / Sunset Ave	38	2%	2006
Willamette Falls Drive / Dollar Street E	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 W	22	2%	2006

OTHER TRAVEL MODES

There are no other modes of transportation within West Linn, with the exception of the Tualatin and Willamette Rivers, which are primarily used for recreation. All major air, rail and natural gas pipelines are located north and south of West Linn in neighboring cities.

Rail

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.

Air

There are no airports located within the West Linn city limits. The closest airports include the Portland International Airport located approximately 19 miles to the north via Interstate 205 (I-205), the Aurora State Airport located approximately 15 miles to the south via 99E, and the Mulino Airport located approximately 14 miles to the south via I-205 and OR 213.

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Freight Routes
West Linn, Oregon

Figure
11

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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: USGS, ESRI, TANA, AND

Water

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 and Volpp Street where the Tualatin River meets the Willamette River and the Cedaroak boat ramp located at the end of Elmran Avenue. The boat ramps office river access for local residents as well as docking systems and wildlife viewing. A public fishing dock is also located along Territorial Drive near the falls.

The Willamette Falls Locks located between Oregon City and West Linn is 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.

Pipeline

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.

TRANSPORTATION SYSTEM MANAGEMENT OPERATIONS

Transportation System Management and Operations (TSMO) measures are designed to increase the efficiency and safety of the transportation system without physically increasing roadway capacity. Typical TSMO measures include Intelligent Transportation System (ITS) solutions, real-time traveler information, and services that respond quickly to traffic incidents. Based on discussions with City staff, the TSMO measures currently in West Linn consist of a coordination signal system along 10th Street between the I-205 eastbound ramps and Blankenship-Salamo Road and two speed feedback signs the City uses in multiple locations around the city to address local concerns for safety.

Metro's 2035 Regional Transportation Plan (RTP) includes projects on regionally significant roadways throughout the region. However, none of the projects are TSMO related.

TRANSPORTATION DEMAND MANAGEMENT

The TPR requires all cities with populations greater than 25,000 people to develop a Transportation Demand Management (TDM) plan. The RTP also requires that TDM strategies be used to encourage alternative transportation modes and achieve higher vehicle occupancy targets. TDM measures are designed to change travel behavior in order to reduce the need for more road capacity and improve performance of the road system. The TDM programs and strategies in West Linn are primarily implemented though City code and include incentives for reduced vehicle parking requirements for private developments.

Section 46.090 through Section 46.150 of the Community Development Code (CDC) indicates the following:

46.090 (Minimum Parking Space Requirements)

G. Parking reductions. CDC 55.100(H)(5) explains reductions of up to 10 percent for development sites next to transit stops and up to 10 percent for commercial development sites adjacent to large multi-family residential sites.

H. For office, industrial, and public uses where there are more than 20 parking spaces for employees on the site, at least 10 percent of the required employee parking spaces shall be reserved for carpool use before 9:00 a.m. on weekdays. The spaces will be the closest to the building entrance, except for any disabled parking and those signed for exclusive customer use. The carpool/vanpool spaces shall be clearly marked "Reserved – Carpool/Vanpool Before 9:00 a.m."

I. Existing developments along transit streets or near transit stops may redevelop up to 10 percent of the existing parking spaces to provide transit-oriented facilities, including bus pullouts, bus stops and shelters, park and ride stations, and other similar facilities.

46.140 (Exemption to Parking Requirements)

To facilitate the design requirements of Chapter 58 CDC, properties in the Willamette Falls Drive Commercial District/Overlay Zone, located between 10th and 16th Streets, shall be exempt from the requirements for off-street parking as identified in this chapter. Any off-street parking spaces provided shall be designed and installed per the dimensional standards of this code. (Ord. 1463, 2000)

46.150 (Design and Standards)

The following standards apply to the design and improvement of areas used for vehicle parking, storage, loading, and circulation:

D. Bicycle facilities and parking.

    1. Provisions shall be made for pedestrian and bicycle ways if such facilities are shown on an adopted plan.

    2. Bicycle parking facilities shall either be lockable enclosures in which the bicycle is stored, or secure stationary racks which accommodate bicyclist's locks securing the frame and both wheels. The bicycle parking shall be no more than 50 feet from the entrance to the building, well-lit, observable, and properly signed.

    3. Bicycle parking must be provided [per Table 46.150(D)(3)-1]

E. Office or industrial developments shall be allowed a 10 percent reduction in the number of required parking spaces when the property owner agrees to a demand management program that includes three or more of the following measures:

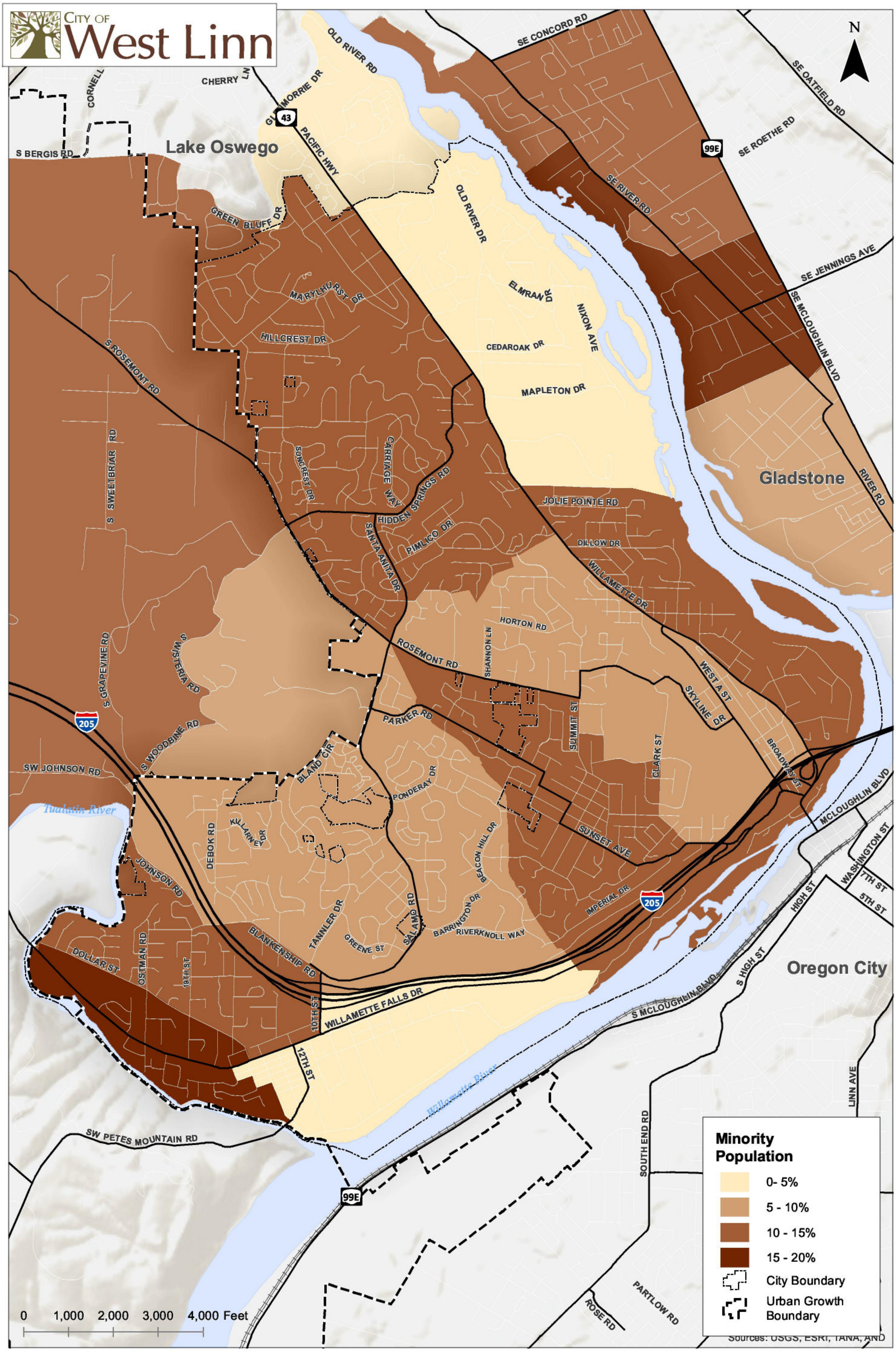
1. Designate a transportation coordinator responsible for promoting public transit and ride-sharing among employees.
2. Participate in region-wide ride matching program at the site.
3. Provide free transit passes to employees.
4. Provide showers and lockers for employees who commute by bicycle.
5. Charge employees for monthly parking and provide a transportation allowance to employees equal to the parking charge.
6. Install office technology, floorplans, and tenant regulations which are permanent, which effectively arrange for at least 10 percent of the employees to telecommute, thereby reducing employee automobile traffic by 10 percent.

The required demand management measures shall be included as conditions of approval for the proposed project. The property owner or manager shall file an annual affidavit with the City of West Linn stating that ongoing demand management measures required as conditions of approval have not been discontinued.

Metro's 2035 Regional Transportation Plan (RSP) includes TDM projects and policies that impact areas throughout the region. These relatively low-cost projects will be implemented by a variety of local and regional organizations and with a variety of funding sources, such as Metro's Metro Regional Travel Options (RTO) grants program. A total of $2.1 million in federal transportation funding is available to government agencies and nonprofit organizations across the region who want to make it easier to walk, bike, take transit and share rides. Metro will also fund projects that improve air quality, improve health, and reduce drive-alone trips and auto traffic.

ENVIRONMENTAL JUSTICE

The socio-economically sensitive populations within West Linn consist of minorities, people with low-income (people who earn 0 to 1.99 times the federal poverty level), elderly people (people 65 years of age or older), youth (people 16 years of age or younger), non-English speakers, and people with disabilities. Identifying the location of these individuals or the concentration of these individuals can be a challenge given the current socio-economic conditions within West Linn. Therefore, 2010 census data was combined with a general understanding of local conditions to ensure that the existing transportation system meets the needs of these individuals. Figure 12 through 17 illustrate the populations within West Linn.



H:\proj\file\17817 - West Linn Transportation System Plan\gis\12 Minority Population.mxd - mbell - 5:10 PM 5/21/2015

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Minority Population
West Linn, Oregon

Figure **12**

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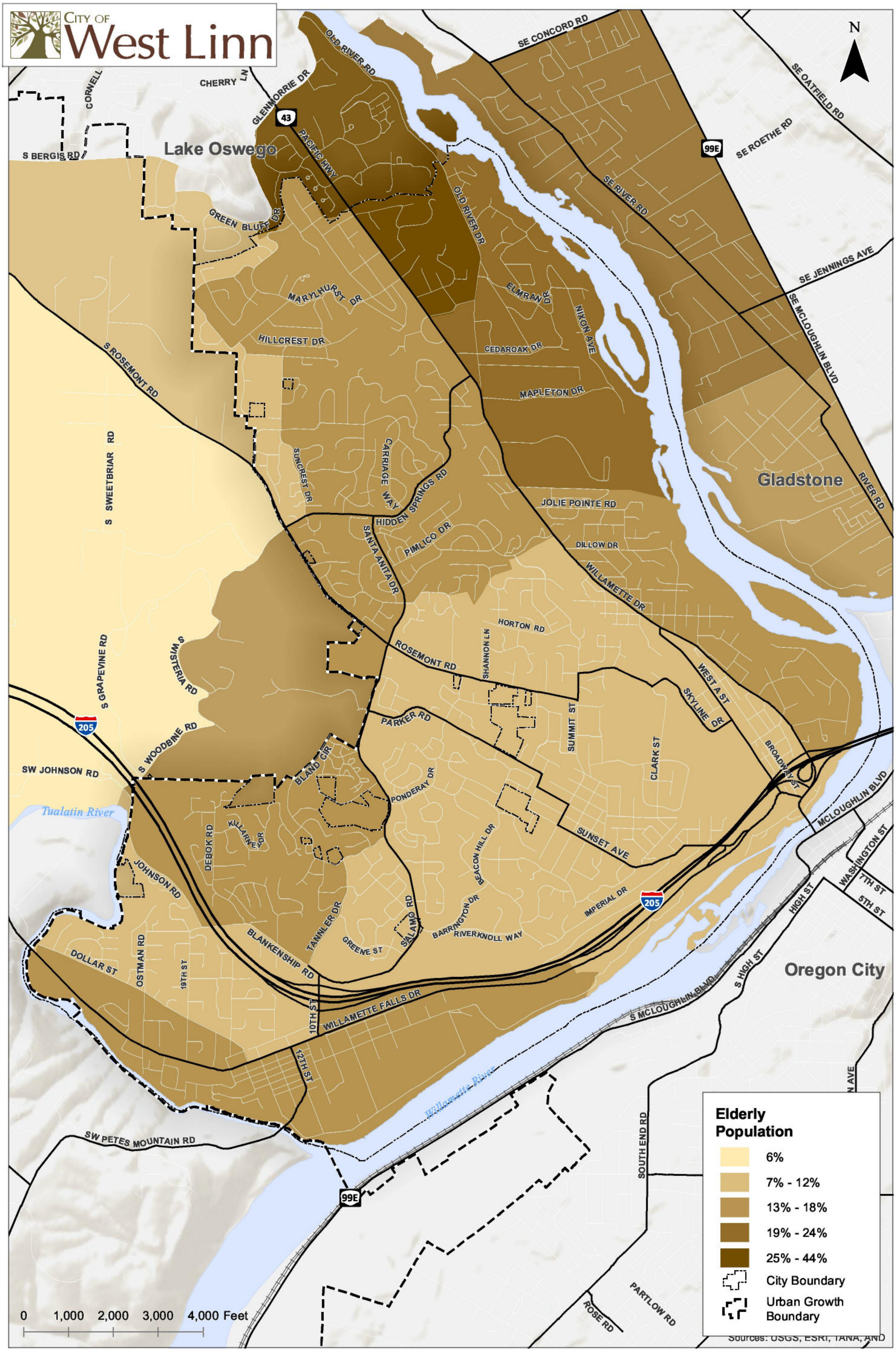
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center



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Elderly Population
West Linn, Oregon

Figure
13

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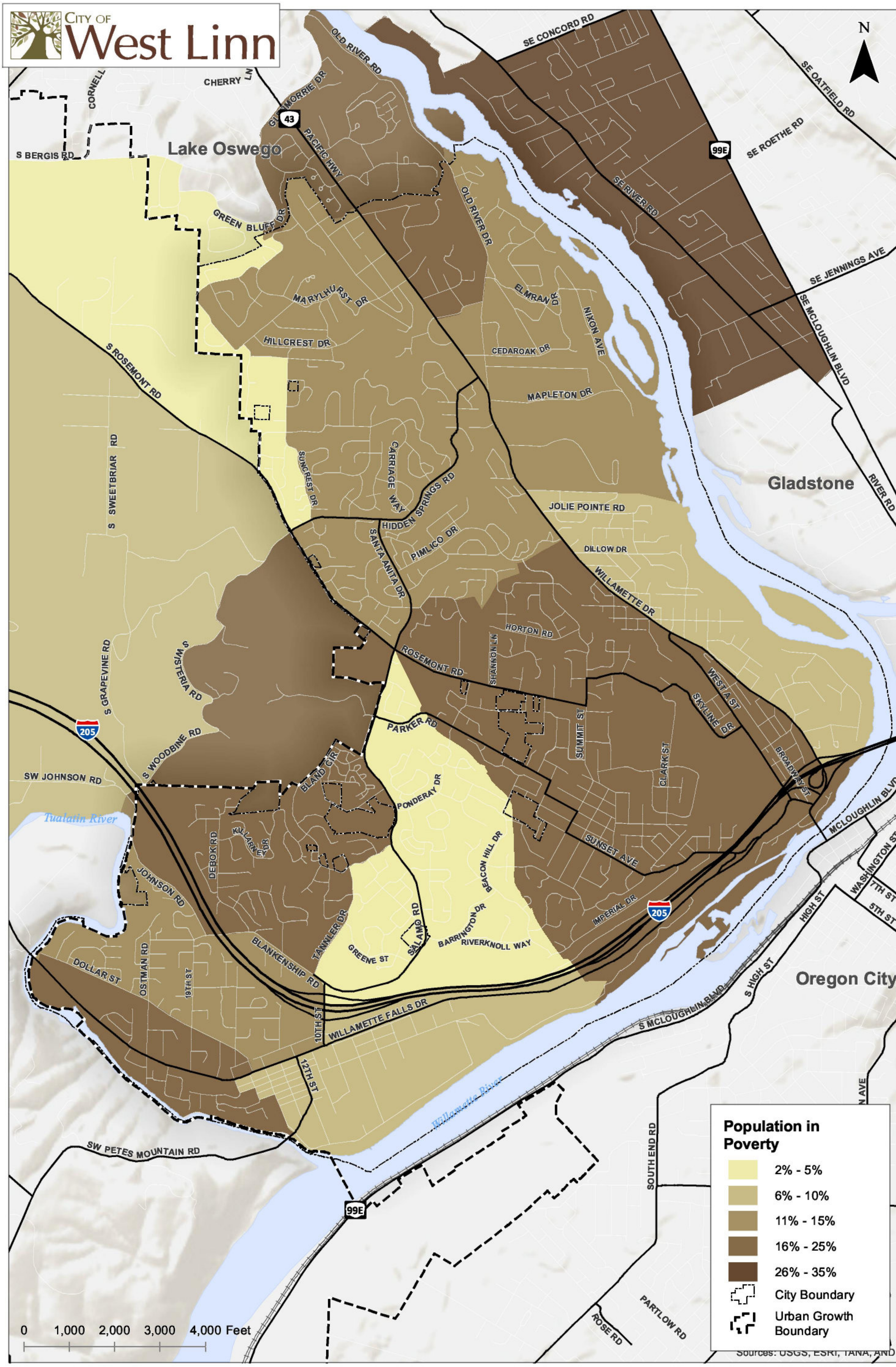
Kittelson & Associates, Inc.
Transportation Engineering/Planning

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



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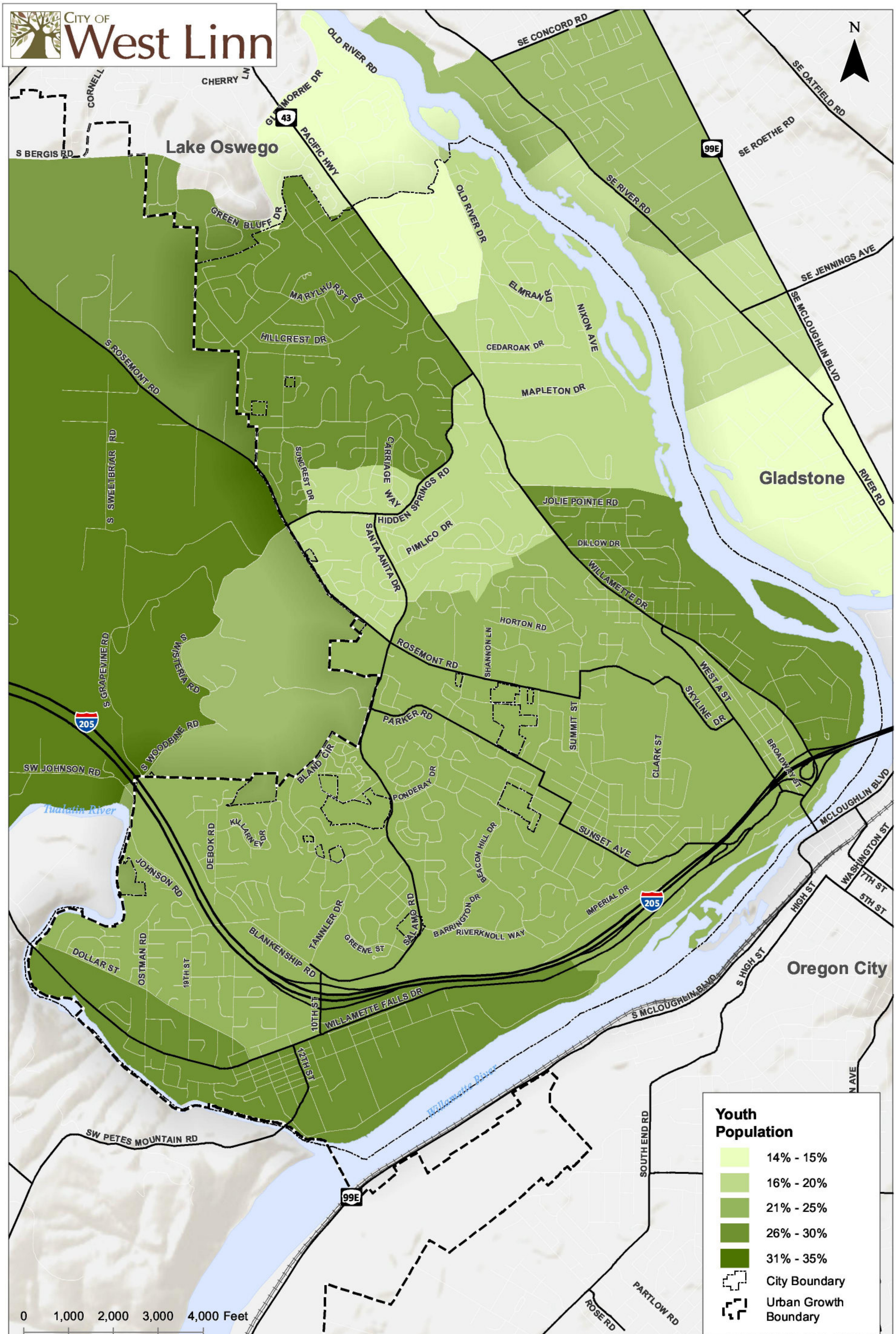
Population in Poverty West Linn, Oregon

Figure **14**

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



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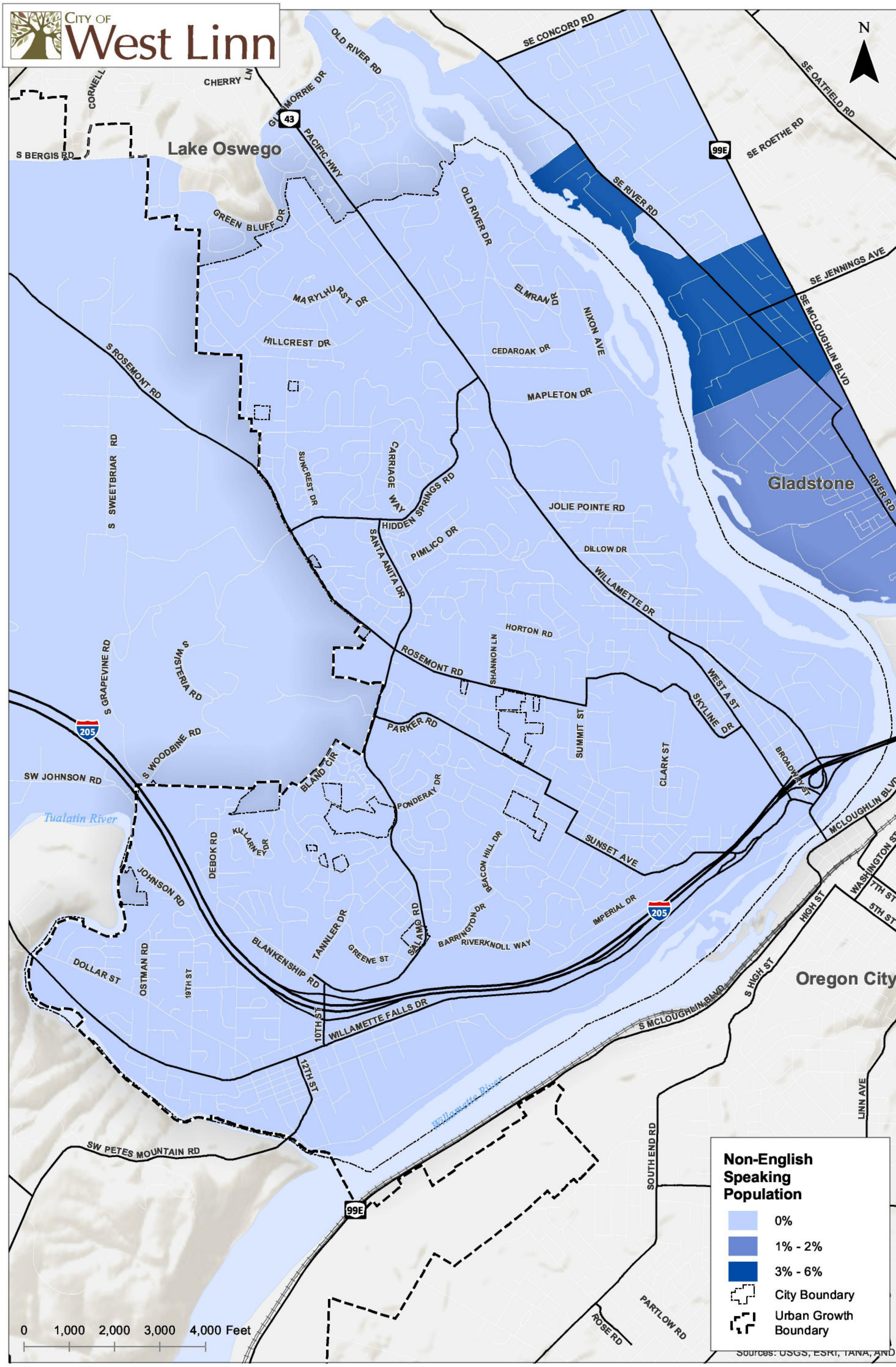
Youth Population
West Linn, Oregon

Figure **15**

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

Kittelson & Associates, Inc. Transportation Engineering/Planning



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Non-English Speaking Population
West Linn, Oregon

Figure
16

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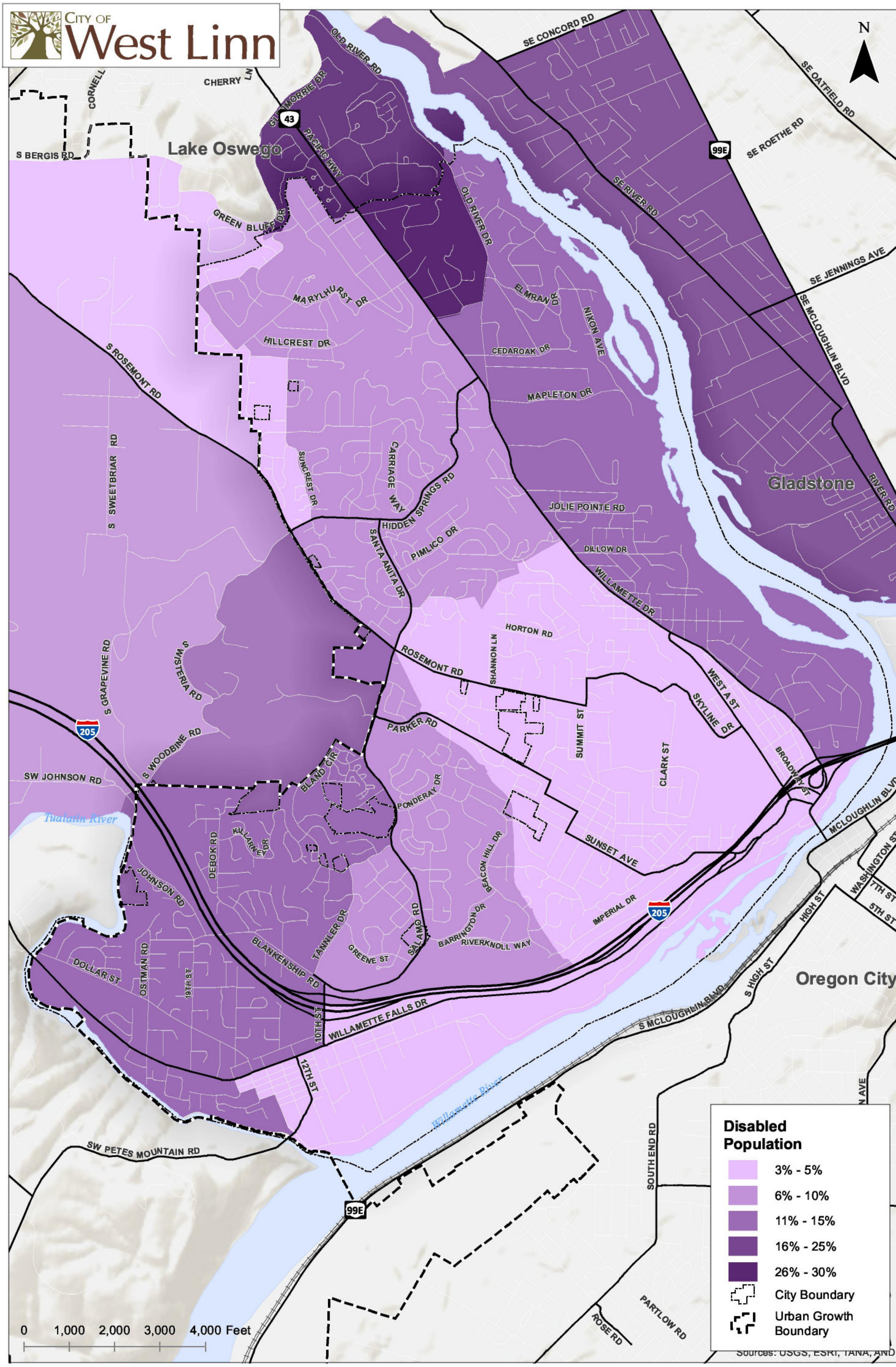

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Disabled Poppulation
West Linn, Oregon

Figure
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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

ATTACHMENTS

A. Pedestrian Assessment

Attachment A Pedestrian Assessment

PEDESTRIAN ASSESSMENT

The following characteristics are considered on roadway segments:

- Adjacent travel lanes: Segments with one adjacent travel lane are rated better than segments with two or more travel lanes.
- Presence of bicycle lane/shoulders: Segments with a bicycle lane or shoulder are rated better than segments without because these facilities create greater separation between vehicles and pedestrian traffic and acts as a buffer.
- Presence of landscape strips: Segments with landscape strip are rated better than segments without because these facilities create greater separation between vehicles and pedestrian traffic and acts as a buffer.
- Presence of sidewalk/path: Segments with sidewalks or paths are rated higher than segments without.
- Presence of lighting: segments with lighting on one or two sides, whether roadway or pedestrian-scale, are rated better than segments without.
- Volume and speed of motorized traffic in adjacent travel lane was not considered as part of this analysis. The number of adjacent travel lanes (described above) was used as a surrogate to volumes and speeds.

The following characteristics are considered at intersections:

- Traffic control: Intersections with a traffic signal or all-way stop control with crosswalks are rated better than locations with only two-way stop control or locations without crosswalks.
- Crossing width: Fewer turn or through travel lanes to be crossed is rated better than more turn/though lanes because the exposure to traffic and potential conflicts are less.
- Median islands: The presence of a median island is rated better than no islands as two-stage crossings are possible at unsignalized crossings.

The following provides a detailed summary of the results of the pedestrian assessment.

Roadway	From/To	Side	Segments								
			Lanes 1 Lane: 2 pts 2 Lanes: 1 pt	Bike Lane/ Shoulder Y: 1 pt N: 0 pts	Sidewalk/Pa th Y: 1 pt N: 0 pts	Buffer Y: 1 pt N: 0 pts	Lighting Y: 1 pt N: 0 pts	Other Y: 1 pt N: 0 pts	Total	Ped QMMLOS	Ped QMMLOS Override
Hidden Springs Road	Rosemont to Suncrest Drive	North	2	1	2	1	1	0	7	Good	
0	0	South	2	1	2	1	1	0	7	Good	
0	Suncrest Drive to approximately 500-feet east of Suncrest Drive	North	2	1	2	0	1	0	6	Good	
0	0	South	2	1	2	1	1	0	7	Good	
0	Approximately 500-feet east of Suncrest Drive to Santa Anita	North	2	1	2	1	1	0	7	Good	
0	0	South	2	1	0	0	1	0	4	Fair	
0	Santa Anita to Carriage Way	North	2	0	2	0	1	1	6	Good	
0	0	South	2	0	2	1	1	1	7	Good	
0	Carriage Way to Approximately 250-feet west of Cottonwood Court	North	2	0	2	0	1	0	5	Good	
0	0	South	2	0	0	0	1	0	3	Fair	Poor
0	Approximately 250-feet west of Cottonwood Court to Wilderness Drive	North	2	0	2	0	1	0	5	Good	
0	0	South	2	0	2	0	1	0	5	Good	
0	Wilderness Drive to Willamette Drive	North	1	0	2	0	1	0	4	Fair	
0	0	South	1	0	2	0	1	0	4	Fair	
Willamette Drive	North City limints to Shady Hollow Way	West	2	1	0	0	1	0	4	Fair	
0	0	East	2	1	0	0	1	0	4	Fair	
0	Shady Hollow Drive to Marylhurst Drive	West	2	1	0	0	1	0	4	Fair	
0	0	East	2	1	2	0	1	0	6	Good	
0	Marylhurst Dr to Walling Way/Circle	West	2	1	2	1	0	0	6	Good	
0	0	East	2	1	2	1	0	0	6	Good	
0	Walling Way/Circle to Cedar Oak Drive	West	2	1	0	0	0	0	3	Fair	
0	0	East	2	1	2	1	0	0	6	Good	
0	Cedar Oak Drive to Mapleton Drive	West	2	1	2	1	0	0	6	Good	
0	0	East	2	1	0	0	0	0	3	Fair	
0	Mapleton Drive to Linwood Dr/Mark Ln	West	2	1	0	0	1	0	4	Fair	
0	0	East	2	1	2	1	1	0	7	Good	
0	Linwood Dr/Mark Ln to Pimlico Dr	West	2	1	2	1	1	0	7	Good	
0	0	East	2	1	2	1	1	0	7	Good	
0	Pimlico Drive to Barlow St	West	2	1	2	1	1	0	7	Good	
0	0	East	2	1	0	0	1	0	4	Fair	
0	Barlow St to Caufield St	West	2	0	0	0	0	0	2	Poor	Poor
0	0	East	2	1	0	0	0	0	3	Fair	
0	Caufield St to approx. 450-feet south of West A St	West	2	1	2	1	1	0	7	Good	
0	0	East	2	1	2	1	1	0	7	Good	
0	Approx. 450-feet south of West A St to Lewis St	West	2	1	2	1	1	0	7	Good	
0	0	East	2	1	0	0	1	0	4	Fair	
0	Lewis St to McKillican St	West	2	1	2	1	1	0	7	Good	
0	0	East	2	1	2	1	1	0	7	Good	
0	McKillican St to 205 WB on/off ramps	West	1	1	2	1	1	0	6	Good	
0	0	East	1	1	2	1	1	0	6	Good	
0	205 WB on/off ramps to Willamette Falls Dr	West	1	1	2	1	1	0	6	Good	
0	0	East	1	1	2	1	1	0	6	Good	
0	Willamette Falls Dr to Bridge	West	2	1	2	1	1	0	7	Good	
0	0	East	2	1	2	1	1	0	7	Good	
Rosemont Rd	Carriage Way to Hidden Springs Road	West	2	1	0	0	0	0	3	Fair	
0	0	East	2	1	2	1	0	0	6	Good	
0	Hidden Springs Road to Bay Meadows Dr	West	2	1	0	0	1	0	4	Fair	
0	0	East	2	1	2	1	1	0	7	Good	
0	Bay Meadows Dr to Furlong Dr	West	2	1	0	0	0	0	3	Fair	
0	0	East	2	1	2	1	0	0	6	Good	
0	Furlong Dr to Santa Anita Dr/Salamo Rd	West	2	1	2	1	1	0	7	Good	

	0		0 East	2	1	2	1	1	0	7	Good	
	0	Santa Anita Dr/Salamo Rd to baseball field driveway	North	2	0	0	0	0	0	2	Poor	Poor
	0		0 South	2	0	2	1	0	0	5	Good	
	0	baseball field driveway to Wild Rose Dr	North	2	0	0	0	1	0	3	Fair	Poor
	0		0 South	2	1	2	1	1	0	7	Good	
	0	Wild Rose Dr to Shannon Ln	North	2	1	2	1	1	0	7	Good	
	0		0 South	2	1	2	1	1	0	7	Good	
	0	Shannon Ln to Gregory Ct	North	2	1	0	0	0	0	3	Fair	
	0		0 South	2	0	2	1	0	0	5	Good	
	0	Gregory Ct to Summit St	North	2	0	0	0	1	0	3	Fair	Poor
	0		0 South	2	0	0	0	1	0	3	Fair	Poor
Parker Rd		Salamo Rd to Noble Ln	North	2	1	2	1	1	1	8	Excellent	
	0		0 South	2	1	2	1	1	1	8	Excellent	
	0	Noble Ln to Dillon Ln	North	2	0	0	0	0	0	2	Poor	Poor
	0		0 South	2	0	2	1	0	0	5	Good	
	0	Dillion Ln to Wild Rose Dr	North	2	1	2	1	0	0	6	Good	
	0		0 South	2	1	2	1	0	0	6	Good	
	0	Wild Rose Dr to Chinook Ct	North	2	1	0	0	1	0	4	Fair	
	0		0 South	2	1	2	1	1	0	7	Good	
	0	Chinook Ct to Summer Run Dr	North	2	1	2	1	1	0	7	Good	
	0		0 South	2	1	2	1	1	0	7	Good	
Santa Anita Dr		Hidden Springs Rd to Hidden Spring Ct/Clubhouse Cir	West	2	1	2	1	0	1	7	Good	
	0		0 East	2	1	0	1	0	1	5	Good	
	0	Hidden Spring Ct/Clubhouse Cir to Clubhouse Dr	West	2	1	2	1	1	1	8	Excellent	
	0		0 East	2	1	2	1	1	1	8	Excellent	
	0	Clubhouse Dr to Pimlico Dr	West	2	1	2	1	1	1	8	Excellent	
	0		0 East	2	1	0	0	1	1	5	Good	
	0	Pimlico Dr to Churchill Downs Dr/Horton Rd	West	2	1	2	1	1	1	8	Excellent	
	0		0 East	2	1	2	1	1	1	8	Excellent	
	0	Churchill Downs Dr/Horton Rd to Rosemont Rd	West	2	1	2	1	1	0	7	Good	
	0		0 East	2	1	2	1	1	0	7	Good	
Salamo Rd		Rosemont Rd to Parker Rd	West	2	1	2	1	1	1	8	Excellent	
	0		0 East	2	1	2	1	1	1	8	Excellent	
	0	Parker Rd to Day Rd	West	2	1	2	1	1	1	8	Excellent	
	0		0 East	2	1	2	1	1	1	8	Excellent	
	0	Day Rd to Weatherhill Rd	West	2	1	2	1	0	1	7	Good	
	0		0 East	2	1	2	1	0	1	7	Good	
	0	Weatherhill Rd to Bland Cir	West	2	1	0	0	1	1	5	Good	
	0		0 East	2	1	2	1	1	1	8	Excellent	
	0	Bland Cir to Crystal Terrace Dr	West	2	1	2	1	1	1	8	Excellent	
	0		0 East	2	1	2	1	1	1	8	Excellent	
	0	Crystal Terrace Dr to Greene St	West	2	1	0	0	0	1	4	Fair	
	0		0 East	2	1	2	1	0	1	7	Good	
	0	Greene St to 10th St/Blankenship Rd	West	2	1	0	0	0	0	3	Fair	
	0		0 East	2	1	0	0	0	0	3	Fair	
Blankenship Rd		Ostman Rd to 19th St	North	2	0	2	1	1	0	6	Good	
	0		0 South	2	0	0	0	1	0	3	Fair	Poor
	0	19th St to Johnson Rd	North	2	0	2	1	0	0	5	Good	
	0		0 South	2	0	2	1	0	0	5	Good	
	0	Johnson Rd to Driveway on Debok Rd	North	2	0	0	0	0	0	2	Poor	Poor
	0		0 South	2	0	2	1	0	0	5	Good	
	0	Debok Rd to Summerlinn Dr	North	2	1	2	1	1	0	7	Good	
	0		0 South	2	1	2	1	1	0	7	Good	
	0	Summerlinn Dr to Tannler Drive	North	2	1	2	1	1	0	7	Good	
	0		0 South	2	1	2	1	1	0	7	Good	
	0	Tannler Drive to 10th St	North	2	1	0	0	1	0	4	Fair	
	0		0 South	2	1	2	1	1	0	7	Good	

Johnson Rd	City Limit to 19th St	West	2	0	0	0	0	0	2	Poor	Poor
0	0	East	2	0	0	0	0	0	2	Poor	Poor
0	19th St to Blankenship Rd	West	2	1	0	0	0	0	3	Fair	
0	0	East	2	1	0	0	0	0	3	Fair	
Ostman Rd	Blankenship Rd to Michael Dr	West	2	0	2	0	0	0	4	Fair	
0	0	East	2	0	2	1	0	0	5	Good	
0	Michael Dr to Fields Dr/Short St	West	2	0	2	1	1	0	6	Good	
0	0	East	2	0	0	0	1	0	3	Fair	Poor
0	Fields Dr/Short St to Dollar St	West	2	0	2	1	1	0	6	Good	
0	0	East	2	0	2	1	1	0	6	Good	
0	Dollar Street to Bexhill Street	West	2	0	0	0	1	0	3	Fair	Poor
0	0	East	2	0	0	0	1	0	3	Fair	Poor
0	Bexhill Street to WFD	West	2	0	0	0	0	0	2	Poor	Poor
0	0	East	2	0	2	0	0	0	4	Fair	
Dollar St	End of Road/City Limit to Brandon Pl	North	2	0	0	0	0	0	2	Poor	Poor
0	0	South	2	0	0	0	0	0	2	Poor	Poor
0	Brandon Pl to Ostman Rd	North	2	1	2	1	1	0	7	Good	
0	0	South	2	0	0	0	1	0	3	Fair	Poor
0	Ostman Rd to 19th St	North	2	1	2	1	1	0	7	Good	
0	0	South	2	1	0	0	1	0	4	Fair	
0	19th St to 16th St	North	2	1	2	1	1	0	7	Good	
0	0	South	2	1	0	0	1	0	4	Fair	
0	16th St to Willamette Falls Dr	North	2	1	2	1	0	0	6	Good	
0	0	South	2	1	0	0	0	0	3	Fair	
10th St	Blankenship/Salamo to 205 EB Ramps	West	1	1	2	1	1	0	6	Good	
0	0	East	1	1	0	0	1	0	3	Fair	
0	205 EB Ramps to 8th Ct	West	2	0	2	1	1	0	6	Good	
0	0	East	2	0	0	0	1	0	3	Fair	Poor
0	8th Ct to Willamette Falls Dr	West	2	0	2	1	1	0	6	Good	
0	0	East	2	0	2	0	1	0	5	Good	
Willamette Falls Dr	City Limits to Epperly Way	North	2	0	0	0	0	0	2	Poor	Poor
0	0	South	2	0	0	0	0	0	2	Poor	Poor
0	Epperly Way to Ostman Rd	North	2	1	2	1	0	0	6	Good	
0	0	South	2	0	0	0	0	0	2	Poor	Poor
0	Ostman Rd to 19th St	North	2	1	2	1	1	0	7	Good	
0	0	South	2	1	2	1	1	0	7	Good	
0	19th St to Dollar St	North	2	1	0	0	0	0	3	Fair	
0	0	South	2	1	0	0	0	0	3	Fair	
0	Dollar St to 10th St	North	2	0	2	1	1	1	7	Good	
0	0	South	2	0	2	1	1	1	7	Good	
0	10th St to 8th St	North	2	0	2	1	0	0	5	Good	
0	0	South	2	1	0	0	0	0	3	Fair	
0	8th St to Sunset Ave	North	2	1	0	0	0	0	3	Fair	
0	0	South	2	1	0	0	0	0	3	Fair	
0	Sunset Ave to West A St	North	1	0	2	0	0	0	3	Fair	
0	0	South	1	1	0	0	0	0	2	Poor	
0	West A St to Willamette Dr	North	1	0	2	0	1	0	4	Fair	
0	0	South	1	0	2	0	1	0	4	Fair	

Roadway	Cross Street	Direction	Crossings: Traffic Control Type (Signal: 3 pts; AWSC: 2 pts; TWSC - ROW; TWSC - No ROW)	Marked Xwalk (Y/N) (Y: 1 pt; N: 0 pts)	Lanes (2 Lanes: 3 pts; 3 Lanes: 2 pts; 4 Lanes: 1 pt; 5+ Lanes: 0 pts)	Median (Y/N) (Y: 1 pt; N: 0 pts)	Total	Ped Crossing QMMLOS
Hidden Springs Road	Nicholas Court	WB	1	0	3	0	4	Fair
0	Suncrest Drive	EB	1	0	3	0	4	Fair
0	0	WB	1	0	3	0	4	Fair
0	Bay Meadows Drive	WB	1	1	3	0	5	Good
0	Hidden Springs Court	EB	1	0	3	0	4	Fair
0	Santa Anita Drive	EB	1	0	3	1	5	Good
0	Carriage Way	WB	1	0	3	0	4	Fair
0	Roan Court (S)	EB	1	0	3	0	4	Fair
0	Roan Court (N)	EB	1	0	3	0	4	Fair
0	Bluegrass Way	WB	1	0	3	0	4	Fair
0	Wildwood Drive	WB	1	0	3	0	4	Fair
0	Cottonwood Court	EB	1	0	3	0	4	Fair
0	0	WB	1	0	3	0	4	Fair
0	Oak Tree Court	WB	1	0	3	0	4	Fair
0	Top View Court	WB	1	0	3	0	4	Fair
0	Wilderness Drive	WB	1	1	3	0	5	Good
0	Willamette Drive	EB	3	1	2	0	6	Good
0	0	WB	3	1	1	0	5	Good
Willamette Drive	Arbor Drive	SB	1	0	3	0	4	Fair
0	0	NB	1	0	3	0	4	Fair
0	Robinwood Way	SB	1	0	3	0	4	Fair
0	Shady Hollow Way	NB	1	0	3	0	4	Fair
0	Marylhurst Dr	SB	3	1	3	0	7	Good
0	0	NB	3	1	3	0	7	Good
0	Fairview Way	NB	1	0	3	0	4	Fair
0	Walling Way/Circle	SB	1	0	3	0	4	Fair
0	0	NB	1	0	3	0	4	Fair
0	Walling Circle	SB	1	0	3	0	4	Fair
0	Cedar Oak Dr	NB	3	1	2	0	6	Good
0	Hidden Springs Rd	SB	3	1	2	0	6	Good
0	Mapleton Dr	NB	1	0	3	0	4	Fair
0	Chow Mein Ln	SB	1	0	3	0	4	Fair
0	Mary S Young State Park	NB	1	0	3	0	4	Fair
0	Mowhawk Way	SB	1	0	3	0	4	Fair
0	Linwood Dr/Mark Ln	SB	1	0	3	0	4	Fair

0	0	NB	1	0	3	0	4	Fair
0	Jolie Pointe Rd	NB	1	0	3	0	4	Fair
0	Underhill Ln	NB	1	0	3	0	4	Fair
0	Pimlico Dr	SB	1	0	3	0	4	Fair
0	Magone Ln	NB	1	0	3	0	4	Fair
0	Dillow Dr	NB	1	0	3	0	4	Fair
0	Hughes Dr	NB	1	0	3	0	4	Fair
0	White Tail Dr	SB	1	0	3	0	4	Fair
0	Barlow St	SB	1	0	3	0	4	Fair
0	Caufield St	SB	1	0	3	0	4	Fair
0	West A St	SB	3	1	2	0	6	Good
0	0	NB	3	1	2	0	6	Good
0	Failing St	NB	1	0	3	0	4	Fair
0	School Access	NB	1	0	3	0	4	Fair
0	Lewis St	NB	1	0	3	0	4	Fair
0	Webb St	SB	1	0	3	0	4	Fair
0	Bolton St	NB	1	0	3	0	4	Fair
0	Wilson St	SB	1	0	3	0	4	Fair
0	Burns St	NB	3	1	2	0	6	Good
0	Easy St	SB	1	0	3	0	4	Fair
0	Central Village	NB	1	1	3	0	5	Good
0	McKillian St	SB	3	1	2	0	6	Good
0	0	NB	3	1	2	1	7	Good
0	Holly St	NB	1	0	3	0	4	Fair
0	205 WB on/off ramps	SB	3	1	3	1	8	Excellent
0	0	NB	3	1	3	0	7	Good
0	205 Eb on/off ramps	SB	3	1	3	0	7	Good
0	Willamette Falls Dr	SB	3	1	1	0	5	Good
0	Mill St	SB	1	1	3	0	5	Good
Rosemont Rd	Carriage Way	SB	1	0	3	0	4	Fair
0	0	NB	1	1	3	0	5	Good
0	Hidden Springs Rd	SB	1	0	3	0	4	Fair
0	0	NB	1	1	3	0	5	Good
0	School Access (North)	NB	1	1	2	0	4	Fair
0	School Access (South)	NB	1	1	2	0	4	Fair
0	Bay Meadows Drive	NB	1	1	3	1	6	Good
0	Furlong Dr	NB	1	0	3	0	4	Fair
0	Santa Anita Drive/Salamo Rd	SB	3	1	2	0	6	Good
0	0	NB	3	1	2	0	6	Good
0	Neighborhood Driveway	NB	1	0	3	0	4	Fair
0	Miles DR	NB	1	0	3	0	4	Fair
0	Wild Rose Dr	SB	1	0	3	1	5	Good
0	0	NB	1	1	3	0	5	Good

0	Shannon Ln	NB	1	0	3	0	4	Fair
0	Gregory Ct	NB	1	0	3	0	4	Fair
0	Ireland Ln	SB	1	0	3	0	4	Fair
0	Linn Ln	NB	1	0	3	0	4	Fair
0	Summit St	SB	1	0	3	0	4	Fair
0	0	NB	1	0	3	0	4	Fair
Parker Rd	Salamo Rd	EB	1	1	2	1	5	Good
0	0	WB	1	1	2	0	4	Fair
0	Store Driveway	WB	1	0	3	0	4	Fair
0	Noble Ln	EB	1	0	3	0	4	Fair
0	0	WB	1	0	3	0	4	Fair
0	Dillon Ln	EB	1	0	3	0	4	Fair
0	Wild Rose Dr	EB	1	0	3	1	5	Good
0	0	WB	1	0	3	1	5	Good
0	Damon Dr	WB	1	0	3	0	4	Fair
0	Maxfield Dr	WB	1	0	3	0	4	Fair
0	Chinook Ct	EB	1	0	3	0	4	Fair
0	Coho Ln	EB	1	0	3	0	4	Fair
0	Summer Run Dr	EB	1	0	3	0	4	Fair
0	0	WB	1	0	3	0	4	Fair
Santa Anita Dr	Hidden Spring Road	SB	1	1	3	0	5	Good
0	0	NB	1	0	2	0	3	Fair
0	Hidden Spring Ct/Clubhouse Cir	SB	1	0	3	0	4	Fair
0	0	NB	1	0	3	0	4	Fair
0	Clubhouse Dr	SB	1	0	3	0	4	Fair
0	Pimlico Dr	NB	1	0	3	0	4	Fair
0	Shetland Ct	NB	1	0	3	0	4	Fair
0	Churchill Downs Dr/Horton Rd	SB	1	0	3	0	4	Fair
0	0	NB	1	0	3	0	4	Fair
Salamo Rd	Rosemont Rd	SB	2	1	2	0	5	Good
0	0	NB	2	1	3	0	6	Good
0	Hoodview Ct	NB	1	0	3	0	4	Fair
0	School Access	SB	1	1	2	0	4	Fair
0	Hoodview Ave	NB	1	0	3	0	4	Fair
0	Parker Rd	SB	1	1	2	0	4	Fair
0	0	NB	1	1	2	1	5	Good
0	Store Driveway	NB	1	0	2	0	3	Fair
0	Day Rd	SB	1	1	3	0	5	Good
0	0	NB	1	1	2	0	4	Fair
0	Weatherhill Rd	SB	1	0	3	0	4	Fair
0	Ponderay Dr	NB	1	0	2	0	3	Fair
0	Bland Cir	SB	1	0	3	0	4	Fair
0	Remington Dr	SB	1	0	3	0	4	Fair

0	0	NB	1	0	3	0	4	Fair
0	Crystal Terrace Dr	NB	1	0	3	0	4	Fair
0	Barrington Dr	NB	1	0	3	1	5	Good
0	Greene St	SB	1	0	3	0	4	Fair
0	10th St/Blankenship Rd	NB	3	1	1	1	6	Good
Blankenship Rd	Ostman Rd	WB	2	0	3	0	5	Good
0	0	EB	2	0	3	0	5	Good
0	19th St	WB	1	0	2	0	3	Fair
0	0	EB	1	0	3	0	4	Fair
0	Johnson Rd	WB	1	0	3	0	4	Fair
0	Debok Rd	WB	1	0	2	1	4	Fair
0	Virginia Ln	EB	1	0	3	0	4	Fair
0	13th St	WB	1	1	3	0	5	Good
0	0	EB	1	1	3	0	5	Good
0	Tannler Dr	WB	1	0	3	0	4	Fair
0	0	EB	1	1	2	0	4	Fair
0	10th St/Salamo Rd	EB	3	1	1	1	6	Good
Johnson Rd	Meadowview Ct	SB	1	0	3	0	4	Fair
0	Ryan Ct	SB	1	0	3	0	4	Fair
0	19th St	SB	1	0	3	0	4	Fair
0	Blankenship Rd	SB	0	0	3	0	3	Fair
0	0	NB	0	0	3	0	3	Fair
Ostman Rd	Blankenship Rd	NB	0	0	3	0	3	Fair
0	Royal Ct	NB	1	0	3	0	4	Fair
0	Michael Dr	SB	1	0	3	0	4	Fair
0	Douglas Dr	NB	1	0	3	0	4	Fair
0	Fields Dr/Short St	SB	1	0	3	0	4	Fair
0	0	NB	1	0	3	0	4	Fair
0	Dollar St	SB	0	0	3	0	3	Fair
0	0	NB	0	0	3	0	3	Fair
Dollar St	Brandon Pl	WB	1	0	3	0	4	Fair
0	River Heights Cir (north)	WB	1	0	3	0	4	Fair
0	River Heights Cir (southh)	WB	1	0	3	0	4	Fair
0	Fields Dr	WB	1	0	3	0	4	Fair
0	Ostman Rd	WB	1	0	2	0	3	Fair
0	0	EB	1	0	3	0	4	Fair
0	Doral Ct	WB	1	0	3	0	4	Fair
0	Bristol Ct	WB	1	0	3	0	4	Fair
0	19th St	WB	1	0	3	0	4	Fair
0	0	EB	1	0	3	0	4	Fair
0	Britton St	EB	1	0	3	0	4	Fair
0	16th St	WB	1	0	3	0	4	Fair
0	0	EB	1	0	3	0	4	Fair

0	8th Ave	EB	1	0	3	0	4	Fair
0	Willamette Falls Dr	WB	0	1	3	0	4	Fair
0	0	EB	0	0	3	0	3	Fair
10th St	Blankenship/Salamo	SB	3	0	2	1	6	Good
0	0	NB	3	1	2	0	6	Good
0	205 WB on/off ramps	SB	3	1	3	0	7	Good
0	0	NB	3	1	3	0	7	Good
0	205 Eb on/off ramps	SB	3	1	3	0	7	Good
0	0	NB	3	1	3	0	7	Good
0	8th Ct	SB	1	1	2	0	4	Fair
0	0	NB	1	1	2	0	4	Fair
0	Willamette Falls Dr	SB	2	1	2	0	5	Good
0	0	NB	2	0	3	0	5	Good
Willamette Falls Dr	Epperly Way	WB	1	0	3	0	4	Fair
0	Joseph Fields St	WB	1	0	3	0	4	Fair
0	Ostman Rd	WB	1	0	3	0	4	Fair
0	0	EB	1	0	3	0	4	Fair
0	Swift Shore Dr	EB	1	0	3	0	4	Fair
0	19th St	WB	1	0	3	0	4	Fair
0	Britton St	WB	1	0	3	0	4	Fair
0	16th St	WB	1	0	3	0	4	Fair
0	0	EB	1	0	3	0	4	Fair
0	15th St	EB	1	0	3	0	4	Fair
0	Dollar St	WB	1	0	3	0	4	Fair
0	14th St	WB	1	1	3	0	5	Good
0	0	EB	1	1	3	0	5	Good
0	13th St	EB	1	1	3	0	5	Good
0	12th St	WB	1	1	3	0	5	Good
0	0	EB	1	1	3	0	5	Good
0	11th St	EB	1	1	3	0	5	Good
0	10th St	WB	1	1	2	0	4	Fair
0	0	EB	1	0	3	0	4	Fair
0	6th St	EB	1	0	3	0	4	Fair
0	Sunset Ave (west)	WB	1	0	3	0	4	Fair
0	Sunset Ave (east)	EB	1	1	3	0	5	Good
0	West A St	WB	1	1	2	1	5	Good
0	Broadway St	WB	1	0	3	0	4	Fair
0	0	EB	1	0	3	0	4	Fair
0	Willamette Drive	WB	0	0	1	0	1	Poor
0	0	EB	0	0	1	0	1	Poor

Date: February 27, 2015

To: West Linn Planning Commission; TSP Citizen Advisory Committee

From: Zach Pelz, City of West Linn

Subject: Draft Technical Memorandum No. 6: Safe Routes to Schools Update

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Background

As part of the City's efforts to promote walking and bicycling as safe and attractive means of transportation, this TSP Update plans to formalize the City's desire to improve safe routes to local schools. Safe Routes to Schools (SRTS) is a collaborative program between schools and local agencies that combines ongoing educational and outreach efforts with pedestrian and bicycle infrastructure improvements along routes used by school children to make walking and bicycling safer and to remove motor vehicles and reduce congestion from the morning commute.

Oregon school districts are not required to provide bus service for elementary school students that reside within one-mile of their school, and for secondary school students that live within one-and-one-half mile of their school (ORS 327.043). An SRTS program is important to the City of West Linn and benefits the City's transportation systems as it provides a key opportunity to improve public health, improve pedestrian and bicycle safety, and to improve the performance of its transportation systems.

SRTS can promote healthy lifestyles. Since 1970, childhood obesity in the United States has tripled; today, more than one-third of youth are either overweight or obese[1]. While the causes of childhood and adult obesity can be attributed to many factors, the City plays a part in the health of its residents through its authority to govern the development of land and the arrangement of uses upon land.

West Linn, like many suburban communities in the United States, is characterized by segregated and homogenous land use districts. Residential land uses in particular, exist as relatively large districts that are separate from commercial and employment uses, with a very limited mix of these different types of uses. This form of development typically results in a reliance on private automobiles for nearly all trip purposes because the distance between home and work,

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[1] Safe Routes to School National Partnership, 2015 (http://saferoutespartnership.org/sites/default/files/pdf/Lib_of_Res/Addressing-Childhood-Obesity-Through-Shared-Recreational-Facilities.pdf)

entertainment and cultural venues, and shopping, is typically too far to reasonably accomplish on foot or by bicycle. This reliance on the automobile subsequently reduces opportunities for physical activity which is increasingly linked to rising rates of obesity among children and adults in the U.S.

An SRTS program can also improve safety for pedestrians and bicyclists. A comprehensive SRTS program is designed around the five E's:

- Education: teaching children and families about the range of transportation choices, instructing them in important lifelong bicycling and walking safety skills, including road sharing and safety campaigns in school neighborhoods;
- Enforcement: partnering with local law enforcement to ensure that traffic laws are obeyed in the vicinity of schools for all road users and enhancing enforcement such as crossing guard programs and student safety patrols;
- Engineering: creating operational and physical improvements to the infrastructure surrounding schools that reduces speed and potential conflicts with motor vehicle traffic and makes walking and bicycling trips safer and more convenient;
- Encouragement: using events and activities to promote walking and bicycling and to generate enthusiasm for the program with students, parents, staff and the surrounding community; and,
- Evaluation: monitoring and documenting outcomes, attitudes and trends through the collection of data before and after activities and projects so modifications can be made if needed.

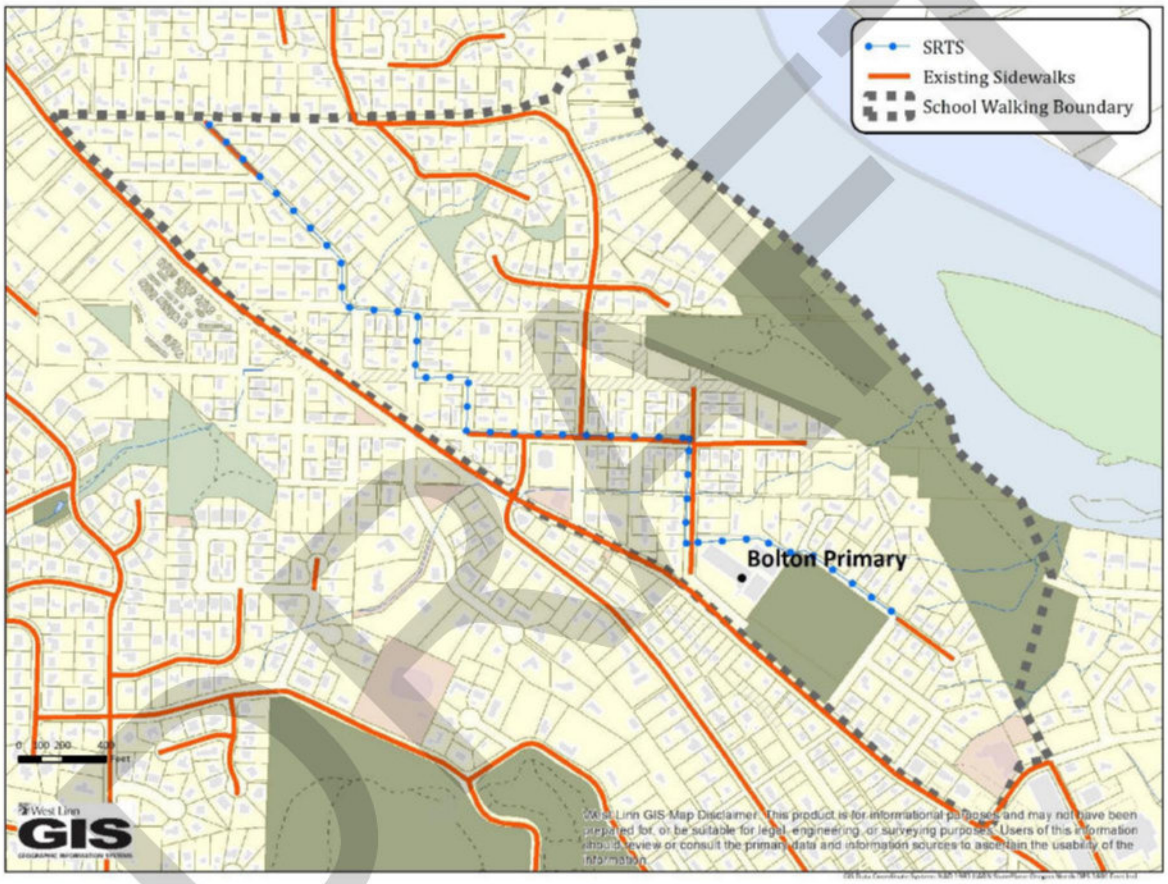
Unsafe road conditions and lack of parent confidence in their children's ability to safety navigate and understand the transportation system is an important barrier preventing many children from walking and bicycling in West Linn. Better enforcement, pedestrian and bicycle safety education built into classroom curricula, and safer infrastructure, can improve safety and encourage more children to walk and bike.

SRTS can also improve the performance of the City's motor-vehicle network. According to the Safe Routes to School National Partnership, between 20 and 30 percent of the morning rush hour traffic can be attributed to parents driving their children to school. Encouraging more kids to walk and bike to school through an SRTS program has the ability to eliminate a significant number of vehicles from the morning commute, reduce congestion and improve the performance and safety of local roadways.

Existing Conditions

The West Linn-Wilsonville School District (WLWV) operates five primary, one middle, one high, and one charter school in West Linn. WLWV has developed safe routes to each of its five primary schools in West Linn. WLWV has not developed SRTS for the charter, middle or high schools in West Linn. This evaluation of existing conditions is constrained to the five primary schools in West Linn and focuses on the presence of sidewalks and street lighting in relation to identified SRTS. This analysis is intended to identify needed safety improvements along SRTS as part of the TSP's overall project development and prioritization.

Figure 1 Bolton Primary Safe Route and Existing Sidewalks



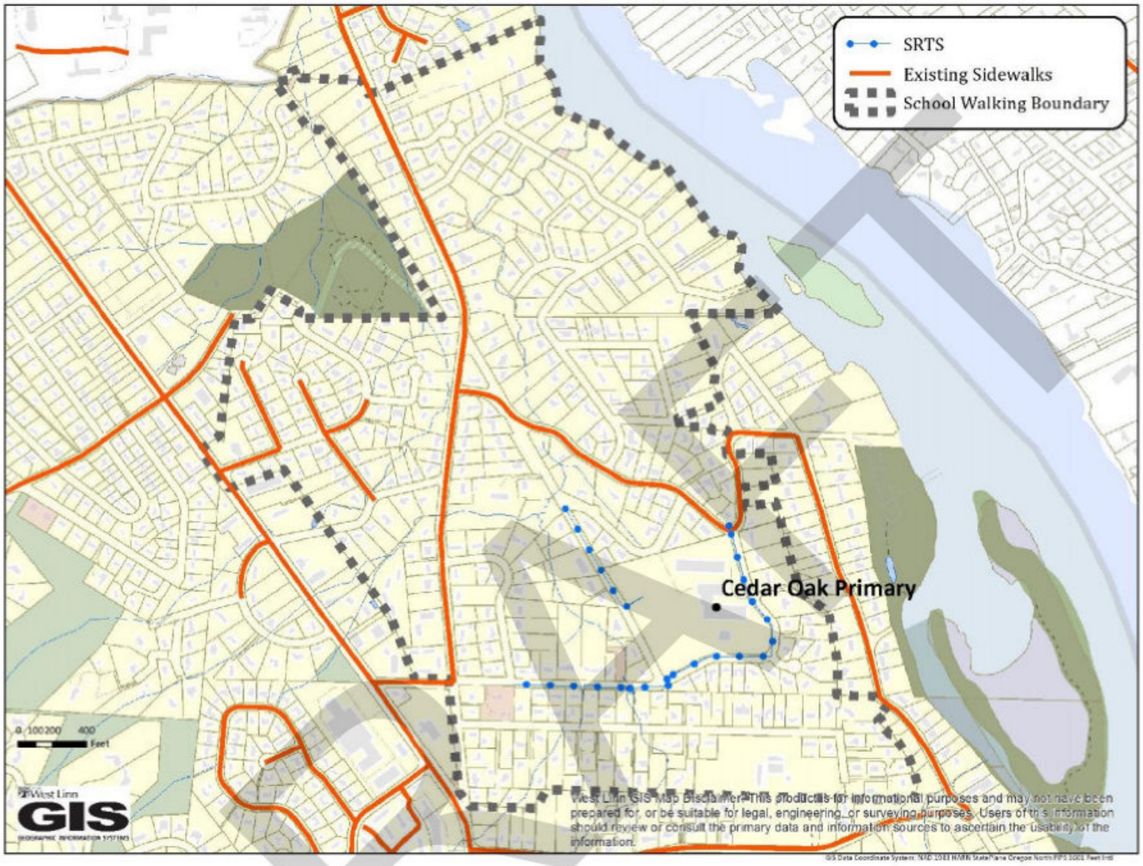
Source Metro RLIS, 2105 (sidewalks); West Linn GIS, 2015

<u>Bolton Primary.</u> Bolton Primary School is located in the southeast corner of West Linn, immediately adjacent Highway 43 (Willamette Drive) and Hammerle Park. Highway 43 carries nearly 21,000 vehicle trips near Bolton Primary School daily.

The map in Figure 1 above, shows sidewalks, the SRTS, and the boundary delineating where bus service is not provided to students attending Bolton Primary. The Safe Route identified by WLWV runs northwest to southeast beginning on Lowrey Drive at Dillow Drive. From here the route serpentines along a number of under-improved local streets until the route reaches Bolton Primary.

As shown in Figure 1, more than two-thirds of this route occurs along streets without sidewalks. Appendix A illustrates that street lights exist along the full extent of the SRTS with an average spacing of 200-feet.

Figure 2 Cedar Oak Safe Routes

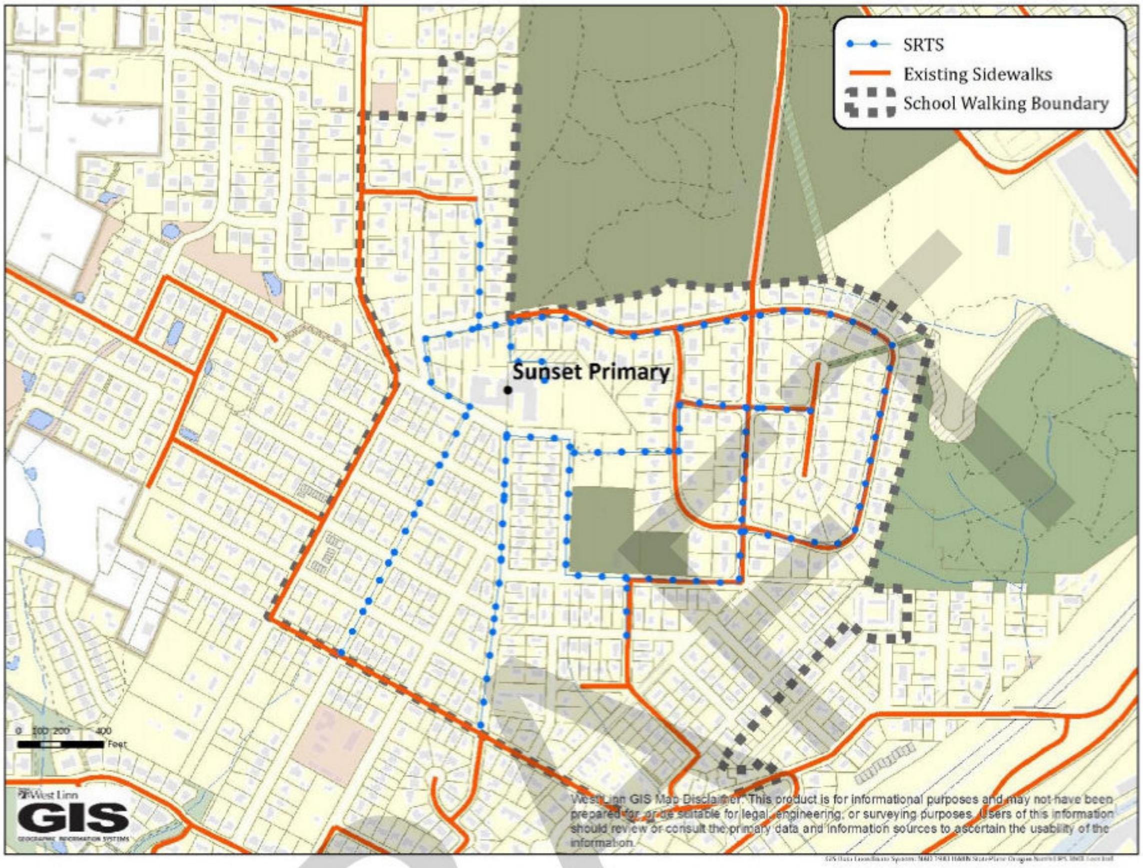


Source Metro RLIS, 2105 (sidewalks); West Linn GIS, 2015

Cedar Oak Primary. Cedar Oak Primary School is located near the north end of West Linn, east of Highway 43 and north of Mary S. Young State Park. Single-family residential development surrounds the area immediately adjacent the school, with a small-scale strip commercial development approximately one-third of a mile west along Highway 43.

The map in Figure 2 above shows sidewalks, the SRTS, and the boundary delineating where bus service is not provided to students attending Cedar Oak Primary. The Safe Route identified by WLWV runs along Cedar Oak Drive, from Old River Road to Elmran Drive and along a portion of Trillium Drive between Glen Terrace and Cedar Oak Drive. As illustrated in Figure 2, sidewalks are lacking along the full extent of the Cedar Oak Primary Safe Routes. Appendix A illustrates that streetlights are present along the entire SRTS with an average spacing of 400-feet on Cedar Oak Drive and 800-feet on Trillium Drive.

Figure 3 Sunset Primary Safe Routes and Existing Sidewalks

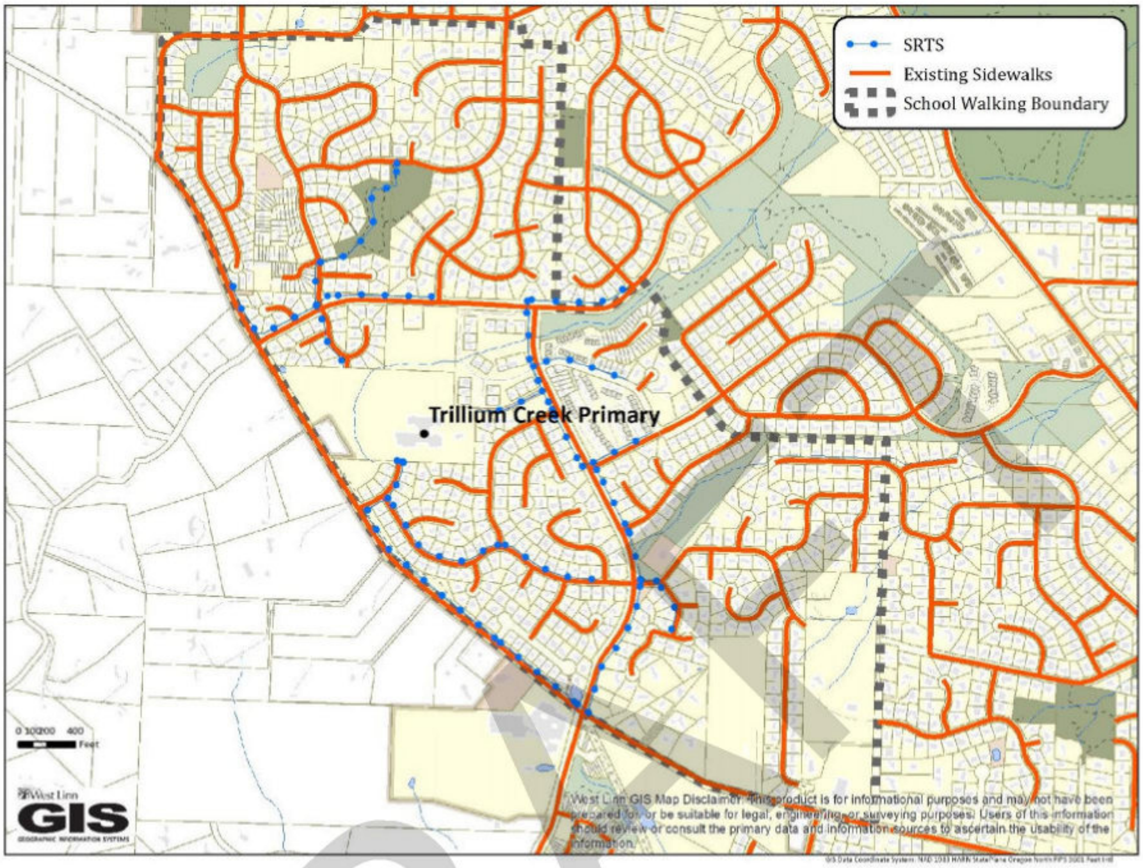


Source Metro RLIS, 2105 (sidewalks); West Linn GIS, 2015

Sunset Primary. Sunset Primary School is located near the geographic center of West Linn, between Wilderness Park and Sunset Park. Single-family residential development surrounds the area immediately adjacent the school.

The map in Figure 3 above shows sidewalks, the SRTS, and the boundary delineating where bus service is not provided to students attending Sunset Primary. The Safe Routes identified by WLWV pervade the residential neighborhoods on all sides of the school. Safe Routes extend nearly one-third of a mile south and east of Sunset Primary but extend less than one-sixth of a mile to the residential areas north and east. As shown in Figure 3, approximately 47 percent of the Sunset Primary Safe Routes, predominately in the newer subdivisions east of the school, include sidewalks. Appendix A illustrates that streetlights are present along most of the SRTS with an average spacing of 400-feet. Streetlights are not present along the pedestrian cut-through between Oregon City Loop and the school-owned properties north of Sunset Park.

Figure 4 Trillium Creek Primary Safe Routes and Existing Sidewalks

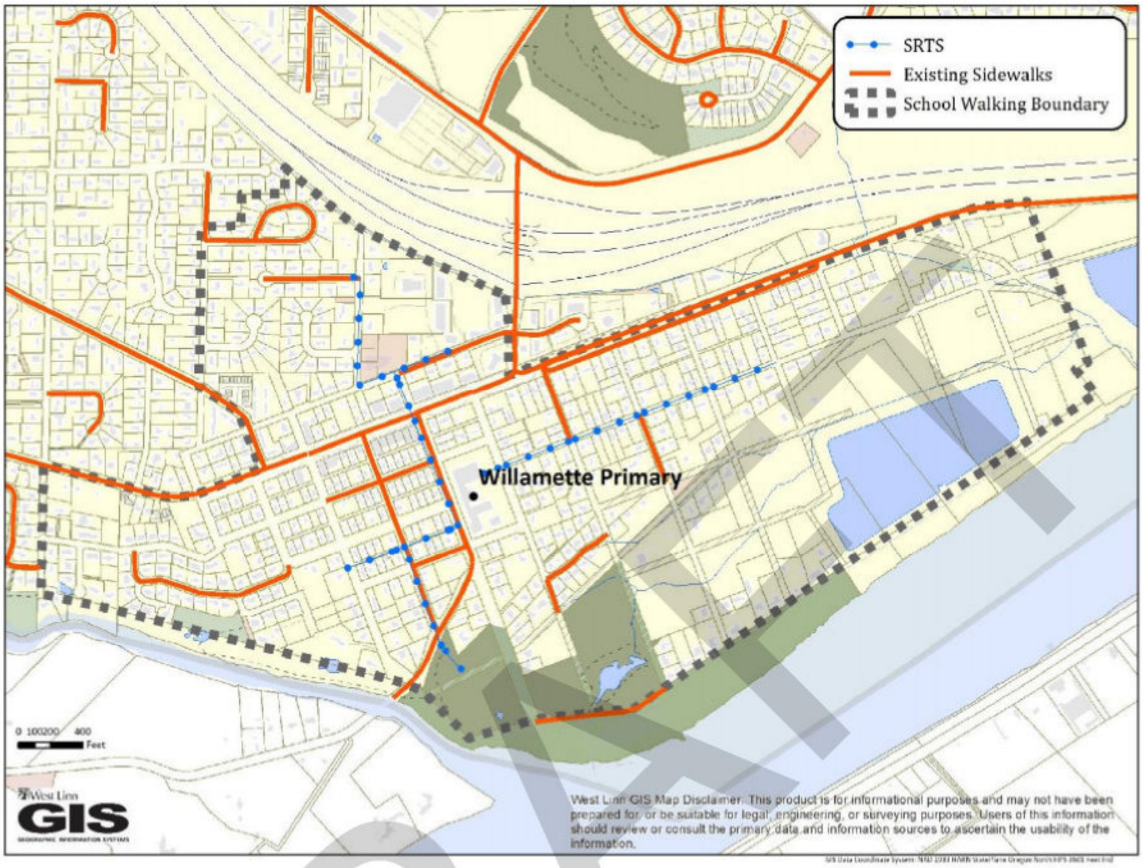


Source Metro RLIS, 2105 (sidewalks); West Linn GIS, 2015

Trillium Creek Primary. Trillium Creek Primary School is located in northwest West Linn, adjacent Rosemont Road and Hidden Springs Road - both of which are classified as collector roadways and carry significant motor vehicle traffic throughout the day. The school is flanked by single-family residential development on all sides.

The map in Figure 4 above shows sidewalks, the SRTS, and the boundary delineating where bus service is not provided to students attending Trillium Creek Primary. The Safe Routes identified by WLWV extend more than one-third of a mile into the residential areas north and east of the school and more than one-half of one-mile into the areas south of the school. As illustrated in Figure 4, more than 95 percent of the Trillium Creek Primary Safe Routes include sidewalks. Appendix A illustrates that streetlights are present along nearly all of the SRTS with an average spacing of 400-feet. Streetlights are not present through Sunburst Park.

Figure 5 Willamette Primary Safe Routes (red lines) and Existing Sidewalks



Source Metro RLIS, 2105 (sidewalks); West Linn GIS, 2015

<u>Willamette Primary.</u> Willamette Primary School is located in the south end of West Linn, less than one-third of a mile south of the I-205 interchange at 10th Street. The Willamette Commercial area sits north of the school, while residential areas border the school's west, south and east sides.

The map in Figure 5 above shows sidewalks, the SRTS, and the boundary delineating where bus service is not provided to students attending Trillium Creek Primary. The Safe Routes identified by WLWV extend about one-third of a mile in all directions from the school. As illustrated in Figure 5, only about 35 percent of the Trillium Creek Primary Safe Routes include sidewalks. Appendix A illustrates that streetlights are present along most of the SRTS with an average spacing of 400-feet.

Table 1, compares the presence of sidewalks along identified SRTS at the five primary schools in West Linn.

Table 1 Comparison of Sidewalks along Safe Routes to Schools, by Distance

School Facility	Pct. of SRTS (total distance) where sidewalks are present
Bolton Primary	28
Cedar Oak Primary	0
Sunset Primary	47
Trillium Creek Primary	95
Willamette Primary	35

Findings and Recommendations

The following recommendations to improve safe routes to schools in West Linn are organized by the five E's:

Education: *teaching children and families about the range of transportation choices, instructing them in important lifelong bicycling and walking safety skills, including road sharing and safety campaigns in school neighborhoods.*

The City should continue to work with the School District to educate students, parents, citizens and elected and appointed officials as to the benefits of SRTS. Additionally the City should be a member of the WLWV SRTS task force to ensure effective communication between these agencies. WLWV should communicate with the City regarding changes to the SRTS maps and the City should coordinate with WLWV regarding infrastructure improvements along SRTS. The WLWV should also consider expanding curriculum programs built around safe walking and bicycling.

Another effective way the WLWV can promote SRTS is to communicate directly with elected and appointed officials, parents and other residents, through in-person meetings, flyers and other media designed to educate as to the myriad benefits of SRTS.

Finally, in addition to closer collaboration with the WLWV regarding infrastructure improvements at or near SRTS, the City should reach out directly to students for input about project development and implementation.

Enforcement: *partnering with local law enforcement to ensure that traffic laws are obeyed in the vicinity of schools for all road users and enhancing enforcement such as crossing guard programs and student safety patrols.*

The West Linn Police Department conducts routine patrols near area schools and should continue this practice into the future. Additionally, the WLWV SRTS task force and other stakeholder teams should develop a list of high priority areas in need of enforcement and communicate that with local law enforcement personnel. Signage, mobile speed radar trailers and other similar types of equipment should continue to be utilized around area schools and along SRTS to supplement officer patrols. Finally, the City of West Linn has established a traffic safety committee, for the purpose of reviewing traffic safety concerns presented by West Linn residents. The Traffic Safety Committee should do more to advertise this resource to local schools, SRTS task force, students and parents.

<u>Engineering:</u> *creating operational and physical improvements to the infrastructure surrounding schools that reduces speed and potential conflicts with motor vehicle traffic and makes walking and bicycling trips safer and more convenient.*

In 2013, the City of West Linn adopted its first ever Trails System Master Plan, which sought to identify funding priorities for the City's Parks and Recreation Department over the next 50 years. An important outcome of this Plan is that off-street trails are viewed not only as recreational facilities but also as facilities that can link with on-street bicycle lanes and sidewalks to create more, and more direct, transportation-related access between homes and points of interest throughout the community. Throughout the development of the Trails System Master Plan, linking off-street facilities with on-street facilities was seen as an important strategy in making efficient use of the City's transportation system and encouraging more people to walk and bicycle for transportation and recreational purposes.

During fall 2014, in anticipation of this TSP Update and the development of the City's 5-year streets Capital Improvement Program (CIP), the City of West Linn's Transportation Advisory Board, with help from City staff, prioritized the inventory of 90 on-street routes proposed in the Trails System Master Plan. The inventory of on-street routes was reviewed and evaluated based on the following seven criteria:

- <u>Safe routes:</u> is the on-street route part of an identified Safe Route to School as developed by the WLWV School District?
- <u>Walking primary</u>: is the on-street route within the walking boundary[2] for a primary school in West Linn identified by the WLWV school district?
- <u>Walking middle or high school:</u> is the on-street route within the walking boundary for a middle or high school in West Linn identified by the WLWV school district?
- <u>1/4 mile from transit:</u> is the on-street route within 1/4 mile of a transit stop?
- <u>1/4 mile from commercial:</u> is the on-street route within 1/4 mile of a commercial use in the City of West Linn?
- <u>Street collector or arterial:</u> is the on-street facility located on a roadway designated as a collector or arterial?

[2] ORS 327.043 does not obligate school districts to provide bus service to elementary school students living within 1 mile or less of their school. The walking boundary delineates the geographic area that is not served by school buses.

- One or more trail connections: does the on-street facility connect to at least one off-street facility?
- Three or more trail connections: does the on-street facility connect to at least three off-street facilities?

The TAB ranked the 90 on-street routes from high to low based on their ability to satisfy the above-mentioned criteria. More than one-third of the top ranking projects recommended for inclusion in the Streets CIP occur along SRTS identified by the WLWV school district. These routes are included in Table 2 below. The map and route number in Table 2 correspond to the *Pathway Planning Map Book* (included in Appendix B of this document), prepared for the CIP analysis described above. Because this memo focuses on SRTS, the remaining CIP recommendations are not included here.

Table 2: SRTS-related Projects Recommended for Inclusion in 5-year CIP

Map No.	Route Number	Route Name from Trails Master Plan	Location Description	Sidewalk Need[3] (as pct.)
3	30	Long St./Exeter St.	Long St. from Sunset Tennis Courts to Oxford St.	100
1	33	Cedaroak Dr./Elmran Dr.	Cedaroak Dr. northeast to 4450 Elmran Dr.	100
6	52	Tualatin/12th St.	Tualatin Ave. ending at Willamette Falls Dr.	50
3	29	Oregon City Blvd/Bonnet Dr.	Oregon City Blvd to Oxford St.	25
2	68	Rosemont Rd. 3	Rosemont Rd. north of Hidden Springs Rd. to Carriage Way	0
2	36	Santa Anita Dr.	All of Santa Anita Dr.	0
1 & 2	32	Hidden Springs Rd.	Hidden Springs Rd from Willamette Dr. to Rosemont Rd.	0

Table 2 reveals that more than half of the CIP recommended SRTS projects (Route Numbers 29, 68, 36 and 32) currently have sidewalks along a majority of their length. Projects in these areas are therefore likely to include safety improvements such as, enhanced crossings, improved signage, wayfinding and possibly relatively minor sidewalk infill. Where funds allow, CIP improvements

[3] Sidewalk need is that proportion of the CIP route in Table 2 where sidewalks currently do not exist along the portion that is also identified as a safe route to school, as a percent of the total distance.

near Cedar Oak Primary should include the installation of sidewalks and complementary safety enhancements along the entire length of the route.

While the extent of each of the projects recommended in the CIP are not described, it is assumed that they will consist of necessary improvements over which the City has control (sidewalks, enhanced crossings, signage, etc.). Because sidewalk infill along the entire length of SRTS at all primary schools in West Linn is not needed, Table 3 compares the relative benefit of likely improvements the City could make, as a percentage of the total length of existing sidewalks, to provide a comparison of the relative benefit of potential future investments near each of these schools.

Table 3 Relative safety benefit from CIP recommended projects near West Linn Primary Schools

School Facility	Pct. of SRTS with existing sidewalks	Pct. of SRTS recommended for CIP improvements where sidewalks currently do not exist
Cedar Oak Primary	0	60
Bolton Primary	28	0
Willamette Primary	35	0
Sunset Primary	47	5
Trillium Creek Primary	95	0

Based on the information included above, staff suggests that the TSP first consider SRTS improvements in the form of sidewalk infill and other safety enhancements (in the following order of priority), near Cedar Oak, Bolton, Willamette and Sunset Primary Schools. Staff also recommends completing gaps in the network of streetlights along SRTS - identified above as through Sunburst Park, north of Sunset Park and along Trillium Drive. Staff suggests the TSP also consider safety enhancements such as enhanced crossings, signage and wayfinding near Trillium Creek Primary.

<u>Encouragement:</u> *using events and activities to promote walking and bicycling and to generate enthusiasm for the program with students, parents, staff and the surrounding community.*

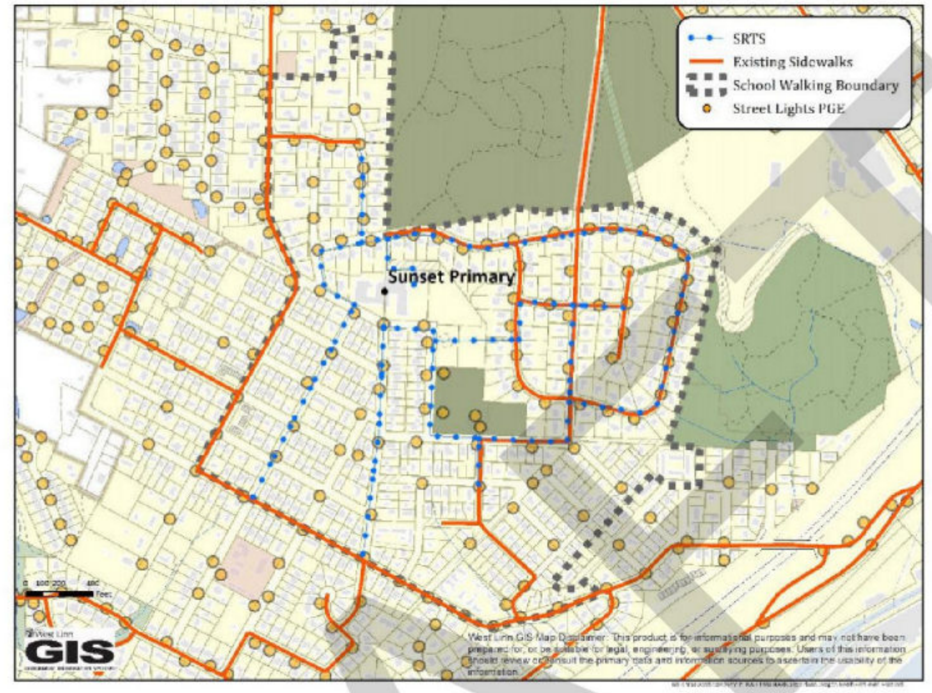
There are a number of events and activities the City and WLWV can use to promote walking and bicycling to school. In 2010 and 2011, the City of West Linn took part in the Bicycle Transportation Alliance's Bike Commute Challenge. The Bike Commute Challenge is a friendly competition among metro area employers to see who can log the highest rate of days where employees rode bike rather than drove to work during the month of September. Events like this raise awareness and encourage individuals who may otherwise choose a mode other than driving. The City and WLWV should consider developing similar events to encourage students to walk and bicycle to school.

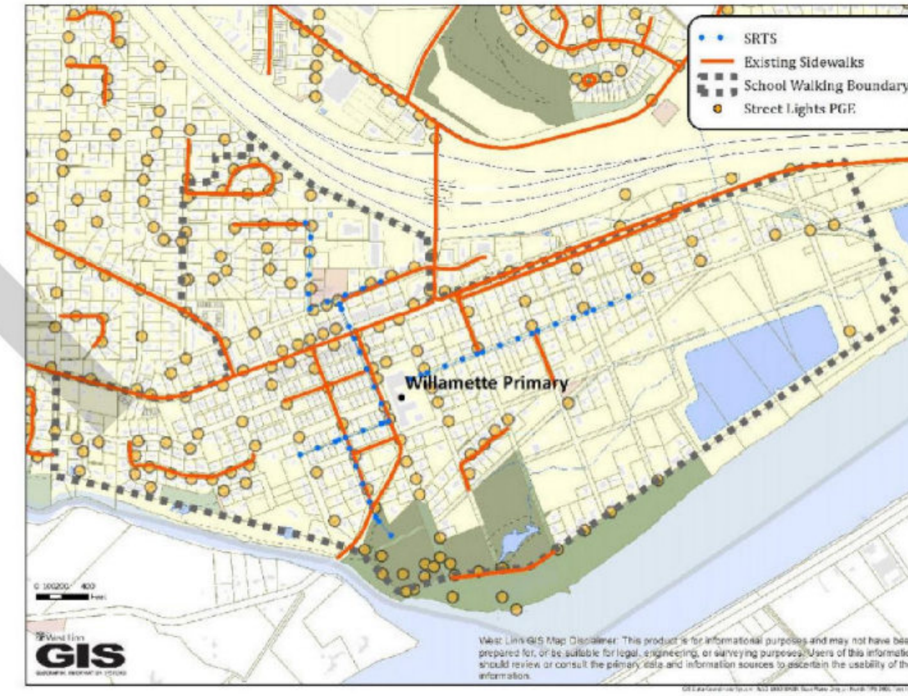
Another good way to promote walking and bicycling to school is by using what is termed a walking school bus. A walking school bus is where parents volunteer to accompany children on a walk or bike ride to school, making stops at designated locations to pick up students, similar to a traditional school bus.

<u>Evaluation:</u> *monitoring and documenting outcomes, attitudes and trends through the collection of data before and after activities and projects so modifications can be made if needed.*

The City and WLWV should work together to collect and share data in order to better understand how students currently use the transportation system and ways it can be improved to encourage more students to safely walk and bicycle to school. The City should partner with the WLWV to collect data regarding the students that walk and bicycle to school; students that participate in walking and bicycling events; the effect of seasonal changes on walking and bicycling; and the type and location of any safety incidents involving students walking and bicycling.

Appendix A: Lighting near Safe Routes to Schools





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Pathway Planning Mapbook

JULY 2014

Legend

On-Street Routes from TMP*

- Primary Route (30)
- Secondary Route (58)
- Local Route (3)
- Complete
- Beginning/Ending Points on Routes

TMP Reference ID, GIS Route Number, See Spreadsheet (Assigned by West Linn GIS & Engineering Staff) Color Coded by Tier Labeled with Route Number

Tier Level: 1 # / 2 # / 3 #

Off-Street and All other Routes*

- Primary Route
- Secondary Route
- Local Route

Path and Trail Information

- Trail Inventory West Linn GIS 2014

NOTE: You can identify unimproved trail routes by looking at green lines that do not have a black dashed line over the top. Improved trails display in the current GIS inventory.

- Trail Connections for On Street and Off Street

Tri-Met

- Bus Stops (Metro RLIS)
- Bus Stops, 1/4 Mile Buffer, Dashed Line

Schools**

WLWV School, Walking Boundaries

- Primary Schools → Overlap Areas, Commercial Area & Primary School
- Middle School → Overlap Areas, Commercial Area & Middle School
- High School → Overlap Areas, Commercial Area & High School

Commercial Areas

- Commercial Areas, 1/4 Mile Buffer (Zoning)

Other Overlaps

- Commercial & Primary School & High School
- Primary School and Middle School
- Primary School and High School

Other School Layers

- Primary Safe Routes to Schools
- School Crossings along Safe Routes
- School Buffers, 1/4 & 1 Mile

Base Map Legend

- Tax Lot Parcel Lines
- Streets
- 5232 Addresses
- Private Roads
- Unimproved Right-of-Way
- Streams
- Rivers
- Ponds
- West Linn City Limits
- City Owned Property

West Linn GIS
GEOGRAPHIC INFORMATION SYSTEMS

0 150 300 600 900 1,200 Feet

0 0.025 0.05 0.1 0.15 0.2 Miles

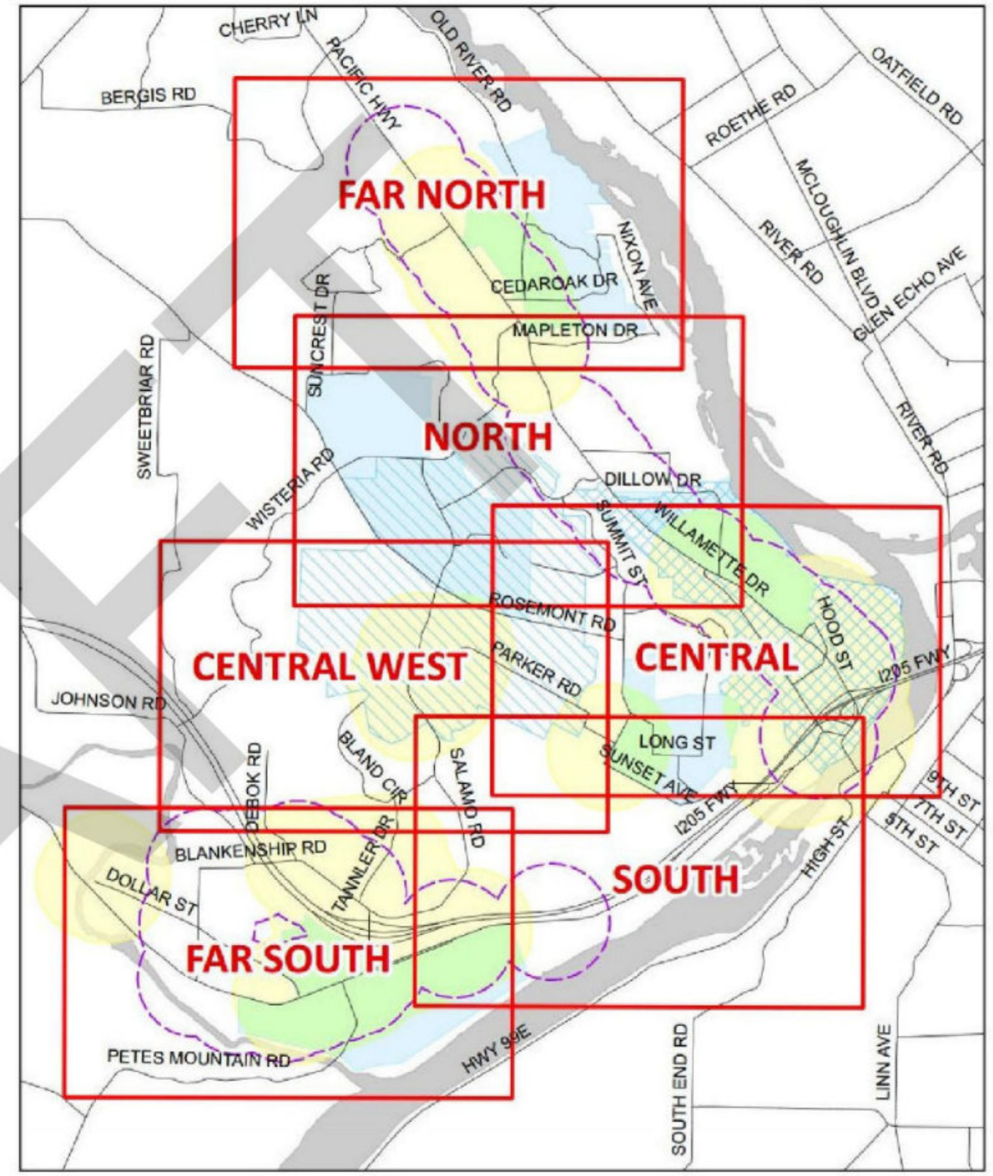
This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Tax Lot Parcel Base Map source: Clackamas County GIS
All other map layers and map production: West Linn GIS

*West Linn 2013 Trails Master Plan (TMP) data provided by MIG.
**Boundaries and Routes from West Linn Wilsonville School District (Digitized and spatially adjusted from Google Map overlays & PDF maps)
All other map overlays provided by West Linn GIS / Public Works

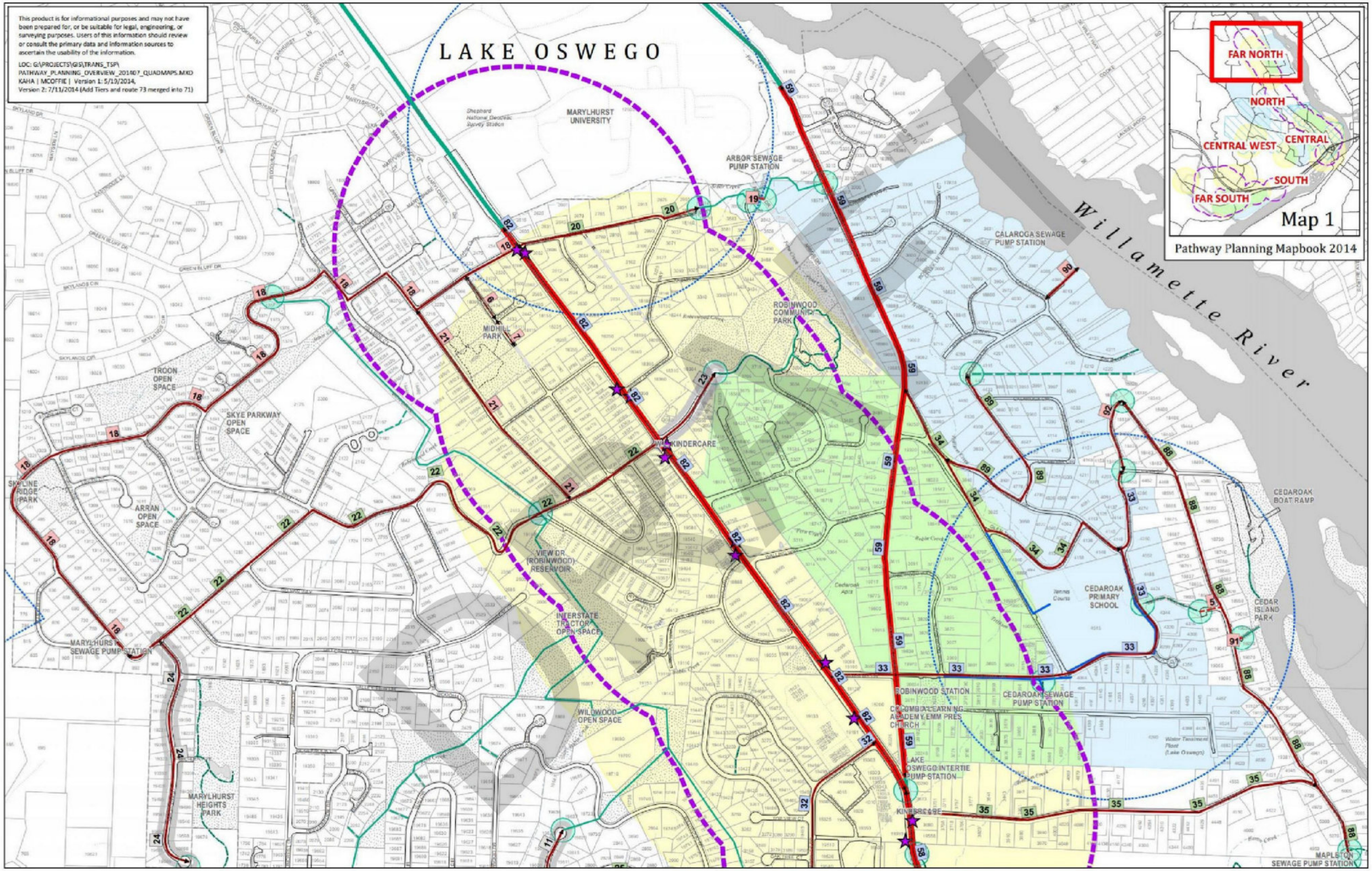
MAP PUBLICATION: JULY 11, 2014 BASE MAP COURTESY OF THE CITY OF WEST LINN GIS CARTOGRAPHER: K. AHA
GIS DATA COORDINATE SYSTEM: NAD 1983 HARN STATEPLANE OREGON NORTH FIPS 3601 FEET INTL

LOC: G:\PROJECTS\GIS\TRANS_TSP\PATHWAY_PLANNING_OVERVIEW_201407_QUADMAPS_COVERSHEET.MXD
KAHA | MCOFFIE | Version 1: 5/19/2014, Version 2: 7/11/2014 (Add Tiers and route 73 merged into 71)



Key Map

Map 1	FAR NORTH
Map 2	NORTH
Map 3	CENTRAL
Map 4	CENTRAL WEST
Map 5	SOUTH
Map 6	FAR SOUTH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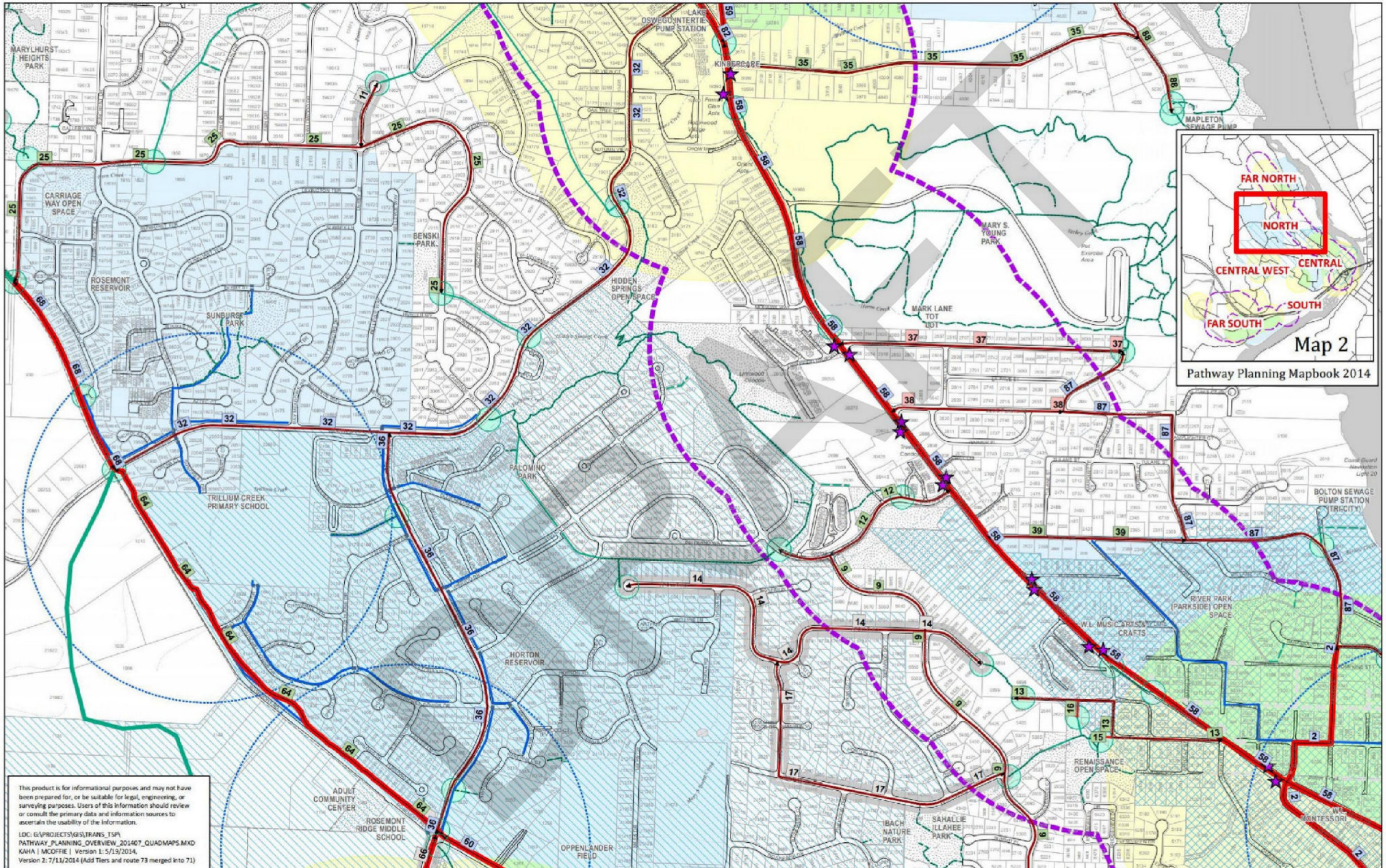
KAHA | MCOFFIE | Version 1: 5/19/2014,
Version 2: 7/11/2014 (Add Tiers and route 73 merged into 71)
LAKE OSWEGO
MARYLHURST UNIVERSITY
ARBOR SEWAGE PUMP STATION
CALAROGA SEWAGE PUMP STATION
Willamette River
MIDHILL PARK
ROBINWOOD COMMUNITY PARK
TROON OPEN SPACE
SKYE PARKWAY OPEN SPACE
KINDERCARE
SKYLINE RIDGE PARK
ARRAN OPEN SPACE
VIEW DR (ROBINWOOD) RESERVOIR
INTERSTATE TRACTOR OPEN SPACE
MARYLHURST SEWAGE PUMP STATION
CEDAROAK PRIMARY SCHOOL
CEDAROAK BOAT RAMP
CEDAR ISLAND PARK
ROBINWOOD STATION
CEDAROAK SEWAGE PUMP STATION
COLUMBIA LEARNING ACADEMY EMM PRES CHURCH
WILDWOOD OPEN SPACE
LAKE OSWEGO INTERTIE PUMP STATION
MARYLHURST HEIGHTS PARK
MAPLETON SEWAGE PUMP STATION
FAR NORTH
NORTH
CENTRAL WEST
CENTRAL
SOUTH
FAR SOUTH
Map 1
Pathway Planning Mapbook 2014


MARYLHURST HEIGHTS PARK
CARRIAGE WAY OPEN SPACE
ROSEMONT RESERVOIR
SUNBURST PARK
BENSKI PARK
HIDDEN SPRINGS OPEN SPACE
LAKE OSWEGO INTERTIE PUMP STATION
MARY S. YOUNG PARK
MARK LANE TOT LOT
MAPLETON SEWAGE PUMP
TRILLIUM CREEK PRIMARY SCHOOL
PALOMINO PARK
HORTON RESERVOIR
ADULT COMMUNITY CENTER
ROSEMONT RIDGE MIDDLE SCHOOL
OPPENLANDER FIELD
IBACH NATURE PARK
SAHALLIE ILLAHEE PARK
RENAISSANCE OPEN SPACE
W.L. MUSIC, ARTS & CRAFTS
RIVER PARK (PARKSIDE) OPEN SPACE
BOLTON SEWAGE PUMP STATION (TRICITY)
FAR NORTH
NORTH
CENTRAL
CENTRAL WEST
SOUTH
FAR SOUTH
Map 2
Pathway Planning Mapbook 2014
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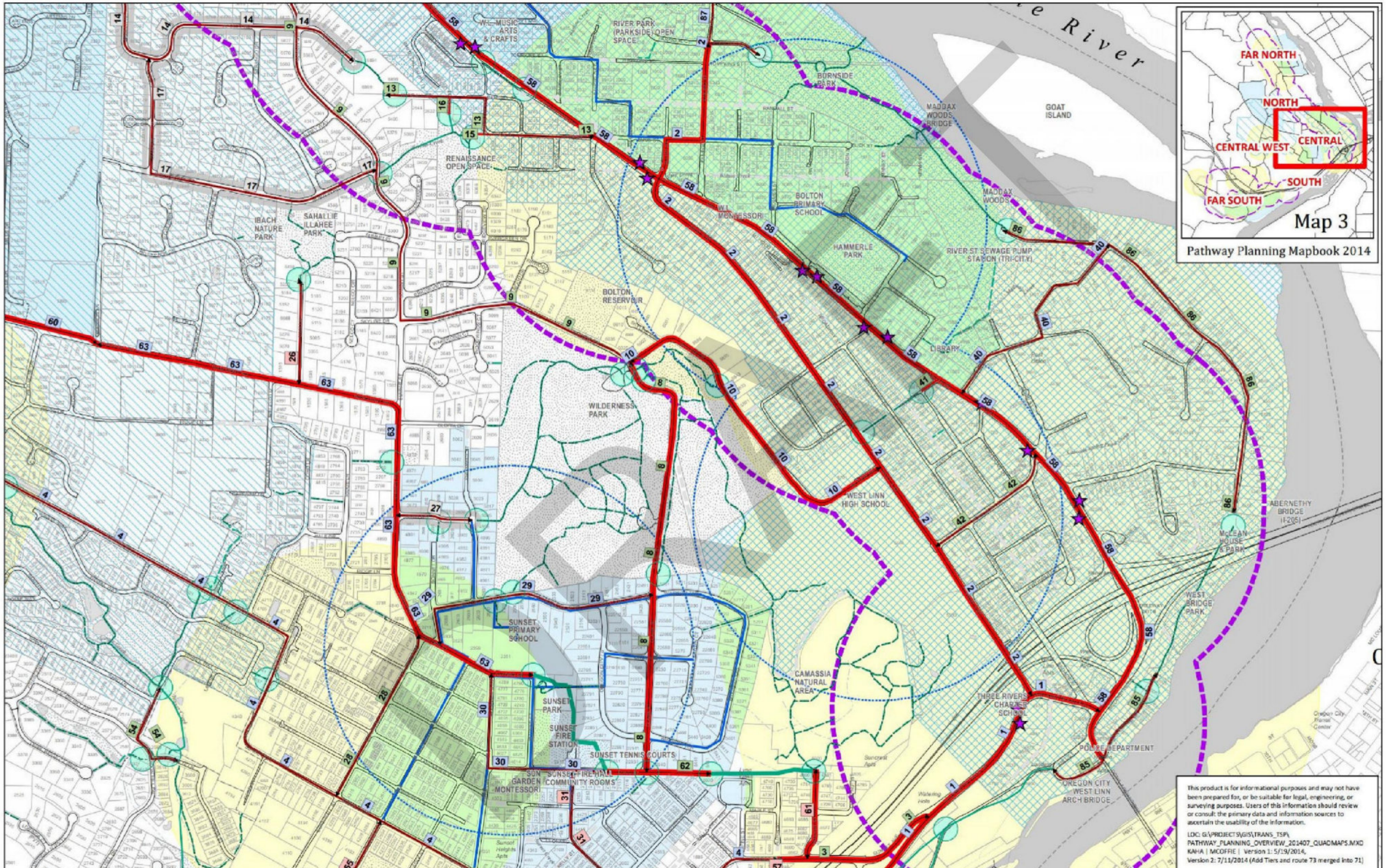

FAR NORTH
NORTH
CENTRAL WEST
CENTRAL
SOUTH
FAR SOUTH
Map 3
Pathway Planning Mapbook 2014
River
GOAT ISLAND
W-L MUSIC ARTS & CRAFTS
RIVER PARK (PARKSIDE) OPEN SPACE
BURNSIDE PARK
MADDAX WOODS BRIDGE
MADDAX WOODS
RENAISSANCE OPEN SPACE
IBACH NATURE PARK
SAHALLIE ILLAHEE PARK
W-L MONTESSORI
BOLTON PRIMARY SCHOOL
HAMMERLE PARK
RIVER ST SEWAGE PUMP STATION (TRI-CITY)
BOLTON RESERVOIR
LIBRARY
WILDERNESS PARK
WEST LINN HIGH SCHOOL
ABERNETHY BRIDGE (I-205)
McLEAN HOUSE & PARK
WEST BRIDGE PARK
SUNSET PRIMARY SCHOOL
CAMASSIA NATURAL AREA
THREE RIVERS CHARTER SCHOOL
SUNSET PARK
SUNSET FIRE STATION
SUNSET TENNIS COURTS
SUN GARDEN MONTESSORI
SUNSET FIRE HALL COMMUNITY ROOMS
POLICE DEPARTMENT
OREGON CITY WEST LINN ARCH BRIDGE
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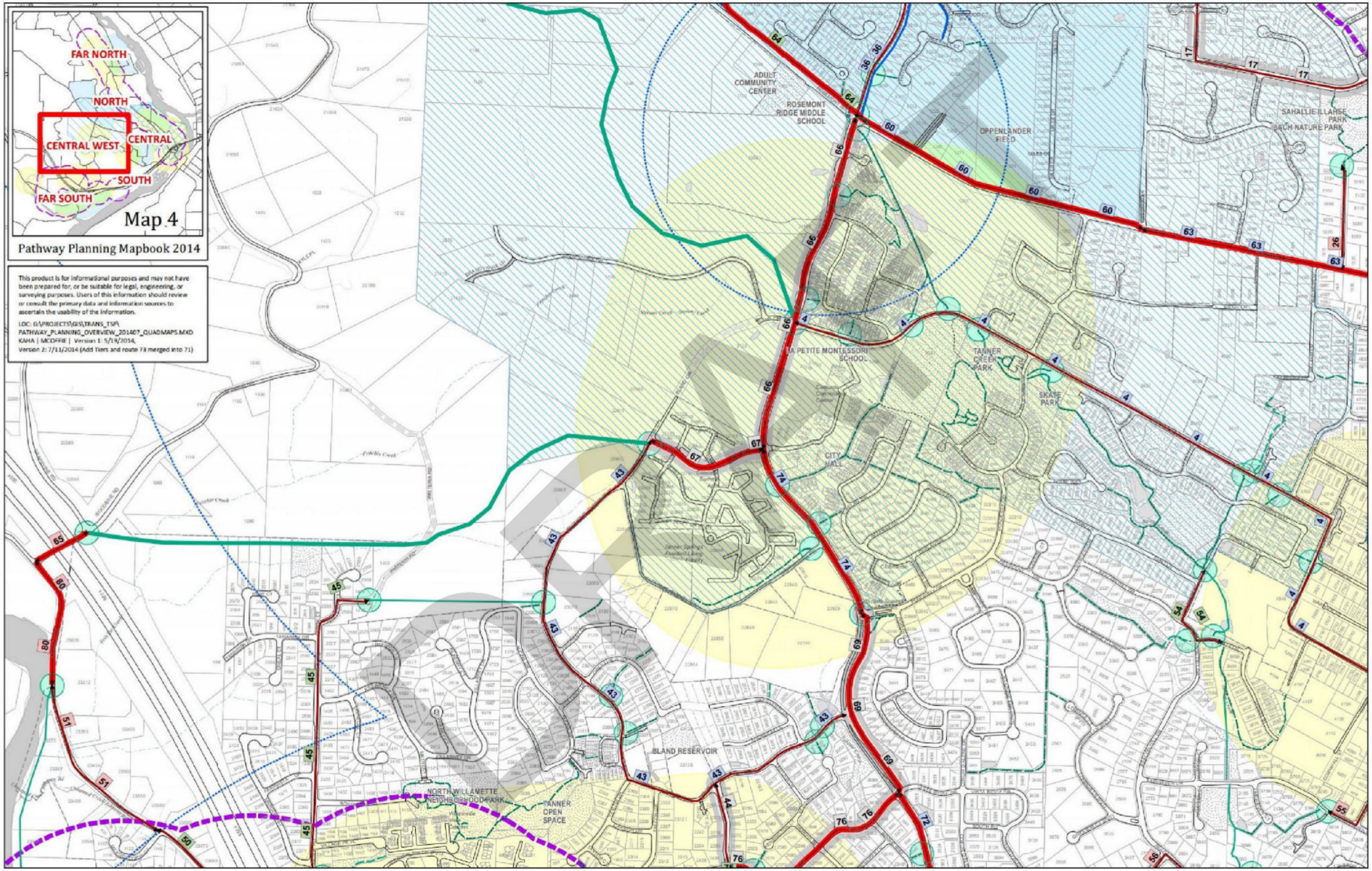
FAR NORTH
NORTH
CENTRAL
CENTRAL WEST
SOUTH
FAR SOUTH
Map 4
Pathway Planning Mapbook 2014
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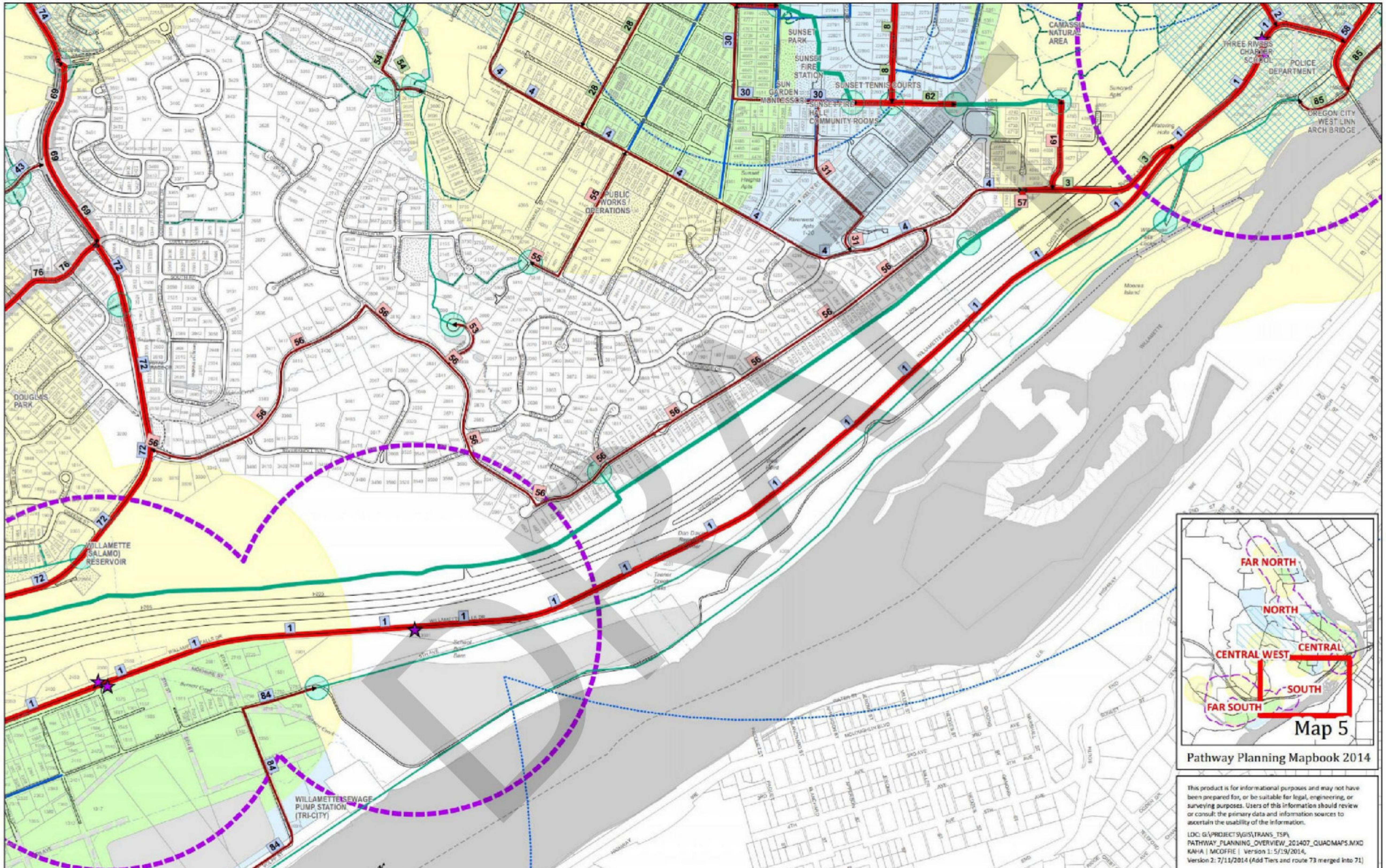
Version 2: 7/11/2014 (Add Tiers and route 73 merged into 71)
ADULT COMMUNITY CENTER
ROSEMONT RIDGE MIDDLE SCHOOL
OPPENLANDER FIELD
SAHALLIE ILLAHEE PARK
BACH NATURE PARK
LA PETITE MONTESSORI SCHOOL
TANNER CREEK PARK
SKATE PARK
CITY HALL
BLAND RESERVOIR
NORTH WILLAMETTE NEIGHBORHOOD PARK
TANNER OPEN SPACE
DRAFT


SUNSET PARK
SUNSET FIRE STATION
SUN GARDEN MONTESSORI
SUNSET TENNIS COURTS
SUNSET FIRE HALL COMMUNITY ROOMS
CAMASSIA NATURAL AREA
THREE RIVERS CHARTER SCHOOL
POLICE DEPARTMENT
OREGON CITY WEST LINN ARCH BRIDGE
PUBLIC WORKS OPERATIONS
DOUGLAS PARK
WILLAMETTE (SALAMO) RESERVOIR
WILLAMETTE SEWAGE PUMP STATION (TRI-CITY)
FAR NORTH
NORTH
CENTRAL WEST
CENTRAL
SOUTH
FAR SOUTH
Map 5
Pathway Planning Mapbook 2014
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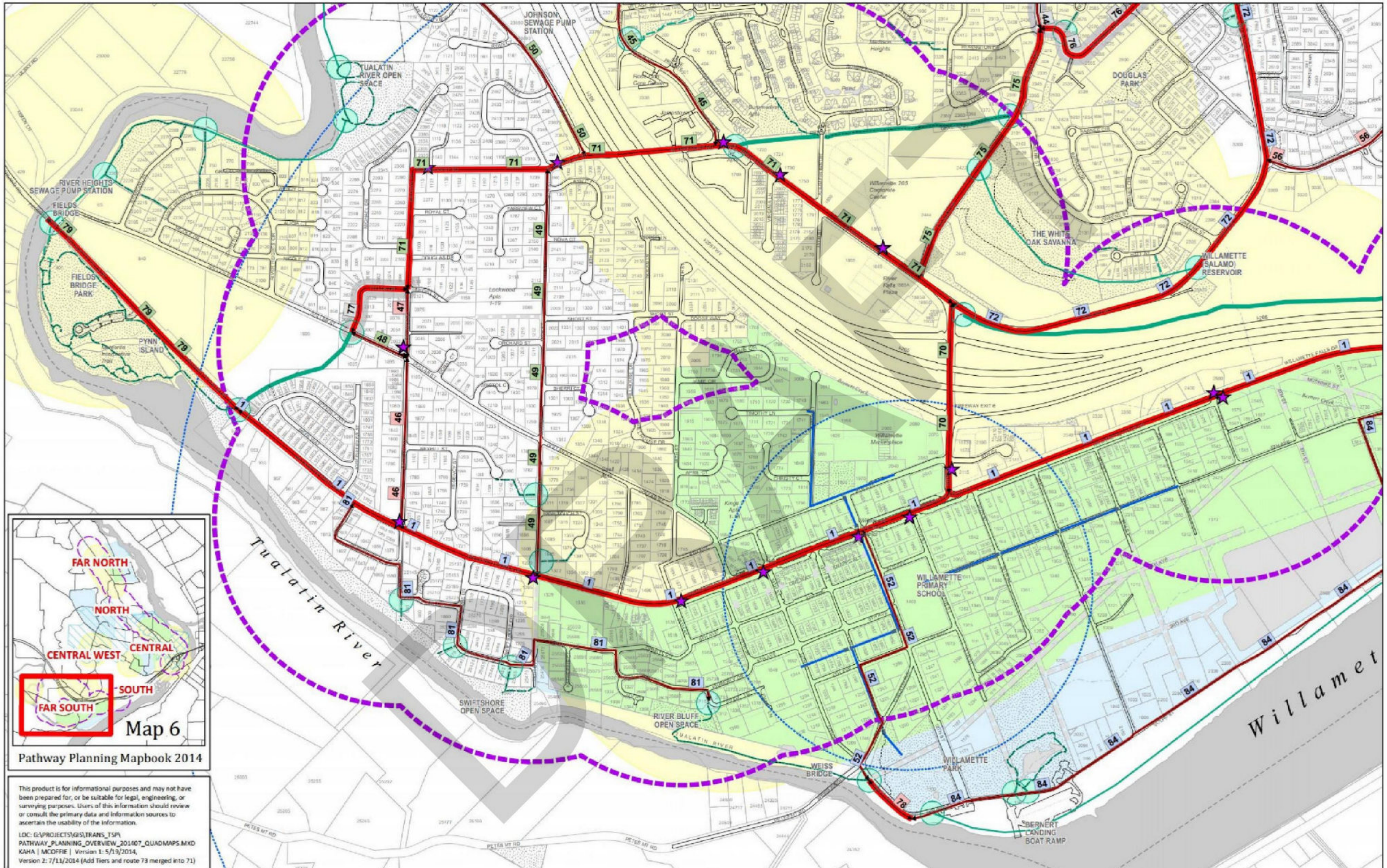
JOHNSON SEWAGE PUMP STATION
TUALATIN RIVER OPEN SPACE
RIVER HEIGHTS SEWAGE PUMP STATION
FIELDS BRIDGE
FIELDS BRIDGE PARK
PYNN ISLAND
DOUGLAS PARK
THE WHITE OAK SAVANNA
WILLAMETTE (SALAMO) RESERVOIR
WILLAMETTE PRIMARY SCHOOL
SWIFTSHORE OPEN SPACE
RIVER BLUFF OPEN SPACE
WEISS BRIDGE
WILLAMETTE PARK
BERNERT LANDING BOAT RAMP
Tualatin River
Willamet
DRAFT
FAR NORTH
NORTH
CENTRAL WEST
CENTRAL
SOUTH
FAR SOUTH
Map 6
Pathway Planning Mapbook 2014
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KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
610 SW Alder Street, Suite 700, Portland, OR 97205 P 503.228.5230 F 503.273.8169

MEMORANDUM

Date: May 22, 2015 Project #: 17817.0

To: Zach Pelz, City of West Linn
Gail Curtis, Oregon Department of Transportation

From: Susan Wright, Matthew Bell, and Ribeka Toda, Kittelson & Associates, Inc.

Project: West Linn Transportation System Plan (TSP) Update

Subject: Final Technical Memorandum #7: Transportation System Needs

This memorandum documents the existing and future transportation system needs within the City of West Linn. The information presented in this memorandum is intended to inform the development of the City's 2015 Transportation System Plan (TSP) update which addresses existing system needs and additional facilities that are required to serve future growth. A menu or "toolbox" of solutions to address many of these needs is included in Attachment "A". Technical Memorandum 10 will include specific solutions to address the transportation system needs identified in this memorandum.

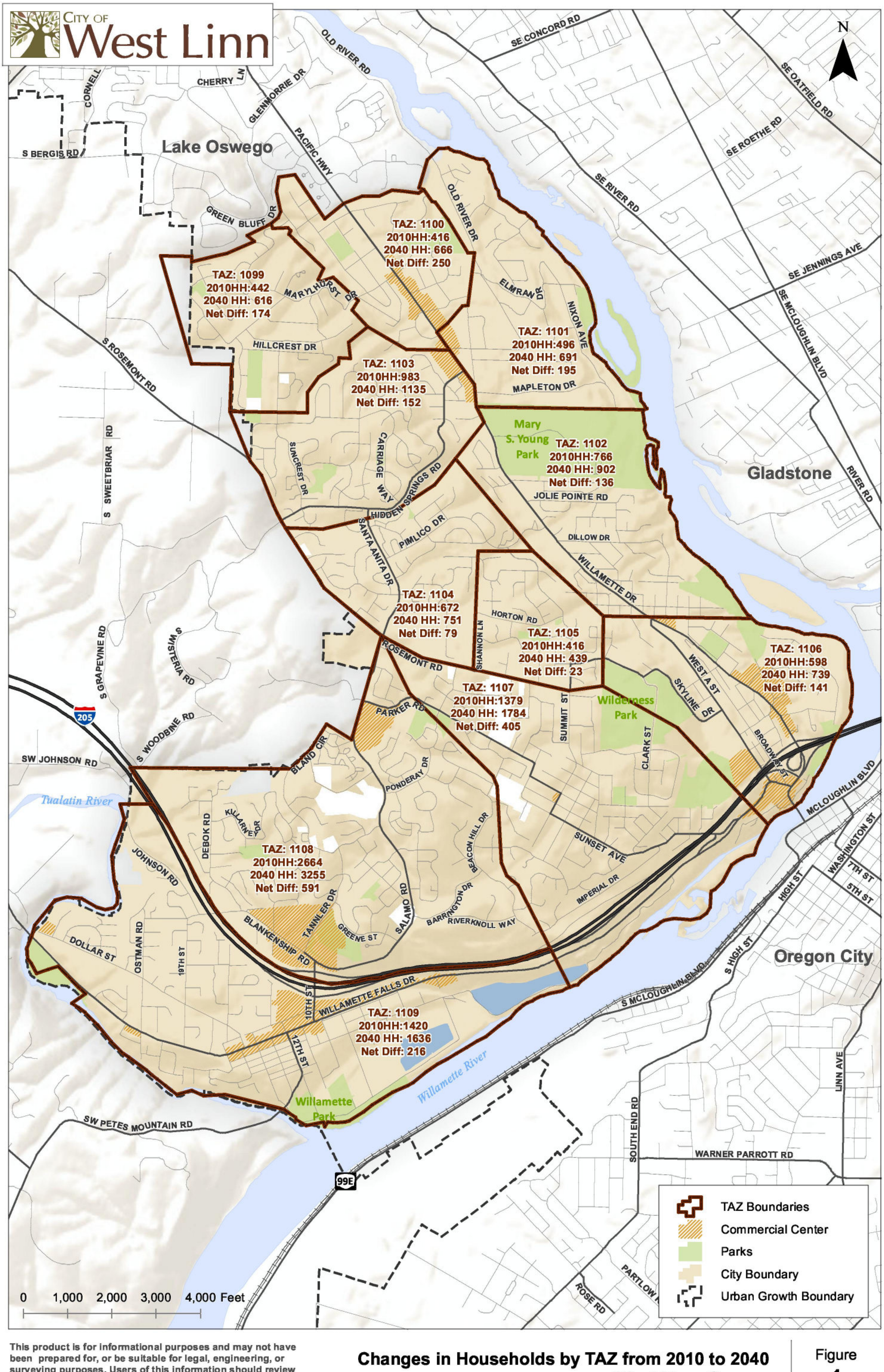
PROJECTED LAND USES

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

Land use data for West Linn was provided by Metro. 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. Figures 1 and 2 illustrate the TAZs and the household and employment changes expected between base year 2010 and forecast year 2040. Table 1 summarizes the TAZ data for base year 2010 and forecast year 2040 conditions. As shown in Table 1, the percent change in population and households over 30 years is anticipated to be less than 1% per year and the growth in employment is anticipated to be approximately 2 % per year.

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%



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Changes in Households by TAZ from 2010 to 2040
West Linn, Oregon

Figure
1

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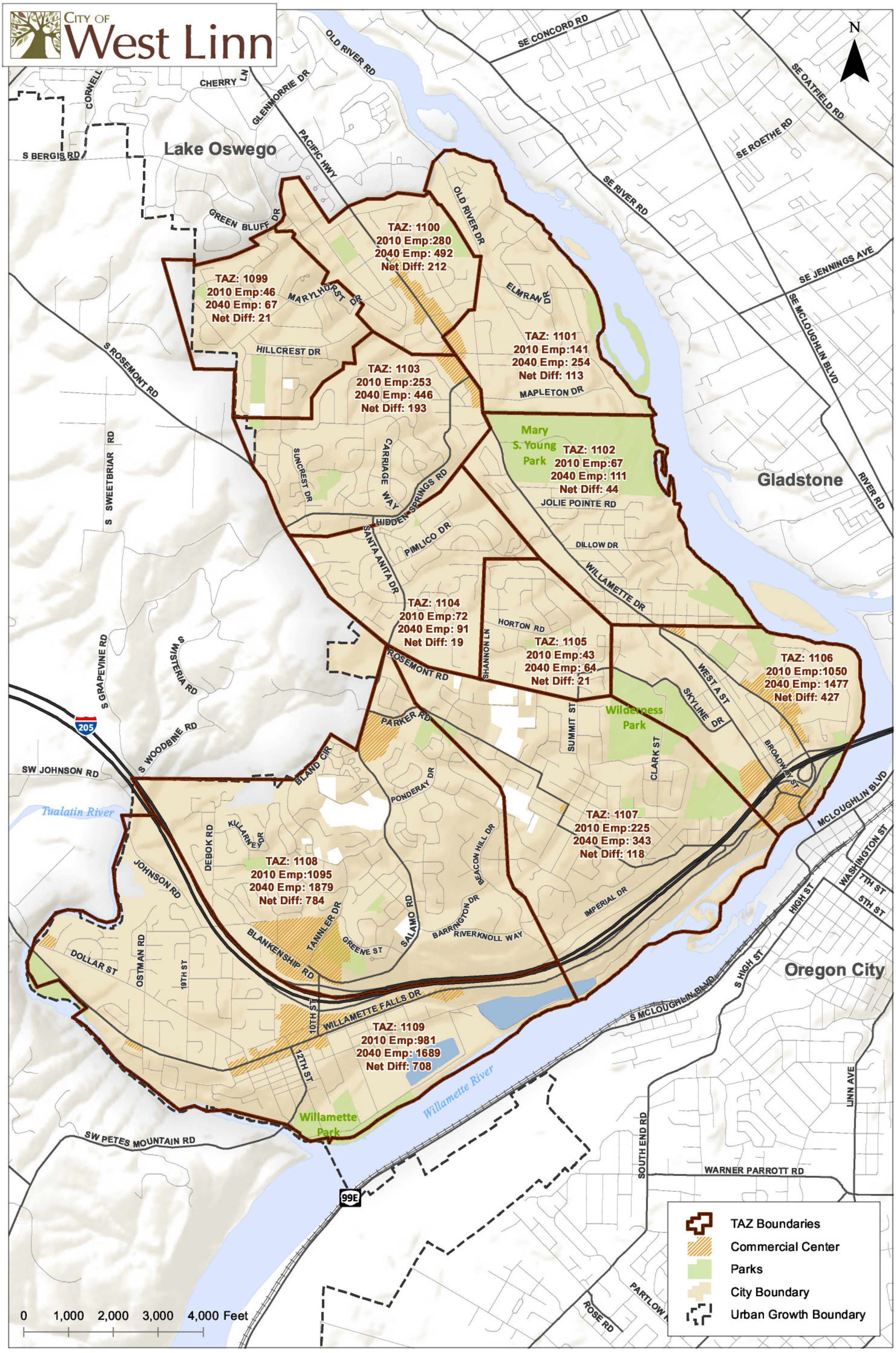
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: USGS, ESRI, TANA, AND



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Changes in Employment by TAZ from 2010 to 2040
West Linn, Oregon

Figure **2**

H:\proj\file\17817 - West Linn Transportation System Plan\gis\TM7\12 TAZ_Employees.mxd - mbell - 5:21 PM 5/21/2015

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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: USGS, ESRI, TANA, AND

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.

The data shown in Table 1 indicates that significant growth is expected in West Linn in the coming decades. The transportation system in West Linn should be monitored to make sure that land uses in the plan are balanced with transportation system capacity.

ACCESS

Access should be provided to all essential destinations in the City, such as transit centers, park and rides, bus stops, schools, parks, public facilities, and commercial centers. Access should also be provided to other networks, such as Metro's Regional Pedestrian and Bicycle Networks, 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).

Access to Essential Destinations

Transit Facilities and Services: Two fixed-route bus lines serve multiple transit stops and one park-and-ride within West Linn and the Oregon City Transit Center located further south.

- TriMet Line 35 provides service along Willamette Drive while Line 154 provides service along Willamette Falls Drive, 10th Street, Blankenship Road, and Ostman Road. There are several gaps in the sidewalks along all four roadways, which limit pedestrian access to both transit lines. Sidewalks are particularly important to transit facilities as most bus riders need safe and comfortable walking routes to access the stops. Also, while there are continuous bicycle lanes along Willamette Drive, there are several gaps in the bicycle lanes along the other roadways which limit access to Line 154.
- The West Linn park-and-ride is located in the southeast corner of the Willamette Drive/Cedar Oak Drive intersection at the Emmanuel United Presbyterian Church. The park-and-ride is served by Line 35 with one stop along the east side of Willamette Drive north of Cedar Oak Drive and one stop along the west side of Willamette Drive approximately halfway between Cedar Oaks drive and Hidden Springs Road. Continuous sidewalks along Willamette Drive and Cedar Oaks Drive connect the park-and-ride with the transit stops and the Willamette Drive/Cedar Oak Drive intersection is signalized with pedestrian activation.

- The Oregon City Transit Center is located across the Arch Bridge in downtown Oregon City between Mcloughlin Boulevard (99E) and Main Street on 11th Street. The Oregon City Transit Center is a major transit hub within the region serving TriMet's fixed-route bus lines 32, 33, 34, 35, 79, 99, and 154, TriMet's Lift service, and Canby Area Transit's (CAT) Orange Line. Continuous sidewalks along the Arch Bridge and through downtown Oregon City provide access to the transit center for pedestrians; however, cyclists must share the roadways with motor vehicles. TriMet's Line 35 and 154 also provide access to the Oregon City Transit Center from West Linn.

Schools: Providing pedestrian and bicycle access to schools can offer multimodal commute options for students. Most of the schools in West Linn have limited or significant gaps in pedestrian and bicycle systems.

Parks: There are numerous parks in West Linn. The three main parks are Mary S. Young Park, Wilderness Park, and Willamette Park.

- Mary S. Young Park is a 128 acre park located along the east side of Willamette Drive between Mapleton Drive and Mark Lane. It is accessible from Willamette Drive, Mark Lane, Munger Drive, and Mapleton Drive. There is an off-street pedestrian path on the east side of Willamette Drive, but no pedestrian facilities on the west side and no crosswalk to cross Willamette Drive. There are bicycle lanes on both sides of Willamette Drive, while Mapleton Drive and Mark lane are low volume, low speed streets where bicyclists can share the road with motor vehicles. Finally, TriMet Line 35 serves four stops adjacent to the part, including one northbound and one southbound stop at the Willamette Drive/Mapleton Drive intersection and one northbound and one southbound stop at the Willamette Drive/Mark Lane intersection.
- Wilderness Park is a 51.4 acre park located southwest of West A Street. It has access points on Clark Street, Oregon City Boulevard, Prospect Street, and Windsor Terrace. Clark Street currently lacks sidewalks and bike lanes between skyline drive and Windsor Terrance; however, it has continuous sidewalks and bike lanes between Windsor Terrace and Long Street. Oregon City Boulevard, Prospect Street, and Windsor Terrace have limited or no sidewalks and bicycle lanes. Transit service is not provided in the area.
- Willamette Park is a 15 acre park located at the intersection of the Tualatin River and the Willamette River at the south end of the City. It is accessible from 12th Street and Volpp Street. 12th Street has sidewalks on the west side only and Volpp has discontinuous sidewalks along both the north and south sides. There are no bicycle lanes on either street. Transit service is provided along Willamette Falls Drive, which is located several blocks north of the park.

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.

- The West Linn City Hall is located at the intersection of Salamo Road and Day Road. There are sidewalks on both sides of Salamo Road and Day Road and marked crosswalks at the intersection. There are bicycle lanes on both sides of Salamo Road and no bicycle facilities along Day Road. Transit service is not provided in the area.
- The West Linn Adult Community Center located at the intersection of Santa Anita Drive and Rosemont Road adjacent to Rosemont Ridge Middle School. There are sidewalks along both sides of Rosemont Road and while there is no crosswalk directly in front of the driveway to the community center, there is a crosswalk at the intersection approximately 400 feet to the east. There are bicycle lanes along both sides of Rosemont Road and there is also an off-street multi-use path along the north side of Rosemont Road. Transit service is not provided in the area.
- The West Linn Public Library is located at the intersection of Hood Street and Burns Street. There are sidewalks along a portion of Burns Street but no sidewalks along Hood Street. It is also located near Willamette Drive, and while the segments of Willamette Drive near the site have sidewalks, there are no crosswalks across Willamette Drive for library patrons walking from west of Willamette Drive. Willamette Drive has bicycle lanes in both directions.

Commercial Centers: There are four main commercial centers in West Linn 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.

- Willamette Drive/I-205 Interchange: The commercial center along Hood Street, which runs parallel to Willamette Drive, is a collection of retail and restaurants in the area enclosed by Willamette Drive, Burns Street and Garden Street.
- Willamette Historic Commercial District: The commercial area along Willamette River Drive near the 10th Street/I-205 interchange includes various restaurants and stores along both sides of Willamette River Drive, and there is a separated frontage road on both sides with parking.
- Salamo Road/Parker Road Intersection: The commercial area located in the southeast corner of the Salamo Road/Parker Road intersection includes City Hall and a shopping center.
- Willamette Drive toward the north end of City: The commercial area along Willamette Drive toward the north end of the City includes a Walmart and other retail uses and restaurants.

Access to Other Networks

Metros Regional Pedestrian Network

Metro's Regional Pedestrian Network consists of pedestrian parkways, regional pedestrian corridors, local pedestrian corridors, and regional pedestrian districts. This network includes the trails identified in the Metro Regional Trails and Greenways network. The components of the Regional Pedestrian Network 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 centers described above.

Metros 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 10^{th} 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. Within West Linn these areas include the four main commercial centers described above.

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.

Metro Regional Trails and Greenways Network

Metro's Regional Trails and Greenways network is the compilation of the trails that connect the parks and natural areas in the region. The trails in this network that are within West Linn are included in Metro's Regional Pedestrian and Bicycle Networks.

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, Route 6a (Willamette Drive/Old River Road) has been identified as a Visionary PAT (V-PAT) Route, which means that it is a long-term project for the County. Route 6a offers a scenic route along the Willamette River south of George Rogers Park. 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.

PEDESTRIAN SYSTEM NEEDS

Pedestrian facilities, such as sidewalks, multi-use paths and trails, marked and unmarked, signalized and unsignalized pedestrian crossings are essential elements of the City's pedestrian system. While these facilities are currently provided along many City streets, there are many more streets where these facilities are needed to improve pedestrian access within the City, consistent with Section 3.08.130 of the RTFP. 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 affords the opportunity to consider the walking mode of travel, especially for trips less than one-half mile in length.

System Connectivity

A well-connected pedestrian system provides continuous sidewalks and other pedestrian facilities between essential destinations, such as residential neighborhoods, schools, parks, and retail/commercial centers. 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 connectivity needs for the pedestrian system.

Sidewalks

Several of the arterial and collector streets within West Linn need sidewalks and other pedestrian facilities to improve connectivity. Figure 3 illustrates the gaps in the pedestrian system. As shown, there is a need for sidewalks along both sides of Willamette Drive, Rosemont Road, Skyline Drive, Parker Road, Sunset Avenue, and many other arterials streets, as well as a need for sidewalks along both sides of Ostman Road, Blankenship Road, Tannler Drive, Pimlico Drive, Summit Street, and many other collector streets. There is also a need for sidewalks on both sides of the neighborhood route and local streets identified in Tech Memo 6 as safe routes to school streets (SRTS streets) and on both sides of the neighborhood route and local streets located within the City's four retail/commercial areas (commercial streets). While the need for sidewalks is shown along both sides of all arterial, collector, STRS, and commercial streets, it may not be feasible or cost effective to construct sidewalks on both sides of all streets. Marylhurst Drive, for example, has significant grade and topography issues that may limit the ability to construct sidewalks on one or both sides of the street. Further evaluation of these streets will be provided in Technical Memorandum 10: Transportation Solutions.

Many of the sidewalk projects identified in previous the TSP and other planning documents have not been constructed, and therefore are still needed today. These projects along with several additional projects identified through a review of the transportation system as well as conversations with City staff, are shown in Table 2. The pedestrian system needs shown in Table 2 are based on road standards that include sidewalks on both sides of the street; however, some locations may be determined to be adequate with a pedestrian facility on one side of the roadway only.

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Pedestrian System Needs
West Linn, Oregon

Figure **3**

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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: USGS, ESRI, TANA, AND

Table 2: Pedestrian System Gaps

Street Name	From	To	Side	Need	SRTS – Memo 6	On-street Connection – Trails Master Plan	SRTS – Trails Master Plan
10th Street	Blankenship Road	8th Avenue-Court	One side only	Construct new sidewalk	No	Route 70	No
19th Street	Blankenship Road	Willamette Falls Drive	Both sides	Construct new sidewalk	No	Route 49	No
Bland Circle	Salamo Road	Tannler Drive	One side only	Construct new sidewalk	No	Route 43	No
Bland Circle	Tannler Drive	North City limits	Both sides	Construct new sidewalks and fill in gaps	No	Route 43	No
Blankenship Road	Ostman Road	19th Street	One side only	Construct new sidewalk	No	Route 71	No
Blankenship Road	Johnson Road	Debok Road	One side only	Construct new sidewalk	No	Route 71	No
Blankenship Road	13th Street	10th Street	One side only	Fill in sidewalk gaps	No	Route 71	No
Carriage Way	Rosemont Road	Suncrest Drive	One side only	Fill in sidewalk gaps	No	Route 25	No
Cedaroak Drive	Highway 43	Old River Drive	One side only	Fill in sidewalk gaps	Yes	Route 33	Yes
Cornwall Street	Sunset Avenue	Oxford Street	Both sides	Construct new sidewalk	No	Route 28	No
Debok Road	Summerlinn Drive	Rosemarie Drive	One side only	Fill in sidewalk gaps	No	Route 45	No
Debok Road	Rosemarie Drive	Farvista Drive	Both sides	Construct new sidewalk	No	Route 45	No
Dillow Drive	Larson Avenue	Failing Street	Both sides	Construct new sidewalk	No	Route 2	Yes
Dollar Street	West City Limits	Willamette Falls Drive	One side only	Construct new sidewalk	No	No	No
Elmran Avenue	Nixon Avenue	Old River Road	Both sides	Construct new sidewalk	No	Routes 34, 89, 33, and 92	Yes (Route 33)
Failing Street	Buck Street	Dillow Drive	Both sides	Construct new sidewalk	No	Route 2	Yes
Hidden Springs Road	Suncrest Drive	Santa Anita Drive	One side only	Fill in sidewalk gaps	Yes	Route 32	Yes
Hidden Springs Road	Carriage Way	Wildwood Drive	One side only	Construct new sidewalk	No	Route 32	Yes
Hidden Springs Road	Wildwood Drive	Cottonwood Court	One side only	Fill in sidewalk gaps	No	Route 32	Yes
Hillcrest Drive	Marylhurst Drive (North)	Marylhurst Drive (South)	Both sides	Construct new sidewalk	No	No	No
Johnson Road	West City limits	Blankenship Road	Both sides	Construct new sidewalk	No	Routes 50 and 51	No
Jolie Pointe Drive	Larson Avenue	Rainier Place	Both sides	Construct new sidewalk	No	Route 38	No
Lancaster Street	Parker Road	Cornwall Street	Both Sides	Construct new sidewalks and fill gaps	No	No	No

Street Name	From	To	Side	Need	SRTS – Memo 6	On-street Connection – Trails Master Plan	SRTS – Trails Master Plan
Larson Avenue	Dillow Drive	Tulane Street	Both sides	Construct new sidewalk	No	Route 87	No
Larson Avenue	Tulane Street	Jolie Pointe Drive	One side only	Construct new sidewalk	No	Route 87	No
Leonard Street	Simpson Street	Riverview Avenue	Both Sides	Construct new sidewalk	No	Route 31	No
Mapleton Drive	Willamette Drive	Nixon Avenue	Both sides	Construct new sidewalk	No	Route 38	No
Marylhurst Drive	Willamette Drive	Hillcrest Drive	Both sides	Construct new sidewalk	No	Route 22	No
McKillican Street	West A Street	Willamette Falls Drive	Both sides	Construct new sidewalk	No	Route 42	No
Nixon Avenue	Mapleton Drive	Elmran Drive	Both sides	Construct new sidewalk	No	Route 88	No
Old River Road	Cedar Oak Drive	North City limits	Both sides	Construct new sidewalk and fill gaps	No	Route 59	No
Ostman Road	Blankenship Road	Willamette Falls Drive	Both sides	Construct new sidewalk and fill gaps	No	Routes 46 and 47	No
Oxford Street	Cornwall Street	Bittner Street	Both sides	Construct new sidewalks and fill gaps	Yes	Route 63	No
Parker Road	Noble Lane	Dillon Lane	Both sides	Construct new sidewalks	No	Route 4	No
Parker Road	Wild Rose Drive	Chinook Court	One Side Only	Construct new sidewalks and fill gaps	No	Route 4	No
Pimlico Drive	Willamette Drive	Palamino Way (East)	Both sides	Construct new sidewalk	No	Route 12	No
Pimlico Drive	Santa Anita Drive	Palamino Way (West)	One side only	Construct new sidewalk	Yes	No	No
Riverview Avenue	Leonard Street	Sunset Avenue	Both sides	Construct new sidewalk	No	No	No
Rosemont Road	Carriage Way	Hidden Springs	One side only	Construct new sidewalk	No	Route 68	Yes
Rosemont Road	Hidden Springs Road	Santa Anita Drive	One side only	Construct new sidewalk	Yes	Route 64	No
Rosemont Road	Santa Anita Drive	Wild Rose Drive	One side only	Construct new sidewalk	No	Route 60	No
Rosemont Road	Shannon Lane	Summit Street	Both sides	Construct new sidewalk and fill gaps	No	Route 63	No
Santa Anita Drive	Hidden Springs Road	Pimlico Drive	One side only	Construct new sidewalk and fill gaps	Yes	Route 36	Yes
Salamo Drive	10th Street	Crystal Terrace Drive	Both sides	Construct new sidewalk	No	Route 72	No
Salamo Drive	Bland Circle	Weatherhill Road	One side only	Construct new sidewalk	No	Routes 72, 69, and 74	No
Simpson Street	Long Street	Leonard Street	Both sides	Construct new sidewalk	No	Route 31	No

Street Name	From	To	Side	Need	SRTS – Memo 6	On-street Connection – Trails Master Plan	SRTS – Trails Master Plan
Skyline Drive	Summit Street	West A Street	Both sides	Construct new sidewalk and fill gaps	No	Routes 9 and 10	No
Summit Street	Skyline Drive	Oxford Street	Both sides	Construct new sidewalk and fill gaps	No	Routes 28 and 63	No
Summit Street	Pimlico Drive	Apollo Road	Both sides	Fill in sidewalk gaps	No	Route 9	No
Suncrest Drive	Hillcrest Drive	Carriage Way	Both sides	Construct new sidewalk and fill gaps	Yes	No	No
Sunset Avenue	Cornwall Street	Kelly Street	Both sides	Construct new sidewalk	No	Route 4	No
Sunset Avenue	Kelly Street	West A Street	One side only	Construct new sidewalk and fill gaps	No	Route 4	No
Tannler Drive	Blankenship Road	Greene Street	Both sides	Construct new sidewalk and fill gaps	No	Route 75	No
Tualatin Avenue	Volpp Street	12th Street	Both sides	Construct new sidewalk	No	Route 52	Yes
West A Street	Willamette Drive	Skyline Drive	Both sides	Construct new sidewalk and fill gaps	No	Route 2	Yes
Willamette Drive	Bolton Street	Failing Street	One side only	Construct new sidewalk and fill gaps	No	Route 58	No
Willamette Drive	Buck Street	Barlow Street	Both sides	Construct new sidewalks	No	Route 58	No
Willamette Drive	Barlow Street	Pimlico Drive	One side only	Construct new sidewalk	No	Route 58	No
Willamette Drive	Mark Lane	Cedaroak Drive	Both sides	Construct new sidewalk and fill gaps	No	Routes 58 and 82	No
Willamette Drive	Cedaroak Drive	North City Limits	Both sides	Construct new sidewalk and fill gaps	No	Route 82	No
Willamette Falls Drive	West City limits	Dollar Street	Both sides	Construct new sidewalk and fill gaps	No	Route 1	No
Willamette Falls Drive	10th Street	West A Street	Both sides	Construct new sidewalk	No	Route 1	No
Safe Routes to School Streets							
Lowry Drive	Dillow Drive	Tompkins Street	Both sides	Construct new sidewalks	Yes	No	No
Tompkins Street	Lowry Drive	Caufield Street	Both Sides	Construct new sidewalks	Yes	No	No
Caufield Street	Tomkins Street	Randal Street	Both Sides	Construct new sidewalks	Yes	No	No
Randal street	Caufield Street	Davenport Street	Both Sides	Construct new sidewalks	Yes	No	No
Davenport Street	Randal Street	Buck Street	Both Sides	Construct new sidewalks	Yes	No	No

Street Name	From	To	Side	Need	SRTS – Memo 6	On-street Connection – Trails Master Plan	SRTS – Trails Master Plan
Holmes Street	Buck Street	Perrin Street	Both Sides	Construct new sidewalk and fill gaps	Yes	No	No
Perrin Street	Holmes Street	Lewis Street	Both Sides	Construct new sidewalks	Yes	No	No
Cedar Oak Drive	Old River Road	Trillium Drive	Both Sides	Construct new sidewalks	Yes	Route 33	Yes
Cedar Oak Drive	Trillium Drive	Glen Terrrace	One Side Only	Construct new sidewalks	Yes	Route 33	Yes
Trillium Drive	Glen Terrace	Cedar Oak Drive	Both Sides	Construct new sidewalks	Yes	No	No
Sussex Street	Sunset Avenue	Oxford Street	Both Sides	Construct new sidewalks	Yes	No	No
Prospect Street	Knox Street	Oregon City Boulevard	Both Sides	Construct new sidewalks	Yes	No	No
Exeter Street	Sunset Avenue	Long Street	Both Sides	Construct new sidewalk and fill gaps	Yes	No	No
Exeter Street	Long Street	Oxford Street	One Side Only	Construct new sidewalks	Yes	Route 30	Yes
Bonnet Drive	Oxford Street	Oregon City Boulevard	One Side Only	Construct new sidewalks	Yes	Route 29	Yes
Oregon City Boulevard	Bonnet Drive	Prospect Street	One Side Only	Fill in sidewalk gaps	Yes	Route 29	Yes
Bitner Street	Long Street	Oxford Street	One Side Only	Construct new sidewalk and fill gaps	Yes	No	No
Oxford Street	Bitner Street	Bonnet Drive	Both Sides	Construct new sidewalks	Yes	Route 63	Yes
Long Street	Clark Street	Exeter Street	Both Sides	Construct new sidewalk and fill gaps	Yes	Route 30	Yes
13th Street	Timothy Lane	8th Avenue	Both Sides	Construct new sidewalk and fill gaps	Yes	No	No
13th Street	4th Avenue	Tualatin Avenue	Both Sides	Fill in sidewalk gaps	Yes	Route 52	Yes
4th Avenue	14th Street	12th Street	One Side Only	Construct new sidewalks	Yes	Route 52	Yes
5th Avenue	11th Street	7th Street	One Side Only	Construct new sidewalks	Yes	No	No
Commercial Streets							
Holly Street	Highway 43	River Street	Both Sides	Fill in sidewalk gaps	No	No	No
Shady Hollow Way	Highway 43	Arbor Drive	Both Sides	Construct new sidewalk and fill gaps	No	No	No
Fairview Way	Highway 43	Roadway Terminus	Both Sides	Fill in sidewalk gaps	No	No	No
Wailing Way	Highway 43	Old River Drive	Both Sides	Fill in sidewalk gaps	No	No	No

Street Name	From	To	Side	Need	SRTS – Memo 6	On-street Connection – Trails Master Plan	SRTS – Trails Master Plan
Wailing Circle	Highway 43	Highway 43	Both Sides	Construct new sidewalk and fill gaps	No	No	No
Failing Street	Highway 43	Buck street	One Side Only	Fill in sidewalk gaps	No	No	No
Webb Street	West A Street	Highway 43	Both Sides	Construct new sidewalks	No	No	No
Lewis Street	Highway 43	Perkins Street	Both Sides	Construct new sidewalks	No	No	No
13th Street	Blankenship Road	Roadway Terminus	Both sides	Construct new sidewalks	No	No	No
Summerlinn Drive	Summerlinn Way	Blankenship Road	Both Sides	Construct new sidewalk and fill gaps	No	No	No

The sidewalk projects shown in Table 2 will be evaluated based on the TSP goals, targets, and evaluation criteria, and input from City staff and local citizens, to determine the highest priority projects for the financially constrained plan. In addition to the sidewalk needs shown in Table 2, there are other deficiencies in sidewalk conditions, including sub-standard sidewalk widths and general poor conditions. The City is currently compiling an inventory of these sidewalk condition deficiencies, including key areas such as the sidewalks near Willamette Primary School and Bolton School.

In addition to the need for new sidewalks, other pedestrian facilities, such as new pedestrian crossings, multi-use paths and trails, and neighborhood connections are identified below.

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 are needed to provide connectivity as well as access to schools, parks, the library, and other essential destinations within the City. The following provides a summary of the additional crossing needs:

- Hidden Springs Road and Carriage Way
- Parker Road at Noble Lane
- Rosemont Road at Rosemont Ridge Middle School Driveway
- Summit at Skyline Drive
- Salamo Road at Safeway Driveway (north)
- Salamo Road at Rosemont Ridge Middle School Driveway

- Willamette Drive at Mapleton Drive
- Willamette Drive at Mary S Young Park
- Willamette Drive at Pimlico Drive
- Willamette Drive at Burns Street
- Willamette Drive at Web Street
- West A Street at Webb Street

Figure 3 illustrates the locations of the crossing needs. Marked pedestrian crossing at each of these locations would improve connectivity along the roadways as well as access to essential destinations. Any new pedestrian crossings located on Willamette Drive will need to meet Oregon Department of Transportation (ODOT) crossing guidelines and be evaluated based on the criteria used by ODOT to ensure the crossing is warranted and safe.

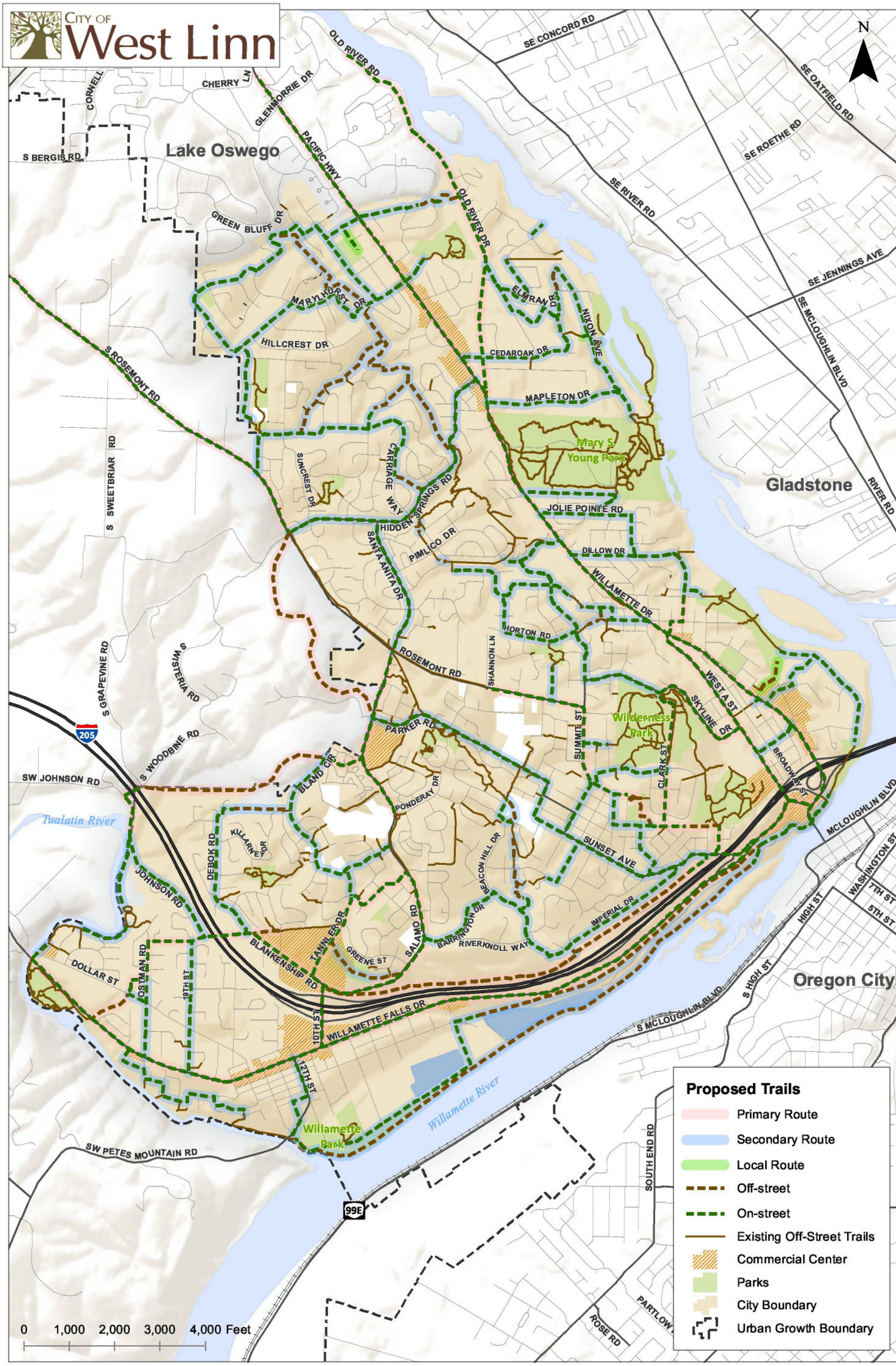
Multi-Use Paths and Trails

Multi-use paths and trails are designated pathways for both bicyclists and pedestrians. There is currently a sparse network of regional and local multi-use paths and trails in the City, comprised of segments along Rosemont Road, Willamette Drive, Willamette Falls Drive, and within parks. Continuous multi-use paths are most comfortable for both pedestrians and bicyclists and increasing the lengths of these short segments would create a more robust network to augment and support the sidewalks and bike lanes on roadways. The City's Trails Master Plan includes multi-use paths and trails as well as on-street facilities to provide connections to the trails. Figure 4 illustrates the City's Trails Master Plan. The on-street segments of the trails master plan should be considered in prioritizing the pedestrian system gaps.

Neighborhood Connections

Connections between cul-de-sacs and adjacent roadways can significantly reduce travel distances for pedestrians, thereby encouraging more pedestrian trips. The identification of such connections in developed areas is required in Section 660-12-045(6) of the Transportation Planning Rule (TPR) as part of a locality's development 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 length of the necessary trail. The following identifies four possible locations for the construction of new pedestrian accessways or shortcuts:



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Trails Master Plan
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: USGS, ESRI, TANA, AND

- 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 that the completion of the connection wait until development occurs, as the length of the needed 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 right-of-way needed to be dedicated along lot lines. The construction of a 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.

Connectivity Analysis

Technical Memorandum #5 identifies the "Excellent/Good/Fair/Poor" rating for pedestrian facilities based on the roadway characteristics. These ratings can be reviewed at a network level to identify the continuous network of "good" or "excellent" facilities and which essential destinations lack pedestrian access via a "fair" or better pedestrian facility. This analysis helps identify gaps in the pedestrian network that should be prioritized to create a more robust network of continuous high quality facilities.

BICYCLE SYSTEM NEEDS

Bicycle facilities, such as on-street bike lanes, shoulder bikeways, 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 within the City, consistent with Section 3.08.140 of the RTFP. The following provides a summary of the bicycle 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 affords the opportunity to consider the bicycle mode of travel, especially for trips up to three miles in length. Because of the length of the trip, bicycle lanes 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 can be categorized into two areas: Connectivity and Access. The Connectivity component creates a continuous web of on-street bicycle lanes 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, such as to transit facilities and to major bicycle generators and attractors such as schools and parks. Both of these categories are described in this section.

System 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 retail/commercial centers. Strategies to improve bicycle connectivity include identifying, prioritizing, and ultimately constructing new on-street bicycle lanes, shared-use pavement markings, bicycle crossings, multi-use paths and trails, and bicycle parking.

On-street Bicycle 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 5 illustrates the bicycle system needs. As shown, there are two prominent north/south roadways that currently provide bicycle lanes in the city – Willamette Drive and Salamo Road. However, these facilities are not well connected by other facilities that could allow for travel to other areas within the city, particularly to the east and west. Also shown in Figure 5, there are no bike facilities on Rosemont Road, Skyline Drive, Sunset Avenue, and many other arterials 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 lanes 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 trail that could accommodate two directions of bicycle travel. Marylhurst Drive, for example, has significant grade and topography issues that may limit the ability to construct on-street bike lanes or other bicycle facilities. Further evaluation of these streets will be provided in Technical Memorandum 10: Transportation Solutions.

Many of the bicycle projects identified in previous TSP's as well as other planning documents have not been constructed and are therefore still needed. These system gaps along with additional needs identified through a review of the transportation system are shown in Table 3. The gaps identified are based on the existing design standards that include bicycle lanes on all collectors and arterials.

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Bicycle Facilities
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: USGS, ESRI, TANA, AND

Table 3: Bicycle System Gaps

Street Name	From	To	SRTS – Memo 6	On-street Connection – Trails Master Plan	SRTS – Trails Master Plan
10th Street	Blankenship Road	Willamette Falls Drive	No	Route 70	No
12th Street	Tualatin Avenue	Willamette Falls Drive	Yes	Route 52	Yes
19th Street	Blankenship Road	Willamette Falls Drive	No	Route 49	No
Bland Circle	Salamo Road	North City limits	No	Route 43	No
Blankenship Road	Ostman Road	Debok Road	No	Route 71	No
Broadway Street	McKillican Street	Willamette Falls Drive	No	No	No
Buck Street	Elliot Street	Failing Street	No	Route 2	Yes
Carriage Way	Rosemont Road	Hidden Springs Road	No	Route 25	No
Cedar Oak Drive	Willamette Drive	Elmran Drive	No	Route 33	Yes
Clark Street	Skyline Drive	Oregon City Boulevard	No	Route 8	No
Cornwall Street	Sunset Avenue	Oxford Street	No	Route 28	No
Debok Road	Summerline Drive	Killarney Drive	No	Route 45	No
Dillow Drive	Larson Avenue	Failing Street	No	Route 2	Yes
Dollar Street	West City limits	Willamette Falls Drive	No	Route 48	No
Elliot Street	Buck Street	Willamette Drive	No	Route 2	Yes
Exeter Street	Oxford Street	Long Street	Yes	Route 30	Yes
Elmran Drive	Old River Drive	Nixon Avenue	No	Routes 34, 89, 33, and 92	Yes (Route 33)
Failing Street	Dillow Drive	Buck Street	No	Route 2	Yes
Green Street	Salamo Road	Tannler Drive	No	No	No
Hidden Springs Road	Santa Anita Drive	Willamette Drive	No	Route 32	Yes
Hillcrest Drive	Marylhurst Drive (west)	Marylhurst Drive (east)	No	No	No
Hood Street	Burns Street	Willamette Drive	No	No	No
Johnson Road	West City limits	Blankenship Road	No	Routes 50 and 51	No
Jolie Point Road	Willamette Drive	Larson Avenue	No	Route 38	No
Lancaster Street	Parker Road	Cornwall Street	No	No	No
Larson Avenue	Jolie Pointe Road	Dillow Drive	No	Route 87	No
Leonard Street	Simpson Street	Riverview Avenue	No	Route 31	No
Long Street	Exeter Street	Clark Street	Yes	Route 30	Yes
Mapleton Drive	Willamette Drive	Nixon Avenue	No	Route 38	No
Marylhurst Drive	Hillcrest Drive (west)	Willamette Drive	No	Route 22	No
McKillican Street	West A Street	Willamette Drive	No	Route 42	No
Nixon Avenue	Elmran Drive	Mapleton Drive	No	Route 88	No
Old River Drive	Cedar Oak Drive	North City limits	No	Route 59	No
Ostman Road	Blankenship Road	Willamette Falls Drive	No	Routes 46 and 47	No
Oxford Street	Summit Street	Exeter Street	Yes	Route 63	No
Parker Road	Noble Lane	Dillon Lane	No	Route 4	No
Pimlico Drive	Santa Anita Drive	Willamette Drive	No	Route 12	No
Riverview Avenue	Leonard Street	Sunset Avenue	No	Route 31	No
Rosemont Road	Carriage Way	Hidden Springs Road	Yes	Route 68	Yes
Rosemont Road	Bay Meadows Drive	Furlong Drive	Yes	Route 64	No
Rosemont Road	Santa Anita Drive	Summit Street	No	Route 60 and 63	No
Salamo Drive	10th Street	Barrington Drive	No	Route 72	No
Simpson Street	Long Street	Leonard Street	No	Route 31	No
Skyline Drive	Summit Street	West A Street	No	Routes 9 and 10	No

Street Name	From	To	SRTS – Memo 6	On-street Connection – Trails Master Plan	SRTS – Trails Master Plan
Summit Street	Skyline Drive	Oxford Street	No	Routes 28 and 63	No
Suncrest Drive	Hillcrest Drive	Hidden Springs Road	No	No	No
Sunset Avenue	Cornwall Street	Willamette Falls Drive	No	Route 3	No
Tannler Drive	Blankenship Road	Bland Circle	No	Route 75	No
Tualatin Avenue	South City limits	12th Street	No	Route 52	Yes
West A Street	I-205 Bridge	Willamette Drive	No	Route 2	Yes
Willamette Falls Drive	Dollar Street (West)	Willamette Drive	No	Route 1	No

The bicycle network gaps shown in Table 3 will be evaluated based on the TSP goals, targets, and evaluation criteria, and input from City staff and local citizens, to determine the highest priority projects for the financially constrained plan.

Shared-Use Streets

Arterials and collectors designated to include bike 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 retail activity centers. 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 area 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 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 Road between the North City Limit and Willamette Drive

Bicycle Crossings

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 bicycle lane, with right-turning vehicles yielding to through cyclists as they cross the bicycle lane. The following summarizes the intersections where there is a need for improvements to the crossing configurations for bicycle 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 ramp - Southbound Right
- Willamette Drive at Willamette Falls Drive
- Broadway Street at Willamette Falls Drive
- West A Street at Willamette Falls Drive

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. Bicycle 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 (e.g., 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 bike 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 commercial uses or near transit tops. 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 the provision of bicycle parking.

Connectivity Analysis

Bicyclists are a varied group of people with different skill levels, abilities, bicycling experience, and trip types. Their needs and comfort level with the City of West Linn's bicycle infrastructure vary as a result of these differences. Technical Memorandum #5 identifies the four levels of traffic stress that a bicyclist can experience on the roadway, ranging from LTS 1 (which represents little traffic stress) to LTS 4 (which represents high stress). Each LTS corresponds to a different bicyclist group, each with their own comfort levels for bicycling in the City. The City should accommodate these user types by providing adequate facilities for the majority of its users. There are multiple bicycle facility types available for the city to construct which appeal to the different user types. For instance, multi-use paths are often favored by less experienced or recreational users (LTS 1 or 2), while bike lanes on major roads tend to be used by commuters and other more experienced users (LTS 3 or 4). This analysis helps identify gaps in the bicycle network that should be prioritized in order to create a more robust network of continuous low stress facilities. The following summarizes the results of the LTS analysis for streets with LTS 3 or higher.

The results of the LTS analysis indicate that there are four street segments at LTS 3 within the City, including most of Parker Road, most of Salamo Drive, a segment of Willamette River Drive, and most of Willamette Drive. Parker Road, Salamo Drive, and Willamette Drive were identified as LTS 3 due to the 6-foot bike lane on a 35 mph roadway. In order to reduce these roadways to LTS 2 or below, the roadway speed could be reduced to 30 mph or lower, or the bike lane could be widened to 7 feet or wider. The bike lane could also be converted to a separated bike path. The segment of Willamette Falls Drive was identified as LTS 3 due to the mixed traffic conditions on a 30 mph roadway with no sharrows. In order to reduce this segment to a LTS 2 or below, the roadway speed could be reduced to 25 mph or lower, or a bike lane could be striped on the roadway.

The results of the LTS analysis also indicate that there are six street segments at LTS 4 within the City, including two segments of Rosemont Road, a segment of Parker Road, a segment of Salamo Drive, a segment of Willamette River Drive, and a segment of Willamette Drive. All of the segments with LTS 4 are mixed traffic roadways with speed limits ranging from 35 to 45 mph. In order to reduce these roadways to LTS 2 or below, the roadway speed could be lowered 5o 30 mph or lower, or a bike lane could be striped on the roadway.

TRANSIT SYSTEM NEEDS

Fixed-Routes

TriMet Lines 35 and 154 provide a basic level of transit service to West Linn. The locations of these routes are convenient for people with access to Willamette Drive and to Willamette Falls Drive, but are not located within a convenient walking distance (typically assumed to be up to one quarter-mile) for the majority of city residents such as those that live in Tanner Basin and neighborhoods along Rosemont Road.

Lines 35 and 154 both provide access to the Oregon City Transit Center. From the Oregon City Transit Center access is provided to six additional bus lines that provide connections to Milwaukie, southeast Portland, and downtown Portland as well as to the Clackamas Town Center and to Canby Transit. The MAX light rail system can be accessed in downtown Portland as well as at Clackamas Town Center to travel around the region including to Portland International Airport.

Line 35 also provides connections to the Lake Oswego Transit Center. From the Lake Oswego Transit Center access is provided to three additional bus lines that provide connections to downtown Portland, the Tigard Transit Center (which connects to the Beaverton to Wilsonville Commuter Rail line), and the Tualatin Park and Ride. To access the Tualatin City Center, Tualatin Transit Center, or Wilsonville, a transfer must be made at the Tualatin Park and Ride. Travel from West Linn to the Tualatin Transit Center requires either a 90 minute trip with one transfer in downtown Portland or a 70-80 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. Provision of 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 35 or more weekday boardings. Ridership data was obtained from TriMet that reflects the average number of boardings and alightings that occurred at each stop in Fall 2014. Based on a review of the data, West Linn has two stops that meet this threshold, but do not currently have shelters. These stops include:

- Stop 6319: Willamette Drive & Hidden Springs Road
- Stop 6339: Willamette Drive & McKillican Road

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.

Transit Level-of-Service Analysis

The transit level-of-service analysis was performed in accordance with the methodology described in TCRP Report 100: Transit Capacity and Quality of Service Manual (TCQSM). Of the six available measures, three were selected for this analysis as being most relevant to a long-range planning effort, including service frequency, hours of service, and service coverage. Table 4 summarizes the TCQSM measures used and the ranges of values used to determine the LOS result for each measure.

Table 4: Transit Capacity and Quality of Service Manual - Level of Service (LOS) Measures

	Transit Capacity and Quality of Service Measures		
Level of Service	Service Frequency (minutes)	Hours of Service	Service Coverage
LOS A	<10	19-24	90.0-100.0%
LOS B	10-14	17-18	80.0-89.9%
LOS C	15-20	14-16	70.0-79.9%
LOS D	21-30	12-13	60.0-69.9%
LOS E	31-60	4-11	50.0-59.9%
LOS F	>60	0-3	<50.0%

It is important to note that high LOS values, such as LOS A or B, may not reflect optimal service from the transit agency's perspective, because the market may not support those service levels. The development of agency service standards helps to bridge the gap between the kind of service passengers would ideally want and the kind of service that is reasonable to provide, given available resources.

Service Frequency

From the user's perspective, service frequency determines how many times an hour a user has access to transit service, assuming that service is provided within acceptable walking distance and at the times the user wishes to travel. Service frequency also measures the convenience of transit service to choice riders and is one component of overall transit trip time. Table 5 summarizes the transit level-of-service analysis results for service frequency.

Table 5: Service Frequency Level-of-Service Analysis – Northwest County

Provider	Routes	Peak/Off-Peak	Service Frequency	LOS
TriMet	Line 35	Peak	20-30 minutes	C-D
	Line 154	Peak	70 minutes	F

As shown, Line 35 currently operates at LOS C-D, while Line 154 operations at LOS F. At LOS C, service frequencies provide a reasonable choice of travel times, but the wait involved if a bus is missed becomes long. At LOS D, service is only available about twice per hour and requires passengers to adjust their routines to fit the transit service provided. At LOS F, service is provided frequencies greater than 1 hour, which entails creative planning or considerable wasted time on the part of passengers.

Hours of Service

Hours of service, also known as "service span," is the number of hours during the day when transit service is provided along a route, a segment of a route, or between two locations. It plays an important a role in determining the availability of transit service to potential users. If transit service is not provided at the time of day a potential passenger needs to take a trip, it does not matter where or how often transit service is provided the rest of the day. Table 6 summarizes the transit level-of-service analysis results for hours of service.

Table 6: Hours of Service Level-of-Service Analysis

Provider	Routes	Hours of Service	LOS
TriMet	Line 35[1]	19 hours	A
TriMet	Line 154[2]	12 hours	D

As shown, Line 35 currently operates at LOS A, while Lone 154 operates at LOS D. At LOS A service is available for most or all of the day. Workers who do not work traditional 8-to-5 jobs receive service and all riders are assured that they will not be stranded until the next morning if a late-evening bus is missed. At LOS D, service meets the needs of commuters who do not have to stay late and still provides service during the middle of the day for others.

Service Coverage

Service Coverage is a measure of the area within walking distance of transit service. Areas must be within 1/4-mile of a bus stop or 1/2 mile of a transit station to be considered an area served by transit. As with the other availability measures, service coverage does not provide a complete picture of transit availability by itself, but when combined with frequency and hours of service, it helps identify the number of opportunities people have to access transit from different locations. Service coverage LOS evaluates the percentage of transit-supportive areas—areas that would typically produce the majority of a system's ridership—that are served by transit.

To qualify as a transit-supportive area (TSA) one of the following thresholds must be met:

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

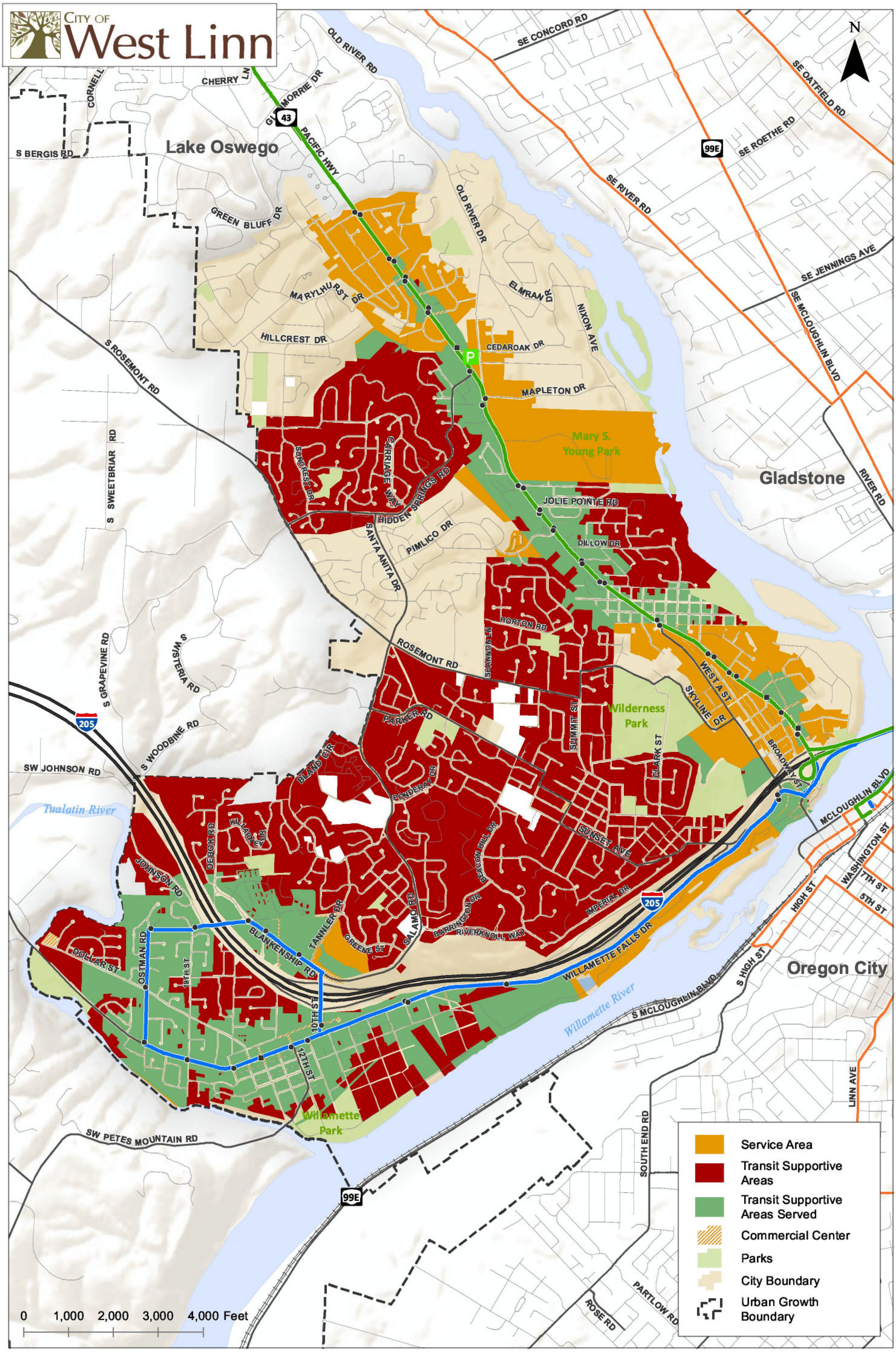
Service coverage is an all-or-nothing issue for transit riders—either service is available for a particular trip or it is not. As a result, there is no direct correlation between service coverage LOS and what a passenger would experience for a given trip. Rather, service coverage LOS reflects the number of potential trip origins and destinations available to potential passengers.

Figure 6 displays the transit level-of-service analysis results for service coverage based on population and employment estimates by Transportation Analysis Zone (TAZ) in the Metro 2010 travel demand model. Areas defined as transit supportive that have service are shown in green. Areas defined as transit supportive that are lacking service are shown in red. Areas that have transit service, but do not qualify as a TSA, are shown in orange. A majority of the areas shown in red would require additional transit routes or the development of new pathway connections to existing transit routes in order to be served.

The percentage of TSA's served in West Linn and the corresponding level of service has been identified using the Transit Level of Service (TLOS) methodology. As shown in Table 7, the percent of transit supportive areas served is less than 50 percent in terms of both households and employment areas. The corresponding LOS is F.

Table 7: Service Coverage Analysis

Area Type	Acres	Population	Households	Employment
Transit Supportive Area (TSA)	2,169	18,663	7,628	3,800
Transit Supportive Areas Served	643	3,995	1,628	3,171
Percent TSA Served by Transit	30%	21%	21%	83%
Level of Service	LOS F	LOS F	LOS F	LOS B
Transit Supportive Areas without service	1,526	14,668	6,000	629



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Year 2010 Transit Supportive Areas
West Linn, Oregon

Figure
6

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: USGS, ESRI, TANA, AND

As shown in Table 7, approximately 6,000 households and 629 jobs are located within areas that do not have transit service. These areas currently have a household and/or employment density that can support transit service and therefore should be included in future efforts to improve service routes and stop locations. TriMet's Southwest region Service Enhancement Plan includes changes to Line 154 to include service along Salamo Road and Hidden Springs Road.

Future Transit Service Coverage

The future transit level-of-service analysis assumes that existing service and service coverage is the same in the future. The only difference is the population and employment growth assumptions included in the 2040 regional traffic model and the resulting transit supportive areas. Figure 7 displays the transit level-of-service analysis results for service coverage. As shown, one additional transit supportive area (located north of Hidden Springs Road) is anticipated in the future. Additional service routes are needed in order to provide service to this area.

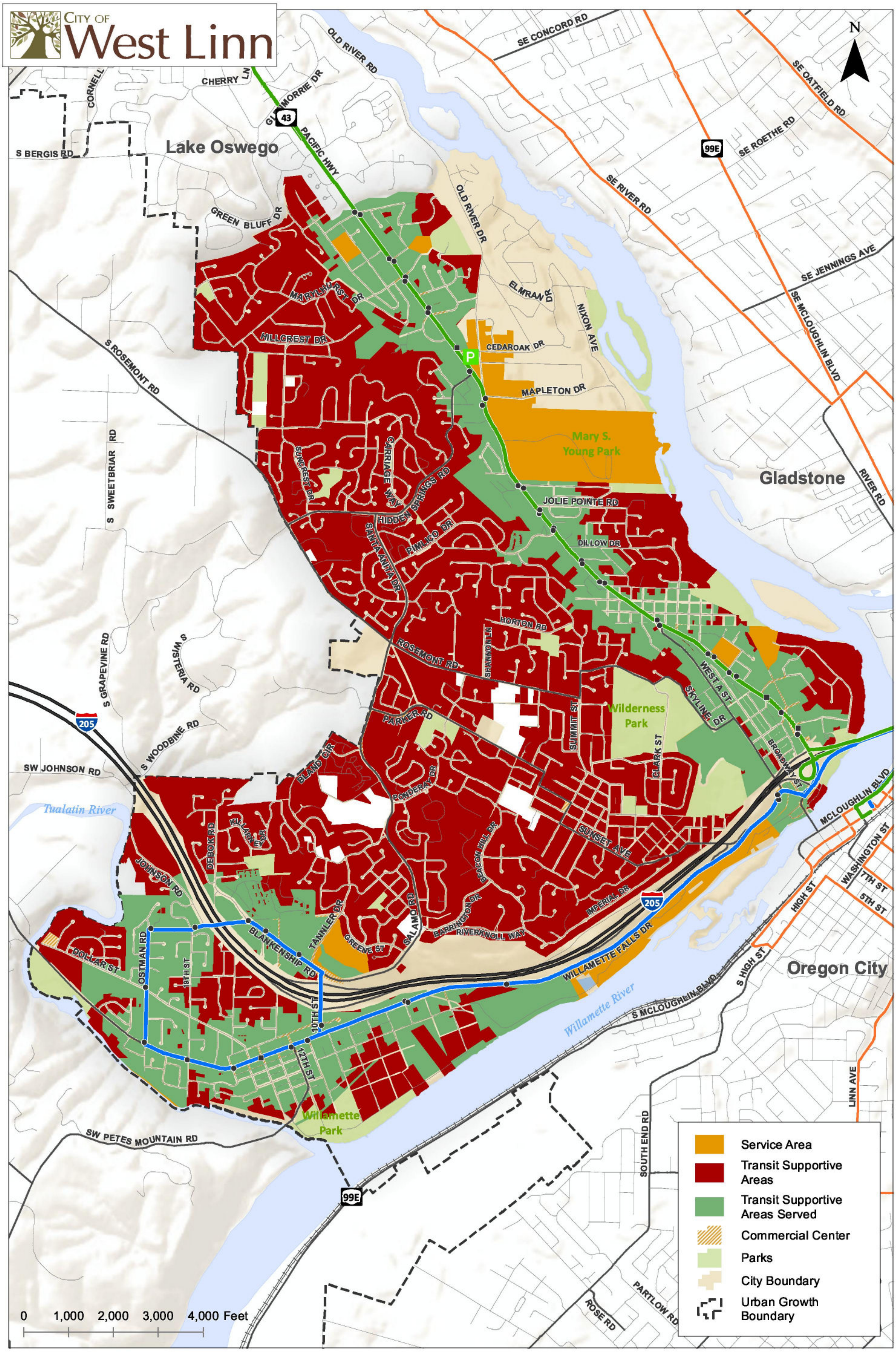
As noted above, TriMet's Southwest region Service Enhancement Plan includes changes to Line 154 to include service along Salamo Road and Hidden Springs Road. This change is proposed to eliminate Line 154's connection to the Oregon City Transit Center. Passengers on Line 154 would need to transfer to Line 35 on Willamette Drive to travel south to the Oregon City Transit Center or north to the Lake Oswego Transit 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 as well as the region's long-term transportation and livability goals. The TIP process helps local governments to 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 visions 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:



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Year 2040 Transit Suppoprtive Areas
West Linn, Oregon

Figure
7

- 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 neighborhood in West Linn as well as several essential destinations, including City Hall, the Adult Community Center, and the retail/commercial center located in the southwest corner of the Salamo Road/Parker Road intersection but would require a transfer to Line 35 to get to Oregon City. According to the hierarchy, local service expansion routes in West Linn receive the lowest priority for regional transit funds. However, local transit needs could be met through alternatives to fixed route expansion such as local shuttle services, vanpools, or the phasing of 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 Concept. The location of any final HCT corridor is decided 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 planned.

Transportation Disadvantaged

The primary transportation disadvantaged populations in West Linn are those too old or too young to drive. Therefore, access to schools and other essential destinations should be prioritized to serve these populations. As the population continues to age, the needs of the elderly and disabled are expected 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 two lines- the Green Line to Oregon City and the Blue Line to

Lake Oswego. The Green Line travels through West Linn along Willamette Drive between Mary's Woods and Oregon City, though there are no official stops aside from the occasional drop-off at key locations like supermarkets. 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 the 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.

MOTOR VEHICLE SYSTEM NEEDS

System Connectivity

A well-connected motor vehicle system minimizes the need for out-of-direction travel while supporting an 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 are intended to provide general mobility for travel within the region as well as connect major commercial, residential, industrial, and institutional centers. Arterials are usually spaced about 1-mile apart and are designed to accommodate motor vehicle and truck traffic as well as pedestrians, bicyclists, and transit riders. Figure 8 illustrates the needs associated with the arterials street system within West Linn.

As shown in Figure 8, few of the arterials streets meet the RTP's arterial spacing guidelines. Also, there appears to be the need for an additional arterial that connects Rosemont Road to Willamette Drive approximately 1-mile north of Hidden Springs Road and an additional arterial that connects West Linn to rural Clackamas County approximately 1-mile west of Rosemont Road – this potential arterial could follow existing segments of Blankenship Road and Johnson Road as shown in Figure 8. The other potential arterial, however, would have significant right-of-way and development costs as well as impacts to existing developments and the natural environment. Given the significant constraints associated with this connection, the TSP update 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 1/2 mile for collectors in order to encourage local traffic to use them instead of higher order facilities. Figure 8 illustrates the existing deficiencies in the collector street system.

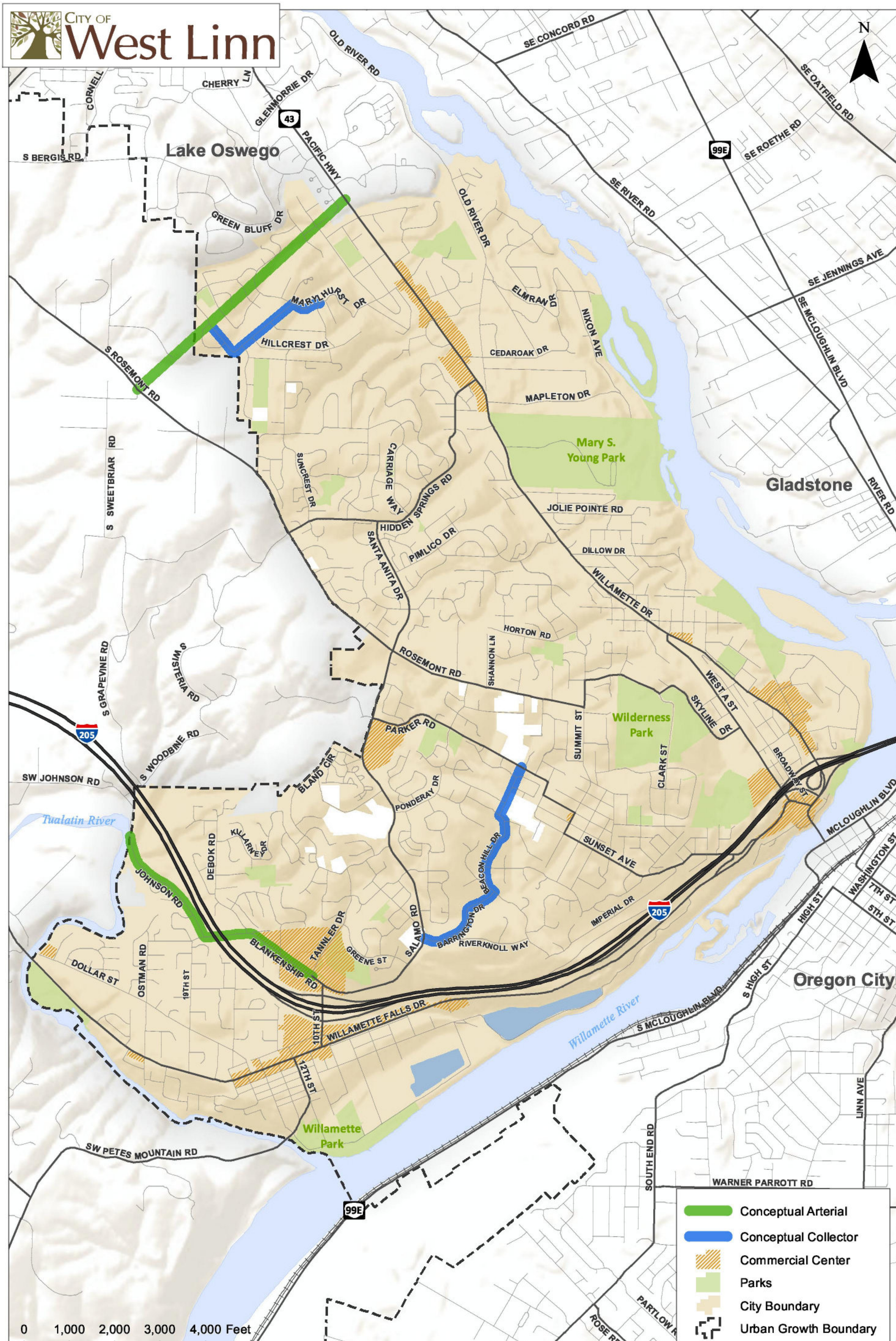
As shown in Figure 8, few of the collector streets meet the RTP's collector spacing guidelines. Also, there appears to be the need for an additional collector that extends north from Marylhurst Drive to the new arterial connection described above – this potential connection could follow existing segments of Marylhurst Drive – and one that connects Salamo Road to Parker Road – this potential connection could follow 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) can be reduced, accessibility between various travel modes can be enhanced and traffic levels can be balanced among various streets. Additionally, public safety response time can be reduced.

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

The local street connectivity needs are shown in Figure 9. In most cases, the improvements would involve the changing of a streets functional classification from local street to neighborhood route. In limited cases, a short length of new road would be necessary for improved connectivity. The arrows on Figure 9 represent recommended connections and the general direction for the placement of the connection in existing configurations. In each case, the specific alignments and design may be modified dependent upon future development review.



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Arterial and Collector Street Connectivity
West Linn, Oregon

Figure
8

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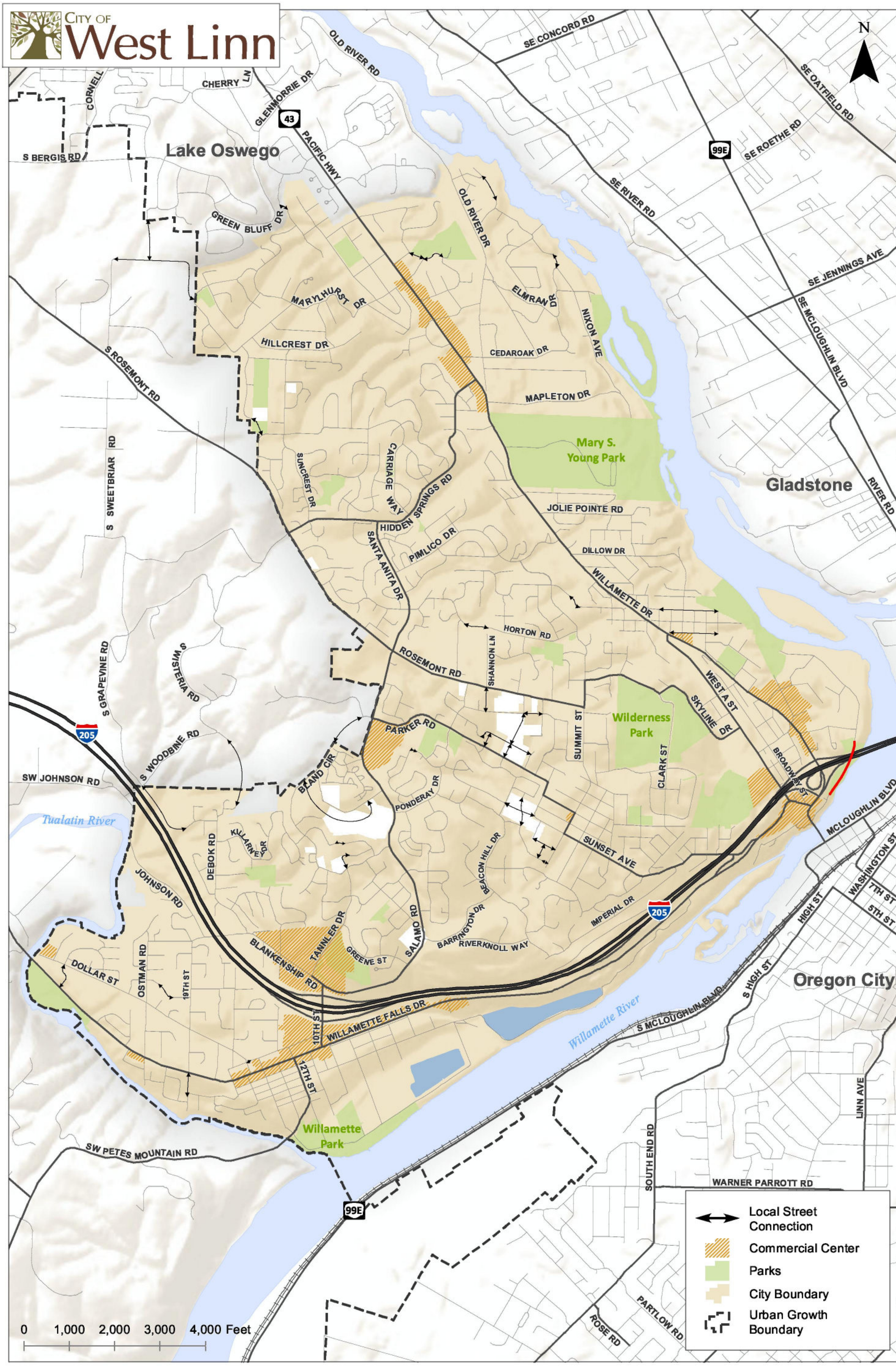
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Sources: City of West Linn, Metro Data Resource Center
Terrain Sources: USGS, ESRI, TANA, AND



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Local Street Connectivity
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: USGS, ESRI, TANA, AND

The criteria for providing local connections are based on the Metro RTP requirements for new residential or mixed-use developments.

- Every 330 feet, a grid for pedestrians and bicycles (may include paved roadway or trails)
- Every 530 feet, a grid for automobiles (local street or higher classification)

The arrows shown on Figure 9 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 connections from any cul-de-sac should be considered mandatory as future development and redevelopment occurs. The goal is to continue to improve connectivity for all modes of transportation. As new development occurs, the opportunities identified in Figure 9 should be considered to create a more efficient network consistent with the RTP guidelines. It should be noted that the primary constraint associated with each of the opportunities shown in Figure 9 is that they are located on private property and will likely only occur as part of new development.

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 update. 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 TSP update 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 (2040) traffic conditions. Based on the analysis, motorists are expected to experience high levels of congestion and delay at these intersections without additional improvements to the existing transportation system. The results of the analysis are summarized in Table 8 and Figure 10.

Traffic Signal Warrants

Traffic signal warrants were conducted as part of the 2008 TSP update for the unsignalized study intersections that were not expected to meet operational standards in the 2040 base case. The intersections that were found to meet the traffic volume warrant for signalization under existing (2015) and base case (2040) are listed in Table 9. 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 warrant would result in shorter spacing. A detailed traffic engineering evaluation must be conducted to evaluate site conditions, signal spacing, and all warrants before the installation of any traffic signal. ODOT signal design and signal phasing guidelines should be followed for all new traffic signal installations. ODOT typically requires an 8-hour warrant to be met. ODOT also requires other improvements, such as channelization to be considered prior to installing a signal.

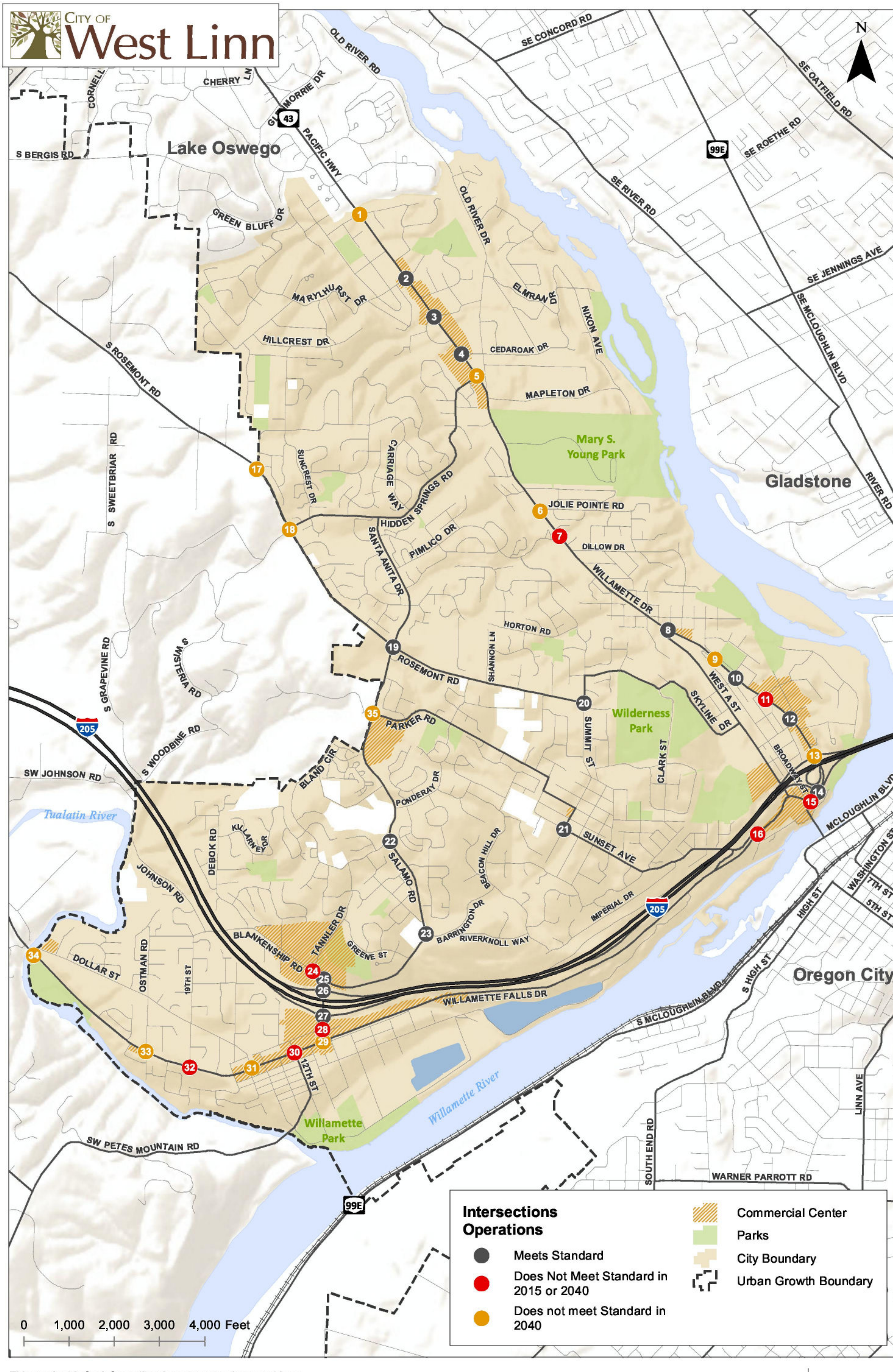
Table 8: Weekday PM Peak Hour Intersection Level of Service

Map ID	Intersection	Existing (2015)[1]			Future Base Case (2040)[1]			Mobility Standard		
		LOS	Average Delay (Sec)	Volume/ Capacity (v/c)	LOS	Average Delay (Sec)	Volume/ Capacity (v/c)	Agency	Minimum	Standard Met?
Signalized Intersections										
2	Highway 43/Marylhurst Drive-Lazy River Drive	B	16.3	0.8	C	26.7	0.94	ODOT	v/c 0.99	Yes
4	Highway 43/Cedaroak Drive	B	10.4	0.65	B	18.3	0.82	ODOT	v/c 0.99	Yes
5	Highway 43/Hidden Springs Road	C	25	0.83	D	42.8	1	ODOT	v/c 0.99	No
8	Highway 43/West A Street	B	12.5	0.74	C	31.1	0.97	ODOT	v/c 1.1	Yes
12	Highway 43/Hood Street-McKillican Street	C	23.6	0.76	E	62.7	1.07	ODOT	v/c 1.1	Yes
13	Highway 43/I-205 SB Ramp	C	26.5	0.85	E	69.1	>1.0	ODOT	v/c 0.85	No
14	Highway 43/I-205 NB Ramp	A	8	0.3	B	10.2	0.41	ODOT	v/c 0.85	Yes
19	Salamo Road/Rosemont Road[2]								LOS D	
25	10th Street/Blankenship-Salamo Road	B	18.2	0.53	C	21.50	0.59	ODOT	v/c 0.85	Yes
26	10th Street/I-205 SB Ramp	C	30.9	0.53	D	36.3	0.65	ODOT	v/c 0.85	Yes
27	10th Street/I-205 NB Ramp	B	13.6	0.53	B	18.6	0.63	ODOT	v/c 0.85	Yes
All-Way Stop Controlled Intersections										
20	Rosemont Road/Summit Street	A	9.2	0.37	B	12.2	0.57	City	LOS D	Yes
21	Sunset Avenue/Cornwall Street	A	7.6	0.15	A	7.8	0.16	City	LOS D	Yes
29	Willamette Falls Drive/10th Street	D	29.7	0.84	F	>80.0	>1.0	City	LOS D	No
Unsignalized Intersections										
1	Highway 43/Arbor Drive	B/F	>50.0	0.03/0.37	B/F	>50.0	0.04/>1.0	ODOT	v/c 0.99	No
3	Highway 43/Walling Way	B/E	42.2	0.04/0.21	B/F	>50.0	0.00/0.92	ODOT	v/c 0.99	Yes
6	Highway 43/Jolie Pointe Road	A/E	47.3	0.03/0.22	B/F	>50.0	0.12/>1.0	ODOT	v/c 0.99	No
7	Highway 43/Pimlico Drive	B/F	>50.0	0.16/>1.0	C/F	>50.0	0.37/>1.0	ODOT	v/c 0.99	No
9	Highway 43/Holmes Street	B/F	>50.0	0.02/0.65	B/F	>50.0	0.03/>1.0	ODOT	v/c 0.99	No
10	Highway 43/Lewis Street	B/E	40	0.01/0.15	B/F	>50.0	0.01/0.54	ODOT	v/c 0.99	Yes
11	Highway 43/Burns Street	B/F	>50.0	0.23/>1.0	D/F	>50.0	0.49/>1.0	ODOT	v/c 1.1	No
15	Highway 43/Willamette Falls Drive	A/F	>50.0	0.21/>1.0	D/F	>50.0	0.77/>1.0	ODOT	v/c 0.99	No
16	Willamette Falls Drive/Sunset Avenue	A/B	13.6	0.29/0.31	A/E	47.6	0.67/0.74	City	LOS D	No
17	Rosemont Road/Carriage Way	A/C	21.9	0.09/0.21	A/F	>50.0	0.12/0.51	City	LOS D	No
18	Rosemont Road/Hidden Springs Road	A/C	18.6	0.10/0.14	B/F	>50.0	0.07/>1.0	City	LOS D	No
22	Salamo Road/Bland Circle	A/B	38.3	0.00/0.09	A/D	34.6	0.02/0.60	City	LOS D	Yes

23	Salamo Road/Barrington Drive	A/C	15.8	0.04/0.20	A/C	21.8	0.05/0.93	City	LOS D	Yes
35	Salamo Road/Parker Road	A/C	17.0	0.05/0.13	A/F	>50.0	0.13/0.79	City	LOS D	No
24	Blankenship Road/Tannler Drive	A/F	>50.0	0.13/0.52	B/F	>50.0	0.19/>1.0	City	LOS D	No
28	10th Street/8th Avenue	A/F	>50.0	0.13/>1.0	B/F	>50.0	0.18/>1.0	ODOT	v/c 0.99	No
30	Willamette Falls Drive/12th Street	A/C	22.7	0.17/0.23	B/F	>50.0	0.44/>1.0	City	LOS D	No
31	Willamette Falls Drive/Dollar Street (East)	A/C	20.6	0.01/0.21	A/F	>50.0	0.15/0.74	City	LOS D	No
32	Willamette Falls Drive/19th Street	A/B	13.0	0.01/0.04	A/C	17.6	0.01/0.06	City	LOS D	Yes
33	Willamette Falls Drive/Ostman Road	A/C	23.6	0.03/0.06	B/F	>50.0	0.01/0.23	City	LOS D	No
34	Willamette Falls Drive/Dollar Street (West)	A/B	12.1	0.03/0.07	A/F	>50.0	0.13/0.71	City	LOS D	No

1. As described in the existing conditions memo, 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 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.
2. A traffic signal was recently installed at the Salamo Road/Rosemont Road intersection, and therefore the intersection operations from the 2008 TSP are no longer current.

Notes:
LOS = Level of Service
Delay = Average vehicle delay in the peak hour for entire intersection in seconds.
MOE = Measure of Effectiveness



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Intersection Operations - Weekday PM Peak Hour
West Linn, Oregon

Figure
10

H:\proj\file\17817 - West Linn Transportation System Plan\gis\TM7\10 Motor Vehicle Needs.mxd - mbell - 5:53 PM 5/21/2015

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: USGS, ESRI, TANA, AND

Table 9: 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

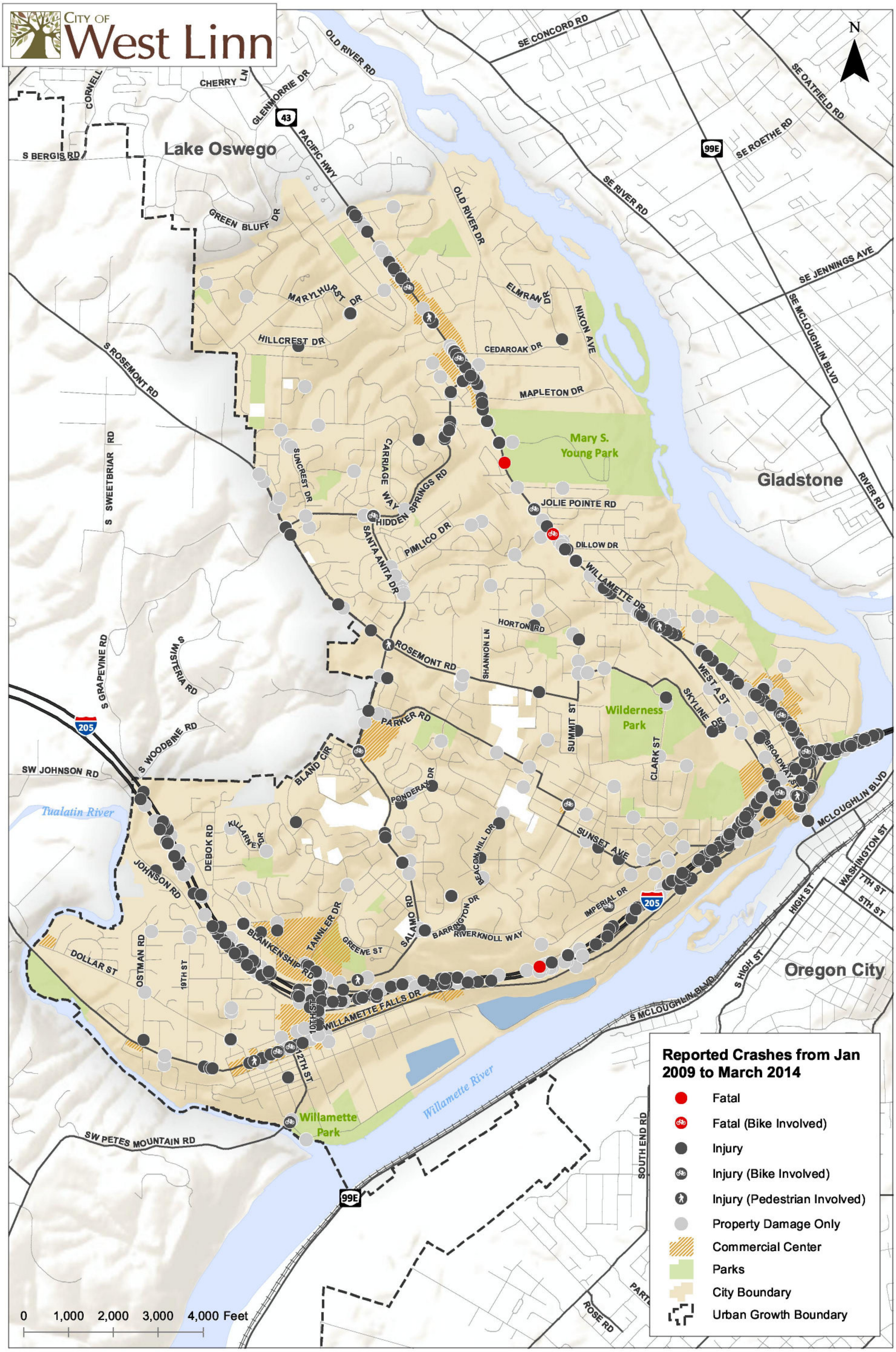
1. As described in the existing conditions memo, traffic volumes within West Linn are generally lower today than they were in 2006 and are projected to be lower in 2040 than they were projected to be 2030. Therefore, use of the existing and projected future traffic volumes from the 2008 TSP to evaluate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

Highway 43

As described throughout this memorandum, Highway 43 has a number of transportation-related issues, including a general lack of pedestrian, bicycle, and transit facilities and several intersections and roadway segments that currently operate at or below their respective operating standards. The Highway 43 Conceptual Design Plan, developed by the City of West Linn in coordination with ODOT as part of the 200 TSP update, identifies the needs, deficiencies, and solutions for the portion of Highway 43 between the north City limits and McMillican Street that are assumed for the TSP update, such as pedestrian crossings, street trees, landscaping, transit stops, and lighting to better support the needs of all roadway users as well as adjacent land uses.

Safety

The analysis in the Tech Memo 5: Existing Conditions revealed that there are currently no major safety issues at any of the intersections studied for this TSP. Figure 11 shows the locations of the crashes in West Linn over a five-year period from 2009 to 2013. ODOT uses the safety priority index system (SPIS) to prioritize safety improvements based on crash frequency and severity on state facilities. A potential southbound climbing lane for trucks traveling on I-205 out of West Linn is the only location in West Linn identified in the Top 5% Report. No locations along Willamette Drive were listed.



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Crashes
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, ODOT
Terrain Sources: USGS, ESRI, TANA, AND

There were a total of 19 crashes involving pedestrians and/or bicyclists over the five year period, 5 involved pedestrians and 14 involved bicyclists. One resulted in a fatal crash. The pedestrian and bicycle crash locations are denoted with pedestrian and bicycle symbols in Figure 11.

- Six of the 19 crashes occurred along Willamette Drive
- One of the 19 crashes occurred at a I-205 ramp
- Five of the 19 crashes occurred along Willamette Falls Drive
- Seven of the 19 crashes occurred at various other intersections in the City

There were a total of three fatal crashes that occurred over the five year period. Two occurred along Willamette Drive and one occurred along I-205. The fatal crash locations are denoted in red in Figure 11.

- One occurred at the intersection of Willamette Drive and Pimlico Drive and involved a bicyclist.
- One occurred as a vehicle hit a pole along Willamette Drive just south of the entrance to Mary S. Young Park, and was alcohol-related.
- One occurred as a vehicle hit the median along I-205 while speeding and changing lanes, and was alcohol-related.

While the last two fatal crashes were alcohol-related and more challenging to propose infrastructure safety improvements, the crash that occurred at Pimlico Drive and involved the bicyclist may warrant additional investigation. The vehicle approached the intersection eastbound on Pimlico Drive and it is possible that a combination of vertical and horizontal curves provided insufficient sight distance for the vehicle to slow down enough before seeing the bicyclist along Willamette Drive. There may also be consideration for placing sidewalks at this intersection. There is currently no sidewalk on any leg of the three-legged intersection and with bus stops on both sides of Willamette Drive, this location could benefit from improved pedestrian facilities.

Critical crash rates (CCRs) were calculated for each of the study intersections following the analysis methodology presented in ODOT's *SPR 667 Assessment of Statewide Intersection Safety Performance*. SPR 667 provided average crash rates at a variety of intersection configurations in Oregon based on the number of approaches and traffic control types. The average crash rate represents the approximate number of crashes that are "expected" at a study intersection. Additionally, this average crash rate was used to calculate the critical crash rate for each study intersection, based on the *Highway Safety Manual* methodology. The critical crash rate is calculated for each intersection based on the average crash rate for each facility and serves as a threshold for further analysis.

Table 10 summarizes the critical crash rate for each intersection and compares those values to the observed crash rate. Per ODOT, if the observed crash rate at the study location exceeds the critical rate, it is a possible indication that the location is exceeding average crash rates. The data used by ODOT in establishing the critical crash rates excluded interstate highway on-ramps and off-ramps, as well as local streets, and as such the critical crash rates were not calculated for six of the safety study intersections.

Table 10: Critical Crash Rates

Location	Total Crashes	PM Peak TEV	Critical Crash Rate		Observed Crash Rate	Observed Crash Rate > CCR?
			By Intersection	By Volume		
Willamette Drive/Cedar Oak Drive	4	1,955	0.43	0.44	0.11	No
Willamette DriveHidden Springs Road	9	2,080	0.43	1.06	0.24	No
Willamette DriveI-205 SB Ramps	13	2,120	-	-	0.34	-
Willamette Falls Drive/10th Street	4	1,545	0.26	0.46	0.14	No
10th Street/8th Avenue-Court	12	1,375	-	-	0.48	-
10th Street/Blankenship Road	1	1,715	0.45	0.45	0.03	No
10th Street/I-205 NB Ramps	5	1,700	-	-	0.16	-
10th Street/I-205 SB Ramps	3	1,775	-	-	0.09	-
Blankenship Road/Tannler Drive	5	1,190	-	-	0.23	-
Willamette Drive/I-205 NB Ramps	5	1,795	-	-	0.15	-
Willamette Drive/Willamette Falls Drive	5	1,975	0.24	0.44	0.14	No

As shown in Table 10, none of the observed crash rates exceed the critical crash rate. Based on the analysis presented herein, no safety-related mitigation measures are recommended. There are, however, several strategies for improving safety in the City of West Linn that are consistent with the 2008 TSP. These strategies are aimed at identifying priorities that meet the goals and policies of the city and should be carried forward with this TSP.

- Work with other agencies such as Clackamas County, ODOT, the school district, as well as local businesses and neighborhood groups to help prioritize and fund safety programs in a coordinated approach
- Develop a citywide safety priority system which identifies high accident locations, ranks the locations and identifies safety mitigation measures
- Consider installation of red light photo equipment where appropriate
- Provide safe crossings for pedestrians and bicyclists, particularly near key destinations such as schools and commercial areas. Locations for potential intersection improvements are listed in the Pedestrian Needs and Bicycle Needs sections of this memorandum.
- Address safety issues on an as needed basis

Freight Needs

Freight movement within the City of West Linn consists of 1) the delivery of goods to commercial sites along Willamette Drive, 2) freight movement associated with the West Linn Paper plant, and 3) commercial freight traffic going through West Linn to other destinations on I-205 and Willamette Drive. 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 Willamette Drive/I-205 interchange. The RTP identifies the segment of I-205 that travel through West Linn as a Main Roadway Route, which is intended to connect major activity centers in the region to other areas in Oregon or the United States, Mexico, and Canada. Within Oregon, these routes include I-5, I-84, I-205, US 26, Hwy 217, 99E, and 99W. The RTP identifies five policies to serve as the foundation for the regional freight network, including 1) Use a system approach to plan for and manage the freight network, 2) Reduce delay and increase reliability, 3) Protect industrial lands and freight transportation investments, 4) Look beyond the roadway network to address critical marine and rail needs, and 5) Pursue clean, green and smart technologies and practices.

OTHER TRAVEL MODE NEEDS

There are no other modes of transportation within West Linn, with the exception of the Tualatin and Willamette Rivers, which are primarily used for recreation. All major rail, air, and natural gas pipelines are located north and south of West Linn in neighboring cities.

Rail

There are no railroads located within the City of West Linn. The closest railroads include the Union Pacific Railroad located in Lake Oswego and the Southern Pacific Railroad located in Oregon City. The closest passenger rail service is provided by AMTRAK, with stops in Oregon City (ORC) 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.

The Oregon Department of Transportation 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 alternatives include one route that follows the I-205 corridor through West Linn and the other route that follows the 99E corridor through Oregon City.

Travel time to Union Station on existing transit service can be long for the West Linn resident. If/when the new passenger rail service becomes a reality, West Linn residents will need access to the service by all appropriate travel modes.

Air

There are no airports located within the City of West Linn. Domestic and international air passenger service is provided at the Portland International Airport. The General Aviation Airport in Aurora also serves the needs of West Linn residents. Some of the local airports open to the public for private aircraft in the area include Happy Valley, Oregon City, Mulino and Canby. 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 30 minutes by vehicle (depending on traffic) or 90 minutes by public transit with a transfer in downtown Portland to the MAX Red Line.

Water

West Linn lies along the west side of the Willamette River. The Willamette Falls Locks, operated by the U.S. Army Corps of Engineers, 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.

The locks and river do not currently provide transportation alternatives to West Linn residents. However, the potential for river taxis and ferries should be examined in the future.

Pipeline

There are no pipelines transporting commodities in West Linn except 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.

There are currently no needs associated with pipelines.

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MEMORANDUM

Date: June 30, 2015 Project #: 17817.3

To: Zach Pelz, City of West Linn
Gail Curtis, Oregon Department of Transportation

From: Susan Wright, P.E. and Matthew Bell, Kittelson & Associates, Inc.

Project: West Linn Transportation System Plan (TSP) Update

Subject: Final Technical Memorandum 8: 10th Street Interchange Area Analysis and Recommendations

This memorandum documents existing and projected future traffic conditions along the segment of 10th Street located between Blankenship-Salamo Road and Willamette Falls Drive in West Linn, Oregon. The information presented in this memorandum is based on a review of previous planning documents, including the City's current Transportation System Plan (2008 TSP - Reference 1), the 10th Street Willamette Falls Drive Intersection Traffic Control Study (10th Street Study - Reference 2); year 2040 traffic volume projections provided by Metro's travel demand model, and; an evaluation of recent traffic counts and field data collected along 10th Street as part of the ongoing West Linn TSP update.

The data shows that traffic volumes along 10th Street are lower today than they were in 2008 and they are projected to be lower in 2040 than previously projected for 2030 based on Metro's most recent travel demand model. As a result, vehicle improvements identified in the 2008 TSP and the 10th Street Study should be modified to meet current 2040 land-use and travel demand projections. This is consistent with findings in the recent Clackamas County TSP Update which also found lower traffic volume forecasts.

As described below, the types of improvements needed to meet current projections include widening along the 10th Street corridor, which could include retaining walls and/or modifications to the I-205 bridge footings, and modifications at each of the study intersections. Full reconstruction of the interchange as a Single Point Urban Interchange (SPUI) or some other alternative interchange form is not projected to be needed based on current 2040 projections. However, given the significant difference in the traffic volume projections used in the 2008 TSP and the 10th Street Study and those used in this analysis, several alternative interchange forms are evaluated in this memorandum at a qualitative level to provide the city and the Oregon Department of Transportation (ODOT) with a variety of potential long-term solutions to accommodate higher traffic volumes.

Additional information about the study methodology, findings, and recommendations is provided below.

STUDY AREA

The study area and intersections included in this analysis were selected based on community needs and direction provided by City and ODOT staff in the scope of work for the West Linn TSP update. Figure 1 illustrates the study area. As shown, the study area consists of the segment of 10th Street from Blankenship-Salamo Road to Willamette Falls Drive with the following study intersections:

- 10th Street/Blankenship-Salamo Road
- 10th Street/I-205 Southbound (SB) Ramps
- 10th Street/I-205 Northbound (NB) Ramps
- 10th Street/8th Avenue-Court
- 10th street/Willamette Falls Drive
- Tannler Drive/Blankenship Road
- 12th Street/Willamette Falls Drive

ANALYSIS YEARS AND TIME PERIODS

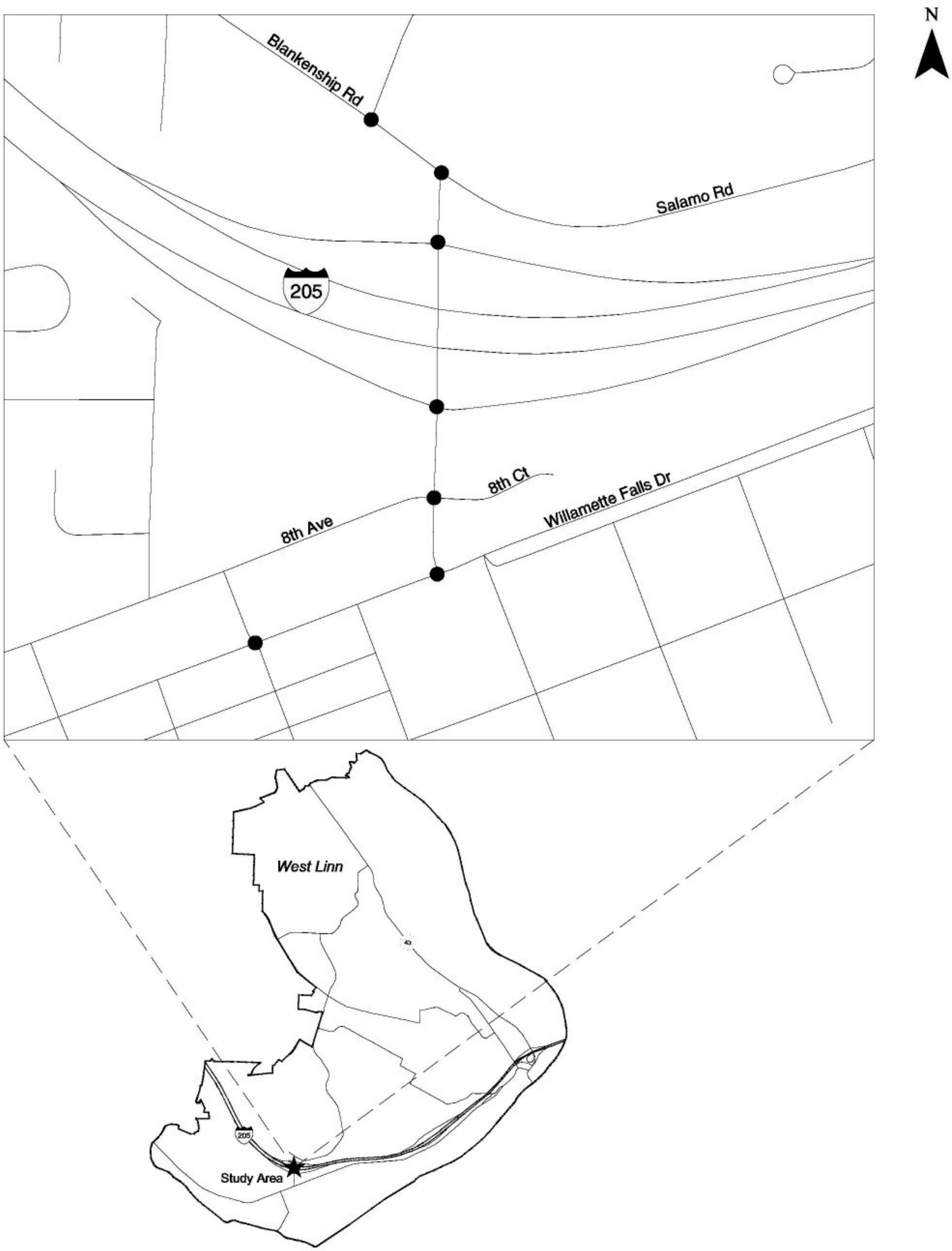
Traffic operations at the study intersections were analyzed during the weekday p.m. peak hour under year 2014 and year 2040 traffic conditions, which is consistent with the future traffic volume projections included in Metro's regional travel demand model.

PERFORMANCE MEASURES AND OPERATING STANDARDS

Two performance measures were used to evaluate traffic operations at the study intersections, including level-of-service (LOS) and volume-to-capacity (v/c). A brief description of each performance measure is provided below:

- *Level-of-service* (LOS) ranks intersections from "A" to "F" based on the average control delay experienced by motorists. LOS "A" reflects relatively low vehicle delay times (10 seconds or less) while LOS "F" reflects relatively high vehicle delay times (over 50 seconds at unsignalized and over 80 seconds at signalized intersections), which is considered unacceptable to most motorists.
- *Volume-to-capacity* (v/c) is a ratio that compares the volume of traffic at a particular movement/approach to the theoretical capacity of that movement/approach to accommodate traffic. A v/c ratio of 1.0 indicates a movement/approach that is operating at capacity. A v/c ratio over 1.0 indicates that the capacity of the movement/approach has been (or will be) exceeded.

The 10th Street/Willamette Falls Drive, Tannler Road/Blankenship Road, and 12th street/Willamette Falls Drive intersections are controlled by the City of West Linn. The City requires all signalized and unsignalized intersections to maintain LOS D or better during peak time periods. The remaining study intersections are controlled by ODOT. Per Policy 1F of the Oregon Highway Plan (OHP – Reference 3), ODOT requires all ramp terminals to maintain a v/c ratio of 0.85 or up to 0.90 in the Metro area if the queuing does not encroach on the deceleration portion of the ramp and all signalized and unsignalized intersections to maintain a v/c ration of 0.99 during peak time periods.



● - Study Intersections

Study Area
West Linn, OR

Figure
1

TRAFFIC ANALYSIS METHODOLOGY

All LOS and v/c analyses described in this report were performed in accordance with the procedures stated in the *2000 Highway Capacity Manual* (HCM – Reference 4). In order to ensure that the analyses were based on reasonable worst-case scenarios, the peak 15-minute flow rates that occurred during the weekday p.m. peak hour were used in the evaluation of all intersections. For this reason, the analyses reflect conditions that are only likely to occur for 15 minutes out of each average peak hour. The transportation system will likely operate under conditions better than those described in this report during all other time periods. The analyses were performed using Synchro 7 modeling software, which implements the methods outlined in the 2000 HCM.

BACKGROUND

The 2008 TSP and the 10th Street Study provide recommendations for improvements to the pedestrian, bicycle, transit, and motor vehicle systems within the study area as described below.

West Linn Transportation System Plan

The 2008 TSP provides a general policy framework regarding transportation services, as well as a number of recommendations for improvements to the pedestrian, bicycle, transit and motor vehicle systems. The following provides a summary of the recommended improvements that are expected to improve traffic flow along 10th Street and increase access for all travel modes. None of these recommended improvements have been completed to date.

Pedestrian Recommendations

- Provide sidewalks on the east side of 10th Street from I-205 to 8th Avenue-Court
- Provide sidewalks on the east side of 10th Street from Blankenship Road to I-205
- Provide sidewalks on both sides of Salamo Drive from 10th Street to 330-feet south of Bland Circle
- Provide sidewalks on both sides of Willamette Falls Drive from 6th Street to 10th Street

Bicycle Recommendations

- Provide on-street bike lanes on Salamo Road from 10th Street to Barrington Drive
- Provide on-street bike lanes on 10th Street from Salamo Road to Willamette Falls Drive

Transit Recommendations

While there are no specific transit improvements identified for the 10th Street corridor, many of the planned improvements will impact transit access and circulation, such as:

- Improve service coordination for Route 154

- Provide Transit amenities at major transit stops
- Improve pedestrian connections to transit facilities
- Decrease headways
- Provide more local service

Motor Vehicle Recommendations

- Widen 10th Street from I-205 SB Ramps to 8th Avenue-Court to five-lane section with center turn lane and two travel lanes in each direction
- Add two through lanes on 10th Street from 8th Avenue-Court to Willamette Falls Drive for a total of two lanes in each direction. Prohibit northbound left turn movement and replaces left turn lane with pedestrian island
- Add a second east bound right turn lane at the 10th Street/Blankenship Road intersection and restripe the westbound approach to have exclusive left-turn and shared left-thru lane
- Change/upgrade the traffic control at the 10th Street/Willamette Falls Drive intersection to either signal or roundabout
  - further evaluation of this recommendation was a conducted as part of the 10th Street Study as described below
- Add right-in/right-out access at the 10th Street/8th Avenue-Court intersection at the time of the 8th Court extension
- Add turns lanes at the 10th Street/I-205 NB Ramps, including northbound right turn lane, stripe southbound approach to have dual left turn lanes and one thru lane, add an exclusive NB off-ramp left turn lane, and widen NB on-ramp to have two receiving lanes to support dual SB left turn movement
- Extend 8th Court to Willamette Falls Drive to provide additional access to 8th Court retail (concurrently restrict access to the 10th Street/8th Avenue-Court intersection to right-in/right-out)
- Construct a long-term interchange improvement (SPUI or Split Diamond) at the 1-205/10th Street interchange to accommodate projected future demand

10th Street at Willamette Falls Drive Intersection Traffic Control Study

The 10th Street Study evaluates three potential alternatives to improve traffic operations at the 10th Street/Willamette Falls Drive intersection. Two of the alternatives include a traffic signal at the intersection and one includes a single-lane roundabout. All three alternatives include near-term and long-term access restrictions at the 10th Street/8th Avenue-Court intersection that are tied to the 8th Court Extension project identified in the 2008 TSP. Given the potential for coordination along the corridor, the traffic signal alternative with dual east-bound left-turn lanes (Alternative 2) was selected as the preferred alternative. The following provides a summary of the recommended improvements that are expected to improve traffic flow along 10th Street. No specific recommendations for improvements to the pedestrian, bicycle, or transit systems were provided in the 10th Street Study.

Motor Vehicle Recommendations

- Install a traffic signal at the 10th Street/Willamette Falls Drive intersection when warranted.
- Install dual eastbound left-turn lanes at the 10th Street/Willamette Falls Drive intersection
  - The additional left-turn lane would require an additional receiving lane on 10th Street and modifications along the south side of Willamette Falls Drive.
- Short-term Access Restriction – install a raised island at the west leg of the 10th Street/8th Avenue-Court intersection that restricts eastbound left, eastbound through, northbound left and westbound through movements.
- Mid-Term Access Restriction (Right-in/Right-out/Left-in) – install raised median island at the 10th Street/8th Avenue-Court intersection to restrict eastbound left, eastbound through, westbound left, westbound through, and northbound left movements.
  - As indicated in the 2008 TSP, extension of 8th Court to Willamette Falls Drive is necessary to restrict the westbound left-turn movement.
- Long-Term Access Restriction (Full Median) – install a raised median island at the 10th Street/8th Avenue-Court intersection to restrict the eastbound and westbound approaches to right-in/right-out only.

EXISTING CONDITIONS

The existing pedestrian, bicycle, and transit facilities located along 10th Street were evaluated along with motor vehicle facilities in order to identify potential improvements to these facilities as well as to establish a baseline for future conditions. Kittelson & Associates, Inc. (KAI) staff visited and inventoried the study area in January 2015. At that time, KAI collected information regarding existing traffic operations and transportation facilities.

Pedestrian Facilities

Continuous sidewalks are currently provided along the west side of 10th Street from Blankenship-Salamo Road to Willamette Falls Drive. The sidewalk located between the I-205 SB Ramps and 8th Avenue-Court is adjacent to the curb (i.e. curb tight with no landscape buffer between the road and the sidewalk) while the sidewalk north of the I-205 SB ramp and south of 8th Avenue-Court has landscape buffers. There is no sidewalk on the east side of 10th Street north of 8th Avenue-Court. There is sidewalk on the east side from 8th Avenue-Court to Willamette Falls Drive; however, it is not accessible per the American's with Disability Act (ADA) and there is a shoulder where pedestrians can walk and locations at each corner where they can wait to cross the street.

There are marked pedestrian crossings at each of the major intersections located on 10th Street. The crossings at the Blankenship-Salamo Road, I-205 SB Ramp, and I-205 NB Ramp intersections are signalized with pedestrian actuation. The crossings at the north leg of the I-205 SB Ramp and I-205 NB Ramp intersections are closed. Pedestrian crossing volumes were obtained at the intersections in April 2014 during the weekday evening peak period (4:00 to 6:00 p.m.). The following provides a summary of pedestrian activity at the study intersections during the weekday evening peak hour:

Intersection	North	South	East	West	Total
10th Street/Blankenship-Salamo Road	0	0	0	0	0
10th Street/I-205 Southbound (SB) Ramps	0	0	0	0	0
10th Street/I-205 Northbound (NB) Ramps	0	0	0	3	3
10th Street/8th Avenue-Court	2	6	0	5	13
10th street/Willamette Falls Drive	0	0	0	0	0
Tannler Drive/Blankenship Road	0	3	0	0	3
12th Street/Willamette Falls Drive	9	10	0	15	44

Bicycle Facilities

There are currently no marked bike lanes located along 10th Street from Blankenship-Salamo Road to Willamette Falls Drive. There are shoulders located on both sides of 10th Street from Blankenship-Salamo Road to the I-205 NB Ramps and along the east side of 10th Street from the I-205 NB Ramps to 8th Avenue-Court that could accommodate bicycle travel; however, the southbound right turn at the 10th Street/I-205 SB Ramp intersection and the northbound right turn lane at the 10th street/I-205 NB Ramp intersection conflict with potential bicycle movements.

The northbound approach to the 10th Street/Blankenship-Salamo Road intersection has a marked bike lane at the intersection for bicycles making a northbound left turn. Bicycle crossing volumes were obtained at the intersections in April 2014 during the weekday evening peak period (4:00 to 6:00 p.m.). The following provides a summary of bicycle activity at the study intersections during the weekday evening peak hour:

Intersection	Northbound	Southbound	Eastbound	Westbound	Total
10th Street/Blankenship-Salamo Road	0	0	1	0	1
10th Street/I-205 Southbound (SB) Ramps	0	1	0	0	1
10th Street/I-205 Northbound (NB) Ramps	0	1	0	0	1
10th Street/8th Avenue-Court	0	1	0	0	1
10th street/Willamette Falls Drive	0	0	1	0	1
Tannler Drive/Blankenship Road	0	0	1	0	1
12th Street/Willamette Falls Drive	0	0	0	3	3

Pedestrian and bicycle activity along 10th Street is expected to increase with full build-out of the City's pedestrian and bicycle system plans and the Metro's regional pedestrian and bicycle networks.

Transit Facilities

TriMet operates one fixed-route bus line along the east side of 10th Street. Line 154 (Willamette) travels west along Willamette Falls Drive, north along 10th Street, west along Blankenship Road, south along Ostman Road, and east along Willamette Falls Drive to the Oregon City Transit. Service is provided Monday through Friday from 6:00 a.m. to 7:00 p.m. on 30 to 60 minute headways. Service is not provided on Saturdays and Sundays.

There is one transit stop along 10th Street in the southeast corner of the 10th Street/8th Avenue-Court intersection. Additional stops are located along Blankenship Road across from the main entrance to Albertsons and along Willamette Falls Drive in the southwest corner of the 11th Street/Willamette Falls Drive intersection. Table 1 summarizes the average daily ons and offs at all three transit stop locations.

Table 1: TriMet Route 154 Average Daily Ridership Fall 2014

Stop Location	Stop ID	Ons	Offs	Total
10th Street	9296	4	10	14
Blankenship Road	9297	5	7	12
Willamette Falls Drive	11766	3	0	3

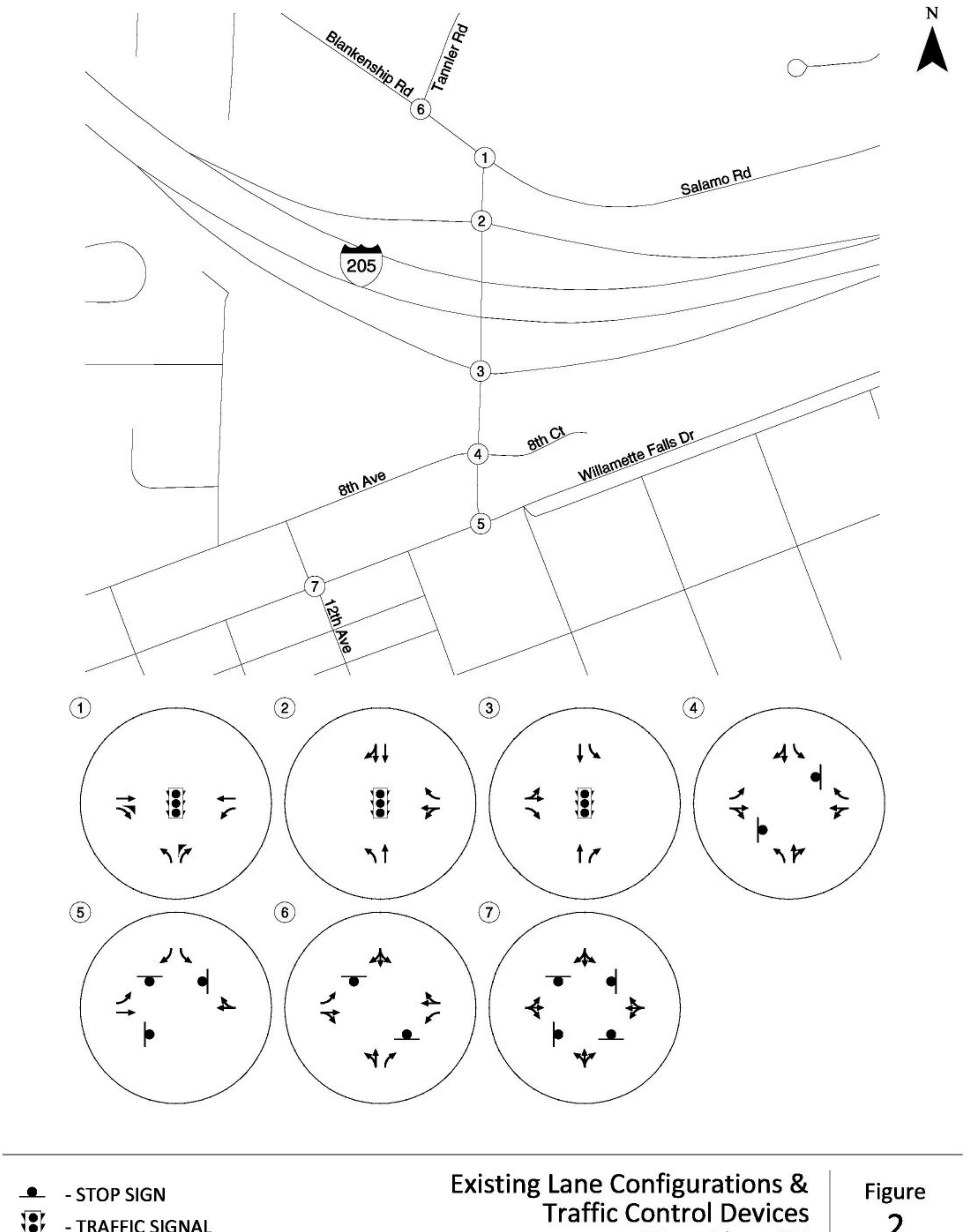
TriMet's plans to reroute Line 154 will not impact the location of transit stops along the 10th Street, Blankenship Road, or Willamette Falls Drive – west of the 10th Street.

Motor Vehicle Facilities

10th Street generally has a three-lane cross section from Blankenship Road to Willamette Falls Drive with separate left-turn lanes at all major intersections and a separate right turn lane at the northbound approach to the I-205 NB Ramps – The northbound left-turn movement at the 10th Street/8th Avenue-Court intersection is restricted during peak time periods. There is a second southbound through lane from Blankenship-Salamo Road to the I-205 SB ramp that tapers to one lane prior to the I-205 NB ramp. The 10th Street/Blankenship-Salamo Road, 10th Street/I-205 SB Ramp, and 10th Street/I-205 NB Ramp intersections are signalized, while the 10th Street/8th Avenue-Court and Tannler Drive/Blankenship Road intersections are two-way stop controlled, and the 10th Street/Willamette Falls Drive and 12th Street/Willamette Falls Drive intersections are all-way stop-controlled. Figure 2 illustrates the existing lane configurations and traffic control devices at the study intersections.

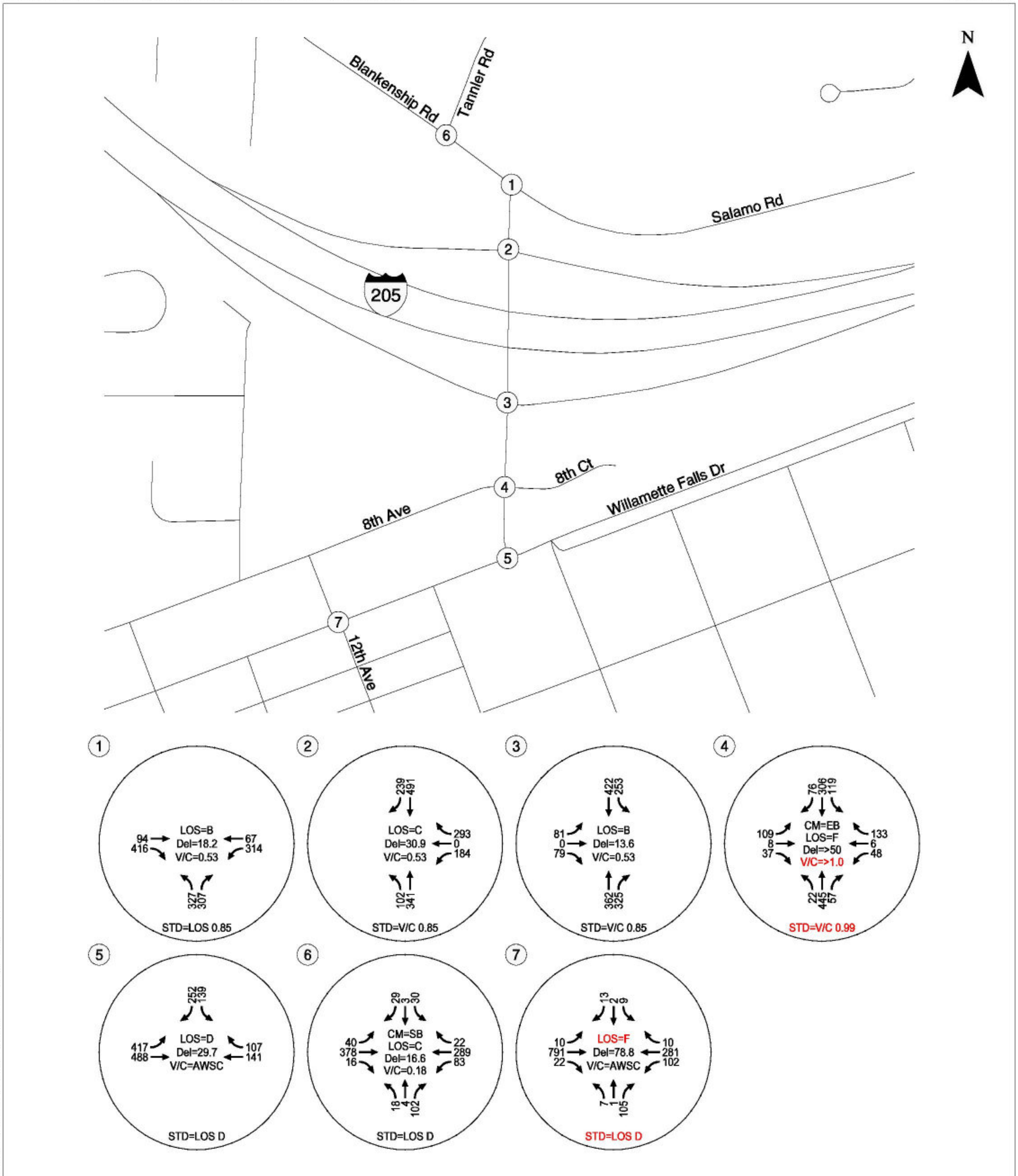
Existing Traffic Volumes

Manual turning-movement counts were conducted at the study intersections in April 2014. All of the counts were conducted on a typical mid-week day during the evening (4:00 to 6:00 p.m.) peak time period. The system-wide peak hour was found to occur from 4:15 to 5:15 p.m. Figure 3 summarizes the year 2014 turning-movement volumes at the study intersections. *Appendix "A" contains the traffic count data used in this study.*



Existing Lane Configurations &
Traffic Control Devices
West Linn, OR

Figure 2



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = CRITICAL MOVEMENT LEVEL OF SERVICE (SIGNALIZED)/
CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/
CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL CRITICAL VOLUME-TO-CAPACITY RATIO
AWSC = ALL-WAY STOP-CONTROL

Existing Traffic Conditions
Weekday PM Peak Hour
West Linn, OR

Figure 3

Intersection Operations

The turning-movement volumes shown in Figure 3 were used to conduct an operational analysis at the study intersections to determine existing traffic conditions along the corridor. As shown, all of the study intersections currently operate acceptably during the weekday p.m. peak hour, with the exception of the 10th Street/8th Avenue-Court and the 12th Street/Willamette Falls Drive intersections. *Appendix "B" contains the year 2014 existing traffic conditions worksheets.*

10th Street/8th Avenue-Court

The eastbound left-turn movement at the 10th Street/8th Avenue-Court intersection currently operates at LOS F and above capacity during the weekday p.m. peak hour. This is primarily due to the relatively high number of eastbound left-turning vehicles conflicting with the relatively high number of north-south through vehicles along 10th Street. A traffic signal is not warranted at the intersection under existing traffic conditions.

12th Street/Willamette Falls Drive

The eastbound approach to the 12th Street/Willamette Falls Drive intersection currently operates as LOS F and above capacity during the weekday p.m. peak hour. This is primarily due to the relatively high number of eastbound through movements. A traffic signal is not warranted at the intersection under existing traffic conditions.

It is important to note that while the other intersections operate acceptably per their respective standards, there are specific movements where the queues are longer than the available storage and impact operations along the corridor. Queuing is discussed further in the following section.

Intersection Queues

Synchro was used to evaluate 95th percentile queues at the signalized study intersections under existing traffic conditions. Table 2 summarizes the 95th percentile queues by movement. The storage lengths shown in Table 2 reflect the striped portion of the turn lanes.

Table 2: Intersection Queues – Existing Traffic Conditions

Intersection	Movement	Queue (feet)	Storage (feet)	Adequate?
10th Street/Blankenship-Salamo Road	EBT	108	Cont.	Yes
	EBR	123	150	Yes
	WBL	272	200	**No**
	WBT	47	Cont.	Yes
	NBL	240	100	**No**
	NBR	18	Cont.	Yes
10th Street/I-205 SB Ramp	WBL	211	200	**No**
	WBR	76	Cont.	Yes
	NBL	103	220	Yes
	NBT	134	Cont.	Yes

	SBT	321	Cont.	Yes
10th Street/I-205 NB Ramp	EBL	78	200	Yes
	EBR	37	Cont.	Yes
	NBT	221	Cont.	Yes
	NBR	78	100	**No**
	SBL	183	130	**No**
	SBT	98	Cont.	Yes

As shown in Table 2, there are several movements where the existing 95th percentile queues currently exceed the available storage, including (most notably) the westbound and northbound left-turn movements at the 10th Street Blankenship-Salamo Road intersection and the southbound left-turn movement at the 10th Street/I-205 NB Ramp intersection. In each case, the movement currently spills into the adjacent lane and prevents other vehicles (through or turning) from continuing through the intersection. The results of the queuing analysis were compared to recent queuing information provided by ODOT and found to be consistent. *Appendix "B" contains the queuing analysis worksheets for existing conditions. Appendix "B" also contains the queuing information provided by ODOT*

Traffic Safety

The crash history of the study intersections was reviewed in an effort to identify any potential safety issues. ODOT provided the five most recent years of crash data available for the study intersections, including January 1, 2008 through December 31, 2012. Table 3 summarizes the crash history of the study intersections over the five-year period.

Table 3: Study Intersection Crash Summary (January 1, 2008 – December 31, 2012)

	Crash Type						Severity		
Location	Angle	Turn	Rear-End	Side Swipe	Fixed Object	Ped/ Bike	PDO*	Injury	Total
10th Street/Blankenship-Salamo Road			1				1		1
10th Street/I-205 SB Ramps		1	2				2	1	3
10th Street/I-205 NB Ramps		1	4				2	3	5
10th Street/8th Avenue-Court	4	8					9	3	12
10th Street/Willamette Falls Drive		2	2				4	0	4
Tannler Drive/Blankenship Road	1	2					1	2	3
12th Street/Willamette Falls Drive		1	2			1	2	2	4

* PDO = Property Damage Only

As shown in Table 3, the highest number of crashes was reported at the 10th Street/8th Avenue-Court intersection. The types of crashes reported at the intersection (Angle and Turn) are typical of two-way stop controlled intersections with side-street movements that are operating above capacity. Also shown in Table 3, two rear-end crashes were reported at the 10th Street/I-205 SB ramps and four rear-end crashes were reported at the 10th Street/I-205 NB ramps. Given ODOT's concern for queues extending into the deceleration lane and/or the I-205 mainline, further review of the crashes was conducted; however, none of the crashes were related to queuing at the intersection. No other trends or patterns were identified in the data that require mitigation associated with the TSP update. *Appendix "C" contains the crash data obtained from ODOT.*

YEAR 2040 NO-BUILD TRAFFIC CONDITIONS

Year 2040 Traffic Volumes

Forecast traffic volumes were developed for the study intersections based on the existing traffic counts and information provided in Metro's fiscally constrained travel demand model. The travel demand model provides calibrated base year 2010 and future year 2040 traffic volume projections that reflect anticipated land use changes and planned transportation improvements within the City and the greater region. The year 2040 traffic volumes were developed by applying the post-processing methodology presented in the National Cooperative Highway Research Program (NCHRP) Report 255 *Highway Traffic Data for Urbanized Area Project Planning and Design* (Reference 5), in conjunction with engineering judgment and knowledge of the study area. Figure 4 illustrates the anticipated year 2040 traffic volumes.

Intersection Operations

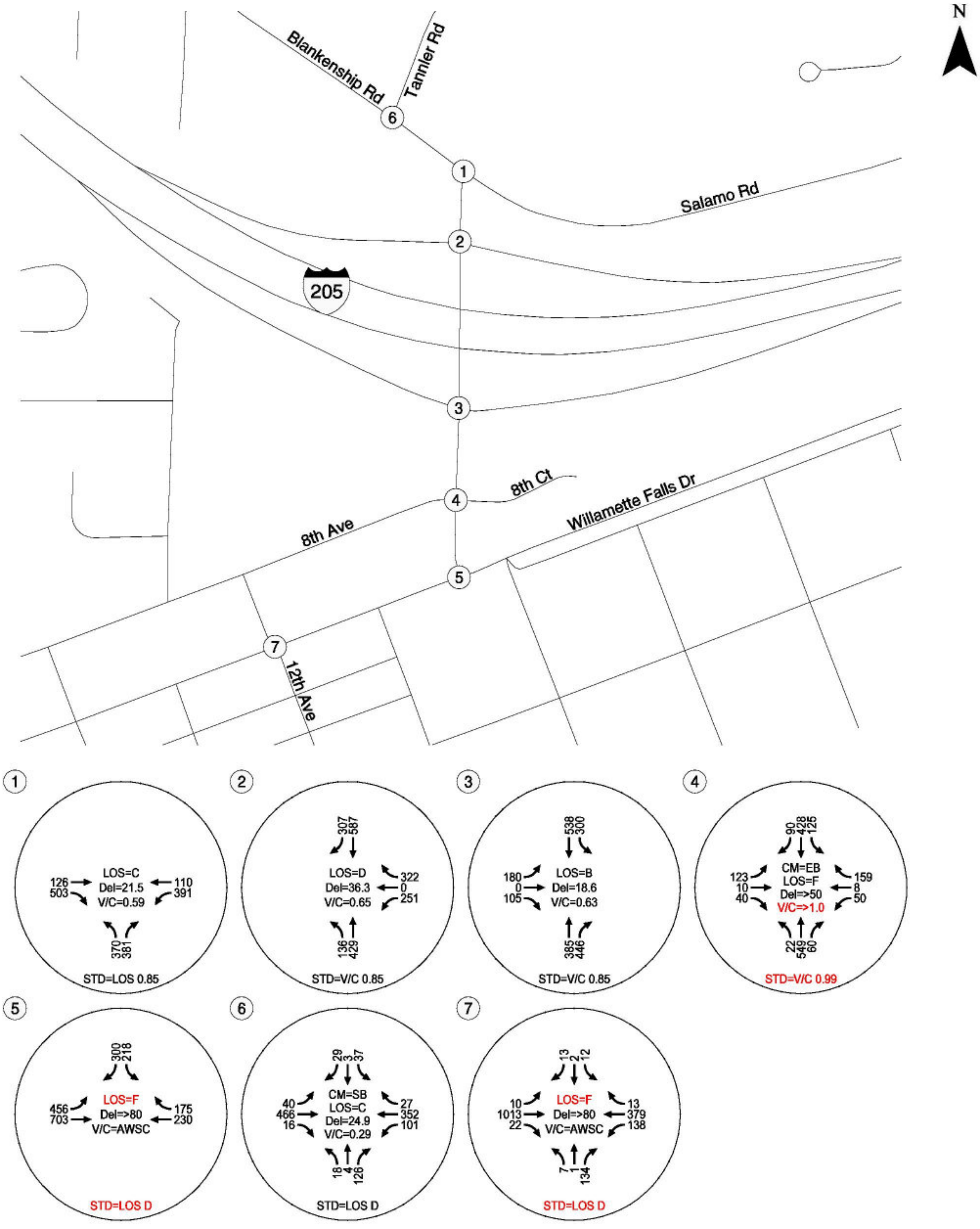
Figure 4 also summarizes the traffic analysis results for the study intersections under year 2040 no-build traffic conditions with no improvements or modifications to the existing roadway or traffic signals. As shown, all of the study intersections are expected to operate acceptably during the weekday p.m. peak hour, with the exception of the 10th Street/8th Avenue-Court, 10th Street/Willamette Falls Drive, and 12th Street/Willamette Falls Drive intersections. *Appendix "D" contains the year 2040 no-build traffic conditions worksheets.*

10th Street/8th Avenue-Court

The eastbound left-turn movement at the 10th Street/8th Avenue-Court intersection is expected to continue to operate at LOS F and above capacity during the weekday p.m. peak hour. This is primarily due to the relatively high number of eastbound left-turning vehicles conflicting with the relatively high number of north-south through vehicles along 10th Street. A traffic signal is warranted at the intersection under year 2040 traffic conditions; however, a signal at this location does not meet ODOT's signal spacing standards.

10th Street/Willamette Falls Drive

The eastbound left-turn movement at the 10th Street/Willamette Falls Drive intersection is also expected to operate at LOS F and above capacity during the weekday p.m. peak hour. This is primarily due to the relatively high number of eastbound left-turning vehicles conflicting with all other movements at the intersection. A traffic signal is warranted at the intersection under year 2040 traffic conditions.



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V/C = CRITICAL CRITICAL VOLUME-TO-CAPACITY RATIO

Year 2040 No-Build Traffic Conditions
Weekday PM Peak Hour
West Linn, OR

Figure 4

12th Street/Willamette Falls Drive

The eastbound approach to the 12th Street/Willamette Falls Dive intersection is also expected to operate at LOS F and above capacity during the weekday p.m. peak hour. This is primarily due to the relatively high number of eastbound through movements. A traffic signal is warranted at the intersection under year 2040 traffic conditions.

It is important to note that while the other intersections operate acceptably per their respective standards, there are specific movements where the queues are longer than the available storage or where the volumes exceed the capacity of the movement and impact operations along the corridor. Queuing is discussed further in the following section.

Intersection Queues

Synchro was used to evaluate 95th percentile queues at the signalized study intersections under year 2040 no-build traffic conditions. Table 4 summarizes the 95th percentile queues by movement. The storage lengths shown in Table 4 reflect the striped portion of the turn lanes.

Table 4: Intersection Queues – Year 2040 No-Build Traffic Conditions

Intersection	Movement	Queue	Storage	Adequate?
10th Street/Blankenship-Salamo Road	EBT	138	Cont.	Yes
	EBR	214	150	**No**
	WBL	#390	200	**No**
	WBT	70	Cont.	Yes
	NBL	287	100	**No**
	NBR	22	Cont.	Yes
10th Street/I-205 SB Ramp	WBL	287	200	**No**
	WBR	80	Cont.	Yes
	NBL	133	220	Yes
	NBT	177	Cont.	Yes
	SBT	#425	Cont.	Yes
10th Street/I-205 NB Ramp	EBL	159	200	Yes
	EBR	41	Cont.	Yes
	NBT	289	Cont.	Yes
	NBR	142	100	**No**
	SBL	241	130	**No**
	SBT	193	Cont.	Yes

95th percentile volume exceeds capacity, queue may be longer.

As shown in Table 4, there are several additional movements (compared to existing traffic conditions) where the 95th percentile queues are expected to exceed the available storage. *Appendix "D" contains the queuing analysis worksheets for year 2040 no-build traffic conditions.*

Based on the intersection operations and queuing analyses described above, improvements to the corridor are needed to improve existing and future year 2040 no-build traffic conditions.

ALTERNATIVES ANALYSIS

Several alternatives were developed to improve existing and year 2040 traffic conditions along the 10th Street corridor that will meet the needs of the City and ODOT. These alternatives were developed based on the existing and year 2040 analyses described above, the improvements identified in the 2008 TSP and the 10th Street Study, and discussions with City and ODOT staff. Other considerations include limited right-of way along 10th Street, limited transportation funding, topography, and impacts to existing businesses and private residencies.

Corridor Improvements

The corridor improvement alternatives are intended to improve traffic operations along the 10th Street corridor for all travel modes without reconstruction of the interchange. These alternatives include widening along 10th Street and modifications at each of the study intersections, but maintain the existing I-205 ramps and ramp terminals. Two different corridor improvement alternatives were developed as part of the alternatives analysis as described below.

Alternative 1

Alternative 1 includes several of the motor vehicle improvements identified in the 2008 TSP and the 10th Street Study as well as a few new improvements not evaluated in any previous studies conducted by the City or ODOT. The improvements have been separated into near-term and long-term improvements based on an evaluation of existing and year 2040 operations.

Near-Term Improvements

The following near-term improvements are included in Alternative 1 to address issues identified under existing conditions:

- Restripe the westbound approach to the 10th Street/Blankenship-Salamo Road intersection to include an exclusive left-turn lane and shared left-through lane.
- Install a raised median island at the eastbound approach to the 10th Street/8th Avenue-Court intersection to restrict the eastbound left, eastbound through, northbound left, and westbound through movements.
  - The raised median island would result in an increase in the southbound left-turn volume at the 12th Street/Willamette Falls Drive intersection, where the eastbound approach will operate at LOS F and above capacity during the weekday p.m. peak hour. A traffic signal is warranted at the intersection under existing traffic conditions with a raised median island at the 10th Street/8th Avenue-Court intersection.
  - The raised median island would result in an increase in the eastbound left-turn volume at the 10th Street/Willamette Falls Drive intersection, where the eastbound left-turn movement will operate at LOS F and above capacity during the weekday

p.m. A traffic signal is warranted at the intersection under existing traffic conditions with a raised median island at the 10th Street/8th Avenue-Court intersection.

- Install a traffic signal at the 12th Street/Willamette Falls Drive intersection.
- Install a traffic signal at the 10th Street/Willamette Falls Drive intersection.
- Coordinate all of the traffic signals along 10th Street and Willamette Falls Drive to minimize queuing and delay at each approach to the I-205 Ramp terminals.

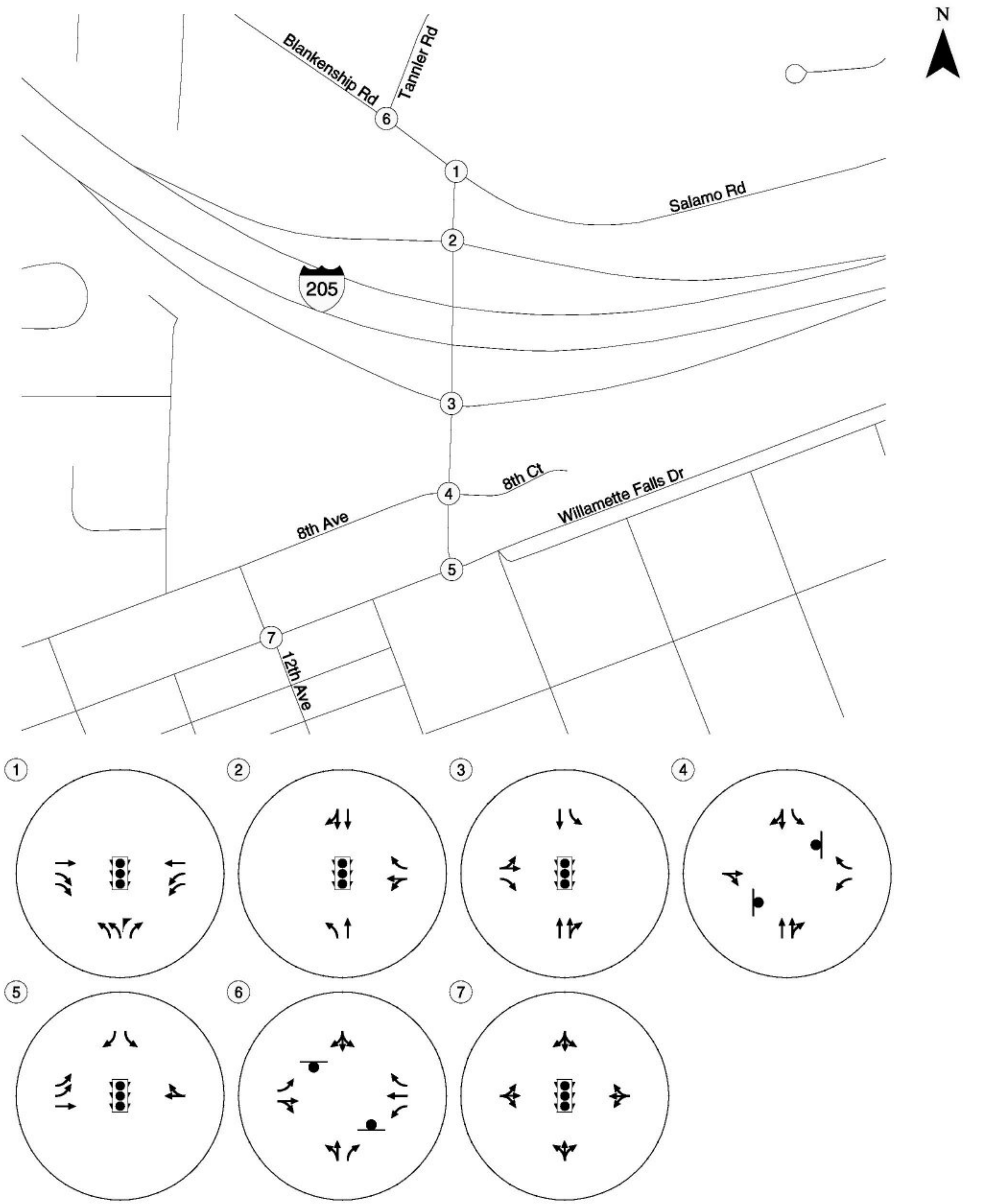
Long-Term Improvements

The following long-term improvements are included in Alternative 1 to address issues identified under year 2040 conditions:

- Widen the eastbound and westbound approaches to the 10th Street/Blankenship-Salamo Road intersection to provide dual westbound left-turn lanes, a single westbound through lane, and to accommodate dual northbound left-turn lanes.
- Add a second exclusive right turn lane to the eastbound approach to the 10th Street/Blankenship-Salamo Road intersection.
  - This improvement could increase the crossing distance located at the south leg of the 10th Street Blankenship-Salamo Road intersection.
  - The need for this improvement could be reduced by restricting access to the commercial property located in the southwest corner of the 10th Street Blankenship-Salamo Road intersection.
- Modify and/or widen 10th Street between the I-205 NB Ramps and the I-205 SB Ramps to provide two lanes in each direction. This allows for one continuous 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)[1].
- Widen 10th Street between the I-205 NB Ramps and Willamette Falls Drive to provide two lanes in each direction.
- Install dual eastbound left-turn lanes at the 10th Street/Willamette Falls Drive intersection.

Figure 5 illustrates the assumed lane configuration and traffic control devices with all of the near-term and long-term improvements included in Alternative 1. The costs associated with these improvements could range from 4-5 million depending on the need for modifications to the bridge structures and right-of way acquisition.

[1] 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.



- STOP SIGN
- TRAFFIC SIGNAL

Year 2040 Assumed Lane Configurations & Traffic Control Devices - Alternative 1
West Linn, OR

Figure 5

Intersection Operations

Figure 6 summarizes the traffic analysis results for the study intersections under year 2040 traffic conditions assuming all of the near-term and long-term improvements included in Alternative 1. As shown, all of the study intersections are expected to operate acceptably during the weekday p.m. peak hour. *Appendix "E" contains the year 2040 traffic conditions worksheets for Alternative 1.*

10th Street/8th Avenue/Court

The westbound approach to the 10th Street/8th Avenue-Court intersection is expected to operate at LOS F (64.6 seconds of delay), but below capacity during the weekday p.m. peak hour. Installation of a raised median island that restricts the westbound left-turn movement would improve operations at the intersection; however, this improvement would require an extension of 8th Court to Willamette Falls Drive, which may not be feasible within the horizon year of the TSP update. Therefore, the City should preserve the right-of-way and maintain an access easement to allow the 8th Court extension in the future as needed.

Intersection Queuing

Synchro was used to evaluate 95th percentile queues at the signalized study intersections under year 2040 traffic conditions assuming all of the improvements included in Alternative 1. Table 5 summarizes the 95th percentile queues by movement.

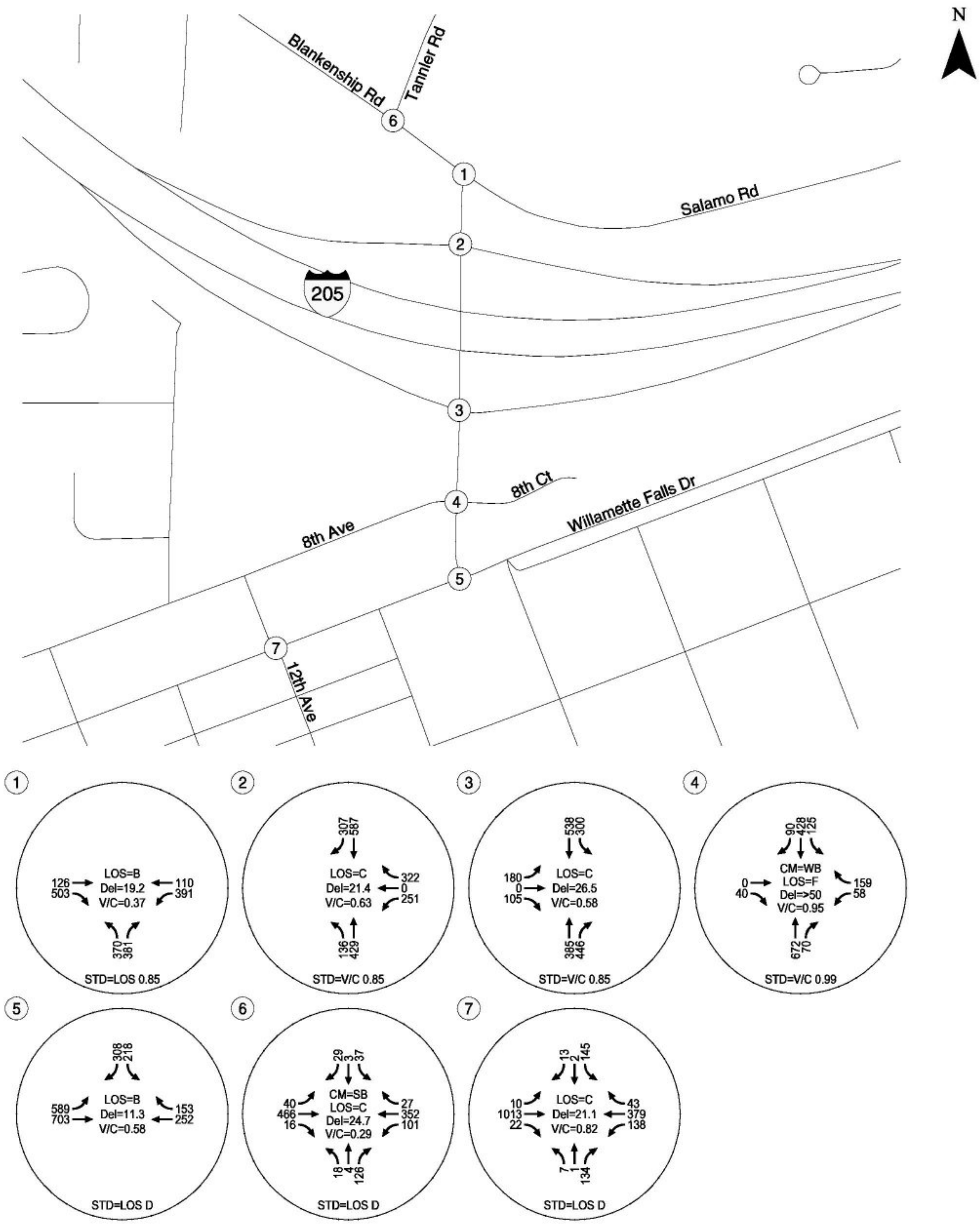
Table 5: Alternative 1 Intersection Queues – Year 2040 Traffic Conditions

Intersection	Movement	Queue	Storage	Adequate?
10th Street/Blankenship-Salamo Road	EBT	122	Cont.	Yes
	EBR	63	150	Yes
	WBL	155	200	Yes
	WBT	72	Cont.	Yes
	NBL	97	150	Yes
	NBR	35	150	Yes
10th Street/I-205 SB Ramp	WBL	215	200	**No**
	WBR	65	Cont.	Yes
	NBL	97	Cont.	Yes
	NBT	31	Cont.	Yes
	SBT	231	Cont.	Yes
10th Street/I-205 NB Ramp	EBL	167	200	Yes
	EBR	43	Cont.	Yes
	NBT	256	Cont.	Yes
	SBL	m214	Cont.	Yes
	SBT	171	Cont.	Yes
10th Street/Willamette Falls Drive	EBL	m43	225	Yes
	EBT	m100	Cont.	Yes
	WBT	92	Cont.	Yes
	SBL	#219	125	**No**

	SBR	70	Cont.	Yes
12th Street/Willamette Falls Drive	EBT	#807	Cont.	Yes
	WBT	#418	Cont.	Yes
	NBT	52	Cont.	Yes
	SBT	#176	Cont.	Yes

95th percentile volume exceeds capacity, queue may be longer.
m 95th percentile queue is metered by upstream signal

As shown in Table 5, there continue to be a few movements where the 95th percentile queues are expected to exceed the available storage. *Appendix "E" contains the queuing analysis worksheets for Alternative 1.*



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Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/ CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL CRITICAL VOLUME-TO-CAPACITY RATIO

Year 2040 Traffic Conditions - Alternative 1
Weekday PM Peak Hour
West Linn, OR

Figure 6

Alternative 2

Alternative 2 also includes several of the motor vehicle improvements identified in the 2008 TSP as well as a few new improvements not evaluated in any previous studies conducted by the City or ODOT. Similar to Alternative 1, the improvements have been separated into near-term and long-term improvements based on an evaluation of existing and year 2040 operations.

Near-Term Improvements

The following improvements are included in Alternative 2 to address issues identified under existing traffic conditions (*Note: the improvements unique to Alternative 2 are identified in **bold** text)*:

- Restripe the westbound approach to the 10th Street/Blankenship-Salamo Road intersection to include an exclusive left-turn lane and shared left-through lane.
- **Install a traffic signal at the 10th Street/8th Avenue-Court intersection when warranted.**
- Install a traffic signal at the 12th Street/Willamette Falls Drive intersection when warranted.

Long-Term Improvements

The following long-term improvements are included in Alternative 2 to address issues identified under year 2040 conditions:

- Widen the eastbound and westbound approaches to the 10th Street/Blankenship-Salamo Road intersection to provide dual westbound left-turn lanes, a single westbound through lane, and to accommodate dual northbound left-turn lanes.
- Add a second exclusive right turn lane to the eastbound approach to the 10th Street/Blankenship-Salamo Road intersection.
  - This improvement could increase the crossing distance located at the south leg of the 10th Street Blankenship-Salamo Road intersection.
  - The need for this improvement could be reduced by restricting access to the commercial property located in the southwest corner of the 10th Street Blankenship-Salamo Road intersection.
- Modify and/or widen 10th Street between the I-205 NB Ramps and the I-205 SB Ramps to provide two lanes in each direction. This allows for one continuous 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)[2].

[2] 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.

- Install a traffic signal at the 10th Street/Willamette Falls Drive intersection.
- Coordinate all of the traffic signals along 10th Street and Willamette Falls Drive to minimize queuing and delay at each approach to the I-205 Ramp terminals.

The installation of a traffic signal at the 10th Street/8th Avenue-Court intersection eliminates the need to widen 10th Street between the I-205 NB Ramps and Willamette Falls Drive. It also eliminates the need for turn movement restrictions at the 10th Street/8th Avenue-Court intersection, which in turn reduces the need for the 8th Court extension to Willamette Falls Drive and dual left-turn lanes at the 10th Street/Willamette Falls. Figure 7 illustrates the assumed lane configuration and traffic control devices with the Alternative 2 improvements. The costs associated with these improvements could range from 1-2 million depending on the need for modifications to the bridge structures and right-of way acquisition.

Intersection Operations

Figure 8 summarizes the traffic analysis results for the study intersections under year 2040 traffic conditions assuming all of the near-term and long-term improvements included in Alternative 2. As shown, all of the study intersections are expected to operate acceptably during the weekday p.m. peak hour. *Appendix "F" contains the year 2040 traffic conditions worksheets for Alternative 2.*

Intersection Queuing

Synchro was used to evaluate 95th percentile queues at the signalized study intersections under year 2040 traffic conditions assuming all of the improvements included in Alternative 2. Table 6 summarizes the 95th percentile queues by movement.

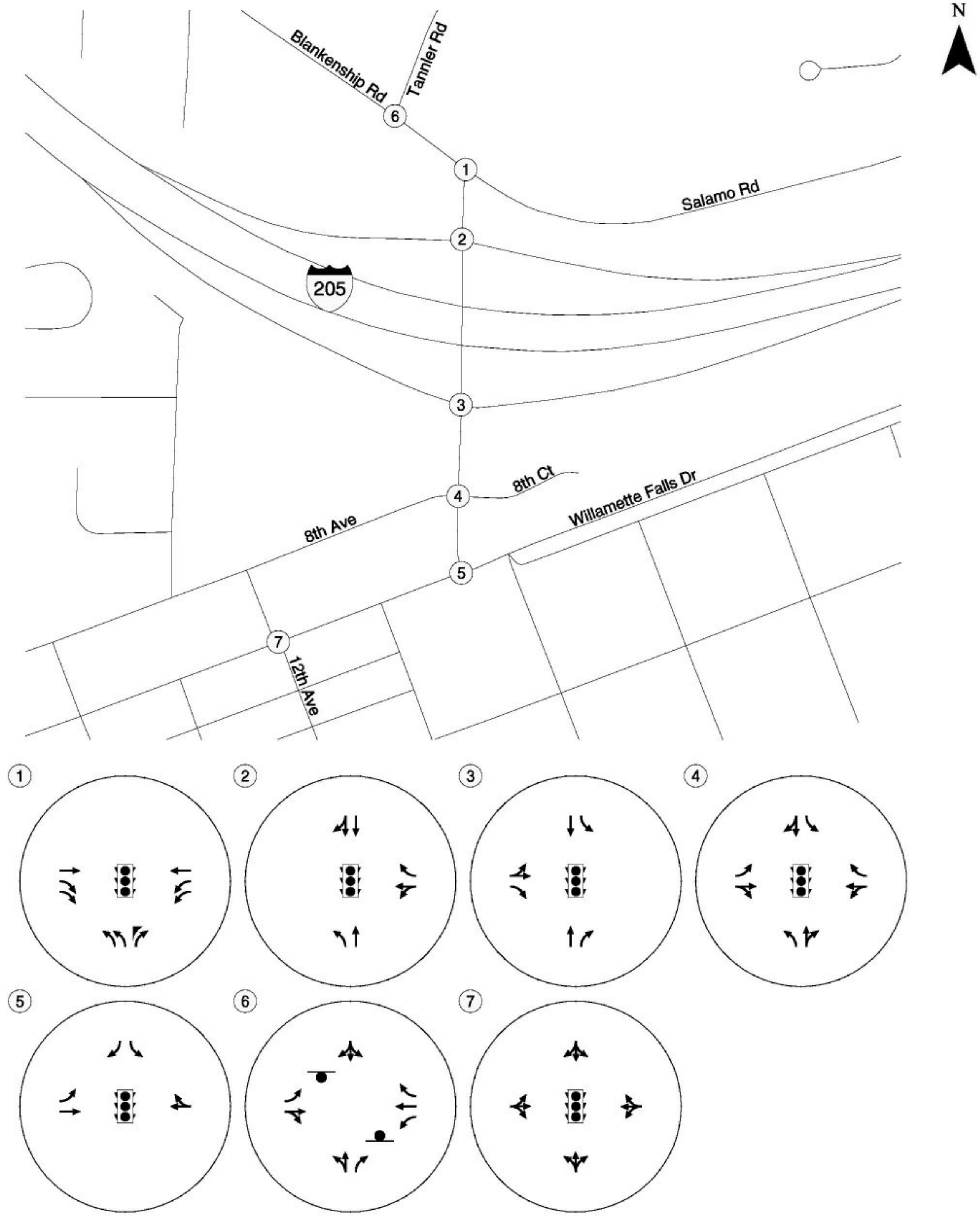
Table 6: Alternative 2 Intersection Queues – Year 2040 Traffic Conditions

Intersection	Movement	Queue	Storage	Adequate?
10th Street/Blankenship-Salamo Road	EBT	122	Cont.	Yes
	EBR	63	150	Yes
	WBL	155	200	Yes
	WBT	72	Cont.	Yes
	NBL	103	100	**No**
	NBR	28	Cont.	Yes
10th Street/I-205 SB Ramp	WBL	215	200	**No**
	WBR	65	Cont.	Yes
	NBL	87	Cont.	Yes
	NBT	2	Cont.	Yes
	SBT	231	Cont.	Yes
10th Street/I-205 NB Ramp	EBL	167	200	Yes
	EBR	43	Cont.	Yes
	NBT	280	Cont.	Yes
	NBR	143	100	**No**
	SBL	m214	Cont.	Yes
	SBT	171	Cont.	Yes

10th Street/8thAvenue-Court	EBL	118	Cont.	Yes
	EBT	34	Cont.	Yes
	WBT	62	Cont.	Yes
	WBR	50	100	Yes
	NBL	m0	50	Yes
	NBT	6	Cont.	Yes
	SBL	42	125	Yes
	SBT	129	Cont.	Yes
10th Street/Willamette Falls Drive	EBL	m31	225	Yes
	EBT	m46	Cont.	Yes
	WBT	86	Cont.	Yes
	SBL	#212	125	**No**
	SBR	87	Cont.	Yes
12th Street/Willamette Falls Drive	EBT	#806	Cont.	Yes
	WBT	384	Cont.	Yes
	NBT	52	Cont.	Yes
	SBT	29	Cont.	Yes

95th percentile volume exceeds capacity, queue may be longer.
m 95th percentile queue is metered by upstream signal

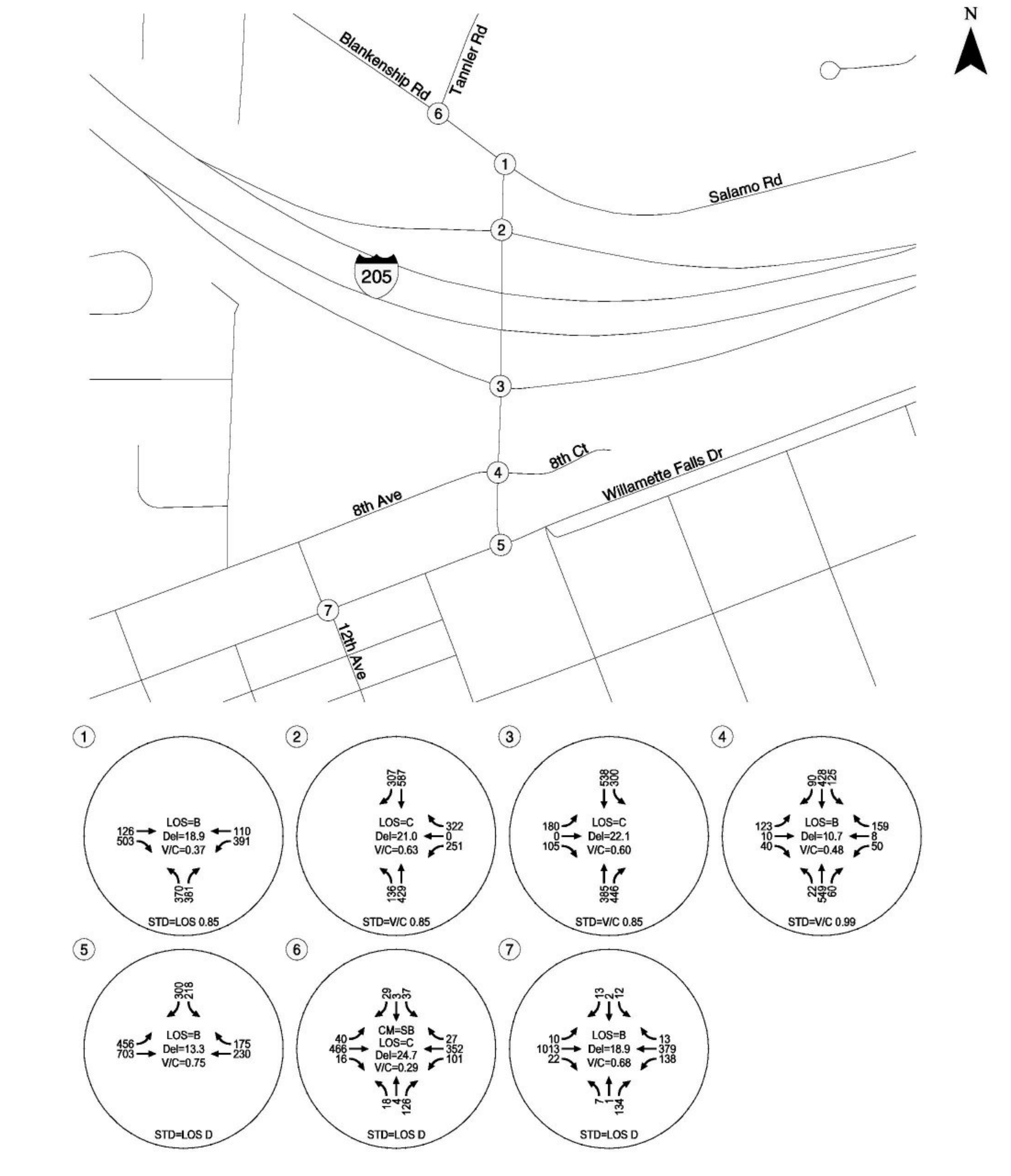
As shown in Table 6, there continue to be a few movements where the 95th percentile queues are expected to exceed the available storage. *Appendix "F" contains the year 2040 queuing analysis worksheets for Alternative 2.*



- STOP SIGN
- TRAFFIC SIGNAL

Year 2040 Assumed Lane Configurations & Traffic Control Devices - Alternative 2
West Linn, OR

Figure 7



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V/C = CRITICAL CRITICAL VOLUME-TO-CAPACITY RATIO

Year 2040 Traffic Conditions - Alternative 2
Weekday PM Peak Hour
West Linn, OR

Figure 8

Interchange Improvements

Given the significant difference in the traffic volume projections used in the 2008 TSP and the 10th Street study versus those used in this analysis, improvements to the interchange are not anticipated to be necessary to accommodate the 2040 forecast traffic volumes; however, alternatives that could potentially accommodate greater traffic demand than projected have been evaluated at a qualitative level. These alternatives include a Diverging Diamond Interchange (DDI), a Single Point Urban Interchange (SPUI –recommended in the 2008 TSP), a Raindrop/Dumbbell Interchange, and a Tight Diamond Interchange. The following provides a high level review of each type of interchange, including the advantages and disadvantages of each form, the feasibility for implementation at the 10th Street interchange, and planning level cost estimates. The cost estimates include the interchange ramps and termini only and do not account for the full set of improvements needed along 10th Street from Willamette Falls Drive to Blankenship-Salamo Road.

Diverging Diamond Interchange

The Diverging Diamond Interchange (DDI) is an emerging interchange form that is becoming more utilized as a method to retrofit conventional diamond interchanges with heavy left turns. The DDI works by crossing through-movement traffic over from the right side to the left side of the road on either side of the interchange where the ramp termini of a conventional diamond would normally exist. Figure 9 illustrates a DDI locate in Alcoa, TN.

The main benefit of the DDI over the conventional diamond interchange is the reduced number of required signal phases (two phases compared with three for a conventional diamond). The reduced number of phases results in a lower percentage of lost time at each signalized intersection, as well as reduced delay and queueing at the interchange. Like the conventional diamond, various signal coordination strategies can be used to progress certain turning movements through the interchange. Another major benefit of the DDI when compared with other interchange forms is that it usually can be constructed in place of a conventional diamond while mostly preserving the footprint of the interchange, and usually does not require major bridge reconstruction. While there are currently no comprehensive crash analyses of built DDIs in the United States, they are presumed to be safer than conventional diamond interchanges due to the reduced number of vehicle-to-vehicle conflict points (18 at a DDI compared to 26 at a conventional diamond). DDIs also contain fewer pedestrian-to-vehicle conflict points than conventional diamonds.

The main disadvantage of the DDI is that it is still relatively new as an interchange form, and most design and operations guidance is still emerging. Another disadvantage of the DDI is that it does not tend to work well with closely-spaced adjacent signalized intersections, since movements at those intersections must be coordinated with the movements of the DDI, and most intersections typically have more than two signal phases. Geometrically, it can be difficult to design a DDI crossover that is compact enough to fit between the freeway and a closely-spaced intersection. If traffic volumes (especially left turn volumes) are not high, then the DDI typically does not provide much benefit over the conventional diamond.

N

Source: Google

Diverging Diamond Interchange (DDI)
Alcoa, TN

Figure
9

At the I-205/10th Street interchange, a DDI would likely result in some operational and safety improvements compared with the existing diamond, especially at the northbound I-205 ramp terminus, but the geometric constraints of the site could make it challenging to fit the DDI within the existing footprint. The short distance (approximately 250 feet) between the southbound I-205 ramp terminus and the Blankenship/Salamo intersection would make it challenging to fit the DDI crossover and coordinate the signal timing between the two intersections. Retrofits of conventional diamond interchanges with a DDI have typically run in the range of $3 million to $8 million, according to the FHWA Diverging Diamond Interchange Informational Guide.

Using a high-level critical movement analysis with the projected 2040 volumes, the traffic operations at the interchange are not expected to improve significantly with the construction of a DDI, so the cost of the DDI will likely outweigh its benefits.

Single Point Urban Interchange

The Single-Point Urban Interchange (SPUI) is an interchange form that is used to retrofit a conventional diamond interchange with heavy traffic where right of way is limited. The SPUI works by bringing all four ramps to a single large intersection with the cross-street either below or above the freeway. This allows opposing left turns to run concurrently. Figure 10 illustrates a SPUI in Salem, OR.

The main benefit of the SPUI over the conventional diamond interchange is the consolidation of all traffic movements into one intersection, which typically allows for more efficient traffic operations. This results in large decreases in delay and travel time compared to a conventional diamond with the same lane configuration. A SPUI can also work well with adjacent signalized intersections or frontage roads, since the one intersection will typically be farther away from adjacent intersections than the two intersections of a conventional diamond.

The main disadvantage of the SPUI is the high cost associated with rebuilding the bridges over 10th Street. If the signal cycle length is low, then some of the operational benefits of the SPUI may also be counteracted with high lost times associated with the large intersection width, which may cause unnecessary delay and queuing during off-peak periods. The SPUI has a similar crash history to the conventional diamond, but pedestrians usually must cross a greater length of crosswalk, since the SPUI usually has a very wide intersection.

Due to the need to rebuild the bridges at the interchange, the SPUI can usually cost upward of $15 million, making it the most expensive of the designs considered. The SPUI would likely result in the greatest operational improvement of any of the designs considered, but it may not be worth the high cost.

N

Source: Google

Single Point Urban Interchange (SPUI)
Salem, OR

Figure
10

Raindrop/Dumbbell Interchange

The raindrop interchange, also known as a dumbbell or diamond with roundabouts, is similar to a conventional diamond but replaces the intersections at the ramp termini with roundabouts. Figure 11 illustrates a raindrop interchange in Gig Harbor, WA.

Many of the advantages of the raindrop interchange correspond with the advantages of roundabouts over signalized or other unsignalized intersections. The main advantage is the reduced queueing and off-peak delay at the ramp termini due to the yield-control at entry. Other benefits include a reduced number of conflict points (eight at each roundabout, compared to 11 at each intersection within a conventional diamond), reduced crash severity associated with low vehicle speeds, reduced maintenance costs, and lower traffic noise and emissions associated with a lower number of stops. Usually, fewer approach lanes are needed to serve the same amount of traffic at a roundabout than at a conventional (signalized or unsignalized) ramp terminus.

The cost to install a raindrop interchange is typically greater than the cost of constructing two individual roundabouts because of increased complexity of maintaining traffic through the interchange and realigning the ramps. Typically, large arterial roundabouts can cost $200,000 to $400,000 to install, with the total cost of a raindrop interchange in the $3 to 6 million range depending on the extent of modifications to the ramps.

Tight Diamond Interchange

The tight diamond interchange is a form of conventional signalized diamond interchange where the ramps are brought close enough to the over/underpass so that they can function off the same signal controller. Figure 12 illustrates a Tight Diamond Interchange in Hayward, CA.

The main advantage of the tight diamond is the ability to efficiently move traffic through the ramp termini with a single signal controller, resulting in reduced delay and number of stops at the intersections. Another advantage of the tight diamond is that it has a smaller footprint than a conventional diamond. The main disadvantage of a tight diamond is the potential for queue spillback between the ramp termini. Queue spillback can be mitigated through the use of additional storage lanes for turning movements, but this often requires a larger footprint for each ramp terminus, and thus a wider or longer over/underpass.

Using a high-level critical movement analysis with the projected 2040 volumes, the tight diamond would operate below capacity but with slightly worse operations at the northbound I-205 ramp terminus than at the conventional diamond. However, the increased spacing between the southbound I-205 ramp terminus and the Blankenship/Salamo intersection would result in substantially better operations between those two intersections. The cost to construct a tight diamond is highly variable but mainly depends on whether the over/underpass would need to be reconstructed. Given the width of 10th Street underneath I-205 is approximately 46 feet (excluding bicycle lanes), it may be possible to accommodate the necessary four lanes there. Thus, if relocating the ramp termini is the main cost, then the tight diamond would probably cost in the $2 to $4 million range.

Source: Google

Raindrop Interchange
Gig Harbor, WA

Figure
11

N

Source: Google

H:\proj\file\17817 - West Linn Transportation System Plan\dwgs\figs\17817_TM8_Fig01.dwg Jun 29, 2015 - 5:46pm - mbell Layout Tab: Fig12

Tight Diamond Interchange
Hayward, CA

Figure
12

FINDINGS AND RECOMMENDATIONS

The results of this analysis indicate that full reconstruction of the interchange is not required to address existing and forecast year 2040 traffic operational issues along the 10th Street corridor and at the study intersection. Incremental improvements implemented over the next 25 years are sufficient to maintaining safe and acceptable traffic operations. The findings of this analysis and our recommendations are discussed below. The improvements identified under the Corridor Improvements are sufficient to address the issues, and therefore should be carried into the TSP update.

Findings

Existing Traffic Conditions

- All of the study intersections currently meet their respective mobility standards during the weekday p.m. peak hour, with the exception of the 10th Street/8th Avenue-Court intersection.
  - The eastbound left-turn movement at this intersection currently operations at LOS F and above capacity during the weekday p.m. peak hour.
- Several movements at the study intersections currently have 95th percentile queues that are longer than the available storage and impact operations along the corridor.
- A review of historical crash data did not reveal any trends or patterns that require mitigation associated with the TSP update.

Year 2040 No-Build Traffic Conditions

- All of the study intersections are expected to meet their respective mobility standards during the weekday p.m. peak hour, with the exception of the 10th Street/8th Avenue-Court and 10th Street/Willamette Falls Drive intersections.
  - The eastbound left-turn movements at both intersections are expected to operate at LOS F and above capacity during the weekday p.m. peak hour.
- Several additional movements at the study intersections (relative to existing conditions) are expected to have 95th percentile queues that are longer than the available storage and impact operations along the corridor.

Alternatives Analysis

Corridor Improvements Alternative 1

- This alternative includes several of the improvement projects identified in the 2008 TSP and the 10th Street Study, including access restrictions at the 10th Street/8th Avenue-Court intersection.

- All of the study intersections are expected to meet their respective mobility standards during the weekday p.m. peak hour with the improvements
- Queuing at many of the study intersections is also expected to be reduced significantly relative to year 2040 no-build traffic conditions.

Corridor Improvements Alternative 2

- This alternative includes many of the improvement projects identified in the 2008 TSP and the 10th Street study; however it includes a new traffic signal at the 10th Street/8th Avenue-Court intersection rather than access restrictions.
    - The final design/timing/phasing of the traffic signal will need to minimize impacts to the I-205 ramp terminals.
- All of the study intersections are expected to meet their respective mobility standards during the weekday p.m. peak hour with the improvements
- Queuing at many of the study intersections is also expected to be reduced significantly relative to year 2040 no-build traffic conditions.

Interchange Improvements

- Full reconstruction of the interchange is not needed based on the current 2040 forecast; however, four alternative interchange forms that could potentially accommodate higher forecast volumes were evaluated at a qualitative level including:
    - Diverging Diamond Interchange (DDI),
    - Single Point Urban Interchange (SPUI –recommended in the 2008 TSP),
    - Raindrop/Dumbbell Interchange, and
    - Tight Diamond Interchange.
- Each of these alternative interchange forms could potentially accommodate greater traffic volume than either of the corridor improvement alternatives described above; however, they have significantly higher costs.

Recommendations

All of the pedestrian, bicycle, and transit improvement projects identified in the 2008 TSP should be carried into the TSP update as planned improvements. Similarly, all of the improvement projects identified under Corridor Improvements Alternative 1 should be carried into the TSP Update.

REFERENCES

1. City of West Linn. *West Linn Transportation System Plan*. 2008
2. DKS Associates. *10th Street at Willamette Falls Drive Intersection Traffic Control Study*. 2011
3. Oregon Department of Transportation. *Oregon Highway Plan*. 2012
4. Transportation Research Board. *Highway Capacity Manual*. 2000 and 2010.
5. National Cooperative Highway Research Program. *Report 255 Highway Traffic Data for Urbanized Area Project Planning and Design*. 1982.

APPENDIX

A. Traffic Counts
B. Existing Traffic Conditions and Queueing Worksheets
C. Crash Data
D. Year 2040 No-Build Traffic Conditions and Queuing Worksheets
E. Year 2040 Traffic Conditions and Queuing Worksheets with Corridor Improvements Alternative 1
F. Year 2040 Traffic Conditions and Queuing Worksheets with Corridor Improvements Alternative 2

Appendix A Traffic Counts

Total Vehicle Summary

All Traffic Data Services Inc.

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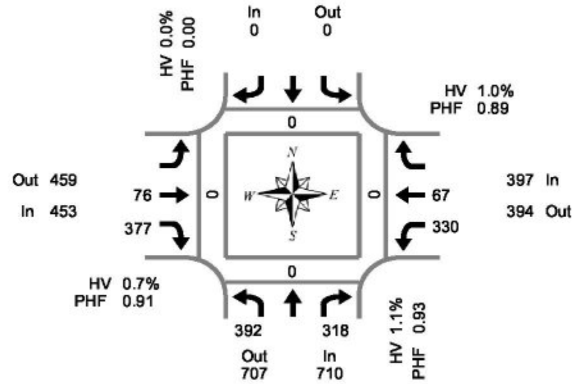

Peak Hour Summary
5:00 PM to 6:00 PM

10th St & Salamo Rd

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Interval	Pedestrians Crosswalk			
Time	L		R	Bikes				Bikes		T	R	Bikes	L	T		Bikes	Total	North	South	East	West
4:00 PM	98		84	0				0		32	113	0	80	11		0	418	0	0	0	0
4:15 PM	76		70	0				0		24	105	0	93	15		0	383	0	0	0	0
4:30 PM	73		74	0				0		25	100	1	61	19		0	352	0	0	0	0
4:45 PM	83		87	0				0		27	102	0	74	19		0	392	0	0	0	0
5:00 PM	88		70	0				0		18	104	0	83	14		0	377	0	0	0	0
5:15 PM	105		77	0				0		26	87	0	81	21		0	397	0	0	0	0
5:30 PM	90		89	0				0		12	82	0	91	20		0	384	0	0	0	0
5:45 PM	109		82	0				0		20	104	0	75	12		0	402	0	0	0	0
Total Survey	722		633	0				0		184	797	1	638	131		0	3,105	0	0	0	0

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	710	707	1,417	0	0	0	0	0	453	459	912	0	397	394	791	0	1,560	0	0	0	0
%HV	1.1%				0.0%				0.7%				1.0%				1.0%				
PHF	0.93				0.00				0.91				0.89				0.97				

By Movement	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	392		318	710				0		76	377	453	330	67		397	1,560
%HV	1.0%	NA	1.3%	1.1%	NA	NA	NA	0.0%	NA	0.0%	0.8%	0.7%	1.2%	0.0%	NA	1.0%	1.0%
PHF	0.90		0.89	0.93				0.00		0.73	0.91	0.91	0.91	0.80		0.89	0.97

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Interval	Pedestrians Crosswalk			
Time	L		R	Bikes				Bikes		T	R	Bikes	L	T		Bikes	Total	North	South	East	West
4:00 PM	330		315	0				0		108	420	1	308	64		0	1,545	0	0	0	0
4:15 PM	320		301	0				0		94	411	1	311	67		0	1,504	0	0	0	0
4:30 PM	349		308	0				0		96	393	1	299	73		0	1,518	0	0	0	0
4:45 PM	366		323	0				0		83	375	0	329	74		0	1,550	0	0	0	0
5:00 PM	392		318	0				0		76	377	0	330	67		0	1,560	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.

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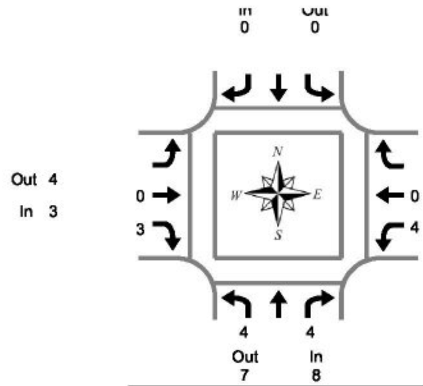

Peak Hour Summary
5:00 PM to 6:00 PM

10th St & Salamo Rd

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	2		1	3				0		0	3	3	2	0		2	8
4:15 PM	1		0	1				0		0	4	4	4	0		4	9
4:30 PM	2		0	2				0		0	0	0	1	0		1	3
4:45 PM	0		2	2				0		0	1	1	0	0		0	3
5:00 PM	1		3	4				0		0	2	2	0	0		0	6
5:15 PM	0		1	1				0		0	0	0	2	0		2	3
5:30 PM	1		0	1				0		0	0	0	1	0		1	2
5:45 PM	2		0	2				0		0	1	1	1	0		1	4
Total Survey	9		7	16				0		0	11	11	11	0		11	38

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound 10th St			Southbound 10th St			Eastbound Salamo Rd			Westbound Salamo Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	8	7	15	0	0	0	3	4	7	4	4	8	15
PHF	0.25			0.00			0.11			0.14			0.19

By Movement	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	4		4	8				0		0	3	3	4	0		4	15
PHF	0.20		0.17	0.25				0.00		0.00	0.11	0.11	0.14	0.00		0.14	0.19

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	5		3	8				0		0	8	8	7	0		7	23
4:15 PM	4		5	9				0		0	7	7	5	0		5	21
4:30 PM	3		6	9				0		0	3	3	3	0		3	15
4:45 PM	2		6	8				0		0	3	3	3	0		3	14
5:00 PM	4		4	8				0		0	3	3	4	0		4	15

Peak Hour Summary

All Traffic Data Services Inc.
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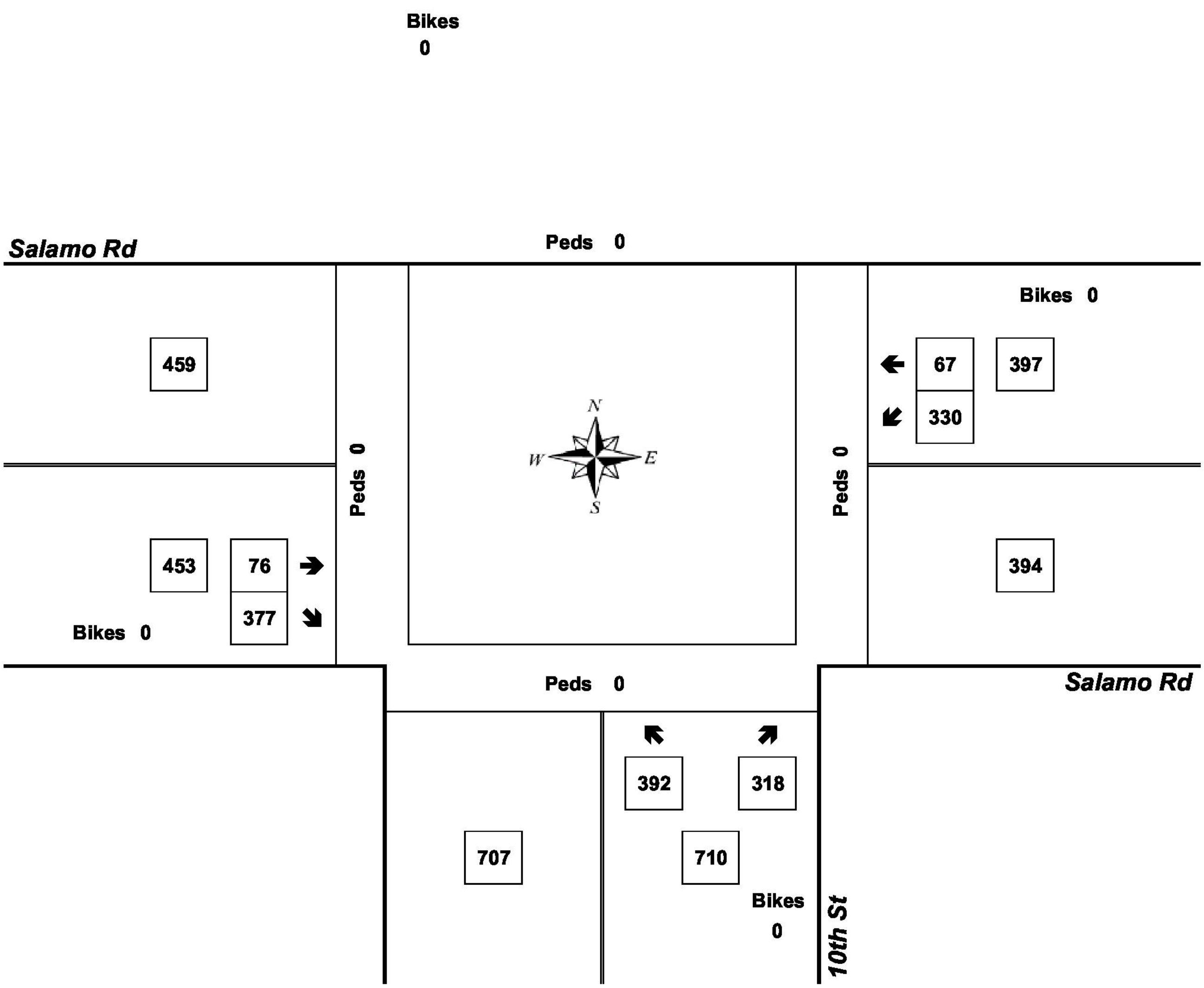
10th St & Salamo Rd

5:00 PM to 6:00 PM
Wednesday, April 16, 2014

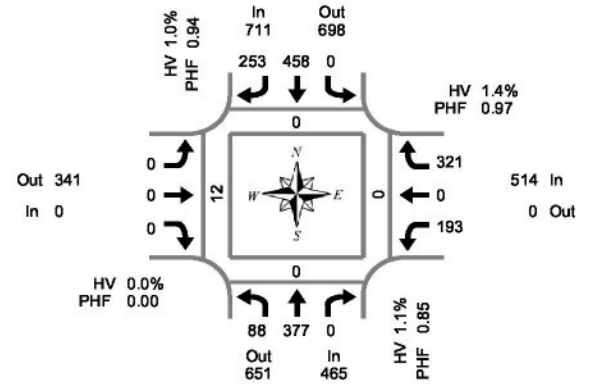


Approach	PHF	HV%	Volume
EB	0.91	0.7%	453
WB	0.89	1.0%	397
NB	0.93	1.1%	710
SB	0.00	0.0%	0
Intersection	0.97	1.0%	1,560

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



10th St & I-205 SB Ramps

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Peak Hour Summary
5:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound 10th St				Southbound 10th St				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Interval	Pedestrians Crosswalk			
Time	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	Total	North	South	East	West
4:00 PM	18	107	0	0	0	136	56	0	0	0	0	0	42	0	71	0	430	0	0	0	0
4:15 PM	31	81	0	0	0	139	61	0	0	0	0	0	41	0	75	0	428	0	0	0	0
4:30 PM	23	80	0	0	0	109	53	1	0	0	0	0	43	0	56	0	364	0	0	0	0
4:45 PM	24	104	0	0	0	120	56	0	0	0	0	0	53	0	80	0	437	0	0	0	0
5:00 PM	23	72	0	0	0	121	69	0	0	0	0	0	46	0	82	0	413	0	0	0	0
5:15 PM	22	96	0	0	0	120	53	0	0	0	0	0	35	0	86	0	412	0	0	0	3
5:30 PM	18	97	0	0	0	101	65	0	0	0	0	0	52	0	80	0	413	0	0	0	5
5:45 PM	25	112	0	0	0	116	66	0	0	0	0	0	60	0	73	0	452	0	0	0	4
Total Survey	184	749	0	0	0	962	479	1	0	0	0	0	372	0	603	0	3,349	0	0	0	12

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound 10th St				Southbound 10th St				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	465	651	1,116	0	711	698	1,409	0	0	341	341	0	514	0	514	0	1,690	0	0	0	12
%HV	1.1%				1.0%				0.0%				1.4%				1.1%				
PHF	0.85				0.94				0.00				0.97				0.93				

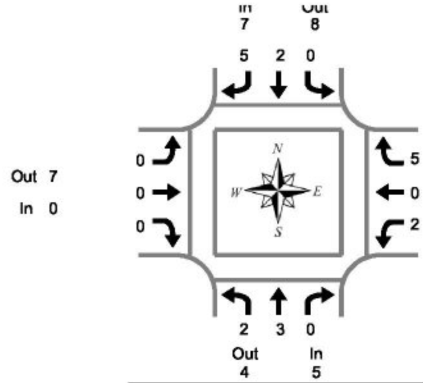
By Movement	Northbound 10th St				Southbound 10th St				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	88	377	0	465	0	458	253	711	0	0	0	0	193	0	321	514	1,690
%HV	2.3%	0.8%	0.0%	1.1%	0.0%	0.4%	2.0%	1.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	1.6%	1.4%	1.1%
PHF	0.88	0.84	0.00	0.85	0.00	0.95	0.92	0.94	0.00	0.00	0.00	0.00	0.80	0.00	0.93	0.97	0.93

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start	Northbound 10th St				Southbound 10th St				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Interval	Pedestrians Crosswalk			
Time	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	Total	North	South	East	West
4:00 PM	96	372	0	0	0	504	226	1	0	0	0	0	179	0	282	0	1,659	0	0	0	0
4:15 PM	101	337	0	0	0	489	239	1	0	0	0	0	183	0	293	0	1,642	0	0	0	0
4:30 PM	92	352	0	0	0	470	231	1	0	0	0	0	177	0	304	0	1,626	0	0	0	3
4:45 PM	87	369	0	0	0	462	243	0	0	0	0	0	186	0	328	0	1,675	0	0	0	8
5:00 PM	88	377	0	0	0	458	253	0	0	0	0	0	193	0	321	0	1,690	0	0	0	12

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

10th St & I-205 SB Ramps

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	2	0	2	0	3	1	4	0	0	0	0	1	0	0	1	7
4:15 PM	2	0	0	2	0	3	5	8	0	0	0	0	0	0	1	1	11
4:30 PM	1	3	0	4	0	1	0	1	0	0	0	0	1	0	0	1	6
4:45 PM	1	1	0	2	0	0	1	1	0	0	0	0	1	0	1	2	5
5:00 PM	0	1	0	1	0	0	2	2	0	0	0	0	0	0	3	3	6
5:15 PM	0	0	0	0	0	0	2	2	0	0	0	0	0	0	1	1	3
5:30 PM	0	1	0	1	0	0	1	1	0	0	0	0	1	0	0	1	3
5:45 PM	2	1	0	3	0	2	0	2	0	0	0	0	1	0	1	2	7
Total Survey	6	9	0	15	0	9	12	21	0	0	0	0	5	0	7	12	48

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound 10th St			Southbound 10th St			Eastbound I-205 SB Ramps			Westbound I-205 SB Ramps			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	5	4	9	7	8	15	0	7	7	7	0	7	19
PHF	0.16			0.13			0.00			0.29			0.20

By Movement	Northbound 10th St				Southbound 10th St				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	3	0	5	0	2	5	7	0	0	0	0	2	0	5	7	19
PHF	0.13	0.15	0.00	0.16	0.00	0.07	0.21	0.13	0.00	0.00	0.00	0.00	0.25	0.00	0.25	0.29	0.20

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	4	6	0	10	0	7	7	14	0	0	0	0	3	0	2	5	29
4:15 PM	4	5	0	9	0	4	8	12	0	0	0	0	2	0	5	7	28
4:30 PM	2	5	0	7	0	1	5	6	0	0	0	0	2	0	5	7	20
4:45 PM	1	3	0	4	0	0	6	6	0	0	0	0	2	0	5	7	17
5:00 PM	2	3	0	5	0	2	5	7	0	0	0	0	2	0	5	7	19

Peak Hour Summary

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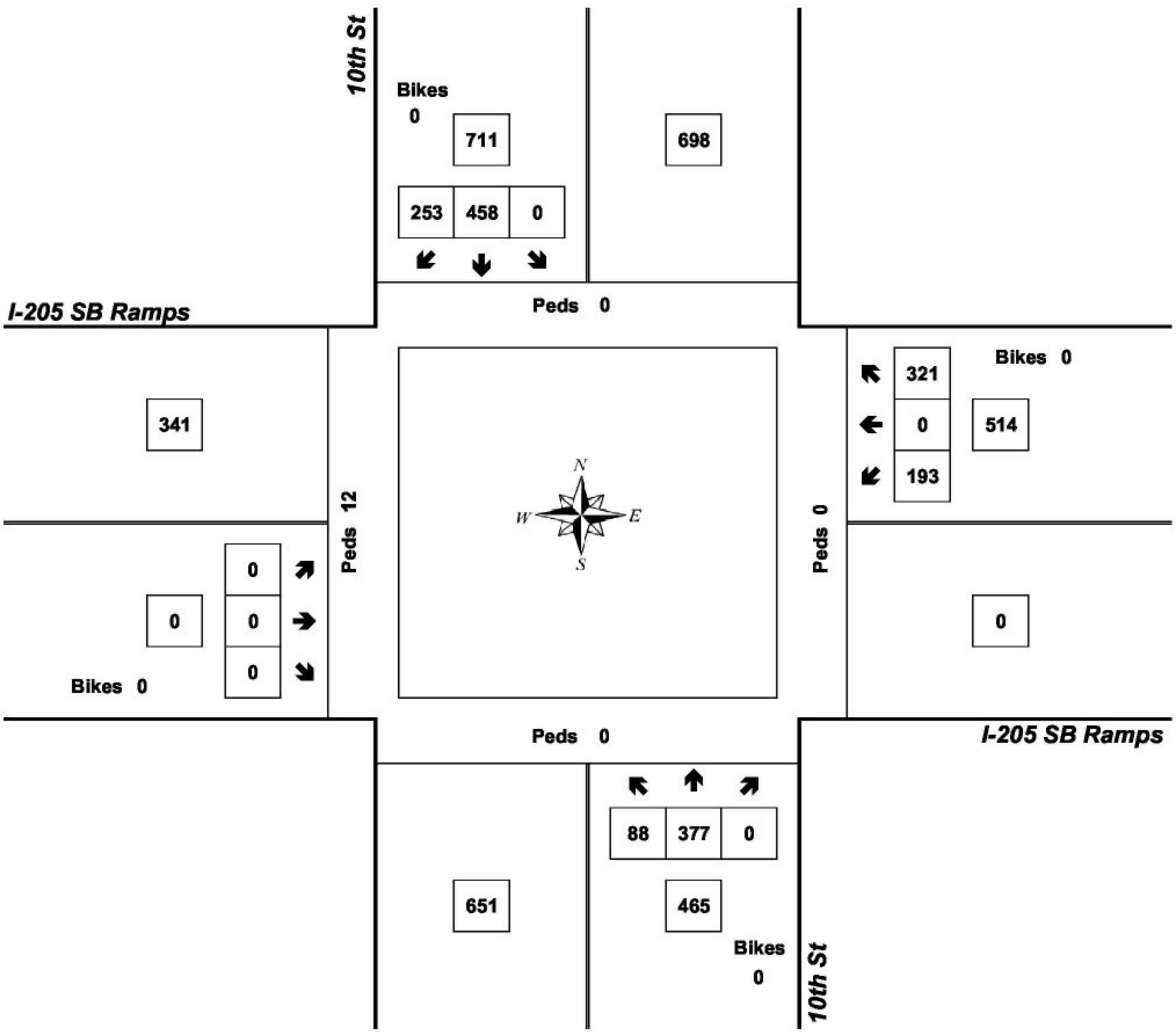
(503) 833-2740

10th St & I-205 SB Ramps

5:00 PM to 6:00 PM

Wednesday, April 16, 2014



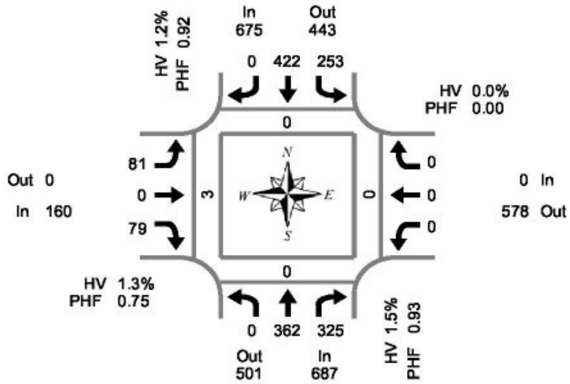
Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.97	1.4%	514
NB	0.85	1.1%	465
SB	0.94	1.0%	711
Intersection	0.93	1.1%	1,690

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

10th St & I-205 NB Ramps

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Interval Total
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	
4:00 PM	0	94	46	0	73	100	0	0	30	0	18	0	0	0	0	0	361
4:15 PM	0	87	84	0	69	114	0	0	27	0	16	0	0	0	0	0	397
4:30 PM	0	83	77	0	56	99	0	1	23	0	30	0	0	0	0	0	368
4:45 PM	0	104	67	0	62	111	0	0	13	0	21	0	0	0	0	0	378
5:00 PM	0	88	97	0	66	98	0	0	18	0	12	0	0	0	0	0	379
5:15 PM	0	86	65	0	65	91	0	0	30	0	14	0	0	0	0	0	351
5:30 PM	0	82	94	0	43	112	0	0	31	0	25	0	0	0	0	0	387
5:45 PM	0	95	53	0	44	126	0	0	47	1	35	0	0	0	0	0	401
Total Survey	0	719	583	0	478	851	0	1	219	1	171	0	0	0	0	0	3,022

Pedestrians Crosswalk			
North	South	East	West
0	0	0	1
0	0	0	1
0	0	0	1
0	0	0	1
0	0	0	0
0	0	0	3
0	0	0	5
0	0	0	4
0	0	0	16

Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound 10th St				Southbound 10th St				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Total
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	687	501	1,188	0	675	443	1,118	1	160	0	160	0	0	578	578	0	1,522
%HV	1.5%				1.2%				1.3%				0.0%				1.3%
PHF	0.93				0.92				0.75				0.00				0.96

Pedestrians Crosswalk			
North	South	East	West
0	0	0	3

By Movement	Northbound 10th St				Southbound 10th St				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	362	325	687	253	422	0	675	81	0	79	160	0	0	0	0	1,522
%HV	0.0%	1.9%	0.9%	1.5%	0.8%	1.4%	0.0%	1.2%	2.5%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%	1.3%
PHF	0.00	0.87	0.84	0.93	0.92	0.93	0.00	0.92	0.75	0.00	0.66	0.75	0.00	0.00	0.00	0.00	0.96

Rolling Hour Summary
4:00 PM to 6:00 PM

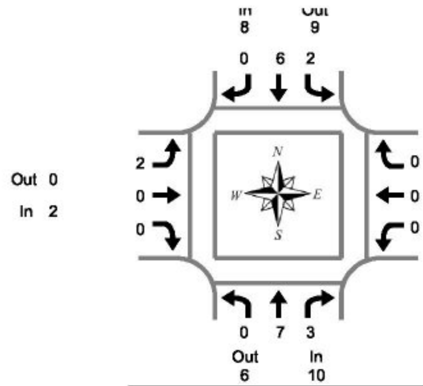
Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Interval Total
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	
4:00 PM	0	368	274	0	260	424	0	1	93	0	85	0	0	0	0	0	1,504
4:15 PM	0	362	325	0	253	422	0	1	81	0	79	0	0	0	0	0	1,522
4:30 PM	0	361	306	0	249	399	0	1	84	0	77	0	0	0	0	0	1,476
4:45 PM	0	360	323	0	236	412	0	0	92	0	72	0	0	0	0	0	1,495
5:00 PM	0	351	309	0	218	427	0	0	126	1	86	0	0	0	0	0	1,518

Pedestrians Crosswalk			
North	South	East	West
0	0	0	4
0	0	0	3
0	0	0	5
0	0	0	9
0	0	0	12

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

10th St & I-205 NB Ramps

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	3	0	3	1	3	0	4	0	0	0	0	0	0	0	0	7
4:15 PM	0	2	2	4	1	4	0	5	0	0	0	0	0	0	0	0	9
4:30 PM	0	2	1	3	1	1	0	2	1	0	0	1	0	0	0	0	6
4:45 PM	0	3	0	3	0	1	0	1	0	0	0	0	0	0	0	0	4
5:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
5:15 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	1	0	1	1	0	0	1	0	0	0	0	2
5:45 PM	0	2	0	2	0	2	0	2	0	0	2	2	0	0	0	0	6
Total Survey	0	12	4	16	3	12	0	15	3	0	2	5	0	0	0	0	36

Heavy Vehicle Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound 10th St			Southbound 10th St			Eastbound I-205 NB Ramps			Westbound I-205 NB Ramps			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	10	6	16	8	9	17	2	0	2	0	5	5	20
PHF	0.25			0.18			0.17			0.00			0.23

By Movement	Northbound 10th St				Southbound 10th St				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	7	3	10	2	6	0	8	2	0	0	2	0	0	0	0	20
PHF	0.00	0.25	0.25	0.25	0.17	0.19	0.00	0.18	0.25	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.23

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

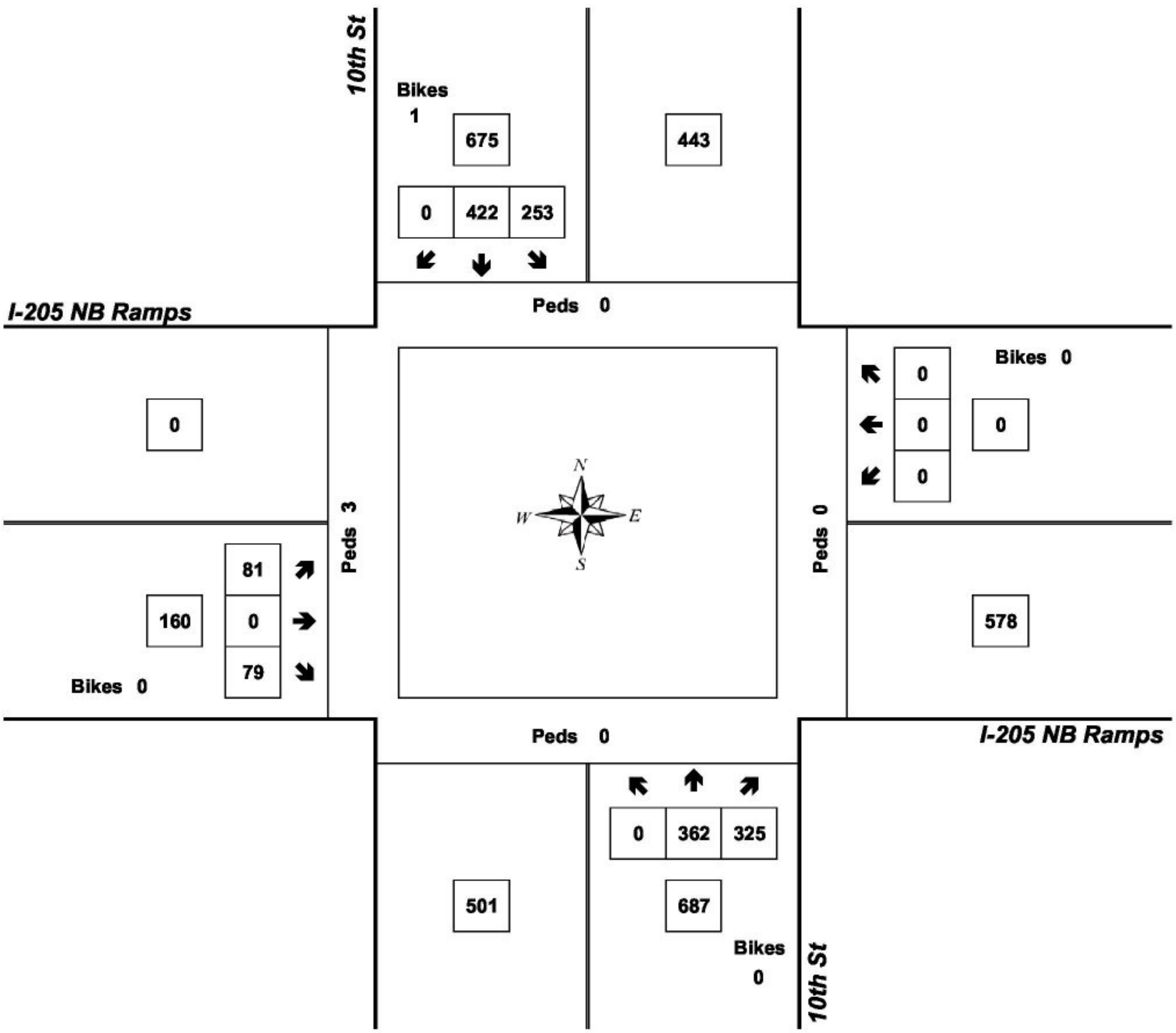
Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	10	3	13	3	9	0	12	1	0	0	1	0	0	0	0	26
4:15 PM	0	7	3	10	2	6	0	8	2	0	0	2	0	0	0	0	20
4:30 PM	0	5	2	7	1	2	0	3	2	0	0	2	0	0	0	0	12
4:45 PM	0	3	1	4	0	2	0	2	2	0	0	2	0	0	0	0	8
5:00 PM	0	2	1	3	0	3	0	3	2	0	2	4	0	0	0	0	10

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

10th St & I-205 NB Ramps

4:15 PM to 5:15 PM
Wednesday, April 16, 2014



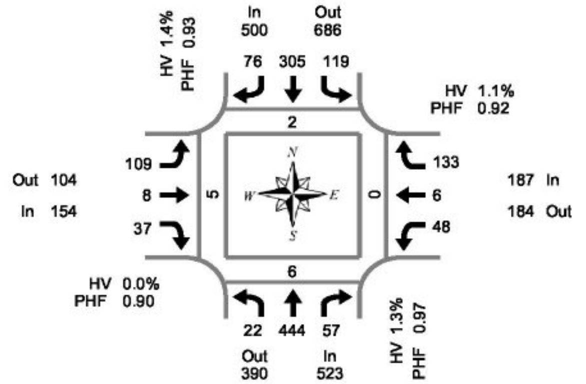
Approach	PHF	HV%	Volume
EB	0.75	1.3%	160
WB	0.00	0.0%	0
NB	0.93	1.5%	687
SB	0.92	1.2%	675
Intersection	0.96	1.3%	1,522

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

10th St & 8th Ave

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound 8th Ave				Westbound 8th Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	3	76	9	0	32	70	18	0	27	1	5	0	6	1	36	0	284	0	0	0	0
4:15 PM	6	108	12	0	31	75	22	0	29	1	9	0	15	2	33	0	343	2	1	0	1
4:30 PM	4	109	17	0	33	76	14	1	20	3	11	0	10	1	33	0	331	0	1	0	0
4:45 PM	5	115	15	0	30	85	19	0	31	2	10	0	13	2	27	0	354	0	4	0	4
5:00 PM	7	112	13	0	25	69	21	0	29	2	7	0	10	1	40	0	336	0	0	0	0
5:15 PM	6	99	14	0	20	69	11	0	25	1	9	0	5	1	30	0	290	0	2	2	3
5:30 PM	5	122	19	0	29	77	27	0	22	5	3	0	13	1	35	0	358	0	1	0	2
5:45 PM	2	86	13	0	27	116	25	0	17	2	6	0	8	2	44	0	348	0	5	0	3
Total Survey	38	827	112	0	227	637	157	1	200	17	60	0	80	11	278	0	2,644	2	14	2	13

Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound 10th St				Southbound 10th St				Eastbound 8th Ave				Westbound 8th Ave				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	523	390	913	0	500	686	1,186	1	154	104	258	0	187	184	371	0	1,364	2	6	0	5
%HV	1.3%				1.4%				0.0%				1.1%				1.2%				
PHF	0.97				0.93				0.90				0.92				0.96				

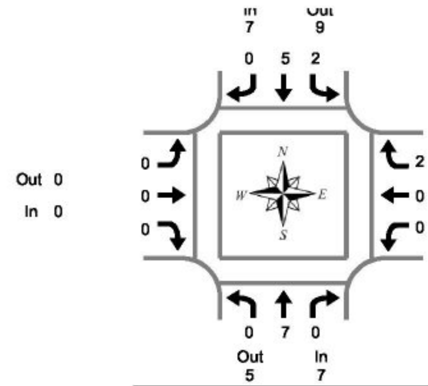
By Movement	Northbound 10th St				Southbound 10th St				Eastbound 8th Ave				Westbound 8th Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	22	444	57	523	119	305	76	500	109	8	37	154	48	6	133	187	1,364
%HV	0.0%	1.6%	0.0%	1.3%	1.7%	1.6%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	1.1%	1.2%
PHF	0.79	0.97	0.84	0.97	0.90	0.90	0.86	0.93	0.88	0.67	0.84	0.90	0.80	0.75	0.83	0.92	0.96

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound 8th Ave				Westbound 8th Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	18	408	53	0	126	306	73	1	107	7	35	0	44	6	129	0	1,312	2	6	0	5
4:15 PM	22	444	57	0	119	305	76	1	109	8	37	0	48	6	133	0	1,364	2	6	0	5
4:30 PM	22	435	59	0	108	299	65	1	105	8	37	0	38	5	130	0	1,311	0	7	2	7
4:45 PM	23	448	61	0	104	300	78	0	107	10	29	0	41	5	132	0	1,338	0	7	2	9
5:00 PM	20	419	59	0	101	331	84	0	93	10	25	0	36	5	149	0	1,332	0	8	2	8

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

10th St & 8th Ave

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound 8th Ave				Westbound 8th Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	3	0	3	0	2	1	3	0	0	0	0	0	0	0	0	6
4:15 PM	0	3	0	3	1	4	0	5	0	0	0	0	0	0	0	0	8
4:30 PM	0	3	0	3	1	0	0	1	0	0	0	0	0	0	1	1	5
4:45 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	1	1	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	1	2
5:45 PM	0	1	0	1	1	2	0	3	2	0	0	2	0	0	0	0	6
Total Survey	0	11	1	12	3	9	2	14	2	0	0	2	1	0	2	3	31

Heavy Vehicle Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound 10th St			Southbound 10th St			Eastbound 8th Ave			Westbound 8th Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	7	5	12	7	9	16	0	0	0	2	2	4	16
PHF	0.19			0.19			0.00			0.25			0.21

By Movement	Northbound 10th St				Southbound 10th St				Eastbound 8th Ave				Westbound 8th Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	7	0	7	2	5	0	7	0	0	0	0	0	0	2	2	16
PHF	0.00	0.19	0.00	0.19	0.25	0.21	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.25	0.21

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

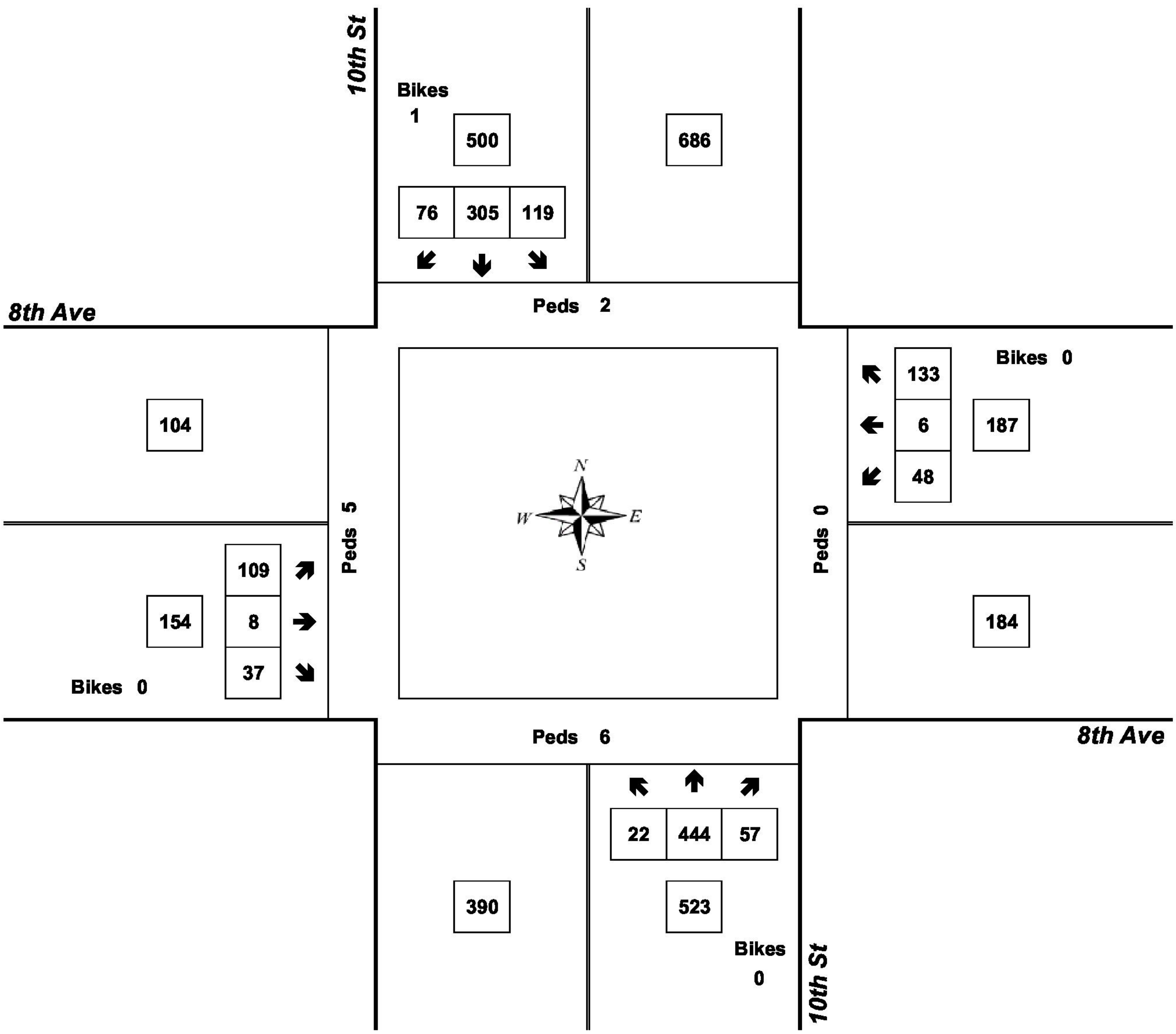
Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound 8th Ave				Westbound 8th Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	10	0	10	2	7	1	10	0	0	0	0	0	0	2	2	22
4:15 PM	0	7	0	7	2	5	0	7	0	0	0	0	0	0	2	2	16
4:30 PM	0	4	1	5	1	1	0	2	0	0	0	0	0	0	2	2	9
4:45 PM	0	1	1	2	0	1	1	2	0	0	0	0	1	0	1	2	6
5:00 PM	0	1	1	2	1	2	1	4	2	0	0	2	1	0	0	1	9

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

10th St & 8th Ave

4:15 PM to 5:15 PM
Wednesday, April 16, 2014



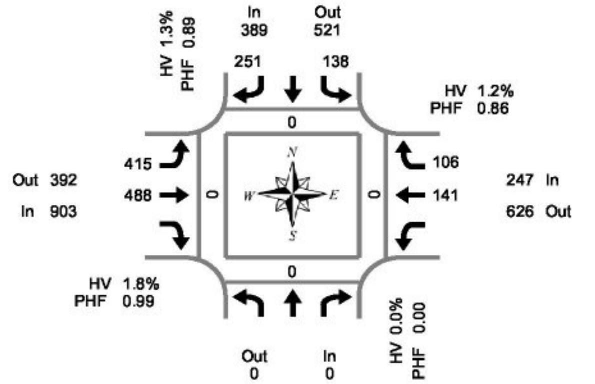
Approach	PHF	HV%	Volume
EB	0.90	0.0%	154
WB	0.92	1.1%	187
NB	0.97	1.3%	523
SB	0.93	1.4%	500
Intersection	0.96	1.2%	1,364

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

10th St & Willamette Falls Dr

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes		North	South	East	West
4:00 PM				0	28		54	0	74	91		0		35	13	0	295	0	0	0	0
4:15 PM				0	37		62	0	101	121		0		33	24	0	378	0	0	0	0
4:30 PM				0	47		50	0	104	123		1		30	26	0	380	0	0	0	0
4:45 PM				0	28		81	0	102	127		0		40	32	0	410	0	0	0	0
5:00 PM				0	26		58	0	108	117		0		38	24	0	371	0	0	0	0
5:15 PM				0	34		50	0	90	108		0		32	30	0	344	2	0	0	0
5:30 PM				0	30		64	0	107	106		0		39	34	0	380	0	0	0	0
5:45 PM				0	46		84	0	81	76		0		23	23	0	333	0	0	0	0
Total Survey				0	276		503	0	767	869		1		270	206	0	2,891	2	0	0	0

Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	389	521	910	0	903	392	1,295	1	247	626	873	0	1,539	0	0	0	0
%HV	0.0%				1.3%				1.8%				1.2%				1.6%				
PHF	0.00				0.89				0.99				0.86				0.94				

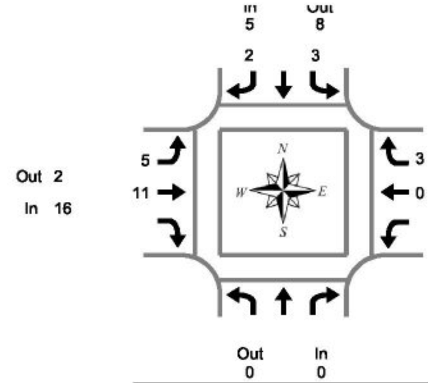
By Movement	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	138		251	389	415	488		903		141	106	247	1,539
%HV	NA	NA	NA	0.0%	2.2%	NA	0.8%	1.3%	1.2%	2.3%	NA	1.8%	NA	0.0%	2.8%	1.2%	1.6%
PHF				0.00	0.73		0.77	0.89	0.96	0.96		0.99		0.88	0.83	0.86	0.94

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes		North	South	East	West
4:00 PM				0	140		247	0	381	462		1		138	95	0	1,463	0	0	0	0
4:15 PM				0	138		251	0	415	488		1		141	106	0	1,539	0	0	0	0
4:30 PM				0	135		239	0	404	475		1		140	112	0	1,505	2	0	0	0
4:45 PM				0	118		253	0	407	458		0		149	120	0	1,505	2	0	0	0
5:00 PM				0	136		256	0	386	407		0		132	111	0	1,428	2	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

10th St & Willamette Falls Dr

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
4:00 PM				0	1		1	2	3	1		4		0	0	0	6
4:15 PM				0	3		1	4	3	3		6		0	1	1	11
4:30 PM				0	0		0	0	2	4		6		0	1	1	7
4:45 PM				0	0		1	1	0	3		3		0	1	1	5
5:00 PM				0	0		0	0	0	1		1		0	0	0	1
5:15 PM				0	0		0	0	1	2		3		0	0	0	3
5:30 PM				0	0		2	2	0	0		0		0	0	0	2
5:45 PM				0	2		0	2	0	1		1		0	1	1	4
Total Survey				0	6		5	11	9	15		24		0	4	4	39

Heavy Vehicle Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	In	Out	Total		In	Out	Total		In	Out	Total		In	Out	Total		
Volume	0	0	0		5	8	13		16	2	18		3	14	17		24
PHF	0.00				0.21				0.25				0.25				0.25

By Movement	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	3		2	5	5	11		16		0	3	3	24
PHF				0.00	0.19		0.25	0.21	0.16	0.28		0.25		0.00	0.25	0.25	0.25

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

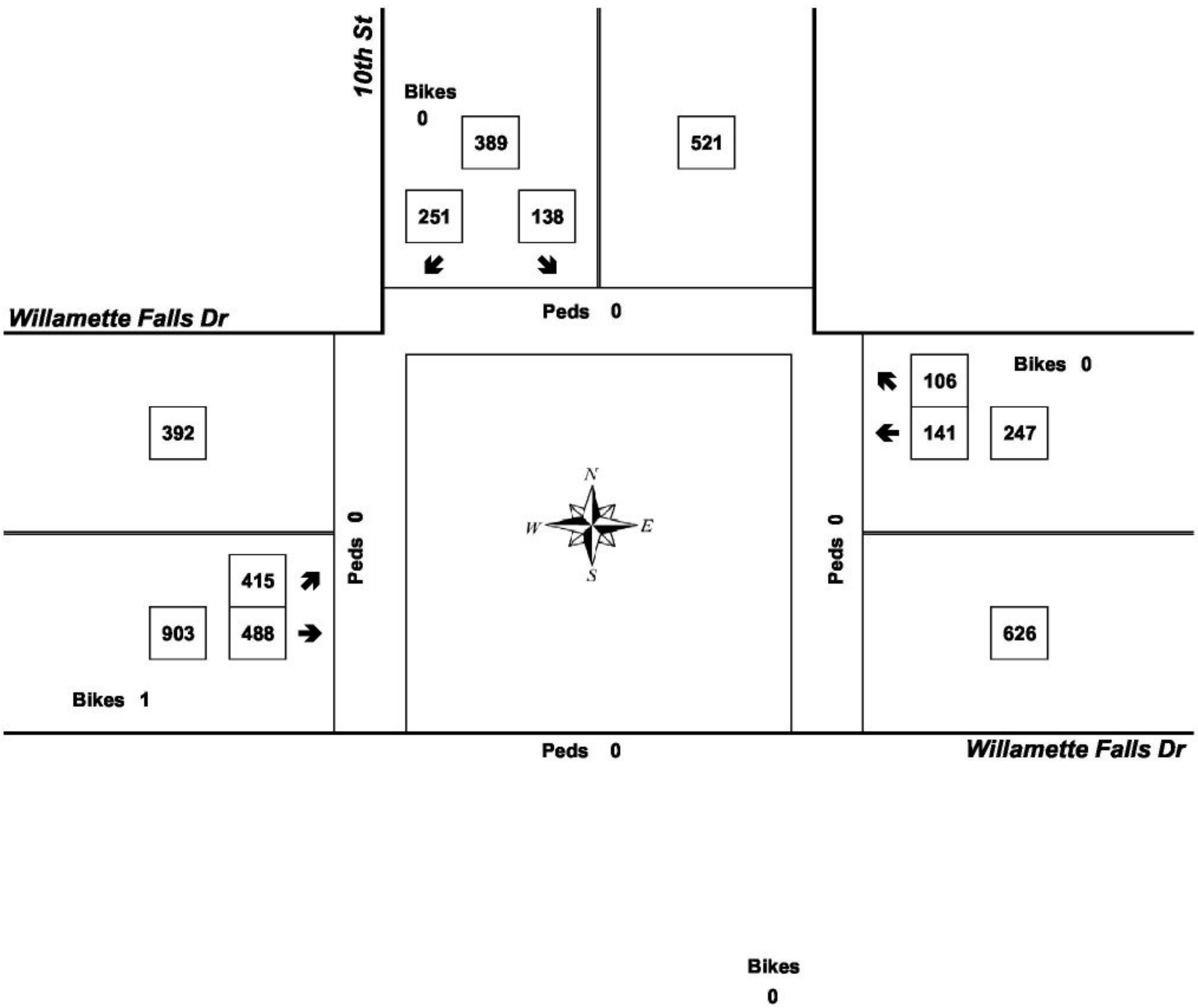
Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
4:00 PM				0	4		3	7	8	11		19		0	3	3	29
4:15 PM				0	3		2	5	5	11		16		0	3	3	24
4:30 PM				0	0		1	1	3	10		13		0	2	2	16
4:45 PM				0	0		3	3	1	6		7		0	1	1	11
5:00 PM				0	2		2	4	1	4		5		0	1	1	10

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

10th St & Willamette Falls Dr

4:15 PM to 5:15 PM
Wednesday, April 16, 2014



Approach	PHF	HV%	Volume
EB	0.99	1.8%	903
WB	0.86	1.2%	247
NB	0.00	0.0%	0
SB	0.89	1.3%	389
Intersection	0.94	1.6%	1,539

Count Period: 4:00 PM to 6:00 PM

Appendix B Existing Traffic Operations and Queuing Worksheets

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	98	433	327	70	341	320
v/c Ratio	0.46	0.43	0.77	0.10	0.39	0.24
Control Delay	45.5	5.9	43.9	15.5	18.6	0.8
Queue Delay	0.0	0.0	0.0	0.0	2.6	0.5
Total Delay	45.5	5.9	43.9	15.5	21.2	1.3
Queue Length 50th (ft)	51	45	167	23	117	0
Queue Length 95th (ft)	108	123	272	47	240	18
Internal Link Dist (ft)	590			679	177	
Turn Bay Length (ft)		150	200		100	
Base Capacity (vph)	648	1004	647	1454	870	1428
Starvation Cap Reductn	0	0	0	0	402	712
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.43	0.51	0.05	0.73	0.45

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	94	416	314	67	327	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	6.0	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1900	1580	1770	1900	1787	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1900	1580	1770	1900	1787	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	98	433	327	70	341	320
RTOR Reduction (vph)	0	92	0	0	0	91
Lane Group Flow (vph)	98	341	327	70	341	229
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	2%	2%	0%	1%	2%
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	4	5	3	8	5	3
Permitted Phases		4				5
Actuated Green, G (s)	7.7	48.7	20.1	32.8	41.0	61.1
Effective Green, g (s)	7.7	48.7	20.1	32.8	41.0	61.1
Actuated g/C Ratio	0.09	0.57	0.24	0.38	0.48	0.72
Clearance Time (s)	5.5	5.5	5.5	6.0	5.5	5.5
Vehicle Extension (s)	2.3	5.2	2.3	2.3	5.2	2.3
Lane Grp Cap (vph)	172	1004	417	731	859	1236
v/s Ratio Prot	c0.05	0.16	c0.18	0.04	c0.19	0.04
v/s Ratio Perm		0.05				0.10
v/c Ratio	0.57	0.34	0.78	0.10	0.40	0.19
Uniform Delay, d1	37.2	9.7	30.6	16.8	14.2	4.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.1	0.1	8.9	0.0	1.4	0.0
Delay (s)	40.3	9.9	39.4	16.8	15.6	4.0
Level of Service	D	A	D	B	B	A
Approach Delay (s)	15.5			35.4	10.0	
Approach LOS	B			D	A	

Intersection Summary			
HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	85.3	Sum of lost time (s)	16.5
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	196	312	109	363	776
v/c Ratio	0.69	0.61	0.16	0.26	0.81
Control Delay	53.4	9.9	23.2	5.7	38.5
Queue Delay	0.0	0.0	0.0	0.0	2.1
Total Delay	53.4	9.9	23.2	5.7	40.6
Queue Length 50th (ft)	119	0	43	65	218
Queue Length 95th (ft)	211	76	103	134	321
Internal Link Dist (ft)	651			256	177
Turn Bay Length (ft)			250		
Base Capacity (vph)	451	633	701	1567	1299
Starvation Cap Reductn	0	0	0	0	361
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.43	0.49	0.16	0.23	0.83

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	184	0	293	102	341	0	0	491	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.5	5.5	5.5	5.5			5.5	
Lane Util. Factor					1.00	1.00	1.00	1.00			0.95	
Frpb, ped/bikes					1.00	1.00	1.00	1.00			0.99	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.95	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1787	1583	1736	1881			3353	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1787	1583	1736	1881			3353	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	196	0	312	109	363	0	0	522	254
RTOR Reduction (vph)	0	0	0	0	0	262	0	0	0	0	53	0
Lane Group Flow (vph)	0	0	0	0	196	50	109	363	0	0	723	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	1%	0%	2%	4%	1%	0%	0%	1%	3%
Turn Type				Split		Perm	Prot					
Protected Phases				8	8		5	2			6	
Permitted Phases						8						
Actuated Green, G (s)					16.1	16.1	40.6	73.2			27.1	
Effective Green, g (s)					16.1	16.1	40.6	73.2			27.1	
Actuated g/C Ratio					0.16	0.16	0.40	0.73			0.27	
Clearance Time (s)					5.5	5.5	5.5	5.5			5.5	
Vehicle Extension (s)					2.3	2.3	5.2	2.3			2.3	
Lane Grp Cap (vph)					287	254	703	1373			906	
v/s Ratio Prot					c0.11		0.06	c0.19			c0.22	
v/s Ratio Perm						0.03						
v/c Ratio					0.68	0.20	0.16	0.26			0.80	
Uniform Delay, d1					39.7	36.5	19.0	4.5			34.0	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					5.7	0.2	0.5	0.1			4.7	
Delay (s)					45.4	36.7	19.4	4.6			38.8	
Level of Service					D	D	B	A			D	
Approach Delay (s)		0.0			40.1			8.0			38.8	
Approach LOS		A			D			A			D	

Intersection Summary			
HCM Average Control Delay	30.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.3	Sum of lost time (s)	16.5
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	84	82	377	339	264	440
v/c Ratio	0.33	0.27	0.50	0.42	0.62	0.30
Control Delay	31.4	10.4	18.0	5.8	29.5	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.4	10.4	18.0	5.8	29.5	4.0
Queue Length 50th (ft)	29	0	103	16	88	48
Queue Length 95th (ft)	78	37	221	78	183	98
Internal Link Dist (ft)	628		216			168
Turn Bay Length (ft)				100	150	
Base Capacity (vph)	663	656	1047	1017	837	1725
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.13	0.36	0.33	0.32	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	0	79	0	0	0	0	362	325	253	422	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	1615					1863	1599	1787	1881	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	1615					1863	1599	1787	1881	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	84	0	82	0	0	0	0	377	339	264	440	0
RTOR Reduction (vph)	0	0	73	0	0	0	0	0	160	0	0	0
Lane Group Flow (vph)	0	84	9	0	0	0	0	377	179	264	440	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	2%	1%	1%	1%	0%
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		8						6		5	2	
Permitted Phases	8		8						6			
Actuated Green, G (s)		6.3	6.3					24.5	24.5	14.1	43.6	
Effective Green, g (s)		6.3	6.3					24.5	24.5	14.1	43.6	
Actuated g/C Ratio		0.11	0.11					0.41	0.41	0.24	0.73	
Clearance Time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)		2.3	2.3					6.9	6.9	2.3	6.9	
Lane Grp Cap (vph)		186	170					762	654	421	1369	
v/s Ratio Prot								c0.20		c0.15	0.23	
v/s Ratio Perm		0.05	0.01						0.11			
v/c Ratio		0.45	0.05					0.49	0.27	0.63	0.32	
Uniform Delay, d1		25.2	24.1					13.1	11.8	20.5	2.9	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.0	0.1					1.8	0.8	2.4	0.5	
Delay (s)		26.2	24.2					14.9	12.6	22.9	3.4	
Level of Service		C	C					B	B	C	A	
Approach Delay (s)		25.2			0.0			13.8			10.7	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	59.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	109	8	37	48	6	133	22	445	57	119	306	76
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	114	8	39	50	6	139	23	464	59	124	319	79
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											296	
pX, platoon unblocked	0.96	0.96	0.96	0.96	0.96		0.96					
vC, conflicting volume	1188	1175	358	1148	1185	493	398			523		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1176	1162	313	1135	1172	493	354			523		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	95	95	65	96	76	98			88		
cM capacity (veh/h)	108	163	704	142	161	576	1169			1044		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	114	47	195	23	523	124	398
Volume Left	114	0	50	23	0	124	0
Volume Right	0	39	139	0	59	0	79
cSH	108	443	499	1169	1700	1044	1700
Volume to Capacity	1.05	0.11	0.39	0.02	0.31	0.12	0.23
Queue Length 95th (ft)	172	9	46	1	0	10	0
Control Delay (s)	176.3	14.1	22.4	8.1	0.0	8.9	0.0
Lane LOS	F	B	C	A		A	
Approach Delay (s)	128.9		22.4	0.3		2.1	
Approach LOS	F		C				

Intersection Summary			
Average Delay	18.5		
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	417	488	141	107	139	252
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	444	519	150	114	148	268

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total (vph)	444	519	264	148	268
Volume Left (vph)	444	0	0	148	0
Volume Right (vph)	0	0	114	0	268
Hadj (s)	0.52	0.03	-0.24	0.53	-0.68
Departure Headway (s)	6.9	6.4	6.4	7.9	6.7
Degree Utilization, x	0.84	0.92	0.47	0.33	0.50
Capacity (veh/h)	520	552	548	447	528
Control Delay (s)	35.6	44.3	15.0	13.5	14.9
Approach Delay (s)	40.3		15.0	14.4	
Approach LOS	E		C	B	

Intersection Summary			
Delay	29.7		
HCM Level of Service	D		
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix C Crash Data

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Willamette Falls Drive & 10th Street

January 1, 2009 through December 31, 2013

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2011														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2011 TOTAL	0	0	2	2	0	0	0	2	0	2	0	2	0	0
YEAR: 2010														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2010 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2009														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2009 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	0	4	4	0	0	0	4	0	4	0	4	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF WEST LINN, CLACKAMAS COUNTY

Willamette Falls Drive & 10th Street
January 1, 2009 through December 31, 2013

SER# INVEST	S P E E D / A L C / D R U G S / S C H L / W O R K	DATE DAY TIME	CLASS DIST FROM	CITY STREET FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFF-RD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
04581	N N N	11/30/2011	16	WILLAMETTE FALLS DR	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE		Wed	0	10TH ST	SW		STOP SIGN	N	DRY	REAR		PRVTE	SW NE									000		00
		4P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK		026	000		07
																			UNK					
											02	NONE 0	STOP											
												PRVTE	SW NE									011		00
												PSNGR CAR		01	DRVR	NONE	46	M	OR-Y		000	000		00
																			OR<25					
02637	N N N	07/23/2011	16	WILLAMETTE FALLS DR	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-R											02
NONE		Sat	0	10TH ST	CN		STOP SIGN	N	DRY	TURN		PRVTE	N SW									015		00
		7P			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		028	000		02
																			OR<25					
											02	NONE 0	STRGHT											
												PRVTE	NE SW									000		00
												PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		000	000		00
																			OR<25					
02189	N N N	06/28/2010	16	WILLAMETTE FALLS DR	INTER	3-LEG	N	N	CLR	S-1TURN	01	NONE 0	STRGHT										004	07
NONE		Mon	0	10TH ST	CN		STOP SIGN	N	DRY	REAR		PRVTE	NE SW									000		00
		12P			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	38	F	OR-Y		026	000		07
																			OR<25					
											02	NONE 0	STOP											
												PRVTE	NE N									013	004	00
												PSNGR CAR		01	DRVR	NONE	65	F	OR-Y		000	000		00
																			OR<25					
														02	PSNG	NO<5	04	M			000	000		00
02098	N N N	06/09/2009	16	WILLAMETTE FALLS DR	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
NONE		Tue	0	10TH ST	CN		UNKNOWN	N	DRY	TURN		PRVTE	W E									000		00
		4P			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	21	F	OR-Y		028	000		02
																			OR<25					
											02	NONE 0	TURN-L											
												PRVTE	E S									000		00
												PSNGR CAR		01	DRVR	NONE	43	F	OR-Y		000	000		00
																			OR<25					

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

10th Street & 8th Avenue/8th Court
January 1, 2009 through December 31, 2013

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2013														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	2	0	2	0	3	0	2	0	1	1	2	0	0
2013 TOTAL	0	2	1	3	0	3	0	3	0	2	1	3	0	0
YEAR: 2012														
ANGLE	0	0	1	1	0	0	0	0	1	0	1	1	0	0
TURNING MOVEMENTS	0	0	2	2	0	0	0	1	1	0	2	2	0	0
2012 TOTAL	0	0	3	3	0	0	0	1	2	0	3	3	0	0
YEAR: 2011														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2011 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2010														
ANGLE	0	0	1	1	0	0	0	0	1	0	1	1	0	0
TURNING MOVEMENTS	0	0	2	2	0	0	0	1	1	1	1	2	0	0
2010 TOTAL	0	0	3	3	0	0	0	1	2	1	2	3	0	0
YEAR: 2009														
TURNING MOVEMENTS	0	0	2	2	0	0	0	2	0	1	1	2	0	0
2009 TOTAL	0	0	2	2	0	0	0	2	0	1	1	2	0	0
FINAL TOTAL	0	3	9	12	0	4	0	8	4	5	7	12	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

064 EAST PORTLAND FREEWAY

10th Street & 8th Avenue/8th Court
January 1, 2009 through December 31, 2013

SER# / INVEST	S P E A U C O / D R S W E L G H R / D C S L K	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# FC / COMPNT MLG TYP / MILEPNT	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL / TRAF- CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00143	N N N	01/12/2012	CLACKAMAS	1 17	2	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L										08
NONE		Thu	WEST LINN	6 0	8TH AVE	N		STOP SIGN	N	DRY	TURN		PRVTE	W N									015	00
		7P	PORTLAND UA	6.40	10TH ST	05	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	80	M	OR-Y		007	000	08
																				OR<25				
												02	NONE 0	STRGHT										
													PRVTE	S N									000	00
													PSNGR CAR		01	DRVR	NONE	20	M	OR-Y		000	000	00
																				OR<25				
00782	N N N	02/28/2009	CLACKAMAS	1 17	2	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L										02
NONE		Sat	WEST LINN	6 0	8TH AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE	E S									015	00
		11P	PORTLAND UA	6.40	10TH ST	01	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	17	F	OR-Y		028	000	02
																				OR<25				
												02	NONE 0	STRGHT										
													PRVTE	N S									000	00
													PSNGR CAR		01	DRVR	NONE	62	F	OR-Y		000	000	00
																				OR<25				
01005	N N N N N	03/17/2009	CLACKAMAS	1 17	2	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	TURN-L										02
CITY		Tue	WEST LINN	6 0	8TH CT	CN		STOP SIGN	N	DRY	TURN		PRVTE	E S									000	00
		3P	PORTLAND UA	6.40	10TH ST	02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	47	M	OR-Y		028	000	02
																				OR>25				
												02	NONE 0	STRGHT										
													PRVTE	S N									000	00
													PSNGR CAR		01	DRVR	NONE	34	M	OR-Y		000	000	00
																				OR<25				
02649	N N N	07/29/2010	CLACKAMAS	1 19	2	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L										02
NONE		Thu	WEST LINN	6 0	8TH CT	CN		STOP SIGN	N	DRY	TURN		PRVTE	NE SE									000	00
		4P	PORTLAND UA	6.40	10TH ST	03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	UNK		028	000	02
																				OR<25				
												02	NONE 0	STRGHT										
													PRVTE	NW SE									000	00
													PSNGR CAR		01	DRVR	NONE	38	M	OR-Y		000	000	00
																				OR<25				
03642	N N N	10/09/2010	CLACKAMAS	1 17	2	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										02
CITY		Sat	WEST LINN	6 0	8TH CT	CN		TRF SIGNAL	N	WET	TURN		PRVTE	S N									000	00
		9P	PORTLAND UA	6.40	10TH ST	04	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	46	M	OR-Y		000	000	00
																				OR<25				
												02	NONE 0	TURN-L										
													PRVTE	E S									015	00
													PSNGR CAR		01	DRVR	NONE	20	F	OR-Y		028	000	02
																				OR>25				
04522	N N N N N	11/29/2010	CLACKAMAS	1 17	2	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE	STRGHT										02
CITY		Mon	WEST LINN	6 0	8TH AVE	CN		STOP SIGN	N	WET	ANGL		PRVTE	W E									015	00
		5P	PORTLAND UA	6.40	10TH ST	04	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	60	F	OR-Y		028	000	02
																				OR<25				

064 EAST PORTLAND FREEWAY

10th Street & 8th Avenue/8th Court
January 1, 2009 through December 31, 2013

```
       S  D
       P   R S W                                                        INT-TYP                                    SPCL USE
       E A U C O  DATE        COUNTY            RD#  FC                 RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP   TRLR QTY  MOVE                 A S
SER#   E L G H R  DAY         CITY              COMPNT   CONN #         DIRECT    LEGS    TRAF-    RNDBT SURF  COLL TYP    OWNER     FROM      PRTC INJ   G E LICNS PED
INVEST D C S L K  TIME        URBAN AREA        MLG TYP  FIRST  STREET  LOCTN   (#LANES)  CNTL     DRVWY LIGHT SVRTY   V# VEH TYPE   TO     P# TYPE SVRTY E X RES   LOC ERROR          ACTN EVENT          CAUSE
                                                MILEPNT  SECOND STREET
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
                                                                                                                       02 NONE       STRGHT
                                                                                                                          PRVTE      S  N                                            000                 00
                                                                                                                         PSNGR CAR          01 DRVR NONE  43 F OR-Y      000         000                 00
                                                                                                                                                              OR<25

03280  N N N N N 09/06/2011 CLACKAMAS          1  19  2             INTER      CROSS  N           N CLR  ANGL-OTH   01 NONE    0 STRGHT                                                   013           02
CITY              Tue       WEST LINN          6 0    8TH CT        CN                STOP SIGN   N DRY  ANGL         PRVTE      NW SE                                           015                 00
                  3P        PORTLAND UA        6.40   10TH ST       04           0                N DAY  INJ         PSNGR CAR          01 DRVR NONE  78 M OR-Y      028         000                 02
                                                                                                                                                              OR<25

                                                                                                                       02 NONE    0 STRGHT
                                                                                                                          PRVTE      SW NE                                           000  013            00
                                                                                                                         PSNGR CAR          01 DRVR NONE  19 M OR-Y      000         000                 00
                                                                                                                                                              OR<25

                                                                                                                       03 NONE    0 STOP
                                                                                                                          PRVTE      SE NW                                           011  013            00
                                                                                                                         PSNGR CAR          01 DRVR INJC  30 M OR-Y      000         000                 00
                                                                                                                                                              OR<25

                                                                                                                       04 NONE    0 STOP
                                                                                                                          PRVTE      SE NW                                           022                 00
                                                                                                                         PSNGR CAR          01 DRVR NONE  43 M OR-Y      000         000                 00
                                                                                                                                                              OR>25
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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF WEST LINN, CLACKAMAS COUNTY

10th Street & 8th Avenue/8th Court
January 1, 2009 through December 31, 2013

SER# INVEST	S P E A U C O / D R S W / E L G H R / D C S L K	DATE DAY TIME	CLASS DIST FROM	CITY STREET FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CONTL	OFF-RD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
04173	N N N N N	11/06/2012	17	8TH AVE	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT											02
CITY		Tue	0	10TH ST	CN		STOP SIGN	N	WET	ANGL		PRVTE	W E									015		00
		8A			03	0		N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	25	M	OR-Y		028	000		02
																			OR<25					
											02	NONE 0	STRGHT											
												PRVTE	N S									015		00
												PSNGR CAR		01	DRVR	NONE	42	F	OR-Y		000	000		00
																			OR<25					
01337	N N N N N	04/19/2013	19	8TH CT	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
CITY		Fri	0	10TH ST	CN		STOP SIGN	N	DRY	ANGL		PRVTE	E W									015		00
		4P			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	62	F	OR-Y		028	000		02
																			OR<25					
											02	NONE 0	STRGHT											
												PRVTE	N S									000		00
												PSNGR CAR		01	DRVR	NONE	19	M	OR-Y		000	000		00
																			OR<25					
01621	N N N	05/10/2013	17	8TH CT	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L											02
NONE		Fri	0	10TH ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	E S									015		00
		11A			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	65	M	OR-Y		028	000		02
																			OR<25					
											02	NONE 0	TURN-L											
												PRVTE	N E									000		00
												PSNGR CAR		01	DRVR	NONE	58	M	OR-Y		000	000		00
																			OR<25					
04201	N N N	11/07/2012	17	8TH CT	INTER	CROSS	N	N	UNK	ANGL-OTH	01	NONE 0	TURN-L											02
NONE		Wed	0	10TH ST	CN		STOP SIGN	N	WET	TURN		PRVTE	E S									000		00
		6P			03	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	16	F	OR-Y		028	000		02
																			OR<25					
											02	NONE 0	STRGHT											
												PRVTE	N S									000		00
												PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		000	000		00
																			OR<25					
04802	N N N N N	12/05/2013	17	8TH CT	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE 0	STRGHT											02,08
CITY		Thu	0	10TH ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S N									000		00
		7P			04	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	46	M	OR-Y		000	000		00
																			OR<25					
											02	NONE 0	TURN-L											
												PRVTE	N E									000		00
												PSNGR CAR		01	DRVR	INJC	17	M	OR-Y		028,004	000		02,08
																			OR<25					

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

10th Street & Blankenship Road/Salamo Road
January 1, 2009 through December 31, 2013

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2013														
REAR-END	0	0	1	1	0	0	0	1	0	0	1	1	0	0
2013 TOTAL	0	0	1	1	0	0	0	1	0	0	1	1	0	0
FINAL TOTAL	0	0	1	1	0	0	0	1	0	0	1	1	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF WEST LINN, CLACKAMAS COUNTY

10th Street & Blankenship Road/Salamo Road
January 1, 2009 through December 31, 2013

SER# INVEST	S P E E D	A L C	D R U G S	S C H L	W O R K	DATE DAY TIME	CLASS DIST FROM	CITY STREET FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CONTL	OFF-RD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
05072	N	N	N			12/29/2013	17	BLANKENSHIP RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE						Sun	0	10TH ST	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	NW SE									000		00
						5P			09	2		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK OR<25		026	000		07
															02	NONE 0	STOP											
																PRVTE	NW SE									011		00
																PSNGR CAR		01	DRVR	NONE	28	M	OR-Y OR>25		000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

10th Street & I-205 (Hwy 064) NB Ramps

January 1, 2009 through December 31, 2013

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2013														
REAR-END	0	1	0	1	0	1	0	1	0	0	1	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	0	1	1	0	0
2013 TOTAL	0	1	1	2	0	1	0	1	1	0	2	2	0	0
YEAR: 2010														
REAR-END	0	0	1	1	0	0	0	1	0	0	1	1	0	0
2010 TOTAL	0	0	1	1	0	0	0	1	0	0	1	1	0	0
YEAR: 2009														
REAR-END	0	2	0	2	0	2	0	1	1	1	1	2	0	0
2009 TOTAL	0	2	0	2	0	2	0	1	1	1	1	2	0	0
FINAL TOTAL	0	3	2	5	0	3	0	3	2	1	4	5	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

064 EAST PORTLAND FREEWAY

10th Street & I-205 (Hwy 064) NB Ramps
January 1, 2009 through December 31, 2013

SER# INVEST	S P E E A L D U C G S R C H L W O R K	DATE DAY TIME	COUNTY CITY URBAN AREA	RD# FC COMPNT MLG TYP MILEPNT	CONN # FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CNTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V# SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
04883	N N N	12/17/2013	CLACKAMAS	1 11	1	INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT											07
NONE		Tue	WEST LINN	6 0	10TH ST	CN		TRF SIGNAL	N	DRY	REAR	PRVTE	W E									000		00
		6P	PORTLAND UA	6.43	EB EXTO 10TH	03	0		N	DLIT	INJ	PSNGR CAR		01	DRVR	NONE	46	F	OR-Y		026	000		07
																			OR<25					
												02 NONE 0	STOP											
												PRVTE	W E									013		00
												PSNGR CAR		01	DRVR	INJA	41	F	OR-Y		000	000		00
																			OR<25					
00124	Y N N N N	01/07/2009	CLACKAMAS	1 17	2	INTER	CROSS	N	N	CLD	S-1STOP	01 NONE 0	STRGHT										002	27,01,07
CITY		Wed	WEST LINN	6 0	10TH ST	N		TRF SIGNAL	N	WET	REAR	PRVTE	N S									000		00
		5P	PORTLAND UA	6.46	EB EXTO 10TH	06	0		N	DLIT	INJ	PSNGR CAR		01	DRVR	NONE	22	F	OR-Y		016,047,026	038		27,01,07
																			OR<25					
												02 NONE 0	STOP											
												PRVTE	N S									011		00
												PSNGR CAR		01	DRVR	NONE	68	F	OR-Y		000	000		00
																			OR<25					
														02	PSNG	INJC	32	F			000	000		00
02595	N N N N N	07/13/2009	CLACKAMAS	1 17	2	INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT										013	07
CITY		Mon	WEST LINN	6 0	10TH ST	N		TRF SIGNAL	N	DRY	REAR	PRVTE	N S									000		00
		12P	PORTLAND UA	6.46	EB EXTO 10TH	06	0		N	DAY	INJ	PSNGR CAR		01	DRVR	NONE	20	F	OR-Y		026	000		07
																			OR<25					
												02 NONE 0	STOP											
												PRVTE	N S									011	013	00
												PSNGR CAR		01	DRVR	NONE	25	F	OR-Y		000	000		00
																			OR<25					
												03 NONE 0	STOP											
												PRVTE	N S									022		00
												PSNGR CAR		01	DRVR	NONE	16	F	OR-Y		000	000		00
																			OR<25					
														02	PSNG	INJC	46	F			000	000		00
04320	N N N	11/11/2010	CLACKAMAS	1 19	2	INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT											27
NONE		Thu	WEST LINN	6 0	10TH ST	S		TRF SIGNAL	N	DRY	REAR	PRVTE	S N									000		00
		8P	PORTLAND UA	6.46	EB ENFR 10TH	06	0		N	DLIT	PDO	PSNGR CAR		01	DRVR	NONE	46	F	OR-Y		016	000		27
																			OR<25					
												02 NONE 0	STOP											
												PRVTE	S N									011		00
												PSNGR CAR		01	DRVR	NONE	91	M	OR-Y		000	000		00
																			OR<25					
00121	N N N	01/10/2013	CLACKAMAS	1 11	2	INTER	CROSS	N	N	RAIN	O-1TURN	01 NONE 0	STRGHT											04
NONE		Thu	WEST LINN	6 0	10TH ST	CN		TRF SIGNAL	N	WET	TURN	PRVTE	S N									000		00
		8P	PORTLAND UA	6.46	EB ENFR 10TH	03	0		N	DLIT	PDO	PSNGR CAR		01	DRVR	NONE	45	F	OR-Y		000	000		00
																			OR<25					

064 EAST PORTLAND FREEWAY

10th Street & I-205 (Hwy 064) NB Ramps
January 1, 2009 through December 31, 2013

```
       S  D
       P   R S W                                RD#  FC                                 INT-TYP                                         SPCL USE
       E A U C O  DATE        COUNTY            COMPNT    CONN #              RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP        TRLR QTY  MOVE                 A  S
SER#   E L G H R  DAY         CITY              MLG TYP   FIRST  STREET       DIRECT     LEGS   TRAF-    RNDBT SURF  COLL TYP         OWNER     FROM      PRTC INJ   G  E  LICNS PED
INVEST D C S L K  TIME        URBAN AREA        MILEPNT   SECOND STREET       LOCTN    (#LANES) CNTL     DRVWY LIGHT SVRTY       V#  VEH TYPE  TO    P#  TYPE SVRTY E  X  RES   LOC  ERROR         ACTN EVENT      CAUSE

                                                                                                                             02  NONE    0  TURN-L
                                                                                                                                 PRVTE      N  E                                                  000             00
                                                                                                                                PSNGR CAR             01  DRVR NONE  00 M  OR-Y        020,004       000             04
                                                                                                                                                                           OR<25
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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

10th Street & I-205 (Hwy 064) SB Ramps
January 1, 2009 through December 31, 2013

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2012														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2012 TOTAL	0	1	1	2	0	1	0	2	0	2	0	2	0	0
YEAR: 2010														
REAR-END	0	0	1	1	0	0	0	0	0	1	0	1	0	0
2010 TOTAL	0	0	1	1	0	0	0	0	0	1	0	1	0	0
FINAL TOTAL	0	1	2	3	0	1	0	2	0	3	0	3	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CONTINUOUS SYSTEM CRASH LISTING

064 EAST PORTLAND FREEWAY

10th Street & I-205 (Hwy 064) SB Ramps
January 1, 2009 through December 31, 2013

SER# INVEST	S D / P R S W / E A U C O / E L G H R / D C S L K	DATE DAY TIME	COUNTY CITY URBAN AREA	RD# COMPNT MILEPNT	FC MLG TYP	CONN # FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CNTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR OWNER VEH TYPE	QTY	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
03096	N N N	08/21/2012	CLACKAMAS	1	17	2	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	0	STRGHT										013	07
NONE		Tue	WEST LINN	6	0	10TH ST	S		TRF SIGNAL	N	DRY	REAR		PRVTE		S N									000		00
		2P	PORTLAND UA	6.57		WB EXTO 10TH	06	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	20	M	OR-Y		026	000		07
																						OR<25					
													02	NONE	0	STOP											
														PRVTE		S N									011	013	00
														PSNGR CAR			01	DRVR	NONE	40	F	OR-Y		000	000		00
																						OR<25					
													03	NONE	0	STOP											
														PRVTE		S N									022		00
														PSNGR CAR			01	DRVR	NONE	67	M	OR-Y		000	000		00
																						OR<25					
03497	N N N N N	09/20/2012	CLACKAMAS	1	17	2	INTER	CROSS	N	N	CLR	S-OTHER	01	NONE	0	TURN-R											27,08
CITY		Thu	WEST LINN	6	0	10TH ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE		N W									000		00
		7P	PORTLAND UA	6.57		WB ENFR 10TH	01	0		N	DAY	INJ		PSNGR CAR			01	DRVR	NONE	42	F	OTH-Y		016,006	038		27,08
																						OR<25					
																	02	PSNG	INJC	65	F			000	000		00
													02	NONE	0	TURN-R											
														PRVTE		N W									000		00
														PSNGR CAR			01	DRVR	NONE	52	F	OR-Y		000	000		00
																						OR<25					
02020	N N N	06/12/2010	CLACKAMAS	1	17	4	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	0	STRGHT											07
NONE		Sat	WEST LINN	6	0	10TH ST	SE		TRF SIGNAL	N	UNK	REAR		PRVTE		SE NW									000		00
		3P	PORTLAND UA	7.01		WB EXTO 10TH	06	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	00	M	UNK		026	000		07
																						OR<25					
													02	NONE	0	STOP											
														PRVTE		SE NW									011		00
														PSNGR CAR			01	DRVR	NONE	58	F	OR-Y		000	000		00
																						OR<25					

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
000	NONE	NO ACTION OR NON-WARRANTED
001	SKIDDED	SKIDDED
002	ON/OFF V	GETTING ON OR OFF STOPPED OR PARKED VEHICLE
003	LOAD OVR	OVERHANGING LOAD STRUCK ANOTHER VEHICLE, ETC.
006	SLOW DN	SLOWED DOWN
007	AVOIDING	AVOIDING MANEUVER
008	PAR PARK	PARALLEL PARKING
009	ANG PARK	ANGLE PARKING
010	INTERFERE	PASSENGER INTERFERING WITH DRIVER
011	STOPPED	STOPPED IN TRAFFIC NOT WAITING TO MAKE A LEFT TURN
012	STP/L TRN	STOPPED BECAUSE OF LEFT TURN SIGNAL OR WAITING, ETC.
013	STP TURN	STOPPED WHILE EXECUTING A TURN
015	GO A/STOP	PROCEED AFTER STOPPING FOR A STOP SIGN/FLASHING RED.
016	TRN A/RED	TURNED ON RED AFTER STOPPING
017	LOSTCTRL	LOST CONTROL OF VEHICLE
018	EXIT DWY	ENTERING STREET OR HIGHWAY FROM ALLEY OR DRIVEWAY
019	ENTR DWY	ENTERING ALLEY OR DRIVEWAY FROM STREET OR HIGHWAY
020	STR ENTR	BEFORE ENTERING ROADWAY, STRUCK PEDESTRIAN, ETC. ON SIDEWALK OR SHOULDER
021	NO DRVR	CAR RAN AWAY - NO DRIVER
022	PREV COL	STRUCK, OR WAS STRUCK BY, VEHICLE OR PEDESTRIAN IN PRIOR COLLISION BEFORE ACC. STABILIZED
023	STALLED	VEHICLE STALLED
024	DRVR DEAD	DEAD BY UNASSOCIATED CAUSE
025	FATIGUE	FATIGUED, SLEEPY, ASLEEP
026	SUN	DRIVER BLINDED BY SUN
027	HDLGHTS	DRIVER BLINDED BY HEADLIGHTS
028	ILLNESS	PHYSICALLY ILL
029	THRU MED	VEHICLE CROSSED, PLUNGED OVER, OR THROUGH MEDIAN BARRIER
030	PURSUIT	PURSUING OR ATTEMPTING TO STOP A VEHICLE
031	PASSING	PASSING SITUATION
032	PRKOFFRD	VEHICLE PARKED BEYOND CURB OR SHOULDER
033	CROS MED	VEHICLE CROSSED EARTH OR GRASS MEDIAN
034	X N/SGNL	CROSSING AT INTERSECTION - NO TRAFFIC SIGNAL PRESENT
035	X W/ SGNL	CROSSING AT INTERSECTION - TRAFFIC SIGNAL PRESENT
036	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
037	BTWN INT	CROSSING BETWEEN INTERSECTIONS
038	DISTRACT	DRIVER'S ATTENTION DISTRACTED
039	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
040	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
041	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
042	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
043	PLAYINRD	PLAYING IN STREET OR ROAD
044	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
045	WORK ON	WORKING IN ROADWAY OR ALONG SHOULDER
046	W/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. WITH TRAFFIC
047	A/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. FACING TRAFFIC
050	LAY ON RD	STANDING OR LYING IN ROADWAY
051	ENT OFFRD	ENTERING / STARTING IN TRAFFIC LANE FROM OFF ROAD
052	MERGING	MERGING
055	SPRAY	BLINDED BY WATER SPRAY
088	OTHER	OTHER ACTION

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
099	UNK	UNKNOWN ACTION

CAUSE CODE TRANSLATION LIST

CAUSE CODE	SHORT DESCRIPTION	LONG DESCRIPTION
00	NO CODE	NO CAUSE ASSOCIATED AT THIS LEVEL
01	TOO-FAST	TOO FAST FOR CONDITIONS (NOT EXCEED POSTED SPEED
02	NO-YIELD	DID NOT YIELD RIGHT-OF-WAY
03	PAS-STOP	PASSED STOP SIGN OR RED FLASHER
04	DIS SIG	DISREGARDED TRAFFIC SIGNAL
05	LEFT-CTR	DROVE LEFT OF CENTER ON TWO-WAY ROAD; STRADDLING
06	IMP-OVER	IMPROPER OVERTAKING
07	TOO-CLOS	FOLLOWED TOO CLOSELY
08	IMP-TURN	MADE IMPROPER TURN
09	DRINKING	ALCOHOL OR DRUG INVOLVED
10	OTHR-IMP	OTHER IMPROPER DRIVING
11	MECH-DEF	MECHANICAL DEFECT
12	OTHER	OTHER (NOT IMPROPER DRIVING)
13	IMP LN C	IMPROPER CHANGE OF TRAFFIC LANES
14	DIS TCD	DISREGARDED OTHER TRAFFIC CONTROL DEVICE
15	WRNG WAY	WRONG WAY ON ONE-WAY ROAD; WRONG SIDE DIVIDED RO
16	FATIGUE	DRIVER DROWSY/FATIGUED/SLEEPY
17	ILLNESS	PHYSICAL ILLNESS
18	IN RDWY	NON-MOTORIST ILLEGALLY IN ROADWAY
19	NT VISBL	NON-MOTORIST CLOTHING NOT VISIBLE
20	IMP PKNG	VEHICLE IMPROPERLY PARKED
21	DEF STER	DEFECTIVE STEERING MECHANISM
22	DEF BRKE	INADEQUATE OR NO BRAKES
24	LOADSHFT	VEHICLE LOST LOAD OR LOAD SHIFTED
25	TIREFAIL	TIRE FAILURE
26	PHANTOM	PHANTOM / NON-CONTACT VEHICLE
27	INATTENT	INATTENTION
28	NM INATT	NON-MOTORIST INATTENTION
29	F AVOID	FAILED TO AVOID VEHICLE AHEAD
30	SPEED	DRIVING IN EXCESS OF POSTED SPEED
31	RACING	SPEED RACING (PER PAR)
32	CARELESS	CARELESS DRIVING (PER PAR)
33	RECKLESS	RECKLESS DRIVING (PER PAR)
34	AGGRESV	AGGRESSIVE DRIVING (PER PAR)
35	RD RAGE	ROAD RAGE (PER PAR)
40	VIEW OBS	VIEW OBSCURED
50	USED MDN	IMPROPER USE OF MEDIAN OR SHOULDER

COLLISION TYPE CODE TRANSLATION LIST

COLL CODE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OTH	MISCELLANEOUS
-	BACK	BACKING
0	PED	PEDESTRIAN
1	ANGL	ANGLE
2	HEAD	HEAD-ON
3	REAR	REAR-END
4	SS-M	SIDESWIPE - MEETING
5	SS-O	SIDESWIPE - OVERTAKING
6	TURN	TURNING MOVEMENT
7	PARK	PARKING MANEUVER
8	NCOL	NON-COLLISION
9	FIX	FIXED OBJECT OR OTHER OBJECT

CRASH TYPE CODE TRANSLATION LIST

CRASH TYPE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OVERTURN	OVERTURNED
0	NON-COLL	OTHER NON-COLLISION
1	OTH RDWY	MOTOR VEHICLE ON OTHER ROADWAY
2	PRKD MV	PARKED MOTOR VEHICLE
3	PED	PEDESTRIAN
4	TRAIN	RAILWAY TRAIN
6	BIKE	PEDALCYCLIST
7	ANIMAL	ANIMAL
8	FIX OBJ	FIXED OBJECT
9	OTH OBJ	OTHER OBJECT
A	ANGL-STP	ENTERING AT ANGLE - ONE VEHICLE STOPPED
B	ANGL-OTH	ENTERING AT ANGLE - ALL OTHERS
C	S-STRGHT	FROM SAME DIRECTION - BOTH GOING STRAIGHT
D	S-1TURN	FROM SAME DIRECTION - ONE TURN, ONE STRAIGHT
E	S-1STOP	FROM SAME DIRECTION - ONE STOPPED
F	S-OTHER	FROM SAME DIRECTION-ALL OTHERS, INCLUDING PARKING
G	O-STRGHT	FROM OPPOSITE DIRECTION - BOTH GOING STRAIGHT
H	O-1TURN	FROM OPPOSITE DIRECTION - ONE TURN, ONE STRAIGHT
I	O-1STOP	FROM OPPOSITE DIRECTION - ONE STOPPED
J	O-OTHER	FROM OPPOSITE DIRECTION-ALL OTHERS INCL. PARKING

DRIVER LICENSE CODE TRANSLATION LIST

LIC CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NOT LICENSED (HAD NEVER BEEN LICENSED)
1	OR-Y	VALID OREGON LICENSE
2	OTH-Y	VALID LICENSE, OTHER STATE OR COUNTRY
3	SUSP	SUSPENDED/REVOKED

DRIVER RESIDENCE CODE TRANSLATION LIST

RES CODE	SHORT DESC	LONG DESCRIPTION
1	OR<25	OREGON RESIDENT WITHIN 25 MILE OF HOME
2	OR>25	OREGON RESIDENT 25 OR MORE MILES FROM HOME
3	OR-?	OREGON RESIDENT - UNKNOWN DISTANCE FROM HOME
4	N-RES	NON-RESIDENT
9	UNK	UNKNOWN IF OREGON RESIDENT

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
000	NONE	NO ERROR
001	WIDE TRN	WIDE TURN
002	CUT CORN	CUT CORNER ON TURN
003	FAIL TRN	FAILED TO OBEY MANDATORY TRAFFIC TURN SIGNAL, SIGN OR LANE MARKINGS
004	L IN TRF	LEFT TURN IN FRONT OF ONCOMING TRAFFIC
005	L PROHIB	LEFT TURN WHERE PROHIBITED
006	FRM WRNG	TURNED FROM WRONG LANE
007	TO WRONG	TURNED INTO WRONG LANE
008	ILLEG U	U-TURNED ILLEGALLY
009	IMP STOP	IMPROPERLY STOPPED IN TRAFFIC LANE
010	IMP SIG	IMPROPER SIGNAL OR FAILURE TO SIGNAL
011	IMP BACK	BACKING IMPROPERLY (NOT PARKING)
012	IMP PARK	IMPROPERLY PARKED
013	UNPARK	IMPROPER START LEAVING PARKED POSITION
014	IMP STRT	IMPROPER START FROM STOPPED POSITION
015	IMP LGHT	IMPROPER OR NO LIGHTS (VEHICLE IN TRAFFIC)
016	INATTENT	INATTENTION (FAILURE TO DIM LIGHTS PRIOR TO 4/1/97)
017	UNSF VEH	DRIVING UNSAFE VEHICLE (NO OTHER ERROR APPARENT)
018	OTH PARK	ENTERING/EXITING PARKED POSITION W/ INSUFFICIENT CLEARANCE; OTHER IMPROPER PARKING MANEUVER
019	DIS DRIV	DISREGARDED OTHER DRIVER'S SIGNAL
020	DIS SGNL	DISREGARDED TRAFFIC SIGNAL
021	RAN STOP	DISREGARDED STOP SIGN OR FLASHING RED
022	DIS SIGN	DISREGARDED WARNING SIGN, FLARES OR FLASHING AMBER
023	DIS OFCR	DISREGARDED POLICE OFFICER OR FLAGMAN
024	DIS EMER	DISREGARDED SIREN OR WARNING OF EMERGENCY VEHICLE
025	DIS RR	DISREGARDED RR SIGNAL, RR SIGN, OR RR FLAGMAN
026	REAR-END	FAILED TO AVOID STOPPED OR PARKED VEHICLE AHEAD OTHER THAN SCHOOL BUS
027	BIKE ROW	DID NOT HAVE RIGHT-OF-WAY OVER PEDALCYCLIST
028	NO ROW	DID NOT HAVE RIGHT-OF-WAY
029	PED ROW	FAILED TO YIELD RIGHT-OF-WAY TO PEDESTRIAN
030	PAS CURV	PASSING ON A CURVE
031	PAS WRNG	PASSING ON THE WRONG SIDE
032	PAS TANG	PASSING ON STRAIGHT ROAD UNDER UNSAFE CONDITIONS
033	PAS X-WK	PASSED VEHICLE STOPPED AT CROSSWALK FOR PEDESTRIAN
034	PAS INTR	PASSING AT INTERSECTION
035	PAS HILL	PASSING ON CREST OF HILL
036	N/PAS ZN	PASSING IN "NO PASSING" ZONE
037	PAS TRAF	PASSING IN FRONT OF ONCOMING TRAFFIC
038	CUT-IN	CUTTING IN (TWO LANES - TWO WAY ONLY)
039	WRNGSIDE	DRIVING ON WRONG SIDE OF THE ROAD (2-WAY UNDIVIDED ROADWAYS)
040	THRU MED	DRIVING THROUGH SAFETY ZONE OR OVER ISLAND
041	F/ST BUS	FAILED TO STOP FOR SCHOOL BUS

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
042	F/SLO MV	FAILED TO DECREASE SPEED FOR SLOWER MOVING VEHICLE
043	TO CLOSE	FOLLOWING TOO CLOSELY (MUST BE ON OFFICER'S REPORT)
044	STRDL LN	STRADDLING OR DRIVING ON WRONG LANES
045	IMP CHG	IMPROPER CHANGE OF TRAFFIC LANES
046	WRNG WAY	WRONG WAY ON ONE-WAY ROADWAY; WRONG SIDE DIVIDED ROAD
047	BASCRULE	DRIVING TOO FAST FOR CONDITIONS (NOT EXCEEDING POSTED SPEED)
048	OPN DOOR	OPENED DOOR INTO ADJACENT TRAFFIC LANE
049	IMPEDING	IMPEDING TRAFFIC
050	SPEED	DRIVING IN EXCESS OF POSTED SPEED
051	RECKLESS	RECKLESS DRIVING (PER PAR)
052	CARELESS	CARELESS DRIVING (PER PAR)
053	RACING	SPEED RACING (PER PAR)
054	X N/SGNL	CROSSING AT INTERSECTION, NO TRAFFIC SIGNAL PRESENT
055	X W/SGNL	CROSSING AT INTERSECTION, TRAFFIC SIGNAL PRESENT
056	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
057	BTWN INT	CROSSING BETWEEN INTERSECTIONS
059	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
060	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
061	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
062	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
063	PLAYINRD	PLAYING IN STREET OR ROAD
064	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
065	WK IN RD	WORKING IN ROADWAY OR ALONG SHOULDER
070	LAYON RD	STANDING OR LYING IN ROADWAY
071	NM IMP USE	IMPROPER USE OF TRAFFIC LANE BY NON-MOTORIST
073	ELUDING	ELUDING / ATTEMPT TO ELUDE
079	F NEG CURV	FAILED TO NEGOTIATE A CURVE
080	FAIL LN	FAILED TO MAINTAIN LANE
081	OFF RD	RAN OFF ROAD
082	NO CLEAR	DRIVER MISJUDGED CLEARANCE
083	OVRSTEER	OVER-CORRECTING
084	NOT USED	CODE NOT IN USE
085	OVRLOAD	OVERLOADING OR IMPROPER LOADING OF VEHICLE WITH CARGO OR PASSENGERS
097	UNA DIS TC	UNABLE TO DETERMINE WHICH DRIVER DISREGARDED TRAFFIC CONTROL DEVICE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
001	FEL/JUMP	OCCUPANT FELL, JUMPED OR WAS EJECTED FROM MOVING VEHICLE
002	INTERFER	PASSENGER INTERFERED WITH DRIVER
003	BUG INTF	ANIMAL OR INSECT IN VEHICLE INTERFERED WITH DRIVER
004	INDRCT PED	PEDESTRIAN INDIRECTLY INVOLVED (NOT STRUCK)
005	SUB-PED	"SUB-PED": PEDESTRIAN INJURED SUBSEQUENT TO COLLISION, ETC.
006	INDRCT BIK	PEDALCYCLIST INDIRECTLY INVOLVED (NOT STRUCK)
007	HITCHIKR	HITCHHIKER (SOLICITING A RIDE)
008	PSNGR TOW	PASSENGER OR NON-MOTORIST BEING TOWED OR PUSHED ON CONVEYANCE
009	ON/OFF V	GETTING ON/OFF STOPPED/PARKED VEHICLE (OCCUPANTS ONLY; MUST HAVE PHYSICAL CONTACT W/ VEHI(
010	SUB OTRN	OVERTURNED AFTER FIRST HARMFUL EVENT
011	MV PUSHD	VEHICLE BEING PUSHED
012	MV TOWED	VEHICLE TOWED OR HAD BEEN TOWING ANOTHER VEHICLE
013	FORCED	VEHICLE FORCED BY IMPACT INTO ANOTHER VEHICLE, PEDALCYCLIST OR PEDESTRIAN
014	SET MOTN	VEHICLE SET IN MOTION BY NON-DRIVER (CHILD RELEASED BRAKES, ETC.)
015	RR ROW	AT OR ON RAILROAD RIGHT-OF-WAY (NOT LIGHT RAIL)
016	LT RL ROW	AT OR ON LIGHT-RAIL RIGHT-OF-WAY
017	RR HIT V	TRAIN STRUCK VEHICLE
018	V HIT RR	VEHICLE STRUCK TRAIN
019	HIT RR CAR	VEHICLE STRUCK RAILROAD CAR ON ROADWAY
020	JACKNIFE	JACKKNIFE; TRAILER OR TOWED VEHICLE STRUCK TOWING VEHICLE
021	TRL OTRN	TRAILER OR TOWED VEHICLE OVERTURNED
022	CN BROKE	TRAILER CONNECTION BROKE
023	DETACH TRL	DETACHED TRAILING OBJECT STRUCK OTHER VEHICLE, NON-MOTORIST, OR OBJECT
024	V DOOR OPN	VEHICLE DOOR OPENED INTO ADJACENT TRAFFIC LANE
025	WHEELOFF	WHEEL CAME OFF
026	HOOD UP	HOOD FLEW UP
028	LOAD SHIFT	LOST LOAD, LOAD MOVED OR SHIFTED
029	TIREFAIL	TIRE FAILURE
030	PET	PET: CAT, DOG AND SIMILAR
031	LVSTOCK	STOCK: COW, CALF, BULL, STEER, SHEEP, ETC.
032	HORSE	HORSE, MULE, OR DONKEY
033	HRSE&RID	HORSE AND RIDER
034	GAME	WILD ANIMAL, GAME (INCLUDES BIRDS; NOT DEER OR ELK)
035	DEER ELK	DEER OR ELK, WAPITI
036	ANML VEH	ANIMAL-DRAWN VEHICLE
037	CULVERT	CULVERT, OPEN LOW OR HIGH MANHOLE
038	ATENUATN	IMPACT ATTENUATOR
039	PK METER	PARKING METER
040	CURB	CURB (ALSO NARROW SIDEWALKS ON BRIDGES)
041	JIGGLE	JIGGLE BAR OR TRAFFIC SNAKE FOR CHANNELIZATION
042	GDRL END	LEADING EDGE OF GUARDRAIL
043	GARDRAIL	GUARD RAIL (NOT METAL MEDIAN BARRIER)
044	BARRIER	MEDIAN BARRIER (RAISED OR METAL)
045	WALL	RETAINING WALL OR TUNNEL WALL
046	BR RAIL	BRIDGE RAILING OR PARAPET (ON BRIDGE OR APPROACH)
047	BR ABUTMNT	BRIDGE ABUTMENT (INCLUDED "APPROACH END" THRU 2013)
048	BR COLMN	BRIDGE PILLAR OR COLUMN
049	BR GIRDR	BRIDGE GIRDER (HORIZONTAL BRIDGE STRUCTURE OVERHEAD)
050	ISLAND	TRAFFIC RAISED ISLAND
051	GORE	GORE
052	POLE UNK	POLE - TYPE UNKNOWN
053	POLE UTL	POLE - POWER OR TELEPHONE
054	ST LIGHT	POLE - STREET LIGHT ONLY
055	TRF SGNL	POLE - TRAFFIC SIGNAL AND PED SIGNAL ONLY
056	SGN BRDG	POLE - SIGN BRIDGE
057	STOPSIGN	STOP OR YIELD SIGN
058	OTH SIGN	OTHER SIGN, INCLUDING STREET SIGNS
059	HYDRANT	HYDRANT

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
060	MARKER	DELINEATOR OR MARKER (REFLECTOR POSTS)
061	MAILBOX	MAILBOX
062	TREE	TREE, STUMP OR SHRUBS
063	VEG OHED	TREE BRANCH OR OTHER VEGETATION OVERHEAD, ETC.
064	WIRE/CBL	WIRE OR CABLE ACROSS OR OVER THE ROAD
065	TEMP SGN	TEMPORARY SIGN OR BARRICADE IN ROAD, ETC.
066	PERM SGN	PERMANENT SIGN OR BARRICADE IN/OFF ROAD
067	SLIDE	SLIDES, FALLEN OR FALLING ROCKS
068	FRGN OBJ	FOREIGN OBSTRUCTION/DEBRIS IN ROAD (NOT GRAVEL)
069	EQP WORK	EQUIPMENT WORKING IN/OFF ROAD
070	OTH EQP	OTHER EQUIPMENT IN OR OFF ROAD (INCLUDES PARKED TRAILER, BOAT)
071	MAIN EQP	WRECKER, STREET SWEEPER, SNOW PLOW OR SANDING EQUIPMENT
072	OTHER WALL	ROCK, BRICK OR OTHER SOLID WALL
073	IRRGL PVMT	OTHER BUMP (NOT SPEED BUMP), POTHOLE OR PAVEMENT IRREGULARITY (PER PAR)
074	OVERHD OBJ	OTHER OVERHEAD OBJECT (HIGHWAY SIGN, SIGNAL HEAD, ETC.); NOT BRIDGE
075	CAVE IN	BRIDGE OR ROAD CAVE IN
076	HI WATER	HIGH WATER
077	SNO BANK	SNOW BANK
078	LO-HI EDGE	LOW OR HIGH SHOULDER AT PAVEMENT EDGE
079	DITCH	CUT SLOPE OR DITCH EMBANKMENT
080	OBJ FRM MV	STRUCK BY ROCK OR OTHER OBJECT SET IN MOTION BY OTHER VEHICLE (INCL. LOST LOADS)
081	FLY-OBJ	STRUCK BY ROCK OR OTHER MOVING OR FLYING OBJECT (NOT SET IN MOTION BY VEHICLE)
082	VEH HID	VEHICLE OBSCURED VIEW
083	VEG HID	VEGETATION OBSCURED VIEW
084	BLDG HID	VIEW OBSCURED BY FENCE, SIGN, PHONE BOOTH, ETC.
085	WIND GUST	WIND GUST
086	IMMERSED	VEHICLE IMMERSED IN BODY OF WATER
087	FIRE/EXP	FIRE OR EXPLOSION
088	FENC/BLD	FENCE OR BUILDING, ETC.
089	OTHR CRASH	CRASH RELATED TO ANOTHER SEPARATE CRASH
090	TO 1 SIDE	TWO-WAY TRAFFIC ON DIVIDED ROADWAY ALL ROUTED TO ONE SIDE
091	BUILDING	BUILDING OR OTHER STRUCTURE
092	PHANTOM	OTHER (PHANTOM) NON-CONTACT VEHICLE
093	CELL PHONE	CELL PHONE (ON PAR OR DRIVER IN USE)
094	VIOL GDL	TEENAGE DRIVER IN VIOLATION OF GRADUATED LICENSE PGM
095	GUY WIRE	GUY WIRE
096	BERM	BERM (EARTHEN OR GRAVEL MOUND)
097	GRAVEL	GRAVEL IN ROADWAY
098	ABR EDGE	ABRUPT EDGE
099	CELL WTNSD	CELL PHONE USE WITNESSED BY OTHER PARTICIPANT
100	UNK FIXD	FIXED OBJECT, UNKNOWN TYPE.
101	OTHER OBJ	NON-FIXED OBJECT, OTHER OR UNKNOWN TYPE
102	TEXTING	TEXTING
103	WZ WORKER	WORK ZONE WORKER
104	ON VEHICLE	PASSENGER RIDING ON VEHICLE EXTERIOR
105	PEDAL PSGR	PASSENGER RIDING ON PEDALCYCLE
106	MAN WHLCHR	PEDESTRIAN IN NON-MOTORIZED WHEELCHAIR
107	MTR WHLCHR	PEDESTRIAN IN MOTORIZED WHEELCHAIR
108	OFFICER	LAW ENFORCEMENT / POLICE OFFICER
109	SUB-BIKE	"SUB-BIKE": PEDALCYCLIST INJURED SUBSEQUENT TO COLLISION, ETC.
110	N-MTR	NON-MOTORIST STRUCK VEHICLE
111	S CAR VS V	STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM) STRUCK VEHICLE
112	V VS S CAR	VEHICLE STRUCK STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM)
113	S CAR ROW	AT OR ON STREET CAR OR TROLLEY RIGHT-OF-WAY
114	RR EQUIP	VEHICLE STRUCK RAILROAD EQUIPMENT (NOT TRAIN) ON TRACKS
115	DSTRCT GPS	DISTRACTED BY NAVIGATION SYSTEM OR GPS DEVICE
116	DSTRCT OTH	DISTRACTED BY OTHER ELECTRONIC DEVICE
117	RR GATE	RAIL CROSSING DROP-ARM GATE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
118	EXPNSN JNT	EXPANSION JOINT
119	JERSEY BAR	JERSEY BARRIER
120	WIRE BAR	WIRE OR CABLE MEDIAN BARRIER
121	FENCE	FENCE
123	OBJ IN VEH	LOOSE OBJECT IN VEHICLE STRUCK OCCUPANT
124	SLIPPERY	SLIDING OR SWERVING DUE TO WET, ICY, SLIPPERY OR LOOSE SURFACE (NOT GRAVEL)
125	SHLDR	SHOULDER GAVE WAY
126	BOULDER	ROCK(S), BOULDER (NOT GRAVEL; NOT ROCK SLIDE)
127	LAND SLIDE	ROCK SLIDE OR LAND SLIDE
128	CURVE INV	CURVE PRESENT AT CRASH LOCATION
129	HILL INV	VERTICAL GRADE / HILL PRESENT AT CRASH LOCATION
130	CURVE HID	VIEW OBSCURED BY CURVE
131	HILL HID	VIEW OBSCURED BY VERTICAL GRADE / HILL
132	WINDOW HID	VIEW OBSCURED BY VEHICLE WINDOW CONDITIONS
133	SPRAY HID	VIEW OBSCURED BY WATER SPRAY

FUNCTIONAL CLASSIFICATION TRANSLATION LIST

FUNC CLASS	DESCRIPTION
01	RURAL PRINCIPAL ARTERIAL - INTERSTATE
02	RURAL PRINCIPAL ARTERIAL - OTHER
06	RURAL MINOR ARTERIAL
07	RURAL MAJOR COLLECTOR
08	RURAL MINOR COLLECTOR
09	RURAL LOCAL
11	URBAN PRINCIPAL ARTERIAL - INTERSTATE
12	URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXP
14	URBAN PRINCIPAL ARTERIAL - OTHER
16	URBAN MINOR ARTERIAL
17	URBAN COLLECTOR
19	URBAN LOCAL
78	UNKNOWN RURAL SYSTEM
79	UNKNOWN RURAL NON-SYSTEM
98	UNKNOWN URBAN SYSTEM
99	UNKNOWN URBAN NON-SYSTEM

HIGHWAY COMPONENT TRANSLATION LIST

CODE	DESCRIPTION
0	MAINLINE STATE HIGHWAY
1	COUPLET
3	FRONTAGE ROAD
6	CONNECTION
8	HIGHWAY - OTHER

INJURY SEVERITY CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
1	KILL	FATAL INJURY
2	INJA	INCAPACITATING INJURY - BLEEDING, BROKEN BONES
3	INJB	NON-INCAPACITATING INJURY
4	INJC	POSSIBLE INJURY - COMPLAINT OF PAIN
5	PRI	DIED PRIOR TO CRASH
7	NO<5	NO INJURY - 0 TO 4 YEARS OF AGE

LIGHT CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	DAY	DAYLIGHT
2	DLIT	DARKNESS - WITH STREET LIGHTS
3	DARK	DARKNESS - NO STREET LIGHTS
4	DAWN	DAWN (TWILIGHT)
5	DUSK	DUSK (TWILIGHT)

MEDIAN TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NO MEDIAN
1	RSDMD	SOLID MEDIAN BARRIER
2	DIVMD	EARTH, GRASS OR PAVED MEDIAN

MILEAGE TYPE CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
0	REGULAR MILEAGE
T	TEMPORARY
Y	SPUR
Z	OVERLAPPING

MOVEMENT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	STRGHT	STRAIGHT AHEAD
2	TURN-R	TURNING RIGHT
3	TURN-L	TURNING LEFT
4	U-TURN	MAKING A U-TURN
5	BACK	BACKING
6	STOP	STOPPED IN TRAFFIC
7	PRKD-P	PARKED - PROPERLY
8	PRKD-I	PARKED - IMPROPERLY

PEDESTRIAN LOCATION CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
00	AT INTERSECTION - NOT IN ROADWAY
01	AT INTERSECTION - INSIDE CROSSWALK
02	AT INTERSECTION - IN ROADWAY, OUTSIDE CROSSWALK
03	AT INTERSECTION - IN ROADWAY, XWALK AVAIL UNKNWN
04	NOT AT INTERSECTION - IN ROADWAY
05	NOT AT INTERSECTION - ON SHOULDER
06	NOT AT INTERSECTION - ON MEDIAN
07	NOT AT INTERSECTION - WITHIN TRAFFIC RIGHT-OF-WAY
08	NOT AT INTERSECTION - IN BIKE PATH
09	NOT-AT INTERSECTION - ON SIDEWALK
10	OUTSIDE TRAFFICWAY BOUNDARIES
13	AT INTERSECTION - IN BIKE LANE
15	NOT AT INTERSECTION - INSIDE MID-BLOCK CROSSWALK
18	OTHER, NOT IN ROADWAY
99	UNKNOWN LOCATION

ROAD CHARACTER CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	INTER	INTERSECTION
2	ALLEY	DRIVEWAY OR ALLEY
3	STRGHT	STRAIGHT ROADWAY
4	TRANS	TRANSITION
5	CURVE	CURVE (HORIZONTAL CURVE)
6	OPENAC	OPEN ACCESS OR TURNOUT
7	GRADE	GRADE (VERTICAL CURVE)
8	BRIDGE	BRIDGE STRUCTURE
9	TUNNEL	TUNNEL

PARTICIPANT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	OCC	UNKNOWN OCCUPANT TYPE
1	DRVR	DRIVER
2	PSNG	PASSENGER
3	PED	PEDESTRIAN
4	CONV	PEDESTRIAN USING A PEDESTRIAN CONVEYA
5	PTOW	PEDESTRIAN TOWING OR TRAILERING AN OB
6	BIKE	PEDALCYCLIST
7	BTOW	PEDALCYCLIST TOWING OR TRAILERING AN
8	PRKD	OCCUPANT OF A PARKED MOTOR VEHICLE
9	UNK	UNKNOWN TYPE OF NON-MOTORIST

TRAFFIC CONTROL DEVICE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
000	NONE	NO CONTROL
001	TRF SIGNAL	TRAFFIC SIGNALS
002	FLASHBCN-R	FLASHING BEACON - RED (STOP)
003	FLASHBCN-A	FLASHING BEACON - AMBER (SLOW)
004	STOP SIGN	STOP SIGN
005	SLOW SIGN	SLOW SIGN
006	REG-SIGN	REGULATORY SIGN
007	YIELD	YIELD SIGN
008	WARNING	WARNING SIGN
009	CURVE	CURVE SIGN
010	SCHL X-ING	SCHOOL CROSSING SIGN OR SPECIAL SIGNAL
011	OFCR/FLAG	POLICE OFFICER, FLAGMAN - SCHOOL PATROL
012	BRDG-GATE	BRIDGE GATE - BARRIER
013	TEMP-BARR	TEMPORARY BARRIER
014	NO-PASS-ZN	NO PASSING ZONE
015	ONE-WAY	ONE-WAY STREET
016	CHANNEL	CHANNELIZATION
017	MEDIAN BAR	MEDIAN BARRIER
018	PILOT CAR	PILOT CAR
019	SP PED SIG	SPECIAL PEDESTRIAN SIGNAL
020	X-BUCK	CROSSBUCK
021	THR-GN-SIG	THROUGH GREEN ARROW OR SIGNAL
022	L-GRN-SIG	LEFT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
023	R-GRN-SIG	RIGHT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
024	WIGWAG	WIGWAG OR FLASHING LIGHTS W/O DROP-ARM GATE
025	X-BUCK WRN	CROSSBUCK AND ADVANCE WARNING
026	WW W/ GATE	FLASHING LIGHTS WITH DROP-ARM GATES
027	OVRHD SGNL	SUPPLEMENTAL OVERHEAD SIGNAL (RR XING ONLY)
028	SP RR STOP	SPECIAL RR STOP SIGN
029	ILUM GRD X	ILLUMINATED GRADE CROSSING
037	RAMP METER	METERED RAMPS
038	RUMBLE STR	RUMBLE STRIP
090	L-TURN REF	LEFT TURN REFUGE (WHEN REFUGE IS INVOLVED)
091	R-TURN ALL	RIGHT TURN AT ALL TIMES SIGN, ETC.
092	EMR SGN/FL	EMERGENCY SIGNS OR FLARES
093	ACCEL LANE	ACCELERATION OR DECELERATION LANES
094	R-TURN PRO	RIGHT TURN PROHIBITED ON RED AFTER STOPPING

095	BUS STPSGN	BUS STOP SIGN AND RED LIGHTS
099	UNKNOWN	UNKNOWN OR NOT DEFINITE

VEHICLE TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
01	PSNGR CAR	PASSENGER CAR, PICKUP, LIGHT DELIVERY, ETC.
02	BOBTAIL	TRUCK TRACTOR WITH NO TRAILERS (BOBTAIL)
03	FARM TRCTR	FARM TRACTOR OR SELF-PROPELLED FARM EQUIPMENT
04	SEMI TOW	TRUCK TRACTOR WITH TRAILER/MOBILE HOME IN TOW
05	TRUCK	TRUCK WITH NON-DETACHABLE BED, PANEL, ETC.
06	MOPED	MOPED, MINIBIKE, SEATED MOTOR SCOOTER, MOTOR BIKE
07	SCHL BUS	SCHOOL BUS (INCLUDES VAN)
08	OTH BUS	OTHER BUS
09	MTRCYCLE	MOTORCYCLE, DIRT BIKE
10	OTHER	OTHER: FORKLIFT, BACKHOE, ETC.
11	MOTRHOME	MOTORHOME
12	TROLLEY	MOTORIZED STREET CAR/TROLLEY (NO RAILS/WIRES)
13	ATV	ATV
14	MTRSCTR	MOTORIZED SCOOTER (STANDING)
15	SNOWMOBILE	SNOWMOBILE
99	UNKNOWN	UNKNOWN VEHICLE TYPE

WEATHER CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	CLR	CLEAR
2	CLD	CLOUDY
3	RAIN	RAIN
4	SLT	SLEET
5	FOG	FOG
6	SNOW	SNOW
7	DUST	DUST
8	SMOK	SMOKE
9	ASH	ASH

Appendix D Year 2040 Traffic Operations and Queuing Worksheets

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	131	524	407	115	385	397
v/c Ratio	0.58	0.56	0.83	0.13	0.50	0.30
Control Delay	50.5	11.4	48.2	15.0	24.0	1.0
Queue Delay	0.0	0.0	0.0	0.0	13.5	0.9
Total Delay	50.5	11.4	48.2	15.0	37.5	2.0
Queue Length 50th (ft)	77	124	227	39	171	0
Queue Length 95th (ft)	138	214	#390	70	287	22
Internal Link Dist (ft)	590			679	177	
Turn Bay Length (ft)		150	200		100	
Base Capacity (vph)	570	928	569	1282	765	1356
Starvation Cap Reductn	0	0	0	0	357	677
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.56	0.72	0.09	0.94	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	126	503	391	110	370	381
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	6.0	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1900	1579	1770	1900	1787	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1900	1579	1770	1900	1787	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	131	524	407	115	385	397
RTOR Reduction (vph)	0	64	0	0	0	117
Lane Group Flow (vph)	131	460	407	115	385	280
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	2%	2%	0%	1%	2%
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	4	5	3	8	5	3
Permitted Phases		4				5
Actuated Green, G (s)	11.3	51.6	25.9	42.2	40.3	66.2
Effective Green, g (s)	11.3	51.6	25.9	42.2	40.3	66.2
Actuated g/C Ratio	0.12	0.55	0.28	0.45	0.43	0.70
Clearance Time (s)	5.5	5.5	5.5	6.0	5.5	5.5
Vehicle Extension (s)	2.3	5.2	2.3	2.3	5.2	2.3
Lane Grp Cap (vph)	228	959	488	853	766	1207
v/s Ratio Prot	0.07	c0.21	c0.23	0.06	0.22	0.06
v/s Ratio Perm		0.09				0.11
v/c Ratio	0.57	0.48	0.83	0.13	0.50	0.23
Uniform Delay, d1	39.1	13.0	32.0	15.2	19.6	4.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	0.2	11.4	0.0	2.3	0.1
Delay (s)	41.7	13.2	43.4	15.2	21.9	5.0
Level of Service	D	B	D	B	C	A
Approach Delay (s)	18.9			37.2	13.3	
Approach LOS	B			D	B	

Intersection Summary			
HCM Average Control Delay	21.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	267	343	145	456	951
v/c Ratio	0.81	0.60	0.23	0.34	0.89
Control Delay	63.1	9.0	27.8	7.2	45.7
Queue Delay	0.0	0.0	0.0	0.4	125.1
Total Delay	63.1	9.0	27.8	7.6	170.8
Queue Length 50th (ft)	191	0	77	116	322
Queue Length 95th (ft)	287	80	133	177	#425
Internal Link Dist (ft)	651			256	177
Turn Bay Length (ft)			250		
Base Capacity (vph)	407	625	632	1413	1180
Starvation Cap Reductn	0	0	0	520	434
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.66	0.55	0.23	0.51	1.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	251	0	322	136	429	0	0	587	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.5	5.5	5.5	5.5			5.5	
Lane Util. Factor					1.00	1.00	1.00	1.00			0.95	
Frpb, ped/bikes					1.00	1.00	1.00	1.00			0.99	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.95	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1787	1583	1736	1881			3342	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1787	1583	1736	1881			3342	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	267	0	343	145	456	0	0	624	327
RTOR Reduction (vph)	0	0	0	0	0	280	0	0	0	0	58	0
Lane Group Flow (vph)	0	0	0	0	267	63	145	456	0	0	893	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	1%	0%	2%	4%	1%	0%	0%	1%	3%
Turn Type				Split		Perm	Prot					
Protected Phases				8	8		5	2			6	
Permitted Phases						8						
Actuated Green, G (s)					20.4	20.4	40.3	79.2			33.4	
Effective Green, g (s)					20.4	20.4	40.3	79.2			33.4	
Actuated g/C Ratio					0.18	0.18	0.36	0.72			0.30	
Clearance Time (s)					5.5	5.5	5.5	5.5			5.5	
Vehicle Extension (s)					2.3	2.3	5.2	2.3			2.3	
Lane Grp Cap (vph)					330	292	633	1347			1009	
v/s Ratio Prot					c0.15		0.08	c0.24			c0.27	
v/s Ratio Perm						0.04						
v/c Ratio					0.81	0.22	0.23	0.34			0.89	
Uniform Delay, d1					43.2	38.3	24.4	5.9			36.8	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					13.1	0.2	0.8	0.1			9.3	
Delay (s)					56.3	38.5	25.2	6.0			46.0	
Level of Service					E	D	C	A			D	
Approach Delay (s)		0.0			46.3			10.6			46.0	
Approach LOS		A			D			B			D	

Intersection Summary			
HCM Average Control Delay	36.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	110.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	188	109	401	465	312	560
v/c Ratio	0.61	0.29	0.58	0.57	0.74	0.44
Control Delay	38.3	8.7	24.1	8.9	37.8	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	8.7	24.1	8.9	37.8	6.8
Queue Length 50th (ft)	83	0	140	35	136	93
Queue Length 95th (ft)	159	41	289	142	241	193
Internal Link Dist (ft)	628		216			168
Turn Bay Length (ft)				100	150	
Base Capacity (vph)	512	545	808	891	646	1561
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.20	0.50	0.52	0.48	0.36

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	0	105	0	0	0	0	385	446	300	538	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	1615					1863	1599	1787	1881	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	1615					1863	1599	1787	1881	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	188	0	109	0	0	0	0	401	465	312	560	0
RTOR Reduction (vph)	0	0	90	0	0	0	0	0	217	0	0	0
Lane Group Flow (vph)	0	188	19	0	0	0	0	401	248	312	560	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	2%	1%	1%	1%	0%
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		8						6		5	2	
Permitted Phases	8		8						6			
Actuated Green, G (s)		12.6	12.6					26.9	26.9	17.1	49.0	
Effective Green, g (s)		12.6	12.6					26.9	26.9	17.1	49.0	
Actuated g/C Ratio		0.18	0.18					0.38	0.38	0.24	0.68	
Clearance Time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)		2.3	2.3					6.9	6.9	2.3	6.9	
Lane Grp Cap (vph)		311	284					700	601	427	1287	
v/s Ratio Prot								c0.22		c0.17	0.30	
v/s Ratio Perm		0.11	0.01						0.15			
v/c Ratio		0.60	0.07					0.57	0.41	0.73	0.44	
Uniform Delay, d1		27.2	24.6					17.8	16.5	25.1	5.1	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.6	0.1					2.7	1.6	5.8	0.8	
Delay (s)		29.8	24.7					20.4	18.1	30.9	5.9	
Level of Service		C	C					C	B	C	A	
Approach Delay (s)		27.9			0.0			19.2			14.8	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM Average Control Delay	18.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	71.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	123	10	40	50	8	159	22	549	60	125	428	90
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	128	10	42	52	8	166	23	572	62	130	446	94
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											296	
pX, platoon unblocked	0.88	0.88	0.88	0.88	0.88		0.88					
vC, conflicting volume	1458	1433	493	1402	1449	603	540			634		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1452	1425	361	1389	1442	603	414			634		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	90	93	36	92	67	98			86		
cM capacity (veh/h)	53	102	608	81	100	499	1022			949		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	128	52	226	23	634	130	540
Volume Left	128	0	52	23	0	130	0
Volume Right	0	42	166	0	62	0	94
cSH	53	306	313	1022	1700	949	1700
Volume to Capacity	2.40	0.17	0.72	0.02	0.37	0.14	0.32
Queue Length 95th (ft)	326	15	131	2	0	12	0
Control Delay (s)	802.2	19.2	43.4	8.6	0.0	9.4	0.0
Lane LOS	F	C	E	A		A	
Approach Delay (s)	575.9		43.4	0.3		1.8	
Approach LOS	F		E				

Intersection Summary			
Average Delay	66.4		
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	456	703	230	175	218	300
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	485	748	245	186	232	319

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total (vph)	485	748	431	232	319
Volume Left (vph)	485	0	0	232	0
Volume Right (vph)	0	0	186	0	319
Hadj (s)	0.52	0.03	-0.24	0.53	-0.68
Departure Headway (s)	7.7	7.2	6.7	8.2	7.0
Degree Utilization, x	1.03	1.49	0.81	0.53	0.62
Capacity (veh/h)	466	505	527	425	501
Control Delay (s)	76.5	248.2	32.0	18.8	19.5
Approach Delay (s)	180.6		32.0	19.2	
Approach LOS	F		D	C	

Intersection Summary			
Delay	111.6		
HCM Level of Service	F		
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		

Appendix E Year 2040 Traffic Conditions and Queuing Worksheets with Corridor Improvements Alternative 1

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	131	524	407	115	385	397
v/c Ratio	0.54	0.29	0.66	0.16	0.23	0.31
Control Delay	42.9	3.2	37.2	17.4	13.5	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.6	0.4
Total Delay	42.9	3.2	37.2	17.4	14.0	1.5
Queue Length 50th (ft)	63	23	100	39	54	0
Queue Length 95th (ft)	125	51	155	72	101	22
Internal Link Dist (ft)	590			679	177	
Turn Bay Length (ft)		190	190		100	100
Base Capacity (vph)	654	1811	1265	1471	1704	1506
Starvation Cap Reductn	0	0	0	0	918	613
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.29	0.32	0.08	0.49	0.44

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	126	503	391	110	370	381
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	6.0	5.5	5.5
Lane Util. Factor	1.00	0.88	0.97	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1900	2775	3433	1900	3467	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1900	2775	3433	1900	3467	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	131	524	407	115	385	397
RTOR Reduction (vph)	0	94	0	0	0	131
Lane Group Flow (vph)	131	430	407	115	385	266
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	2%	2%	0%	1%	2%
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	4	5	3	8	5	3
Permitted Phases		4				5
Actuated Green, G (s)	10.5	50.7	14.6	30.1	40.2	54.8
Effective Green, g (s)	10.5	50.7	14.6	30.1	40.2	54.8
Actuated g/C Ratio	0.13	0.62	0.18	0.37	0.49	0.67
Clearance Time (s)	5.5	5.5	5.5	6.0	5.5	5.5
Vehicle Extension (s)	2.3	5.2	2.3	2.3	5.2	2.3
Lane Grp Cap (vph)	244	1907	613	699	1704	1167
v/s Ratio Prot	c0.07	0.11	c0.12	0.06	0.11	c0.04
v/s Ratio Perm		0.04				0.13
v/c Ratio	0.54	0.23	0.66	0.16	0.23	0.23
Uniform Delay, d1	33.4	6.9	31.3	17.4	11.9	5.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	0.0	2.3	0.1	0.3	0.1
Delay (s)	34.9	6.9	33.6	17.5	12.2	5.3
Level of Service	C	A	C	B	B	A
Approach Delay (s)	12.5			30.1	8.7	
Approach LOS	B			C	A	

Intersection Summary			
HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	81.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	267	343	145	456	951
v/c Ratio	0.81	0.60	0.23	0.34	0.89
Control Delay	63.1	9.0	27.8	7.2	45.7
Queue Delay	0.0	0.0	0.0	0.4	125.1
Total Delay	63.1	9.0	27.8	7.6	170.8
Queue Length 50th (ft)	191	0	77	116	322
Queue Length 95th (ft)	287	80	133	177	#425
Internal Link Dist (ft)	651			504	177
Turn Bay Length (ft)					
Base Capacity (vph)	407	625	632	1413	1180
Starvation Cap Reductn	0	0	0	520	434
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.66	0.55	0.23	0.51	1.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	251	0	322	136	429	0	0	587	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.5	5.5	5.5	5.5			5.5	
Lane Util. Factor					1.00	1.00	1.00	1.00			0.95	
Frpb, ped/bikes					1.00	1.00	1.00	1.00			0.99	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.95	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1787	1583	1736	1881			3342	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1787	1583	1736	1881			3342	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	267	0	343	145	456	0	0	624	327
RTOR Reduction (vph)	0	0	0	0	0	280	0	0	0	0	58	0
Lane Group Flow (vph)	0	0	0	0	267	63	145	456	0	0	893	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	1%	0%	2%	4%	1%	0%	0%	1%	3%
Turn Type				Split		Perm	Prot					
Protected Phases				8	8		5	2			6	
Permitted Phases						8						
Actuated Green, G (s)					20.4	20.4	40.3	79.2			33.4	
Effective Green, g (s)					20.4	20.4	40.3	79.2			33.4	
Actuated g/C Ratio					0.18	0.18	0.36	0.72			0.30	
Clearance Time (s)					5.5	5.5	5.5	5.5			5.5	
Vehicle Extension (s)					2.3	2.3	5.2	2.3			2.3	
Lane Grp Cap (vph)					330	292	633	1347			1009	
v/s Ratio Prot					c0.15		0.08	c0.24			c0.27	
v/s Ratio Perm						0.04						
v/c Ratio					0.81	0.22	0.23	0.34			0.89	
Uniform Delay, d1					43.2	38.3	24.4	5.9			36.8	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					13.1	0.2	0.8	0.1			9.3	
Delay (s)					56.3	38.5	25.2	6.0			46.0	
Level of Service					E	D	C	A			D	
Approach Delay (s)		0.0			46.3			10.6			46.0	
Approach LOS		A			D			B			D	

Intersection Summary			
HCM Average Control Delay	36.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	110.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	NBT	SBL	SBT
Lane Group Flow (vph)	188	109	866	312	560
v/c Ratio	0.60	0.29	0.61	0.73	0.44
Control Delay	37.8	8.7	13.6	37.2	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	8.7	13.6	37.2	6.9
Queue Length 50th (ft)	78	0	90	128	92
Queue Length 95th (ft)	159	41	193	241	193
Internal Link Dist (ft)	628		216		504
Turn Bay Length (ft)					
Base Capacity (vph)	516	548	1627	651	1580
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.36	0.20	0.53	0.48	0.35

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	0	105	0	0	0	0	385	446	300	538	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0					5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00					0.95		1.00	1.00	
Frpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Frt		1.00	0.85					0.92		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1770	1615					3271		1787	1881	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1770	1615					3271		1787	1881	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	188	0	109	0	0	0	0	401	465	312	560	0
RTOR Reduction (vph)	0	0	90	0	0	0	0	219	0	0	0	0
Lane Group Flow (vph)	0	188	19	0	0	0	0	647	0	312	560	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	2%	1%	1%	1%	0%
Turn Type	Perm		Perm							Prot		
Protected Phases		8						6		5	2	
Permitted Phases	8		8									
Actuated Green, G (s)		12.5	12.5					26.4		17.0	48.4	
Effective Green, g (s)		12.5	12.5					26.4		17.0	48.4	
Actuated g/C Ratio		0.18	0.18					0.37		0.24	0.68	
Clearance Time (s)		5.0	5.0					5.0		5.0	5.0	
Vehicle Extension (s)		2.3	2.3					6.9		2.3	6.9	
Lane Grp Cap (vph)		312	285					1218		428	1284	
v/s Ratio Prot								c0.20		c0.17	0.30	
v/s Ratio Perm		0.11	0.01									
v/c Ratio		0.60	0.07					0.53		0.73	0.44	
Uniform Delay, d1		26.9	24.3					17.4		24.8	5.1	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		2.6	0.1					1.3		5.5	0.8	
Delay (s)		29.5	24.4					18.7		30.4	5.9	
Level of Service		C	C					B		C	A	
Approach Delay (s)		27.6			0.0			18.7			14.7	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	70.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	40	0	0	159	0	672	60	0	553	90
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	0	42	0	0	166	0	700	62	0	576	94
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								275			296	
pX, platoon unblocked												
vC, conflicting volume	1139	1385	335	1061	1401	381	670			762		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1139	1385	335	1061	1401	381	670			762		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	94	100	100	73	100			100		
cM capacity (veh/h)	116	145	667	170	141	617	930			846		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	42	166	467	296	384	286
Volume Left	0	0	0	0	0	0
Volume Right	42	166	0	62	0	94
cSH	667	617	1700	1700	1700	1700
Volume to Capacity	0.06	0.27	0.27	0.17	0.23	0.17
Queue Length 95th (ft)	5	27	0	0	0	0
Control Delay (s)	10.8	13.0	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	10.8	13.0	0.0		0.0	
Approach LOS	B	B				

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	603	759	470	341	289
v/c Ratio	0.88	0.72	0.91	0.78	0.47
Control Delay	40.5	15.0	44.8	34.5	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	15.0	44.8	34.5	5.6
Queue Length 50th (ft)	110	187	148	111	0
Queue Length 95th (ft)	#197	315	#313	#220	49
Internal Link Dist (ft)		670	736	195	
Turn Bay Length (ft)	220				
Base Capacity (vph)	687	1059	526	488	650
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.88	0.72	0.89	0.70	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	567	713	276	165	321	272
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.5	5.5
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.95		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3467	1863	1784		1770	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3467	1863	1784		1770	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	603	759	294	176	341	289
RTOR Reduction (vph)	0	0	36	0	0	217
Lane Group Flow (vph)	603	759	434	0	341	72
Heavy Vehicles (%)	1%	2%	0%	3%	2%	1%
Turn Type	Prot					Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	11.5	32.7	15.7		14.4	14.4
Effective Green, g (s)	11.5	32.7	15.7		14.4	14.4
Actuated g/C Ratio	0.20	0.56	0.27		0.25	0.25
Clearance Time (s)	5.5	5.5	5.5		5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	686	1049	482		439	396
v/s Ratio Prot	0.17	c0.41	c0.24		c0.19	
v/s Ratio Perm						0.04
v/c Ratio	0.88	0.72	0.90		0.78	0.18
Uniform Delay, d1	22.6	9.4	20.4		20.4	17.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	12.3	2.5	19.8		8.4	0.2
Delay (s)	34.9	11.9	40.2		28.8	17.4
Level of Service	C	B	D		C	B
Approach Delay (s)		22.1	40.2		23.6	
Approach LOS		C	D		C	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	16.5
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Appendix F Year 2040 Traffic Conditions and Queuing Worksheets with Corridor Improvements Alternative 2

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	131	524	407	115	385	397
v/c Ratio	0.57	0.28	0.69	0.17	0.21	0.31
Control Delay	46.4	3.7	40.8	19.1	11.9	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.3
Total Delay	46.4	3.7	40.8	19.1	12.3	1.0
Queue Length 50th (ft)	71	28	113	45	50	0
Queue Length 95th (ft)	122	58	151	69	84	10
Internal Link Dist (ft)	590			679	177	
Turn Bay Length (ft)		150	200		100	100
Base Capacity (vph)	623	1859	820	1182	1812	1373
Starvation Cap Reductn	0	0	0	0	900	446
Spillback Cap Reductn	0	22	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.29	0.50	0.10	0.42	0.43

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	126	503	391	110	370	381
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	6.0	5.5	5.5
Lane Util. Factor	1.00	0.88	0.97	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1900	2776	3433	1900	3467	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1900	2776	3433	1900	3467	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	131	524	407	115	385	397
RTOR Reduction (vph)	0	72	0	0	0	121
Lane Group Flow (vph)	131	452	407	115	385	276
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	2%	2%	0%	1%	2%
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	4	5	3	8	5	3
Permitted Phases		4				5
Actuated Green, G (s)	10.9	57.9	15.6	31.5	47.0	62.6
Effective Green, g (s)	10.9	57.9	15.6	31.5	47.0	62.6
Actuated g/C Ratio	0.12	0.64	0.17	0.35	0.52	0.70
Clearance Time (s)	5.5	5.5	5.5	6.0	5.5	5.5
Vehicle Extension (s)	2.3	5.2	2.3	2.3	5.2	2.3
Lane Grp Cap (vph)	230	1956	595	665	1811	1198
v/s Ratio Prot	c0.07	0.12	c0.12	0.06	0.11	c0.04
v/s Ratio Perm		0.04				0.13
v/c Ratio	0.57	0.23	0.68	0.17	0.21	0.23
Uniform Delay, d1	37.3	6.7	34.9	20.2	11.6	5.0
Progression Factor	1.00	1.00	1.00	1.00	0.90	0.41
Incremental Delay, d2	2.3	0.0	2.8	0.1	0.2	0.1
Delay (s)	39.7	6.8	37.7	20.3	10.7	2.1
Level of Service	D	A	D	C	B	A
Approach Delay (s)	13.3			33.9	6.3	
Approach LOS	B			C	A	

Intersection Summary			
HCM Average Control Delay	16.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	267	343	145	456	951
v/c Ratio	0.74	0.58	0.53	0.36	0.60
Control Delay	46.3	7.6	33.9	1.6	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.4
Total Delay	46.3	7.6	33.9	1.6	14.1
Queue Length 50th (ft)	142	0	43	2	110
Queue Length 95th (ft)	213	64	93	8	174
Internal Link Dist (ft)	651			504	177
Turn Bay Length (ft)					
Base Capacity (vph)	459	661	334	1274	1591
Starvation Cap Reductn	0	0	0	0	218
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.58	0.52	0.43	0.36	0.69

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	251	0	322	136	429	0	0	587	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.5	5.5	5.5	5.5			5.5	
Lane Util. Factor					1.00	1.00	1.00	1.00			0.95	
Frpb, ped/bikes					1.00	1.00	1.00	1.00			0.99	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.95	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1787	1583	1736	1881			3343	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1787	1583	1736	1881			3343	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	267	0	343	145	456	0	0	624	327
RTOR Reduction (vph)	0	0	0	0	0	274	0	0	0	0	65	0
Lane Group Flow (vph)	0	0	0	0	267	69	145	456	0	0	886	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	1%	0%	2%	4%	1%	0%	0%	1%	3%
Turn Type				Split		Perm	Prot					
Protected Phases				8	8		5	2			6	
Permitted Phases						8						
Actuated Green, G (s)					18.1	18.1	14.3	60.9			41.1	
Effective Green, g (s)					18.1	18.1	14.3	60.9			41.1	
Actuated g/C Ratio					0.20	0.20	0.16	0.68			0.46	
Clearance Time (s)					5.5	5.5	5.5	5.5			5.5	
Vehicle Extension (s)					2.3	2.3	5.2	2.3			2.3	
Lane Grp Cap (vph)					359	318	276	1273			1527	
v/s Ratio Prot					c0.15		c0.08	0.24			c0.27	
v/s Ratio Perm						0.04						
v/c Ratio					0.74	0.22	0.53	0.36			0.58	
Uniform Delay, d1					33.8	30.0	34.7	6.2			18.1	
Progression Factor					1.00	1.00	0.82	0.13			0.69	
Incremental Delay, d2					7.5	0.2	3.0	0.7			1.5	
Delay (s)					41.2	30.2	31.4	1.5			14.1	
Level of Service					D	C	C	A			B	
Approach Delay (s)		0.0			35.0			8.7			14.1	
Approach LOS		A			D			A			B	

Intersection Summary			
HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	188	109	401	465	312	560
v/c Ratio	0.70	0.32	0.59	0.57	0.55	0.40
Control Delay	50.3	9.4	23.9	8.1	24.0	3.0
Queue Delay	0.0	0.0	4.1	0.9	0.0	0.0
Total Delay	50.3	9.4	28.1	9.0	24.0	3.0
Queue Length 50th (ft)	102	0	177	65	127	104
Queue Length 95th (ft)	167	43	283	157	181	8
Internal Link Dist (ft)	628		216			504
Turn Bay Length (ft)				100		
Base Capacity (vph)	334	393	683	818	564	1388
Starvation Cap Reductn	0	0	202	144	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.28	0.83	0.69	0.55	0.40

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	0	105	0	0	0	0	385	446	300	538	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	1615					1863	1599	1787	1881	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	1615					1863	1599	1787	1881	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	188	0	109	0	0	0	0	401	465	312	560	0
RTOR Reduction (vph)	0	0	93	0	0	0	0	0	232	0	0	0
Lane Group Flow (vph)	0	188	16	0	0	0	0	401	233	312	560	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	2%	1%	1%	1%	0%
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		8						6		5	2	
Permitted Phases	8		8						6			
Actuated Green, G (s)		13.6	13.6					33.0	33.0	28.4	66.4	
Effective Green, g (s)		13.6	13.6					33.0	33.0	28.4	66.4	
Actuated g/C Ratio		0.15	0.15					0.37	0.37	0.32	0.74	
Clearance Time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)		2.3	2.3					6.9	6.9	2.3	6.9	
Lane Grp Cap (vph)		267	244					683	586	564	1388	
v/s Ratio Prot								c0.22		c0.17	0.30	
v/s Ratio Perm		0.11	0.01						0.15			
v/c Ratio		0.70	0.07					0.59	0.40	0.55	0.40	
Uniform Delay, d1		36.3	32.8					23.0	21.1	25.5	4.4	
Progression Factor		1.00	1.00					0.87	1.04	0.77	0.45	
Incremental Delay, d2		7.2	0.1					3.4	1.9	3.1	0.7	
Delay (s)		43.5	32.8					23.4	23.8	22.8	2.7	
Level of Service		D	C					C	C	C	A	
Approach Delay (s)		39.6			0.0			23.6			9.9	
Approach LOS		D			A			C			A	

Intersection Summary			
HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	52	60	166	23	634	130	540
v/c Ratio	0.62	0.18	0.29	0.43	0.04	0.47	0.26	0.41
Control Delay	47.6	13.9	35.6	8.9	0.2	0.7	2.4	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.3
Total Delay	47.6	13.9	35.6	8.9	0.2	1.6	2.4	2.1
Queue Length 50th (ft)	69	5	31	0	0	1	3	11
Queue Length 95th (ft)	118	34	63	50	m0	m2	14	41
Internal Link Dist (ft)		412	312			195		216
Turn Bay Length (ft)				100	50		125	
Base Capacity (vph)	341	449	341	520	588	1337	504	1322
Starvation Cap Reductn	0	0	0	0	0	395	0	269
Spillback Cap Reductn	0	14	9	12	0	133	0	57
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.12	0.18	0.33	0.04	0.67	0.26	0.51

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	123	10	40	50	8	159	22	549	60	125	428	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.88			1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1670			1821	1583	1805	1839		1770	1814	
Flt Permitted	0.72	1.00			0.72	1.00	0.43	1.00		0.37	1.00	
Satd. Flow (perm)	1364	1670			1364	1583	811	1839		694	1814	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	128	10	42	52	8	166	23	572	62	130	446	94
RTOR Reduction (vph)	0	36	0	0	0	141	0	3	0	0	6	0
Lane Group Flow (vph)	128	16	0	0	60	25	23	631	0	130	534	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	2%	0%	2%	2%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	13.7	13.7			13.7	13.7	65.3	65.3		65.3	65.3	
Effective Green, g (s)	13.7	13.7			13.7	13.7	65.3	65.3		65.3	65.3	
Actuated g/C Ratio	0.15	0.15			0.15	0.15	0.73	0.73		0.73	0.73	
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	208	254			208	241	588	1334		504	1316	
v/s Ratio Prot		0.01						c0.34			0.29	
v/s Ratio Perm	c0.09				0.04	0.02	0.03			0.19		
v/c Ratio	0.62	0.06			0.29	0.10	0.04	0.47		0.26	0.41	
Uniform Delay, d1	35.7	32.7			33.8	32.9	3.5	5.2		4.2	4.8	
Progression Factor	1.00	1.00			1.00	1.00	0.03	0.01		0.22	0.18	
Incremental Delay, d2	5.3	0.1			0.8	0.2	0.1	0.7		1.2	0.9	
Delay (s)	41.0	32.8			34.6	33.1	0.2	0.7		2.1	1.7	
Level of Service	D	C			C	C	A	A		A	A	
Approach Delay (s)		38.6			33.5			0.7			1.8	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	485	748	431	232	319
v/c Ratio	0.88	0.69	0.86	0.44	0.29
Control Delay	39.2	16.3	45.1	32.4	3.6
Queue Delay	0.0	0.0	0.0	1.1	0.4
Total Delay	39.2	16.3	45.1	33.5	4.1
Queue Length 50th (ft)	191	248	206	126	14
Queue Length 95th (ft)	#352	342	#323	190	40
Internal Link Dist (ft)		670	736	195	
Turn Bay Length (ft)	225			125	
Base Capacity (vph)	575	1190	570	523	1124
Starvation Cap Reductn	0	0	0	128	421
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.84	0.63	0.76	0.59	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	456	703	230	175	218	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.5	5.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.94		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1863	1766		1770	1599
Flt Permitted	0.15	1.00	1.00		0.95	1.00
Satd. Flow (perm)	285	1863	1766		1770	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	485	748	245	186	232	319
RTOR Reduction (vph)	0	0	32	0	0	144
Lane Group Flow (vph)	485	748	399	0	232	175
Heavy Vehicles (%)	1%	2%	0%	3%	2%	1%
Turn Type	pm+pt					pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases	4					6
Actuated Green, G (s)	52.5	52.5	24.0		26.5	49.5
Effective Green, g (s)	52.5	52.5	24.0		26.5	49.5
Actuated g/C Ratio	0.58	0.58	0.27		0.29	0.55
Clearance Time (s)	5.5	5.5	5.5		5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	550	1087	471		521	977
v/s Ratio Prot	c0.23	0.40	0.23		c0.13	0.05
v/s Ratio Perm	c0.29					0.06
v/c Ratio	0.88	0.69	0.85		0.45	0.18
Uniform Delay, d1	22.0	13.1	31.3		25.8	10.1
Progression Factor	1.00	1.00	1.00		1.05	2.59
Incremental Delay, d2	15.3	1.8	13.2		2.6	0.1
Delay (s)	37.3	14.9	44.4		29.7	26.2
Level of Service	D	B	D		C	C
Approach Delay (s)		23.7	44.4		27.7	
Approach LOS		C	D		C	

Intersection Summary			
HCM Average Control Delay	28.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

MEMORANDUM

Daniel Heffernan Company
2525 NE Halsey Street
Portland. OR 97232

DATE: June 18, 2015
TO: Susan Wright, Kittelson Associates
Zach Pelz, City of West Linn, Planning
FROM: DJ Heffernan, DHC
SUBJECT: Technical Memorandum #9 – Regulatory Solutions

Context

As part of the process to update the City of West Linn transportation system plan (TSP), the city is required to review and where necessary update implementation measures, such as its development code and public works design standards. Cities and counties across the state rely on these tools to address specific requirements in the Oregon Transportation Planning Rule (TPR) and the Regional Transportation Functional Plan (RTFP).

The City's implementing measures are used to achieve specific local transportation goals. These include:

1. Safety: Reduce transportation related fatalities and serious injuries across all modes;
2. Mobility, Access and 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;
3. Maintenance: Deliver access and safety improvements cost effectively, within available revenues;
4. Equity: Equitably respond to the needs of all users of the transportation system, and in a way that is beneficial to the natural environment.

Performance measures are used over time to monitor the achievement of these goals. Performance measures have been established for safety, vehicle miles traveled per capita, freight reliability, congestion, and walking, bicycling and transit mode shares. Technical Memorandum #3 includes draft "Performance Measures" for West Linn's 2015 TSP update. These measures are used over time to monitor the TSP[1] and, when performance measures are not being met, they guide the reexamination of city regulations to improve performance.

Purpose

The purpose of this memorandum is to review West Linn's implementation measures for compliance with state and regional requirements. At their core, the state and regional requirements

[1] Section 3.08.230 Performance Targets and Standards, Chapter 3.08, Regional Transportation Function Plan, Exhibit E. to Ordinance No 10-1241B

are intended to reduce reliance on single-occupancy vehicles, reduce environmental impacts related to automobile use, and expand mobility choices for transportation system users.

The implementing measures include local neighborhood plans (NPs), which provide local context and refinement of the West Linn Comprehensive Land Use Plan (Comp Plan) and the West Linn Transportation System Plan (TSP), which is a part of the Comp Plan. They also include the West Linn Community Development Code (CDC) and other documents that are integral to the City's transportation system, like the West Linn Master Trails Plan, and West Linn's Public Works Design Standards (PWDS). The analysis also considered ways to improve consistency between the Comp Plan, the TSP, and the city's implementing measures.

Exhibit A to this memorandum summarizes state and regional compliance requirements and documents where and how the City's implementing measures meet or do not meet these requirements. The review shows that the City complies with most but not all state and regional transportation planning requirements. Where implementing measures are inadequate, the table indicates the reason why.

Compliance Issues Summary

The non-compliance issues identified in the review generally involve state and regional requirements for local transportation regulations, or conflicts within city documents. The following summary highlights the issues and solutions to address them.

1. The West Linn Comprehensive Plan (Comp Plan) includes language that grants neighborhood plans presumptive standing as part of the Comp Plan. The Comp Plan should clarify that this standing can only apply when a neighborhood plan has been formally adopted as part of the Comp Plan [i.e., by ordinance and in conformance with state post-acknowledgement plan amendment (PAPA) adoption procedures in OAR 660.18.0020]. In the absence of such action, the Comp Plan should clarify that land use decision makers may consult neighborhood plans as advisory documents but they may not rely on them in rendering land use decisions.
2. The Comp Plan narrative for Goal 12 – Transportation, needs to be updated to reflect the revised improvement program for the I-205/10th Street interchange area.
3. The Functional Street Classifications in the Comp Plan, the TSP, and the West Linn Community Development Code (CDC) are inconsistent. Amendments are needed to bring them into agreement.
4. The Comp Plan and TSP in effect say that the City's four mixed-use commercial districts function as "town centers" by supporting transit-oriented development, providing employment opportunities, and enhancing multi-modal accessibility to services for the surrounding neighborhoods. The Comp Plan should include a cross reference to the term "town center" for the city's mixed-use districts to ensure the city is able to access regional,

state, and federal resources that specifically pertain to town center areas[2]. CDC regulations should reference the mixed-use districts in a consistent manner. Boundaries should be established for the Mixed Use Commercial Districts, which may be accomplished using an overlay that may apply to more than one base zone. It is recommended that this work be initiated through a community planning effort after the TSP has been adopted. There will be community-wide interest in this process. It is beyond the scope of the TSP update to address these complex comprehensive planning policy and land use issues.

5. A number of modifications are recommended to the CDC Design Review Approval Criteria:
    a. Add requirements for Transportation Demand Management (TDM) measures for all "major" developments, major redevelopments, and conditional use applications;
    b. Amend the sidewalk fee-in-lieu program to specify where it may be used and to ensure this revenue is used elsewhere in West Linn for frontage improvements;
    c. Allow flexibility to street design standards in locations where terrain or natural features prevent construction of a standard street cross-section, but in other areas limit discretionary review of required transportation improvements;
    d. Require land division preliminary plats to show connectivity for bike/ped/transit access where street connections are not required and the distance between connectivity points exceeds RTFP requirements;
    e. Reduce discretionary review of land use applications in mixed-use commercial districts by offering a clear and objective approval option for all permitted uses and by adopting clear and objective design standards for mixed use areas, (e.g. the design standards for the Willamette District). These amendments likely will become part of the work program for item #4 above.

6. Amend West Linn Public Works Design and Construction Standards to include a cross section standard for a *Neighborhood Route*, a *Green Street*, a *Shared Street* and for streets that are planned to accommodate an on-street trail segment.

7. Amend West Linn CDC 48.0 – Access, Egress, and Circulation to include standards and guidance for the Planning Director, Public Works Director, City Engineer, and Planning Commission to follow when confronting land use actions that effect non-conforming access and access consolidation per the recommendations in TM 11.

Solutions to these issues are presented below in tables that identify: the compliance issue(s), the city plan or regulation that needs to be amended; recommended language to address the issue; and the regulatory requirement(s) that pertains to the issue. In some instances, the solution to a compliance issue requires a multi-faceted approach involving policy and regulatory solutions that reach beyond amendments that primarily relate to Goal 12 – Transportation, and effect a variety of local and regional stakeholders and involve issues that reach beyond the scope of the TSP Update. In these instances, the table references the need for a future planning work program to address the issue.

[2] Metro's Regional Transportation Facility Plan (RTFP) and the Metro 2040 Growth Plan use the term "town center" to describe mixed use activity centers, which are priority areas for transportation investment.

Exhibit A includes a detailed review of the regional regulatory compliance requirements and a summary for how the city either meets the requirement or amendments that are needed to address an issue. The exhibit focuses on Regional Transportation Plan and Metro Title 3 requirements, which also embody the requirements of the Oregon Transportation Planning Rule and are, therefore, comprehensive.

Exhibit B includes draft text for proposed plan policy and development code amendments when the solution(s) identified in the table require multi-faceted amendments or text that is too lengthy to put into the table format.

Draft Regulatory Solutions for the West Linn Transportation System Plan Update

CITY PLAN AND POLICY SOLUTIONS			
Issue	Summary	Recommendation	Compliance
Neighborhood Plan/ Comp Plan Consistency	✓ West Linn's neighborhood plans (NPs) were not formally adopted as elements of the Comp Plan; they have not been reviewed for conformity with Statewide Land Use Planning goals. Until they have, NPs do not have standing as part of the Comp Plan and may only be relied on as advisory documents in land use proceedings.	This solution needs to be developed as part of a future work program that amends policies in the Comp Plan related to Goals 1 and 2 in order to clarify the process for developing and using NPs in land use proceedings per Statewide Land Use Planning Goal 2. A draft recommendation for amending Goal 1 policies is included in Appendix B.	OAR 660.015.0000; OAR 660.018.0020;
Neighborhood Plan Concurrency	✓ The Willamette neighborhood plan was prepared in 2003. The Bolton, Marylhurst, and Parker Crest neighborhood plans were adopted in 2006. The Tanner Basin Neighborhood Plan was adopted in 2007. The Robinwood and Sunset Neighborhood Plans were adopted in 2008. While the policies in these plans generally are compatible and supportive of the Comp Plan and TSP, some are not. All neighborhood plans pre-date the updated TSP. Since none were adopted as elements of the Comp Plan, their standing is uncertain.	Amend the Comp Plan language in Goal 2 to clarify the role of neighborhood plans in land use proceedings; where necessary update neighborhood plans so that they are consistent with the TSP and Comp Plan. Amending Goal 2 – Land Use Planning necessitates a review of city planning policies and procedures. This needs to be done as part of a future work program.	OAR 660.015.0000;

CITY PLAN AND POLICY SOLUTIONS			
Issue	Summary	Recommendation	Compliance
10th Street Interchange - Comp Plan, Neighborhood Plan, and TSP Consistency	✓ There are references to the I-205/10th Street interchange in the Comp Plan, and in the Tanner Basin, Sunset, and Willamette Neighborhood plans. These references may need to be updated to reflect the revised interchange improvement program in the updated TSP.	Update the narrative in the Comp Plan for Goal 12 – Transportation to reflect the program for improving the I-205/10th Avenue interchange area so that the narrative is consistent with the updated TSP. Consider updating NPs, if necessary. Specific language that will address this issue is being developed under a separate task.	OAR 660-12-0015; ODOT TSP; Metro RTP
Roadway Functional Classifications	✓ West Linn's CDC Chapter 85 lists "Neighborhood Route" as roads whose functional purpose falls between "Collector" and "Local" roadways. The Comp Plan and TSP should define and identify where this classification is applicable. There also is a need for a plan policy that limits the use of alternative street designs to areas where proximity to sensitive resources, steep slopes, narrow rights of way, or other extenuating factors justify alternative design options.	In Comp Plan Goal 12, add descriptions for alternative street designs, such as placing pedestrian and/or bicycle facilities on one side of the roadway, and a "Shared Street" functional classification, which would permit multi-modal use of the roadway. This text is being developed as part of a separate task. Add a policy that provides guidance for the use of these alternative designs. Draft text amendments are under development.	RTFP 3.08.210.B(2)

CITY PLAN AND POLICY SOLUTIONS			
Issue	Summary	Recommendation	Compliance
Mixed Use District Designations and Policies	✓ In Comp Plan Goal 2 – Land Use Planning, Section 3, which pertains to West Linn's four Mixed Use Commercial Districts, the narrative should recognize the "Town Center" function that these areas provide West Linn residents. This establishes functional equivalency between the Comp Plan and the Metro 2040 Growth Plan for West Linn's four mixed-use districts that are subject to RTFP connectivity requirements.	Add policy language to Section 3, Goals 6 and 7 that recognize the "Town Center" function of West Linn's mixed-use commercial districts. Draft text recommendations are included in Appendix B. The Metro 2040 Growth Plan map in the Comp Plan needs to be updated to the 2014 version.	RTFP 3.08.710.M RTFP 3.08.710.JJ
Mixed Use District Connectivity	✓ Comp Plan Goal 12 – Transportation calls for multi-modal connectivity between West Linn's town center commercial districts.	Modify city transportation policies that call for strategies to "…connect the four mixed-use commercial centers in Willamette, Bolton, Robinwood, and Tanner Basin" to include bike, ped, transit strategies.	RTFP 3.08.220.A;

CITY PLAN AND POLICY SOLUTIONS			
Issue	**Summary**	**Recommendation**	**Compliance**
Requirements for TDM Policies and programs for major development, redevelopment, and conditional uses in metropolitan areas.	✓ OAR 660.12.0045(5) requires cities in MPO areas to take steps to reduce single-occupancy vehicle (SOV) trips through their land use plans, development regulations and through Transportation Demand Management (TDM) programs. The later is often implemented through a "Transportation Options" program that adds regulations for new development that generates traffic above certain thresholds, or in areas and corridors with significant congestion.	Add the following policy to Goal 12 – Transportation under General Policies and Action Measures: 9. Take action using the following measures to promote the use of Transportation Options: • Support community education to increase efficient use of existing transportation infrastructure and minimize congestion and safety concerns by offering choices of mode, route, and time. • Support and participate in efforts by Metro, the Department of Environmental Quality (DEQ), transit providers, and Transportation Management Associations (TMAs) to develop, monitor and fund local TDM programs. • Provide adequate bicycle and pedestrian facilities connecting mixed-use commercial centers to encourage use of bicycles or walking for the commute to work and to improve access to jobs for workers without cars. • Take steps to reduce drive-alone vehicle trips with the goal to reach 40% non-drive alone trips in mixed-use areas by 2040. • Develop regulations for mixed-use areas that require major new development and redevelopment and conditional use applications to address Transportation Options requirements.	RTFP 308.120(C); OAR 660.012.0045 (4)-(5)

CITY PLAN AND POLICY SOLUTIONS			
Issue	Summary	Recommendation	Compliance
Street Design	✓ West Linn's Comp Plan does not include a policy reference to Metro's Street Design Classifications for supporting multi-modal street use and Green Streets.	Add the following policies to the West Linn Comprehensive Land Use Plan (WLCP) under Goal 12 – Transportation: General Policies. 10. Consider the Metro Regional Street Design Classifications for new and redesigned city streets prior to construction or reconstruction. 11. Minimize impacts of managing storm water by allowing for Metro's alternative street standards, such as "green streets," as design alternatives.	RTFP 3.08.110.A
Access Management	✓ West Linn's Comp Plan should include a policy that requires land use decision makers to take proactive steps to resolve non-conforming access in order to improve public safety and to reduce on-street vehicular conflicts.	Add the following policies to the West Linn Comprehensive Land Use Plan (WLCP) under Goal 12 – Transportation: General Policies. 12. West Linn will take proactive steps to eliminate and/or consolidate non-conforming vehicular, pedestrian, and bicycle access and egress through its land use regulatory authority.	3.08.220 Transportation Solutions

CITY DEVELOPMENT CODE ACTIONS			
Issue	**Summary**	**Recommendation**	**Compliance**
CDC Design Review Standards	✓ The purpose statement in CDC Chapter 55.010 states "Multi-family, industrial, commercial, office, and public projects will comply with the Transportation Planning Rule (TPR)". The requirement is aimed at encouraging design features that promote the use of alternative modes and improve connectivity rather than demonstrating project-level compliance with the TPR (OAR 660.12.000). Use alternative wording.	Make the following change to CDC 55.010 Developers of ~~Multi~~multi-family, industrial, commercial, office, and public projects ~~will comply with the Transportation Planning Rule (TPR). The TPR is a State requirement that jurisdictions must~~ are required to take steps to reduce reliance on the automobile by, in part, encouraging other modes of transportation, such as transit, bicycles, and foot traffic, or through building orientation or location.	RTFP 3.08.120.B; RTFP 3.08.130.A(3); RTFP 3.08.140.A(3); RTFP 3.08.220.A(2); OAR 660-12-045(3)
CDC Design Review Standards – Transportation Demand Management (TDM)	✓ The TPR mandates that TDM measures be integrated with all "major" new developments, redevelopments, and all conditionally approved development. "Major" is not defined in the rule. We have defined it as any project that requires discretionary (Type 3/Type 4) review.	Amend CDC 55.100.B.7: *k. Major developments and conditional use applications in designated town center and industrial areas must include a transportation option (TO) elements into the development program. Table A outlines requirements and appropriate TDM measures for various types of development. In general, larger scale developments and development that generates a large amount of auto-trips are required to implement more significant TO measures.* Development of local TO rules may need to be completed as part of a future work program. An outline for a TO program is included in Exhibit B.	RTFP 3.08.120; OAR 660.012.0045(5)

CITY DEVELOPMENT CODE ACTIONS			
Issue	Summary	Recommendation	Compliance
CDC Design Standards for "mixed-user" Areas	✓ West Linn's CDC Chapter 55 100 includes design and development standards for multi-family, commercial, public, and employment land uses. Standards do not distinguish between the development requirements in mixed-use areas and other districts in West Linn. Design requirements for multi-family in particular may violate state law that requires all cities to provide a clear and objective path to development approval for needed housing types.	Add language to the CDC that distinguish design standards and public facility requirements for development in mixed-use commercial districts. These are intended to meet RTFP requirements for "mixed use" and "Town Center" areas, including parking, bicycle/pedestrian accessibility, transit access, alternative mobility, etc. Adding requirements for enhancing multi-modal access and use within, and in proximity to, mixed-use districts. Establish a "Type 2" approval process for projects that meet specific design criteria as an alternative to "Type 3" discretionary review. This is especially important for multi-family housing projects that are required by state law to have a clear and objective path to development approval. **Implementing this will require a future planning work program.**	OAR 660.012.0045(3); RTFP 3.08.110.A; RTFP 3.08.110.B;
CDC Design Standards for "mixed-use" areas and Transit Corridors	✓ OAR 660.12.0045(4) and (5) require cities in MPOs to take steps to promote transit where available. The city's approval criteria for building orientation and access is vague for determining when and how an applicant needs to make special accommodations for transit orientation.	Modify the design requirements in CDC 55.100.B.7.g to specify a distance parameter from transit stops that triggers the requirement to orient a main building entrance to transit and establish a pathway to the stop in transit corridors. Add standards and criteria for all development in mixed-use areas to design development for access to transit and to provide information about transit stops/schedules/etc. **Implementing this will require a future planning work program.**	RTFP 3.08.120.B

CITY DEVELOPMENT CODE ACTIONS			
Issue	Summary	Recommendation	Compliance
CDC Design Standards for "Town Center" Areas	✓ RTFP 3.08.130 includes an alternate provision for meeting transit accessibility requirements using designating Pedestrian Districts. Town Center areas may be suitable areas for this approach.	Add regulations for property in a designated pedestrian district if applicable. **Implementing this will require a future planning work program.**	RTFP 3.08.130.B, OAR 660-12-00045.(3) - (5)
Fee in lieu requirement	✓ CDC 96.010.A.3 allows development in neighborhoods without sidewalks to pay a fee in lieu of building sidewalks in order to match the existing development pattern. These funds, however, go into the City's General Fund where they are not limited in use to sidewalk construction.	West Linn should alter its fee in lieu policy for sidewalk construction. Dedicate fee revenue to a Sidewalk Construction Fund that would be used to build higher priority sidewalks first. The fee in lieu would apply to development applications that are required to construct sidewalks along their site frontage. In certain circumstances, the fee in lieu policy lets them pay a fee equivalent to the cost of constructing the frontage improvement. Prioritize the use of the Sidewalk Construction Fund for sidewalks and multi-modal trails that enhance pedestrian safety on designated safe routes to school and connections to/within mixed-use centers. **Implementing this will require a future planning work program.**	RTFP 3.08.130; OAR 660.012.0045.(3); WLCLP Goal 12, General Policy 8, Action #5; Street Policies 9 and 12.

CITY DEVELOPMENT CODE ACTIONS			
Issue	Summary	Recommendation	Compliance
Development Approval Criteria	✓ CDC Chapter 60 - Conditional Uses: The approval criteria in 60.090 - Transportation Facilities (Type II), which are used to review the appropriateness of transportation improvements NOT included in the TSP, does not include a reference to the Metro Regional Transportation Functional Plan (RTFP).	Add to the approval criteria in CDC 60.090.A.1. and include a criterion that requires consistency of the proposed conditional use with the adopted RTP.	OAR 660.012.0015(2)(b).
Increase the availability of Non-discretionary Land Use Approval	✓ Virtually every land use application other than development approval for single-family residential lots is required to go through some form of discretionary review either as a conditional use or through a design review process. This adds cost, and opportunities for opponents, even where development is consistent with the adopted plan. Discretionary review has been used to obstruct local connectivity and alternative mode improvements even when these improvements are listed in the TSP and required by plan policies and CDC rule.	Provide a clear path to development approval (Type 1 and/or 2 review) for most development in mixed-use commercial areas and along transit corridors. Develop design criteria for commercial districts. Additionally, for Type 3 applications, limit the scope of review for transportation improvements to those that require subjective interpretation of a policy (e.g. locating a new or improved street near a designated Water Resource Area, on a steep slope, or in a designated historic districts). Clarify that when the WLCP, the TSP, the Trails Plan, and/ or the CDC requirements are definitive, the approval of transportation improvements is not discretionary. **Implementing this will require a future planning work program.**	OAR 660.012.0015

CITY DEVELOPMENT CODE ACTIONS			
Issue	Summary	Recommendation	Compliance
Design requirements and Approval Criteria for Preliminary Plat	✓ CDC Chapter 85 lacks specific guidance for when partition requests need to show tentative street plans for remnant undivided portions of the property. Doing so will serve to protect future street alignments from encroachment by interim development. The regulation also does not require tentative plans to show internal and external connectivity for pedestrians/bicycle/transit access where street connections are not present.	Add the following text to CDC 85.120: Where the tentative subdivision … for the unsubdivided portion. A tentative street plan is required for sites where the un-subdivided portion of the property is greater than 300 percent of the minimum lot size allowed in the underlying zoning district. Add the following text to 85.170.B. Transportation 1. Centerline profiles … of street construction. Where street connections are not proposed within or beyond the limits of the proposed subdivision on blocks exceeding 330 feet, or for cul-de-sacs, the tentative plat or partition shall indicate the location of easements that provide connectivity for bicycle, pedestrian use to accessible public rights of way.	RTFP 3.08.110.E(4); RTFP 3.08.130.B; RTFP 3.08.110.B.6; OAR660.012.0045.(3)
Travel Lane Widths	✓ The travel lane widths in the CDC vary by functional class. Local streets have the widest land widths, presumably because on-street parking and bikeway travel is envisioned to share the standard 24' of pavement. This same approach should be available to Neighborhood Routes where ROW is insufficient to allow for designated bike lanes and sidewalks.	Amend the table in CDC Chapter 85.200 A. Streets, 3. Street Widths to allow travel lane widths on Neighborhood Routes to be 10 - 12 feet. Include a footnote that 12-foot travel lanes may only be used when the ROW is too narrow to accommodate bike lanes and sidewalks.	RTFP 3.08.110.A; RTFP 3.08.110.B

CITY DEVELOPMENT CODE ACTIONS			
Issue	Summary	Recommendation	Compliance
Flexible Street Design	✓ There are circumstances in West Linn where topography, proximity to sensitive resource sites, or prevailing development conditions make it infeasible or impractical to build a standard street cross section improvement.	Add the following street classification to CDC Chapter 85.200 Approval Criteria, 2. Right of Way: *Neighborhood Route 40-60 feet* Add the following street description to CDC Chapter 85.200 Approval Criteria 3. Streets Widths: *Shared Street – Provides access to residential or commercial uses in areas in which right-of-way is constrained by topography or historically significant structures. The constrained right-of-way prevents typical bicycle and pedestrian facilities such as sidewalks and bicycle lanes. Therefore, pedestrians, bicycles, and motor vehicles may share the entire width of the street. The design of the street should emphasize a slower speed environment and provide clear physical and visual indications that the space is shared across modes.*	RTFP 3.08.110.C(8)
Access Management/ Consolidation	✓ In commercial corridors and mixed use districts, there are non-conforming access and egress points that are not in compliance with city standards.	Amend CDC Chapter 48.25 to establish clear guidance for land use decision makers to take to resolve access compliance issues over time using access consolidation, cross-over easements, and other techniques outlined in TM 11.	RTFP 3.08.220 Transportation Solutions

CITY PUBLIC WORKS DESIGN STANDARDS			
Issue	**Summary**	**Recommendation**	**Compliance**
On-street Trail	✓ West Linn's Trails Master Plan calls for a number of trail segments on existing streets but the city's design standards do not include guidance for these facilities.	Amend WLPW Design Standards, Division 5.0050 and 5.0060 to provide dimensional standards for on-street trail facilities.	West Linn Trails Plan; RTFP 3.08.110.C(8)
Shared Street	✓ The updated TSP includes identification of locations where mixed-modal use of the right of way is appropriate because of the existing development pattern or because of natural conditions that preclude building a standard improvement.	Amend WLPW Design Standards, Division 5.0110, to include a cross section and amenities for streets that are designed to integrate autos, bikes, and pedestrian use of the street.	RTFP 3.08.110.C(8)

CITY PUBLIC WORKS DESIGN STANDARDS			
Issue	Summary	Recommendation	Compliance
Green Street	✓ West Linn's public works design standards do not include guidance for locations where *green streets* may be constructed in place of a more conventional street design.	Amendments are proposed to Public Works Design Standards, Division 5 that will establish clear guidance for the construction of approved green street infrastructure. Details for the proposed standard, which is based on Metro's Green Street Design Manual, is in Exhibit B.	RTFP 3.08.110.C(8)

Exhibit A – Regulatory Review Compliance Matrix

Regional Transportation Functional Plan Requirement	Development Code Compliance
Allow complete street designs consistent with regional street design policies **(Title 1, Street System Design Sec 3.08.110A(1))**	Existing code requirements and the updated TSP meet this requirement by requiring construction of streets that accommodate all modes of transportation. See **Street Design Requirements: CDC 92.010.**
Allow green street designs consistent with federal regulations for stream protection **(Title 1, Street System Design Sec 3.08.110A(2))**	Amendments are proposed to CDC 92.010.R allowing development of green streets, and to West Linn Public Works (WLPW) Standards, Section 5 Streets and Section 2 Storm Drainage specifying conditions where a green street may be constructed and to what design standard.
Allow transit-supportive street designs that facilitate existing and planned transit service pursuant 3.08.120B **(Title 1, Street System Design Sec 3.08.110A(3))**	CDC 85.200 Approval Criteria for land divisions requires street widths to accommodate transit stops on arterial and collector streets and on Neighborhood Routes in circumstances where a transit route is present or planned. Amendment CDC 92.010 to include a requirement for the accommodation of transit facilities in identified transit corridors; Modify *WLPW Standards, Section 5 – Streets* to include design standards for transit stops and shelters.
Allow implementation of: • narrow streets (<28 ft curb to curb); • wide sidewalks (at least five feet of through zone); • landscaped pedestrian buffer strips or paved furnishing zones of at least five feet, that include street trees; • Traffic calming to discourage traffic infiltration and excessive speeds; • short and direct right-of-way routes and shared-use paths to connect residences with commercial services, parks, schools, hospitals, institutions, transit corridors, regional trails and other neighborhood activity centers; • opportunities to extend streets in an incremental fashion, including posted notification on streets to be extended. **(Title 1, Street System Design Sec 3.08.110B)**	Existing and proposed code amendments (TSP Appendix __), and the updated TSP meet these RTFP requirements as follows: CDC 85.200.A.8 includes an approval criterion for land divisions that requires street ends at the boundary of subdivisions be constructed without turnarounds, unless required by the fire department, to promote future street connectivity. CDC 92.010.B – Extension of streets to subdivisions requires street extensions to intersect with the existing grade of adjacent streets. Street widths may be approved as narrow as 24-feet. Amendments are proposed to: CDC 92.010.H.4 to increase the landscape buffer between the sidewalk and street from 3.5' to 5'; CDC 92.010.H.3 to reduce the sidewalk buffer to 5' from 6' for consistency;

Regional Transportation Functional Plan Requirement	Development Code Compliance
	CDC 92.010.H, add subsection 6 to required construction of a sidewalk or pedestrian access-way in locations where topography or development patterns interfere with direct street connections to activity centers, such as schools, parks, transit corridors, health care facilities, shopping districts, and community centers. CDC 92.010.I Bicycle Routes will be amended to include a reference to the need for connectivity to community activity centers for requirements to construct separate bicycle paths. CDC 92.010.C for improvements to local and minor collector streets permitting traffic calming when deemed appropriate by the City Engineer; CDC 92.010.B extending streets to subdivisions will include a requirement that the developer include a sign at the end of streets that will be extended and indicate "future street extension" on the plat where streets stub-out. Note that these requirements will serve to implement the TSP's Safe Routes to School plan (TSP Chapter __).
Require new residential or mixed-use development (of five or more acres) that proposes or is required to construct or extend street(s) to provide a site plan (consistent with the conceptual new streets map required by Title 1, Sec 3.08.110D) that: • provides full street connections with spacing of no more than 530 feet between connections except where prevented by barriers • Provides a crossing every 800 to 1,200 feet if streets must cross water features protected pursuant to Title 3 UGMFP (unless habitat quality or the length of the crossing prevents a full street connection) • provides bike and pedestrian accessways in lieu of streets with spacing of no more than 330 feet except where prevented by barriers • limits use of cul-de-sacs and other closed-end street systems to situations where barriers prevent full street connections • includes no closed-end street longer than 220 feet or having no more than 25	Existing city regulations meet the RTFP requirements as follows: CDC 85.200-Approval Criterial (for land divisions): A. Streets 11. limits approval of cul-de-sacs to less than 200' and serving no more than 25 dwellings; B. Blocks 2. The city standard/recommended block length is 400 feet. Amendments are proposed to city regulations as follows: CDC 85.200-Approval Criterial (for land divisions): B. Blocks Amend criterion *2. Block Sizes*, to establish that blocks may not exceed 530' (rather than 800') and add a requirement for crossing water courses except when avoidance is necessary to protect water quality/habitat; C. Bike/Ped Trails 1. Add a 330 ft. spacing standard to the requirement for connecting routes to activity centers within

Regional Transportation Functional Plan Requirement	Development Code Compliance
dwelling units **(Title 1, Street System Design Sec 3.08.110E)**	neighborhoods where street connections are not feasible. 3. Street widths – change the table to list the minimum landscaped strips from 6' to 5' for consistency; 4. add criterion *m. transit access* to require that developers make accommodation for transit accessibility in transit corridors/routes/districts.
Establish city/county standards for local street connectivity, consistent with Title 1, Sec 3.08.110E, that applies to new residential or mixed-use development (of less than five acres) that proposes or is required to construct or extend street(s). **(Title 1, Street System Design Sec 3.08.110F)**	Existing city regulations meet these requirements as follows: *CDC Chapter 92.010.A – Streets within subdivisions, and C – Local and Minor Collector Streets*, require that streets "shall be graded for the full right-of-way width and improved to the City's permanent improvement standards and specifications". Exceptions to this requirement are allowed with a finding that the full improvement cannot be made in order to protect a drainage way or wetland, or when there are other reasons demonstrated that the Street ROW is not needed. A change is proposed to *CH 92.010.A.2* requiring that an alternative trail, bikeway or access way be constructed when a street connection is not feasible (see Exhibit B).
<u>Applicable to both Development Code and TSP</u> To the extent feasible, restrict driveway and street access in the vicinity of interchange ramp terminals, consistent with Oregon Highway Plan Access Management Standards, and accommodate local circulation on the local system. Public street connections, consistent with regional street design and spacing standards, shall be encouraged and shall supersede this access restriction. Multimodal street design features including pedestrian crossings and on-street parking shall be allowed where appropriate. **(Title 1,Street System Design Sec 3.08.110G)**	The existing development code and the updated TSP meet these requirements as follows: The TSP specifically addresses proposed improvements to the I-205/10th Street interchange and local streets that serve the interchange. An amendment is proposed to *CDC 48.000 – Access, Egress and Circulation* directing property owners and developers to refer to the TSP for projects that alter access in the vicinity of the interchange (See Exhibit B).
Include Site design standards for new retail, office, multi-family and institutional buildings located near or at major transit stops shown in Figure 2.15 in the RTP: • Provide reasonably direct pedestrian	West Linn does not have any major transit stops (see RTP Figure 2.10). Note that there is a reference error in the RTP to Figure 2.15, which we anticipate will be corrected in the next TRP update.

<table>
<tr><th>Regional Transportation Functional Plan Requirement</th><th>Development Code Compliance</th></tr>
<tr><td>connections between transit stops and building entrances and between building entrances and streets adjoining transit stops;
• Provide safe, direct and logical pedestrian crossings at all transit stops where practicable.

At major transit stops, require the following:
• Locate buildings within 20 feet of the transit stop, a transit street or an intersection street, or a pedestrian plaza at the stop or a street intersections;
• Transit passenger landing pads accessible to disabled persons to transit agency standards;
• An easement or dedication for a passenger shelter and an underground utility connection to a major transit stop if requested by the public transit provider;
• Lighting to transit agency standards at the major transit stop;
• Intersection and mid-block traffic management improvements as needed and practicable to enable marked crossings at major transit stops.
(Title 1, Transit System Design Sec 3.08.120B(2))</td><td>CDC 55.100 Approval Standards – Class II Design Review provides guidance for approval of land use applications that require discretionary design review, which includes most development types except single family uses. The TSP proposes a future work program to improve connectivity within and between Commercial Mixed Use (Town Center) areas, including transit, to establish design standards for development within town centers that promote less single occupancy vehicle use, and to reduce the number of land use actions that required discretionary review.

CDC 55.100.B.7 – TPR Compliance generally promotes connectivity within and from commercial, multi-family, and office developments to transit stops. In particular, (g) requires a main entrance and a direct pathway to transit stops. Language is proposed to simplify this review criterion (see Exhibit B).

CDC 55.100.H – Public Transit requires development that abuts existing or planned transit routes to orient the development to transit facilities, provide transit shelters, bus turnouts, hard surface pathways to stops, and other enhancements that promote safe convenient access to transit service.

Inclusion of these approval criteria is recommended in non-discretionary review proceedings for all land uses that abut transit corridors and in town center areas. Development and adoption of these criteria will be made part of a TSP implementation planning process.</td></tr>
<tr><td><u>(Could be in Comprehensive plan or TSP as well)</u> As an alternative to implementing site design standards at major transit stops (section 3.08.120B(2), a city or county may establish pedestrian districts with the following elements:
• A connected street and pedestrian network for the district;
• An inventory of existing facilities, gaps and deficiencies in the network of pedestrian routes;
• Interconnection of pedestrian, transit and bicycle systems;
• Parking management strategies;
• Access management strategies;
• Sidewalk and accessway location and</td><td>There are no major transit stops or designated pedestrian districts in West Linn. A pedestrian district may be appropriate in one or more of the City's designated Commercial Mixed Use (Town Center) Areas. A decision to use this approach may emerge from future planning programs for mixed use areas and transit corridors. These criteria do not apply.</td></tr>
</table>

Regional Transportation Functional Plan Requirement	Development Code Compliance
width; • Landscaped or paved pedestrian buffer strip location and width; • Street tree location and spacing; • Pedestrian street crossing and intersection design; • Street lighting and furniture for pedestrians; • A mix of types and densities of land uses that will support a high level of pedestrian activity. **(Title 1, Pedestrian System Design Sec 3.08.130B)**	
Require new development to provide on-site streets and accessways that offer reasonably direct routes for pedestrian travel. **(Title 1, Pedestrian System Design Sec 3.08.130C)**	Review CDC Chapter 85 and 92. A change is proposed to *CH 92.010.A.2* requiring that an alternative trail, bikeway or access way be constructed when a street connection is not feasible (see Exhibit B).
Establish parking ratios, consistent with the following: • No minimum ratios higher than those shown on Table 3.08-3. • Mo maximum ratios higher than those shown on Table 3.08-3 and illustrated in the Parking Maximum Map. If 20-minute peak hour transit service has become available to an area within a one-quarter mile walking distance from bus transit one-half mile walking distance from a high capacity transit station, that area shall be removed from Zone A. Cities and counties should designate Zone A parking ratios in areas with good pedestrian access to commercial or employment areas (within one-third mile walk) from adjacent residential areas. Establish a process for variances from minimum and maximum parking ratios that include criteria for a variance. Require that free surface parking be consistent with the regional parking maximums for Zones A and B in Table 3.08-3. Following an adopted exemption process and	Existing code requirements and the updated TSP meet these requirements in the following ways. CDC Chapter 46 regulates off street parking. CDC 46.090 A – the minimum parking ratios for residential units mirror those in Metro Table 3.08-3. Parking minimums for non-residential uses are at or below the minimum levels in Metro Table 3.08-3. CDC 46.090.F sets parking maximums for non-residential uses at 10% above the minimum, which conforms to the maximum ratios in in Metro Table 3.08-3. include parking maximums for the following uses: high schools, CDC 46.090.G and CDC 55.100.(H)(5) allow for reductions to parking ratios when developments are in proximity to transit stops. An amendment is proposed to allow reductions in Town Centers and along Transit Corridors. Other amendments to city regulations and design standards in commercial mixed use districts and transit corridors may emerge from a future planning effort that is targeting how to establish boundaries and regulate land

Regional Transportation Functional Plan Requirement	Development Code Compliance
criteria, cities and counties may exempt parking structures; fleet parking; vehicle parking for sale, lease, or rent; employee car pool parking; dedicated valet parking; user-paid parking; market rate parking; and other high-efficiency parking management alternatives from maximum parking standards. Reductions associated with redevelopment may be done in phases. Where mixed-use development is proposed, cities and counties shall provide for blended parking rates. Cities and counties may count adjacent on-street parking spaces, nearby public parking and shared parking toward required parking minimum standards. Use categories or standards other than those in Table 3.08-3 upon demonstration that the effect will be substantially the same as the application of the ratios in the table. Provide for the designation of residential parking districts in local comprehensive plans or implementing ordinances. Require that parking lots more than three acres in size provide street-like features along major driveways, including curbs, sidewalks and street trees or planting strips. Major driveways in new residential and mixed-use areas shall meet the connectivity standards for full street connections in section 3.08.110, and should line up with surrounding streets except where prevented by topography, rail lines, freeways, pre-existing development or leases, easements or covenants that existed prior to May 1, 1995, or the requirements of Titles 3 and 13 of the UGMFP. Require on-street freight loading and unloading areas at appropriate locations in centers. Establish short-term and long-term bicycle parking minimums for: • New multi-family residential developments of four units or more; • New retail, office and institutional	uses in these special areas.

Regional Transportation Functional Plan Requirement	Development Code Compliance
developments; • Transit centers, high capacity transit stations, inter-city bus and rail passenger terminals; and • Bicycle facilities at transit stops and park-and-ride lots. **(Title 4, Parking Management Sec 3.08.410)**	

Regional Transportation Functional Plan Requirement	Public Works Design Standards Compliance
Allow implementation of: • narrow streets (<28 ft curb to curb); • wide sidewalks (at least five feet of through zone); • landscaped pedestrian buffer strips or paved furnishing zones of at least five feet, that include street trees; • Traffic calming to discourage traffic infiltration and excessive speeds; • short and direct right-of-way routes and shared-use paths to connect residences with commercial services, parks, schools, hospitals, institutions, transit corridors, regional trails and other neighborhood activity centers; • opportunities to extend streets in an incremental fashion, including posted notification on streets to be extended. **(Title 1, Street System Design Sec 3.08.110B)**	*WLPW Standards, Section 5 – Street Requirements* meet these requirements as follows. *5.0110 – Streets with Adverse Topography* allows local streets with as little as 20' of pavement. *5.0081.C Design Speeds* grants the City Engineer authority to install traffic calming on local and collector streets in locations where traffic speeds are in excess of design speeds. A number of amendments are proposed to CDC 85.200 and CDC 92.010 that affect street design standards that are related to street widths, access, and connectivity. Some modification to WLPW standards may result from amendments in the CDC, but the city's current design standards meet Title 3 requirements for: • 5.0011 – R.O.W and Pavement • 5.0050 – Sidewalks (including landscape strips) • 5.0060 – Bikeways/Paths • 5.0090 – Dead Ends/Cul-de-sac turnarounds

Exhibit B – Draft Text for Proposed Comp Plan, TSP, and CDC Amendments

West Linn Comprehensive Land Use Plan

Goal 1 – Citizen Involvement:

Policy 7.

c. Neighborhood plans will be treated as advisory documents in land-use planning proceedings until they are formally adopted as a refinement plan and an element of the Comprehensive Plan.

Recommended Action Measures

10. The City Council, together with neighborhood leaders, shall formulate a neighborhood plan adoption process for each neighborhood prior to beginning a neighborhood plan. Neighborhood Plans may be adopted by resolution when intended to be an advisory document, or by ordinance when adopted as part of the Comprehensive Plan. Neighborhood Plans may be periodically amended by the City Council directly or in response to ~~the~~ a request of the neighborhood association, or others~~, in accordance with the plan amendment procedures of the City Of West Linn~~.

Goal 2 - Land Use Planning:

Section 1 – Residential Development

Goal 2. Allow a mix~~ed~~ of residential and commercial uses~~existing~~ in Mixed Use Commercial Districts ~~commercial areas only in conjunction with an adopted neighborhood plan designed~~ to ensure compatibility ~~and maintain~~ of these districts with the residential character of existing neighborhoods.

Section 3 – Mixed Use /Commercial Development

Background and Findings:

West Linn is unique in that it does not have a major commercial district or downtown… The major districts are Willamette, including the area north of I-205 at the 10th Street interchange, Bolton, the Robinwood area adjacent to Highway 43, and Tanner Basin. These areas function like the "Town Centers" that are shown on the Metro 2040 Growth Concept plan; they have transit service, include a mix of commercial and residential land uses, and provide connections to essential services and employment opportunities for the surrounding neighborhoods.

Goals:

6. Provide for multi-modal connections to and interconnections between mixed use/commercial centers via automobiles, transit, bicycles, and pedestrian ~~pathways~~facilities~~, and other means~~.

7. Require standards for mixed-use commercial districts that promote safe access into and within these areas for walking, biking, and transit use from surrounding neighborhoods ~~areas~~ and that create livable areas ~~that fit in~~ compatible with existing neighborhood character.

Policies:

Amend or redact policies 1 – 3 to remove references to neighborhood plans that have not been adopted as elements of the Comp Plan. Consider replacing these policies with one policy that establishes common land use attributes for these areas.

Section 5 – Intergovernmental Coordination

Policies:

6. Adopt amendments to the West Linn Comprehensive Plan, including ancillary elements that are elements of the Plan such as the Transportation System Plan, Public Facility Plan, and neighborhood plans, as well as implementing ordinances consistent with Statewide Land Use Planning requirements.

(Note: Update Figure 2-1 Comprehensive Plan to show boundaries for Mixed Use Commercial Districts;

Update Figure 2-2 Metro 2040 Growth Concept to the current version.)

Goal 12 - Transportation:

General Policies and Action Measures

Policies:

9. Take action using the following measures to promote the use of Transportation Options:

- Support community education to increase efficient use of existing transportation infrastructure and minimize congestion and safety concerns by offering choices of mode, route, and time.
- Support and participate in efforts by Metro, the Department of Environmental Quality (DEQ), transit providers, and Transportation Management Associations (TMAs) to develop, monitor and fund local TDM programs.
- Provide adequate bicycle and pedestrian facilities connecting mixed-use commercial centers to encourage use of bicycles or walking for the commute to work and to improve access to jobs for workers without cars.
- Take steps to reduce drive-alone vehicle trips with the goal to reach 40% non-drive alone trips in mixed-use areas by 2040.
- Develop regulations for mixed-use areas that require major new development and redevelopment and conditional use applications to address Transportation Options requirements.

10. Consider the Metro Regional Street Design Classifications for new and redesigned city streets prior to construction or reconstruction.
11. Minimize impacts of managing storm water by allowing for Metro's alternative street standards, such as "green streets," as design alternatives.
12. West Linn will take proactive steps to eliminate and/or consolidate non-conforming vehicular, pedestrian, and bicycle access and egress through its land use regulatory authority.

West Linn Community Development Code (CDC)

CDC 46.090

G. Parking reductions. CDC 55.100(H)(5) explains reductions of up to 10 percent for development sites ~~next to~~ within ¼ miles of a transit ~~stops~~ corridor or within a town center area, and up to 10 percent for commercial development sites adjacent to ~~large~~ multi-family residential sites with the potential to accommodate more than __ dwelling units.

CDC 48.025 – Access Control

A. Purpose – The following access control standards … as required by the West Linn Transportation System Plan. All development applications in the vicinity of the I-205/10th Street Interchange are specifically required to meet the access spacing and control framework established for the interchange area by the TSP in addition to the regulations set-forth herein. When there the regulations below are in conflict with the TSP, the TSP shall have precedence.

CDC 92.010

A. Streets in Subdivisions

2. When the decision-making authority makes these findings, the decision-making authority ~~may~~ shall impose any of the following conditions of approval:

   a. A condition that the applicant initiate vacation proceedings for all or part of the right-of-way.

   b. A condition that the applicant build a trail, bicycle path, or other appropriate way.

C. Local and minor collector streets within the public rights-of-way abutting a subdivision or within a town center area shall be graded for the full right-of-way width and approved to the City's permanent improvement standards and specifications. The City Engineer shall review the need for street improvements and shall specify whether full street or partial street improvements shall be required. Where a street connection is not feasible and the distance from the nearest street connection exceeds 330', the City Engineer shall require the subdivider to build a trail, bicycle path, or other appropriate way.

Transportation Demand Management:

CDC 55.100.7:
k. Major developments and conditional use applications in designated town center and industrial areas must include a transportation demand management (TDM) elements into the development program. Table A outlines requirements and appropriate TDM measures for various types of development. Larger scale developments that generate more auto-trips are required to implement more significant TDM measures. The measures are organized into three categories based on their level of impact. Development that falls below the threshold for Category 1 are encouraged but not required to address TDM measures..

1. Low- development that is expected to generate from __ to __ new auto trips.

2. Moderate – development that is expected to generate from __ to __ new auto trips.
3. High – development that is expected to generate more than__ new auto trips.

Category 1 developments are required to implement __ strategies from this part of the table. Category 2 developments must choose __ strategies from Category 1 and __ strategies from Category 2. Category 3 developments must meet the requirements for Categories 1 and 2 and also implement __ strategies from Category 3.

Table k.1: Transportation Demand Management Strategies for Employers[3]

Strategy	Description	Potential Trip Reduction[a]
Category 1 Strategies		
Walking Program	Provide support services for those who walk to work. This could include buying walking shoes or providing lockers and showers.	0-3%
Bicycle Program[b]	Provide support services to those employees that bicycle to work. Examples include: safe/secure bicycle storage, shower facilities, and subsidy of commute bicycle purchase.	0-10% *Percentage of employees living within 6 mi. of work site*
Telecommuting	Allow employees to perform regular work duties at home or at a work center closer to home, rather than commuting from home to work. This can be full time or on selected workdays. This can require computer equipment to be most effective.	82-91% (Full Time) 14-36% (1-2 day/wk) *Per employee participating*
Alternative Mode Subsidy[b]	Provide a monetary bonus to employees that commute to work by modes other than driving alone.	**High Transit Service:** 21-34% (full subsidy) 10-17% (half subsidy) **Medium Transit Service:** 5-7% (full subsidy) 2-4% (half subsidy) **Low Transit Service:** 1-2% (full subsidy) 0.5-1% (half subsidy)21-34%
Category 2 Strategies		
Transit Pass Subsidyb	Pay a portion of the cost of a monthly transit pass for employees that commute to work by bus or other public transportation methods. (The potential trip reduction is lower than the alternative mode subsidy because it does not incentivize bicycle,	**High Transit Service:** **19-32% (full subsidy)** **10-16% (half subsidy)** **Medium Transit Service:** **4-6% (full subsidy)**

[3] *Guidance for Estimating Trip Reductions from Commute Options*, Oregon Department of Environmental Quality (DEQ), August 1996, and *Employee Commute Options (ECO) Sample Trip Reduction Plan*, Oregon DEQ, October 2006.

Strategy	Description	Potential Trip Reduction[a]
	pedestrian, and vanpool/carpool modes.)	**2-3% (half subsidy)** **Low Transit Service:** **0.5-1% (full subsidy)** **0-0.5% (half subsidy)**
Compressed Work Week	Allow employees to work their regularly scheduled number of hours in fewer days per week.	**Most Typical:** **16-18% (4 day/40 hr)** **Other Options:** **7-9% (9 day/80 hr)** **32-36% (3 day/36 hr)** **Per employee participating**

(Continued) Table A: Transportation Demand Management Strategies for Employers

Strategy	Description	Potential Trip Reduction
Category 2 Strategies	(continued)	
Preferential Parking for Carpools	Provide preferred parking stalls to employees using carpools and vanpools.	[c]
Time off with Pay for Alternative Mode Use	Offer employees time off with pay as an incentive to use alternative modes.	1-2%
Gift/Awards for Alternative Mode Use	Offer employees the opportunity to receive a gift or an award for using modes other than driving alone.	0-3%
Category 3 Strategies		
Car-Sharing	Pay for car-sharing memberships (such as Zipcar) for business-related travel during the day	[c] *Dependent upon presence of nearby cars*
On-Site Services	Provide services at the work site that are frequently used by employees (and that employees would typically need to drive to use). Examples include cafes/restaurants, dry cleaners, day care centers, and bank machines.	1-2%
Provide Vanpools[b]	Organize employees that live near each other into a vanpool for their trips to and from work. The employer may subsidize the van's operation and maintenance costs. Existing programs in the area that could be utilized include Valley VanPool (for Salem destinations) and Metro VanPool (for Portland destinations)	30-40% (Fully-subsidize van) 15-25% (Run vanpool but charge fee) *Percentage of employees living more than 20 mi. away from work site*
On-Site Rideshare Matching for HOVs	Match employees who can reasonably carpool or vanpool together based on information that employees provide regarding their work hours, availability of a vehicle, and place of residence.	6-8% (with support strategies) 1-2% (without support strategies)
Company Cars for Business Travel	Provide company cars for business-related travel during the day	0-1%
Guaranteed Ride Home Program	Maintain a company owned or leased vehicle that is available in the case of an emergency for employees that arrived to work using transit or bicycle.	1-3% *When used in combination with other measures*

[a] Reduction applicable to total number of employees, unless otherwise noted.
[b] Tax benefits may be available to employers who provide their employees with certain transportation benefits (see www.irs.gov/pub/irs-pdf/p15b.pdf).
[c] Strategy not identified in Employee Commute Options (ECO) table, so potential trip reduction is unknown.

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MEMORANDUM

Date:	March 25, 2015	Project #: 17817.0
To:	Zach Pelz, City of West Linn Gail Curtis, Oregon Department of Transportation	
From:	Susan Wright, Matthew Bell, and Ribeka Toda, Kittelson & Associates, Inc.	
Project:	West Linn Transportation System Plan (TSP) Update	
Subject:	Final Technical Memorandum #10: TSP Solutions	

This memorandum documents potential solutions to address the existing and future transportation system needs within the City of West Linn, which were identified in Technical Memorandum 7. The solutions fall into the following categories:

- Transportation System Management and Operations (TSMO)
- Access Management
- Safety Solutions
- Pedestrian, Bicycle, Trail and Transit Solutions
- System Connectivity
- Freight Mobility and Reliability
- Roadway Capacity

These solutions are intended to address the city's goals and desired outcomes for the performance of the transportation system. These include:

- **Goal 1: Safety** – Reduce transportation-related fatalities and serious injuries across all modes
- **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
- **Goal 3: Equity** – Develop transportation facilities that are accessible to all members of the community
- **Goal 4: Maintenance** – Deliver access and safety improvements cost effectively, and within available revenues

The solutions include potential projects, policies, and programs for inclusion in the city's updated Transportation System Plan (TSP) which provides a framework and plan for addressing the city's existing transportation needs and the additional needs to serve future growth. These solutions will be reviewed by the project Technical Advisory Committee (TAC), Citizens Advisory Committee (CAC), and general public to determine if they should move forward into the Draft Transportation System Plan and to identify the highest priorities for limited funding.

TRANSPORTATION SYSTEM MANAGEMENT AND OPERATIONS (TSMO) SOLUTIONS AND IMPROVEMENTS

Transportation Demand Management (TDM) and Transportation System Management (TSM) strategies are two complementary approaches to managing transportation and maximizing the existing system. Together, these strategies are referred to as Transportation System Management and Operations (TSMO). TDM addresses the *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 the 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.

Metro's Regional TSMO Plan identifies four main areas of investment to improve system performance:

- Multi-modal traffic management – traffic signal coordination, transit signal priority, detection and countdown timers for bicycles and pedestrians.
- Traveler information – real-time traveler information for freeways and arterials and enhance traveler information tools.
- Traffic incident management – such as improved surveillance and expanded incident management teams and training.
- Transportation demand management (TDM) – ridesharing, collaborative marketing, individualized marketing, Transportation Management Associations, and employer outreach.

The Plan also identifies specific strategies for 24 mobility corridors in the region. The following strategies are identified for the mobility corridors in the City of West Linn:

- Freeway Management for I-205
- Arterials Corridor Management for Highway 43
- Arterial Corridor Management for Willamette Falls Drive

In the TSMO Plan, Freeway Management refers to the expansion of freeway vehicle detection to provide comprehensive freeway traveler information including travel speed, travel times, volumes, forecasted information, incident conditions, and weather conditions. Arterial Corridor Management (ACM) refers to installing upgraded traffic signal controllers, establishing communications to the central traffic signal system, providing arterial detection (including bicycle detection where appropriate), routinely updating signal timings, upgrading traffic signage, and performing on-going maintenance and parts replacement. In addition, it may include providing real-time and forecast 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 following section provides an overview of a broad range of TSMO measures that are being implemented and considered in the region and identifies and explains those that are most applicable to the City of West Linn.

TSMO Strategies

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 1 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 applicability of these strategies can be further reviewed. Additional information on potential strategy implementation within West Linn is discussed below.

Table 1: Transportation system management and transportation demand management 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
Flexible Work Shifts	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					P
Regional traffic management	TSM	Infrastructure	P					

Advanced signal systems	TSM	Infrastructure	S			S		P
Real time traveler data	TSM	Infrastructure	P					P
Arterial corridor management	TSM	Infrastructure	P					

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

Strategies for West Linn

The following section provides more detail on policy, programming and infrastructure 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. Given the limited transit network and the perceived rural character, it is likely that some of the options listed may receive some degree of public opposition in the near future. As such, care should be taken to implement strategies that are consistent with West Linn's vision and goals, while still effectively reducing travel demand.

Programming

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

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.

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 single-occupancy vehicles.

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.

Limited and/or Flexible Parking Requirements

Cities set policies related to parking requirements for new developments. In order to allow developments 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 provision of parking to the rear of buildings, allowing buildings in commercial areas 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 management of parking resources 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.

Access Management

Access management describes a practice of managing the number, placement, and movements of intersections and driveways that provide access to adjacent land uses. Access management policies can be an important tool to improve transportation system efficiency by limiting the number of opportunities for turning movements on to or off of certain streets.

In addition, well deployed access management strategies can help manage travel demand by improving travel conditions for pedestrian and bicycles. Eliminating the number of access points on roadways allows for continuous sidewalk and bicycle facilities and reduces the number of potential interruptions and conflict points between pedestrians, bicyclists, and cars.

Access management is typically adopted as a policy in development guidelines. It can be extremely difficult to implement an access management program once properties have been developed along a corridor. Cooperation among and involvement of relevant government agencies, business owners, land developers and the public is necessary to establish an access management plan that benefits all roadway users and businesses. Additional information on potential access management solutions is provided in a following section.

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 high pedestrian or desired pedestrian areas, signal retiming can facilitate pedestrian movements through intersections by increasing minimum green times to give pedestrians time to cross during each cycle, eliminating the need to push pedestrian crossing buttons. Signals can also facilitate bicycle movements with the inclusion of bicycle detectors.

Signal upgrades often come at a higher cost and usually require further coordination between jurisdictions. However, upgrading signals provides the opportunity to incorporate advanced signal systems to further improve the efficiency of a transportation network. Strategies include coordinated signal operations across jurisdictions, centralized control of traffic signals, adaptive or active signal control, and transit 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. These systems include:

- **Transit signal priority** systems use sensors to detect approaching transit vehicles and alter signal timings to improve transit performance. This improves travel times for transit, reliability of transit travel time, and overall attractiveness of transit. 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 detect traffic flows adequately, in addition to hardware and software upgrades.
- **Traffic responsive control** uses data collected from traffic detectors to change signal timing plans for intersections. The data collected from the detectors is used by the system 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 timings 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.

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 can choose. 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 the attractiveness of transit to the public by encouraging travelers to consider transit as opposed to driving alone. They do require cooperation and integration between agencies for disseminating the information.

ACCESS MANAGEMENT SOLUTIONS

The Oregon Highway Plan (OHP) defines access management as a set of 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 siting of interchanges, 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 OHP requires that new connections to arterials and state highways be consistent with designated access management categories. The intent of this requirement is to provide guidance on the spacing of future extensions and connections along existing and future streets that are needed to provide reasonably direct routes for bicycle and pedestrian travel.

The City's access management policy maintains and enhances the integrity (capacity, safety, and level of service) of city streets while conforming to ODOT's requirement for Highway 43. The TSP should identify access management techniques and strategies that help to preserve transportation system investments and guard against deteriorations in safety and increased congestion. The City's approach to access management should balance the need for land use activities and property parcels to be served with appropriate access while preserving safe and efficient movement of traffic. Access management solutions include:

- setting city-wide access spacing standards according to a roadway's functional classification;
- defining a variance process for when the standard cannot be met;
- obtaining special area designations along ODOT facilities that have alternative access spacing standards; and,
- establishing an approach for access consolidation over time to move in the direction of the standards at each opportunity.

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 OHP. The OHP serves as the policy basis for implementing Division 51 and guides the administration of access management rules, 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 are 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 2 summarizes ODOT's current access management standards for Highway 43 per the OHP as of June 30, 2014.

Table 2: Highway 43 Access Spacing Standards

Highway Classification	Posted Speed (MPH)	Spacing Standards (Feet)[1]
Statewide Highway	30 & 35	500
District Highway	25 & 30	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

Special Transportation Areas (STA) are highways or highway segments where alternate mobility and access management standards are considered. STAs look like traditional main streets with development generally located near the back of sidewalk on both sides of the highway. The primary objective of STAs is to provide access to and circulation amongst community activities, businesses and residences and to accommodate pedestrian, bicycle and transit movement on and across the highway. Direct local 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.

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 (e.g. 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 overtime to uses consistent with STA implementation.

Two locations on Highway 43 can be considered for STAs, including the Robinwood Area commercial district and the Bolton Area commercial district. Both locations have intersections that are projected to exceed their respective mobility standards in 2040 and multiple local street connections and driveways that do not meet access spacing standards. Designating Highway 43 as an STA within these commercial areas would allow them to operate with more congestion and with closer access spacing than would typically be allowed. 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 the roadway functional classification. Table 3 summarizes the City's current standards as they relate to new development and redevelopment. In addition to the spacing standards below, the City should adopt a policy that requires access be taken from lower classification streets whenever possible.

Table 3: City Street Access Spacing Standards

Roadway Functional Classification	Area	Traffic Signals (miles)	Public Intersections (feet)	Private Driveways (feet)	Median Opening (feet)
Arterial	Urban	½	600	300	600
Arterial	Commercial area	¼	NA	NA	NA
Collector	All	¼	200	150	NA
Neighborhood Route	All	¼	150	100	NA
Local Residential Street	All	NA	100	50	NA
Local Commercial Street	All	NA	100	50	NA

"Urban" refers to intersections inside the West Linn urban growth boundary and outside the central business district or designated town centers.
"Commercial" refers to the designated commercial areas located in the Robinwood, Bolton, and Willamette neighborhoods.

Access Spacing Variances

Access spacing variances may be provided to parcels whose highway/street frontage, topography, or location would otherwise preclude issuance of a conforming permit and would either have no reasonable access or cannot obtain reasonable alternate access to the public road system. In such a situation, a conditional access permit may be issued by ODOT or the City, as appropriate, for a connection to a property that cannot be accessed in a manner that is consistent with the spacing standards. The permit can carry a condition that the access may be closed at such time that reasonable access becomes available to a local public street. The approval condition might 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 a deviation from ODOT's minimum spacing standards are documented in OAR 734-051-3050. For streets under the City's jurisdiction, the City may reduce the access spacing standards at the discretion of the City Engineer if the following conditions exist:

- Joint access driveways and cross access easements are provided in accordance with the standards;
- The site plan incorporates a unified access and circulation system in accordance with the standards;
- The property owner enters into a written agreement with the City that pre-existing connections on the site will be closed and eliminated after construction of each side of the joint use driveway; and/or,
- The proposed access plan for redevelopment properties moves in the direction of the spacing standards.

The City Engineer may modify or waive the access spacing standards for streets under the City's jurisdiction where the physical site characteristics or layout of abutting properties would make development of a unified or shared access and circulation system impractical, subject to the following considerations:

- Unless modified, application of the access standard will result in the degradation of operational and safety integrity of the transportation system.
- The granting of the variance shall meet the purpose and intent of these standards and shall not be considered until every feasible option for meeting access standards is explored.
- Applicants for variance from these standards must provide proof of unique or special conditions that make strict application of the standards impractical. Applicants shall include proof that:
    - Indirect or restricted access cannot be obtained;
    - No engineering or construction solutions can be applied to mitigate the condition; and,

- No alternative access is available from a road with a lower functional classification than the primary roadway.

No variance shall be granted where such hardship is self-created. The West Linn Community Development Code (Section 48.060) also contains access separation requirements that in many instances limits the discretion of the City Engineer to modify access spacing as listed above. Consistency between access spacing requirements and exceptions in the TSP and CDC is an important regulatory solution to be addressed as part of this TSP update.

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. Enforcement of the access spacing standards should be complemented 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 an access management approach is taken, alternative access should 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.

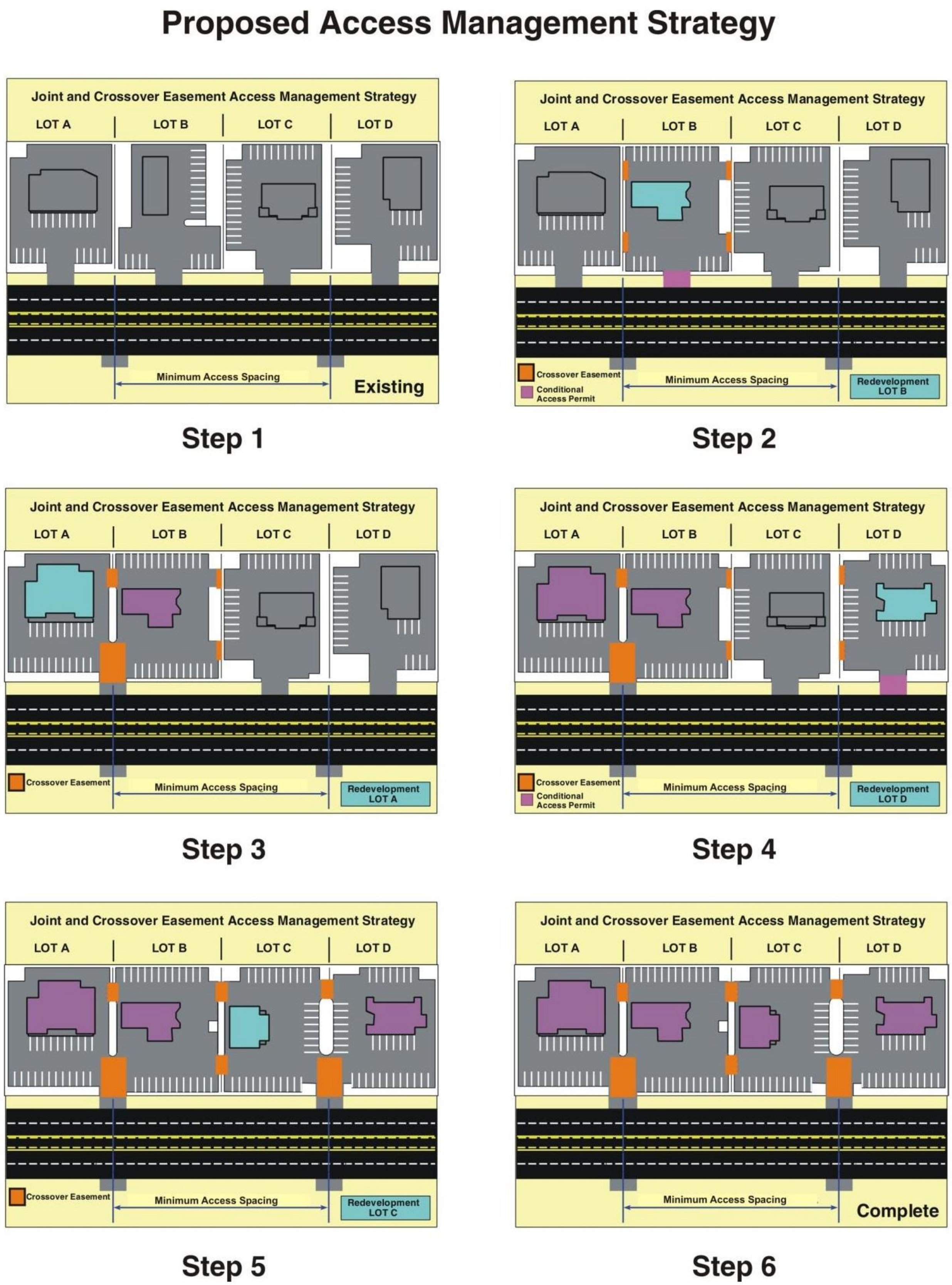
- Providing access only to the lower classification roadway when multiple roadways are abut the property.
- Provision of crossover easements on all compatible parcels (considering topography, access, and land use) to facilitate future access between adjoining parcels.
- Issuance of conditional access permits to developments having proposed access points that do not meet the designated access spacing policy and/or have the ability to align with opposing driveways.
- Right-of-way dedications to facilitate the future planned roadway system in the vicinity of proposed developments.
- Half-street improvements (sidewalks, curb and gutter, bike lanes/paths, and/or travel lanes) along site frontages that do not have full build-out improvements in place at the time of development.

Exhibit 1 illustrates the application of cross-over easements and conditional access permits over time to achieve access management objectives. The individual steps are described in Table 4. As illustrated in the exhibit and supporting table, by using these guidelines, all driveways along the highways can eventually move in the overall direction of the access spacing standards as development and redevelopment occur along a given street.

Table 4: Example of Crossover Easement/Indenture/Consolidation

Step	Process
1	EXISTING – Currently Lots A, B, C, and D have site-access driveways that neither meet the access spacing criteria of 500 feet nor align with driveways or access points on the opposite side of the highway. Under these conditions motorists are into situations of potential conflict (conflicting left turns) with opposing traffic. Additionally, the number of side-street (or site-access driveway) intersections decreases the operation and safety of the highway
2	REDEVELOPMENT OF LOT B – At the time that Lot B redevelops, the City would review the proposed site plan and make recommendations to ensure that the site could promote future crossover or consolidated access. Next, the City would issue conditional permits for the development to provide crossover easements with Lots A and C, and ODOT/City would grant a conditional access permit to the lot. After evaluating the land use action, ODOT/City would determine that LOT B does not have either alternative access, nor can an access point be aligned with an opposing access point, nor can the available lot frontage provide an access point that meets the access spacing criteria set forth for segment of highway.
3	REDEVELOPMENT OF LOT A – At the time Lot A redevelops, the City/ODOT would undertake the same review process as with the redevelopment of LOT B (see Step 2); however, under this scenario ODOT and the City would use the previously obtained cross-over easement at Lot B consolidate the access points of Lots A and B. ODOT/City would then relocate the conditional access of Lot B to align with the opposing access point and provide and efficient access to both Lots A and B. The consolidation of site-access driveways for Lots A and B will not only reduce the number of driveways accessing the highway, but will also eliminate the conflicting left-turn movements the highway by the alignment with the opposing access point.
4	REDEVELOPMENT OF LOT D – The redevelopment of Lot D will be handled in same manner as the redevelopment of Lot B (see Step 2)
5	REDEVELOPMENT OF LOT C – The redevelopment of Lot C will be reviewed once again to ensure that the site will accommodate crossover and/or consolidated access. Using the crossover agreements with Lots B and D, Lot C would share a consolidated access point with Lot D and will also have alternative frontage access the shared site-access driveway of Lots A and B. By using the crossover agreement and conditional access permit process, the City and ODOT will be able to eliminate another access point and provide the alignment with the opposing access points.
6	COMPLETE – After Lots A, B, C, and D redevelop over time, the number of access points will be reduced and aligned, and the remaining access points will meet the access spacing standard.

Exhibit 1: Cross Over Easement



SAFETY SOLUTIONS

The 2008 TSP does not include any projects specifically identified as safety improvements. For the TSP update, the five most recent years of crash data available (January 1, 2009 to December 31, 2013) was obtained from ODOT and reviewed to identify motor vehicles crashes that were classified as fatal or injury A crashes (incapacitating/broken bones) and pedestrian/bicyclist crashes. Willamette Drive was excluded from this analysis as the existing Highway 43 Concept Plan considered safety needs and the upcoming Highway 43 Concept Plan Refinement Project will consider the most recent safety data and issues along the corridor. Crashes that occurred along I-205 were also excluded, as it is an ODOT facility on the Interstate system.

Motor Vehicles Crashes

A total of three fatal and 15 Injury A crashes occurred within West Linn over the five year period. Two of the fatal crashes occurred along Willamette Drive and one along I-205. The fatal crash locations are denoted in red in Figure 1. The fatal crashes that occurred along Willamette Drive will be considered in the Highway 43 Concept Plan update. No solutions are proposed for the fatal crash that occurred along I-205. Six of the Injury A crashes occurred along Willamette Drive and five along I-205. The Injury A crashes are denoted in orange in Figure 1. No solutions are proposed for the Injury A crashes that occurred along Willamette Drive and I-205 as described above. The four remaining crashes are summarized below.

Willamette Falls Drive

- Intersection crash at the 14th Street/Willamette Falls Drive intersection:
  - Rear end crash due to driver inattention
  - The motor vehicle solutions identify the potential conversion of the intersection to all way stop control (AWSC) when warranted, which may improve safety
- Segment crash at 500 feet west of West A Street – a segment crash is a crash that occurs between two intersections:
  - Mid-block head-on collision due to driver inattention and car driving to the left of the centerline
  - No potential solutions are identified to address this type of crash

Hidden Springs Drive

- Segment crash at 75 feet north of Cottonwood Court:
  - Mid-block collision with retaining wall due to excessive speed
  - Not potential solutions are identified to address this type of crash

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Motor Vehicle and Pedestrian/Bicycle Crashes
West Linn, Oregon

Figure
1

McKillican Street

- Segment crash at 100 feet northeast of Broadway Street:
  - Turning movement crash at a midblock location
  - No potential solutions are identified to address this type of crash

Pedestrian/Bicyclist Crashes

There were a total of 19 crashes involving pedestrians and/or bicyclists over the five year period, five involved pedestrians and 14 involved bicyclists. One resulted in a fatal crash. The pedestrian and bicycle crash locations are denoted with pedestrian and bicycle symbols in Figure 1. As shown, seven crashes occurred along Willamette Drive and one occurred at an I-205 ramp. No solutions are proposed for crashes that occur along Willamette Drive and I-205 as described above. The 11 remaining crashes are summarized below. Several potential solutions have been proposed to improve pedestrian and bicycle safety at these locations.

Willamette Falls Drive

- Segment crash with pedestrian at 150 feet west of 14th Street:
  - Mid-block pedestrian collision
  - Potential pedestrian improvements include the installation of sidewalks along both sides of Willamette Falls Drive as described below. These improvements should improve pedestrian safety along this segment
  - Additional improvements proposed: Crosswalk on west side leg of 14th Street
- Driveway crash with bicyclist at 55 feet east of 13th Street:
  - Bicyclist not visible for turning vehicle
  - Potential bicycle improvements include the installation of bike lanes along both sides of Willamette Falls Drive as described below. These improvements should improve bicyclist safety at this intersection
- Intersection crash with bicyclist at 12th Street/Willamette Falls Drive:
  - Angle crash due to ROW non-compliance at stop sign
  - Potential bicycle improvements include the installation of bike lanes along both sides of Willamette Falls Drive as described below. These improvements should improve bicyclist safety at this intersection. In addition, the motor vehicle improvements identify the potential conversion of the intersection to an all-way stop-control when warranted, which may improve the safety
- Intersection crash with bicyclist at West A Street/Willamette Falls Drive:
  - Crash due to ROW non-compliance at stop sign

- Potential bicycle improvements include the installation of bike lanes along both sides of Willamette Falls Drive as described below. These improvements should improve bicyclist safety at this intersection

- Intersection crash with pedestrian at Broadway Street/Willamette Falls Drive
  - Pedestrian not visible for vehicle
  - Potential pedestrian improvements include the installation of sidewalks along Willamette Falls Drive as described below. These improvements should improve pedestrian safety at this intersection. In addition, the motor vehicle improvements propose the installation of a traffic signal at the Willamette Drive/Willamette Falls Drive intersection
  - Additional improvements proposed: Crosswalk across Broadway Street

Hidden Springs Road

- Intersection crash with bicyclist at Santa Anita Drive/Hidden Springs Road:
  - Turning crash due to ROW non-compliance
  - Potential bicycle improvements include the installation of bike lanes along both sides of Hidden Springs Road and along both sides of Santa Anita Drive as described below. These improvements should improve bicyclist safety at this intersection

Rosemont Road

- Intersection crash with pedestrian at Santa Anita Drive/Rosemont Road:
  - Crash due to ROW non-compliance
  - A traffic signal has been installed at this location since the crash occurred.

Cornwall Street

- Intersection crash with bicycle at Lancaster Street/Cornwall Street:
  - Phantom / Non-contact vehicle
  - Pedestrian and bicycle improvements are recommended for this segment; however, they are not anticipated to have an impact on this type of crash

Salamo Road

- Intersection crash with bicycle at Day Road/Salamo Road:
  - Crash due to ROW non-compliance
  - Pedestrian and bicycle improvements are recommended for this segment; however, they are not anticipated to have an impact on this type of crash

- Segment crash with pedestrian at 900 feet east of 10th Street:
  - Mid-block pedestrian collision
  - The pedestrian improvements recommend the installation of sidewalks along both sides of Salamo Road in this segment, which should improve pedestrian safety

Imperial Drive

- Intersection crash with bicyclist at Rockridge Drive/Imperial Drive:
  - Turning crash due to ROW non-compliance
  - No relevant improvements have been identified in the pedestrian, bicycle, transit, or motor vehicle improvements

PEDESTRIAN, BICYCLE, TRAIL, AND TRANSIT SOLUTIONS AND IMPROVEMENTS

The following describes a variety of potential pedestrian, bicycle, trail, and transit solutions and improvements for addressing the transportation system needs identified in Tech Memo 7. The on-street pedestrian and bicycle networks need to be designed to complement the existing and future transit network as well as off-street trails identified in the City's Trails Master Plan. This will ensure access to the transit and the trails network for pedestrians and cyclists which increases resident's access to transit for longer trips and increases access to the lower-stress walking and cycling network which will help attract more people to these modes of travel.

Following a brief overview of the potential pedestrian and bicycle solutions and improvements, alternatives specific to the following arterials, collectors, neighborhood routes, and local streets along the Safe Routes to Schools (SRTS) for the five primary schools with SRTS programs are provided. Relative costs (high, medium, and low) are provided for each improvement based on a per/foot cost. Figure 2 illustrates the location of the following corridors.

- Lancaster Street
- Hidden Springs Road
- Parker Road
- Rosemont Road
- Salamo Road
- Santa Anita Drive
- Skyline Drive
- Sunset Avenue
- West A Street
- Willamette Falls Drive
- 10th Street
- Bland Circle
- Blankenship Road
- Carriage Way
- Clark Street
- Cornwall Street
- Dollar Street
- Johnson Road
- Marylhurst Drive
- Old River Drive
- Ostman Road
- Pimlico Drive
- Summit Street
- Suncrest Road
- Tannler Drive

Although there are a variety of alternative solutions identified for each of the above corridors, the project evaluation criteria (see Technical Memo 3) have been applied to help identify priorities amongst the corridors. This will help identify which corridors should be prioritized for improvements based on how well they advance the TSP Update goals and will move the City in the direction of achieving the various system performance targets. *This project evaluation matrix is included in Attachment A.*

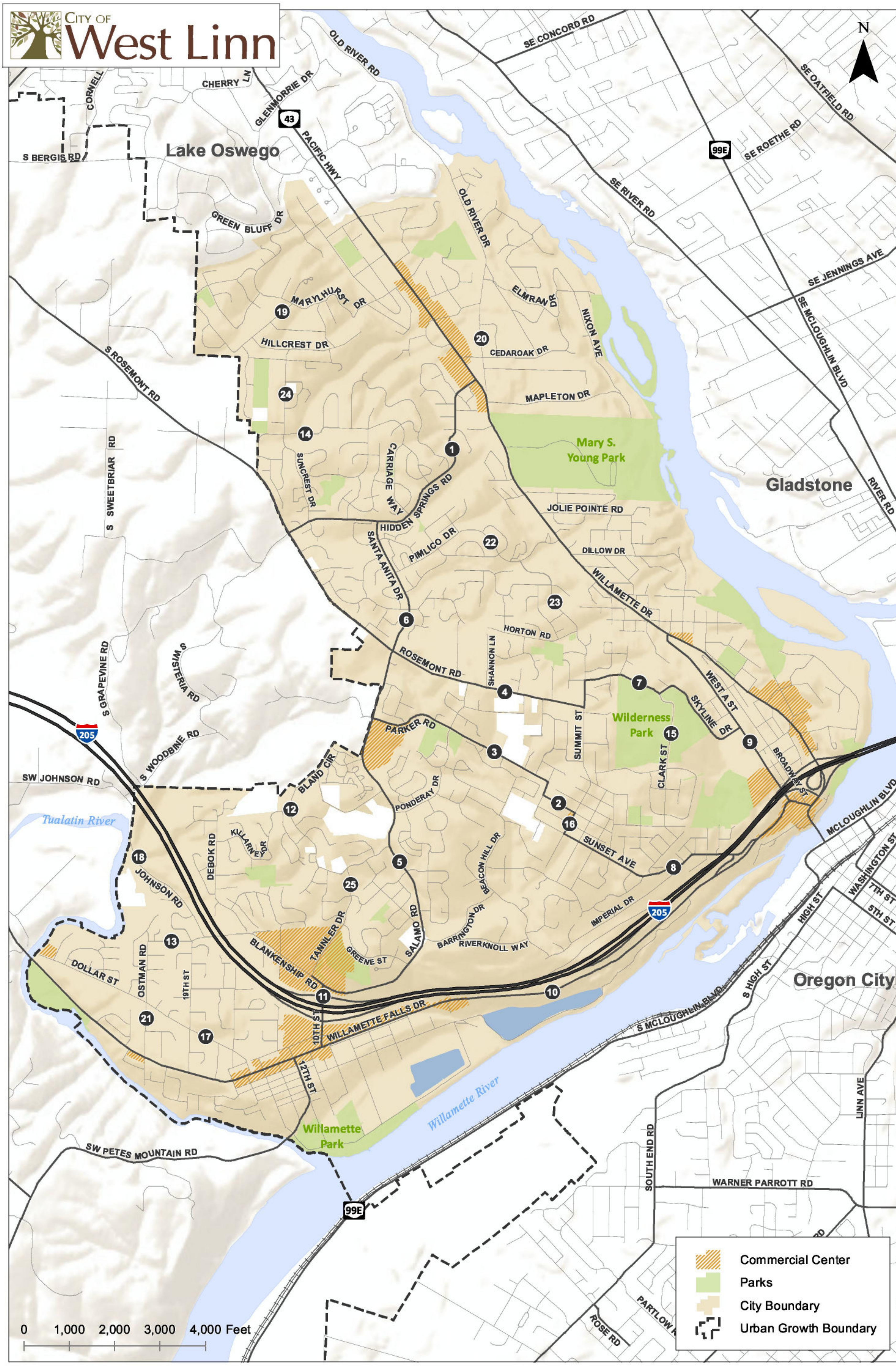
Pedestrian Solutions

Pedestrian facilities are the elements of the transportation system that enable people to walk safely and efficiently between neighborhoods, commerce centers, employment areas, and transit stops. These include facilities for pedestrian movement along key roadways (e.g., sidewalks, mixed-use shoulders, shared-use paths, and trails) as well as for safe roadway crossing locations (e.g., crosswalks, crossing beacons, pedestrian refuge islands). Each plays a role in developing a comprehensive pedestrian network. The following provides a summary of the types of solutions identified below to address pedestrian needs along each corridor.

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 they 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 urban and suburban settings.





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Corridor Solutions
West Linn, Oregon

Figure
2

H:\proj\file\17817 - West Linn Transportation System Plan\gis\TM10\2_Corridor Solutions.mxd - mbell - 9:08 AM 5/26/2015

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, ODOT
Terrain Sources: USGS, ESRI, TANA, AND

Pedestrian Crossings

Crossing facilities 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 the desired routes of walkers.

The state of Oregon considers all roadway intersections to be legal crossing locations for pedestrians regardless of whether a painted crosswalk is provided. At these locations, drivers are required to yield the right of way 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; each of these is applicable under a different range of considerations. The images below show pedestrian crossings in a variety of urban and suburban settings.

Bicycle Solutions

Bicycle facilities enable cyclists to travel safely and efficiently on the transportation system. Both public infrastructure (bicycle lanes, cycletracks, mixed-use trails, signage and striping) and "on-site" facilities (secure parking, changing rooms, and showers at worksites) are important to providing a comprehensive bicycle system.

Many different bicycle facility types are needed to create a complete bicycle system that connects people to their destinations and allows cyclists to feel comfortable and safe while riding. While there are some bicycle lanes along select arterial and collector streets within the city, these lanes are not provided along the entire lengths of the corridors. This existing network could be supplemented by additional bicycle lanes or other types of bicycle facilities. The following provides a summary of the types of solutions identified below to address bicycle needs along each corridor.

Bicycle Lanes

Bike lanes are on-street facilities that provide designated spaces 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 and with vehicular travel volumes and speeds that make it difficult for drivers and cyclists 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.

Shared-use Pavement Markings

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

Mixed-Use Shoulders

A mixed-use shoulder is a roadway shoulder that is wide enough to be used by pedestrians and bicyclists as a mixed-use path. Mixed-use shoulders are ideal on low-volume streets where topography or the surrounding environment does not allow for the addition of a sidewalk or separate bicycle facility.

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 cyclists.

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.

Public Transit Solutions

Public transit can provide important connections to destinations for people that do not 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 the land use 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.

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.

Transit Stops

Transit stops are designated locations where residents can access local transit service. Transit stops are normally located at major intersections. The types of amenities provided at each transit stop (i.e. pole, bench, shelter, ridership information, trash receptacles) tend to reflect the level of usage. A minimum of 30 average daily boardings and alightings is required by TriMet to warrant a shelter.

Park & 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 centers, or on express and commuter bus routes. It is Oregon state policy to encourage the development and use of park & 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 Town Center area. 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.

CORRIDOR SPECIFIC SOLUTIONS

This section identifies corridor specific solutions for all of the arterial and collector streets within the city as well as all of the safe routes to school streets and streets that provide access to the commercial areas.

Arterials

The current standard cross-section for an arterial street is seventy-two feet wide and includes: six-foot wide sidewalks, landscape strips and bike lanes on both sides of the street; eleven-foot wide vehicle travel lanes in both directions; and a fourteen-foot wide median or center turn lane. The following identifies potential solutions for the arterial streets within the city.

1. Hidden Springs Road

Near Bluegrass Way

Hidden Springs Road provides an important east-west connection between Rosemont Road and Willamette Drive. Hidden springs road is classified as a minor arterial, which is generally consistent with how it operates today. As a minor arterial Hidden Springs Road should provide continuous sidewalk and bicycle lanes on both sides of the roadway to meet City standards. The segment of Hidden Springs Road between Santa Anita Drive and Willamette Drive is identified as a potential future transit opportunity corridor, and therefore should be prioritized amongst the list of potential improvements.

Pedestrian Solution Alternatives

- Install sidewalks on the south side of the roadway from 500' east of Suncrest Drive to Santa Anita Drive – *while this potential improvement would improve pedestrian access along Hidden Springs Road, existing pedestrian crossings at Suncrest Drive and Santa Anita Drive provide access to the sidewalks along the north side of the roadway.* **Relative Cost: medium**
- Install sidewalks on the south side of the roadway from Carriage Way to approximately 350 feet south of Cottonwood Court – *this potential improvement will require widening the roadway, which may not be feasible due to steep grades on the south side of the roadway.* **Relative Cost: high**
- Install crosswalks at Carriage Way and Cotton Wood Court to improve access to the sidewalks on the north side of the roadway – *the potential crosswalk at Carriage Way would*

also improve access to the existing off-street trail located southeast of the Carriage Way/Hidden Springs Road intersection. **Relative Cost: low**

- Install a crosswalk at the existing off-street trail located approximately half-way between Wildwood Drive and Cotton Wood Court – *this potential project would also provide access to a planned off-street trail on the north side of the roadway.* **Relative Cost: low**

Bicycle Solution Alternatives

- Install bike lanes on both sides of the roadway from Santa Anita to Bluegrass Way – *this potential improvement could be completed with striping only.* **Relative Cost: low**
- Install bike lanes on both side of the roadway from Bluegrass Way to approximately 350 feet south of Cottonwood Court – *this potential improvement will require widening the roadway, which may not be feasible due to steep grades on the north and south sides of the roadway.* **Relative Cost: high**
  - As an alternative, install shared use pavement markings and/or signs on the south side of the roadway from Bluegrass Way to approximately 350 feet south of Cottonwood Court. **Relative Cost: low**
- Install bike lanes on both sides of the roadway from approximately 350 feet south of Cottonwood Court to Willamette Drive – *this potential improvement would require removal of the separate left-turn lanes at Wilderness Drive and the business park driveway and the reconfiguration of the eastbound approach to the Willamette Drive/Hidden Springs Road intersection.* **Relative Cost: medium**

Transit Solution Alternatives

- Work with TriMet to install transit stops on both sides of the roadway at Santa Anita Drive, Bluegrass Way, and Cottonwood Court – *these potential improvements would serve TriMet Line 154 once it is re-routed to Lake Oswego via Salamo Road, Santa Anita Road, Hidden Springs Road, and Willamette Drive.* **Relative Cost: low**

2. Lancaster Street

Near Parker Road

Lancaster Street is classified as a minor arterial from Parker Road to Cornwall Street. However, several single family residential homes have direct access on both sides of the roadway. As a minor arterial, this segment of Lancaster Street should provide continuous sidewalk and bicycle lanes on both sides of the roadway to meet City standards.

Pedestrian Solution Alternatives

- Install sidewalks on the south side of the roadway from Parker Road to Cornwall Street – *this potential improvement will require widening the roadway, which may not be feasible until redevelopment occurs*.
- Install sidewalks on the north side of the roadway from approximately 175 feet east of Parker Road to Cornwall Street *this potential improvement will require widening the roadway, which may not be feasible until redevelopment occurs*.

Bicycle Solution Alternatives

- Install bike lanes on both sides of the roadway from Parker Road to Cornwall Street – *this potential improvement will require widening the roadway in some areas, which may not be feasible until redevelopment occurs*.
    - As an interim improvement, install shared-use pavement markings and/or signs on both sides of the roadway from Parker Road to Cornwall Street.
- Install wayfinding signs that direct bicyclists to nearby schools, parks, and other essential destinations. **Relative Cost: low**

Transit Solution Alternatives

- No potential transit improvements have been identified for the roadway.

3. Parker Road

Near Wild Rose Drive

Parker Road is classified as a minor arterial, which is generally consistent with how it operates today. As a minor arterial Parker Road should provide continuous sidewalks and bicycle lanes on both sides of the roadway to meet City standards.

Pedestrian Solution Alternatives

- Install sidewalks on both sides of the roadway from approximately 125 feet east of Noble Lane to approximately 100 feet west of Dillon Lane – *this potential improvement will require widening of the roadway.* **Relative Cost: medium**
- Install a crosswalk at Noble Lane to improve access to the sidewalks, multi-use path, and commercial center on the south side of the roadway. **Relative Cost: low**
- Install sidewalks on the north side of the roadway from approximately 150 feet west of Damon Drive to approximately 75 feet west of Chinook Court – *this potential improvement will require widening of the roadway.* **Relative Cost: high**

Bicycle Solution Alternatives

- Install bike lanes from approximately 125 feet east of Noble Lane to approximately 100 feet west of Dillon Lane – *this potential improvement will require widening the roadway*. **Relative Cost: medium**
- Install wayfinding signs that direct bicyclists to nearby schools, parks, and other essential destinations. **Relative Cost: low**

Transit Solution Alternatives

- No potential transit improvements have been identified for the roadway.

4. Rosemont Road

Near Hidden Springs Road

Rosemont Road provides and important east-west connection between West Linn and areas located further west. Rosemont Road is classified as a minor arterial, which is generally consistent with how it operates today west of Salamo Road. However, east of Salamo road, several single family residential homes have direct access on both sides of the roadway. As a minor arterial, Rosemont Road should provide continuous sidewalk and bicycle lanes on both sides of the roadway to meet City standards.

Pedestrian Solution Alternatives

- Install sidewalks on the south side of the roadway from Carriage Way to Hidden Springs Road – *this potential improvement will require widening the roadway and retaining walls in several areas, which may not be feasible until redevelopment occurs.* **Relative Cost: high**
  - As an interim improvement, improve access to the sidewalks on the north side of the roadway with crosswalks at Carriage way and Hidden Springs Road. **Relative Cost: low**
- Install sidewalks on the south side of the roadway from Hidden Springs Road to approximately 100 feet east of Furlong Drive – this potential improvement will require widening the roadway. **Relative Cost: medium**
- Install sidewalks on the south side of the roadway from Santa Anita Drive to Wild Rose Drive – *This potential improvement will require widening the roadway, which may not be feasible until redevelopment occurs.* **Relative Cost: high**
- Install sidewalks on both sides of the roadway from Shannon Lane to Summit Street – *There are three small segments along both sides of the roadway with existing sidewalks.* **Relative Cost: medium**

Bicycle Solution Alternatives

- Install bike lanes on the south side of the roadway from Carriage Way to Hidden Springs Road – *this potential improvement will require widening the roadway with retaining walls in several areas, which may not be feasible until redevelopment occurs.* **Relative Cost: high**
  - As an interim improvement, install a mixed-use shoulder on the south side of the roadway – while this potential improvement will still require widening the roadway, it will serve pedestrian and bicyclists. **Relative Cost: medium**
- Install bike lanes on the south side of the roadway from Hidden Springs Road to approximately 100 feet east of Furlong Drive – *this potential improvement will require widening the roadway*. **Relative Cost: medium**
  - As an interim improvement, install a mixed-use shoulder on the south side of the roadway – while this potential improvement will still require widening the roadway, it will serve pedestrian and bicyclists. **Relative Cost: medium**
- Install bike lanes on the south side of the roadway from Santa Anita Drive to Wild Rose Drive – *This potential improvement will require widening the roadway.* **Relative Cost: high**
- Install bike lanes on both sides of the roadway from Shannon Lane to Summit Street – *this potential improvement will require widening on both sides of the roadway.* **Relative Cost: high**

Transit Solution Alternatives

- No potential transit improvements have been identified for the roadway.

5. Salamo Road

Near Bland Circle

Salamo Road provides an important north south connection between I-205 and the 10th Street interchange area and higher elevation locations in West Linn. Salamo Road also provides the most accessible grades for heavy vehicles accessing these areas. In 2006 more than 9.500 vehicles used Salamo Road on a daily basis. Evening peak hour volumes along this roadway are expected to increase by 42 percent by 2040. Salamo Road is classified as a minor arterial, which is generally consistent with how it operates today. As a minor arterial, Salamo Road should provide continuous sidewalk and bicycle lanes on both sides of the roadway to meet City standards. Salamo road is identified as a potential future transit opportunity corridor, and therefore should be prioritized amongst the list of potential improvements.

Pedestrian Solution Alternatives

- Install sidewalks on the west side of the roadway from Weatherhill Road to Bland Circle. **Relative Cost: medium**
- Install sidewalks on the west side of the roadway from approximately 750 feet south of Remington Drive to approximately 300 feet south of Barrington Drive. **Relative Cost: medium**
- Install sidewalks on both sides of the roadway from approximately 300 feet south of Barrington Drive to 10th Street – *this potential improvement will require widening the roadway, which may not be feasible due to steep grades on both sides of the roadway.* **Relative Cost: high**
  - As an alternative, install a shared-use path on the west-north side of the roadway from approximately 300 feet south of Barrington Drive to 10th Street. Install a crosswalk at approximately 300 feet south of Barrington Drive to provide access to the shared-use path. **Relative Cost: medium**

Bicycle Solution Alternatives

- Install bike lanes on both sides of the roadway from approximately 300 feet south of Barrington Drive to 10th Street – *this potential improvements will require widening the roadway.* **Relative Cost: high**

Transit Solution Alternatives

- Work with TriMet to install transit stops on both sides of the roadway at Rosemont Road, Parker Road, Day Road, Ponderay Drive, Vista Ridge Drive, Barrington Drive, and Greene Street – *these potential improvements would serve TriMet Line 154 once it is re-routed to Lake Oswego via Salamo Road, Santa Anita Road, Hidden Springs Road, and Willamette Drive*. **Relative Cost: low**

6. Santa Anita Drive

Near Pimlico Drive

Santa Anita Drive is classified as a minor arterial, which is generally consistent with how it operates today. As a minor arterial, Santa Anita Drive should provide continuous sidewalk and bicycle lanes on both sides of the roadway to meet City standards. Santa Anita Drive is identified as a potential future transit opportunity corridor, and therefore should be prioritized amongst the list of potential improvements.

Pedestrian Solution Alternatives

- Install sidewalks on the east side of the roadway from Hidden Springs Road to Clubhouse Circle. **Relative Cost: medium**
- Install sidewalks on the east side of the roadway from approximately 250 feet south of Clubhouse Circle to Pimlico Drive. **Relative Cost: medium**

Bicycle Solution Alternatives

- Improve the bicycle crossing at the northbound approach to Hidden Springs Road. **Relative Cost: low**

Transit Solution Alternatives

- Work with TriMet to install transit stops on both sides of the roadway at Horton Road, Pimlico Drive and Hidden Springs Road – *these potential improvements would serve TriMet Line 154 once it is re-routed to Lake Oswego via Salamo Road, Santa Anita Road, Hidden Springs Road, and Willamette Drive*. **Relative Cost: low**

7. Skyline Drive

Near West Linn High School

Skyline Drive provides an important east-west connection between Summit Street and West A Street as well as access to West Linn High School. Skyline Drive is classified as a minor arterial; however, several single family residential homes have direct access on both sides of the roadway. As a minor arterial, Skyline Drive should provide continuous sidewalks and bicycle lanes on both sides of the roadway to meet City standards.

Pedestrian Solution Alternatives

- Install sidewalks on the north side of the roadway from Summit Street to approximately 150 feet west of Firwood Drive. **Relative Cost: medium**
- 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– *this potential improvement will require widening the roadway, which may not be feasible due to existing development patterns and steep grades along the north side of the roadway.* **Relative Cost: high**
- Install sidewalks on the south side of the roadway from approximately 150 feet east of Woodwinds court to approximately 750 feet west of West A Street– *this potential improvement will require widening the roadway, which may not be feasible due to steep grades on the south side of the roadway*. **Relative Cost: high**
  - As an alternative or an interim improvement, install a mixed use shoulder on the south side of the roadway from approximately 150 feet east of Woodwinds court to approximately 750 feet west of West A Street – while this potential improvement will still require widening the roadway, it will serve both pedestrians and bicyclists. **Relative Cost: medium**

Bicycle Solution Alternatives

- Install bike lanes on both sides of the roadway from Summit Street to Firwood Street – *this potential improvement could be completed with striping only.* **Relative Cost: low**
- Install bike lanes on both sides of the roadway from Firwood Drive to West A Street – *this potential improvement will require widening the roadway, which may not be feasible due to existing development patterns and steep grades on the north and south side of the roadway.* **Relative Cost: high**
    - As an alternative or an interim improvement, Install shared use pavement markings and/or signs on both sides of the roadway from Firwood Drive to West A Street. **Relative Cost: low**

Transit Solution Alternatives

- No potential Transit improvements have been identified for the roadway.

Other Solution Alternatives

- Consider installation of traffic calming measures appropriate for a minor arterial, such as speed feedback signs.

8. Sunset Avenue

Cedar Oak Drive

Pedestrian Solution Alternatives

- Install sidewalks on the north side of the roadway from Cornwall Street to Willamette Falls Drive – *this potential improvement will require widening the roadway, which may not be feasible due to existing development patterns.* **Relative Cost: high**
- Install sidewalks on the south side of the roadway from Cornwall Street to approximately 150 feet west of Spring Rock Circle – *this potential improvement will require widening the*

roadway, which may not be feasible due to existing development patterns. **Relative Cost: high**

Bicycle Solution Alternatives

- Install bike lanes from Cornwall Street to Willamette Falls Drive – *this potential improvement will require widening the roadway in some areas.* **Relative Cost: high**
- Install wayfinding signs that direct bicyclists to nearby schools, parks, and other essential destinations. **Relative Cost: low**

Transit Solution Alternatives

- No potential transit improvements have been identified for the roadway.

9. West A Street

Near Webb Street

West A Street provides an important north south connection between Willamette Falls Drive and Willamette Drive as well as access to Wst Linn High School. West A Street is classified as a minor arterial; however, several single family residential homes and West Linn Highway School have direct access on both sides of the roadway. As a minor arterial, West A Street should include continuous sidewalks and bike lanes on both sides of the roadway.

Pedestrian Solution Alternatives

- Install sidewalks on the north side of the roadway from approximately 250 feet east of Willamette Drive to Skyline Drive. **Relative Cost: medium**
- Install sidewalks on the south side of the roadway from approximately 250 feet east of Willamette Drive to Terrace Drive. **Relative Cost: medium**

Bicycle Solution Alternatives

- Install bike lanes from the west side of the I-205 bridge to Willamette Falls Drive – *this potential improvement could be completed with striping only.* **Relative Cost: low**

Transit Solution Alternatives

- No potential Transit improvements have been identified for the roadway.

10. Willamette Falls Drive

Near 12th Street

Near Tanner Creek

Willamette Falls Drive provides an important east-west connection between Willamette Drive, the 10th Street interchange area, and areas located further west of the City limits. A significant amount of traffic uses Willamette Falls Drive to bypass congestion on I-205 between the Stafford Road interchange and the 10th Street interchange or the Highway 43 interchange. Willamette Falls Drive is classified as a minor arterial, which is generally how it operates; however, several single family residential homes and local businesses have direct access on both sides of the roadway. As a minor arterial, Willamette Falls Drive should include continuous sidewalks and bike lanes on both sides of the roadway.

Pedestrian Solution Alternatives

- Install sidewalks on the south side of the roadway from approximately 250 feet west of West A Street to Sunset Avenue – *this potential improvement will require widening the roadway, which may not be feasible due to steep grades on the south side of the roadway.* **Relative Cost: high**
- Install a crosswalk at approximately 250 feet south of West A Street to improve pedestrian access to the sidewalks on the north side of the roadway as well as access to the transit existing stops. **Relative Cost: low**
- Install sidewalks on both sides of Willamette Falls Drive from Sunset Avenue to 10th Street – *this potential improvement will require widening the roadway – there are two short segments on the south side and one short segment on the north side of the roadway with sidewalks adjacent to transit stops. There is also a multi-use path on the north side from 8th Street to 10th Street.* **Relative Cost: high**
  - As an alternative, install sidewalks on the south side of the roadway only with pedestrian crossings at multiple locations – this potential improvements will still require widening the roadway in some areas. **Relative Cost: medium**
  - As another alternative, install mixed use shoulders on one or two sides of the roadway from Sunset Avenue to 10th Street – *this potential improvement will still require widening the roadway in some areas; however it will accommodate both pedestrians and bicyclists.* **Relative Cost: medium**
- Install sidewalks on the north side of the roadway from Dollar Street (east) to approximately 200 feet east of 19th Street –*this potential improvement will require widening the roadway.* **Relative Cost: medium**
- Install sidewalks on the north side of the roadway from approximately 150 feet west of Epperly Way to the west City limits – *this potential improvement will require widening the roadway.* **Relative Cost: medium**
- Install sidewalks on the south side of the roadway from 16th Street to approximately 200 feet west of 16th Street. **Relative Cost: medium**
- Install sidewalks on the south side of the roadway from approximately 500 feet west of 16th Street to 350 feet east of Swift Shore Drive. **Relative Cost: medium**
- Install sidewalks on the south side of the roadway from approximately 200 feet east of Ostman Road to the west City limits – *this potential improvement will require widening the roadway.* **Relative Cost: medium**

Bicycle Solution Alternatives

- Install bike lanes on both sides of the roadway from Willamette Drive to Sunset Avenue – *this potential improvement will require widening the roadway, which may not be feasible due to steep grades on both sides of the roadway.* **Relative Cost: high**
  - As an alternative, reconfiguring the roadway cross section from Willamette Drive to Sunset Avenue to a three lane cross section (road diet) would provide space for bike lanes on both sides of the roadway. **Relative Cost: low**

Transit Solution Alternatives

- Work with TriMet to relocate the stop located on the west side of the roadway near West A Street further south across from the stop on the east side of the roadway – *this potential improvement would allow the installation of a crosswalk between the two stops.* **Relative Cost: low**

11. 10th Street

Near 8th Avenue

10th Street provides an important north-south connection below I-205 as well as access to I-205 for local residents. 10th Street is classified as a minor arterial, which is consistent with how it operates today. As a minor arterial, 10th Street should provide continuous sidewalks and bike lanes on both sides of the roadway. Additional information on the motor vehicles improvements is provided in the motor vehicle solutions section of this memorandum.

Pedestrian Solution Alternatives

- Install sidewalks on the east side of 10th Street from Blankenship Road to I-205 SB Ramps – *this potential improvement may require widening the roadway.* **Relative Cost: medium**
- Install sidewalks on the east side of 10th Street from I-205 SB Ramps to 8th Avenue-Court. **Relative Cost: medium**

Bicycle Solution Alternatives

- Install bike lanes on 10th Street from the I-205 SB Ramps to Willamette Falls Drive – *this potential improvement will require widening the roadway, which may not be feasible due to existing development patterns.* **Relative Cost: high**
- Improve the bicycle crossings at the eastbound and northbound approaches to the 10th Street/Blankenship-Salamo Road intersection. **Relative Cost: low**
- Improvement the bicycle crossing at the northbound approach to the 10h Street/I-205 NB Ramps intersection. **Relative Cost: low**
- Improve the bicycle crossing at the southbound approach to the 10th Street/Willamette Falls Drive intersection. **Relative Cost: low**

Transit Solution Alternatives

- Work with TriMet to install a stop on the east side of the roadway at Salamo Road – this potential improvement could serve TriMet Line 154 once it is re-routed to Lake Oswego via Salamo Road, Santa Anita Road, Hidden Springs Road, and Willamette Drive. **Relative Cost: low**

Collectors

The current standard cross-section for a collector street is fifty-eight feet wide and includes: six-foot wide sidewalks, six-foot wide landscape strips, and five-foot wide bike lanes on both sides of the street and twelve-foot wide vehicle travel lanes in both directions. The following identifies potential solutions for the collector streets within the city.

12. Bland Circle

Near Tannler Drive

Near Weatherhill Road

Pedestrian Solution Alternatives

- Install sidewalks on the north side of the roadway from Salamo Road to Tannler Drive – *this potential improvement will require widening the roadway*. **Relative Cost: medium**
- Install sidewalks on the north side of the roadway from Tannler Drive to approximately 100 feet east of Falcon Drive – *this potential improvement will require widening the roadway*. **Relative Cost: medium**
- Install sidewalks on the north side of the roadway from Falcon Drive to approximately 400 feet north of Fircrest Drive – *this potential improvement will require widening the roadway*. **Relative Cost: medium**
- Install sidewalks on the south side of the roadway from approximately 200 feet west of Tannler Drive to approximately 350 feet east of Tannler Drive – *this potential improvement will require widening the roadway*. **Relative Cost: low**
- Install sidewalks on the west side of the roadway from St Moritz Loop to approximately 150 feet north of St Mortiz Loop – *this potential improvement will require widening the roadway*. **Relative Cost: medium**
- Install sidewalks on both sides of the roadway from approximately 400 feet north of Fircrest Drive to Weatherhill Road – *this potential improvement will require widening the roadway.* **Relative Cost: high**
- Install sidewalks on the west side of the roadway from Weatherhill Road to the roadway terminus – *this potential improvement will require widening the roadway*. **Relative Cost: medium**

Bicycle Solution Alternatives

- Install bike lanes on both sides of the roadway from Salamo Road to the roadway terminus *– this potential improvement will require widening the roadway in some areas, which may not be feasible due to the built environment*. Relative Cost: high
  - As an alternative, install shared use pavement marking and/or signs on one side of the roadway with a striped bike lane in the other side or on both sides of the roadway from Salamo Road to the roadway terminus. **Relative Cost: low**
- Install wayfinding signs that direct bicyclists to nearby schools, parks, and other essential destinations. **Relative Cost: low**

Transit Solution Alternatives

- No potential transit improvements have been identified for the roadway.

13. Blankenship Road

Near 10th Street

Blankenship Road is classified as a collector, which is generally how it operates today. As a collector, Blankenship Road should provide continuous sidewalks and bike lanes on both sides of the roadway to meet City standards.

Pedestrian Solution Alternatives

- Install sidewalks on the north side of the roadway from 10th Street to approximately 50 feet east of the Willamette Corporate Center driveway. **Relative Cost: medium**
- Install sidewalks on the north side of the roadway from approximately 400 feet west of Debok Road to Johnson Road – *this potential improvement will require widening the roadway and potential modifications to the I-205 bridge structure.* **Relative Cost: high**
- Install a crosswalk at the north leg of the Johns Road/Blankenship Road intersection and extend the sidewalks on the north side of Blankenship Road west of Johnson Road to the

intersection – *this potential crosswalk would be improved by reconfiguring the intersection to reduce the curb radius in the northeast corner of the intersection*. **Relative Cost: medium**

- Install sidewalks on the south side of the roadway from 19th Street to approximately 175 feet east of Ostman Road. **Relative Cost: high**

Bicycle Solution Alternatives

- Install bike lanes on both sides of the roadway from Debok Road to 19th Street – *this potential improvement will require widening on both sides of the roadway and potential modifications to the I-205 bridge structure.* **Relative Cost: high**
- Install bike lanes from 19th Street to Ostman Road – *this potential improvement will require widening on both sides of the roadway.* **Relative Cost: high**
- Install wayfinding signs that direct bicyclists to nearby schools, parks, and other essential destinations. **Relative Cost: low**

Transit Solution Alternatives

- Improve access to the existing transit stops with pedestrian crossings at the Albertson's main driveway, Virginia Lane, Debok Road, and 19th Street. **Relative Cost: low**

14. Carriage Way

Near Derby Street-Court

Carriage Way is classified as a collector, which is generally how it operates today. As a collector, Carriage Way should provide continuous sidewalks and bike lanes on both sides of the roadway to meet City standards.

Pedestrian Solution Alternatives

- Improve the substandard sidewalks on the north side of the roadway from Sun Circle to approximately 200 feet west of Sun Circle. **Relative Cost: medium**
- Install sidewalks on the north-west side of the roadway from approximately 350 feet west of Suncrest Drive to Rosemont Road – *this potential improvement will require widening the roadway.* **Relative Cost: high**

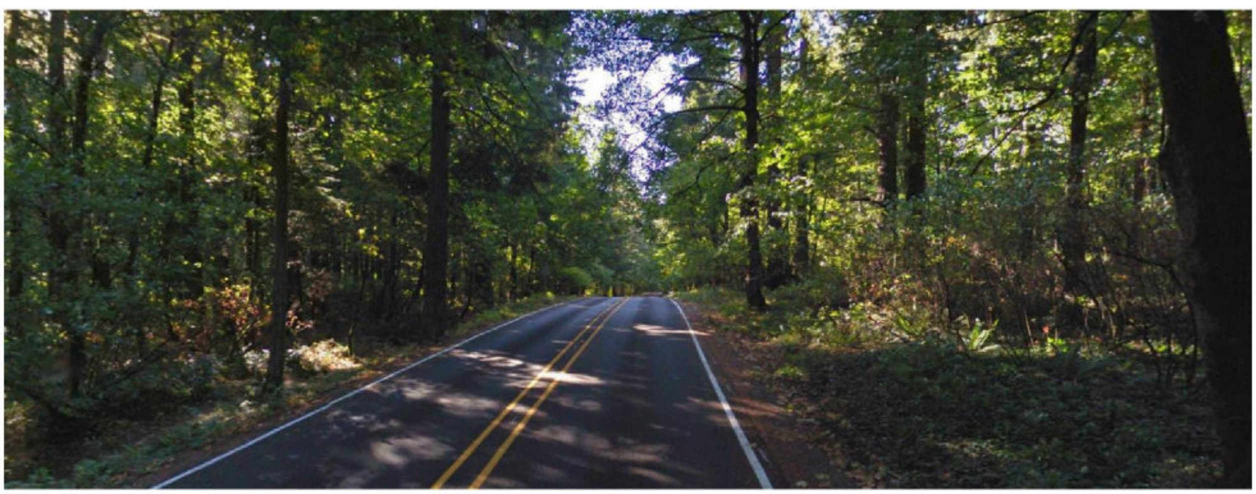
Bicycle Solution Alternatives

- Install bike lanes on Carriage Way from Hidden Springs Road to approximately 350 feet west of Suncrest Drive – *this potential improvement could be completed with striping only.* **Relative Cost: low**
- Install bike lanes on Carriage Way from approximately 350 feet west of Suncrest Drive to Rosemont Road – *this potential improvement will require widening the roadway in some areas.* **Relative Cost: medium**
- Install wayfinding signs that direct bicyclists to nearby schools, parks, and other essential destinations. **Relative Cost: low**

Transit Solution Alternatives

- No potential transit improvements have been identified for the roadway.

15. Clark Street



Near Sana Anita Drive

Near Windsor Terrace

Clark Street is classified as a collector, which is generally how it operates today. As a collector, Clark Street should provide continuous sidewalks and bike lanes on both sides of the roadway to meet City standards.

Pedestrian Solution Alternatives

- Install sidewalks on both sides of the roadway from Skyline Drive to approximately 150 feet north of Windsor Boulevard – *this potential improvement will require widening the roadway.* **Relative Cost: high**
  - As an alternative, install a mixed-use shoulder on one or two sides of the roadway from Skyline Drive to approximately 150 feet north of Windsor Boulevard – *this potential improvement will still require widening the roadway; however it will serve pedestrians and bicyclists.* **Relative Cost: medium**

Bicycle Solution Alternatives

- Install bike lanes on both sides of the roadway from Skyline Drive to approximately 150 feet north of Windsor Boulevard – *this potential improvement will require widening the roadway.* **Relative Cost: high**
  - As an alternative, install shared use pavement marking on both sides of the roadway from Skyline Drive to approximately 150 feet north of Windsor Boulevard. **Relative Cost: low**
- Install bike lanes on both sides of the roadway from approximately 150 feet north of Windsor Boulevard to Windsor Boulevard – *this potential improvement can be completed with striping only.* **Relative Cost: low**
- Install wayfinding signs that direct bicyclists to nearby schools, parks, and other essential destinations. **Relative Cost: low**

Transit Solution Alternatives

- No potential transit improvements have been identified for the roadway.

16. Cornwall Street

Near York Street

The segment of Cornwall Street from Lancaster Street to Sunset Avenue is classified as a minor arterial. As a minor arterial, Cornwall Street should provide continuous sidewalks and bike lanes on both sides of the roadway to meet City standards.

Pedestrian Solution Alternatives

- Install sidewalks on both sides of the roadway from Oxford Street to Sunset Avenue – *this potential improvement will require widening the roadway* **Relative Cost: high**

Bicycle Solution Alternatives

- Install bike lanes on both sides of the roadway from Oxford Street to Sunset Avenue – *this potential improvement could be completed with striping only.* **Relative Cost: low**
- Install wayfinding signs that direct bicyclists to nearby schools, parks, and other essential destinations. **Relative Cost: low**

Transit Solution Alternatives

- No potential transit improvements have been identified for the roadway.

17. Dollar Street

Near Ostman Road

Dollar Street is classified as a collector, which is generally consistent with how it operates today. As a collector, Dollar Street should provide continuous sidewalks and bike lanes on both sides of the roadway to meet City standards.

Pedestrian Solution Alternatives

- Install sidewalks on the south side of the roadway from Willamette Falls Drive to the western terminus – *this potential improvement will require widening the roadway.* **Relative Cost: high**

Bicycle Solution Alternatives

- Install bike lanes on both side of the roadway from Willamette Falls Drive to the western terminus – *this potential improvement will require widening the roadway in some areas.* **Relative Cost: medium**
- Install wayfinding signs that direct bicyclists to nearby schools, parks, and other essential destinations. **Relative Cost: low**

Transit Solution Alternatives

- No potential transit improvements have been identified for the roadway.

18. Johnson Road

Near Blankenship Road

Johnson Road is classified as a collector, which is generally consistent with how it functions today. As a collector, Johnson Road should provide continuous sidewalks and bike lanes on both sides of the roadway to meet City standards.

Pedestrian Solution Alternatives

- Install sidewalks on both sides of the roadway from Blankenship Road to the western City limits – *this potential improvement will require widening the roadway, which may not be feasible due to steep grades on both sides of the roadway.* **Relative Cost: high**
  - As an alternative, install mixed use shoulders on one or two sides of the roadway from Blankenship Road to the western City limits – *this potential improvement will require widening the roadway; however it will serve pedestrian and bicyclists.* **Relative Cost: medium**

Bicycle Solution Alternatives

- Install bike lanes on both sides of the roadway from Blankenship Road to the western City limits – *this potential improvement will require widening the roadway in some areas, which may not be feasible due to steep grades.* **Relative Cost: medium**
  - As an alternative, install shared-use pavement markings and/or signs on both sides of the roadway from Blankenship Road to the western City limits. **Relative Cost: low**
- Install wayfinding signs that direct bicyclists to nearby schools, parks, and other essential destinations. **Relative Cost: low**

Transit Solution Alternatives

- No potential transit improvements have been identified for the roadway.

Other Solution Alternatives

- Consider installation of traffic calming measures appropriate for a minor arterial, such as speed feedback signs.

19. Marylhurst Drive

Near View Drive

Marylhurst Drive is classified as a collector, which is generally consistent with how it functions today. As a collector, Marylhurst Drive Road should provide continuous sidewalks and bike lanes on both sides of the roadway to meet City standards. However, Marylhurst Drive is steep and has steep grades on both sides of the roadway, which may make these types of improvements infeasible.

Pedestrian Solution Alternatives

- Install sidewalks on both sides of the roadway from Willamette Drive to Hillcrest Drive (west) – *this potential improvement will require widening the roadway, which may not be feasible due to steep grades.* **Relative Cost: high**
  - As an alternative or interim improvement, install mixed-use shoulders on one or two sides of the roadway – while this potential improvement will also require widening the roadway, it will serve both pedestrians and bicyclists. **Relative Cost: medium**

Bicycle Solution Alternatives

- Install bike lanes on both sides of the roadway from Willamette Drive to Hillcrest Drive (west) – *this potential improvement will require widening the roadway, which may not be feasible due to steep grades.* **Relative Cost: high**
  - As an alternative or interim improvement, install shared-use pavement markings and/or signs on both sides of the roadway from Willamette Drive to Hillcrest Drive (west) or the mixed-use should described above. **Relative Cost: low**

Transit Solution Alternatives

- No potential Transit improvements have been identified for the roadway.

20. Old River Drive

Cedar Oak Drive

Pedestrian Solution Alternatives

- Install sidewalks on the east side of the roadway from approximately 100 feet north of Riverside Court to Cedar Oak Drive – *this potential improvement will require widening of the roadway.* **Relative Cost: high**
- Install sidewalks on the west side of the roadway from approximately 200 feet north of Riverside Court to Cedar Oak Drive – *this potential improvement will require widening of the roadway.* **Relative Cost: high**
- As an alternative or an interim improvement, install a mixed-use shoulder on the east side of the roadway - *this potential improvement will still require widening the roadway; however, is will serve pedestrians and bicyclists.* **Relative Cost: medium**

Bicycle Solution Alternatives

- Install bike lanes from the northern City limits to Cedar Oak Drive – *this potential improvement will require widening of the roadway.* **Relative Cost: high**
  - As an alternative, install shared used pavement markings and /or signs on both sides of the roadway from the northern City limits to Cedar Oak Drive. **Relative Cost: low**
- Install wayfinding signs that direct bicyclists to nearby schools, parks, and other essential destinations. **Relative Cost: low**

Transit Solution Alternatives

- No potential transit improvements have been identified for the roadway.

21. Ostman Road

Near Blankenship Road

Ostman Road is classified as a collector street, which is generally consistent with how it functions today; however, there are several single family residential homes with direct access on both sides of the roadway. As a collector, Ostman Road should provide continuous sidewalks and bike lanes on both sides of the roadway to meet City standards.

Pedestrian Solution Alternatives

- Install sidewalks on the east side of the roadway from approximately 150 feet south of Blankenship Road to Dollar Street – *there are currently several short segments of sidewalk on the east side of the roadway that meet city standards and several others that do not.* **Relative Cost: medium**
- Install sidewalks on the east side of the roadway from Dollar Street to Willamette Falls Drive – *there are currently several short segments of sidewalk on the east side of the roadway that meet city standards and several others that do not.* **Relative Cost: medium**
- Install sidewalks on the west side of the roadway from Michael Drive to approximately 150-feet south of Michael Drive. **Relative Cost: low**
- Install sidewalks on the west side of the roadway from Dollar Street to Willamette Falls Drive. **Relative Cost: high**

Bicycle Solution Alternatives

- Install bike lanes from Blankenship Road to Willamette Falls Drive – *this potential improvement will require widening on both sides of the roadway.* **Relative Cost: high**

Transit Solution Alternatives

- Improve the visibility of the transit stop located in the northwest corner of the Ostman Road/Dollar Street intersection

22. Pimlico Drive

Near Sana Anita Drive

Pimlico Drive is classified as a collector, which is generally consistent with how it functions today. As a collector, Pimlico Drive should provide continuous sidewalks and bike lanes on both sides of the roadway to meet City standards.

Pedestrian Solution Alternatives

- Install sidewalks on the south side of the roadway from Santa Anita Drive to approximately 150 feet west of Palomino Way (west). **Relative Cost: medium**
- Install crosswalks at Santa Anita Drive and Palomino Way (west) to improve access to the sidewalks on the north side of the roadway. **Relative Cost: low**
- Install sidewalks on the north side of the roadway from Pimlico Terrace to Treetop Lane – *this potential improvement may not be feasible due to steep grades on the north side of the roadway; however it may be more feasible than installing sidewalks on the south side of the roadway.* **Relative Cost: medium**
- Install sidewalks on the south side of the roadway from Palomino Way (east) to Willamette Drive - *this potential improvement may not be feasible due to steep grades on the south side of the roadway.* **Relative Cost: high**
- Install crosswalk at Palmino Way (east) to improve access to the sidewalks on the north side of the roadway. **Relative Cost: low**

Bicycle Solution Alternatives

- Install bike lanes from Santa Anita Drive to Willamette Drive – *this potential improvement could be completed with striping only.* **Relative Cost: low**
- Install wayfinding signs that direct bicyclists to nearby schools, parks, and other essential destinations. **Relative Cost: low**

Transit Solution Alternatives

- No potential transit improvements have been identified for the roadway.

Other Solution Alternatives

- Consider traffic calming measures appropriate for a collector street, such as speed feedback signs.

23. Summit Street

Near Causey Way

The segment of Summit Street from Skyline Drive to Rosemont Road is classified as a minor arterial. As a minor arterial, this segment of Summit Street should provide continuous sidewalks and bike lanes on both sides of the roadway.

Pedestrian Solution Alternatives

- Install sidewalks on both sides of the roadway from Pimlico Drive to 150 feet south of Pimlico Drive. **Relative Cost: medium**
- Fill in the 65-foot gap in the sidewalk on the north side of roadway at approximately 350 feet south of Pimlico Drive. **Relative Cost: low**
- Install sidewalks on the west side of the roadway from approximately 100 feet south of Skyline Drive to Rosemont Road and from approximately 150 feet south of Rosemont Road to 400 feet south of Rosemont Road. **Relative Cost: high**
- Install sidewalks on the west side of the roadway from approximately 100 feet south of Ridge Lane to Oxford Street. **Relative Cost: high**
- Install sidewalks on the east side of the roadway from Woodsprite Court to 75 feet north of Knox Street. **Relative Cost: high**

- Install sidewalks on the east side of the roadway from approximately 100 feet south of Knox Street to Oxford Street. **Relative Cost: medium**

Bicycle Solution Alternatives

- Install bike lanes on both sides of the roadway from Pimlico Drive to approximately 150 feet south of Pimlico Drive – *this potential improvement can be completed with striping only*. **Relative Cost: low**
- Install bike lanes from Skyline Drive to Oxford Street – *this potential improvement will require widening the roadway in some areas.* **Relative Cost: medium**
- Install wayfinding signs that direct bicyclists to nearby schools, parks, and other essential destinations. **Relative Cost: low**

Transit Solution Alternatives

- No potential transit improvements have been identified for the roadway.

24. Suncrest Drive

Near Suncrest Drive

Suncrest Drive is classified as a collector, which is generally consistent with how it functions today. As a collector, Suncrest Drive should provide continuous sidewalks and bike lanes on both sides of the roadway to meet City standards.

Pedestrian Solution Alternatives

- Install sidewalks on the east side of the roadway from approximately 200 feet north of Carriage Way to approximately 100 feet south of Ridgebrook Drive (south). **Relative Cost: medium**

- Install sidewalks on the east side of the roadway from approximately 250 feet south of Ridgebrook Drive (north) to Ridgebrook Drive (north). **Relative Cost: medium**
- Install sidewalks on the east side of the roadway from approximately 150 feet north of Ridgebrook Drive (north) to Hillcrest Road. **Relative Cost: medium**
- Install sidewalks on the west side of the roadway from approximately 100 feet south of Ridgebrook Drive (south) to Ridgebrook Drive (south). **Relative Cost: medium**
- Install sidewalks on the west side of the roadway from approximately 150 feet north of Ridgebrook Drive (south) to approximately 10 feet south of Ridgebroook Drive (north). **Relative Cost: medium**
- Install sidewalks on the west side of the roadway from approximately 250 feet north of Ridgebrook Drive (north) to Hillcrest Drive. **Relative Cost: medium**
- Each of these potential improvements will require widening the roadway in some areas.

Bicycle Solution Alternatives

- Install bike lanes on both sides of the roadway from Hillcrest Drive to Carriage Way – *this potential improvement may require widening the roadway in some areas*. **Relative Cost: medium**
  - As an alternative, install shared use pavement markings and/or signs on both sides of the roadway from Carriage Way to Hidden Springs Road – *this potential improvement could be completed with striping only*. **Relative Cost: low**

Transit Solution Alternatives

- No potential Transit improvements have been identified for the roadway.

25. Tannler Drive

Near Blankenship Road

Tannler Drive is classified as a collector, which is generally consistent with how it operates today. As a collector, Tannler Drive should provide continuous sidewalks and bike lanes on both sides of the roadway to meet City standards.

Pedestrian Solution Alternatives

- Install sidewalks on both sides of the roadway from Blankenship Road to Greene Street. **Relative Cost: high**

Bicycle Solution Alternatives

- Modify the existing striping to include bike lanes on both sides and parking on one side of the roadway from Blankenship Road to the northern terminus. **Relative Cost: low**
- Install wayfinding signs that direct bicyclists to nearby schools, parks, and other essential destinations. **Relative Cost: low**

Transit Solution Alternatives

- No potential transit improvements have been identified for the roadway.

Safe Routes to School

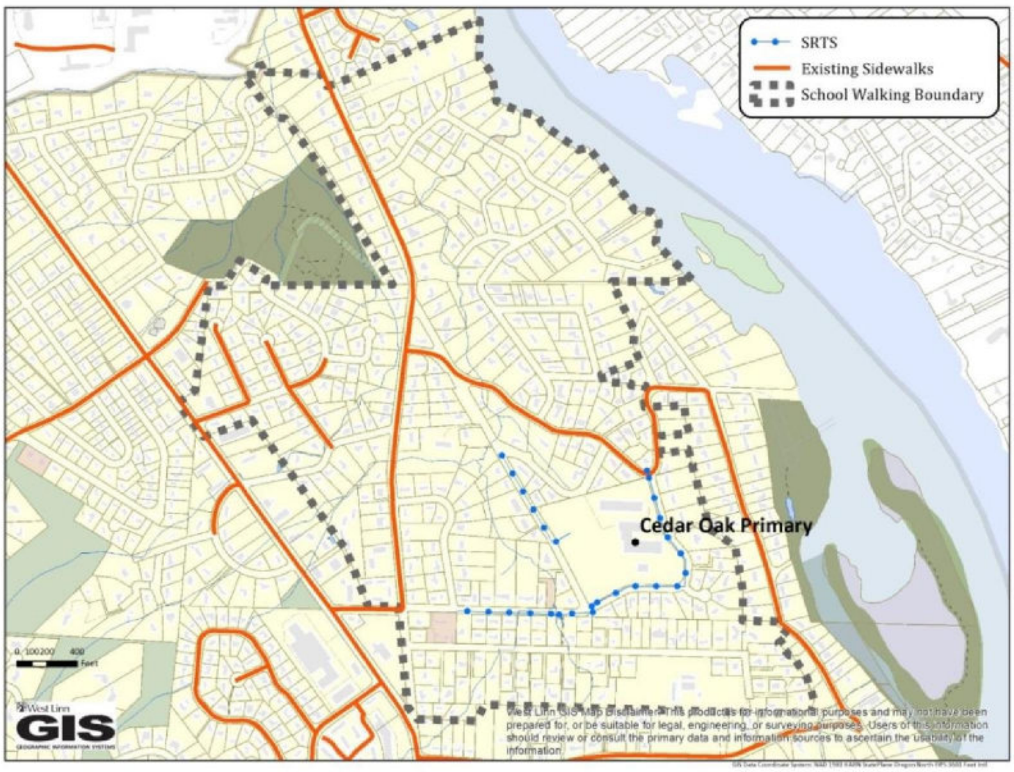
Several of the Safe Routes to School (SRTS) currently lack sidewalks and bike lanes as well as other transportation facilities that accommodate students walking and biking to school. The following provides a summary of the potential improvements for the City's existing designated SRTS.

Bolton Primary Safe Routes

- Install sidewalks on both sides of the following roadways and roadway segments consistent with the City's local street standard:
  - Lowry Drive from Dillow Drive to Tompkins Street
  - Tompkins Street from Lowry Drive to Caufield Street
  - Caufield Street from Tomkins Street to Randal Street
  - Randal Street from Caufield Street to Davenport Street
  - Davenport Street from Randal Street to Buck Street
  - Buck Street from Davenport Street to Holmes Street – *this segment of Buck Street currently has sidewalks on both sides of the roadway; however, with the exception of the sidewalk on the south side of Buck Street from Elliot Street to Failing Street, most of the sidewalks are substandard and will need to be replaced as redevelopment occurs.*
  - Holmes Street from Buck street to Perrin Street
  - Perrin Street from Holmes Street to Lewis Street
- Each of these potential improvements will require widening the roadway, which may not be feasible due to existing developments. The following provides a number of alternatives solutions:

- Install sidewalks on one side of the roadway only –*this potential improvement will still require widening the roadway; however, it will have less of an impact on existing developments.*
- Install mixed use shoulders on one side of the roadway –*this potential improvement will still require widening the roadway; however, it will have less of an impact on existing developments and it will serve both pedestrians and bicyclists.*
- Change the designation of the roadways from local streets to shared streets – *this potential modification would require the city to adopt a shared street standard*.

Cedar Oak Safe Routes



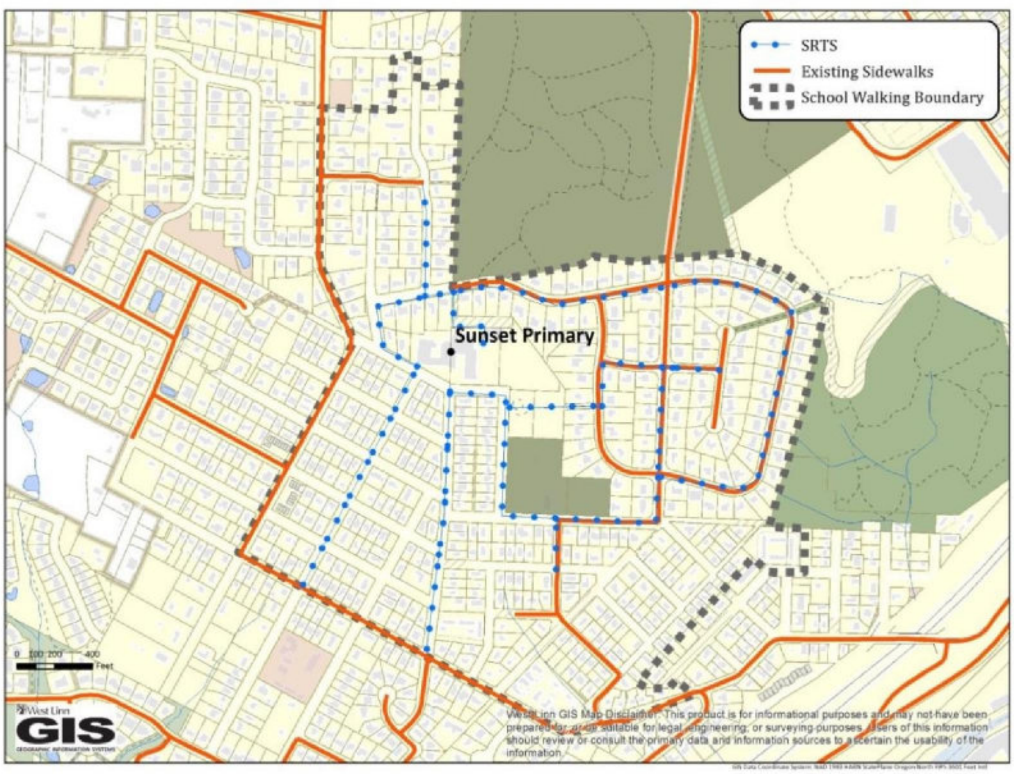
- Install sidewalks on both sides of Cedar Oak Drive from Old River Road to Trillium Drive – *this potential improvement will require widening the roadway, which may not be feasible due to existing development*.
- Install sidewalks on the south side of Cedar Oak Drive from Trillium Drive to Glen Terrace – *this potential improvement will require widening the roadway, which may not be feasible due to existing developments* consistent with the City's standards for neighborhood routes.
- Install sidewalks on both sides of Trillium Drive from Glen Terrace to Cedar Oak Drive consistent with the City's local street standard – *this potential improvement will require*

widening the roadway, which may not be feasible due to existing developments. The following provides a number of alternatives pedestrian solutions:

  - Install sidewalks on one side of the roadway only –*this potential improvement will still require widening the roadway; however, it will have less of an impact on existing developments.*
  - Install a mixed use shoulder on one side of the roadway –*this potential improvement will still require widening the roadway; however, it will have less of an impact on existing developments and it will serve both pedestrians and bicyclists*.
  - Change the designation of the roadway from a local street to a shared street – *this potential modification would require the city to adopt a shared street standard.*

- Install bike lanes on both sides of Cedar Oak Drive from Old River Road to Glen Terrace consistent with the City's neighborhood route standard - *this potential improvement will require widening the roadway*.

Sunset Primary Safe Routes



- Install sidewalks on both sides of the following roadway segments consistent with the City's local street standard:
  - Sussex Street from Sunset Avenue to Oxford Street
  - Prospect Street from Knox Street to Oregon City Boulevard

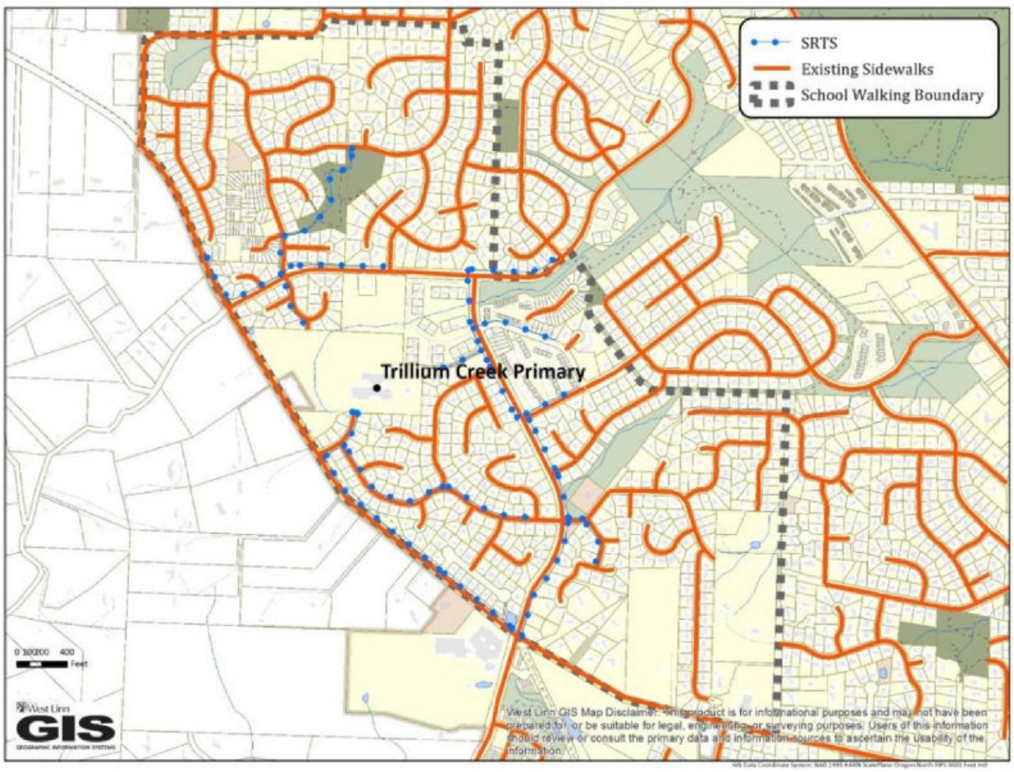
   - Exeter Street from Lancaster Street to Sunset Avenue

- These potential improvements will require widening the roadway, which may not be feasible due to existing developments. The following provides a number of alternative pedestrian solutions:
   - Install sidewalks on one side of the roadway only –*this potential improvement will still require widening the roadway; however, it will have less of an impact on existing development.*
   - Install mixed use shoulders on one side of the roadway –*this potential improvement will still require widening the roadway; however, it will have less of an impact on existing development and it will serve both pedestrians and bicyclists.*
   - Change the designation of the roadway from a local street to a shared street – *this potential modification would require the city to adopt a shared street standard*.
- Install sidewalks on one side of the following roadway segments consistent with the City's local street standard:
   - the west side of Bonnet Drive from Oxford Street to Oregon City Boulevard
   - the north side of Windsor Terrace from Bonnet Drive to approximately 350 feet east of Prospect Street
   - The east side of Bitner Street from Long Street to Oxford Street – *the sidewalks on the west side of the roadway also appear to be substandard*
   - The south side of Oxford Street from Bitner Street to Exeter Street
   - The east side of Exeter Street from Long Street to Lancaster Street
- These potential improvements will require widening the roadways, which may not be feasible due to existing developments. As an alternative, improve pedestrian access at major intersections to the side of the street with sidewalks.
- Install sidewalks (and bike lanes) on both sides of the following roadways consistent with the City's neighborhood routes standard:
   - Long Street from Simpson Street to Exeter Street
   - Oxford Street from Exeter Street to Sussex Street
- These potential improvements will require widening the roadways, which may not be feasible due to existing developments. The following provides a number of alternative solutions:
   - Install sidewalks on one side of the roadway only –*this potential improvement will still require widening the roadway; however, it will have less of an impact on existing development.*

    - Install mixed use shoulders on one side of the roadway –*this potential improvement will still require widening the roadway; however, it will have less of an impact on existing development and it will serve both pedestrians and bicyclists.*

- Install sidewalks (and bike lanes) on one side of the following roadways consistent with the City's neighborhood routes standard:
    - The west side of Exeter Street from Long Street to Oxford Street
    - The south side of Oxford Street from Sussex Street to Bonnet Drive
- These potential improvements will require widening the roadways, which may not be feasible due to existing development. As an alternative, improve pedestrian access at major intersections on the side of the street with sidewalks.

Trillium Creek Primary Safe Routes

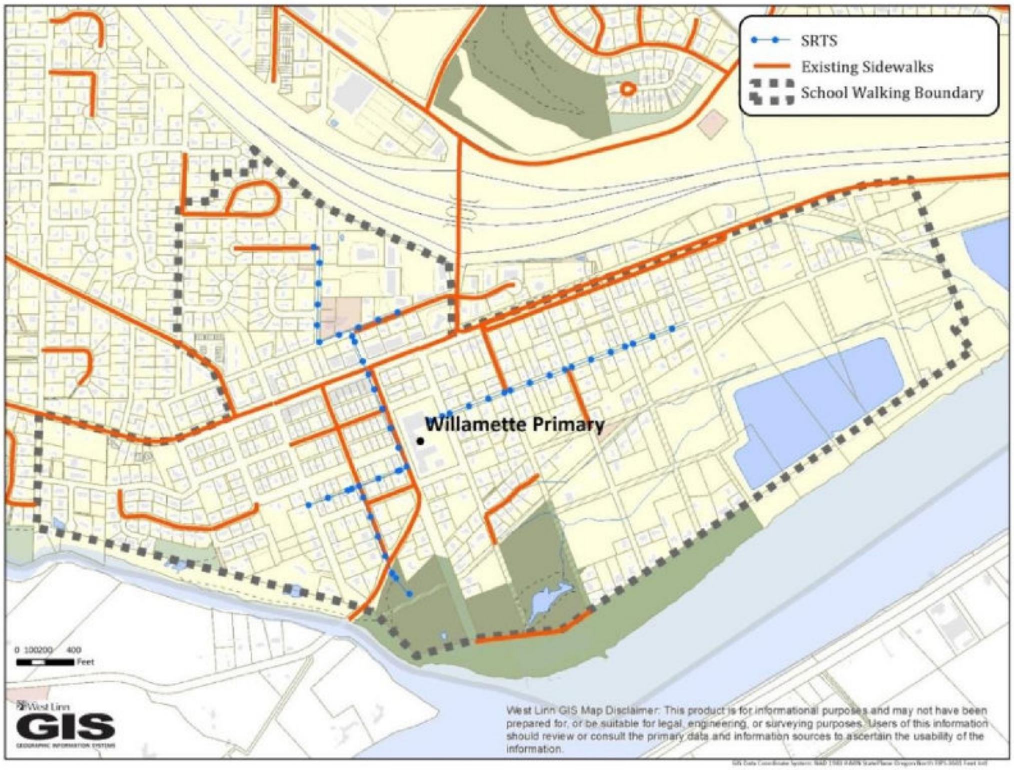


The Trillium Creek Primary SRTS consist of sidewalks and bike lanes on arterials, collectors, neighborhood routes, and local streets. The arterial and collector streets are addressed above. The following summarizes the transportation solutions for the neighborhood routes and local streets.

- All of the neighborhood routes and local streets currently have sidewalks on both sides of the roadway.

- Install bike lanes on the following roadway segments consistent with the city's neighborhood route standards:
    - Suncrest Drive from Sunburst Park to Hidden Springs Road
    - Suncrest Drive from Hidden Springs Road to the southern terminus
    - Bay Meadows Drive from Rosemont Road to the northern terminus

Willamette Primary Safe Routes



The Willamette Primary SRTS consist of sidewalks and bike lanes on arterials and local streets. The arterial are addressed above. The following summarizes the transportation solutions for the local streets.

- Install sidewalks on the following roadways and roadway segments consistent with the City's local street standard:
    - The west side of 13th Street from Timothy Lane to 8th Avenue
    - The east side of 13th Street from Timothy Lane to approximately 100 feet north of Christy Court
    - The south side of 4th Avenue from 14th Street to 12th Street
    - The north side of 5th Avenue from 11th Street to 7th Street

- These potential improvements will require widening the roadways, which may not be feasible due to existing development. As an alternative, improve pedestrian access at major intersections on the side of the street with sidewalks.
- There are several additional roadway segments with substandard sidewalks that should be updated as development occurs.

Commercial Streets

Several streets that provide access to the commercial areas within the City currently lack sidewalks and bike lanes as well as other transportation facilities that accommodate people walking and biking to retail/commercial land uses. The following provides a summary of the potential improvements for the City's commercial streets.

Robinwood Commercial Area

- Shady Hollow-Way – Install sidewalks on the north side of the roadway from Highway 43 to Arbor Drive.
- Shady Hollow way – Install sidewalks on the south side of the roadway from approximately 150-feet east of Highway 43 to Arbor Drive.
- Fairview Way – Install sidewalks on the north side of the roadway from approximately 200-feet east of Highway 43 to approximately 100-west of Rose Way and from Chippewa Court to the roadway terminus.
- Fairview Way – Install sidewalks on the south side of the roadway from approximately 200-feet east of Highway 43 to the roadway terminus.
- Wailing Way – Install sidewalks on both sides of the roadway from approximately 350-feet east of Highway 43 to Old River Drive.
- Walling Circle – Install sidewalks on the west side of the roadway from approximately 250-feet west of Highway 43 to Highway 43.
- Walling Circle – Install sidewalks on the east side of the roadway from Highway 43 to Highway 43.

Bolton Commercial Area

- Failing Street – Install sidewalks on the east side of the roadway from approximately 200-feet north of Highway 43 to Buck Street.
- Holly Street – Install sidewalks on both sides of the roadway from approximately 150-feet east of Highway 43 to River Street
- Webb Street – Install sidewalks on both sides of the roadway from West A Street to Highway 43.

- Lewis Street – Install sidewalks on both sides of the roadway from Highway 43 to Perkins Street.

10th Street Commercial Area

- 19th Street – Install is sidewalks on the west side of the street from Blankenship Road to Dollar Street
- 19th Street - Install sidewalks on the west side of the roadway from Dollar Street to Willamette Falls Drive
- 19th Street – Install sidewalks on the east side of the roadway from Nova Court to Dollar Street
- 19th Street – Install sidewalks on the east side of the roadway from Dollar Street to approximately 200-feet north of High Touch Street.
- 13th Street – Install sidewalks on both sides of the roadway from Blankenship Road to the roadway terminus
- Summerlinn Drive – Install sidewalks on the west side of the roadway from Summerlinn Way to Blankenship Road.

Each of these potential improvements will require widening the roadway, which may not be feasible due to existing developments. The following provides a number of alternatives solutions:

- Improve access to existing sidewalks on one side of the roadway with pedestrian crossings at major intersections.
- Install sidewalks on one side of the roadway only – *this potential improvement will still require widening the roadway; however, it will have less of an impact on existing developments.*

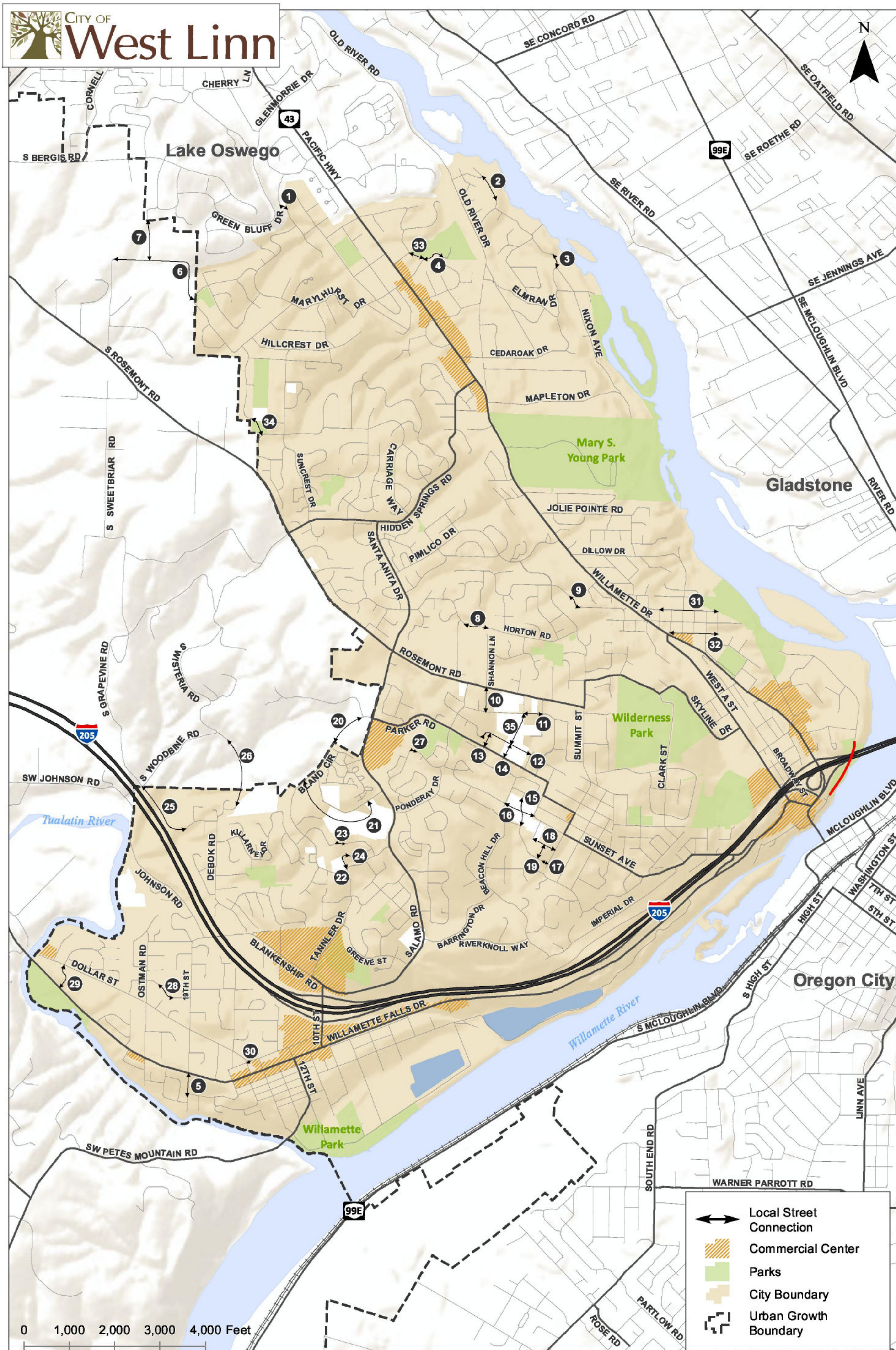
SYSTEM CONNECTIVITY IMPROVEMENTS

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 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 limit options for people to walk and bike to the places they want to go.

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 can be planned carefully to provide route choices for motorists, cyclists and pedestrians while accounting for potential neighborhood impacts. In addition, the quality of the transportation system can be improved by making connectivity improvements to the pedestrian and bicycle system separate from street connectivity.

Given that there are limited opportunities for new arterial collector streets within the City, the following identifies the potential local street connectivity improvements. Figure 3 illustrates the conceptual alignment of the potential connections.

1. Woodhurst Place extension to Scenic Drive – *this potential connection exists today as an informal off-street connection for pedestrians and bicyclists. Given existing developments and topography, it will likely remain as a pedestrian/bicycle connection in the future.*
2. Robin View Court extension to Old River Landing – *this potential connection exists today as a series of driveways to private residences, and therefore may not be feasible as a pedestrian/bicycle or local street connection in the future.*
3. Calaroga Court extension to Nixon Avenue – *this potential connection will have significant impacts to the built environment, and therefore may only be feasible as a ped/bike connection.*
4. Fairview Way extension to Lazy River Drive – *this potential connection will have significant impacts to the built environment, and therefore may only be feasible as a ped/bike connection.*
5. 19th Street extension from Willamette Falls Drive to Swift Shore drive – *this potential connection will have significant impacts to the built environment, and therefor may only be feasible as a ped/bike connection.*
6. Whitten Lane extension to Marylhurst Drive - *this potential connection could be completed as a local street with minimal impacts to the built environment.*
7. New north-south connection from Crestline Drive to Whitten Lane extension – *this potential connection could be completed as a local street with minimal impacts to the built environment.*
8. Horton Road extension to Horton road - *this potential connection will have minimal impacts to the built environment; however, impacts on the natural environment should be considered.*
9. Apollo Road extension to Randal Street – *this potential connection exists today as a series of driveways to private residences, and therefore may not be feasible as a pedestrian/bicycle or local street connection in the future.*
10. Shannon Lane extension to Ridge Lane – *this potential connection could be completed as a local street with minimal impacts to the built environment.*
11. Ridge Lane extension to Ridge Lane – *this potential connection could be completed as a local street with minimal impacts to the built environment.*
12. Roxbury Drive extension to Chinook Court – *this potential connection could be completed as a local street with minimal impacts to the built environment; however, impacts on the natural environment should be considered.*



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Local Street Connectivity Solutions
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: USGS, ESRI, TANA, AND

13. Damon Drive extension to Roxbury Drive extension – *this potential connection could be completed as a local street with minimal impacts to the built environment; however, impacts on the natural environment should be considered.*
14. Maxfield Drive extension to Roxbury Drive extension – *this potential connection could be completed as a local street with minimal impacts to the built environment.*
15. Landis Street extension to Landis Street – *this potential connection could be completed as a local street with minimal impacts to the built environment.*
16. Sabo Lane extension to Sunset Avenue – *this potential connection could be completed as a local street with minimal impacts to the built environment.*
17. Landis Street extension to Cornwall Street – *this potential connection could be completed as a local street with minimal impacts to the built environment; however, impacts on the natural environment should be considered.*
18. New east-west connection from Reed Street to Cornwall Street – *this potential connection could be completed as a local street with minimal impacts to the built environment.*
19. New north-south connection from the Landis Street extension to the new east-west connection – *this potential connection could be completed as a local street with minimal impacts to the built environment.*
20. Bland Circle extension to Parker Road – *this potential connection could be completed as a collector street with minimal impacts to the built environment.*
21. New east-west connection from Bland Circle to Weatherhill Road – *this potential connection could be completed as a local street with minimal impacts to the built environment.*
22. Crestview Drive extension to Crestview Drive - *this future local street connection is currently underway.*
23. Tannler Drive extension to Sunbreak Lane extension - *this future local street connection is currently underway.*
24. Sunbreak extension to Tannler Drive - *this future local street connection is currently underway.*
25. Tamarisk Drive extension to Grapevine Road – *this potential connection could be completed as a local street with minimal impacts to the built environment; however, impacts on the natural environment should be considered.*
26. Wisteria Road extension to Wisteria Road – *this potential connection could be completed as a local street with minimal impacts to the built environment; however, impacts on the natural environment should be considered.*
27. Wild Rose Loop extension to Chelan Drive – *this potential connection could be completed as a local street with minimal impacts to the built environment.*

28. Orchard Street extension to Short Street – *this potential connection will have significant impact to the built environment, and therefore may only be feasible as a ped/bike connection.*
29. Brandon Place extension to Willamette Falls Drive – *this potential connection could be completed as a local street with minimal impacts to the built environment; however, impacts on the natural environment should be considered.*
30. 8th Avenue extension from 14th Street to Dollar Street – *this potential connection exists today as a series of driveways to private residences, and therefore could be completed as a local street with minimal impact to the built environment.*
31. Randal Street extension to Irving Street – *this potential connection could be completed as a local street with minimal impacts to the built environment.*
32. New east-west connection from Elliot Street to Irving Street – *this potential connection could be completed as a local street with minimal impacts to the built environment.*
33. Shady Hollow Way to Lazy River Drive – *this potential connection will have significant impacts to the built environment, and therefore may only be feasible as a ped/bike connection.*
34. Kapteyns Street to Carriage Way– *this potential connection could be completed as a local street with minimal impacts to the built environment.*
35. Maxfield Drive extension to Ridge Lane – *this potential connection could be completed as a local street with minimal impacts to the built environment.*

FREIGHT MOBILITY AND RELIABILITY IMPROVEMENTS

Rail Transportation

Given West Linn's current density and the urban form of the Portland metropolitan area, it is unlikely that passenger rail transportation will come directly to the City of West Linn. It is recommended that City continue to support the services and facilities in the Oregon City and Portland area by providing adequate connections to these facilities. Potential improvements in service exist with the expansion of regional systems currently being discussed. West Linn should continue to support and promote regional improvements to the transit system, and be actively involved in the coordination of these services and possible connecting services to best serve its residents. As the details of these systems and potential connecting points are not yet known, it is not possible to incorporate them into existing plans and facility improvements. West Linn should advocate for good connections from the city to future passenger rail stations.

ROADWAY CAPACITY IMPROVEMENTS

The potential motor vehicle improvements shown in Figure 4 and identified below are those from the 2008 Motor Vehicle Action Plan and Master Plan that have not yet been implemented. These projects are intended to bring the roadways up to current standards and improve the motor vehicle operations at intersections and along corridors in West Linn. Projects along Willamette Drive are included in the Highway 43 Concept Plan and are addressed separately, and projects related to the 10th Street interchange for I-205 are included in the 10th Street Interchange Project and are also addressed separately.

2008 TSP solutions

- Install traffic signals at the following intersections when warranted:
  1. Willamette Falls Drive/Sunset Avenue
  2. Willamette Falls Drive /12th Street
  3. Salamo Road/Parker Road
  4. Rosemont Road/Hidden Springs Road
  5. Highway 43/Willamette Falls Drive (traffic signal should be coordinated with the adjacent signal at I-205 NB Off Ramps)
- Modify the traffic control at the following intersections to all way stop control when warranted:
  6. Willamette Falls Drive/14th Street
  7. Willamette Falls Drive/19th Street
- Install separate left and right turn lanes at the following intersections when warranted:
  8. Rosemont Road/Hidden Springs Road (northbound and southbound lefts)
- Widen the following roadway segments as indicated below:
  9. Add a center median on Rosemont Road to allow two-stage left turn from Carriage Way
  10. Widen Willamette Falls Drive with center median 500' on each side of intersection to allow for two-stage left turn from Ostman Road
  11. Widen Willamette Falls Drive with center median 500' on each side of intersection for two-stage left turn from Dollar Street
- Upgrade the following roadway segments as indicated below:
  12. Modify Dollar Street connection to reconnect to 8th Avenue, and provide alternative route for local trips.

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Motor Vehicle Solutions
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: USGS, ESRI, TANA, AND

13. Upgrade 19th Street to current City standards from Blankenship Road/Debok Road to Willamette Falls Drive
14. Upgrade 8th Avenue from 10th Street to Dollar Street

OR 43 Concept Plan Solutions

The Highway 43 Concept Plan was developed by the City of West Linn in coordination with ODOT as part of the 2008 TSP update. The Plan identifies the needs, deficiencies, and solutions for the portion of Highway 43 between the north City limits and McMillican Street that are assumed for the TSP update, such as pedestrian crossings, street trees, landscaping, transit stops, and lighting to better support the needs of all roadway users as well as adjacent land uses. The Plan is currently being updated concurrent with the TSP update. The findings of the updated Plan will be incorporated into the TSP.

- Install a traffic signal at the Highway 43/Pimlico Drive intersection when warranted
- Add left turn lanes at the northbound and southbound approaches to the Highway 43/Arbor Drive intersection
- Realign the shopping center driveway located to the southeast of the Highway 43/Cedar Oak Drive intersection with the intersection
- Modify circulation at the Highway 43/Holmes Street intersection to allow exit only traffic from Holmes Street
- Modify circulation at the Highway 43/Lewis Street intersection to prohibit left turns out from Lewis Street
- Modify traffic signal timing at the Highway 43/Hood Street/McKillican Street intersection to have protected/permitted phasing on Hood-McKillican Street
- Install sidewalks, planter strips, raised bikeways, and two travel lanes, one in each direction from the northern City limits to Marylhurst Drive
- Install sidewalks, planter strips, raised bikeways, a landscaped median, and two travel lanes, one in each direction from Marylhurst Drive to Hidden Springs Road
- Install sidewalks, planter strips, raised bikeways, and two travel lanes, one in each direction from Hidden Springs Road to Pimlico Drive – some segments contain a median, or a dual left turn lane
- Install sidewalks, planter strips, raised bikeways, and two travel lanes, one in each direction from Pimlico Drive to Buck Street – one segment includes a separated bike lane
- Install sidewalks, raised bikeways, and two travel lanes, one in each direction from West A Street to Webb Street – one segment includes plant strips
- Install sidewalks, raised bikeways, a landscaped median with a pedestrian refuge, and two travel lanes, one in each direction from Webb Street to Hood-McKillican Street.

10th Street Solutions

This section identifies the potential motor vehicle solutions for the 10th Street interchange. The pedestrian, bicycle, and transit solutions are identified on page 33 of this memorandum. Two sets of potential solutions were evaluated in Tech Memo 8 for the 10th Street interchange to address motor vehicle needs. Both sets of solutions include near and long-term improvements. The alternative that ultimately moves forward will determined on feedback from ODOT on the feasibility of extending 8th Court to Willamette Falls Drive as identified in Alternative 1 and installing a traffic signal at the 10th Street/8th Avenue-Court intersection identified in Alternative 2.

Alternative 1

Alternative 1 includes several of the motor vehicle improvements identified in the 2008 TSP and the 10th Street Study as well as a few new improvements not evaluated in any previous studies conducted by the City or ODOT. The improvements have been separated into near-term and long-term improvements based on an evaluation of existing and year 2040 operations.

Near-Term Improvements

The following near-term improvements are included in Alternative 1 to address issues identified under existing conditions:

- Restripe the westbound approach to the 10th Street/Blankenship-Salamo Road intersection to include an exclusive left-turn lane and shared left-through lane.
  - This improvement would require replacing the signal heads and detector loops and reprograming the traffic signal.
- Install a raised median island at the eastbound approach to the 10th Street/8th Avenue-Court intersection to restrict the eastbound left-turn and through movements.
  - This improvement would result in an increase in the east-bound left-turn volume at the 10th Street/Willamette Falls Drive intersection, where the eastbound left-turn movement would then operate at LOS F (delay = 83.1 seconds versus 35.6 seconds today) and over capacity (v/c = 1.07 versus 0.84 today); however, the delay would be less than the delay at the 10th Street/8th Avenue-Court intersection and the overall intersection would operate at LOS E.

Long-Term Improvements

The following long-term improvements are included in Alternative 1 to address issues identified under year 2040 conditions:

- Widen the eastbound and westbound Blankenship-Salamo Road approaches approximately 500 feet in each direction to provide dual westbound left-turn lanes, a single westbound through lane, and to accommodate dual northbound left-turn lanes.

- Add a second exclusive right turn lane to the eastbound approach to the 10th Street/Blankenship-Salamo Road intersection to prevent queues from spilling past the Albertson's driveway.
  - This improvement would increase the crossing distance located at the south leg of the 10th Street Blankenship-Salamo Road intersection.
  - The need for this improvement could be reduced by restricting access to the commercial property located in the southwest corner of the 10th Street Blankenship-Salamo Road intersection and/or realigning Tannler Road to the main access further to the west.
- Modify and/or widen 10th Street between the I-205 NB Ramps and the I-205 SB Ramps to two lanes in either direction. This allows for one continuous left turn lane and one continuous through-movement lane in either direction 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)[1].
- Widen 10th Street between the I-205 NB Ramps and Willamette Falls Drive to provide two lanes in each direction.
- Extend 8th Court to Willamette Falls Drive to provide additional access to 8th Court retail.
- Install a median along 10th Street to restrict the eastbound and westbound approaches to the 10th Street/8th Avenue-Court intersection to right-in/right-out.
- Install a traffic signal and separate dual eastbound left-turn lanes at the 10th Street/Willamette Falls Drive intersection.

Alternative 2

Alternative 2 also includes several of the motor vehicle improvements identified in the 2008 TSP as well as a few new improvements not evaluated in any previous studies conducted by the City or ODOT. Similar to Alternative 1, the improvements have been separated into near-term and long-term improvements based on an evaluation of existing and year 2040 operations.

Near-Term Improvements

The following improvements are included in Alternative 2 (*Note: the improvements unique to Alternative 2 are identified in **bold** text)*:

- Restripe the westbound approach to the 10th Street/Blankenship-Salamo Road intersection to include an exclusive left-turn lane and shared left-through lane.

[1] 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.

Long-Term Improvements

The following long-term improvements are included in Alternative 1 to address issues identified under year 2040 conditions:

- Widen the eastbound and westbound Blankenship-Salamo Road approaches approximately 500 feet in each direction to provide dual westbound left-turn lanes, a single westbound through lane, and to accommodate dual northbound left-turn lanes.
- Add a second exclusive right turn lane to the eastbound approach to the 10th Street/Blankenship-Salamo Road intersection to prevent queues from spilling past the Albertson's driveway.
    - This improvement would increase the crossing distance located at the south leg of the 10th Street Blankenship-Salamo Road intersection.
    - The need for this improvement could be reduced by restricting access to the commercial property located in the southwest corner of the 10th Street Blankenship-Salamo Road intersection and/or realigning Tannler Road to the main access further to the west.
- Modify and/or widen 10th Street between the I-205 NB Ramps and the I-205 SB Ramps to two lanes in either direction. This allows for one continuous left turn lane and one continuous through-movement lane in either direction 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)[2].
- **Install a traffic signal at the 10th Street/8th Avenue-Court intersection[3].**
- Install a traffic signal at the 10th Street/Willamette Falls Drive intersection.
- Coordinate all of the traffic signals along 10th Street to minimize queuing and delay at each approach to the I-205 Ramp terminals.

The installation of a traffic signal at the 10th Street/8th Avenue-Court intersection eliminates the need to widen 10th Street between the I-205 NB Ramps and Willamette Falls Drive. It also eliminates the need for turn movement restrictions at the 10th Street/8th Avenue-Court intersection, which in turn reduces the need for the 8th Court extension to Willamette Falls Drive and dual left-turn lanes at the 10th Street/Willamette Falls.

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[2] 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.

[3] In lieu of access restrictions and the extension of 8th Court.

PERFORMANCE MEASURES AND TARGETS AND SYSTEM PERFORMANCE MONITORING

The TSP Update has four primary goals and desired outcomes for the transportation system. They include:

- **Goal 1 – Safety -** Reduce transportation-related fatalities and serious injuries across all modes.
- **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.
- **Goal 3 – Equity -** Develop transportation facilities that are accessible to all members of the community.
- **Goal 4 – Maintenance -** Deliver access and safety improvements cost effectively, and within available revenues.

Table 5 identifies the targets and measures for evaluating progress towards the City's goals for performance of the transportation system. It also identifies how the city is currently performing on each target, the proposed solutions that will help the city advance the target, how the city could perform on each target if the proposed solutions could all be implemented, and how the targets and system performance can be monitored over time.

Table 5: West Linn TSP Update Targets, Performance Measures, and Monitoring Plan

Target	Success is…	Solutions that Advance Target	Current Baseline Metric	Projected 2040 Metric of Unconstrained Plan	Monitoring Plan
Target 1A – Zero severe injury and fatal collisions by mode.	A steady reduction each year in the number of severe injury and fatal collisions as compared to prior years.	• Intersection improvements with consideration for bicyclists and pedestrians • Pedestrian crossings near schools and high pedestrian traffic areas • Bicycle and pedestrian treatments at intersections (e.g., crossing islands, painted boxes and bike signals) • Bicycle and pedestrian facility improvements with emphasis on separated facilities on high-speed or high-volume roads • Traffic calming and greenways • Education and enforcement	• 15 Injury A crashes (2013) • 3 fatal crashes (2013) • 19 crashes involving pedestrians or bicyclists (2013)	• Vision 0	• Document the measure on an annual basis based on a review of data maintained by ODOT. Successful progress towards the target includes a steady reduction each year in the number severe injury and fatal collisions compared to prior years.
Target 1B - Reduce total number of high collision locations to zero by 2040.	A steady reduction each year in the number of locations on the ODOT Safety Priority Index System (SPIS) List or where collision rate exceeds 1.0 crashes per million entering vehicles	• Intersection improvements with consideration for bicyclists and pedestrians • Bicycle and pedestrian treatments at intersections (e.g., crossing islands, painted boxes and bike signals) • Bicycle and pedestrian facility improvements with emphasis on separated facilities • Traffic calming and greenways • Pedestrian crossings near schools and high pedestrian traffic areas	• 1 ODOT SPIS location (2013) • No intersections with a crash rate above 1.0 crashes/MEV (2013)	• Vision 0	• Document the measure on an annual basis based on a review of data maintained by ODOT. Successful progress towards the target includes a steady reduction each year in the number of SPIS locations and locations with a crash rate above 1.0.
Mobility, Access and Environment **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.	A reduction in VMT per capita such that VMT remains steady or declines over time even as growth occurs.	• Transit queue jumps • Improved use of technology to improve user information • Park and ride lots with secure bike racks • Bicycle, pedestrian, and transit amenities Frequent bus service • Educational and incentive programs to encourage and facilitate shifts to carpool, bike, walk, transit, telecommuting	• Metro Travel Demand Model VMT and VMT per Capita (2010)	• Metro Travel Demand Model VMT and VMT per Capita (2040)	• Document the measure each time a new base year is created 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	Success is…	Solutions that Advance Target	Current Baseline Metric	Projected 2040 Metric of Unconstrained Plan	Monitoring Plan
Mobility, Access and Environment **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 by 2040.	40-45 percent non-SOV mode share in industrial and employment areas and neighborhoods by 2040 *and* 45-55 percent non-SOV mode share in town centers, main streets and corridors by 2040	• Bicycle, pedestrian, and transit facility improvements • Bus rapid transit, such as transit priority • Educational and incentive programs to encourage shifts to carpool, bike, pedestrian, and transit • Bicycle, pedestrian, and transit amenities such as bus shelters and benches, signage, bike maps, bike parking	• Metro Travel Demand Model Non-SOV mode share in industrial and employment areas and neighborhoods (2010) • Metro Travel Demand Model Non-SOV mode share in town centers, main streets and corridors (2010)	• Metro Travel Demand Model Non-SOV mode share in industrial and employment areas and neighborhoods (2040) • Metro Travel Demand Model Non-SOV mode share in town centers, main streets and corridors (2040)	• Document the measure each time a new base year is created 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.
Mobility, Access and Environment **Target 2C** – Improve freight travel time reliability.	Lower degree of variability from mean commercial heavy vehicle travel time compared to baseline on I-205 and OR 43	• Reduce peak-hour travel • Intersection operational improvements • Signal synchronization • Transit queue jumps • Improved use of technology to improve user information • Increase access to Oregon City transit and light rail transit to increase transit mode split	• Metro DTA model Travel Time Reliability on I-205 (2010) • Metro DTA model Travel Time Reliability on OR 43 (2010)	• Metro DTA model Travel Time Reliability on I-205 (2040) • Metro DTA model Travel Time Reliability on OR 43 (2040)	• Document the measure each time a new base year is created 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 OR 43
Mobility, Access and Environment **Target 2D** - Increase the percentage of people that can access key destinations via a 20 minute walk, bike or public transit ride by 40 percent by 2040.	An increase at each TSP Update in the percent of the West Linn population within a 20 minute walk, bike or public transit ride of key destinations.	• Educational and incentive programs to encourage and facilitate shifts to carpool, bike, walk, transit, telecommuting • Bicycle and pedestrian facilities near major activity centers with emphasis on filling gaps in the network • Transit level of service improvements, such as service frequency, hours, and coverage • Implement the Oregon Highway 43 Conceptual Design Plan • ADA curb ramps • Developer incentives to support transit, walking and biking and off-peak travel	• Percent of the population within a 20 minute walk, bike, or public transit ride of key destinations (2010)	• Percent of the population within a 20 minute walk, bike, or public transit ride of key destinations (2040)	• Document the measure at each TSP Update 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	Success is…	Solutions that Advance Target	Current Baseline Metric	Projected 2040 Metric of Unconstrained Plan	Monitoring Plan
Mobility, Access and Environment **Target 2E** –Actuve Safe Routes to School (SRTS) Programs in place in all West Linn schools.	All schools in West Linn having SRTS programs that conduct one or more events per year to encourage walking and biking to school.	• • Pedestrian and bicycle projects that provide facilities and crossings and increase the safety of the SRTS routes.	• As of 2014, SRTS routes have been identified for the five primary schools. The number of programs/activities that occur per year to encourage walking and biking is unknown.	• All schools, including elementary, middle, and high schools	• Document the measure at each TSP Update. Successful progress towards the target includes the identification of SRTS for each school, information being made 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.
Mobility, Access and Environment **Target 2F** – A good quality pedestrian network and low stress bicycle network connecting all residents to key destinations.	All residential areas and key destinations connected to the network of "Good" quality pedestrian facilities and LTS Level 2 or better bicycle facilities	• Bicycle and pedestrian facilities in key destination areas with emphasis on filling gaps in the network • Bicycle/pedestrian separated facilities • Bicycle and pedestrian treatments at intersections (e.g. crossing islands, painted boxes, bike signals etc.) • Wider sidewalks buffered from automobile traffic • Traffic calming and greenways • Curb ramps	• 2014 "Good" quality pedestrian network • 2014 LTS 2 or better bicycle network • 2014 residential areas and key destinations not connected to the network • Calculate with GIS	• All streets with "good" quality pedestrian network • All streets with LTS 2 or better bicycle network • All residential areas and key destinations connected to the network	• Document the measure at each TSP Update. Successful progress towards the target includes an increase in the network of "Good" quality pedestrian facilities and LTS Level 2 or better bicycle facilities and a reduction in the number of residential areas and key destinations that are not connected to this network.
Mobility, Access and Environment **Target 2G –** Increase the number of green street facilities by 2040	Number of green street facilities in West Linn in 2040 is higher than baseline.	• Update street standards to incorporate green streets. • Build green streets • Updated maintenance practices to reduce rate of run-off	• 2014 number of green street facilities • Coordinate with City	•	• Document the measure at each TSP Update. Successful progress towards the target includes an increase in the number of green street facilities at each TSP Update.
Equity **Target 3A** – By 2040 increase walking, bicycle and public transit access, for transportation disadvantaged populations, to key destinations, by 40 percent	An increase at each TSP Update in the percent of the transportation disadvantaged population within a 20 minute walk, bike or public transit ride of key destinations.	• Bicycle and pedestrian facility improvements near schools and other transportation disadvantaged destinations with emphasis on filling gaps in the network and ADA improvements • Transit improvements such as increased service on high ridership routes • Curb ramps • Rail transit	• Percent of the transportation disadvantaged population within a 20 minute walk, bike, or public transit ride of key destinations (2010) • Calculate with GIS	• Percent of the transportation disadvantaged population within a 20 minute walk, bike, or public transit ride of key destinations (2040) • Calculate with GIS	• Document the measure at each TSP Update 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	Success is…	Solutions that Advance Target	Current Baseline Metric	Projected 2040 Metric of Unconstrained Plan	Monitoring Plan
Equity **Target 3B** - Ensure transportation services (and impacts) are equitably distributed to all segments of the population.	Number of projects, on 2040 TSP financially constrained project list, that are within or adjacent to areas of low income or minority populations is proportionate to the population in those areas relative to the City of West Linn as a whole	• Transit improvements such as increased frequent-service routes • Street or streetscape improvements • Bicycle and pedestrian improvements	• N/A	•	• Document the measure at each TSP Update
Maintenance Target 4A - Increase the average local road pavement condition index (PCI) to 70 by 2040.	2040 average local road PCI is 70 or greater.	• Maintenance, repair and operation of local roadways • Road rehabilitation and reconstruction	• 2014 average local road PCI.	•	• Document the measure annually. Successful progress towards the target includes an increase in the average local road PCI.
Maintenance Target 4B - Reduce the number of transportation facilities in "distressed" condition by 5 percent by 2040.	Number of transportation facilities in distressed condition in 2040 is at least 5 percent below 2014 baseline	• Maintenance, repair and operation of local roadways • Bus replacements • Upgrades to transit facilities • Road rehabilitation and reconstruction	• 2014 number of facilities in distressed condition.	•	• Document the measure annually. Successful progress towards the target includes a reduction in the number of facilities in distressed condition.

Attachment A Project Evaluation Criteria

Goal		Safety: Reduce transportation-related fatalities and injuries for all transportation modes		Mobility, Access and the Environment: Improve access to jobs, schools, health care and other regular needs in ways the improve health, reduce pollution and retain money in the local economy							Equity: Deliver transportation improvements equitably	Maintenance: Deliver access and safety improvements cost effectively, within available revenues, and responsively to the needs of all users of the transportation system		Concurrency				Fiscal Efficiency (RTFP 3.02.220)	
Target / Resource		1a: Would likely reduce severe injury and fatal crashes at location with known or perceived safety risks/ (TM 7 Figure 10: Crash Data)	1b: Would likely reduce the number of high collision locations/ (TM 10 Figure 1: Crash Severity)	2A: Would likely reduce VMT	2B: Supports a compact urban form and would likely increase non-SOV modes of travel in West Linn's commercial districts	2C: Would result in improved freight travel time reliability/ (Figure 3-10: Freight Routes)	2D: Would allow more people to access schools, parks and open spaces, within a 20 minute walk, bike or bus ride/ (Figure 3-6: Functional Roadway Classifications)	2E: Increases number of schools with SRTS programs in place that conduct one or more activities per year to encourage walking and biking to school.	2F: Implementation would result in "good" or better, level of quality bicycle or pedestrian facility/ (Figure 3-2: Pedestrian Facilities; Figure 3-3: Bicycle Facilities; Figure 3-4: Bicycle LTS)	2G: Is a "green street" facility	3A: Would allow more people, who are considered transportation disadvantaged, to access schools, parks and open spaces, and employment and commercial areas within a 20 minute walk, bike or bus ride/ Figures 3-11 through 3-16)	4A: Improves the pavement condition index	4B: Improves a distressed facility	Project or program is in Trails Master Plan (TM 7: Figure 4)	Project or program is in Metro Regional Trails and Greenways Plan	Project or program is part of SRTS (TM 7: Figure 4)	Project or program is in 2008 TSP Action Plan (TM 7: Figure 4)	Project is one of the following: 1) TSMO (4 points); 2) Transit, bike and/or ped improvements (4 points); 3) Traffic-calming (3 points); 4) Land use strategies (2 points); 5) Connectivity improvements (1 point); 6) Motor-vehicle capacity improvements (0 points)	
Points		4	4	2	2	N/A	2	N/A	2	N/A	8	N/A	N/A	1	1	1	1	4	32
Project Type	Project/Goal	1A	1B	2A	2B	2C	2D	2E	2F	2G	3A	4A	4B	NA	NA	NA	NA	NA	Total Score
10th-1	10th St - Alternative 1	4	4	0	0	N/A	0	N/A	0	N/A	0	N/A	N/A	0	0	0	0	4	12
10th-2	10th St - Alternative 2	4	4	0	0	N/A	0	N/A	0	N/A	0	N/A	N/A	0	0	0	0	4	12
C-1	Willamette Drive (Highway 43 Concept Plan)	4	4	2	2	N/A	2	N/A	2	N/A	8	N/A	N/A	1	0	0	1	4	30
C-2	Willamette Falls Drive	4	4	2	2	N/A	2	N/A	2	N/A	8	N/A	N/A	1	0	0	1	4	30
C-3	10th Street	4	4	2	2	N/A	2	N/A	2	N/A	8	N/A	N/A	1	0	0	1	4	30
C-4	Hidden Springs Road	4	4	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	1	0	1	0	4	28
C-5	Rosemont Road	0	4	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	1	1	1	1	4	26
C-6	West A Street	0	4	2	2	N/A	2	N/A	2	N/A	8	N/A	N/A	1	0	0	0	4	25
C-7	Ostman Road	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	1	0	0	1	4	20
C-8	Old River Drive (Cedar Oak Street)	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	1	0	0	0	4	19
C-9	Carriage Way	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	1	0	0	0	4	19
C-10	Salamo Road	0	4	2	2	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	0	1	4	18
C-11	Blankenship Road	0	4	2	2	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	0	1	4	18
C-12	Dollar Street	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	0	0	0	0	4	18
C-13	Parker Road	0	4	2	2	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	0	0	4	17
C-14	Santa Anita Drive	0	4	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	1	0	4	16
C-15	Skyline Drive	0	4	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	0	0	4	15
C-16	Summit Street	0	4	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	0	0	4	15
C-17	Sunset Avenue	0	4	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	0	0	4	15
C-18	Tannler Drive	0	0	2	2	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	0	0	4	13
C-19	Pimlico Drive	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	0	0	4	11
C-20	Johnson Road	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	0	0	4	11
C-21	Lancaster Street	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	0	0	4	11
C-22	Cornwall Street	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	0	0	4	11
C-23	Clark Street	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	0	0	4	11
C-24	Bland Circle	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	0	0	4	11
C-25	Jolie Pointe Road	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	1	0	0	0	4	19
C-26	Marylhurst Drive	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	1	0	0	0	4	19
C-27	Nixon Avenue	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	0	0	4	11
LSC-1	Fairview Way extension to Shady Hollow	0	0	2	2	N/A	2	N/A	2	N/A	8	N/A	N/A	0	0	0	0	2	18
LSC-2	8th Avenue extension from 14th Street to Dollar Street	0	0	2	2	N/A	2	N/A	2	N/A	8	N/A	N/A	0	0	0	0	2	18
LSC-3	Woodhurst Place extension to Scenic Drive	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	0	0	0	0	2	16
LSC-4	Robin View Court extension to Old River Landing	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	0	0	0	0	2	16
LSC-5	Calaroga Court extension to Nixon Avenue	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	0	0	0	0	2	16
LSC-6	19th Street extension from Willamette Falls Drive to Swift Shore Drive	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	0	0	0	0	2	16
LSC-7	Whitten Lane extension to Marylhurst Drive	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	0	0	0	0	2	16
LSC-8	New north-south connection from Crestline Drive to Whitten Lane extension	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	0	0	0	0	2	16
LSC-9	Apollo Road extension to Randall Street	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	0	0	0	0	2	16
LSC-10	Orchard Street extension to unnamed roadway	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	0	0	0	0	2	16
LSC-11	Randal Street extension to Irving Street	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	0	0	0	0	2	16
LSC-12	Bland Circle extension to Parker Road	0	0	2	2	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	10
LSC-13	Wild Rose Loop extension to Chelan Drive	0	0	2	2	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	10
LSC-14	Horton Road extension to Horton Road	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-15	Shannon Lane extension to Ridge Lane	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-16	Ridge Lane extension to Ridge Lane	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-17	Roxbury Drive extension to Chinook Court	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-18	Damon Drive extension to Roxbury Drive extension	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-19	Maxfield Drive extension to Roxbury Drive extension	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-20	Landis Street extension to Landis Street	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8

LSC-21	Sabo Lane extension to Sunset Avenue	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-22	Landis Street extension to Cornwall Street	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-23	New east-west connection from Reed Street to Cornwall Street	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-24	ew north-south connection from the Landis Street extension to the new east-west connecti	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-25	New east-west connection from Bland Circle to Weatherhill Road	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-26	Crestview Drive extension to Crestview Drive	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-27	Tannler Drive extension to Sunbreak Lane extension	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-28	Sunbreak extension to Tannler Drive	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-29	Tamarisk Drive extension to Grapevine Road	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-30	Wisteria Road extension to Wisteria Road	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-31	Brandon Plae extension to Willamette Falls Drive	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
LSC-32	New east-west connection from Elliot Street to Irving Street	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	0	0	0	0	2	8
OR43-1	Cross section improvements - Highway 43 from Marylhurst Dr to Hidden Springs Rd	4	4	2	2	N/A	2	N/A	0	N/A	8	N/A	N/A	1	0	0	1	4	28
OR43-2	Cross section improvements - Highway 43 from West A St to Webb St	4	4	2	2	N/A	2	N/A	0	N/A	8	N/A	N/A	1	0	0	1	4	28
OR43-3	Cross section improvements - Highway 43 from Webb St to Hood-McKillican St	4	4	2	2	N/A	2	N/A	0	N/A	8	N/A	N/A	1	0	0	1	4	28
OR43-4	Cross section improvements - Highway 43 from Hidden Springs Rd to Pimlico Dr	4	4	2	0	N/A	2	N/A	0	N/A	8	N/A	N/A	1	0	0	1	4	26
OR43-5	Cross section improvements - Highway 43 from Pimlico Dr to Buck St	4	4	2	0	N/A	2	N/A	0	N/A	8	N/A	N/A	1	0	0	1	4	26
OR43-6	Traffic signal - Highway 43 / Pimlico Dr	4	4	0	0	N/A	2	N/A	0	N/A	8	N/A	N/A	1	0	0	1	4	24
OR43-7	Modify circulation - Highway 43 / Lewis St	4	4	0	0	N/A	2	N/A	0	N/A	8	N/A	N/A	1	0	0	1	4	24
OR43-8	Cross section improvements - Highway 43 from Northern City limits to Marylhurst Dr	0	4	2	0	N/A	2	N/A	0	N/A	8	N/A	N/A	1	0	0	1	4	22
OR43-9	Modify circulation - Highway 43 / Holmes St	0	4	0	0	N/A	2	N/A	0	N/A	8	N/A	N/A	1	0	0	1	4	20
OR43-10	Realign driveway - near Highway 43 / Cedar Oaks Dr	4	4	0	0	N/A	0	N/A	0	N/A	0	N/A	N/A	1	0	0	1	4	14
OR43-11	LTL - Highway 43 / Arbor Dr	0	4	0	0	N/A	0	N/A	0	N/A	0	N/A	N/A	1	0	0	1	4	10
OR43-12	Modify signal timing- Highway 43 / Hood-McKillican St	0	4	0	0	N/A	0	N/A	0	N/A	0	N/A	N/A	1	0	0	1	4	10
S-1	Crosswalk - West leg of 14th St / Willamette Falls Dr	4	4	2	2	N/A	2	N/A	2	N/A	8	N/A	N/A	0	0	0	0	4	28
S-2	Crosswalk - E-W at Broadway St / Willamette Falls Dr	0	4	2	2	N/A	2	N/A	2	N/A	8	N/A	N/A	0	0	0	0	4	24
SRTS-1	SRTS - Bolton Primary	0	4	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	1	0	1	0	4	24
SRTS-2	SRTS - Willamette Primary	0	0	2	0	N/A	2	N/A	2	N/A	8	N/A	N/A	0	0	1	0	4	19
SRTS-3	SRTS - Trillium Creek Primary	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	1	1	1	0	4	13
SRTS-4	SRTS - Sunset Primary	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	1	0	4	12
SRTS-5	SRTS - Cedar Oak Primary	0	0	2	0	N/A	2	N/A	2	N/A	0	N/A	N/A	1	0	1	0	4	12
V-1	AWSC - Willamette Falls Dr / 14th St	4	4	0	0	N/A	2	N/A	0	N/A	8	N/A	N/A	1	0	0	1	0	20
V-2	Traffic signal - Willamette Falls Dr / 12th St	0	4	0	0	N/A	2	N/A	0	N/A	8	N/A	N/A	1	0	0	1	0	16
V-3	Traffic signal - Rosemont Rd / Hidden Springs Rd	0	4	0	0	N/A	2	N/A	0	N/A	8	N/A	N/A	1	0	0	1	0	16
V-4	AWSC - Willamette Falls Dr / 19th St	0	0	0	0	N/A	2	N/A	0	N/A	8	N/A	N/A	1	0	0	1	0	12
V-5	Traffic signal - Willamette Falls Dr / Sunset Ave	0	4	0	0	N/A	2	N/A	0	N/A	0	N/A	N/A	1	0	0	1	0	8
V-6	Traffic signal - Salamo Rd / Parker Rd	0	4	0	0	N/A	2	N/A	0	N/A	0	N/A	N/A	1	0	0	1	0	8
V-7	Traffic signal - Highway 43 / Willamette Falls Dr	0	4	0	0	N/A	2	N/A	0	N/A	0	N/A	N/A	1	0	0	1	0	8
V-8	Separate LT and RT lanes - Rosemont Rd / Hidden Springs Rd	0	4	0	0	N/A	0	N/A	0	N/A	0	N/A	N/A	1	0	0	1	0	6
V-9	Widening - Willamette Falls Dr near Dollar St	0	4	0	0	N/A	0	N/A	0	N/A	0	N/A	N/A	1	0	0	1	0	6
V-10	Widening - Rosemont Rd near Carriage Way	0	0	0	0	N/A	0	N/A	0	N/A	0	N/A	N/A	1	0	0	1	0	2
V-11	Widening - Willamette Falls Dr near Ostman Rd	0	0	0	0	N/A	0	N/A	0	N/A	0	N/A	N/A	1	0	0	1	0	2
V-12	Upgrade - Dollar St	0	0	0	0	N/A	0	N/A	0	N/A	0	N/A	N/A	1	0	0	1	0	2
V-13	Upgrade - 8th Ave	0	0	0	0	N/A	0	N/A	0	N/A	0	N/A	N/A	1	0	0	1	0	2
V-14	Upgrade - 19th St	0	0	0	0	N/A	0	N/A	0	N/A	0	N/A	N/A	1	0	0	0	0	1

C = corridor
SRTS = Safe Routes to School
V = vehicle
OR 43 = OR43 Concept Plan
10th = 10th St interchange
S = safety improvement
AWSC = all-way stop control
LSC = Local street connection

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MEMORANDUM

Date:	June 24, 2015	Project #: 17817
To:	Zach Pelz, City of West Linn Gail Curtis, Oregon Department of Transportation	
From:	Susan Wright, PE, Matthew Bell, and Ribeka Toda, Kittelson & Associates, Inc.	
Project:	West Linn Transportation System Plan (TSP) Update	
Subject:	Final Technical Memorandum #11: Planned and Financially Constrained Transportation Systems	

The purpose of this memorandum is to present the draft planned and cost constrained transportation systems for the City of West Linn Transportation System Plan (TSP) update. Previous technical memorandums documented existing and future conditions and recommended solutions to the existing and anticipated system deficiencies. The consultant team developed the draft planned transportation system and identified priorities using the input gathered from the Project Management Team (PMT), Technical Advisory Committee (TAC), Citizen Advisory Committee (CAC), and Community Workshops on the solutions as well as the TSP goals, objectives, targets and project evaluation criteria documented in Technical Memorandum #3.

Project Evaluation Criteria and Prioritization

The draft planned system identifies high, medium, and low priority projects required to address the City of West Linn's goals for the transportation system. The goals are documented in detail in Technical Memorandum #3 and summarized below.

- **Goal 1: Safety** – Reduce transportation-related fatalities and serious injuries across all modes.
- **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.
- **Goal 3: Equity** – Develop transportation facilities that are accessible to all members of the community.
- **Goal 4: Maintenance** – Deliver access and safety improvements cost effectively, and within available revenues.

Targets and measures for evaluating the City's progress towards the goals were developed to identify and prioritize solutions that will help the city advance the target. The targets and measures (described in Technical Memorandum #3) were used to develop evaluation criteria to prioritize projects. The evaluation criteria help identify how well a project advances TSP targets. In addition to evaluation criteria related to the above goals, two additional project evaluation criteria were added which include whether a project is currently identified as a priority project 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.

Draft project evaluation criteria were applied to the solutions in Technical Memorandum #10 and reviewed with the TAC and CAC in April, 2015. The evaluation criteria were then revised based on the committee's input and were applied in this memorandum. The project evaluations were used to identify the projects within each section of the plan as high, medium, or low priority relative to each other. *The revised evaluation criteria are included in Attachment A. The evaluation of each of the projects in the draft planned system is included in Attachment B.*

Planning level cost estimates were generated for each project within the preferred alternative. These cost estimates were used to construct the cost constrained alternative to provide a more realistic plan based on the City's financial forecast. The draft cost constrained plan was developed by identifying forecasted transportation funding (documented in Technical Memorandum #4) and selecting higher priority projects from the draft planned system that can be funded with forecasted funds.

Transportation funding

The TSP will include a cost constrained plan which 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 estimated to be approximately $20,000,000 or roughly $800,000 per year on average (documented in Technical Memorandum #4).[1]

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[1] This number does not include potential additional funding from state and federal grants and loans such as 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, 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.

Planned Transportation System Cost Summary

Table 1 provides a summary of the full cost of the planned transportation system. As shown, the full cost of the planned system is approximately $69.4 million over the 25 year period, including $26.4 million in high priority, 26.2 million in medium priority, and 16.8 million in low priority projects. Based on the anticipated funds available for capital improvement projects ($20.0 million over the 25 year period), **the draft financially constrained plan includes a majority of the high priority projects.** This leaves an approximately $6.4 million funding gap for the City to completed the full list of high priority projects over the 25 year period.

Table 1: Planned Transportation System Cost Summary

Project Type	High Priority (Cost Constrained Plan Projects) (0-10 years)	Medium Priority (10-20 years)	Low Priority (20-25 years)	Total
		Planned Transportation System		
TSMO[1]	$150,000	$150,000	$75,000	**$375,000**
TDM[1]	$750,000	$750,000	$495,000	**$1,995,000**
Land Use		$185,000		**$185,000**
Access Management			$75,000	**$75,000**
Bike/Ped	$20,130,000	$17,752,500	$1,695,000	**$39,577,500**
Transit		$485,000		**$485,000**
Motor Vehicle	$5,346,250	$6,865,000	$14,525,000	**$26,736,250**
Total	**$26,376,250**	**$26,187,500**	**$16,865,000**	**$69,428,750**
		Available Funding		
Total	$8,000,000	$8,000,000	$4,000,000	$20,000,000

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

DRAFT PLANNED SYSTEM

This section outlines the policies, programs, and projects included in the draft planned system. These were identified based on a technical analysis of the West Linn transportation system and comments from the Project Management Team (PMT), Technical Advisory Committee (TAC), and Citizen Advisory Committee (CAC) members.

This section is divided into the following sections outlined below:

- Functional Classification
- Transportation System Management and Operations (TSMO)
    - Transportation System Management (TSM)
    - Travel Demand Management (TDM)

- Land Use Management
- Neighborhood Traffic Management (NTM)
- Access Management
- Local Street Connectivity
- Safety
- Maintenance

- Pedestrian and Bicycle Plan
  - Trails Plan
  - Arterials
  - Collectors
  - Neighborhood Routes and Local Streets
- Transit Plan
- Motor Vehicle Plan
- Freight and Rail Plan

The recommendations in each section may include any of the following:

- Policies: Policy modifications that should be considered for implementation by the City of West Linn.
- Programs: Programs recommended to be implemented by the City of West Linn.
- Studies: Proposed studies or refinement plans for intersections and/or corridors throughout West Linn.
- Projects: Proposed capital improvement projects developed based on an analysis of existing and forecasted deficiencies of the transportation system within the City of West Linn.

Functional Classification

The functional classification of a roadway aids in defining its primary function and associated design standards for the facility. The hierarchy of the roadway facilities within the network in regards to the type of traffic served (through or local trips), balance of function (providing access and/or capacity), and the level of use (generally measured in vehicles per day) are generally dictated by its functional classification.

The proposed functional classification of roadways within West Linn was developed based on a review of the existing West Linn TSP and direction provided by City staff. Several changes have been proposed to the existing functional classification to align with existing use and defined characteristics. These changes primarily lower the roadway's classification from arterial to collector, collector to neighborhood route, and from neighborhood route to local street. Table 2 summarizes the proposed changes in functional classification.

Table 2: Proposed Changes in Functional Classification

Street	Segment	Existing Classification	Future Classification
12th Street	Willamette Falls Drive to Tualatin Avenue	Minor Arterial	Collector
Alpine Drive	Killarney Drive to Bland Circle	Local	Neighborhood Route
Bay Meadows Drive	Rosemont Road to eastern roadway terminus	Neighborhood Route	Local
Beacon Hill Drive	Riverknoll Way to Barrington Drive	Local	Neighborhood Route
Beacon Hill Drive	Barrington Drive to Beacon Hill Lane	Neighborhood Route	Local
Beacon Hill Lane	Beacon Hill Drive to Winkle Way	Neighborhood Route	Local
Bland Circle	Salamo Road to Crestview Drive	Collector	Neighborhood Route
Bland Circle	Crestview Drive to northern terminus	Collector	Local
Bland Cirlce	Salamo Road to western roadway terminus	Collector	Local
Blankenship Road	10th street to Tannler Drive	Minor Arterial	Neighborhood Route
Broadway Street	McKillican Street to Willamette Falls Drive	Neighborhood Collector	Local
Buck Street	Elliot Street to Failing Street	Collector	Local
Burns Street	Highway 43 to Hood Street	Collector	Lcaol
Carriage Way	Suncrest Drive to Hidden Springs Road	Collector	Neighborhood Route
Cedar Oak Drive	Highway 43 to Old River Drive	Collector	Neighborhood Street
Cedar Oak Drive	Old River Drive to Elmran Drive	Neighborhood Route	Local
Chestnut Street	Sunset Avenue to Willamette Falls Drive	Minor Arterial	Collector
Clark Street	Skyline Drive to Long Street	Collector	Neighborhood Route
Cornwall Street	Lancaster Street to Sunset Avenue	Minor Arterial	Collector
Crestview Drive	Alpine Drive to Bland Circle	Local	Neighborhood Route
Debok Drive	Blankenship Road to Killarney Drive	Collector	Neighborhood Route
Debok Drive	Killarney Drive to northern roadway terminus	Collector	Local
Dillow Dive	Highway 43 to Larson Avenue	Neighborhood Route	Local
Dillow Drive	Larson Street to Failing Street	Collector	Local
Dollar Street	Willamette Falls Drive to western terminus	Collector	Local
Elliot Street	Highway 43 to Buck Street	Collector	Local
Elmran Drive	Old River Drive to Nixon Avenue	Collector	Local
Exeter Street	Oxford Street to Long Street	Neighborhood Route	Local
Failing Street	Dillow Drive to Buck Street	Collector	Local
Greene Street	Salamo Road to Tannler Drive	Neighborhood Route	Local
Hidden Springs Road	Rosemont Road to Highway 43	Minor Arterial	Collector
Hillcrest Drive	Marylhurst Drive (west) to Suncrest Drive	Collector	Local
Hood Street	Highway 43 to Burns Street	Collector	Local
Jolie Pointe Road	Highway 43 to Larson Avenue	Collector	Local
Lancaster Street	Parker Road to Cornwall Street	Minor Arterial	Collector
Larson Avenue	Jolie Pointe Road to Dillow Drive	Collector	Local
Leonard Street	Simpson Street to Riverview Avenue	Collector	Neighborhood Route
Long Street	Exeter Street to Simpson Street	Neighborhood Route	Local
Long Street	Simpson Street to Clark Street	Collector	Neighborhood Route
Mapleton Drive	Highway 43 to Nixon Avenue	Collector	Local

Marylhurst Drive	Hillcrest Drive to Hillcrest Drive	Collector	Local
McKillican Drive	West A Street to Highway 43	Collector	Local
Nixon Avenue	Elmran Drive to Mapleton Drive	Collector	Local
Old River Drive	Cedar Oak Drive to north City limits	Collector	Neighborhood Route
Oxford Street	Summit Street to Exeter Street	Neighborhood Route	Local
Parker Road	Salamo Road to Lancaster Street	Minor Arterial	Collector
Riverknoll Way	Barrington Drive to Beacon Hill Drive	Neighborhood Route	Local
Riverview Avenue	Leonard Street to Sunset Avenue	Collector	Neighborhood Route
Santa Anita Drive	Rosemont Road to Hidden Springs Road	Minor Arteri	Collector
Shannon Lane	Horton Road to Rosemont Road	Neighborhood Route	Local
Simpson Street	Long Street to Leonard Street	Collector	Neighborhood Route
Skyline Drive	Summit Street to West A Street	Minor Arterial	Collector
Summit Street	Skyline Drive to Rosemont Road	Minor Arterial	Collector
Summit Street	Pimlico Drive to Skyline Drive	Collector	Neighborhood Route
Suncrest Drive	Hidden Springs Road to Martin Court	Neighborhood Route	Local
Sunset Avenue	Summit Street to Willamette Falls Drive	Minor Arterial	Collector
Riverview Avenue	Leonard Street to Sunset Drive	Collector	Neighborhood Route
Rosemont Road	Salamo Road to Summit Street	Minor Arterial	Collector
Tannler Drive	Blankenship Road to Bland Circle	Collector	Neighborhood Route
Tualatin Road	12^{th} Street to south city limits	Minor Arterial	Collector
West A Street	Willamette Falls Drive to Highway 43	Minor Arterial	Collector

The changes shown in Table 2 will impact the design standards applied to the roadways. Changes from a neighborhood route to a local street remove bicycle lanes from a roadway's standard; however, local streets identified as on-street connections for the Trails Master Plan could have a special standard for accommodation of bicycles. The proposed functional classification for the existing and planned roadways within the City of West Linn is shown in Figure 1. *Descriptions of the city's functional classifications and their cross-section standards are included in Attachment "C".*

Transportation System Management and Operations (TSMO)

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 efficiency of the existing system. TDM addresses the *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 the 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.

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Proposed Functional Roadway Classification Plan
West Linn, Oregon

Figure
1

H:\projfile\17817 - West Linn Transportation System Plan\gis\TM1111_Functional Classifications.mxd - mbell - 1:34 PM 6/24/2015

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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: USGS, ESRI, TANA, AND

Transportation System Management (TSM)

Transportation System Management (TSM) focuses on low cost strategies within the 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 could be used in a smaller scale environment such as within the City of West Linn. The following sections discuss TSM measures that could be appropriate for the City of West Linn. Technical Memorandum #10 identifies several potential TSM strategies for implementation in West Linn. Table 3 summarizes the strategies that best meet the goals and objectives of the TSP update.

Table 3: Transportation System Management Projects and Programs

Project/Program Number	Name	Description	Priority	Cost
TSM1	Signal Retiming and Optimization	Update signal timing plans and coordinate signals to better match prevailing traffic conditions	High/Medium/Low	$15,000/year
TSM2	Transit Signal Priority	Work with ODOT to establish transit Signal Priority on Highway 43 as needed	Medium	TBD
TSM3	Adaptive or active signal control	Work with ODOT to establish adaptive signal control on Highway 43 as needed	Low	TBD
TSM4	Traffic responsive control	Work with ODOT to establish transit responsive control as needed	Low	TBD
TSM5	Truck signal priority	Work with ODOT to establish truck signal priority on Highway 43 as needed	Low	TBD
			TOTAL High Priority Costs	**$150,000**
			TOTAL Medium Priority Costs	**$150,000**
			TOTAL Low Priority Costs	**$75,000**
			TOTAL Program Costs (25 years)	**$375,000**

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 7: Tualatin to Oregon City:

- **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. *This project was identified for the 6-10 year time frame with a cost of $650,000 and annual operating costs of $13,000.*
- **Arterial Corridor Management for Willamette Falls Drive** – Improve corridor operations by expanding traveler information and upgrading traffic signal equipment and timings. Install upgraded traffic signal controllers, establish communications to the central traffic signal

system, provide arterial detections (including bicycle detection where appropriate) and routinely update signal timings. 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. *This project was identified for a timeframe beyond 11 years with a cost of $1,600,000 and annual operating costs of $30,000.*

Other regional projects identified in the Metro's Regional Transportation Plan Project List include the following:

- RTP Project #: 10020 – **Clackamas County ITS Plan** - Deploy traffic responsive signal timing, ramp metering, traffic management equipment for better routing of traffic during incidents along the three key ODOT corridors - I-205, I-5, 99E. Install signal controller upgrades and update county ITS plan. *This project was identified for 2014-2040 with an estimated cost of $21,300,000*
- RTP Project #: 11104 – **Regional TSMO** - Provide strategic and collaborative program management including coordination of activities for TransPort TSMO committee; allocation and implementation of MTIP programming for TSMO; manage regional policy and project development; and oversee performance data development and tracking. *This project was identified for 2014-2040 with an estimated cost of $40,500,000.*
- RTP Project #: 11584 – **Region-Wide TSMO Active Transportation** – specific projects to be determined. *This project was identified for 2033-2040 with an estimated cost of $90,630,000*

Clackamas County Intelligent Transportation Systems (ITS)

ITS involves 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. ITS focuses on increasing the efficiency of existing transportation infrastructure, which enhances the overall system performance and reduces the need to add capacity (e.g. travel lanes). Efficiency is achieved by 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.

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 identifies ITS projects in West Linn located along I-205 and Highway 43. The two projects located along I-205 have been completed. The remaining projects along Highway 43 (and planned implementation schedules) are:

- CCTV cameras at three locations [Planned 11-20 years]
- Detector station [Planned 11-20 years]

- Incident management corridor [Planned 11-20 years]
- Transit priority corridor (and information display) [Planned 6-10 years]
- Fiber optic cable [Planned 11-20 years]

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.

Technical Memorandum #10 identifies several program and policy based 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. Table 4 summarizes the strategies that best meet the goals and objectives of the TSP update. As with all new public and private investments, the implementation of TDM strategies is sure to draw opposition from some. Given West Linn's lack of experience with TDM strategies, it is important that decision-makers understand their long-term costs and benefits and are able evaluate these along-side arguments from opponents in achieving outcomes that best reflect the City's vision and goals while effectively reducing travel demand.

Table 4: Transportation Demand Management Program Strategies

Program/Project Number	Name	Description	Priority	Cost
TDM1	Carpool Match Services Service	Work with Metro to coordinate a rideshare/carpool program that regional commuters can use to find other commuters with similar routes to work	High/Medium/Low	$30,000/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	High/Medium/Low	$45,000/year
TDM3	Limited and/or Flexible parking Requirements	Refine the City's current parking policy to include parking maximums, low(er) minimums, shared parking provisions, fee in-lieu options, and other strategies to encourage multi-modal transportation	Low	$80,000
TDM4	Parking Management	Modify the City's current parking policy to impose time limits in commercial areas and allow for the potential to charge for parking	Low	$40,000
			TOTAL High Priority Costs	**$750,000**
			TOTAL Medium Priority Costs	**$750,000**
			TOTAL Low Priority Costs	**$495,000**
			TOTAL Program Costs (25 years)	**$1,995,000**

Other potential TDM projects include:

- 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 the development of high speed communication in all part of the city (fiber optic, digital cable, DSL, etc). The objective would be to allow employers and residents the maximum opportunity to rely upon other systems for conducting business and activities than the transportation system 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.

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 to be a mixture of housing densities and areas of mixed use development (i.e., a mix of residential, retail, commercial and/or office uses). Technical Memorandum #2 demonstrates the benefits of incorporating commercial nodes into residential neighborhood and encouraging mixed-use development on transit ridership and other more active modes of transportation. Technical Memorandum #10 identifies several land use strategies that could be implemented in West Linn. Table 5 summarizes the strategies that best meet the goals and objectives of the TSP update.

Table 5: Land Use Projects

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

Neighborhood Traffic Management (NTM)

Neighborhood Traffic Management (NTM) is a term that has been used to describe traffic control devices typically used in residential neighborhoods to slow traffic or possibly reduce the volume of traffic. NTM is commonly referred to as traffic calming because of its ability to reduce travel speeds and improve neighborhood livability. The City of West Linn currently utilizes NTM elements of education, enforcement and engineering (such as speed humps, raised pavement markings, medians, bulb-outs, etc).

The City has an established traffic safety committee (whose membership consists of city staff and a representative from 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 concern by citizens, after which the committee review the situation and conducts a speed/volume survey if warranted to obtain necessary data. Once the concern has been identified and classified, the committee recommends appropriate follow-up action. There are many different NTM options available to the committee. Typically, the committee starts with education and enforcement. If it is deemed an engineering solution is required, the committee will forward this information to engineering staff for follow-up and budgeting as appropriate. The implementation of the selected NTM solution may be funded by the city and/or the concerned citizens. Tualatin Valley Fire and Rescue maintains a list of common NTM engineering solutions acceptable to the agency where minimum street design criteria are met.

While no specific NTM projects are identified for the TSP update, they are an important part of the City's ongoing effort to improve livability. Any future NTM projects should include coordination with emergency agency staff to ensure public safety is not compromised. NTM engineering solutions are limited to neighborhood routes and local streets. Implementation of NTM solutions that limit traffic on collector/arterial routes is counterproductive and can lead to cut through traffic onto local streets. NTM is also restricted on collector/arterial routes to avoid conflicts with emergency access/public safety as well as conflicts with public transit.

Access Management

Access management is a set of measures regulating 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 the ability to allow access to individual properties. Proper implementation of access management techniques should guarantee reduced congestion, reduced accident rates, less need for roadway widening, conservation of energy, 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 current 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. Technical Memorandum #10 identifies a number of potential access management techniques and strategies that help to preserve transportation system investments and guard against deteriorations in safety and increased congestion. Table 6 summarizes the projects that best meet the goals and objectives of the TSP update.

Table 6: Access Management Projects

Project Number	Name	Description	Priority	Cost[1]
AM1	Access Spacing Standard Modifications	Modify city-wide access spacing standards according to a roadway's jurisdiction and functional classification	Low	$20,000
AM2	Special Transportation Area Designation	Pursue Special Transportation Area (STA) designations along Highway 43 within the commercial areas to allow alternative access spacing (and mobility) standards	Low	$15,000
AM3	Access Spacing Variances	Develop an access spacing variance process for when the standard cannot be met	Low	$20,000
AM4	Access Consolidation	Refine the City's approach for access consolidation to focus on incremental improvements that can occur over time	Low	$20,000
			TOTAL Low Priority Costs	**$75,000**
			TOTAL Program Costs (25 years)	**$75,000**

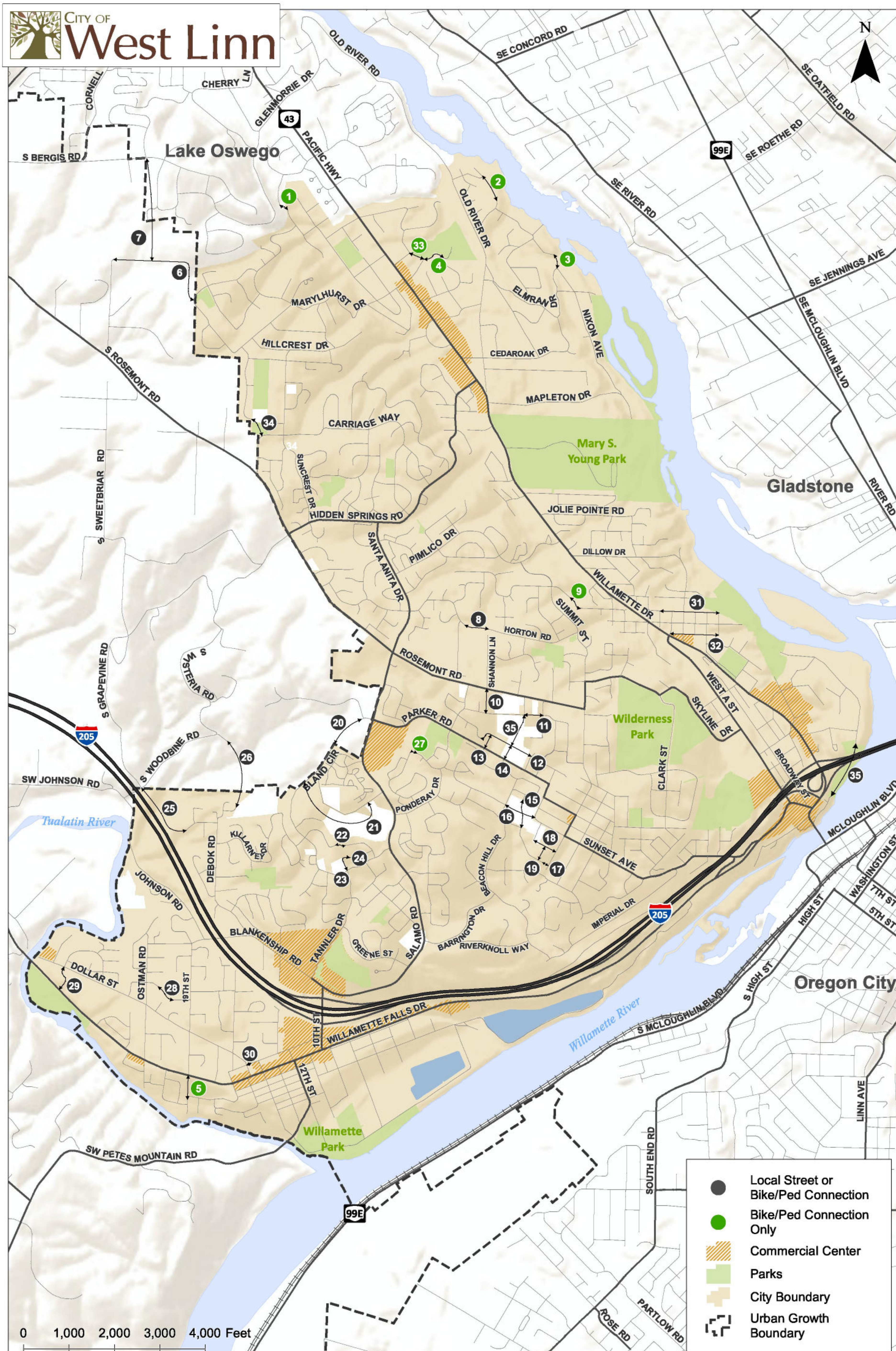
Additional projects related to Access Management are included in the motor vehicle section and include the installation of separate left-turn lanes onto cross streets when warranted and the construction of raised median islands.

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 speeds and volumes on local streets, but cul-de-sacs and dead end streets result in longer trip distances, increase response time for emergency responders, increased reliance on arterials for local trips, and limit 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) can be reduced, congestion on roads such as Rosemont Road, Salamo Road, or Hidden Springs Road could be improved, accessibility between various travel modes can be enhanced and traffic levels can be balanced among various streets. Additionally, public safety response time can be reduced.

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 can be planned carefully to provide route choices for motorists, cyclists and pedestrians while accounting for potential neighborhood impacts. In addition, the quality of the transportation system can be improved by making connectivity improvements to the pedestrian and bicycle system separate from street connectivity.

Figure 2 illustrates the location of the local street connections identified for the TSP update. Table 7 summarizes the connections by their recommended type and priority based on the project evaluation criteria. Costs are not provided for these projects as they are anticipated to be constructed by future development. Any projects that are desired to be city initiated projects should be identified and identified as a high priority to be included in the cost-constrained plan.



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Recommended Local Street Connectivity Projects
West Linn, Oregon

Figure **2**

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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: USGS, ESRI, TANA, AND

Table 7: Street Connections by Priority

Project Number	Name	Type	Priority
LSC-1	Woodhurst Place extension to Upper Midhill Drive	Bike/Ped	Low
LSC-2	Robin View Court extension to Old River Landing	Bike/Ped	Low
LSC-3	Calaroga Court extension to Nixon Avenue	Bike/Ped	Low
LSC-4	Fairview Way extension to Lazy River Drive	Bike/Ped	Medium
LSC-5	19th Street extension from Willamette Falls Drive to Swift Shore Drive	Bike/Ped	Low
LSC-6	Whitten Lane extension to Marylhurst Drive	Local Street	Low
LSC-7	New north-south connection from S Bergis Road to Whitten Lane extension	Local Street	Low
LSC-8	Horton Road extension to Horton Road	Local Street	Low
LSC-9	Apollo Road extension to Randall Street	Bike/Ped	Low
LSC-10	Shannon Lane extension to Ridge Lane	Local Street	Low
LSC-11	Ridge Lane extension to Ridge Lane	Local Street	Low
LSC-12	Roxbury Drive extension to Chinook Court	Local Street	Low
LSC-13	Damon Drive extension to Roxbury Drive extension	Local Street	Low
LSC-14	Maxfield Drive extension to Roxbury Drive extension	Local Street	Low
LSC-15	Landis Street extension to Landis Street	Local Street	Low
LSC-16	Sabo Lane extension to Sunset Avenue	Local Street	Low
LSC-17	Landis Street extension to Cornwall Street	Local Street	Low
LSC-18	New east-west connection from Reed Street to Cornwall Street	Local Street	Low
LSC-19	New north-south connection from the Landis Street extension to the new east-west connection	Local Street	Low
LSC-20	Bland Circle extension to Parker Road	Collector Street	Medium
LSC-21	New east-west connection from Bland Circle to Weatherhill Road	Local Street	Low
LSC-22	Crestview Drive extension to Crestview Drive	Local Street	Under Construction
LSC-23	Tannler Drive extension to Sunbreak Lane extension	Local Street	Under Construction
LSC-24	Sunbreak extension to Tannler Drive	Local Street	Under Construction
LSC-25	Tamarisk Drive extension to Grapevine Road	Local Street	Low
LSC-26	Wisteria Road extension to Wisteria Road	Local Street	Low
LSC-27	Wild Rose Loop extension to Chelan Drive	Bike/Ped	Medium
LSC-28	Orchard Street extension to Short Street	Local Street	Low
LSC-29	Brandon Place extension to Willamette Falls Drive	Local Street	Low
LSC-30	8th Avenue extension from 14th Street to Dollar Street	Local Street	Medium
LSC-31	Randall Street extension to Irving Street	Local Street	Low
LSC-32	New east-west connection from Elliot Street to Irving Street	Local Street	Low
LSC-33	Shady Hollow Way to Lazy River Drive	Local Street	Low
LSC-34	Kapteyns Street to Carriage Way	Local Street	Low
LSC-35	Maxfield Drive extension to Ridge Lane	Local Street	Medium

Safety

Based on the above safety analysis, the safety projects shown in Table 8 are recommended in addition to those identified in the pedestrian, bicycle, and vehicle plans. The priority is based on the project evaluation criteria.

Table 8: Safety Projects

Location	Type of Crash	Solution	Project
14th Street / Willamette Falls Drive	Severe Injury	Install pedestrian crossing across Willamette Falls Drive at 14th Street	A22
Hidden Springs Road, 75 feet north of Cottonwood Road	Severe Injury	Install bike lanes on one side of the roadway, which will likely narrow the roadway and reduce speeds	A4
12th Street / Willamette Falls Drive	Bicyclist Crash	Install traffic signal when warranted	M11
West A Street / Willamette Falls Drive	Bicyclist Crash	Install bike lanes on both sides of the roadway	A20
Broadway Street / Willamette Falls Drive	Pedestrian Crash	Install pedestrian crossing across Broadway Street at Willamette Falls Drive	A20
Santa Anita Drive / Rosemont Road	Pedestrian Crash	Traffic signal has already been installed	N/A
Salamo Road, 900 feet east of 10th Street	Pedestrian Crash	Install sidewalks on both sides of the roadway	A13

Maintenance

The City of West Linn has a Pavement Management Program (PMP) in place for cost effective maintenance treatments for city streets. A PMP is a systematic method of organizing and analyzing information about pavement conditions. As a management tool, it aids the decision-making process by determining the magnitude of the problem, the optimum way to spend funds for the greatest return on the dollar, and the consequences of insufficient and/or unwise street maintenance investments. The City of West Linn seeks to maintain an annual program of pavement management and monitors conditions in setting priorities for overlays, slurry seals and joint sealing. The City's 2014-2019 Capital Improvement Plan budgets a total of $3.8 million ($633,000/year avg.) for the pavement management program which represents one of the City's largest transportation expenditures.

Pedestrian and Bicycle Plan

The planned pedestrian and bicycle networks include completion of the sidewalks and bike lanes or alternative pedestrian and bicycle treatments on all collector and arterial roadways and some neighborhood routes. Sidewalk improvements have also been identified on some local streets and neighborhood route streets that are associated with Safe Routes to School, along routes that provide access to commercial areas, and in other high priority locations identified by the public. The Pedestrian and Bicycle Plan recognizes that these user groups may use both on- and off-street facilities to complete at least some trips. For this reason, preference is given to on-street bicycle and pedestrian projects in the TSP that connect to existing and/or planned off-street facilities identified in the West Linn Trails System Master Plan. Finally, cycle tracks are recommended in lieu of bike lanes on all streets where the posted speed limit is 30 miles per hour or greater (regardless of vehicular volume).

The projects below are separated into projects on arterials, collectors and neighborhood routes, and local streets to aid in review. Some of the roadway functional classifications are proposed to change; however, the recommendations for bicycle and pedestrian facilities are not anticipated to be impacted by these changes unless noted.

Trails Plan

Figure 3 illustrates the City's Trails Master Plan which includes off-street trails as well as on-street connections to the trail system. The on-street connections and their priority in the Trails Master Plan were considered in the development of the on-street bicycle and pedestrian plan for the arterials, collectors, and local streets described in the following sections.

Arterials

Table 9 identifies the bicycle and pedestrian projects for various segments of the arterials throughout the City of West Linn. The priorities shown in Table 9 are based on the project evaluation criteria. The cost estimates are based on average unit costs for roadway improvements. Figure 4 illustrates the location of the arterial corridor projects.

Table 9: Arterial Pedestrian and Bicycle Projects

Segment		Type	Project	Cost Estimate	Priority
Hidden Springs Road					
A1	Suncrest Drive to Santa Anita Drive	Pedestrian	Install sidewalks on the south side of the roadway (Maintain existing curbline)	$80,000	Medium
A2	Santa Anita Drive to Bluegrass Way	Bicycle	Install bike lanes on both sides of the roadway (Striping only)	$30,000	Medium
A3	Bluegrass Way to Cottonwood Court	Bicycle	Install bike lanes on both sides of the roadway	$220,000	High
		Interim	*Install shared use pavement markings and/or signs on both side of the roadway*	*$20,000*	*Low*
		Pedestrian	Install sidewalks on the south side of the roadway from Carriage Way to Cottonwood Court	$145,000	High
		Pedestrian Crossing	Install crosswalks at Carriage Way and Cottonwood Court	$5,000	High
		Pedestrian Crossing	Install crosswalk at the existing off-street trail located approximately halfway between Wildwood Drive and Cottonwood Court	$5,000	High
A4	Cottonwood Court to Willamette Drive	Bicycle	Install bike lanes on the westbound 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 eastbound side of the roadway	$120,000	High

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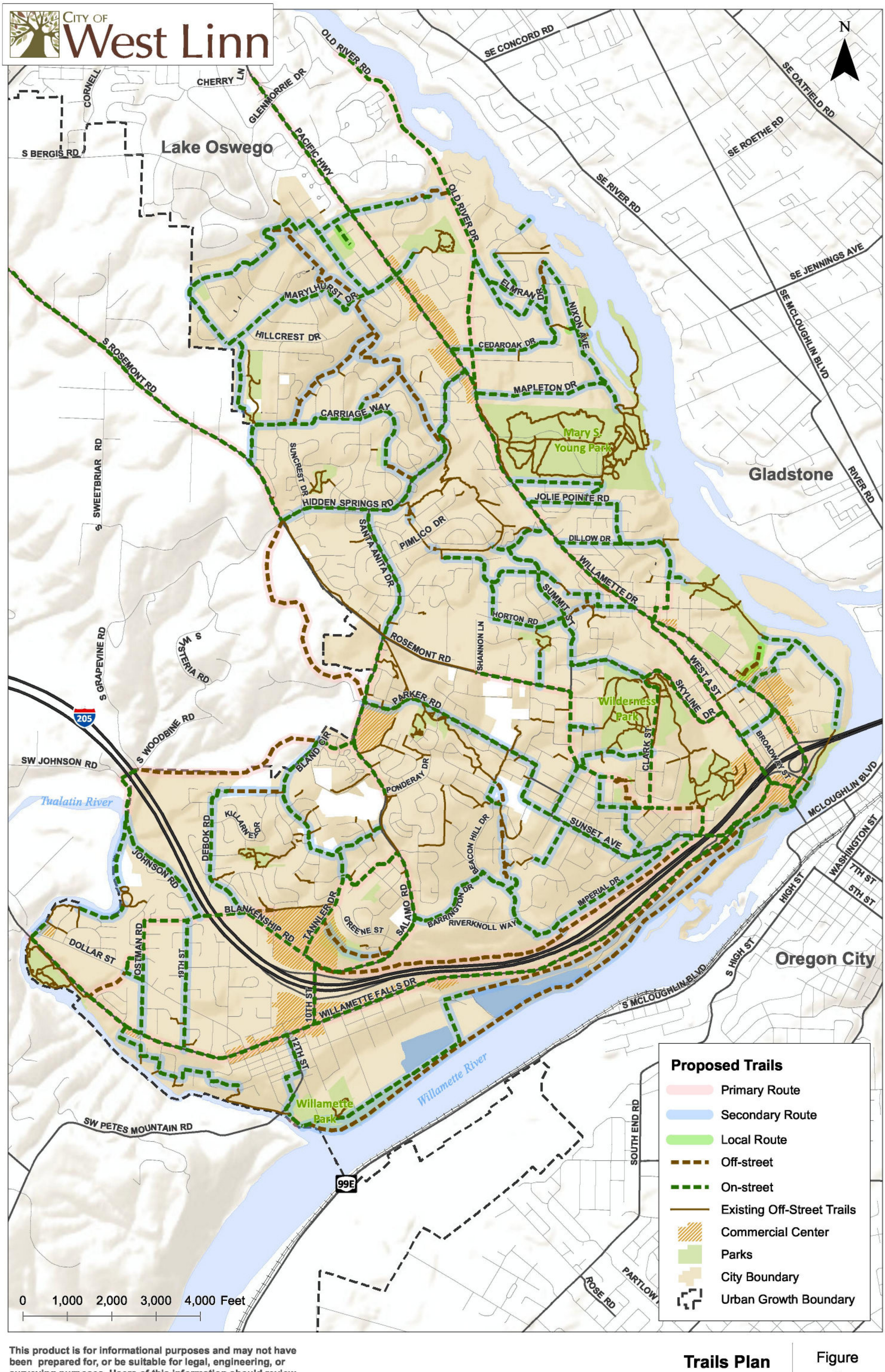

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Trails Plan
West Linn, Oregon

Figure
3

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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: USGS, ESRI, TANA, AND

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Recommended Arterial Projects
West Linn, Oregon

Figure
4

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

Continued from Above

Lancaster Street					
A5	Parker Road to Cornwall Street	Pedestrian	Install sidewalks on the south side of the roadway	$110,000	High
		Pedestrian	Install sidewalks on the north side of the roadway from approximately 175 feet east of Parker Road to Cornwall Street	$90,000	High
		Bicycle	Install bike lanes on both sides of the roadway	$115,000	High
		Interim Bicycle	*Install shared-use pavement markings and/or signs on both sides of the roadway*	*$10,000*	*Low*
Parker Road					
A6	Noble Lane to Lancaster Street	Pedestrian	Install sidewalks on both sides of the roadway from approximately 125 feet east of Noble Lane to approximately 100 feet west of Dillon Lane	$155,000	High
		Pedestrian crossing	Install a crosswalk at Noble Lane	$5,000	High
		Bicycle	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	$120,000	High
		Pedestrian	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 and from 150 west of Damon Drive to 75 feet west of Chinook Court	$145,000	High
Rosemont Road					
A7	Carriage Way to Hidden Springs Road	Pedestrian	Install sidewalks on the south side of the roadway	$205,000	High
		Bicycle	Install bike lanes on the south side of the roadway	$160,000	High
		Pedestrian crossing	Install crosswalks at Carriage Way and Hidden Springs Road	$5,000	High
A8	Hidden Springs Road to Santa Anita Drive	Pedestrian	Install sidewalks on the south side of the roadway from Hidden Springs Road to approximately 100 feet east of Furlong Drive	$370,000	High
A9	Santa Anita Drive to Wild Rose Drive	Pedestrian	Install sidewalks on the south side of the roadway	$250,000	Medium
		Pedestrian	Improve the substandard sidewalks on the north side of the roadway from Santa Anita Drive to Oppenlander Field	$250,000	Medium
		Bicycle	Install bike lanes on both sides of the roadway	$195,000	Medium
A10	Shannon Lane to Summit Street	Pedestrian	Install sidewalks on both sides of the roadway	$540,000	Medium
		Bicycle	Install bike lanes on both sides of the roadway	$345,000	Medium
Salamo Road					
A11	Weatherhill Road to Bland Circle	Pedestrian	Install sidewalks on the west side of the roadway	$115,000	High
A12	Remington Drive to Barrington Drive	Pedestrian	Install sidewalks on the west side of the roadway from approximately 750 feet south of Remington Drive to Barrington Drive	$70,000	High
A13	Barrington Drive to 10th Street	Pedestrian	Install sidewalks on the west side of the roadway	$380,000	High
		Pedestrian	Install sidewalks on the south side of the roadway from approximately 275 feet south of Barrington Drive to 10th Street	$345,000	High
		Bicycle	Install bike lanes on both sides of the roadway from approximately 300 feet south of Barrington Drive to 10th Street	$200,000	High
Santa Anita Drive					
A14	Hidden Springs Road to Pimlico Drive	Pedestrian	Install sidewalks on the east side of the roadway from Hidden Springs Road to Clubhouse Circle	$40,000	High
		Pedestrian	Install sidewalks on the east side of the roadway from approximately 250 feet south of Clubhouse Circle to Pimlico Drive	$50,000	High

		Bicycle	Improve the bicycle crossing at the northbound approach to Hidden Springs Road	$2,500	High
Skyline Drive					
A15	Summit Street to Firwood Drive	Pedestrian	Install sidewalks on the north side of the roadway from Summit Street to approximately 150 feet west of Firwood Drive	$55,000	High
		Bicycle	Install bike lanes on both sides of the roadway from Summit Street to Firwood Drive (Striping Only)	$10,000	High
A16	Firwood Drive to West A Street	Pedestrian	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	$450,000	High
		Bicycle	Install bike lanes on both sides of the roadway from Firwood Drive to West A Street	$700,000	High
		Interim Bicycle	*Install shared-use pavement markings and/or signs on both sides of the roadway from Firwood Drive to West A Street*	$35,000	*Low*
		Pedestrian	Install sidewalks on the south side of the roadway from approximately 150 feet east of Woodwinds Court to approximately 750 feet west of West A Street	$365,000	High
Sunset Avenue					
A17	Cornwall Street to Willamette Falls Drive	Pedestrian	Install sidewalks on the north side of the roadway	$595,000	High
		Pedestrian	Install sidewalks on the south side of the roadway from Cornwall Street to approximately 150 feet west of Spring Rock Circle	$210,000	High
		Bicycle	Install bike lanes on both sides of the roadway	$680,000	High
West A Street					
A18	Willamette Drive to Skyline Drive	Pedestrian	Install sidewalks on the north side of the roadway from approximately 250 feet east of Willamette Drive to Skyline Drive	$210,000	High
		Pedestrian	Install sidewalks on the south side of the roadway from approximately 250 feet east of Willamette Drive to Terrace Drive	$175,000	High
A19	I-205 Bridge to Willamette Falls Drive	Bicycle	Install bike lanes on both sides of the roadway (Striping only)	$5,000	High
Willamette Falls Drive					
A20	Willamette Drive to Sunset Avenue	Pedestrian	Install sidewalks on the south side of the roadway from West A Street to Sunset Avenue	$300,000	High
		Pedestrian	Install pedestrian crossing across Broadway Street at Willamette Falls Drive	$30,000	High
		Bicycle	Install bike lanes on both sides of the roadway	$235,000	High
		Interim	*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*	$15,000	*Low*
A21	Sunset Avenue to 10th Street	Pedestrian	Install sidewalks on the south side of the roadway	$2,565,000	High
		Bicycle	Install bike lanes on both sides of the roadway	$2,945,000	High
A22	10th Street to Dollar Street	Pedestrian	Install crosswalk on the west leg of the 14th Street / Willamette Falls intersection	$30,000	High
A23	Dollar Street (east) to West City Limits	Pedestrian	Install sidewalks on the north side of the roadway from Dollar Street (east) to 19th Street	$195,000	High
		Pedestrian	Install sidewalks on the north side of the roadway from Epperly Way to West City Limits	$290,000	High
		Pedestrian	Install sidewalks on the south side of the roadway from 16th Street to 200 feet west of 16th Street	$25,000	High

		Pedestrian	Install sidewalks on the south side of the roadway from 16th Street to Swift Shore Drive	$185,000	High
		Pedestrian	Install sidewalks on the south side of the roadway from Ostman Road to West City Limits	$465,000	High
10th Street					
A24	Blankenship Road to I-205 SB ramps	Pedestrian	Install sidewalks on the east side of the roadway	$110,000	High
		Bicycle Crossing	Improve bicycle crossing at the northbound approach to Blankenship-Salamo Road	$5,000	High
A25	I-205 SB ramps to Willamette Falls Drive	Pedestrian	Install sidewalks on the east side of the roadway from I-205 SB ramps to 8th Avenue-Court	$40,000	High
		Bicycle	Install bike lanes on both sides of the roadway from I-205 SB ramps to Willamette Falls Drive (Striping Only)	$10,000	High
		Bicycle Crossing	Improve bicycle crossing at the northbound approach to I-205 NB ramps	$5,000	High
			TOTAL High Priority Costs	**$14,067,500**	
			TOTAL Medium Priority Costs	**$1,690,000**	
			TOTAL Low Priority Costs	**$80,000**	
			TOTAL Program Costs (25 years)	**$15,837,500**	

Collectors

Table 10 identifies the bicycle and pedestrian projects for various segments of the collectors throughout the City of West Linn. The priorities shown in Table 10 are based on the project evaluation criteria. The cost estimates are based on average unit costs for roadway improvements. Figure 5 illustrates the location of the collector corridor projects.

Table 10: Collector Pedestrian and Bicycle Projects

Segment		Type	Project	Cost Estimate	Priority
Bland Circle					
C1	Salamo Road to Roadway Terminus	Pedestrian	Install sidewalks on the north side of the roadway from Salamo Road to Tannler Drive	$95,000	Medium
		Pedestrian	Install sidewalks on the north side of the roadway from Tannler Drive to approximately 100 feet east of Falcon Drive	$55,000	Medium
		Pedestrian	Install sidewalks on the north side of the roadway from Falcon Drive to approximately 400 feet north of Fircrest Drive	$230,000	Medium
		Pedestrian	Install sidewalks on the south side of the roadway from approximately 200 feet west of Tannler Drive to approximately 350 feet west of Tannler Drive	$20,000	Medium
		Pedestrian	Install sidewalks on the west side of the roadway from St Moritz Loop to approximately 150 feet north of St Mortiz Loop	$20,000	Medium
		Pedestrian	Install sidewalks on both sides of the roadway from approximately 400 feet north of Fircrest Drive to Weatherhill Road	$295,000	Medium
		Pedestrian	Install sidewalks on the west side of the roadway from Weatherhill Road to the roadway terminus	$130,000	Medium
		Bicycle	Install bike lanes on both sides of the roadway from Salamo Road to Weatherhill Road	$230,000	Medium

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Recommended Collector Projects
West Linn, Oregon

Figure
5

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, ODOT
Terrain Sources: USGS, ESRI, TANA, AND

Continued from Above

Blankenship Road					
C2	10th Street to Debok Road	Pedestrian	Install sidewalks on the north side of the roadway from 10th Street to approximately 50 feet east of the Willamette Corporate Center driveway	$65,000	High
C3	Debok Road to 19th Street	Pedestrian	Install sidewalks on the north side of the roadway from approximately 400 feet west of Debok Road to Johnson Road	$90,000	High
		Pedestrian	Install a crosswalk at the north leg of the Johnson Road/Blankenship Road intersection and extend the sidewalks on the north side of Blankenship Road west of Johnson Road to the intersection	$15,000	High
		Bicycle	Install bike lanes on both sides of the roadway from Debok Road to 19th Street	$85,000	High
C4	19th Street to Ostman Road	Pedestrian	Install sidewalks on the south side of the roadway from 19th Street to approximately 175 feet east of Ostman Road	$110,000	High
		Bicycle	Install bike lanes from 19th Street to Ostman Road	$60,000	High
Carriage Way					
C5	Hidden Springs to Suncrest Drive	Bicycle	Install bike lanes on both sides from Hidden Springs to approximately 350 feet west of Suncrest Drive (Striping only)	$75,000	Medium
C6	Suncrest Drive to Rosemont Road	Pedestrian	Install sidewalks on the north-west side of the roadway from approximately 350 feet west of Suncrest Drive to Rosemont Road	$265,000	Medium
		Bicycle	Install bike lanes on both sides from approximately 350 feet west of Suncrest Drive to Rosemont Road	$15,000	Medium
Clark Street					
C7	Skyline Drive to Windsor Boulevard	Pedestrian	Install sidewalks on both sides of the roadway from Skyline Drive to approximately 150 feet north of Windsor Boulevard	$475,000	Medium
		Bicycle	Install bike lanes on both sides of the roadway from Skyline Drive to approximately 150 feet north of Windsor Boulevard	$370,000	Medium
		Interim	*Install a mixed-use shoulder on one side of the roadway from Skyline Drive to approximately 150 feet north of Windsor Boulevard*	*$185,000*	*Low*
		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*	*$20,000*	*Low*
		Bicycle	Install bike lanes on both sides of the roadway from approximately 150 feet north of Windsor Boulevard to Windsor Boulevard	$2,500	Medium
Cornwall Street					
C8	Oxford Street to Sunset Avenue	Pedestrian	Install sidewalks on both sides of the roadway	$355,000	High
		Bicycle	Install bike lanes on both sides of the roadway	$140,000	High
Dollar Street					
C9	Willamette Falls Drive to the Western Terminus	Pedestrian	Install sidewalks on the south side of the roadway	$740,000	Medium
		Bicycle	Install bike lanes on both sides of the roadway	$385,000	Medium
Johnson Road					
C10	Blankenship Road to Western City Limits	Pedestrian	Install sidewalks on both sides of the roadway	$775,000	Medium
		Bicycle	Install bike lanes on both sides of the roadway	$605,000	Medium
		Interim Bicycle	*Install shared-use pavement markings and/or signs on both sides of the roadway*	*$30,000*	*Low*

		Interim	*Install mixed use shoulders on one side of the roadway*	*$305,000*	*Low*
Marylhurst Drive					
C11	Willamette Drive to Hillcrest Drive (West)	Pedestrian	Install sidewalks on both sides of the roadway	$1,170,000	Medium
		Bicycle	Install bike lanes on both sides of the roadway	$915,000	Medium
		Interim Bicycle	*Install shared-use pavement markings and/or signs on both sides of the roadway*	$45,000	*Low*
		Interim	*Install mixed use shoulders on one side of the roadway*	$455,000	*Low*
Old River Drive					
C12	Northern City limits to Cedar Oaks Drive	Pedestrian	Install sidewalks on the east side of the roadway from approximately 100 feet north of Riverside Court to Cedar Oak Drive	$550,000	Medium
		Pedestrian	Install sidewalks on the west side of the roadway from approximately 200 feet north of Riverside Court to Cedar Oak Drive	$475,000	Medium
		Bicycle	Install bike lanes on both sides from the northern City limits to Cedar Oak Drive	$945,000	Medium
		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*	*$35,000*	*Low*
		Interim	*Install a mixed-use shoulder on the east side of the roadway from the northern City limits to Cedar Oak Drive*	*$475,000*	*Low*
Ostman Road					
C13	Blankenship Road to Willamette Falls Drive	Pedestrian	Install sidewalks on the east side of the roadway from approximately 150 feet south of Blankenship Road to Dollar Street	$75,000	Medium
		Pedestrian	Install sidewalks on the east side of the roadway from Dollar Street to Willamette Falls Drive	$100,000	Medium
		Pedestrian	Install sidewalks on the west side of the roadway from Michael Drive to approximately 150-feet south of Michael Drive	$40,000	Medium
		Pedestrian	Install sidewalks on the west side of the roadway from Dollar Street to Willamette Falls Drive	$330,000	Medium
		Bicycle	Install bike lanes from Blankenship Road to Willamette Falls Drive	$180,000	Medium
Pimlico Drive					
C14	Santa Anita Drive to Willamette Drive	Pedestrian	Install sidewalks on the south side of the roadway from Santa Anita Drive to approximately 100 feet west of Palomino Way (west)	$85,000	Medium
		Pedestrian	Install crosswalks at Santa Anita Drive and Palomino Way (west) to improve access to the sidewalks on the north side of the roadway	$10,000	Medium
		Pedestrian	Install sidewalks on the north side of the roadway from Pimlico Terrace to Treetop Lane	$85,000	Medium
		Pedestrian	Install sidewalks on the south side of the roadway from Palomino Way (east) to Willamette Drive	$140,000	Medium
		Pedestrian	Install crosswalk at Palmino Way (east) to improve access to the sidewalks on the north side of the roadway	$5,000	Medium
		Bicycle	Install bike lanes on both sides of the roadway from Santa Anita Drive to Willamette Drive (Striping Only)	$65,000	Medium
		Interim Bicycle	*Install shared use pavement markings and/or signs on both sides of the roadway from Santa Anita Drive to Willamette Drive*	*$45,000*	*Low*
Summit Street					
C15	Pimlico Drive to Skyline Drive	Pedestrian	Install sidewalks on both sides of the roadway from Pimlico Drive to 150 feet south of Pimlico Drive	$25,000	High

		Bicycle	Install bike lanes on both sides of the roadway from Pimlico Drive to approximately 150 feet south of Pimlico Drive (Striping only)	$2,500	High
		Pedestrian	Fill in the 65-foot gap in the sidewalk on the north side of roadway at approximately 350 feet south of Pimlico Drive	$5,000	High
C16	Skyline Drive to Oxford Street	Pedestrian	Install sidewalks on the west side of the roadway from approximately 150 feet south of Skyline Drive to Rosemont Road and from approximately 150 feet south of Rosemont Road to 400 feet south of Rosemont Road	$80,000	High
		Pedestrian	Install sidewalks on the west side of the roadway from approximately 100 feet south of Ridge Lane to Oxford Street	$50,000	High
		Pedestrian	Install sidewalks on the east side of the roadway from Woodsprite Court to 75 feet north of Knox Street	$125,000	High
		Pedestrian	Install sidewalks on the east side of the roadway from approximately 100 feet south of Knox Street to Oxford Street	$105,000	High
		Bicycle	Install bike lanes from Skyline Drive to Oxford Street	$320,000	High
Suncrest Drive					
C17	Carriage Way to Hillcrest Drive	Pedestrian	Install sidewalks on the east side of the roadway from approximately 250 feet south of Ridgebrook Drive (north) to Ridgebrook Drive (north)	$70,000	Medium
		Pedestrian	Install sidewalks on the east side of the roadway from approximately 150 feet north of Ridgebrook Drive (north) to Hillcrest Road	$135,000	Medium
		Pedestrian	Install sidewalks on the west side of the roadway from approximately 100 feet south of Ridgebrook Drive (south) to Ridgebrook Drive (south)	$25,000	Medium
		Pedestrian	Install sidewalks on the west side of the roadway from approximately 150 feet north of Ridgebrook Drive (south) to Ridgebroook Drive (north)	$130,000	Medium
		Pedestrian	Install sidewalks on the west side of the roadway from approximately 250 feet north of Ridgebrook Drive (north) to Hillcrest Drive	$135,000	Medium
		Bicycle	Install bike lanes on both sides of the roadway from Carriage Way to Hillcrest Drive	$30,000	Medium
		Interim Bicycle	*Install shared use pavement markings and/or signs on both sides of the roadway from Carriage Way to Hillcrest Drive*	*$20,000*	*Low*
Tannler Drive					
C18	Blankenship Road to the Northern Terminus	Pedestrian	Install sidewalks on both sides of the roadway from Blankenship Road to Greene Street	$235,000	Medium
		Bicycle	Modify the existing striping to include bike lanes on both sides of the roadway from Blankenship Road to the northern terminus	$5,000	Medium
			TOTAL High Priority Costs	**$1,632,500**	
			TOTAL Medium Priority Costs	**$10,717,500**	
			TOTAL Low Priority Costs	**$1,615,000**	
			TOTAL Program Costs (25 years)	**$13,965,000**	

Local Street and Neighborhood Routes

Table 11 identifies the pedestrian projects for various segments of the local street and neighborhood routes throughout the City of West Linn. The priorities shown in Table 11 are based on the project evaluation criteria. The cost estimates are based on unit costs for roadway improvements. Figure 6 illustrates the location of the local street and neighborhood route projects.

Table 11: Local Street and Neighborhood Route Pedestrian and Bicycle Projects

Segment		Type	Project	Priority	Cost Estimate
Lowry Drive (Bolton Primary)					
L1	Dillow Drive to Tompkins Street	Pedestrian	Install sidewalks on both sides of the roadway	High	$305,000
Tompkins Street (Bolton Primary)					
L2	Lowry Drive to Caufield Street	Pedestrian	Install sidewalks on both sides of the roadway	High	$90,000
Caufield Street (Bolton Primary)					
L3	Tompkins Street to Randall Street	Pedestrian	Install sidewalks on both sides of the roadway	High	$80,000
Randall Street (Bolton Primary)					
L4	Caufield Street to Davenport Street	Pedestrian	Install sidewalks on both sides of the roadway	High	$65,000
Davenport Street (Bolton Primary)					
L5	Randall Street to Buck Street	Pedestrian	Install sidewalks on both sides of the roadway	High	$65,000
Holmes Street (Bolton Primary)					
L6	Buck Street to Perrin Street	Pedestrian	Install sidewalks on east side of the roadway from 150 feet south of Buck Street to Perrin Street	High	$80,000
		Pedestrian	Install sidewalks on the west side of the roadway from Buck Street to Perrin Street	High	$60,000
Perrin Street (Bolton Primary)					
L7	Holmes Street to Lewis Street	Pedestrian	Install sidewalks on both sides of the roadway	High	$290,000
13th Street (Willamette Primary)					
L8	Timothy Lane to 8th Avenue	Pedestrian	Install sidewalks on the west side of the roadway from Timothy Lane to 8th Avenue and on the east side of the roadway from Timothy lane to approximately 350-feet north of 8th Avenue	High	$125,000
L9	4th Avenue to Tualatin Avenue	Pedestrian	Install sidewalks on the east side of the roadway from 100 feet north of Tualatin Avenue to Tualatin Avenue	High	$15,000
8th Avenue (Willamette Primary)					
L10	13th Street to 400 feet east of 12th Street	Pedestrian	Install sidewalks on the south side of the roadway from 12th Street to 400 feet east of 12th Street	High	$55,000
4th Avenue (Willamette Primary)					
L11	14th Street to 12th Street	Pedestrian	Install sidewalks on the south side of the roadway from 14th Street to 12th Street	High	$100,000
5th Avenue (Willamette Primary)					
L12	11th Street to 7th Street	Pedestrian	Install sidewalks on the north side of the roadway from 11th Street to 7th Street	High	$250,000
			Install sidewalks on the south side of the roadway from 25 feet west of 8th Street to 150 feet east of 8th Street	High	$25,000

Continued Below

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Recommended Local Street and Neighborhood Route Projects - West Linn, Oregon

Figure 6

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, ODOT
Terrain Sources: USGS, ESRI, TANA, AND

Continued from Above

Clubhouse Circle (Trillium Creek Primary)					
L13	Santa Anita Drive to 200 feet east of Clubhouse Court	Pedestrian	Install sidewalks on the south side of the roadway from Belmont Way to 200 feet east of Clubhouse Court	High	$45,000
Sussex Street (Sunset Primary)					
L14	Oxford Street to Sunset Avenue	Pedestrian	Install sidewalks on both sides of the roadway	High	$350,000
Exeter Street (Sunset Primary)					
L15	Oxford Street to Sunset Avenue	Pedestrian	Install sidewalks on the west side of the roadway from Oxford Street to Long Street	High	$90,000
		Pedestrian	Install sidewalks on the east side of the roadway from Long Street to Sunset Avenue	High	$105,000
		Pedestrian	Install sidewalks on the west side of the roadway from Lancaster Street to Sunset Avenue	High	$75,000
Oxford Street (Sunset Primary)					
L16	Bonnet Drive to Sussex Street	Pedestrian	Install sidewalks on the south side of the roadway	High	$35,000
L17	Exeter Street to Bittner Street	Pedestrian	Install sidewalks on the south side of the roadway	High	$50,000
Bonnet Drive (Sunset Primary)					
L18	Windsor Terrace to Oxford Street	Pedestrian	Install sidewalks on the west side of the roadway	High	$50,000
Oregon City Boulevard (Sunset Primary)					
L19	Bonnet Drive to Clark Street	Pedestrian	Install sidewalks on the north side of the roadway from Bonnet Drive to 350 feet east of Prospect Street	High	$135,000
Prospect Street (Sunset Primary)					
L20	Knox Street to Oregon City Boulevard	Pedestrian	Install sidewalks on the east side of the roadway from Knox Street to Oregon City Boulevard	High	$135,000
		Pedestrian	Install sidewalks on the west side of the roadway from 125 feet south of Knox Street to Oregon City Boulevard	High	$115,000
Bittner Street (Sunset Primary)					
L21	Oxford Street to Long Street	Pedestrian	Install sidewalks on the east side of the roadway	High	$180,000
Long Street (Sunset Primary)					
L22	Bittner Street to Clark Street	Pedestrian	Install sidewalks on both sides of the roadway from Bittner Street to Simpson Street	High	$90,000
		Pedestrian	Install sidewalks on the north side of the roadway from 125 feet east of Simpson Street to 250 feet east of Simpson Street	High	$115,000
Simpson Street (Sunset Primary)					
L23	Long Street to Charman Street	Pedestrian	Install sidewalks on both sides of the roadway	High	$415,000
Cedar Oaks Drive (Cedar Oak Primary)					
L24	Old River Drive to Trillium Drive	Pedestrian	Install sidewalks on the north side of the roadway from Old River Drive to Trillium Drive	High	$170,000
		Pedestrian	Install sidewalks on the south side of the roadway from Older River Drive to 200 feet west of Trillium Drive	High	$140,000
L25	Trillium Drive to Elmran Drive	Pedestrian	Install sidewalks on the south/east side of the roadway from Trillium Drive to Elmran Drive	High	$210,000
Trillium Drive (Cedar Oak Primary)					
L26	Glen Terrace to 700 feet south of Glen Terrace	Pedestrian	Install sidewalks on both sides of the roadway	High	$320,000

Shady Hollow Way (Robinwood Commercial Area)					
L27	Highway 43 to Arbor Drive	Pedestrian	Install sidewalks on the north side of the roadway	Medium	$275,000
L28	Highway 43 to Arbor Drive	Pedestrian	Install sidewalks on the south side of the roadway from approximately 150-feet east of Highway 43 to Arbor Drive	Medium	$230,000
Fairview Way (Robinwood Commercial Area)					
L29	Highway 43 to Rose Way	Pedestrian	Install sidewalks on the north side of the roadway from approximately 200-feet east of Highway 43 to approximately 100-west of Rose Way	Medium	$100,000
L30	Chippewa Court to the roadway terminus	Pedestrian	Install sidewalks on the north side of the roadway	Medium	$200,000
L31	Highway 43 to the roadway terminus	Pedestrian	Install sidewalks on the south side of the roadway from approximately 200-feet east of Highway 43 to the roadway terminus	Medium	$420,000
Walling Way (Robinwood Commercial Area)					
L32	Highway 43 to Old River Drive	Pedestrian	Install sidewalks on both sides of the roadway from approximately 350-feet east of Highway 43 to Old River Drive	Medium	$435,000
L33	Highway 43 to Highway 43	Pedestrian	Install sidewalks on the west side of the roadway from approximately 250-feet west of Highway 43 to Highway 43	Medium	$235,000
L34	Highway 43 to Highway 43	Pedestrian	Install sidewalks on the east side of the roadway	Medium	$305,000
Failing Street (Bolton Commercial Area)					
L35	Highway 43 to Buck Street	Pedestrian	Install sidewalks on the east side of the roadway from approximately 200-feet north of Highway 43 to Buck Street	Medium	$65,000
Holly Street (Bolton Commercial Area)					
L36	Highway 43 to River Street	Pedestrian	Install sidewalks on both sides of the roadway from approximately 150-feet east of Highway 43 to River Street	Medium	$620,000
Webb Street (Bolton Commercial Area)					
L37	West A Street to Highway 43	Pedestrian	Install sidewalks on both sides of the roadway from West A Street to Highway 43	Medium	$385,000
Lewis Street (Bolton Commercial Area)					
L38	Highway 43 to Perkins Street	Pedestrian	Install sidewalks on both sides of the roadway from Highway 43 to Perkins Street	Medium	$305,000
19th Street (10th Street Commercial Area)					
L39	Blankenship Road to Dollar Street	Pedestrian	Install is sidewalks on the west side of the roadway	Medium	$540,000
L40	Dollar Street to Willamette Falls Drive	Pedestrian	Install sidewalks on the west side of the roadway	Medium	$265,000
L41	Nova Court to Dollar Street	Pedestrian	Install sidewalks on the east side of the roadway	Medium	$400,000
L42	Dollar Street to High Touch Street	Pedestrian	Install sidewalks on the east side of the roadway from Dollar Street to approximately 200-feet north of High Touch Street	Medium	$90,000
13th Street (10th Street Commercial Area)					
L43	Blankenship Road to the roadway terminus	Pedestrian	Install sidewalks on both sides of the roadway	Medium	$295,000
Summerlinn Drive (10th Street Commercial Area)					
L44	Summerlinn Way to Blankenship Road	Pedestrian	Install sidewalks on the west side of the roadway	Medium	$180,000

TOTAL High Priority Costs	$4,430,000
TOTAL Medium Priority Costs	$5,345,000
TOTAL Low Priority Costs	$0
TOTAL Program Costs (25 years)	**$9,775,000**

Transit Plan

Public transit can provide important connections to destinations for people that do not drive or bike and can provide an additional option for all transportation system users. Public transit complements 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 relies on appropriate land uses and densities that can support transit 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 to leave their bike at one trip-end instead of taking it with them on the bus.

The City of West Linn can support improved transit service by providing easy and safe walking and bicycling connections between key roadways, neighborhoods and local destinations, by providing amenities, such as shelters and benches, at transit stops, by encouraging an appropriate mix and density of uses that support public transit, and by providing and planning for park-and-ride locations. Table 12 summarizes the transit plan identified for West Linn.

Table 12: Transit Plan

Project/ Program Number	Name	Agency Responsible	Description	Priority	Cost
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 (30 average daily boardings and alightings are required by TriMet to warrant a shelter).	Medium	$80,000
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 designated overlay district in Willamette commercial area.	Medium	See Corridor Projects

T3	Increase Density Adjacent to Transit	West Linn	Direct growth to increase the density of houses within 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 LU2.	Medium	\$150,000
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 Rd and Hidden Springs Drive.	Medium	\$150,000
T5	Increase Park-and-Ride Capacity along Highway 43	West Linn/ TriMet	Work with TriMet and local property owners to identify additional locations for park-and-ride lots along Highway 43	Medium	\$15,000
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	\$30,000
T7	Implement Employee Commute Options Program	West Linn	Work with larger employers on development 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	\$30,000
T10	Feasibility analysis for development of commuter shuttle	West Linn	Conduct a feasibility analysis of development of commuter shuttle	Medium	\$30,000
				TOTAL Medium Priority Costs	**\$485,000**
				TOTAL Program Costs (25 years)	**\$485,000**

1. Specific projects and costs included in Pedestrian Plan of this TSP

Motor Vehicle Plan

The Motor Vehicle Plan identifies projects to meet the needs of motor vehicles using the transportation system in West Linn. The motor vehicle improvement locations are shown in Figure 7. These projects are intended to bring roadways up to current standards and improve motor vehicle operations at intersections and along corridors in West Linn.

Highway 43 Corridor

The Highway 43 Concept Plan was developed by the City of West Linn in coordination with ODOT as part of the 2008 TSP update. 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.

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Recommended Motor Vehicle Projects
West Linn, Oregon

Figure
7

H:\projfile\17817 - West Linn Transportation System Plan\gis\TM1117_Motor Vehicles.mxd - mbell - 1:35 PM 6/24/2015

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: USGS, ESRI, TANA, AND

The Plan maintains the current cross-section of one travel lane in each direction in order to keep the local character and meet community concerns, while not requiring additional right of way acquisition from private land owners. Improvements such as adding left turn lanes to the median and traffic control are planned in some locations to increase capacity. However, due to the stated constraints, performance standards are not expected to be met at several locations, and exceptions to ODOT design standards will be required. This Plan is currently being refined 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 findings of the updated Plan will be incorporated into the TSP.

The projects identified in the current Highway 43 Corridor Plan are summarized in Table 13 and the Bicycle and Pedestrian Plan tables for arterials. All projects associated with the Highway 43 Plan were identified as a high priority based on the project evaluation criteria with the exception of the Arbor Drive intersection which scored as a medium priority project.

10^th^ Street Interchange Area

Technical Memorandum #8 identifies two alternative sets of improvements for addressing motor vehicle issues along the 10th Street corridor. The alternatives include a signal at the intersection of 10th Street/8th Avenue-Court intersection and an extension of 8th Court east to Willamette Falls Drive. The likelihood/feasibility of both projects are questionable: the traffic signal is likely to create coordination difficulties with other signals in the corridor and the extension of 8th Court may be cost-prohibitive relative to the incremental performance benefit such an improvement would provide. A final improvement recommendation for this corridor is dependent upon a cost-benefit analysis of the alternatives above. Table 13 summarizes the motor vehicle improvements projects for the 10th Street corridor assuming an extension of 8th Court. *A concept sketch of the improvements is provided in Attachment "D".*

Other Vehicle Improvements

In addition to the Highway 43 and 10th Street corridor improvements identified above, Table 13 includes additional intersection and roadway projects throughout the City of West Linn.

Table 13: Motor Vehicle Plan Projects

Project Number	Location	Description	Priority	Cost
		City of West Linn Facility Projects		
M1	Willamette Falls Drive/ Sunset Avenue	Add a traffic signal when warranted	Low	$260,000
M2	Rosemont Road/ Carriage Way	Add a center median on Rosemont Road to allow two-stage left turn from Carriage Way	Low	$1,475,000
M3	Rosemont Way/ Hidden Springs Road	Add a traffic signal when warranted and northbound/southbound left turn lanes on Rosemont Road	Medium	$780,000

M4	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 Rd	Low	$1,335,000
M5	Willamette Falls Drive/ Dollar Street (east)	Widen Willamette Falls Drive with center median 500' on each side of intersection for two-stage left turn from Dollar St	Low	$1,475,000
M6	10th Street (Blankenship to Willamette Falls Drive)	Widening to four lanes with side-by-side left-turn lanes between the ramp terminals	Medium	$2,000,000
M7	Blankenship Road/ 10th Street	Add 2nd eastbound right turn lane and 2nd westbound left-turn lanes.	Low	$520,000
M8	10th Street/ Willamette Falls Drive	Install traffic signal with dual eastbound left-turn lanes	Medium	$830,000
M9	10th Street/ 8th Avenue	Restrict to right-in, right-out, left-in when warranted if of 8th Court is extended to Willamette Falls Drive	Low	$20,000
M10	8th Court	Extend 8th Ct to Willamette Falls Dr. to provide additional access to 8th Court retail. (Concurrently make 10th Street/8th Avenue right-in right-out access.)	Medium	$2,075,000
M11	Willamette Falls Drive/ 12th Street	All way stop control/ traffic signal when warrants are met	Medium	$260,000
M12	Willamette Falls Drive/ 14th Street	All way stop control when warrants are met	High	$10,000
M13	Willamette Falls Drive/ 19th Street	All way stop control when warrants are met	Low	$10,000
M14	8th Avenue	Modify Dollar St connection to reconnect to 8th Avenue, and provide alternative route for local trips.	Low	$1,035,000
M15	19th Street/ Blankenship Road	Upgrade to current City standards from Blankenship Road/Debok Road to Willamette Falls Drive	Low	$6,115,000
M16	8th Avenue	Upgrade from 10th Street to Dollar Street	Low	$1,760,000
M17	Salamo Road/ Parker Road	Add a traffic signal when warranted	Low	$260,000
M18	Tannler Street Realignment	Realign Tannler Street at Blankenship Road to align with the driveway located approximately 200-feet west	Medium	$920,000
		ODOT Facility Projects		
M19	Highway 43 / Willamette Falls Drive	Add a traffic signal that is coordinated with adjacent signal at I-205 NB Off Ramps	Low	$260,000
		ODOT Facility Projects (Highway 43 Concept Plan Improvements)		
M20	Highway 43 / Arbor Drive	Add left turn lanes on Highway 43 (cost included in Highway 43 segment cost, listed below)	Medium	$0
M21	Highway 43 / Cedar Oak Drive	Realign shopping center driveway located to the southeast with intersection	High	$130,000[1]
M22	Highway 43 / Holmes Street	Modify circulation to allow exit only traffic from Holmes Street	High	$2,500[1]
M23	Highway 43 / Lewis Street	Modify circulation to prohibit left turns out from Lewis Street	High	$2,500[1]
M24	Highway 43 / Pimlico Drive	Add a traffic signal when warranted	High	$65,000[1]
M25	North City Limit to Marylhurst	Highway 43 Improvements	High	$757,500[1]
M26	Marylhurst to Hidden Springs	Highway 43 Improvements	High	$1,087,500[1]

M27	Hidden Springs to Pimlico	Highway 43 Improvements	High	$1,396,250[1]
M28	Pimlico to Buck	Highway 43 Improvements	High	$865,000[1]
M29	West A Street to Webb	Highway 43 Improvements	High	$535,000[1]
M30	Webb to Hood-McKillican	Highway 43 Improvements	High	$495,000[1]
		TOTAL High Priority Costs	**$5,346,250**	
		TOTAL Medium Priority Costs	**$6,865,000**	
		TOTAL Low Priority Costs	**$14,525,000**	
		TOTAL Program Costs (25 years)	**$26,736,250**	

1. Estimated City contribution to overall project cost (25 percent)

Freight and Rail Plan

There are no freight corridors or rail corridors within the City of West Linn. The following summarizes West Linn's policies related to freight and rail.

Freight and Goods Movement

The two routes within West Linn most used for freight movement by truck are I-205 and Highway 43, both under the jurisdiction of the Oregon Department of Transportation. West Linn will encourage the ODOT to monitor the traffic and accident patterns along I-205, especially in the vicinity of the Highway 43 interchange.

Highway 43, which extends from Gibbs Street in Portland to Main Street in Oregon City, is a multi-modal major arterial, designed to accommodate the movement of people and goods in and around the region. The Draft Interim Corridor Strategy is dedicated to ensuring adequate access to I-205 from the corridor and to removing future bottlenecks at this location. West Linn will continue to be involved in this corridor study and in the development of appropriate plans to improve goods movement in the corridor. West Linn will encourage measures which result in non-local freight trips bypassing Highway 43.

Rail Transportation

Given West Linn's current density and the urban form of the Portland metropolitan area, it is unlikely that passenger rail transportation will come directly to the City of West Linn. It is recommended that residents continue to use the services and facilities in the Portland area. Potential improvements in service exist with the expansion of regional systems currently being discussed. West Linn will continue to support and promote regional improvements to the transit system, and be actively involved in the coordination of these services and possible connecting services to best serve its residents. West Linn will advocate for good connections and service enhancements for Amtrak and high-speed passenger rail in Oregon City.

Attachment A Project Evaluation Criteria

PROJECT EVALUATION CRITERIA

Each of the TSP goals include targets that were used to evaluate projects developed during the solutions phase (see Technical Memorandum #10) of the draft TSP Update. Each goal category and target within that category has been assigned an individual score (weight) based on feedback regarding priorities as expressed by the TAC and PAC. In most cases, projects receive the full point allocation for a given target if they are likely to advance the objectives of that target (e.g., a safety improvement project at a location with a known crash history will receive 11 of 11 total points). In limited circumstances, points are awarded to projects on a graded scale, based on the relative importance of the project (e.g., pedestrian improvements that are recommended as Tier 1 projects in the Trails System Master Plan receive 4 of 4 total points, pedestrian projects that are recommended as non-Tier 1 projects receive 2 of 4 total points and pedestrian projects that are not included in the Plan receive 0 of 4 total points). The total points available for each goal category is 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)
- Priority Project in Other Plans – 12 points (based on four different plans valued from 2 to 4 points each)
- Fiscal Efficiency – 4 points

Table A-1 defines the scoring methodology used and the resources used to assess the score (i.e., crash history, forecast travel information, GIS maps, land use characteristics, and demographic data).

Table A-1: Evaluation Criteria and Scoring Methodology

Goal	Target	Resources for determining score	Scoring methodology
Safety: Reduce transportation-related fatalities and injuries for all transportation modes	1A: Would likely reduce severe injury and fatal crashes at a location with known or perceived safety risks for that 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, as shown in Figure 1 of TM 9.	11 points if: the project or program is likely to reduce injury and fatal crashes at a location with a crash history on Figure 1 of TM 9 or another location known by the City
	1B: Would likely reduce the number of high collision locations	High collision locations are roadway segments with a relatively high number of crashes within a certain roadway segment between 2009 and 2014 as shown in Figure 10 of TM 7	11 points if: the project or program would likely reduce crashes at this segment over a 5 year period following project/program implementation
Mobility, Access and the Environment: Improve 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: Would likely reduce VMT		3 points if: the project/program would likely reduce vehicle miles traveled
	2B: Supports a compact urban form and would likely increase non-SOV modes of travel in 2040 Regional Investment Centers	Location of commercial centers 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 centers for non-single occupancy vehicle modes
	2D: Would allow more people to access schools, parks and open spaces, and employment and commercial areas within a 20-minute walk, bike or bus ride	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 within a 20-minute walk, bike and bus-shed of schools (6 points), parks (4 points) and open spaces (2 points)
	2F: Implementation would result in "good" or better level of quality bicycle or pedestrian facility	Figure 2: Pedestrian Facilities; Figure 3: Bicycle Facilities; Figure 4: Bicycle LTS	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: Deliver transportation improvements equitably	3A: Would allow more people, who are considered transportation disadvantaged (elderly, youth, and transit users), to access schools, parks and open spaces, and employment and commercial areas within a 20-minute walk, bike or bus ride	20 minute walking radius: 1 mile 20 minute biking radius: 2 miles 20 minute transit radius: 0.25 miles (walking to nearest transit stop) Figures 12, Figure 14	6 points if: the project/program increases the number of persons considered transportation disadvantaged (elderly, youth, and transit riders), within a 20-minute walk, bike and bus-shed of schools, parks and open spaces, and employment and commercial areas
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.

Attachment B Project Evaluation Matrix

	Target	1a: Would likely reduce severe injury and fatal crashes at location with known or perceived safety risks for that mode	1b: Would likely reduce the number of high collision locations	2A: Would likely reduce VMT	2B: Supports a compact urban form and would likely increase non-SOV modes of travel in West Linn's commercial districts	2D: Would allow more people to access schools (6 pts), parks (4 pts) and open spaces (2 pts), within a 20 minute walk, bike or bus ride	2F: Implementation would result in "good" or better, level of quality bicycle or pedestrian facility	3A: Would allow more people, who are considered transportation disadvantaged (elderly, youth, and transit users), to access schools, parks and open spaces, and employment and commercial areas within a 20 minute walk, bike or bus ride	Project or program is in Trails Master Plan (4 points if in top tier, 2 points if other)	Project or program is in Metro Regional Trails and Greenways Plan or Active Transportation Plan	Project or program is part of SRTS	Project or program is in 2008 TSP Action Plan	Project is one of the following: 1) TSMO (4 points); 2) Transit, bike and/or ped improvements (4 points); 3) Traffic-calming (3 points); 4) Land use strategies (2 points); 5) Connectivity improvements (1 point); 6) Motor-vehicle capacity improvements (0 points)	Total Score	Priority
	Points	11	11	3	8	6	3	6	4	2	4	2	4	64	
Project Type	Project/Goal	1A	1B	2A	2B	2D	2F	3A	NA	NA	NA	NA	NA	Total Score	
M26	Highway 43: Cross section improvements - Highway 43 from Marylhurst Dr to Hidden Springs R	11	11	3	8	6	0	6	4	2	0	2	4	57	high
M29	Highway 43: Cross section improvements - Highway 43 from West A St to Webb St	11	11	3	8	6	0	6	4	2	0	2	4	57	high
M30	Highway 43: Cross section improvements - Highway 43 from Webb St to Hood-McKillican St	11	11	3	8	6	0	6	4	2	0	2	4	57	high
A11	Salamo Road: Weatherhill Road to Bland Circle	0	11	3	8	6	3	6	4	2	0	2	4	49	high
A12	Salamo Road: Remington Drive to Barrington Drive	0	11	3	8	6	3	6	4	2	0	2	4	49	high
A13	Salamo Road: Barrington Drive to 10th Street	0	11	3	8	6	3	6	4	2	0	2	4	49	high
A20	Willamette Falls Drive: Willamette Drive to Sunset Avenue	0	11	3	8	6	3	6	4	2	0	2	4	49	high
A21	Willamette Falls Drive: Sunset Avenue to 10th Street	0	11	3	8	6	3	6	4	2	0	2	4	49	high
A23	Willamette Falls Drive: Dollar Street (east) to West City Limits	0	11	3	8	6	3	6	4	2	0	2	4	49	high
M27	Highway 43: Cross section improvements - Highway 43 from Hidden Springs Rd to Pimlico Dr	11	11	3	0	6	0	6	4	2	0	2	4	49	high
M28	Highway 43: Cross section improvements - Highway 43 from Pimlico Dr to Buck St	11	11	3	0	6	0	6	4	2	0	2	4	49	high
A24	10th Street: Blankenship Road to I-205 SB ramps	0	11	3	8	6	3	6	3	2	0	2	4	48	high
A25	10th Street: I-205 SB ramps to Willamette Falls Drive	0	11	3	8	6	3	6	3	2	0	2	4	48	high
C2	Blankenship Road: 10th Street to Debok Road	0	11	3	8	6	3	6	3	2	0	2	4	48	high
A19	West A Street: I-205 Bridge to Willamette Falls Drive	0	11	3	8	6	3	6	4	2	0	0	4	47	high
A6	Parker Road: Noble Lane to Sunset Avenue	0	11	3	8	6	3	6	4	0	0	0	4	45	high
A7	Rosemont Road: Carriage Way to Hidden Springs Road	0	11	3	0	6	3	6	4	2	4	2	4	45	high
A8	Rosemont Road: Hidden Springs Road to Santa Anita Drive	0	11	3	0	6	3	6	3	2	4	2	4	44	high
M23	Highway 43: Modify circulation - Highway 43 / Lewis St	11	11	0	0	6	0	6	4	0	0	2	4	44	high
M24	Highway 43: Traffic signal - Highway 43 / Pimlico Dr	11	11	0	0	6	0	6	4	0	0	2	4	44	high
A14	Santa Anita Drive: Hidden Springs Road to Pimlico Drive	0	11	3	0	6	3	6	4	0	4	0	4	41	high
A22	Willamette Falls Drive: 10th Street to Dollar Street (east)	0	11	3	8	6	3	6	0	0	0	0	4	41	high
A16	Skyline Drive: Firwood Drive to West A Street	0	11	3	0	6	3	6	4	2	0	0	4	39	high
A17	Sunset Avenue: Cornwall Street to Willamette Falls Drive	0	11	3	0	6	3	6	4	2	0	0	4	39	high
C16	Summit Street: Skyline Drive to Oxford Street	0	11	3	0	6	3	6	4	2	0	0	4	39	high
M25	Highway 43: Cross section improvements - Highway 43 from Northern City limits to Marylhurst	0	11	3	0	6	0	6	4	2	0	2	4	38	high
A3	Hidden Springs Road: Bluegrass Way to Cottonwood Court	0	11	3	0	6	3	6	4	0	0	0	4	37	high
A4	Hidden Springs Road: Cottonwood Court to Willamette Drive	0	11	3	0	6	3	6	4	0	0	0	4	37	high
C17	Suncrest Drive: Carriage Way to Hillcrest Drive	0	11	3	0	6	3	6	0	0	4	0	4	37	high
C3	Blankenship Road: Debok Road to 19th Street	0	0	3	8	6	3	6	3	2	0	2	4	37	high
C4	Blankenship Road: 19th Street to Ostman Road	0	0	3	8	6	3	6	3	2	0	2	4	37	high
L1	SRTS - Lowry Drive (Bolton Primary): Dillow Drive to Tompkins Street	0	11	3	0	6	3	6	0	0	4	0	4	37	high
A18	West A Street: Willamette Drive to Skyline Drive	0	0	3	8	6	3	6	4	2	0	0	4	36	high
C15	Summit Street: Pimlico Drive to Skyline Drive	0	11	3	0	6	3	6	3	0	0	0	4	36	high
M12	AWSC - Willamette Falls Dr / 14th St	11	11	0	0	6	0	6	0	0	0	2	0	36	high
C18	Tannler Drive: Tannler Drive	0	0	3	8	6	3	6	3	0	0	0	4	33	high
M22	Highway 43: Modify circulation - Highway 43 / Holmes St	0	11	0	0	6	0	6	4	0	0	2	4	33	high
M21	Highway 43: Realign driveway - near Highway 43 / Cedar Oaks Dr	11	11	0	0	0	0	0	4	0	0	2	4	32	high
A1	Hidden Springs Road: Suncrest Drive to Santa Anita Drive	0	0	3	0	6	3	6	4	0	4	0	4	30	medium
A10	Rosemont Road: Shannon Lane to Summit Street	0	0	3	0	6	3	6	4	2	0	2	4	30	medium
A2	Hidden Springs Road: Santa Anita Drive to Bluegrass Way	0	0	3	0	6	3	6	4	0	4	0	4	30	medium
A9	Rosemont Road: Santa Anita Drive to Wild Rose Drive	0	0	3	0	6	3	6	4	2	0	2	4	30	medium
L15	SRTS - Exeter Street (Sunset Primary): Oxford Street to Sunset Avenue	0	0	3	0	6	3	6	4	0	4	0	4	30	medium
L16	SRTS - Oxford Street (Sunset Primary): Bonnet Drive to Sussex Street	0	0	3	0	6	3	6	4	0	4	0	4	30	medium
L17	SRTS - Oxford Street (Sunset Primary): Exeter Street to Bittner Street	0	0	3	0	6	3	6	4	0	4	0	4	30	medium
L18	SRTS - Bonnet Drive (Sunset Primary): Windsor Terrace to Oxford Street	0	0	3	0	6	3	6	4	0	4	0	4	30	medium

	Target	1a: Would likely reduce severe injury and fatal crashes at location with known or perceived safety risks for that mode	1b: Would likely reduce the number of high collision locations	2A: Would likely reduce VMT	2B: Supports a compact urban form and would likely increase non-SOV modes of travel in West Linn's commercial districts	2D: Would allow more people to access schools (6 pts), parks (4 pts) and open spaces (2 pts), within a 20 minute walk, bike or bus ride	2F: Implementation would result in "good" or better, level of quality bicycle or pedestrian facility	3A: Would allow more people, who are considered transportation disadvantaged (elderly, youth, and transit users), to access schools, parks and open spaces, and employment and commercial areas within a 20 minute walk, bike or bus ride	Project or program is in Trails Master Plan (4 points if in top tier, 2 points if other)	Project or program is in Metro Regional Trails and Greenways Plan or Active Transportation Plan	Project or program is part of SRTS	Project or program is in 2008 TSP Action Plan	Project is one of the following: 1) TSMO (4 points); 2) Transit, bike and/or ped improvements (4 points); 3) Traffic-calming (3 points); 4) Land use strategies (2 points); 5) Connectivity improvements (1 point); 6) Motor-vehicle capacity improvements (0 points)	Total Score	Priority
	Points	11	11	3	8	6	3	6	4	2	4	2	4	64	
Project Type	Project/Goal	1A	1B	2A	2B	2D	2F	3A	NA	NA	NA	NA	NA	Total Score	
L19	SRTS - Oregon City Boulevard (Sunset Primary): Bonnet Drive to Clark Street	0	0	3	0	6	3	6	4	0	4	0	4	30	medium
L22	SRTS - Long Street (Sunset Primary): Bittner Street to Clark Street	0	0	3	0	6	3	6	4	0	4	0	4	30	medium
L24	SRTS - Cedar Oaks Drive (Cedar Oak Primary): Ridgewood Way to Trillium Drive	0	0	3	0	6	3	6	4	0	4	0	4	30	medium
L25	SRTS - Cedar Oaks Drive (Cedar Oak Primary): Trillium Drive to Elmran Drive	0	0	3	0	6	3	6	4	0	4	0	4	30	medium
TDM1	Carpool Match Services	0	0	3	8	6	0	6	0	0	0	2	4	29	medium
TDM2	Collaborative Marketing	0	0	3	8	6	0	6	0	0	0	2	4	29	medium
TSM2	Transit Signal Priority	0	0	3	8	6	0	6	0	0	0	2	4	29	medium
T1	Transit Amenities at Major Transit Stops	0	0	3	8	6	0	6	0	0	0	2	4	29	medium
T2	Improve Pedestrian Connections to Transit Facilities	0	0	3	8	6	0	6	0	0	0	2	4	29	medium
T3	Increase Density Adjacent to Transit	0	0	3	8	6	0	6	0	0	0	2	4	29	medium
T4	Provide More Local Service / Coordinate with TriMet on Route 154 Changes	0	0	3	8	6	0	6	0	0	0	2	4	29	medium
T5	Increase Park-and-Ride Capacity along Highway 43	0	0	3	8	6	0	6	0	0	0	2	4	29	medium
T6	Identify Park-and-Ride Lot Locations near the 10th Street Interchange	0	0	3	8	6	0	6	0	0	0	2	4	29	medium
C12	Old River Drive (Cedar Oak Street): Northern City Limits to Cedar Oaks Drive	0	0	3	0	6	3	6	4	2	0	0	4	28	medium
L23	SRTS - Simpson Street (Sunset Primary): Long Street to Charman Street	0	0	3	0	6	3	6	2	0	4	0	4	28	medium
LSC20	Bland Circle extension to Parker Road	0	0	3	8	6	3	6	0	0	0	0	2	28	medium
LSC27	Wild Rose Loop extension to Chelan Drive	0	0	3	8	6	3	6	0	0	0	0	2	28	medium
LSC30	8th Avenue extension from 14th Street to Dollar Street	0	0	3	8	6	3	6	0	0	0	0	2	28	medium
LSC4	Fairview Way extension to Shady Hollow	0	0	3	8	6	3	6	0	0	0	0	2	28	medium
TSM1	Signal Retiming and Optimization	11	11	0	0	0	0	0	0	0	0	2	4	28	medium
A15	Skyline Drive: Summit Street to Firwood Drive	0	0	3	0	6	3	6	3	2	0	0	4	27	medium
C10	Johnson Road: Blankenship Road to Western City Limits	0	0	3	0	6	3	6	3	2	0	0	4	27	medium
C13	Ostman Road: Blankenship Road to Willamette Falls Drive	0	0	3	0	6	3	6	3	0	0	2	4	27	medium
C8	Cornwall Street: Oxford Street to Sunset Avenue	0	0	3	0	6	3	6	3	2	0	0	4	27	medium
M18	Realign Tannler Road to align with commercial driveway	0	11	0	8	0	0	6	0	0	0	2	0	27	medium
M8	Traffic signal - 10th Street / Willamette Falls Drive	0	11	0	8	0	0	6	0	0	0	2	0	27	medium
T7	Implement Employee Commute Options Program	0	0	3	8	6	0	6	0	0	0	0	4	27	medium
T8	Support TriMet's Marketing Efforts	0	0	3	8	6	0	6	0	0	0	0	4	27	medium
T9	Feasibility Analysis for Development of Local Public Transit Shuttle	0	0	3	8	6	0	6	0	0	0	0	4	27	medium
T10	Feasibility Analysis for Development of Commuter Shuttle	0	0	3	8	6	0	6	0	0	0	0	4	27	medium
C1	Bland Circle: Salamo Road to Roadway Terminus	0	0	3	0	6	3	6	4	0	0	0	4	26	medium
L10	SRTS - 8th Avenue (Willamette Primary): 13th Street to 12th Street	0	0	3	0	6	3	6	0	0	4	0	4	26	medium
L11	SRTS - 4th Avenue (Willamette Primary): 14th Street to 12th Street	0	0	3	0	6	3	6	0	0	4	0	4	26	medium
L12	SRTS - 5th Avenue (Willamette Primary): 11th Street to 7th Street	0	0	3	0	6	3	6	0	0	4	0	4	26	medium
L13	SRTS - Clubhouse Circle (Trillium Creek Primary): Santa Anita Drive to 200 feet east of Clubhou	0	0	3	0	6	3	6	0	0	4	0	4	26	medium
L14	SRTS - Sussex Street (Sunset Primary): Oxford Street to Sunset Avenue	0	0	3	0	6	3	6	0	0	4	0	4	26	medium
L2	SRTS - Tompkins Street (Bolton Primary): Lowry Drive to Caufield Street	0	0	3	0	6	3	6	0	0	4	0	4	26	medium
L20	SRTS - Prospect Street (Sunset Primary): Knox Street to Oregon City Boulevard	0	0	3	0	6	3	6	0	0	4	0	4	26	medium
L21	SRTS - Bittner Street (Sunset Primary): Oxford Street to Long Street	0	0	3	0	6	3	6	0	0	4	0	4	26	medium
L26	SRTS - Trillium Drive (Cedar Oak Primary): Glen Terrace to 700 feet south of Glen Terrace	0	0	3	0	6	3	6	0	0	4	0	4	26	medium
L3	SRTS - Caufield Street (Bolton Primary): Tompkins Street to Randall Street	0	0	3	0	6	3	6	0	0	4	0	4	26	medium
L4	SRTS - Randall Street (Bolton Primary): Caufield Street to Davenport Street	0	0	3	0	6	3	6	0	0	4	0	4	26	medium
L5	SRTS - Davenport Street (Bolton Primary): Randall Street to Buck Street	0	0	3	0	6	3	6	0	0	4	0	4	26	medium
L6	SRTS - Holmes Street (Bolton Primary): Buck Street to Perrin Street	0	0	3	0	6	3	6	0	0	4	0	4	26	medium
L7	SRTS - Perrin Street (Bolton Primary): Holmes Street to Lewis Street	0	0	3	0	6	3	6	0	0	4	0	4	26	medium
L8	SRTS - 13th Street (Willamette Primary): Timothy Lane to 8th Avenue	0	0	3	0	6	3	6	0	0	4	0	4	26	medium

	Target	1a: Would likely reduce severe injury and fatal crashes at location with known or perceived safety risks for that mode	1b: Would likely reduce the number of high collision locations	2A: Would likely reduce VMT	2B: Supports a compact urban form and would likely increase non-SOV modes of travel in West Linn's commercial districts	2D: Would allow more people to access schools (6 pts), parks (4 pts) and open spaces (2 pts), within a 20 minute walk, bike or bus ride	2F: Implementation would result in "good" or better, level of quality bicycle or pedestrian facility	3A: Would allow more people, who are considered transportation disadvantaged (elderly, youth, and transit users), to access schools, parks and open spaces, and employment and commercial areas within a 20 minute walk, bike or bus ride	Project or program is in Trails Master Plan (4 points if in top tier, 2 points if other)	Project or program is in Metro Regional Trails and Greenways Plan or Active Transportation Plan	Project or program is part of SRTS	Project or program is in 2008 TSP Action Plan	Project is one of the following: 1) TSMO (4 points); 2) Transit, bike and/or ped improvements (4 points); 3) Traffic-calming (3 points); 4) Land use strategies (2 points); 5) Connectivity improvements (1 point); 6) Motor-vehicle capacity improvements (0 points)	Total Score	Priority
	Points	11	11	3	8	6	3	6	4	2	4	2	4	64	
Project Type	Project/Goal	1A	1B	2A	2B	2D	2F	3A	NA	NA	NA	NA	NA	Total Score	
L9	SRTS - 13th Street (Willamette Primary): 4th Avenue to Tualatin Avenue	0	0	3	0	6	3	6	0	0	4	0	4	26	medium
C11	Marylhurst Drive: Willamette Drive to Hillcrest Drive (West)	0	0	3	0	6	3	6	3	0	0	0	4	25	medium
C14	Pimlico Drive: Santa Anita Drive to Willamette Drive	0	0	3	0	6	3	6	3	0	0	0	4	25	medium
C5	Carriage Way: Hidden Springs to Suncrest Drive	0	0	3	0	6	3	6	3	0	0	0	4	25	medium
C6	Carriage Way: Suncrest Drive to Rosemont Road	0	0	3	0	6	3	6	3	0	0	0	4	25	medium
C7	Clark Street: Skyline Drive to Windsor Boulevard	0	0	3	0	6	3	6	3	0	0	0	4	25	medium
M11	Traffic signal - Willamette Falls Dr / 12th St	0	11	0	0	6	0	6	0	0	0	2	0	25	medium
M3	Traffic signal and separate LT and RT lanes - Rosemont Rd / Hidden Springs Rd	0	11	0	0	6	0	6	0	0	0	2	0	25	medium
M6	Widening - 10th Street between I-205 ramps for side-by-side left-turn lanes	11	11	0	0	0	0	0	0	0	0	2	0	24	medium
A5	Lancaster Street: Parker Road to Cornwall Street	0	0	3	0	6	3	6	0	0	0	0	4	22	medium
C9	Dollar Street: Willamette Falls Drive to the Western Terminus	0	0	3	0	6	3	6	0	0	0	0	4	22	medium
M10	Extend 8th Court to Willamette Falls Drive	0	0	0	8	6	0	6	0	0	0	2	0	22	medium
LU1	Commercial Nodes	0	0	3	8	0	0	6	0	0	0	2	2	21	medium
LU2	Mixed Use Development	0	0	3	8	0	0	6	0	0	0	2	2	21	medium
LU3	Alternative Mobility Standards	0	0	3	8	0	0	6	0	0	0	2	2	21	medium
M20	Highway 43: LTL - Highway 43 / Arbor Dr	0	11	0	0	0	0	0	4	0	0	2	4	21	medium
LSC1	Woodhurst Place extension to Scenic Drive	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC10	Shannon Lane extension to Ridge Lane	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC11	Ridge Lane extension to Ridge Lane	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC12	Roxbury Drive extension to Chinook Court	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC13	Damon Drive extension to Roxbury Drive extension	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC14	Maxfield Drive extension to Roxbury Drive extension	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC15	Landis Street extension to Landis Street	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC16	Sabo Lane extension to Sunset Avenue	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC17	Landis Street extension to Cornwall Street	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC18	New east-west connection from Reed Street to Cornwall Street	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC19	New north-south connection from the Landis Street extension to the new east-west connectio	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC2	Robin View Court extension to Old River Landing	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC21	New east-west connection from Bland Circle to Weatherhill Road	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC22	Crestview Drive extension to Crestview Drive	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC23	Tannler Drive extension to Sunbreak Lane extension	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC24	Sunbreak extension to Tannler Drive	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC25	Tamarisk Drive extension to Grapevine Road	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC26	Wisteria Road extension to Wisteria Road	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC28	Orchard Street extension to Short Street	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC29	Brandon Place extension to Willamette Falls Drive	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC3	Calaroga Court extension to Nixon Avenue	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC31	Randall Street extension to Irving Street	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC32	New east-west connection from Elliot Street to Irving Street	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC33	Shady Hollow Way to Lazy River Drive	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC34	Kapteyns Street to Carriage Way	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC5	19th Street extension from Willamette Falls Drive to Swift Shore Drive	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC6	Whitten Lane extension to Marylhurst Drive	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC7	New north-south connection from Crestline Drive to Whitten Lane extension	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC8	Horton Road extension to Horton Road	0	0	3	0	6	3	6	0	0	0	0	1	19	low
LSC9	Apollo Road extension to Randall Street	0	0	3	0	6	3	6	0	0	0	0	1	19	low

Target		1a: Would likely reduce severe injury and fatal crashes at location with known or perceived safety risks for that mode	1b: Would likely reduce the number of high collision locations	2A: Would likely reduce VMT	2B: Supports a compact urban form and would likely increase non-SOV modes of travel in West Linn's commercial districts	2D: Would allow more people to access schools (6 pts), parks (4 pts) and open spaces (2 pts), within a 20 minute walk, bike or bus ride	2F: Implementation would result in "good" or better, level of quality bicycle or pedestrian facility	3A: Would allow more people, who are considered transportation disadvantaged (elderly, youth, and transit users), to access schools, parks and open spaces, and employment and commercial areas within a 20 minute walk, bike or bus ride	Project or program is in Trails Master Plan (4 points if in top tier, 2 points if other)	Project or program is in Metro Regional Trails and Greenways Plan or Active Transportation Plan	Project or program is part of SRTS	Project or program is in 2008 TSP Action Plan	Project is one of the following: 1) TSMO (4 points); 2) Transit, bike and/or ped improvements (4 points); 3) Traffic-calming (3 points); 4) Land use strategies (2 points); 5) Connectivity improvements (1 point); 6) Motor-vehicle capacity improvements (0 points)	Total Score	Priority
Points		11	11	3	8	6	3	6	4	2	4	2	4	64	
Project Type	Project/Goal	1A	1B	2A	2B	2D	2F	3A	NA	NA	NA	NA	NA	Total Score	
M1	Traffic signal - Willamette Falls Dr / Sunset Ave	0	11	0	0	6	0	0	0	0	0	2	0	19	low
M17	Traffic signal - Salamo Rd / Parker Rd	0	11	0	0	6	0	0	0	0	0	2	0	19	low
M19	Traffic signal - Highway 43 / Willamette Falls Dr	0	11	0	0	6	0	0	0	0	0	2	0	19	low
AM1	Access Spacing Standard Modification	0	11	0	0	0	0	0	0	0	0	2	4	17	low
AM2	Special Transportation Area Designation	0	0	3	8	0	0	0	0	0	0	2	4	17	low
AM4	Access Consolidation	0	11	0	0	0	0	0	0	0	0	2	4	17	low
TDM3	Limited and/or Flexible Parking Requirements	0	0	3	8	0	0	0	0	0	0	2	4	17	low
TDM4	Parking Management	0	0	3	8	0	0	0	0	0	0	2	4	17	low
M13	AWSC - Willamette Falls Dr / 19th St	0	0	0	0	6	0	6	0	0	0	2	0	14	low
M5	Widening - Willamette Falls Dr near Dollar St	0	11	0	0	0	0	0	0	0	0	2	0	13	low
M7	Restripe - 10th Street / Blankenship-Salmo Road	0	11	0	0	0	0	0	0	0	0	2	0	13	low
AM3	Access Spacing Variances	0	0	0	0	0	0	0	0	0	0	2	4	6	low
TSM3	Adaptive or Active Signal Control	0	0	0	0	0	0	0	0	0	0	2	4	6	low
TSM4	Traffic Response Control	0	0	0	0	0	0	0	0	0	0	2	4	6	low
TSM5	Truck Signal Priority	0	0	0	0	0	0	0	0	0	0	2	4	6	low
M14	Upgrade - Dollar St	0	0	0	0	0	0	0	0	0	0	2	0	2	low
M15	Upgrade - 19th St	0	0	0	0	0	0	0	0	0	0	2	0	2	low
M16	Upgrade - 8th Ave	0	0	0	0	0	0	0	0	0	0	2	0	2	low
M2	Widening - Rosemont Rd near Carriage Way	0	0	0	0	0	0	0	0	0	0	2	0	2	low
M4	Widening - Willamette Falls Dr near Ostman Rd	0	0	0	0	0	0	0	0	0	0	2	0	2	low
M9	10th St/8th Ave - Restrict to RIRO/LI when warranted if 8th Ct extended	0	0	0	0	0	0	0	0	0	0	2	0	2	low

Travel Demand Management (TDM)
Transportation Systm Management (TSM)
Access Management (AM)
Land Use (LU)
Transit (T)
Collector Street Bike/Ped Project (C)
Arterial Street Bike/Ped Project (A)
Local Street Bike/Ped Project (L)
Local Street Connection (LSC)
Safety Improvement (S)
Motor Vehicle (M)

Attachment C Roadway Functional Classification Descriptions and Cross-section Standards

ROADWAY FUNCTIONAL CLASSIFICATION DESCRIPTIONS AND CROSS-SECTION STANDARDS

Functional Classifications

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 the 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 or principal arterial streets.

Major Arterials are typically state highways that provide the high level roadway capacity to local land uses. These routes connect over the longest distance (sometimes miles long) 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 principal arterial within the West Linn city limits. Neighborhood Traffic Management strategies are not appropriate on major arterials.

Minor Arterials serve to interconnect the City. These streets link major commercial, residential, industrial and institutional areas. Arterial streets are typically spaced at least one mile apart to assure accessibility and reduce the incidence of traffic using collectors or local streets for through traffic in lieu of a well-placed arterial street. Access control is a key feature of an arterial route. Arterials are typically multiple miles in length. Neighborhood Traffic Management strategies are not appropriate on minor arterials.

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 0.5 to 1.0 miles in length. Neighborhood Traffic Management strategies are not appropriate on collector streets.

Neighborhood Routes are usually long relative to local streets and provide connectivity to collectors or 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 on neighborhood routes to balance traffic and livability/character as determined by an engineering study.

Local Streets have the sole function of providing access to immediately adjacent land uses. 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 local street to balance traffic and livability/character as determined by an engineering study.

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 C-1 outlines the width requirements for different street elements for streets in the City of West Linn. The cross-section standards for each functional classification are further detailed in Exhibits 1 through 4.

Unless prohibited by significant topographic conditions or modification recommended by the City Engineer responding to another environmental constrain, newly constructed streets shall meet the maximum standards indicated in the cross-sections. When widening an existing street, lesser standards than the maximum may be used 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 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 to manage drainage) may be appropriate due to design limitations or adjacent land use. Green street elements (shown in the cross section figures) may be used as determined by the City Engineer.

Table C-1: City of West Linn Roadway Cross-Section Standards

Street Element	Characteristic	Width/Options
Vehicle Lane Widths (Typical widths)	Arterial	11-12 feet
	Collector	10-12 feet
	Neighborhood Route	10-12 feet
	Local	10-12 feet
	Turn Lane	10-14 feet
On-Street Parking	Arterials	Limited (in designated commercial areas)
	Collectors	Optional (8 feet typical)
	Neighborhood Route	Optional (8 feet typical)
	Local	Optional (8 feet typical)
Bicycle Lanes (Typical widths)	Arterial	5-6feet
	Collector	5-6 feet
	Neighborhood Route	5-6 feet
Cycle Track	Arterial (30 MPH or greater)	7 feet
	Collector (30 MPH or greater)	7-feet

Sidewalks (Typical widths)	Arterial/Collector	6 feet, 8 feet in commercial areas
	Along Cycle Track	5-6 feet, 8 feet in commercial areas
	Neighborhood/Local	6 feet (4-5 feet historic), 8 feet in commercial areas
Landscape Strips	Can be included on all streets	6 feet
Raised Medians	5-Lane	Optional
	3-Lane	Optional
	2-Lane	Consider if appropriate
Neighborhood Traffic Management	Arterials	None
	Collectors	None
	Neighborhood Route	At the discretion of the City Engineer
	Local	
Transit	Arterial/Collectors	Appropriate
	Neighborhood	Only in special circumstances
	Local	Not recommended

Attachment D 10th Street Long-Term Improvements

SALAMO RD
BLANKENSHIP RD
10TH ST
I-205 SB RAMP
I-205 NB RAMP
8TH CT
8TH AVE
WILLAMETTE FALLS DR
INSTALL MEDIAN AFTER 8TH CT EXTENSION TO WILLAMETTE FALLS DR IS COMPLETE

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
610 SW Alder Street, Suite 700, Portland, OR 97205 P 503.228.5230 F 503.273.8169

MEMORANDUM

Date: June 24, 2015 Project #: 17817

To: Zach Pelz, City of West Linn
Gail Curtis, Oregon Department of Transportation

From: Susan Wright, PE, Matt Bell, and Ribeka Toda

Project: City of West Linn Transportation System Plan Update

Subject: Performance Analysis of Financially Constrained and Planned Transportation Systems

The purpose of this memorandum is to document how well the Draft Planned and Draft Cost Constrained transportation systems identified in Technical Memo #11 meet or help advance the goals and targets for the TSP Update that were developed at the beginning of the project. As part of that assessment, the potential future bicycle and pedestrian networks were evaluated to determine the future Bicycle Level of Traffic Stress (LTS) and Pedestrian Qualitative Multi-modal Level of Service (QMMLOS) based on completion of the projects in the Draft Cost Constrained Plan. The purpose of this review is to determine if any changes to the Draft Financially Constrained Plan are warranted to improve connectivity of the low stress and high quality networks. In addition, future traffic operations from the previous TSP were reviewed and compared to the Draft Financially Constrained Plan to determine if City and ODOT operation standards are likely to be met in the future and if not, identify if alternative actions or mobility standards may be warranted.

SAFETY

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

Table 1: Safety

Target	Current Benchmark	2040 Financially Constrained Plan Performance	Monitoring Plan
Target 1A – Zero severe injury and fatal 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**)	11 projects are included in the Draft TSP project list to improve safety at existing locations of severe injury and fatal crashes. 9 are included in the Draft Financially Constrained Plan.	Document the measure on an annual basis based on a review of data maintained by ODOT. Successful progress towards the target includes a steady reduction each year in the number severe injury and fatal collisions compared to prior years.
Target 1B - Reduce total number of high collision locations to zero by 2040.	Number of ODOT SPIS locations (**1 location**) Number of intersections with a crash rate above 1.0 crashes/MEV (**0 intersections**)	48 projects are included in the Draft TSP that will improve safety for all roadway users. 34 are included in the Draft Financially Constrained Plan.	Document the measure on an annual basis based on a review of data maintained by ODOT. Successful progress towards the target includes a steady reduction each year in the number of SPIS locations and locations with a crash rate above 1.0.

MOBILITY, ACCESS AND ENVIRONMENT

The second goal of the TSP update 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 update will help the City make progress toward meeting this goal, seven targets were identified (2A through 2G). Table 2 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 Draft Plan and the Draft 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 monitoring its progress toward meeting the goal.

Table 2: Mobility, Access and Environment

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 of the pedestrian, bicycle, and transit projects included in the Draft TSP that will have an impact on this measure. However, 128 projects in the Draft TSP are anticipated to help reduce VMT. 33 are included in the Draft Financially Constrained Plan.	Document the measure each time a new base year is created 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	2010 Metro Travel Demand Model Non-SOV mode share in industrial and employment areas and neighborhoods - **49%**[1] 2010 Metro Travel Demand Model	Projects were evaluated based on this target. 45 projects meet this target, and 19 are considered high priority. The model is not sensitive enough to evaluate the impacts to mode split of	Document the measure each time a new base year is created 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

and neighborhoods, and 45-55% in 2040 town centers, main streets, and corridors by 2040.	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 pedestrian, bicycle, and transit projects included in the Draft TSP that will have an impact on this measure. However, 45 projects in the Draft TSP are anticipated to help increase mode splits. 19are included in the Draft Financially Constrained Plan.	even as growth occurs.
Target 2C – Improve freight travel time reliability.	There is currently no existing data available for this target.	Projects were not evaluated based on this target, but this target should be a consideration for future projects as it applies.	Document the measure each time a new base year is created 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 OR 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 percent by 2040.	Percent of the population within a 20 minute walk, bike, or public transit ride of key destinations - **100%**	133 projects in the Draft TSP are anticipated to further reduce walking, biking and transit times to key destinations. 37 are included in the Draft Financially Constrained Plan.	Document the measure at each TSP Update 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, SRTS routes have been identified for the **five primary schools**. The number of programs/activities that occur per year to encourage walking and biking is unknown.	26 projects in the Draft TSP will improve conditions along the safe routes to school	Document the measure at each TSP Update. Successful progress towards the target includes the identification of SRTS for each school, information being made 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 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	Projects were evaluated based on this target. 103 projects are included in the Draft TSP that will improve Bicycle LTS and Pedestrian QMMLOS. 27 are included in the Draft Financially Constrained Plan. See Figures 1 and 2 for the changes in the LTS and QMMLOS networks resulting from the Draft Financially Constrained Plan projects.	Document the measure at each TSP Update. 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.	Projects were not evaluated based on this target, but this target should be considered during project development.	Document the measure at each TSP Update. Successful progress towards the target includes an increase in the number of green street facilities at each TSP Update.

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

Figures 1 and 2 identify the future Bicycle Level of Traffic Stress (LTS) and Pedestrian Qualitative Multi-modal Level of Service (QMMLOS) based on completion of the projects in the Draft Cost Constrained Plan.

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Future Pedestrian Qualitative Multi-modal Level of Service (PQMMLOS) West Linn, Oregon

Figure 1

H:\proj\file\17817 - West Linn Transportation System Plan\gis\TM12\1 Future_PQMMLOS.mxd - mbell - 1:38 PM 6/24/2015

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Bicycle Level of Traffic Stress (LTS)
West Linn, Oregon

Figure
2

H:\projfile\17817 - West Linn Transportation System Plan\gis\TM12\2 Bicycle LTS.mxd - mbell - 1:39 PM 6/24/2015

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

Pedestrian QMMLOS

As show in Figure 1, the QMMLOS analysis results indicate that seven roadway segments will continue to be ranked fair and five segments will continue to be ranked poor with the projects included in the Draft Cost Constrained Plan. The following summarizes the segments that will continue to be ranked poor:

- Rosemont Road - The south side of Rosemont Road from Salamo Road to Wild Rose Drive
- Rosemont Road - The north side of Rosemont Road from Gregory Court to Summit Street.
- Willamette Drive - The south side of Willamette Drive from Barlow Street to Caulfield Street.
- Dollar Street - The south side of Dollar Street from Ostman Road to the western roadway terminus.
- Ostman Road - The west side of Ostman Road from Dollar Street to Willamette Falls Drive.

The Draft Plan includes sidewalk projects along each of these roadway segments. The Draft Cost Constrained Plan could be updated to include these projects to further improve pedestrian connectivity within the City. As an alternative, the Draft Cost Constrained Plan could be updated to emphasize continuous sidewalks on a least one side of all major roadways, such as Rosemont Road, Willamette Falls Drive, Skyline Drive, Sunset Avenue, and others to improve pedestrian connectivity.

Bicycle LTS

As shown in Figure 2, the LTS analysis results indicate that five roadway segments will continue to be ranked LTS 3 and six segments will continue to be ranked LTS 4 with the projects included in the Draft Cost Constrained Plan. The following summarizes the segments that will continue to be ranked LTS 4:

- Rosemont Road – Both sides of the roadway from Carriage Way to Hidden Springs Road
- Rosemont Road – Both sides of the roadway from Bay Meadows Drive to Furlong Drive
- Parker Road – Both sides of the roadway from Noble Lane to Dillon Lane
- Salamo Road – Both sides of the roadway \from Barrington Drive to 10th Street
- Willamette Falls Drive – Both sides of the Roadway from Highway 43 to 10th Street
- Highway 43 from Mill street to the south city limits

The Draft Plan includes new bike lanes along each of these roadways. The Draft Cost Constrained Plan could be updated to include these projects to further improve bicycle connectivity within the City. As an alternative, the Draft Cost Constrained Plan could be updated to include shared use pavement markings and/or signs as interim improvements along several streets to improve bicycle connectivity.

EQUITY

The third goal of the TSP update is to deliver transportation improvements equitably. In order to ensure the TSP update will help the City make progress toward meeting this goal, two targets were identified (3A and 3B). Table 3 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 Draft Planned TSP and the Draft Financially Constrained plan that are intended to address a specific equity issue or will improve conditions in general, and how the city will monitor its progress toward meeting the goal.

Table 3: Equity

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	Percent of the transportation disadvantaged population within a 20 minute walk, bike, or public transit ride of key destinations (2010) - **100%**	135 projects are included in the Draft TSP project list 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. 37 of the projects are included in the Draft Financially Constrained Plan.	Document the measure at each TSP Update 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 is currently no existing data available for this target.	Of the 85 projects in the Draft Financially Constrained Plan, a majority are located within census tracts with the highest concentrations of transportation disadvantaged	Evaluate distribution of capital improvements at each CIP Update. Document the measure at each TSP Update

MAINTENANCE

The fourth goal of the TSP update is to deliver access and safety improvements cost effectively, within available revenues, and responsively to the needs of all users of the transportation system. The City currently prioritizes roadway maintenance projects based on a Pavement Condition Index (PCI) prioritization system. Although pavement conditions were not used to identify or prioritize projects for the TSP Update, two maintenance related targets were identified (4A and 4B) to help the City track progress toward meeting this goal. Table 4 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 4: 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 (**TBD**)	N/A – PCI not considered in TSP Update.	Document the measure annually. 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 percent by 2040.	2014 number of facilities in distressed condition (**TBD**).	N/A – PCI not considered in TSP Update.	Document the measure annually. Successful progress towards the target includes a reduction in the number of facilities in distressed condition.

OPERATIONS AND MOBILITY TARGETS

The majority of the motor vehicle projects in the Draft Plan are currently ranked medium and low priority and therefore, not included in the Draft Cost Constrained Plan. The result is that several intersections are expected to exceed their respective operational standards (City) or mobility targets (ODOT) in the future. The following intersections are expected to exceed their standards/targets under 2040 traffic conditions. While there are projects identified in the Draft Plan to address the issues, none of them are included in the Draft Cost Constrained Plan:

- M1: Willamette Falls Drive/Sunset Avenue – Install a traffic signal when warranted.
- M2: Rosemont Road/Carriage Way – Add a center median on Rosemont Road to allow two stage left-turn from Carriage Way.
- M3: Rosemont Road/Hidden Springs Road – Add a traffic signal when warranted and northbound/southbound left-turn lanes on to Rosemont Road.
- M4: 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.
- M5: Willamette Falls Drive/Dollar Street (east) – Widen Willamette Falls Drive with center median 500' on each side of intersection for two-stage left turn from Dollar Street.
- M6: 10th Street/I-205 NB Ramp - Widening 10th Street to four lanes with side-by-side left-turn lanes between the ramp terminals.
- M7: 10th Street/Blankenship-Salamo Road – Add a 2nd eastbound right turn lane and a 2nd westbound left-turn lane.
- M8: 10th Street/Willamette Falls Drive – Install traffic signal with dual eastbound left-turn lanes.
- M9: 10th Street/8th Avenue-Court – Restrict to right-in, right-out, left-in when warranted if 8th Court is extended to Willamette Falls Drive.
- M11: Willamette Falls Drive/12th Street – All way stop control/ traffic signal when warrants are met.
- M17: Salamo Road/Parker Road – Add a traffic signal when warranted.
- M19: Highway 43/Willamette Falls Drive – Add a traffic signal that is coordinated with adjacent signal at I-205 NB off-ramps.
- M20: Highway 43/Arbor Drive – Add left turn lanes on Highway 43.

The following intersections are expected to exceed their respective mobility standards under 2040 traffic conditions and do not have projects identified in the Draft Plan or the Draft Cost Constrained Plan:

- Highway 43/Hidden Springs Road
- Highway 43/Jolie Pointe Road
- Highway 43/Burns Street
- Highway 43/I-205 SB Ramp
- Highway 43/Willamette Falls Drive
- Willamette Falls Drive/Dollar Street (west)

The following actions are recommended for locations that are not projected to meet city standards or ODOT mobility targets:

City Intersections

- Identify projects that are likely or feasible to be triggered by and completed by development.
- Review the remaining locations to determine if they warrant an increase in priority based on potential safety issues.

ODOT Intersections

- 10th Street Corridor – It is unlikely that the improvements identified in the Draft Plan for 10th Street will be completed by private development. Currently the Draft Plan improvements are ranked low and medium priority. The city should consider collecting proportionate shares from development (in addition to their Transportation SDCs) and seek regional funds to help fund these improvements or consider increasing the priority.
- Highway 43 – The Highway 43 Concept Plan and the Draft TSP include improvements at several Highway 43 intersections all of which are included in the Cost Constrained Plan. Although the Highway 43 Concept Plan is not increasing the capacity of the corridor, it will increase capacity and safety at some locations through the provision of turn lanes and traffic signals. The Highway 43 locations listed above do not currently include an improvement in the Highway 43 Concept Plan but should be re-evaluated through the existing Highway 43 Concept Plan Refinement process. If no additional mitigation is recommended, the City should work with ODOT to develop alternative mobility targets per Oregon Highway Plan policy 1F.3.

Appendix A – Section 2
Meeting Minutes

Meeting Minutes

West Linn TSP Update

Technical Advisory Committee (TAC) Meeting #1

Thursday, January 8th, 2015 – 1:30 to 3:30 p.m.

West Linn City Hall – 22500 Salamo Road, West Linn, OR 97068 – Bolton Room

Attendees: Amanda Owings, City of Lake Oswego; Chris Myers, Metro; Gail Curtis, ODOT; Susan Wright, Kittelson and Associates; Matt Bell, Kittelson and Associates; DJ Heffernan, Daniel Heffernan Company; Lance Calvert, City of West Linn; Zach Pelz, City of West Linn.

Meeting Purpose: The purpose of TAC Meeting #1 was to introduce the project, provide an overview of the work completed to date, and obtain input on key outcomes and existing conditions and needs. Five memos were provided in advance of the meeting that provided background information for the project. The City and Consultant team provided highlights and solicited questions and comments on each memo at the meeting.

Discussion Topics and Action Items:

1. Tech Memo 1
    a. There is a 15 year land supply within the West Linn City limits, which is largely defined by Metro's Urban Growth Boundary (UGB).
    b. City policy currently supports retaining the existing UGB – the City decided to forgo including any additional land in the Urban Reserve.
    c. City policy, however, is ambiguous about growth both in terms of density and/or population.
    d. There seems to be a disconnect between City policy and the existing TSP where transit is identified as a potential solution to many of the future transportation issues – City Policy will not allow enough population or population density to support transit.
    e. There were lots of new developments in early 2000's - Currently, there are only small subdivisions. There is one property left with the potential for a large subdivision.
    f. There may be existing policies within the development code that could be cleaned up/removed.
    g. 10th Street Intersection:
        i. Is there an alternative that is more fiscally conservative?
        ii. Ask the community how they want to move forward with the interchange – Do they want to fund it, it is not a state priority and the state will not fund it.

2. Tech Memo 2
    a. There are currently parking issue within the Willamette neighborhood related to special events.
    b. The City worked with the Willamette neighborhood association to develop a variety of potential solutions to the parking issues.
    c. Some of the solutions could be incorporated into TSP, such as
        i. developing shared parking arrangements,
        ii. implementing land use changes to reduce Single Occupancy Vehicle (SOV) use, and
        iii. working with local business owners to encourage employees to not take prime party.
    d. Arch Bridge may provide opportunity to plan for new land uses. Some of the potential land use changes could also be implemented to accommodate transit.
3. Tech Memo 3
    a. The City is currently working with Metro to define the Arch Bridge Town Center.
    b. There seems to be a concern for defining town center in other areas throughout the city.
    c. Geography is not as much of an issue to Metro as meeting employment target.
    d. ODOT, on the other hand, does have an issue with lack of boundary.
    e. It is not that Metro is not concerned, but it is a local decision and needs to be made locally.
    f. The Town Centers could be identified as area in ¼ mile (20 minute walk) of commercial centers and high density areas (red, pink and brown)
    g. There should be a park and ride located in each town center
    h. Dial-a-ride service could be implemented throughout the City
    i. Transportation Options:
        i. Modify target to include number of schools with SRTS program or program coordinator. Another option is number of schools with SRTS coordinator.
4. Tech Memo 4
    a. No Comments
5. Tech Memo 5
    a. The City recently added an all-way-stop at the 12th Street/Willamette Falls Drive intersection.

Meeting Minutes

West Linn TSP Update

Citizens Advisory Committee (CAC) Meeting #1

Thursday, January 8th, 2014 – 6:00 to 8:00 p.m.

West Linn City Hall – 22500 Salamo Road, West Linn, OR 97068 – Bolton Room

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Attendees: Zach Pelz, Gail Curtis, Susan Wright, Matt Bell, Craig Bell, Joyce Jackson, and Kimberly Steele

Meeting Purpose: The purpose of CAC Meeting #1 was to introduce the project, provide an overview of the work completed to date, and obtain input on key outcomes and existing conditions and needs. Five memos were provided in advance of the meeting that provided background information for the project. The City and Consultant team provided highlights and solicited questions and comments on each memo at the meeting.

Discussion Topics and Action Items:

1. General Question and Answer
    a. What is the relationship between the City's Transportation System Plan (TSP) and Metro's Regional Plans? The TSP needs to be consistent with the most recent state and regional transportation plans.
    b. What is the current status for operations and project status? Will these be updated? Existing and projected future traffic operations show that most facilities are operating within standard, therefore, with the exception of the 10th Street corridor, which will be refined as part of Tech Memo 8, we will not be reevaluating operations throughout the city.
    c. Will the memo be delivered electronically? Yes.
    d. Will the June 4th meeting be critical? Yes, but you can review the materials and provide input in advance.
2. Question and Answer related to Tech Memo 1
    a. How much of the land located outside the UGB is within the City limits? None.
    b. Where in the policy does ped/bike fit? Increase mobility through transit.
    c. Regarding ODOT's decision not to fund the 10th Street Single Point Urban Interchange (SPUI) as identified in the current TSP – Area there reasons other than funding? How was it evaluated? It was a prioritization process. ODOT makes investment decisions based on a variety of factors and it will not provide the cost benefit that they need.

d. Does that decision take Exit 8 into account? ODOT has identified potential improvements to I-205 (widening to three lanes in both directions). The City has supported improvement to I-205. Other ramps are not on their radar, not considered in prioritization. Any improvements will not impact ability to do construct it in the future if necessary.

e. In summary, the interchange is not a priority for ODOT, but is has been earmarked in the region. The question is: does the City want to fund it on their own?

f. Are there any other improvements that could be made? Getting on and off the highway at 10th Street can be a challenge. Yes, we will evaluate a variety of potential solutions as part of Tech Memo 8.

3. Question and Answer related to Tech Memo 3

   a. Do these targets assume that we have a problem or are they based on goals? They are based on goals and establish baseline objectives for the long term - What gets measured gets noticed.

   b. Target 2B: Sounds like you are targeting areas where it is achievable, is that correct? Yes.

   c. Are we going to recommend steps to achieve the targets? Yes, adoption will include policies, programs, projects, changes to code and the comprehensive plan to achieve targets.

   d. Is there an opportunity to incorporate the locks? Yes, there is a policy in the plan for reopening locks for transportation.

4. Question and Answer related to Tech Memo 4

   a. Where do grants factor in? They don't, grants are above and beyond - also does not include regional funds

5. Question and Answer related to Tech Memo 5

   a. There is an existing safety issue at OR43/Pimlico Drive where there is currently just a stop sign. It is a popular bike route and also has freight movements – what does the data show here? We currently do not have crash data for the intersection, but we will be looking at crashes system wide as part of Tech Memo 7.

Meeting Minutes

West Linn TSP Update

Technical Advisory Committee (TAC) Meeting #2

Wednesday, February 18th, 2015 – 1:30 to 3:30 p.m.

West Linn City Hall – 22500 Salamo Road, West Linn, OR 97068 – Bolton Room

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Attendees: Zach Pelz, City of West Linn; Amanda Owings, City of Lake Oswego; Chris Myers, Metro; Gail Curtis, ODOT; Susan Wright, Kittelson and Associates; DJ Heffernan, Consultant; John Boyd, City of West Linn; Khoi Le, City of West Linn.

Meeting Purpose: The purpose of TAC Meeting #2 was to review and receive feedback on Draft Tech Memos 6-9, in order to determine if any discrepancies exist or any further revisions are required.

Discussion Topics and Action Items:

Project Updates (Zach Pelz, 10 min)

5 new planning commissioners. Met with them 2 weeks ago to give a high level overview. Prior to that they had an introduction to planning from John Morgan. Meeting with them again tonight to discuss Memos 1-4. City Council expressed interest in improvements to Hwy 43. Mayor resigned at the end of the meeting. Council has two new members. May be a special election in May.

Memo 9 – Regulatory Solutions (DJ, 50 min)

Gail asked if Comp Plan would need updates to be consistent with the existing or new TSP. DJ suggested there may need to be some redactions. Susie suggested the TSP implementing actions should identify necessary amendments to the Comp Plan.

Zach to talk to the City Attorney about what weight the neighborhood plans carry legally.

Memo 9 should identify what can/should be addressed as part of the TSP vs at a later time.

Town Centers – DJ suggested referring to mixed-use areas and describing the characteristics of them related to transportation and land use and access. Need Metro to confirm if mixed use commercial areas can substitute for 2040 investment areas.

TDM – discussed setting threshold for when transportation options are required to be looked at. TPR requires TDM plan for all conditional uses but everything in West Linn is a conditional use. Need to discuss changing the types of development that are conditional use with the council.

DJ asked if we should look at lowering the connectivity threshold from 5 acres to 2 or 3 acres as there is so little 5 acre parcels left. Susie indicated we also have a connectivity map in the TSP.

DJ also asked if we wanted to define when the PC is and is not able to modify cross-sections.

Gail – One of the geographic related connections in the RTFP to town centers are mobility standards and parking requirements.

Zach said that Willamette District already has no minimum parking requirements.

Memo 7 – Needs Analysis (Susan, 30 min)

Gail asked if there was any interest in creating a pedestrian district? It's allowed in the RTFP.

Amanda – have we considered what neighborhood plans say about sidwalks?

Add local sidewalks to Figure 1. GAP analysis to essential destinations should consider local streets.

Sidewalk deficiencies – near Willamette Primary and Bolton School.

This summer the City will be inventorying sidewalk width and deficient areas.

Amanda – Marylhurst has a shuttle service that goes to LO and Oregon City. Funded by grant. Targeted towards seniors. Marys Woods on the same campus.

Safety map – Check if 2014 fatality was added. Can we discuss crash rates on Willamette Falls and OR 43 to help PC and CC know if these are high or not?

DJ – it would helpful to set boundaries or requirements for where the cross-sections have to be met and where they don't.

Memo 8- 10th Street Interchange Area Analysis and Recommendations Report (Susan)(10 min)

No questions/discussion

Memo 6 – Safe Routes to School (Zach, 20 min)

Amanda – Have you thought about lighting in the SRTS? LO considering adding lighting requirements along SRTS.

Gail – would be good to see discussion of the other E's in the memo.

Next Steps

a. Comments due 2/20/15 to Zach
b. Meetings
    i. Planning Commission Meeting #1B – 2/18/15
    ii. Planning Commission Meeting #2 – 3/4/15
    iii. CAC Meeting #2 – 3/5/15
    iv. Community Meeting #1 – 3/10/15

Meeting Minutes

West Linn TSP Update

Citizens Advisory Committee (CAC) Meeting #2

Thursday, March 5th, 2015 – 6:00 to 8:00 p.m.

West Linn City Hall – 22500 Salamo Road, West Linn, OR 97068 – Bolton Room

Attendees: Zach Pelz, Gail Curtis, Susan Wright, Matt Bell, Craig Bell, Joyce Jackson, and Kimberly Steele

Meeting Purpose: The purpose of CAC Meeting #2 was to review and receive feedback on Draft Tech Memos 6- 9 in order to determine if any discrepancies exist or any further revisions are required.

Discussion Topics and Action Items:

1. Project Updates:
    a. Presenting background information on current and forecasted needs
    b. Developing goals and evaluation criteria for selecting projects moving forward
    c. Going to lay out alternative solutions on how to address needs
    d. Then developing the Draft TSP
2. Overview of Technical Memorandum 6 – Safe Routes to School:
    a. City council for the last two or three years has been very interested in formalizing the safe routes to school element in the TSP.
    b. People move to West Linn because of the schools.
    c. SRTS improves public health, supplements daily activity, and helps improve the performance on the transportation system.
    d. The analysis looked at where there are sidewalks relative to these routes.
    e. All schools have identified SRTS, which are consistent with the walking bus and other routes.
    f. The City reviewed the sidewalks coverage and lighting on each route.
    g. Is there a model for how many kids are walking alone versus walking with parents? - There is a walking school bus. Parent's need to determine if their kids are safe to be alone or not. That's why the other E's are so important – educate on how to walk safely, encourage more people to be walking.
    h. Would like to see fundraising for SRTS to implement better cross-walks and speed signs.

i. Will crossings come into the SRTS analysis? Yes, that's our next step.

j. Enforcement – would be more effective having an officer out on the street rather than hiding and doing a speed trap. That would be more effective at slowing people down.

k. City is working hard to align TSP with trails plan. When the trails plan was developing, there was a strong recommendation for on-street facilities (bikes, sidewalks, wayfinding), City council asked the TAB to prioritize the improvements based on SRTS, proximity to schools, other.

l. The School district is planning to replace Sunset primary school.

m. Elementary school kids are paying more attention that the high school students who would benefit from similar measures.

3. Overview of Technical Memorandum 7 – Needs Analysis

   a. If we start with the assumption that the streets are mostly built out, what is left? Removing cul-de-sacs? The anti- cul-de-sac language could be viewed as a hot-button issue – maybe we can soften the language?

   b. It will be important to come to terms with how to handle cul-de-sacs.

   c. Are we going to go in and take out part of someone's yard? – No, but when properties are redeveloped we will look for opportunities to install ped/bike paths.

   d. What is our percent built-out in West Linn? – We have about 15 years of capacity or roughly 1,500 housing units.

   e. So are the connections we are discussing going to be local streets? – They will be a combination of local streets and/or ped/bike connections.

4. Overview of Technical Memorandum – 10th Street Interchange Area Analysis and Recommendations Report

   a. Stopping sight distance is limited at the southbound approach to 10th street along Salamo Road, especially when there is a long queue.

   b. Is a bulk of this ODOT money? - This interchange is not a regional priority so there are not likely to fund it.

   c. Want to identify potential improvements that are more likely to get funded.

5. Overview of Tech Memo 9 – Regulator Solutions

   a. Tech Memo 9 involves a review of the City's regulatory solutions as they relate to transportation. Specific issues to be addressed through tech memo 9 include:

      i Are there areas where current TSP is inconsistent with State and regional transportation plans?

      ii Are there any local plans that are inconsistent with the TSP?

b. Implementation measures ensure the plan does what it is supposed to do, encourage walking, biking, transit use, and a general reduction in SOV.

c. TSP is adopted as an element to the comprehensive plan

d. Implementing measures are also adopted through a legislative process and will:

   i Make sure the metro 2040 growth map is included

   ii Make sure the street map/classifications are adopted into the comp plan

e. Fee-in-lieu programs – currently discussing how to make those funds available to ped/bike improvements only.

f. Given the topography, there are a lot of times when requirements are waived; however, want to make sure connection is still provided for ped/bike at a minimum.

g. Town Centers/Commercial Areas:

   i Is the only purpose of the boundary for measurement? - For the purpose of the TSP, we need to reduce SOV trips within these areas by 45 to 55 percent

   ii Do they use the town centers for regional planning, such as for transit service? - Yes, region-wide they use town center to focus certain types of investments.

   iii It had sounded like it would be west Linn's responsibility to provide some sort of transportation system between centers.

   iv In the long term, a lot of what we are talking about won't be achieved in this TSP, but it will help with the longer vision of the City.

   v Is there anything that binds West Linn to complete the vision within the town centers first? No, developers can build where the land is available.

   vi Is there anything to encourage development within the town centers?

   vii The four commercial areas were reviewed when the city decided to complete the Arch Bridge Plan.

h. Neighborhood plans are considered supplements to the comprehensive plans. The comp plan says the neighborhood plan should supersede the comp plan.

6. Next Steps

   a. Community open house next Tuesday along with Virtual Open House (VOH)

      i Advisory board members are encouraged to come

      ii As a reminder, anytime three or more CAC (TAB) members meet it needs to be advertised.

      iii Would be great to take a moment to introduce the CAC (TAB) at the open house.

   a. Next TAC/CAC meetings are on April 2nd

b. Second Community Meeting is on April 8th

Meeting Minutes

West Linn TSP Update

Citizens Advisory Committee (CAC) Meeting #3

Thursday, April 2nd, 2015 – 6:00 to 8:00 p.m.

West Linn City Hall – 22500 Salamo Road, West Linn, OR 97068 – City Council Chambers

Attendees: Craig Bell, Dave Klienke, Joyce Jackson, Kim Bira, Kimberly Steele, Kris Kachirsky, Susan Wright, Matt Bell, Khoi Le

Meeting Purpose: The purpose of CAC Meeting #3 was to review and receive feedback on Draft Tech Memo 10.

Discussion Topics and Action Items:

General Q&A:

- Will there be any changes to the code to implement the solutions? Yes, the TSP implements the Comp Plan, the development code implements the TSP, engineering standards, etc.

Evaluation Criteria:

- Why are there N/A's on the evaluation criteria? These are criteria that no projects can meet, but the project team felt we should leave then in to show that they are important to the overall process.
- Why is SRTS shown as N/A under 2E? This is for programs, not projects. SRTS are getting points under 2D, 3A, and under concurrency.
- Green street facilities? Green street treatments are not specifically addressed under the criteria.
- If there is something missing from the solutions what do we do? Tell us. Yes, tell us.
  - **Install a crosswalk on Hidden Springs at Carriage Way**
- Church crossing on Rosemont? This questions would be better addressed at traffic committee meeting.

General Comments on Evaluation Criteria and Outcome

- It is odd that Pimlico would be so low and Suncrest would be so high.
- It seems like bicycle use should be considered.
- Is there any way to give them a more or less points?

- Should we weigh some things higher than others?
- Why doesn't safety rank higher than others?
- How can skyline be ranked the same way as Summit?
- Are the goals that should be ranked higher than others?
- Add access to transit to connections to 3A
- Should some essential destinations rank higher than others?
- Should we separate 2D?
- Does 2D do anything is everything is ranked the same?
- Should we have differentiation in every column where they are same?
- Which criteria could be address by more than a yes/no? 2A, others?
- Pimlico is very steep and therefore shouldn't be ranked last.
- There seems to be a lot of focus on VMT but without mention of how people will get down/up the hills.
- It is confusing that the streets are listed without improvements. We will be able to define the types of corridor improvement based on ranking.
- Incorporate typography to list.
- How does the trails master plan ranking factor in? It does not feel like it is being given enough attention in the TSP. The Trails master plan ranking will be used to help define improvements
- Would it make sense to have sidewalks as a separate doc?
- Hide or remove N/A columns – takes away from the chart

Potential Action Items

- Try to make the criteria not so binary (yes/no)
- Weigh things that have more influence on walking/biking/transit higher
- Weigh things that provide connection to transit higher
- Separate 2D
- Allow for varying scales
- Consider influence of trails ranking
- Consider typography
- Differentiate by land use
- Break up corridors
- Give more weight to trails - review tier ranking for consistency
- Overlay safety with destinations

- 3A is ranked high and it is difficult to determine if it is accurate (locations of low income…)
- 3A - It is a good goal, but why is it there if we can't tell the difference between projects?

Corridors:

- Speed bumps? Other traffic calming? The City tries to stay away from speed bumps because of emergency response
- What else can we do to slow speeds?
    - Police come up with enforcement.
    - Needs analysis should have identified speed issues.
- There are currently speed issue on Pimlico, Hidden springs, and Skyline
- What is in our tool bag for traffic calming?
- Should streets with speed problems be ranked higher than 8?

Corridors – which Corridors rank the highest for you?

- Willamette Falls Drive
- Hidden springs – don't overlook bike needs
- Valley view – Park needs half street improvements
- Pilmico – lack of sidewalks with lots of walkers
- Santa Anita Drive – key corridor crossing at Starbucks
- Salamo Road – key corridor crossing at Starbucks
- Skyline – add sidewalks on park side of Skyline
- Summits street/Skyline – Pedestrian crossing
- Rosemont – getting in and out of school parking lot
- Acknowledge trails plan in prioritization.

Meeting Minutes

West Linn TSP Update

Citizens Advisory Committee (CAC) Meeting #3

Thursday, May 7th, 2015 – 6:00 to 8:00 p.m.

West Linn City Hall – 22500 Salamo Road, West Linn, OR 97068 – City Council Chambers

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Meeting Organizer: Zach Pelz, City Project Manager

Meeting Purpose: The purpose of CAC Meeting #4 was to:

- Review the changes to the project evaluation criteria that were made as a result of PAC input at PAC Meeting #3.
- Review Technical Memorandum #11 (draft project list and priorities based on the updated criteria), and discuss how the prioritization impacts the financially constrained project list.

Discussion Topics and Action Items:

Evaluation Criteria

- Updates to the evaluation criteria are included in at the end of tech memo 11 in attachment A
- Same primary goals, with several changes:
    - Made criteria less binary
    - Accounted for transit use
    - Gave more weight to projects in trails master plan
    - Incorporated metro regional plans
    - Reevaluated total points in each category - Safety now has the most potential points under each category
- Concepts presented in previous memo are now shown as projects
- How do the regional priorities factor in? We know from the regional policy to address the low hanging fruit first - Do TSMO prior to major financial and major capacity based improvements.
    - There is an evaluation criteria aimed at TSMO projects, which gives them some priority.
- TM11 presents the first draft of what is in the high medium and low categories. We have applied the criteria over a broad range of projects. We will look at what the evaluation criteria is telling us and identify where we need to make changes.

- Right now we have a little buffer within the constrained plan- 20 percent. That gives us some room to add things in. There may be some things that you want to add others that you want to take out. We needed to allow buffer to allow for changes in cost estimates, etc.
- What is the time period?
  - The horizon of the TSP is 25 years
- Is there any consideration for projects that may be picked up by development?
  - It is not accounted for in the cost estimates right now. Of the 80 million, we would assume some of that would be completed by private development, but most private development improves local streets only.
  - Also, the money shown here contributes to the SDC calculation - anything on the list related to future development and/or growth will be applied to the SDC.
- When the City looks at prioritization, we look at high medium and low, the individual scores don't matter as much. We seem to be in a good position considering we have funded our whole high priority project list. However, we may want to make changes, so we are trying to get that feedback and input on what is important.
- A number of the high priority projects are on Highway 43, how do we address those?
  - From a cost perspective we have included them in the high bucket, we did not assume any ODOT or regional funds, only city funds. The City can expect that some projects on Highway 43 to be good candidates for outside funding, but they are very unlikely to get funded without a significant match.
  - When they City stages improvements we typically see a 10-15 percent match, but we will likely see at 20-25 percent match. We look at developer contributions for those types of facilities, local match, regional funds, etc. Right now we have a negative outlook for regional funds. Hopefully the region gets better and we get a more positive outcome.
  - Good subject for West Linn citizens to grapple with - How much does the City want to invest in Highway 43 to stimulate economic development?
  - ODOT doesn't control their own money, OTC now has regional ACT or committee for the region. There is a big regional process and competition for the funds.
  - Currently OTC is grappling with the question of whether all the money for the next STIP cycle should go to maintenance, leaving nothings for improvements.
- How does ODOT delineate between maintenance and improvements?
  - The STIP has two programs: Fix-it and Enhance it. All maintenance projects are handled under the Fix-it program.

Functional Classification

- Functional classification relates specifically to the development code and to roadway design, access management – spacing of driveways – the higher the classification the stricter the requirements.
- Streets with higher designation are where we want the traffic to go. Collectors and arterials will not get Neighborhood Traffic Management (NT). From a technical perspective, if it is an arterial or collector it is held to a higher level of design, less slope, less grad change.
- Does that include other restrictions like weight limits?
  - There are no weight limits on streets in the City – garbage trucks have to drive down every street every day.
- Would there be more options for NTM on a collector than an arterial?
  - Yes, speeds would be slower, curb radii would be tighter, curb extensions could be used, but options for NTM (speed humps, etc.) are not big on arterials and collectors.
- Is there a list of the changes (from/to)?
  - **No, but we will add one to the memo.**
- Is Dollar Street more suitable as a minor arterial or collector to allow for transit access?
  - No. Dollar will not serve transit in the future. It will be provided along Willamette Falls Drive, which is a parallel route.
- How would you know as a developer that you are expected to make a connection between Dollar Street and WFD?
  - The local street connection map includes a future connection between Dollar Street and WFD.
- One of the bigger safety issues is the acute angle of the intersections along Dollar Street. It is really hard to see around sharp angles, maybe small fixes could be included?
- 19th street is really well traveled and there is not shoulder or sidewalks. Is it included in the project list
  - **No, but we will add projects for sidewalks and bike lanes on 19th Street.**
- Do we have a consistent guide for development?
  - The consistent guide is the TSP. The community development code allow some flexibility for new projects.

Local Street Connections

- LSC 8 – Horton Road - What would it take to get it developed?
  - It is located on private property, so it is only a matter of time before someone comes in with a development application.

- **Any connections that you would like to see advanced as part of the TSP improvement projects – one that doesn't have to wait for private development, we would like to know**
- **We would like all feedback from the group by Monday.**
- Is there a reason why it would be difficult to connect Dollar Street to WFD?
    - o Not difficult, it is just that the school owns the property. They have been marketing the property, but have not sold it yet.

Project Tables and Maps

- No comments on the priorities for the bike/ped projects on arterials, collectors, or local streets.
- Do you think there are opportunities for additional safety points for SRTS?
- Are there some areas where priorities between SRTS should be different? For example, some areas don't need sidewalks because the parents drive their kids to school every day.
- Many people drive their kids to school every day.
- Teenagers need a SRTS plan as much as elementary school kids.
- Should they have different priorities?
- **TAB liked the idea of programmatic approach with a set aside amount each year, maybe $200,000, for SRTS projects each year with possible an option to use funds for capital or educational components.**
- Ask the schools what they need – what would be most affective/meaningful – infrastructure or outreach?

Transit

- **The city would benefit from more than one park and ride on Highway 43**
- Rather than additional capacity, consider second location.
    - The Highway 43 Concept Plan update and other plans have considered under I-205 bridge as a possibility.

Motor Vehicle Plan

- Are all signal projects along Highway 43, which are show as high priority, needed today or in the future?
- People tend to go 45 mph on WFD – is there a way to slow those vehicles down?
- Is there an opportunity to increase the priority of the projects near 10th Street interchange?
    - Yes

- **Highway 43/WFD should be high priority.**
- Is the Highway 43/WFD intersection being realigned?
    - No
- Is it an ODOT intersection?
    - Yes, but the City is responsible for identifying potential improvements
- Why realign Tannler Drive?
    - Future development will require a traffic signal at Tannler Drive/Blankenship Road. The realignment will provide greater separation between 10th Street and Tannler Drive.
    - **M18 is mislabeled**

Meeting Minutes

West Linn TSP Update

Technical Advisory Committee (TAC) Meeting #4

Thursday, June 4th, 2015 – 1:30 to 3:30 p.m.

West Linn City Hall – 22500 Salamo Road, West Linn, OR 97068 – Bolton Room

Meeting Organizer: Zach Pelz, City Project Manager

Attendees: John Boyd and Khoi Le, City of West Linn; Laura Terway and Martin Lintel, City of Oregon City; Amanda Owings, City of Lake Oswego; John Mermin, Metro; Susan Wright and Matt Bell, Kittelson & Associates, Inc..

Meeting Purpose: The purpose of TAC Meeting #4 was to:

- Review final project evaluation criteria and Technical Memorandum #11 (draft project list and priorities based on the updated criteria), discuss projects in the plan and the draft financially constrained project list.
- Discuss further reductions in the financially constrained plan (approximately 50%) to reflect a more conservative forecast, increasing maintenance costs, and no federal funds.
- Review Technical Memorandum #12 (system performance) to see how well the draft plan achieves the project goals and targets and if any changes to priorities are recommended.

Discussion Topics and Action Items:

1. Review Draft Tech Memo 11
    a. Why are the Horton Road and Tannler Road extensions shown on the updated functional classification map? They were identified by City staff as high priority street connections, and therefore included as potential projects.
    b. Why are the Horton Road and Tannler Road extensions not shown on the other maps? **We will update the other maps to include the extensions.**
    c. Are there any other local street connections that should be identified as projects? This is a question for City staff, TAC and CAC members, and the general public.
    d. Does the change in functional classification also change the cross section? It depends on the change. Arterials, collectors and neighborhood routes all require bike lanes while local streets do not. Any change from a collector or neighborhood route to a local street will remove the requirement for bike lanes. The biggest change is the access requirements along the different classification streets.
    e. There are grammatical errors in Table 1 (Cirlce and Lcaol). **We will address the grammatical errors.**

f. Did the updates to mobility standards fall into the 25 percent list? No, not currently.

g. Does the project list include any County projects? No, there are no county facilities in the City.

h. What about the local street connections located outside the City limits; LSC20, 26, etc? **We will review these connections and determine how to address them.**

i. The memo mentions inclusion of raised bike lanes and cycle tracks on streets above 30 mph. How are these being incorporated into the project list? They have been incorporated into the roadway design standards and are an option along all arterial streets.

j. A20 includes an interim improvement project that is shown as low priority? Are there others? **We need to decide whether or not to remove the interim project if the city does not want the project there.**

k. Is there a rational for not including the off-street trail plans on the project list? Our original direction was to not include them given that they are accounted for by the parks department, but we certainly could add them. **We will discuss whether or not to include trails in the project list.**

l. A21 should not be an interim project. **We will update the table accordingly.**

m. Consider changing high priority projects to green, medium to orange, and low to red.

n. The Tannler Road extension should be shown as medium per the project tables. **The maps are consistent with the evaluation framework so the table should be updated but we will verify.**

o. The commercial zoning should not be on top of parks in Savanah Oaks Area (10th Street interchange area). **We will update the map accordingly.**

p. The future LTS map should be updated to reflect the final refinement plan for Highway 43.

2. RTFP Checklist

a. The RTFP checklist includes stuff that is in the code, but not the stuff that is in the plan. **This will be provided with the Draft TSP.**

b. Forward Tech Memo 9 to John Mermin for his review.

3. Other

a. Oregon City has placed a moratorium on all zone changes and master plans until they decide what to do about the OR213/Beavercreek Road intersection.

b. Oregon City is experiencing issues on the south side of the arch bridge with truck drivers not realizing that they are approaching a tight T-intersection. Oregon City is thinking of adding a length restriction to the current weight restriction to the Arch Bridge – in order for ODOT to implement this, they will require a meeting with them, ODOT and West Linn.

Meeting Minutes

West Linn TSP Update

Citizens Advisory Committee (CAC) Meeting #5

Thursday, June 4th, 2015 – 6:00 to 8:00 p.m.

West Linn City Hall – 22500 Salamo Road, West Linn, OR 97068 – City Council Chambers

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Meeting Organizer: Zach Pelz, City Project Manager

Meeting Purpose: The purpose of CAC Meeting #5 was to:

- Discuss input from the Planning Commission and City Council on the Tech Memo #11 priorities.
- Discuss further reductions in the financially constrained plan (approximately 50%) to reflect a more conservative forecast, increasing maintenance costs, and no federal funds.
- Review Technical Memorandum #12 (system performance) to see how well the draft plan achieves the project goals and targets and if any changes to priorities are recommended.

Discussion Topics and Action Items:

1. Financially Constrained Plan
   a. Does the city have any interest in expanding the definition of safe routes to school to include middle school and high school?
      - The national safe routes to school program includes K through 8.
      - The West Linn Budget Committee recently approved 250K for a new sidewalk along Skyline Road that connects to the high school as well as 300K in dedicated funds for safe routes to school.

   b. If the City only contributes 25-50 percent of the improvement costs along Highway 43, where does the rest of the money come from? Tiger grants, regional flex funds, ODOT – ODOT's position is that they will not contribute more than 25 percent, which is the norm around the region.

   c. Why are Sunset, Skyline, and West A Street not included on the Pedestrian QMMLOS and BLTS maps? There were not included in the original scope of work, but **we will add them to the map.**

   d. A15 - Skyline (Summit to West A), A5 - Lancaster (Parker to Cornwall), and C8 – Cornwall (Sunset to Summit) should be considered for the high priority network. This would connect Salamo to Willamette Falls Drive and Summit to West A Street with continuous sidewalks.

e. Remove the segment of the I-205 southbound ramp from the Pedestrian QMMLOS map. **We will update the map accordingly.**

2. Review Draft Tech Memo 12

   a. Who voted on the 6, 8, 3, 0? We developed the criteria, reviewed it with this group, applied it to the projects, reviewed the changes with this group, made more edits, more changes, and settled in on three groups.

   b. Why are these intersections called out? Are they getting a second ranking? They are not, we need to decide that it is okay that they will not meet standards because many of them will be developed through a development process or are we going to accept higher congestion.

   c. Can we differentiate between projects that solve a problem today versus a problem in 25 years? **Yes, we will update the text, tables, and maps accordingly.**

   d. Is there any consideration to making Highway 43 a city street? The needs do not change whether it is a City or State facility. It is still up to the City to define the plan for the facility.

   e. There appears to be a commercial area overlapping with a park near the 10th Street Interchange. This is an error. **We will update the map accordingly.**

   f. Highway 43 and 10th Street are ranked high and so they are going to soak up all the money – it is important to identify these projects as high priority to give direction to staff on what they should be seeking funding for. For example, should they spend time on grants for Highway 43? Yes, because it is identified as a high priority.

      - There are different grant opportunities for Safe Routes to School than for Highway 43 improvements. Staff may even choose to look at local funding resources if they thought it was important enough to the general public.

   g. Safe Routes to School are currently shown as medium, but the will be changed to High in the next draft.

Appendix A – Section 3
Open House Summaries

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
610 SW Alder Street, Suite 700, Portland, OR 97205 P 503.228.5230 F 503.273.8169

Community Workshop #1 Summary

West Linn Transportation System Plan Update

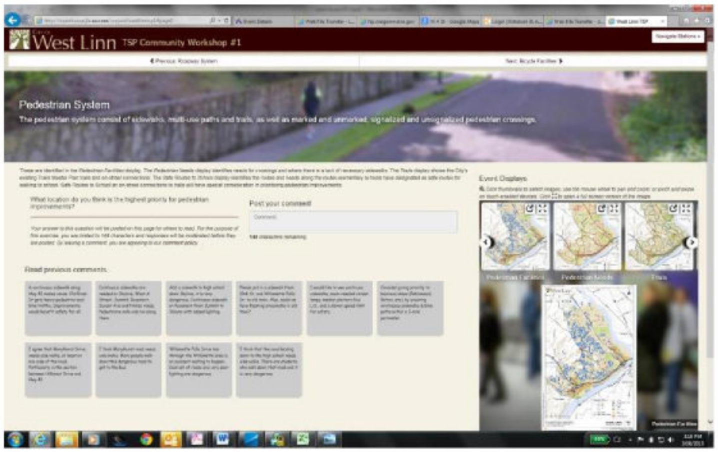
Date:	March 20, 2015	Project #: 17817
To:	Zach Pelz, City of West Linn	
From:	Susan Wright, PE and Matt Bell	
cc:	Project Management Team	

WorkshopDate: 3/10/15
Time: 6 p.m. – 8 p.m.
Location: City Hall

Community Workshop #1 included approximately 25 poster boards containing project information with five stations designed to obtain input. The stations included information about the project and the existing and future needs of the pedestrian, bicycle, transit, and motor vehicle systems.

Participation

- 16 people signed in but more than 16 people were in attendance. *Attachment A includes the sign-in sheets from the event.*
- Comment forms with questions about safety, transit, and general comments were submitted by five attendees. *The comment forms are included in Attachment B.*
- Community Workshop # 1 was also available on-line from 3/10/15 through 3/17/15. The on-line workshop received 112 unique visitors. 20 people participated in the on-line surveys or submitted comments. The on-line Community Workshop is still availabe on-line to be viewed, but the site is no longer accepting comments. The site is available at the following address: http://openhouse.jla.us.com/project/westlinntsp1. Over 85% of visitors to the site were from West Linn, Portland, or Oregon City per the Google site analytics.



Online Community Workshop Screen Capture

Public Input/Comments

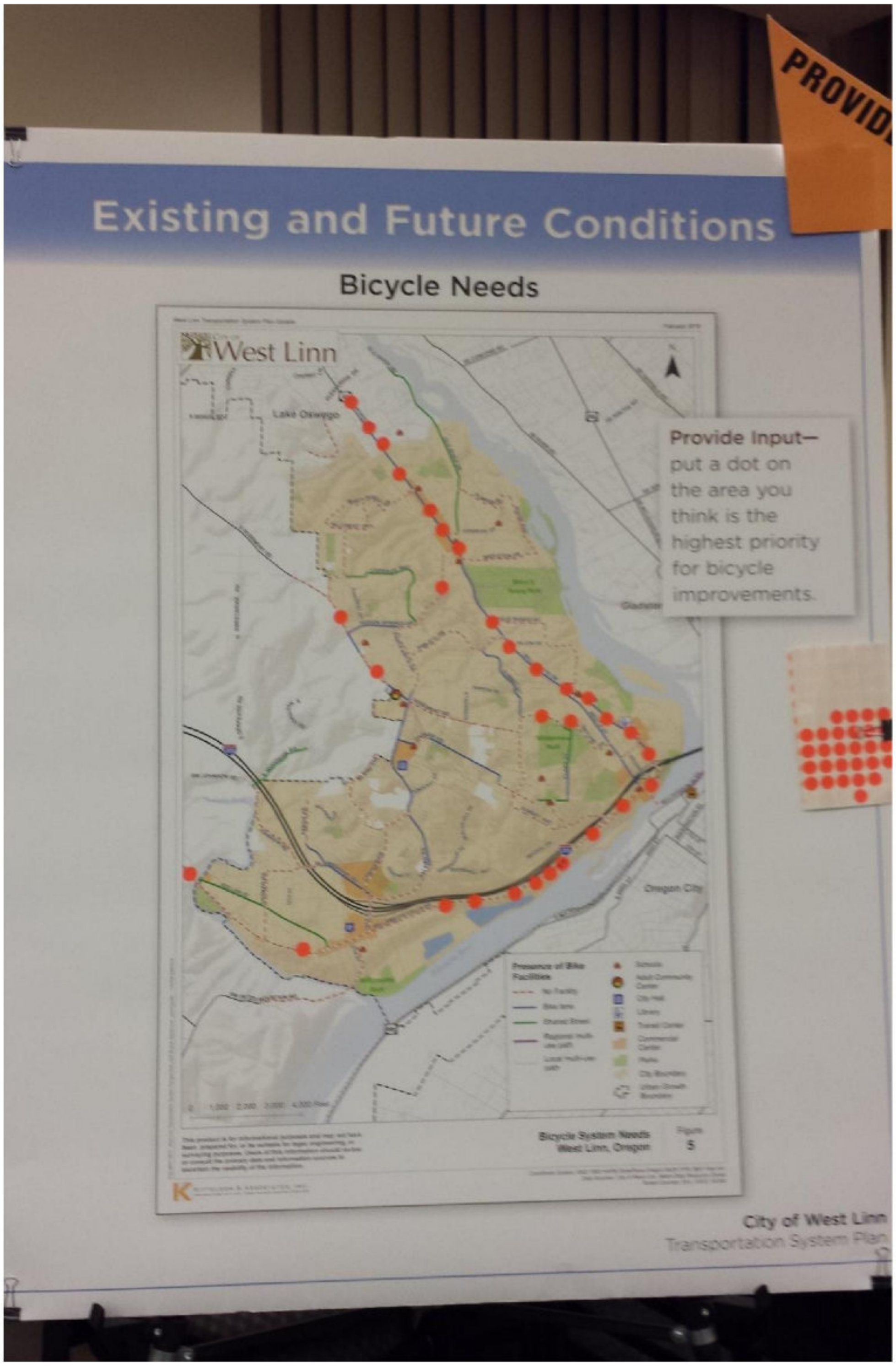
The following provides an overview of the comments received at the in-person and the on-line workshop. From the in-person workshop the overview includes pictures of the input received and notes that were made on flip-charts for public comments at each station. Tables of comments and survey results are provided from the on-line workshop which included a similar station format and questions.

Where do you live and work?

The red dots indicate where workshop participants live in West Linn and the green dots indicate where they work in West Linn (if applicable).

Bicycle Needs

The orange dots on the map indicate locations where participants believe bicycle improvements should be a priority. Note: one participant put all of the dots along Highway 43 and Willamette Falls Drive.



The following comments were received at the adjacent flip chart:

- Left turn lanes at Arbor Drive on Highway 43

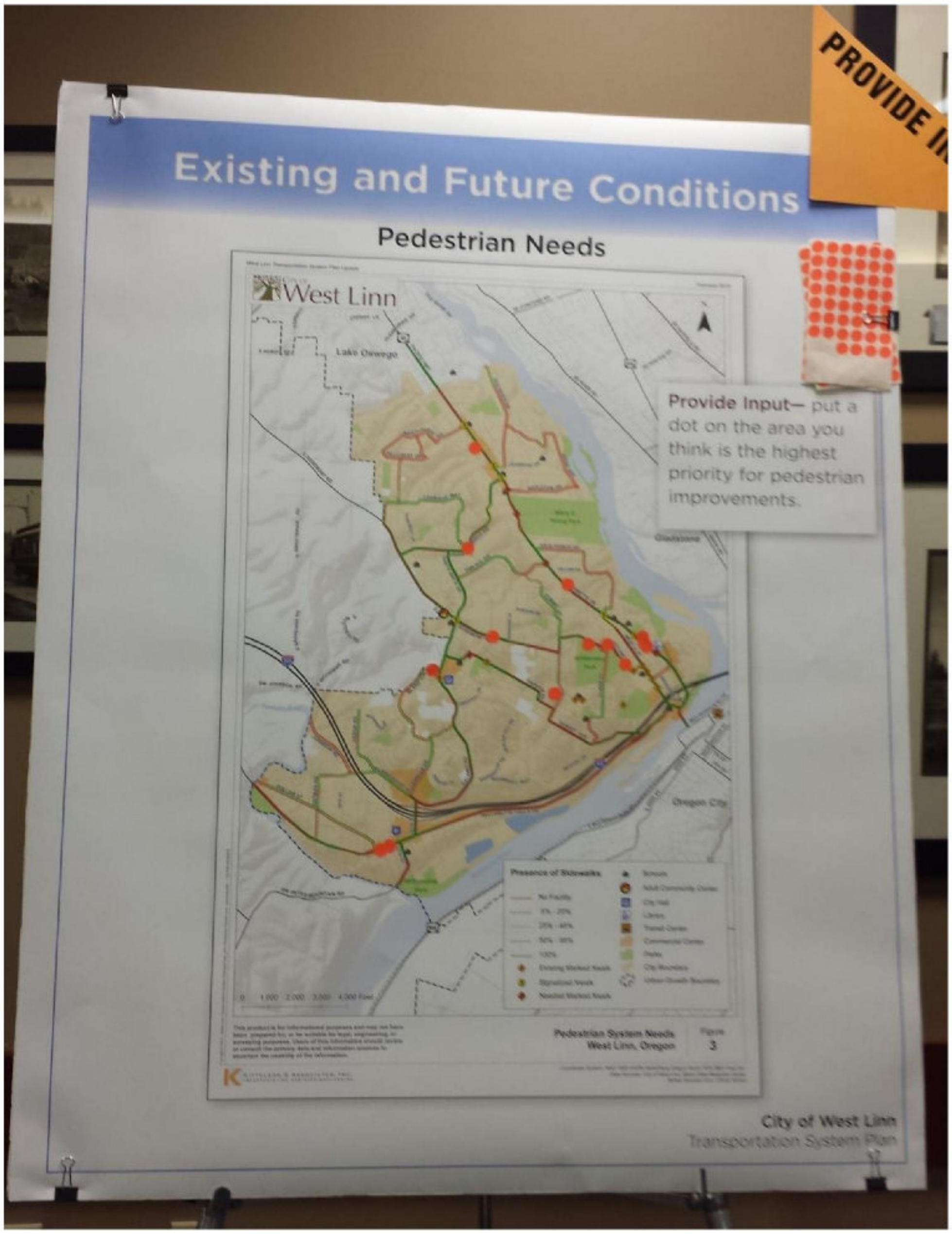
- Widen Willamette Falls Drive for bike facilities
- Willamette Falls Drive
    - Shoulders
    - Bike lane
    - High traffic conflicts
- Put light (not stop lights, just light it up) at crosswalk in Willamette Falls downtown area
- Need pedestrian crossing improvement at Carriage Way & Hidden Springs where connect/cross the creek trail on south side
- Imperial Drive – on- street trail connection
    - Consider on street parking
    - Pedestrian activity
- I-205 Trail (old rest area) human element
- Consider 3 way stops at corners of:
    - Riverknoll way and Riverknoll Ct.
    - Riverknoll Way and Beacon Hill
    - This would SLOW the oblivious drivers down
- Consider pedestrian crossings and speed bumps on West A
- Consider closing West A to all vehicle traffic

The following comments were received on-line:

What location do you think is the highest priority for bicycle improvements?
Any of the major commuter routes: WF Drive, Hwy 43. Rosemont has the trail. Kudos for cyclists. Important for them to be safe.
Willamette Falls Drive and Rosemont both need improvement. I see several cyclists riding where no facilities exist.
No bikes on Rosemont Road, anywhere, period!
I'd like to see alternative trails or parallel street routes for bikes & get them off WF Drive and Hwy 43 completely.
Rosemont
They are an impediment to traffic on Willamette Falls Drive from Borland to the OC bridge.

Pedestrian Needs

The orange dots indicate where participants believe pedestrian improvements should be a priority.



The following comments were received at the adjacent flip chart:

Consider one-way couplet on Lancaster & Sunset

- Consider Median refuge areas HWY 43 for safer pedestrian crossing
- Sight distance issue near cross walk by Tanner Springs and apartment complex
  - RRFB?
- No lighting along Rosemont and striping from baseball field to Salamo
- Willamette Old Town

  - o Buy open lot and build parking, take parking off street for bike lanes and easier/safer for pedestrians
  - o Better cross walks/light them up
- Crossing of 43/Webb – to school and past and bus stop

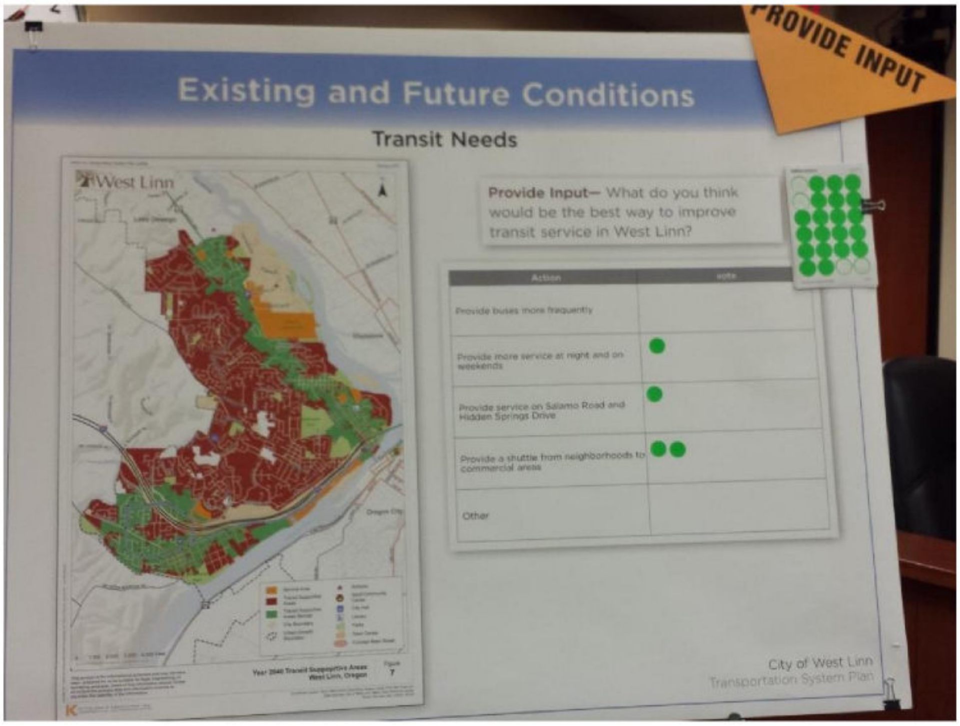
The following comments were received on-line:

What location do you think is the highest priority for pedestrian improvements?
A continuous sidewalk along Hwy 43 makes sense. Old River Dr gets heavy pedestrian and bike traffic. Improvements would benefit safety for all.
Continuous sidewalks are needed on Skyline, West A Street, Summit, Rosemont, Sunset Ave and Pimlico roads. Pedestrians walk and run along them.
Add a sidewalk to high school down Skyline, it is very dangerous. Continuous sidewalk on Rosemont from Summit to Salamo with added lighting.
Please put in a sidewalk from 19th St. and Willamette Falls Dr. to old town. Also, could we have flashing crosswalks in old town?
I would like to see continuous sidewalks, much-needed street lamps, median planters like L.O., and a slower speed limit for safety.
Consider giving priority to business areas (Robinwood, Bolton, etc.) by ensuring continuous sidewalks & bike paths within a 2-mile perimeter.
I agree that Marylhurst Drive needs sidewalks, at least on one side of the road. Particularly in the section between Hillcrest Drive and Hwy 43
I think Marylhurst road needs sidewalks. Many people walk down this dangerous road to get to the bus.
Willamette Falls Drive has through the Willamette area is an accident waiting to happen. Dual set of roads and very poor lighting are dangerous.
I think that the road leading down to the high school needs sidewalks. There are students who walk down that road and it is very dangerous.

Transit Needs

Participants voted with green dots as to what they believe is the best way to improve transit service in West Linn.

- Provide buses more frequently – 0 votes
- Provide more service on nights and weekends – 1 vote
- Provide service on Salamo Road and Hidden Springs Drive – 1 vote
- Provide a neighborhood shuttle – 2 votes

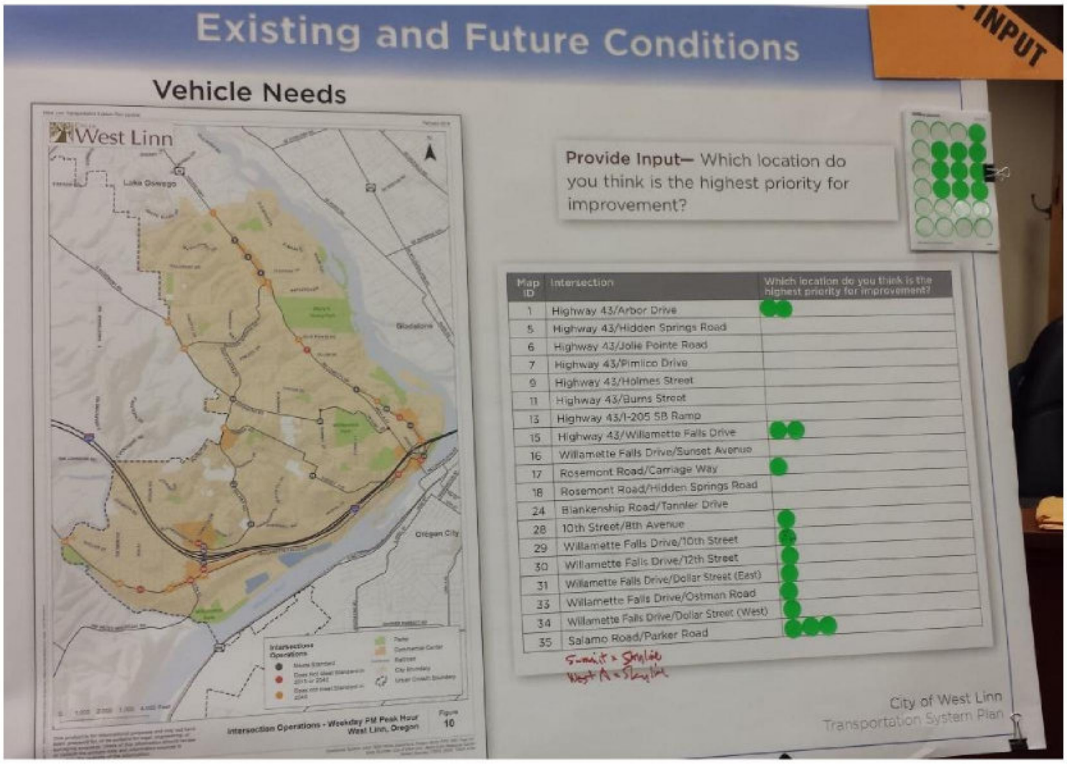


The following comments were received on-line:

What do you think would be the best way to improve transit service in West Linn?
Provide buses more frequently – 2 votes
Provide more service on nights and weekends – 0 votes
Provide service on Salamo Road and Hidden Springs Drive – 4 votes
Provide a neighborhood shuttle – 4 votes
Other: I'd suggest West Linn consider withdrawing from the TriMet service district and forming a new transit district, as Wilsonville, Canby, Sandy and Molalla have done. It's highly likely that the city could provide far superior levels of service at less cost.
Other: Add more park and ride locations, the one on 43 gets full at times and there is not a safe way for passengers disembarking from the Hidden Springs south bound stop to walk to the park and ride. You have to walk in a bike lane without a sidewalk.
Other: More Sidewalks for Pedestrians and Bicycles
Other: Focus on roads...we live in the suburbs and drive cars.

Vehicle Needs

Participants voted for the intersections they believe are the highest priority for improvements.



The following comments were received at the adjacent flip chart:

- 17 (Rosemont Road/Carriage Way) - East Bound site distance/stopping distance issue-consider signage or left turn lane

- Willamette Falls Drive
  - Heavy congestion from Stafford to Highway 43
  - No shoulders
  - No bike lanes
  - Baseball impact at Fields Bridge
  - Now it's an alternative to congestion on I-205
  - Willamette Old Town Parking issues and unsafe crossings
  - Fire and Police are locked into the middle

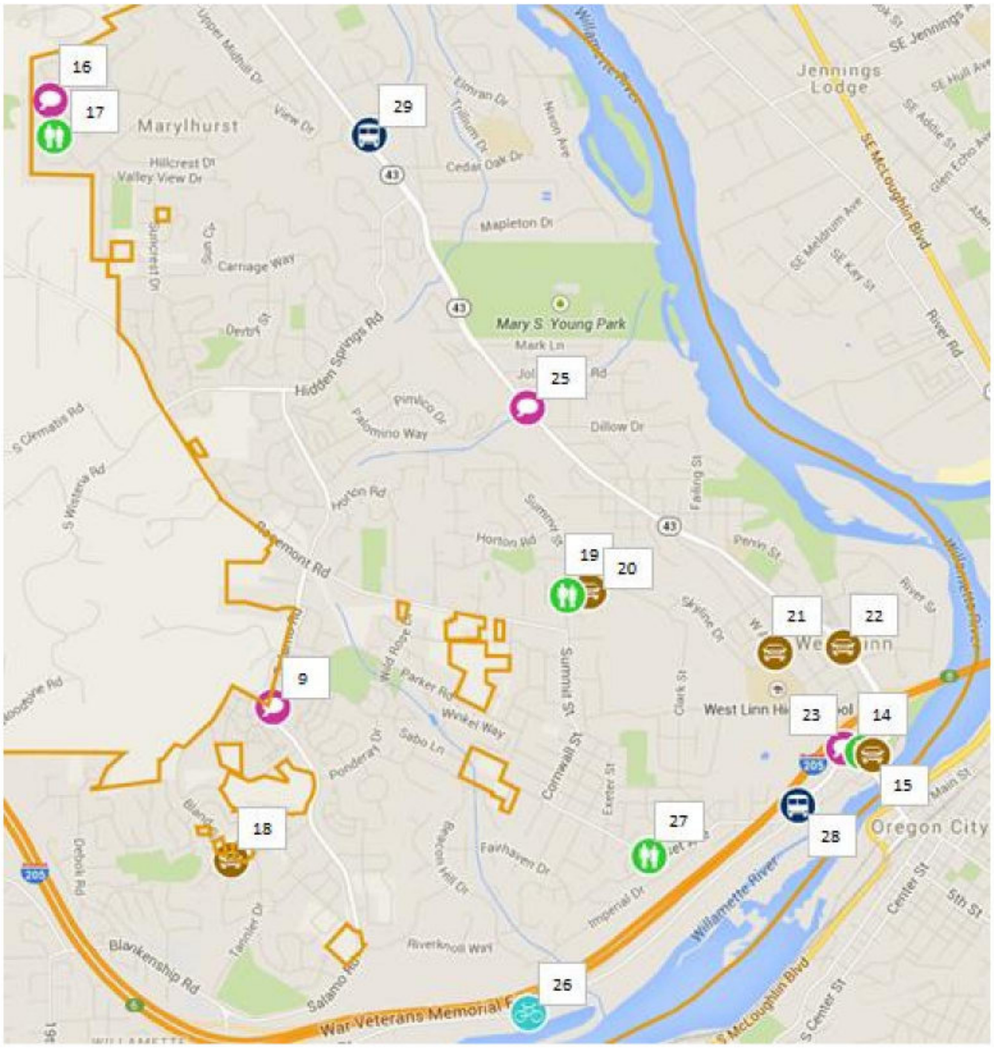
- Webb and Highway 43 - The corner in extremely unsafe. Needs signage on Webb and pedestrian crosswalk to cross HWY 43 on south side of Webb.

The following comments were received on-line:

The following intersections have congestion, backups, or are difficult to turn today OR are anticipated to have these type of problems in the future. Which ones do you think are most in need of an improvement? You may find the "Intersection Operations" display helpful to answer this question. (Check all that apply.)

Intersection (Map ID)	Votes
Highway 43/ Arbor drive (1)	4
Highway 43/ Hidden Springs Road (5)	**6**
Highway 43/ Jolie Pointe Road (6)	2
Highway 43/ Pimlico Drive (7)	**7**
Highway 43/Holmes Street (9)	2
Highway 43/Burns Street (11)	2
Highway 43/I-205 SB Ramp (13)	3
Highway 43/Willamette Falls Drive (15)	**8**
Willamette Falls Drive/Sunset Avenue (16)	2
Rosemont Road/Carriage Way (17)	2
Rosemont Road/Hidden Springs Road (18)	2
Blankenship Road/Tannler Drive (24)	1
10th Street/8th Avenue (28)	**7**
Willamette Falls Drive/10th Street (29)	**5**
Willamette Falls Drive/12th Street (30)	3
Willamette Falls Drive/ Dollar Street (East) (31)	3
Willamette Falls Drive/ Ostman Road (33)	2
Willamette Falls Drive/ Dollar Street (West) (34)	3
Salamo Road/ Parker Road (35)	2

The following comments were received through the on-line workshop via a comment map.



ID	Location Name	Travel Mode	Comment
29	Near Hwy 43 and Walling Circle	transit	Need Park-and-Ride facility for weekend bus travel.
28	WF Drive	transit	Need better waiting areas/bus facilities along Willamette Falls Drive.
27	Sunset	pedestrian	Need continuous sidewalks along Sunset for pedestrians who walk down the hill.
26	Wilamette Falls Drive	bicycle	Need better bicycling options along this road, WF Dr. Very narrow shoulders and a few blind turns.
25	Pimlico Dr.		Need a better refuge lane or a signal here for people making left hand turns off of Pimlico. Left turners and right turners get crowded at the stop sign and make it hard for each other to see oncoming traffic. Left turns can only be made if there is a break in traffic, which is not very often. Would be nice if bus stop had a shelter. Need more sidewalks along Pimlico. Road gets closed due to ice in the winter.

24			This intersection gets very congested. It is hard to make a left hand turn onto 43 from Willamette Falls Drive during traffic. People don't always know how to merge with 43 North traffic at this point.
23	West A x Willamette Falls Dr.		Tricky intersection. It's difficult to turn left (either onto or off of West A). It's even trickier for peds. Traffic comes steaming around the bend eastbound, it's hard to see them coming as they slow from 40+ MPH. While there are crosswalks nearby, I can't recommend them. the curve and hill make it tricky for drivers to see you. I understand that a stoplight won't be desirable here, due to the nearby stoplight downhill at the new intersection by the bridge. Even so, this intersection will need improvement before it can be integrated into the new pedestrian promenade that runs up from the overlook. Thank you for reading. [Note - I also provided a similar comment at the 3/10 open house.]
22	McKillican x-Willamette Dr.	car	McKillican Neighborhood issues: The acute angle and steep grade of McKillican make for an unusually dangerous difficult with OR-43. If you don't baby it going downhill, you can easily bottom out, or swing into the opposing lane while turning. West Linn has many hilly, curvy streets; but this is below modern standards, especially at such a busy intersection. Also, the blind curve for drivers headed southbound on Willamette makes turning on and off of McKillican yet more risky. I always warn my visitors about this intersection, so they don't take it for granted that they can take it at normal speeds. Finally, the Hood St. exit from Central Village mixes McKillican traffic with everyone waiting to turn north on Willamette. A third lane for right-hand turns would relieve pressure on traffic waiting to leave Central village, who are stuck behind the few cars going straight (up McKillican). Thank you for reading.
21	West A x-Skyline	car	All-way stop insufficient to handle peak traffic. West A is, of course, very busy when school is starting, or letting out. That's understandable; but it could still be better. The new pedestrian flashers are a help for safety; but car traffic gets backed up pretty good, as people double-park to let kids in and out. Something more than a basic all-way stop might be helpful keeping the traffic from backing up too far at school time. Also, there are many people who (sadly) don't seem to get the rules of the road with regards to who goes next at a stop sign. Thank you for reading. [Note - I provided this same comment at the 3/10 open house]
20	Skyline between Summit and Clark	car	Excessive speed - many vehicles exceed the 25MPH limit in both directions on this stretch of Skyline. Cars often top 35-40MPH - drivers below 30MPH are the exception. This area is viewed as being unpopulated, despite the presence of many pedestrians, bikes, &c. Permanent traffic calming would be needed in order to keep drivers somewhere near the 25MPH limit. The advisory indicator helps a little with EB traffic heading downhill; but that's only there a few weeks out of the year. People also speed uphill as they top out at Clark Street, it's just their regular driving habits as there is no enforcement here. I know that speed bumps are out of favor; but they work *really* well on Summit. They could also work well on Skyline. Please consider adding them.
19	Summit x-Skyline	pedestrian	Difficult to cross at this intersection. Drivers going fast, rolling the stop, and unwilling to wait for non-vehicular traffic. Eastbound traffic heading down the steep hill on Summit often does not stop at Skyline before turning right. A fence on the SE corner further masks pedestrians at the crosswalk from the driver's point-of-view. Although this was not a surveyed intersection, it gets very busy at certain times of day. I've waited 10+ minutes to cross (with the dogs) on a few occasions. [Note - I also provided this comment at the open house]
18	Bland Cir. at Falcon	car	When cars are parked along the curb on Bland next to the house, 2303 Falcon Dr, it is very dangerous for cars driving on Bland to get by. Can that section of the block be marked No Parking?

17	Marylhurst Dr	pedestrian	It would be great to have a sidewalk along Marylhurst Drive connecting Skyline Ridge Park to Marylhurst Heights Park
16	Skyline Ridge park		Skyline Ridge Park is located in this area. The map has it in the wrong spot.
15	Willamette Falls Drive Intersection	car	We need a light here. Oftentimes, during high traffic times, I sit for long periods of time to be able to turn. It isn't always safe trying to turn either.
14	cross walk on Willamette Falls Drive and Broadway	pedestrian	This cross walk would benefit from the crossing lights and better street lighting, especially during busy morning and evening hours when traffic coming down hill is backed up in both lanes.. uphill traffic cannot see pedestrians trying to cross. In addition in the evening it is so dark it also makes it very difficult to see pedestrians.
9	City Hall at Salamo		Poor visibility at this intersection affects safety for all modes.

Other On-line Comments

The following general comments were received through the on-line workshop:

What did we miss in identifying problems and decisions regarding the transportation systems? What are your additional concerns? Tell us what you think are the main transportation needs the plan should consider.
I believe people will need to use alternate modes of transportation (than car) and have it be the norm. If you are able-bodied and can walk or bike half a mile to the store to pick up that little thing, that should be the norm, not jumping in the car to do so. Any way our TSP can be improved to encourage and make it safer and enjoyable for people to do that should improve the status quo. Can we improve carpooling opportunities? Can we promote and make a shuttle feasible?
How to travel from on top of the hill (City Hall) to Highway 43 (bus, bicycle) and vice versa. How do people get access to the bus from the neighborhoods on the hill? Should there be paths for children to walk safely between all schools listed on the maps?
The worst transportation/pedestrian area in West Linn, is the 1-205 exit 6 to Willamette Drive. Ironically the new police station is right there. I hope they don't need to get to I-205 in a hurry during rush hour or on weekends.
The new 4 way stop on Willamette Falls Dr. in old town is awful! The backup during the evening commute is terrible. Please find a better solution.
I would like to see evidence of consideration given to past studies (Hwy 43 study and the smaller and more recent Hwy 43/Willamette FallsF Drive study) so the public knows those efforts were not ignored. At least, I HOPE they were not ignored.
Skye Parkway needs sidewalks. There are no sidewalks coming up the hill from Hillside Drive and Skye Parkway. This is a dangerous hill when it is icy out and I have seen a few cars rolled over due to snow and icy conditions. It is also very dangerous to walk up and down this hill as well due to no sidewalks. Once you are at the top of the hill then there are sidewalks - just not down the hill. There are three entrances to Skyline Ridge and two of the three do not have sidewalks.
West Linn has traffic problems during evening and morning rush hour. Don't make the problem bigger than it is. Focus on flow on Will. Falls Drive, the 205 access areas and Hwy 43. Putting up four way stops and traffic circles is not a solution (example Willamette Falls Drive & 12th).
Sunset Ave. needs mirrors where the blind corners are. It is dangerous to pull out from Riverview Ave. onto Sunset because you cannot see traffic coming from either direction until it is right on top of you.

Handout and Next Steps

The following handout was made available at the workshop. It invited people to have their friends and neighbors participate on-line and informed them of the next workshop on April 8th, 2015.

City of West Linn

Transportation System Plan Update

The City of West Linn is currently working with the Oregon Department of Transportation (ODOT) and others to update the City's Transportation System Plan (TSP).

The West Linn TSP is a long-range planning document that helps the City identify and prioritize improvements to the transportation system over the next 25 years. The West Linn TSP Update will include an evaluation of the existing transportation systems within West Linn, including the pedestrian, bicycle, transit, motor vehicle, and other systems, the identification of existing and future transportation system needs, and prioritization of potential transportation improvement projects to address needs.

Community Workshops

There will be three community workshops for this project. You will be able participate in all workshops in person at City Hall or on-line. The on-line "Virtual Community Meetings" allow local residents to receive all of the same information and provide comments on-line. They will be held at the same time as the in person workshops on the City's website and will be available to provide comments for up to one-week following the meeting. The information will remain available even after the commenting period is over.

Community Workshop #1 - 3/10/15 at City Hall and Online through 3/16/15

Community Workshop #1 for the West Linn TSP Update will be held on **March 10th, 2015** from 6 p.m. to 8 p.m. at West Linn City Hall in the Council Chambers. The purpose of the meeting is to introduce local residents to the project purpose, process, and intended outcomes as well as to receive comments on the identified transportation needs.

Project Goals

Goals for the updated **Transportation System Plan** include:

SAFETY – Reduce transportation related fatalities and injuries for all transportation modes

MOBILITY, ACCESS AND ENVIRONMENT – Improve people's access to jobs, schools, healthcare and other needs in ways that improve health, reduce pollution and retain money in the local economy

EQUITY – Deliver transportation improvements equitably

MAINTENANCE – Deliver access and safety improvements cost effectively, within available revenues and responsibly to the needs of all users of the transportation system

Attend the Community Workshop #1 Online through Monday, March 16th. – westlinntsp.org

Community Workshop #2 - 4/8/15 at City Hall and Online through 4/14/15

Community Workshop #2 will be held on April 8th, 2015 from 6 p.m. to 8 p.m. at West Linn City Hall in the Council Chambers. The purpose of this workshop is to share and discuss transportation solutions to address the City's needs discussed at Workshop #1. *Attend the workshop online through April 14th, 2015.*

Community Workshop #3 - July 2015

Community Workshop #3 will be held in July 2015 and will also include an in-person workshop at City Hall as well as an on-line Virtual Community Workshop.

The purpose of this workshop will be to obtain feedback on the Draft Transportation System Plan prior to adoption hearings by the Planning Commission and City Council in the fall of 2015.

Other Opportunities

We are also meeting periodically with the **Transportation Advisory Board, Planning Commission, and City Council** about this project. Check the project website to see when these occur.

http://westlinnoregon.gov/planning/transportation-system-plan-update

Stay Involved

Project documents and meeting dates can be found on the City's project website:

http://westlinnoregon.gov/planning/transportation-system-plan-update

Project Timeline

Questions/Comments?

Not finding what you need on-line? Please feel free to contact Zach Pelz with the City of West Linn with any questions or comments you have about the West Linn TSP Update.

Zach Pelz, AICP
Associate Planner
City of West Linn
22500 Salamo Rd.
(503) 723-2542
zpelz@westlinnoregon.gov

CITY OF WEST LINN
TRANSPORTATION SYSTEM PLAN

Public Workshop #1
March 10, 2015
Sign-in Sheet

Name Ty Darby
Address TVF&R
Email TY.DARBY@TVFR.COM

Name Vicki Handy
Address 960 Rancho Lobo
Email vickihandy@aol.com

Name Larry Meese
Address 3560 RiverKnoll Way
Email Lpmeese@me.com

Name Alan Smith
Address 1941 BUCK ST
Email aglansmith57@gmail.com

Name Peggy Kuhendall
Address 1825 Webb St
Email peggy@wlneighbor.com

Name Craig S. Bell
Address 6035 Skyline Dr
Email craig.s.bell@gmail.com

Name Russ Axelrod
Address
Email

Name Alice Richmond
Address
Email

CITY OF WEST LINN
TRANSPORTATION SYSTEM PLAN

Public Workshop #1
March 10, 2015
Sign-in Sheet

Name Bob Stowell
Address 2606 Maria Ct.
Email stowell 50954 @ AOL.Com

Name Dede Montgomery
Address 19648 Wildwood Dr
Email dedeM13@comcast.net

Name Mary O'Malley
Address 25425 Swiftshore Dr
Email weare1@pacbell.net

Name Troy Bowers
Address 2790 Lancaster St
Email Troy.Bowers@msa-ep.com

Name Don Kanngshorough
Address Box 148 city
Email Kanngslorpups@AOL.com

Name Dennis Richey
Address 2311 Jolie Pointe
Email denn2311@Q.com

Name FRED G.A SICKERT
Address 15715 ROSEMONT
Email fgasickert@gmail.com

Name Meredith Olmsted
Address 3560 Riverknoll Way
Email clubolmsted@comcast.net

CITY OF WEST LINN
TRANSPORTATION SYSTEM PLAN

Public Workshop #1
March 10, 2015
Comment Sheet

Name Troy Bowers
Address 2790 Lancaster St
Email Troy.Bowers@msa-ep.com

1. SAFETY

a. If your streets were made safer would your children walk or bike to school? No
Why or why not? Senior in HS - leaving for college otherwise, it would be a good option.

b. If your streets were made safer would you walk or bike more? We drive to a safer neighborhood to walk in...

c. What street safety improvements would you like to see and where?
- Shoulder/walking improvements @ Cornwall/Oxford
- Will. Falls Drive to N. Bound Hwy 43 intersection queing.

2. TRANSIT:

a. If you had a convenient "park and ride" lot at a transit stop, would you use transit at least once a week? Not currently If yes, what would be your destination?
Wish I could say yes.

3. OTHER:

What else would you like us to know?
Consider couplet @ Lancaster/Sunset to ~~equitably re~~ restore equity to historic load sharing of traffic. This will yield half street on Lancaster to dedicate to moderate pedestrian/bike traffic.
Thank you!

CITY OF WEST LINN
TRANSPORTATION SYSTEM PLAN

Public Workshop #1
March 10, 2015
Comment Sheet

Name Bob Stowell
Address 2606 MARIA Ct
Email Stowell5050@AOL.Com

1. SAFETY

a. If your streets were made safer would your children walk or bike to school?

Why or why not?

Maria Ct is a perfect family St

b. If your streets were made safer would you walk or bike more?

c. What street safety improvements would you like to see and where?

2. TRANSIT:

a. If you had a convenient "park and ride" lot at a transit stop, would you use transit at least once a week? If yes, what would be your destination?

3. OTHER:

What else would you like us to know?

Left Turns at 43 & Arbor Dr.
Widen Willamette Falls Dr for Bikes
& pedestrians

CITY OF WEST LINN
TRANSPORTATION SYSTEM PLAN

Public Workshop #1
March 10, 2015
Comment Sheet

Name Dennis Richey
Address 2311 Jolie Pointe
Email denn2311@Q.com

1. SAFETY

a. If your streets were made safer would your children walk or bike to school?

Why or why not? NA

b. If your streets were made safer would you walk or bike more?

Yes –

c. What street safety improvements would you like to see and where?

sidewalks along Hwy 43 from Mary Young State Park to Bolton / Library

2. TRANSIT:

a. If you had a convenient "park and ride" lot at a transit stop, would you use transit at least once a week? If yes, what would be your destination?

twice / month – going downtown via bus

3. OTHER:

What else would you like us to know?

Sidewalks on feeder streets to Elementary Schools very important!

CITY OF WEST LINN
TRANSPORTATION SYSTEM PLAN

Public Workshop #1
March 10, 2015
Comment Sheet

Name Vicki Handy
Address 960 Rancho Lobo
Email vickihandy@aol.com

1. SAFETY

a. If your streets were made safer would your children walk or bike to school? yes

Why or why not? Willamette Falls Drive is unsafe to H.S.

b. If your streets were made safer would you walk or bike more? yes!

c. What street safety improvements would you like to see and where? Willamette Falls Drive development from 43 to Stafford

2. TRANSIT:

a. If you had a convenient "park and ride" lot at a transit stop, would you use transit at least once a week? If yes, what would be your destination?

No

3. OTHER:

What else would you like us to know?

CITY OF WEST LINN
TRANSPORTATION SYSTEM PLAN

Public Workshop #1
March 10, 2015
Comment Sheet

Name Meredith Olmsted
Address 3560 Riverknoll Way
Email cluboolmsted@comcast.net.

1. SAFETY

a. If your streets were made safer would your children walk or bike to school? n/a
Why or why not?

b. If your streets were made safer would you walk or bike more? -no- my neighborhood is ok on sidewalks.

c. What street safety improvements would you like to see and where? Speed control on Riverknoll Way → Barrington Dr → Imperial. Drivers are increasingly speeding, arrogant, and un-concerned about residents and pedestrians

2. TRANSIT:

a. If you had a convenient "park and ride" lot at a transit stop, would you use transit at least once a week? no If yes, what would be your destination?

3. OTHER:

What else would you like us to know? Please consider all the small Children/pets on Imperial Dr. when planning a Trail path on that street. Also please consider the dangers the human element brings to the I-205 path section (ie: closed rest area).

PLEASE consider 3 way Stops @ Beacon Hill / Riverknoll Way and also at Riverknoll Way / Riverknoll Court intersections

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
610 SW Alder Street, Suite 700, Portland, OR 97205 P 503.228.5230 F 503.273.8169

Community Workshop #2 Summary

West Linn Transportation System Plan Update

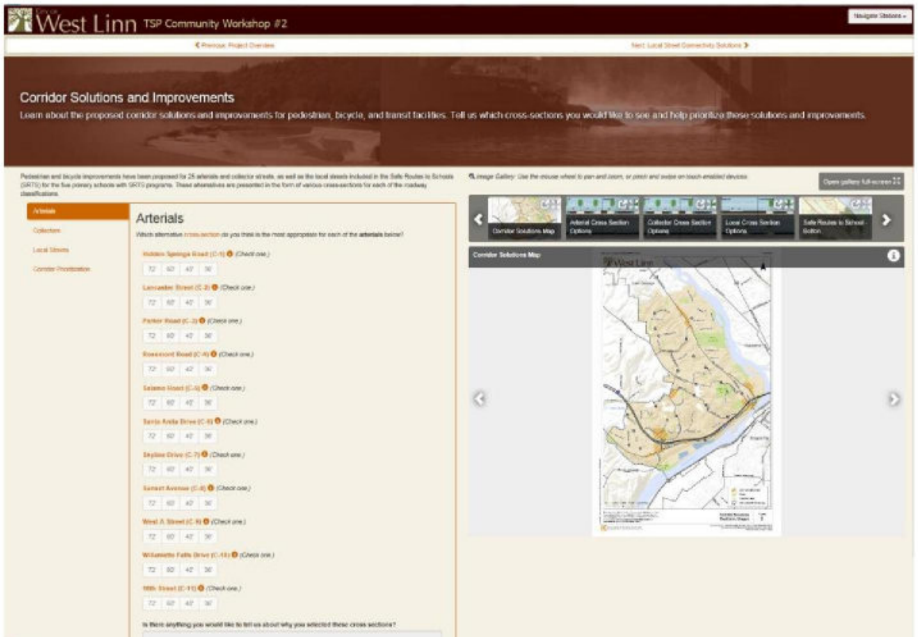
Date:	April 30, 2015	Project #: 17817
To:	Zach Pelz, City of West Linn	
From:	Susan Wright, PE and Matt Bell	
cc:	Project Management Team	

Workshop **Date:** 4/8/15
Time: 6 p.m. – 8 p.m.
Location: City Hall

Community Workshop #2 included approximately 25 poster boards containing project information with 6 stations designed to obtain input. The stations included information about the project, existing and future transportation needs of all modes, and proposed projects and proioritiesfor bicycle and pedestrian improvments on arterials, collectors, and local streets and motor vehicle projects.

Participation

- 10 people signed in but more than 10 people were in attendance. *Attachment A includes the sign-in sheets from the event.*
- Community Workshop # 2 was also available on-line from 4/8/15 through 4/14/15. The on-line workshop received 174 unique visitors. 51 people participated in the on-line surveys or submitted comments. The on-line Community Workshop is still availabe on-line to be viewed, but the site is no longer accepting comments. The site is available at the following address: http://openhouse.jla.us.com/project/westlinntsp2. Around 70% of visitors to the site were from West Linn, Portland, or Oregon City per the Google site analytics.



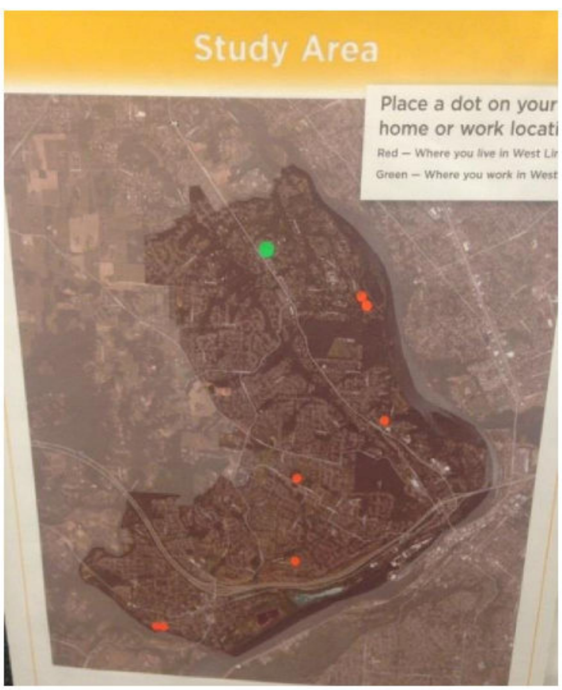
Online Community Workshop Screen Capture

Public Input/Comments

The following provides an overview of the comments received at the in-person and the on-line workshop. From the in-person workshop the overview includes pictures of the input received and notes that were made on flip-charts for public comments. Tables of comments and survey results are provided from the on-line workshop which included a similar station format and questions.

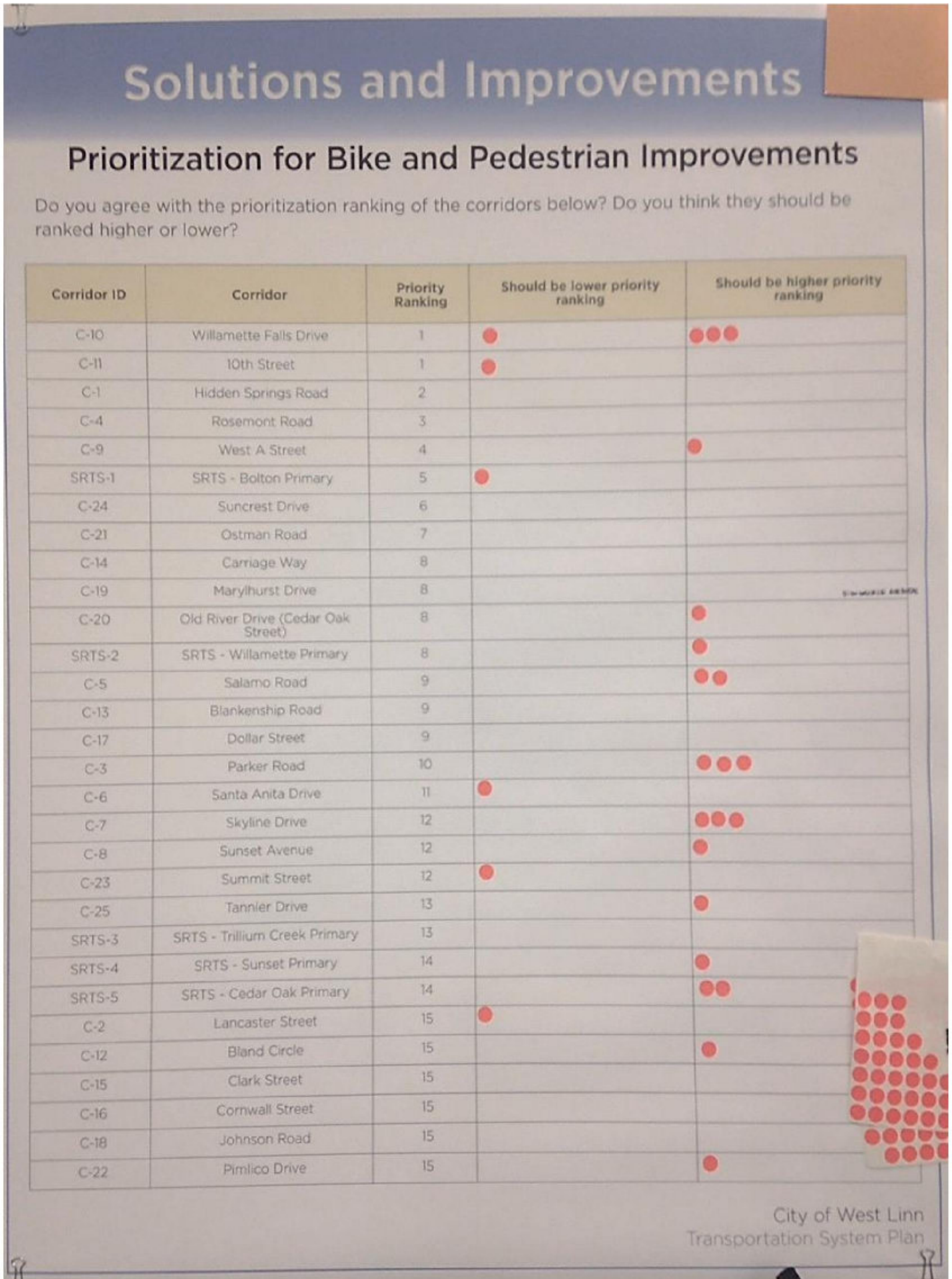
Where do you live and work?

The red dots indicate where workshop participants live in West Linn and the green dots indicate where they work in West Linn (if applicable).



Solutions and Improvements

The project corridors were prioritized and ranked in priority from 1-15 (some corridors have the same ranking) for bicycle and pedestrian improvements. Participants were asked to review the preliminary prioritization ranking of the corridors and indicate whether they should be ranked higher or lower. As shown below, several participants indicated that Willamette Falls Drive, Parker Road, and Skyline Drive should be higher priority; although Willamette Falls Drive was already ranked priority #1.



Solutions and Improvements

Prioritization for Bike and Pedestrian Improvements

Do you agree with the prioritization ranking of the corridors below? Do you think they should be ranked higher or lower?

Corridor ID	Corridor	Priority Ranking	Should be lower priority ranking	Should be higher priority ranking
C-10	Willamette Falls Drive	1	●	●●●
C-11	10th Street	1	●	
C-1	Hidden Springs Road	2		
C-4	Rosemont Road	3		
C-9	West A Street	4		●
SRTS-1	SRTS - Bolton Primary	5	●	
C-24	Suncrest Drive	6		
C-21	Ostman Road	7		
C-14	Carriage Way	8		
C-19	Marylhurst Drive	8		
C-20	Old River Drive (Cedar Oak Street)	8		●
SRTS-2	SRTS - Willamette Primary	8		●
C-5	Salamo Road	9		●●
C-13	Blankenship Road	9		
C-17	Dollar Street	9		
C-3	Parker Road	10		●●●
C-6	Santa Anita Drive	11	●	
C-7	Skyline Drive	12		●●●
C-8	Sunset Avenue	12		●
C-23	Summit Street	12	●	
C-25	Tannler Drive	13		●
SRTS-3	SRTS - Trillium Creek Primary	13		
SRTS-4	SRTS - Sunset Primary	14		●
SRTS-5	SRTS - Cedar Oak Primary	14		●●
C-2	Lancaster Street	15	●	
C-12	Bland Circle	15		●
C-15	Clark Street	15		
C-16	Cornwall Street	15		
C-18	Johnson Road	15		
C-22	Pimlico Drive	15		●

City of West Linn
Transportation System Plan

The online input is summarized below. As shown, most corridors had a mix of input for higher and lower rankings. Suncrest Road and Sunset Primary SRTS both had greater support for a higher ranking than lower or OK. Parker Road had greater support for a lower ranking than higher or OK.

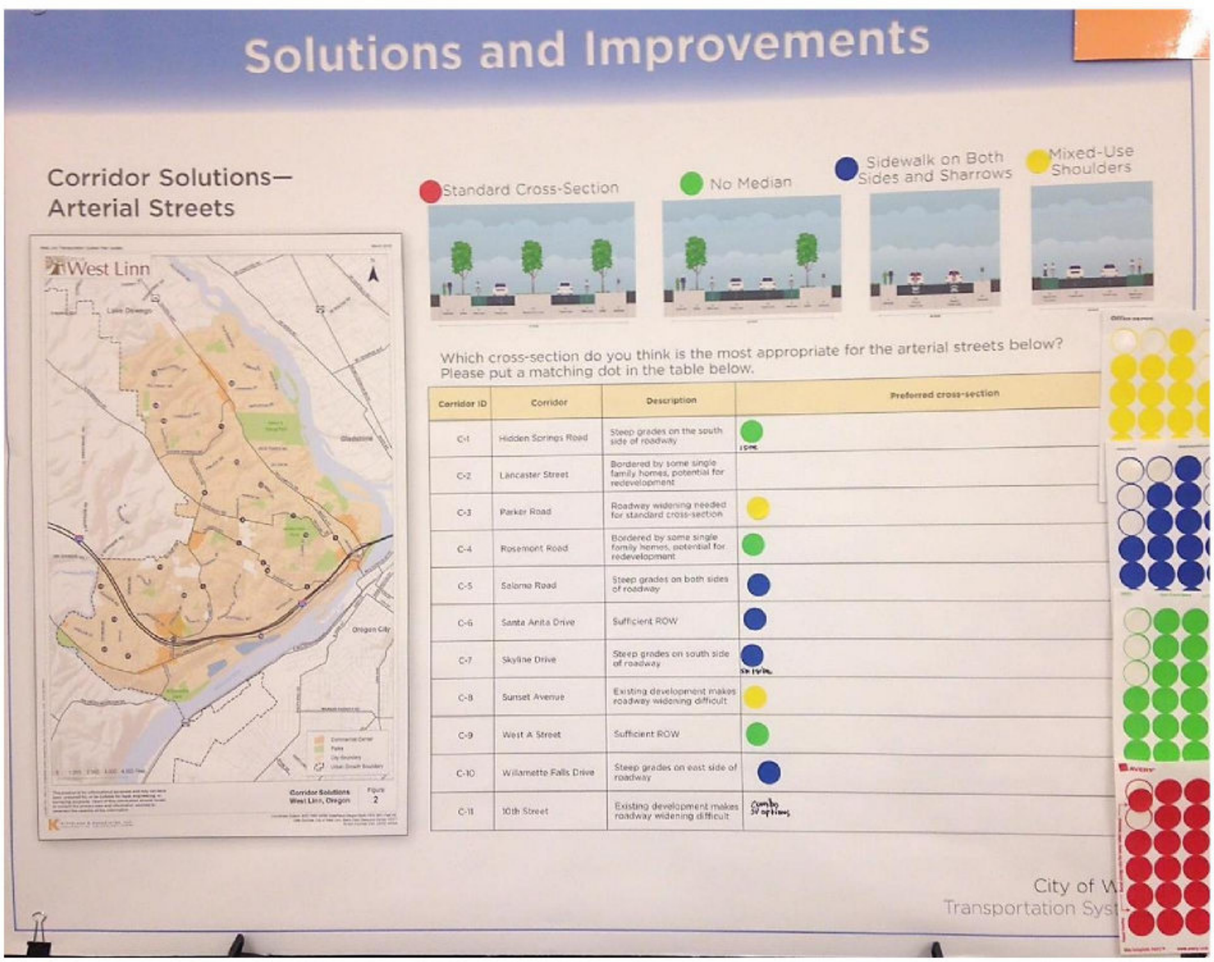
			Public Input		
Corridor ID	**Corridor**	**Draft Ranking**	**Should be lower**	**OK with priority**	**Should be higher**
C-10	Willamette Falls Drive	1	2	4	1
C-11	10^{th} Street	1	2	3	2
C-1	Hidden Springs Road	2	1	9	0
C-4	Rosemont Road	3	2	5	3
C-9	West A Street	4	2	5	1
SRTS-1	SRTS – Bolton Primary	5	0	5	2
C-24	**Suncrest Road**	**6**	**1**	**3**	**5**
C-21	Ostman Road	7	1	5	1
C-14	Carriage Way	8	3	3	1
C-19	Marylhurst Drive	8	0	4	3
C-20	Old River Drive	8	2	4	1
SRTS-2	SRTS Willamette Primary	8	0	4	3
C-5	Salamo Road	9	1	4	4
C-13	Blankenship Road	9	3	3	3
C-17	Dollar Street	9	3	3	1
C-3	**Parker Road**	**10**	**5**	**3**	**1**
C-6	Santa Anita Drive	11	0	5	3
C-7	Skyline Drive	12	3	4	1
C-8	Sunset Avenue	12	2	4	1
C-23	Summit Street	12	1	3	3
C-25	Tannler Drive	13	0	6	1
SRTS-3	SRTS – Trillium Creek Primary	13	0	6	1
SRTS-4	**SRTS – Sunset Primary**	**14**	**0**	**3**	**7**
SRTS-5	SRTS – Cedar Oak Primary	14	0	4	3
C-2	Lancaster Street	15	1	6	0
C-12	Bland Circle	15	1	4	4
C-15	Clark Street	15	3	4	2

			Public Input		
Corridor ID	**Corridor**	**Draft Ranking**	**Should be lower**	**OK with priority**	**Should be higher**
C-16	Cornwall Street	15	1	4	2
C-18	Johnson Road	15	0	3	4
C-22	Pimlico Drive	15	1	3	4

Comments related to corridor prioritization:
I am pleased to see the Johnson rd priority!! Bike paths very important on this road!!
I support prioritizing Willamette Falls drive as #1 and doing everything possible to protect the downtown Willamette area and neighborhoods along this stretch from I-205 overflow traffic.
As previously mentioned, the Cedar Oak area west of the school needs attention, particularly Walling Way
Hidden springs is too steep and dangerous for traffic flow. Feeding more traffic on it will be dangerous. Use Pimlico.

Corridor Solutions – Arterial Streets

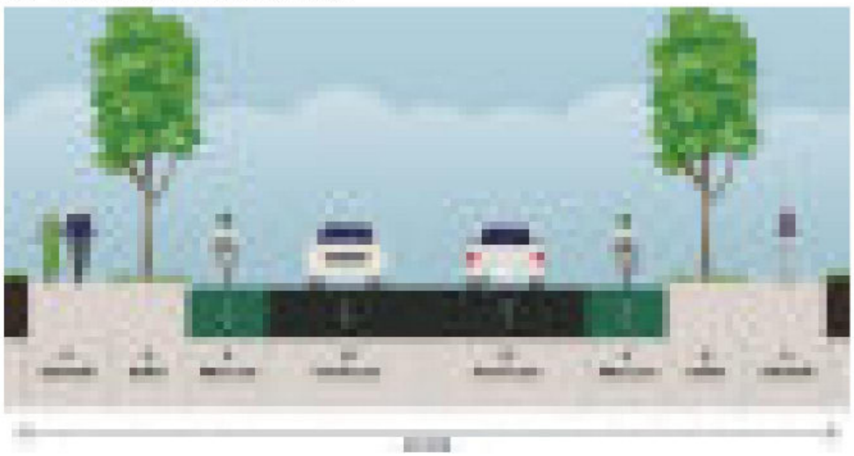
Participants were asked which cross-section they think is the most appropriate for arterial streets in the City, as shown in the image below:



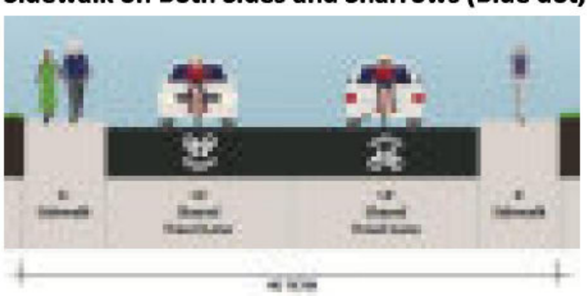
The arterial cross-section options provided are shown enlarged below:

Standard Cross-Section (Red dot, 72'):

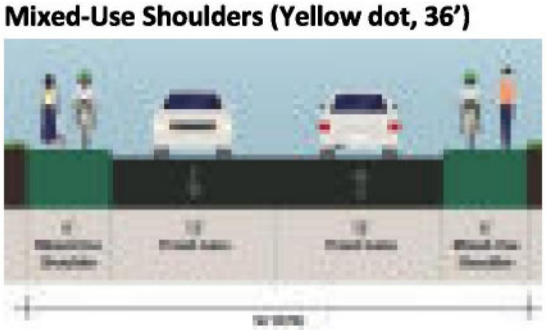
No Median (Green dot, 60'):



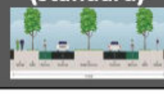
Sidewalk on Both Sides and Sharrows (Blue dot, 40')



Mixed-Use Shoulders (Yellow dot, 36')



The following input and comments were received on-line:

ID	Corridor	72' (standard) 	60' (no median) 	40' (sharrows and sidewalks) 	36' (mixed-use shoulders) 	Total
C-1	Hidden Springs Road	1	3	3	2	**9**
C-2	Lancaster Street	1	1	3	2	**7**
C-3	Parker Road	1	3	3	0	**7**
C-4	Rosemont Road	4	5	1	0	**10**
C-5	Salamo Road	5	2	2	0	**9**
C-6	Santa Anita Drive	5	1	2	1	**9**
C-7	Skyline Drive	1	3	5	0	**9**
C-8	Sunset Avenue	0	1	5	2	**8**
C-9	West A Street	0	8	0	1	**9**
C-10	Willamette Falls Drive	3	9	0	0	**12**
C-11	10^{th} Street	4	4	2	1	**11**

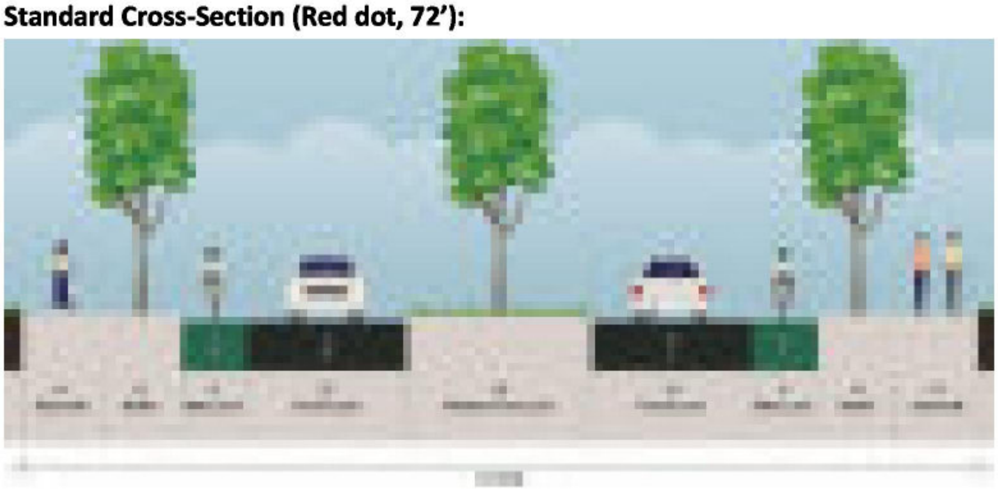
Comments related to cross-sections for arterials streets:
As a West Linn citizen and mother to two young children who will grow up here, it is important to me that roadways are safe for both walkers & bikers, and in turn, drivers. As it is, West Linn is not friendly to non-motorists. I would like to see this change.
The piece of Willamette Falls drive from Swiftshore into town should really be paved...kids could then safely walk to WPS and folks in the neighborhood would more easily walk into town rather than creating parking congestion in Willamette.
Willamette Falls Drive is a major concern for me, as I ride this often. High speeds, blind corners, frequent bike traffic and a deteriorating shoulder make this route a priority in my mind.

Corridor Solutions – Collector Streets

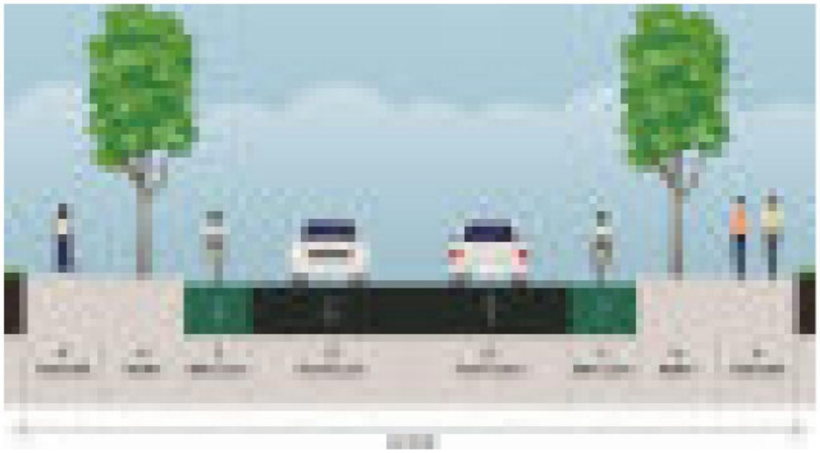
Participants were asked which cross-section they think is the most appropriate for collector streets, as shown in the image below:

The options given were similar to that provided for arterial streets, as shown below:

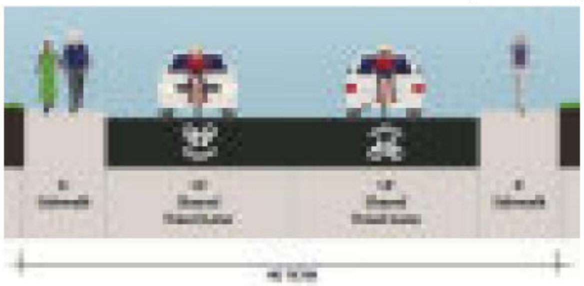
Standard Cross-Section (Red dot, 72'):



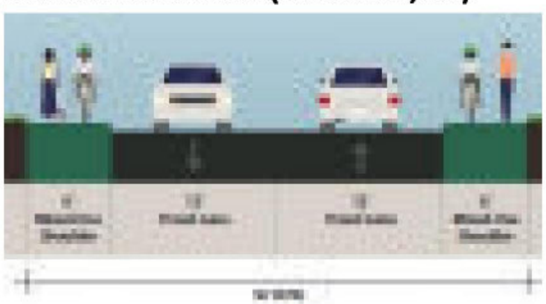
No Median (Green dot, 58'):



Sidewalk on Both Sides and Sharrows (Blue dot, 40')

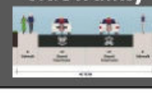


Mixed-Use Shoulders (Yellow dot, 36')



The following input and comments were received on-line:

ID	Corridor	72' (standard) 	58' (no median) 	40' (sharrows and sidewalks) 	36' (mixed-use shoulders) 	Total
C-12	Bland Circle	0	0	3	3	6
C-13	Blankenship Road	2	2	3	2	9
C-14	Carriage Way	0	1	2	3	6
C-15	Clark Street	1	0	1	4	6
C-16	Cornwall Street	1	0	2	3	6

ID	Corridor	72' (standard) 	58' (no median) 	40' (sharrows and sidewalks) 	36' (mixed-use shoulders) 	Total
C-17	Dollar Street	2	3	0	3	8
C-18	Johnson Road	3	2	2	2	9
C-19	Marylhurst Drive	2	2	3	0	7
C-20	Old River Drive	1	2	1	3	7
C-21	Ostman Road	0	2	2	4	8
C-22	Pimlico Drive	2	1	1	3	7
C-23	Summit Street	1	0	2	3	6
C-24	Suncrest Road	1	0	1	4	6
C-25	Tannler Drive	1	1	2	2	6

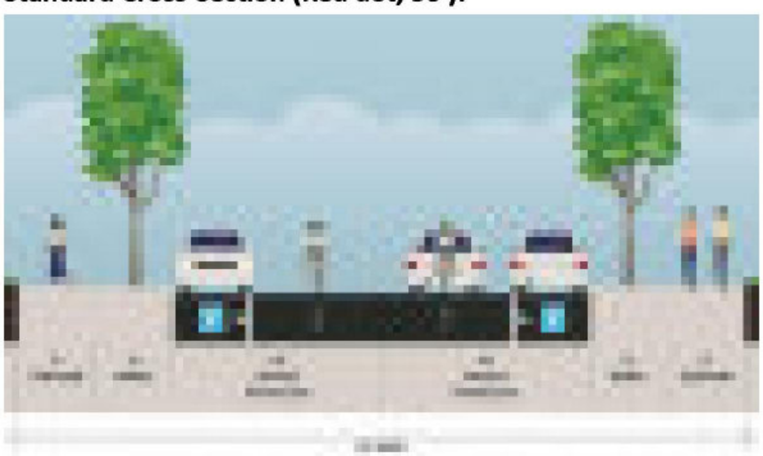
Comments related to cross-sections for collector streets:
Johnson Rd is extremely dangerous for bikers and walkers, yet is one of the most beautiful streets in the city.
As a West Linn citizen and mother to two young children who will grow up here, it is important to me that roadways are safe for both walkers & bikers, and in turn, drivers. As it is, West Linn is not friendly to non-motorists. I would like to see this change.

Corridor Solutions – Local Streets

Participants were asked which cross-section they think is the most appropriate for local streets, as shown in the image below:

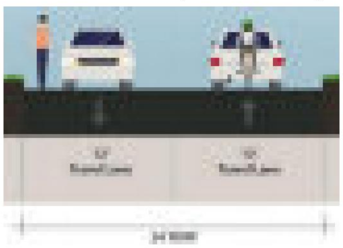
The cross-section options provided are shown enlarged below:

Standard Cross-Section (Red dot, 56'):



No Parking (Green dot, 48')

Shared Street (Yellow dot, 24')



The following input and comments were received on-line:

ID	Corridor	56' (standard) 	48' (no parking) 	24' (shared street) 	Total
SRTS-1	SRTS – Bolton Primary	2	3	1	6
SRTS-2	SRTS Willamette Primary	3	3	1	7
SRTS-3	SRTS – Trillium Creek Primary	1	4	1	6
SRTS-4	SRTS – Sunset Primary	3	2	1	6
SRTS-5	SRTS – Cedar Oak Primary	2	7	1	10

Comments related to cross-sections for local streets:
As a West Linn citizen and mother to two young children who will grow up here, it is important to me that roadways are safe (especially in school zones) for both walkers & bikers, and in turn, drivers. As it is, West Linn is not friendly to non-motorists. I would like to see this change.
Walling Way is not an option for widening, but that has the most pedestrian, bike and car traffic of any east/west corridor in my neighborhood. A bike lane or sidewalk would be really helpful

Local Street Connectivity Solutions - Prioritization

Participants were asked to indicate which local street connections (LSC they agree with the most, using a red dot. The results are shown in the image below. As shown, multiple participants indicated concern with LSC-5 (19th – Willamette Falls Drive to Swiftshore) and LSC-30 (8th Ave. – 14th to Dollar).

The comments received on-line are shown below. As shown, nearly all connections had a mix of support and concern but there was significant concern indicated for LSC-5 (19th – Willamette Falls Drive to Swiftshore).

LSC ID	Corridor	Yes – Prioritize connection	Yes – but only with development	No – concerns with connection
LSC-1	Woodhurst Place extension to Scenic Drive	2	4	6
LSC-2	Robin View Court extension to Old River Landing	3	3	4
LSC-3	Calaroga Court extension to Nixon Avenue	4	2	5
LSC-4	Fairview Way extension to Shady Hollow	2	3	6

LSC ID	Corridor	Yes – Prioritize connection	Yes – but only with development	No – concerns with connection
LSC-5	**19th Street extension from Willamette Falls Drive to Swift Shore Drive**	**2**	**3**	**27**
LSC-6	Whitten Lane extension to Marylhurst Drive	1	5	4
LSC-7	New north-south connection from Crestline Drive to Whitten Lane extension	1	5	4
LSC-8	Horton Road extension to Horton Road	2	5	4
LSC-9	Apollo Road extension to Randall Street	2	2	7
LSC-10	Shannon Lane extension to Ridge Lane	1	4	6
LSC-11	Ridge Lane extension to Ridge Lane	1	5	4
LSC-12	Roxbury Drive extension to Chinook Court	1	6	3
LSC-13	Damon Drive extension to Roxbury Drive extension	1	6	3
LSC-14	Maxfield Drive extension to Roxbury Drive extension	1	5	3
LSC-15	Landis Street extension to Landis Street	1	5	4
LSC-16	Sabo Lane extension to Sunset Avenue	1	6	4
LSC-17	Landis Street extension to Cornwall Street	2	5	2
LSC-18	New east-west connection from Reed Street to Cornwall Street	1	5	4
LSC-19	New north-south connection from the Landis Street extension to the new east-west connection	1	5	4
LSC-20	Bland Circle extension to Parker Road	1	6	4
LSC-21	New east-west connection from Bland Circle to Weatherhill Road	2	3	5
LSC-22	Crestview Drive extension to Crestview Drive	2	4	4
LSC-23	Tannler Drive extension to Sunbreak Lane extension	3	6	2
LSC-24	Sunbreak extension to Tannler Drive	1	5	4
LSC-25	Tamarisk Drive extension to Grapevine Road	0	7	3
LSC-26	Wisteria Road extension to Wisteria Road	2	6	6
LSC-27	Wild Rose Loop extension to Chelan Drive	2	7	4

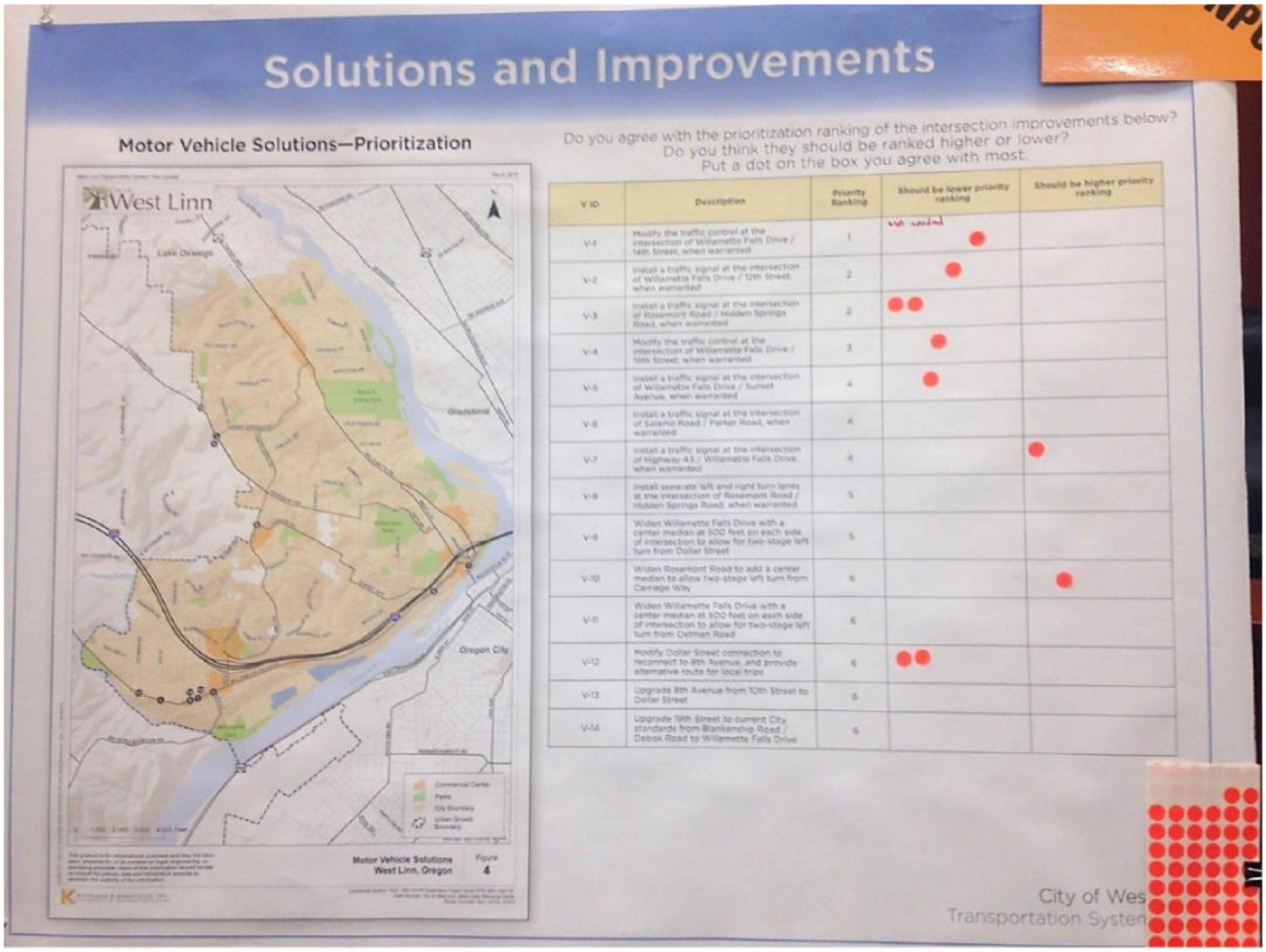
LSC ID	Corridor	Yes – Prioritize connection	Yes – but only with development	No – concerns with connection
LSC-28	Orchard Street extension to Short Street	2	4	6
LSC-29	Brandon Place extension to Willamette Falls Drive	3	4	9
LSC-30	8th Avenue extension from 14th Street to Dollar Street	5	3	7
LSC-31	Randall Street extension to Irving Street	2	5	5
LSC-32	New east-west connection from Elliot Street to Irving Street	2	3	5

Comments related to local street connections
There is absolutely NO reason to extend 19th street to Swiftshore Dr. The area of Swiftshore Drive already has fine access. In order to extend 19th out would require an absurd amount of eminent domain and land acquisition costing far too much money than any benefit would rationalize. Additionally it would be either a circuitous and/or very steep street, and far what possible reason? Better access to Swiftshore Park? It is already very accessible. This is extremely low on priorities.
I strongly object to connecting 19th Street to Swiftshore Drive. Please consider the many, many runners/walkers that pass through here and the children play in the Swiftshore and Cheryl Drive neighborhoods. This is a safe alternative for all of us to walking along Willamette Falls Drive, where there is already a lack of safe walking (no contiguous sidewalks). Not only is it safer to walk and play with the roads as they are now, but there is an element of being in "Wild West Linn" in spots that will disappear if the roads are connected. Personally, we bought a house on Swiftshore Drive because it is quiet and not a through street. Connecting 19th to Swiftshore will only give another "short cut" for the clogged Willamette Falls Drive, and may encourage more exposure/traffic to Swiftshore Park, which gets overrun by careless, rowdy partiers in the summer. There isn't a logical reason to connect these two roads, that I can see. The stairs are wonderful, "secret" stairs. Please, please do not connect these two roads!
If I read this idea right the road will cut my property in half and take out 16 old growth firs. When Short street was put in next to my house I was assured that no way would the city try to extend that road. Both myself and Mr Barnes were against this road going thru and were promised that it would never happen unless we both were to subdevide our lots, how is going to be proposed without even letting us know. Not the first time the city has tried to ram something over on me since I moved in back in 1964. The traffic is already speeding by in front of the house now you want them speeding by in the back and sides of the house. Thanks for your promise you made to us when ICON put all those houses in on Short street by saying on the record that the street would not be on any agenda. My how times change.
Extending 19th street down past Willamette Falls drive implies cutting down many very old and very beautiful trees that contribute significantly to the character of the overall neighborhood. I do not believe the minimal transportation benefit that putting this road in would effect would offset the crime off removing these trees.
The 19th street extension is ill conceived and unnecessary. The terrain is too steep and the money that would be spent on this job should be spent on higher priority needs.
Regarding the 19th Street connection - I am strongly opposed. This would increase traffic where none is needed and there are large 100+ year old douglas fir trees on that land. No need for this connection.

West Linn needs to repair the streets it currently does have, not create connections such as this.
Extending 19th to Swiftshore would create a very STEEP graded street to the same area that Swiftshore Dr. off Willamette leads. No reason to take out the steps that walkers use and put in an expensively engineered short street. Swiftshore Dr. is ONE word according to City sign on corner and post office.
#3 is private property and is a wildlife corridor That goes right next to a pond I am working hard to restore!!
I am concerned about the 19th street extension. This area already has access through walking paths to the other neighborhoods and is not necessary. We have discussed this with the city engineers and they had determined this section of the street would be too steep to build on and would be too costly for any benefits. It would cause excessive traffic to an already quiet neighborhood and potentially be dangerous for the Children playing and living here. Please withdraw this 19th street extension from your agenda.
Is there a mix up between LSC-22 and LSC-23? Diagram appears to have them mixed up compared to survey. My vote is actually for the Crestview Dr. extension to Crestview Dr. extension. On diagram, it's 23 but the survey lists it as 22.
Connecting 19th from Willamette Falls Drive to Swiftshore is illogical and impractical. Have you *looked* at the terrain and the neighborhood? I would *far* rather you spend the money on just providing sidewalks along WFD from Fields Bridge Park to the intersection with Willamette Drive (near the old bridge). On *both* sides of the road.
Re: LSC-5 I don't see a significant advantage in this extension that would justify the cost. Given the current configuration of neighborhood streets, homes, and walking access, I don't see that this extension would improve access, In fact, I think it would unnecessarily encourage traffic flow onto neighborhood streets as a bypass for congestion of Willamette Falls Dr due to I-205 overflow. The current local access in this area is more than adequate. Money should not be spent on this extension.
I would like a continuous sidewalk from the historic Willamette commercial district to Fields Bridge. Thank You
Many of the street connections will increase local traffic and provide better escape routes for criminal activity. Right now, many of the neighborhoods you have slated enjoy relatively low traffic and low home burglary. Increasing ease of thoroughfare will reduce quality of life in those neighborhoods.
The only thing putting streets through would do would be to increase traffic on those streets, particularly in mostly developed areas. In those cases, little is served but to increase traffic through what are very quite, safe neighborhoods.
Any discussion of opening 8th Ave. at Dollar St needs to be tabled for good. Without adequate pedestrian refuge it is a fatal auto-ped crash waiting to happen. Historically, 8th Ave. was a city street that had near freeway speeds it was closed due to pedestrian safety issues, opening it without addressing that would be criminal.

Motor Vehicle Solutions – Prioritization

Participants were asked whether they agree with the prioritization ranking of the intersection improvements, or whether they should be ranked higher or lower. The results are shown below:



The comments received on-line are summarized below. As shown, most projects had a mix of support for higher or lower ranking; however the top four projects had more equal support for lower ranking as OK or OK and higher. V-7 (signal at Hwy 43/Willamette Falls Drive) was the only project with overwhelming support for higher ranking.

V ID	Project	Priority Ranking	Should be lower	OK with priority	Should be higher
V-1	Modify the traffic control at the intersection of Willamette Falls Drive / 14th Street, when warranted	1	7	6	0
V-2	Install a traffic signal at the intersection of Willamette Falls Drive / 12th Street, when warranted	2	7	4	3
V-3	Install a traffic signal at the intersection of Rosemont Road / Hidden Springs Road, when warranted	2	5	5	1

V ID	Project	Priority Ranking	Should be lower	OK with priority	Should be higher
V-4	Modify the traffic control at the intersection of Willamette Falls Drive / 19th Street, when warranted	3	8	6	1
V-5	Install a traffic signal at the intersection of Willamette Falls Drive / Sunset Avenue, when warranted	4	5	4	4
V-6	Install a traffic signal at the intersection of Salamo Road / Parker Road, when warranted	4	4	7	0
V-7	**Install a traffic signal at the intersection of Highway 43 / Willamette Falls Drive, when warranted**	**4**	**0**	**2**	**12**
V-8	Install separate left and right turn lanes at the intersection of Rosemont Road / Hidden Springs Road, when warranted	5	2	6	3
V-9	Widen Willamette Falls Drive with a center median at 500 feet on each side of intersection to allow for two-stage left turn from Dollar Street	5	3	5	5
V-10	Widen Rosemont Road to add a center median to allow two-stage left turn from Carriage Way	6	2	6	1
V-11	Widen Willamette Falls Drive with a center median at 500 feet on each side of intersection to allow for two-stage left turn from Ostman Road	6	4	6	2
V-12	Modify Dollar Street connection to reconnect to 8th Avenue, and provide alternative route for local trips	6	4	5	4
V-13	Upgrade 8th Avenue from 10th Street to Dollar Street	6	3	3	5
V-14	Upgrade 19th Street to current City standards from Blankenship Road / Debok Road to Willamette Falls Drive	6	0	0	0

Comments related to motor vehicle solutions
Please, please, please focus on getting lights at the intersection of Willamette Falls Drive and Highway 43! This is the WORST nightmare in West Linn. Please and Thank you!!
I have concerns about over-regulating the traffic flow in the old Willamette area. Slow-downs in traffic (e.g.: where the new stop sign has been put in at 12th & Willamette Falls) can cause a lengthing of high traffic times, and also will contribute to air pollution. It would be great to have traffic flow thru more smoothly, but I'm also not eager to have lanes widened, as I think it would change the "small town" feel of the area. I don't have any solutions though...
I am wondering why you don't address the odd intersection of Ostman and Dollar street. The owner to the south east corner was allowed to not do any street modifications for curbs or sidewalks during their applicaiton for a retirement home business. To the North West Corner the street should be widened to to accomidate sidewalks as well. Not sure why the city is so concerned about their rules and

regulations when they let items like this slip. Sorry, don't mean to be disrespectful but I just don't understand. Anyway this corner should be put on your agenda as well. Thank you
There have been several studies in the past concerning traffic signals. ALL of them indicated that traffic slows when signals are installed unless the signals are coordinated/synchronized to maintain the flow of traffic. Nearly 1/3 more fuel is consumed along with a 40% increase in pollution and reduction in traffic flow when using "on demand" or simple timed traffic signals. If traffic signals are installed, every effort must be made to ensure those signals are controlled to allow free flow of traffic. With the cheap technology we have today, it is both foolish and environmentally irresponsible to increase traffic pollution simply to achieve a stated city goal. Traffic control by obstruction is not control, it is mismanagement and irresponsible Bureaucratic sloth.
You need a signal at Hwy 43 and Pimlico. People have died there.

Other Workshop Comments:

The following comments were recorded at the workshop flipcharts throughout the room:

- Non-local streets should have median (all streets) to support sensors for driverless vehicles – especially to meet the needs of future shopping centers.
- Sidewalks on one side where geography permits, especially Salamo.
- Current ODOT report says Willamette Falls Borland traffic is only 15% freeway bypass for non-locals. Redo study or city of West Linn do our own study.
- Light up crosswalk in downtown Willamette.
- Pedestrian and bike crossing at Mapleton needs to be addressed- accidents.
- River taxi to downtown.
- On route 43, install zebra crossing cross 43 between all the bus stops opposite (or closely opposite) from West A Street through the Hidden Springs. No pedestrian island (anywhere) because limits bailing options for both pedestrian and vehicle. Not necessary to have flashing crossing lights at these zebra crossing.
- Roundabout on Arch Bridge Project saves lives and keep scar insurance rates down!
- Remove clover leaf of I-205 and Route 43
- Make a left turn lane from HWY 43 to Buck Street heading North.
- Sidewalk on Falling to Old River Road

On-line Comments

The following general comments were received through the on-line workshop:

What did we miss in identifying problems and decisions regarding the transportation systems? What are your additional concerns? Tell us what you think are the main transportation needs the plan should consider.
Many of the street extensions are just not needed
I'd like to see ways to get kids over the hills. I feel that kids are so dependent on parents driving cars to get from, say, Debok Road, to West Linn High School or to the Parker Road area. I'd like to see shuttles that run all day during the week, and occasionally on the weekends. Ones that kids can put their bikes on and maybe even flag down if needed. It may sound crazy but there would be fewer cars on the streets and our kids could be much more independent!

Very concerned about the lack of school speed signage around Willamette Primary school on 5th Ave. Commuters cut through our neighborhoods to avoid Willamette Falls Drive (often speeding) in the morning and in the afternoons when neighborhoods are full of children outside playing and or walking to/from school.
I am concerned about the proposed 19th street extension. The proposed area is very steep and would probably be a road hazard for cars. Furthermore, this route is already serviced by walking steps that are frequented by children. The increased traffic would be a hazard. Thank you.
This project would be very costly with little if any gain for traffic issues.
n/a at this time
Bike lanes would be really nice, especially on Willamette Falls drive! Sidewalks in all areas would be real nice too.
Please do not put in the 19th street extension, The added intersection to an already busy Willamette Falls drive is unnecessary. It does not add any benifit to the City of West Linn or the local residences. There is already connectivity through walking paths to the Neighborhoods and adiquate access for vehicals, has been fine for 35 years. This is a quite and peiceful Neighborhood and we would like to keep it that way.
No reason to take out the walking steps, Grade too steep 15%, Increased traffic, Possible speed bumps, All houses on that extension are facing their back yard, More possible crime - easy access to backyards, Traffic avoiding delays on Willamette falls will cut through our neighborhood, Putting children at risk, Increased intersections on an already busy Willamette Falls drive, Costly for little if any gain, Neighborhood already connected.
My family and I are concerned about your proposal to extend 19th street. This would cause excessive traffic and a potentially dangerous situation for the residence. Travelers trying to skip around Willamette Falls traffic would try to find a short cut through our neighbor hood. We have steep streets and tight corners and the additional traffic racing through our neighbor hood would be dangerous for the children that play and live here. Cars driving through would not be paying attention to children playing in the streets or riding their bikes. The next thing we know is we would have to endure speed bumps. Just not right for a small neighbor hood that is already well connected. All the homes adjacent to the extension have road access from the front of their houses, the extension would only boarder the backyards of the existing residences. We also have enough problems with teen agers racing through our neighbor hood as it is. This would just give them another avenue. This section is very steep and not buildable by the city anyway, we have discussed this in detail in previous meetings with the city. The engineers had deemed this impractical and costly. This neighbor hood dead ends in this section and there is no need for extending neighbor hoods. Please consider withdrawing this proposal from your agenda (Permanently). Thank you.
Build a bike lane along one side of Willamette Falls Drive, from hwy. 43 all the way to Stafford Road. Runners, bikers and pedestrians need a safe space to travel. Please

Citizens wish you would hire people who do this pre work and planning work for the city, that LIVE in the city of West Linn...so they understand out city better. YES .. you would have a good selection of candidates with the job qualifications needed, to pull from. . The 19th Street Extension makes no sense. To spend a huge amount of money, because of the 15% or more grade needed to accomplish this, to end up at a dead end? When you have nice walking steps for citizens to walk....taking these out and putting in a street to a dead end? In future please give reasons employee came up with in thinking this needed to be extended? When asked at meeting... employee simply said was part of " old plan" but did not know why it was on the "old plan" either. City doesn't have any money, why waste city money on work to put an extension up for questioning when city employees could not find, or did not know of reason for an extension in first place?
As a West Linn resident and an employee for a local business I am opposed to the expansion of 19th street and find this idea disturbing and a waist of local resources. If the expansion were to take place, property values would be dramatically reduced due to the by-pass traffic that would come from cars skirting around the Willamette Falls congestion. This is a quiet neighborhood with its own charm. No new local traffic would be achieved. Please take you effort and money to some other better use.
Cheryl Drive and Swift Shore Drive provide more than enough access to neighborhood. Furthermore, given the amount of traffic on Willamette Falls drive, it seems that adding another arterial road to feed this, makes little sense. The potentially very small benefits of extending 19th street would seem to outweigh the costs (incline, 200 year old trees, etc)
Sidewalks on the streets we have, not new streets
Concerning: extending 19th to Swiftshore Drive, from Willamette Falls (thru steps) down to the river. As an engineer, I can see the logistics and changes involved, particularly the destruction of quite scenic property. I can also see the destruction of two quiet, close knit neighborhoods which have achieved this because of the elimination of thru traffic in those areas. If I were a skateboarder, I would love this idea but realistically, what does the city gain for a huge expense? If the city gains nothing and the community looses completely, then the object behind this must be profit for the contractor. Who is the contractor who is likely to benefit and what is their relationship with the people pushing for this unwarranted and completely foolish idea? Corruption in government is so very shameful and I cannot believe West Linn officials would stoop to such a move.
Remember that one of the reasons we live here is because it is quite and peaceful and has a low crime rate. We LIKE that. We don't want traffic racing around our residential streets because you put in connectors in places that haven't had them for 25+ years. You need to put a light down on Hwy 43 and Pimlico, it is bad down there during rush hour. Also at Hwy 43 and Williamette Falls drive, very congested. Otherwise, if you are doing stuff just to spend money, consider waiting.
The main issues are safe and functional intersections. Those without traffic lights like at Pimlico and Hwy 43, and Willamette Falls Drive and Willamette Dr near the bridge get horrendously congested during peak traffic hours. Other than that, many of the through puts you suggest will only increase traffic and reduce quality of life in those neighborhoods. I have been getting around here for 13 years just fine without the through puts suggested.
hidden springs is too steep to be a major feeder. Start pushing more traffic to Pimlico. Trucks should be restricted on hidden springs due to dangerousness.
As my property backs onto hwy 43, I am concerned about how much property I may lose if the changes go into effect. I also think a light should be considered at the hwy43/walling circle near mcdonalds. It is a very tough intersection during morning and evening rush hours.

Handouts

The following handout was provided at the workshop and online:

CITY OF West Linn
Transportation System Plan Update

The City of West Linn is currently working with the Oregon Department of Transportation (ODOT) and others to update the City's Transportation System Plan (TSP).

The West Linn TSP is a long-range planning document that helps the City identify and prioritize improvements to the transportation system over the next 25 years. The West Linn TSP Update will include an evaluation of the existing transportation systems within West Linn, including the pedestrian, bicycle, transit, motor vehicle, and other systems, the identification of existing and future transportation system needs, and prioritization of potential transportation improvement projects to address needs.

Community Workshops

There will be three community workshops for this project. You will be able participate in all workshops in person at City Hall or on-line. The on-line "Virtual Community Meetings" allow local residents to receive all of the same information and provide comments on-line. They will be held at the same time as the in person workshops on the City's website and will be available to provide comments for up to one-week following the meeting. The information will remain available even after the commenting period is over.

Community Workshop #1 – 3/10/15 at City Hall and Online through 3/16/15

In March we had the first of three community workshops that will occur over the course of this project. The workshop was held at City Hall and on-line. The purpose of Community Workshop #1 was to introduce local residents to the project purpose, process, and intended outcomes as well as to receive comments on the identified transportation needs. We received over 150 comments from dozens of people. Did you miss the workshop? See what others had to say on the online workshop at http://openhouse.jla.us.com/project/westlinntsp1

Project Goals

Goals for the updated **Transportation System Plan** include:

SAFETY — Reduce transportation related fatalities and injuries for all transportation modes

MOBILITY, ACCESS AND ENVIRONMENT — Improve people's access to jobs, schools, healthcare and other needs in ways that improve health, reduce pollution and retain money in the local economy

EQUITY — Deliver transportation improvements equitably

MAINTENANCE — Deliver access and safety improvements cost effectively, within available revenues and responsibly to the needs of all users of the transportation system

Attend the Community Workshop #2 Online through Tuesday, April 14th. — westlinntsp.org

Community Workshop #2 – 4/8/15 at City Hall and Online through 4/14/15

Community Workshop #2 will be held on April 8th, 2015 from 6 p.m. to 8 p.m. at West Linn City Hall in the Council Chambers. The purpose of this workshop is to share and discuss transportation solutions to address the City's needs discussed at Workshop #1. *Attend the workshop online through April 14th, 2015.*

Community Workshop #3 – July 2015

Community Workshop #3 will be held in July 2015 and will also include an in-person workshop at City Hall as well as an on-line Virtual Community Workshop.

The purpose of this workshop will be to obtain feedback on the Draft Transportation System Plan prior to adoption hearings by the Planning Commission and City Council in the fall of 2015.

Other Opportunities

We are also meeting periodically with the **Transportation Advisory Board, Planning Commission, and City Council** about this project. Check the project website to see when these occur.

http://westlinnoregon.gov/planning/transportation-system-plan-update

Project Timeline

We Are Here

July 2015

September 2015

TAC= Technical Advisory Committee
CAC= Citizen Advisory Committee
PC= Planning Commission
CC= City Council

Questions/Comments?

Not finding what you need on-line? Please feel free to contact Zach Pelz with the City of West Linn with any questions or comments you have about the West Linn TSP update.

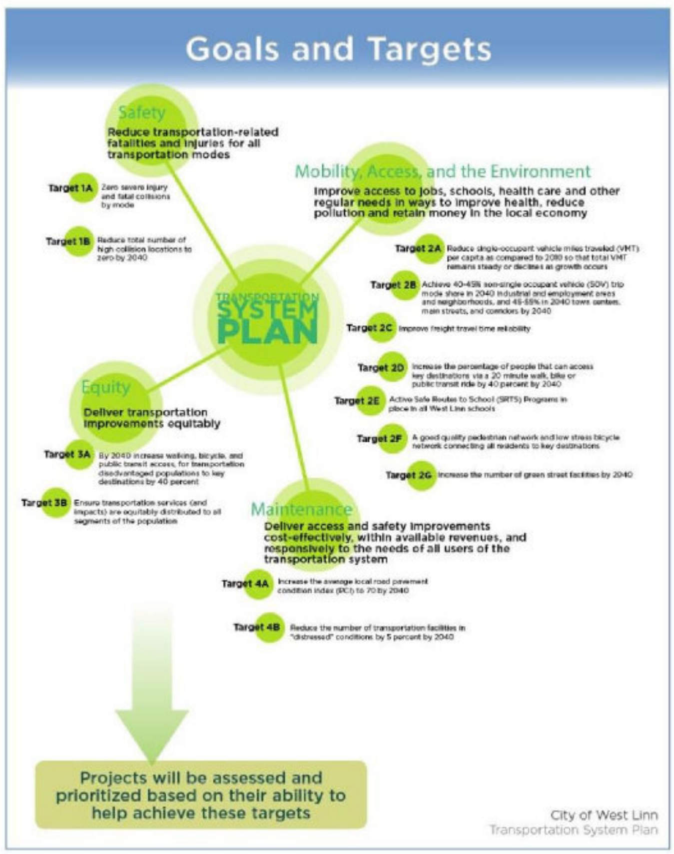
Zach Pelz, AICP
Associate Planner
City of West Linn
22500 Salamo Rd.
(503) 723-2542
zpelz@westlinnoregon.gov

Stay Involved

Project documents and meeting dates can be found on the City's project website:

http://westlinnoregon.gov/planning/transportation-system-plan-update

In addition, the following poster illustrating the four project goals and associated targets was provided at the workshop and online:



CITY OF WEST LINN
TRANSPORTATION SYSTEM PLAN

Public Workshop #2
April 8, 2015
Sign-in Sheet

Name ALICE RICHMOND
Address 3939 Parker Rd - 97068
~~Email~~ phone 503 723 0101

Name Kathleen McDonald
Address 25435 Swift Shore West Linn
Email Kathleen@ KathleenMcDonaldRealEstate.com

Name Mary O'Malley
Address 25425 Swiftshore Dr West Linn
Email weare1@pacbell.net

Name GAIL CURTIS, ODOT
Address 123 NW FLANDERS PORT. 97201
Email gail.e.curtis@odot.state.or.us

Name Paul Osborn
Address 2331 Hammerle St.
Email phosborn@comcast.net

Name Don Kanssbonough
Address Box 148
Email Kanssbonnons@AOL.COM.

Name Joyce Jackson
Address 1940 Sylvan Way
Email jj@joycejackson-la.com

Name Cindy & Steve Garner
Address 3535 Riverknoll Way
Email clgarner@comcast.net

CITY OF WEST LINN
TRANSPORTATION SYSTEM PLAN

Public Workshop #2
April 8, 2015
Sign-in Sheet

Name GLEN FRIEDMAN
Address 19250 NIXON AVE
Email

Name Alan Smith
Address 1941 Buck St.
Email aalansmith57@gmail.com

Name
Address
Email

Name
Address
Email

Name
Address
Email

Name
Address
Email

Name
Address
Email

Name
Address
Email

CITY OF WEST LINN
TRANSPORTATION SYSTEM PLAN

Public Workshop #2
April 8, 2015
Comment Sheet

Name Alice Richmond. Dec. 1958 to present.
Address 3939 Parker Rd.
Email none

What would you like us to know?

1st a lodging as B & B High quality
or an elite iNN as Country formal -
or so it looks very appealing - with
arcade type entertainment for guests and
other public (Residents - local from around)
to enjoy the facilities - could (and should?)
have a swimming pool same as High end
lodgings offers (even the Hiltons & marriotts do.).

and the todays T.S. plan should accommodate
and prepare the mode of getting from one
destination to another - it should make TSP.
appealing and dependable and relyable for
the (very) near needs of future vehicules etc.
for Residents and destinations —

CITY OF WEST LINN
TRANSPORTATION SYSTEM PLAN

Public Workshop #2
April 8, 2015
Comment Sheet

Name Alice Richmond

Address

Email

What would you like us to know?

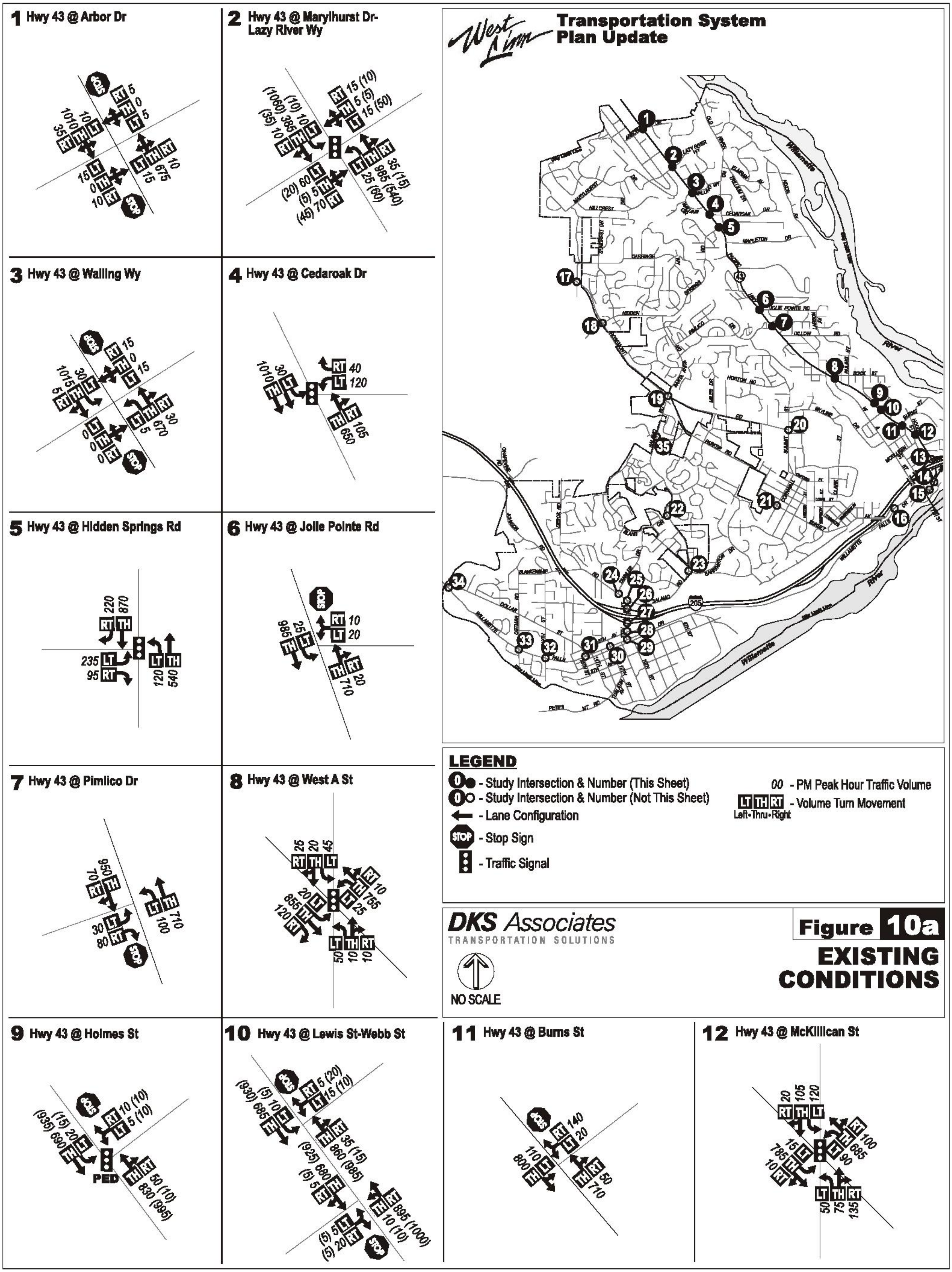
(1) Left turn from Wild Rose to WB Rosemont Rd is dangerous due to sight distance. Worsened by new signal @ Salamo Rd. / Rosemont Rd.

(2) Turn onto West A from McKillican after school is difficult

(3) while ~~large~~ bicycles are a good thing for some people to use for recreation, but when used these 2 wheelers as destination vehicules and Riden on T.S. Road they should shoulder the burden to share the Road (O.dot) Taxes - just because they do not use gas - They are hazards on T.S.'s Road. - let's have bicyclers ~~pay~~ pay their dues - thank you! —

(4) High Schoolers driving cars need to respect other drivers around when they all are discharge from school and gang together and not giving a chance for drivers to enter from side street - such as Kiligan Rd & Hlo Sunset Rd —

Appendix B
Traffic Volumes/Counts



1 Hwy 43 @ Arbor Dr
2 Hwy 43 @ Marylhurst Dr-Lazy River Wy
3 Hwy 43 @ Walling Wy
4 Hwy 43 @ Cedaroak Dr
5 Hwy 43 @ Hidden Springs Rd
6 Hwy 43 @ Jolie Pointe Rd
7 Hwy 43 @ Pimlico Dr
8 Hwy 43 @ West A St
9 Hwy 43 @ Holmes St
10 Hwy 43 @ Lewis St-Webb St
11 Hwy 43 @ Burns St
12 Hwy 43 @ McKillican St
West Linn
Transportation System Plan Update
Willamette River
LEGEND
- Study Intersection & Number (This Sheet)
- Study Intersection & Number (Not This Sheet)
- Lane Configuration
- Stop Sign
- Traffic Signal
00 - PM Peak Hour Traffic Volume
LT TH RT - Volume Turn Movement
Left•Thru•Right
DKS Associates
TRANSPORTATION SOLUTIONS
NO SCALE
Figure 10a
EXISTING CONDITIONS

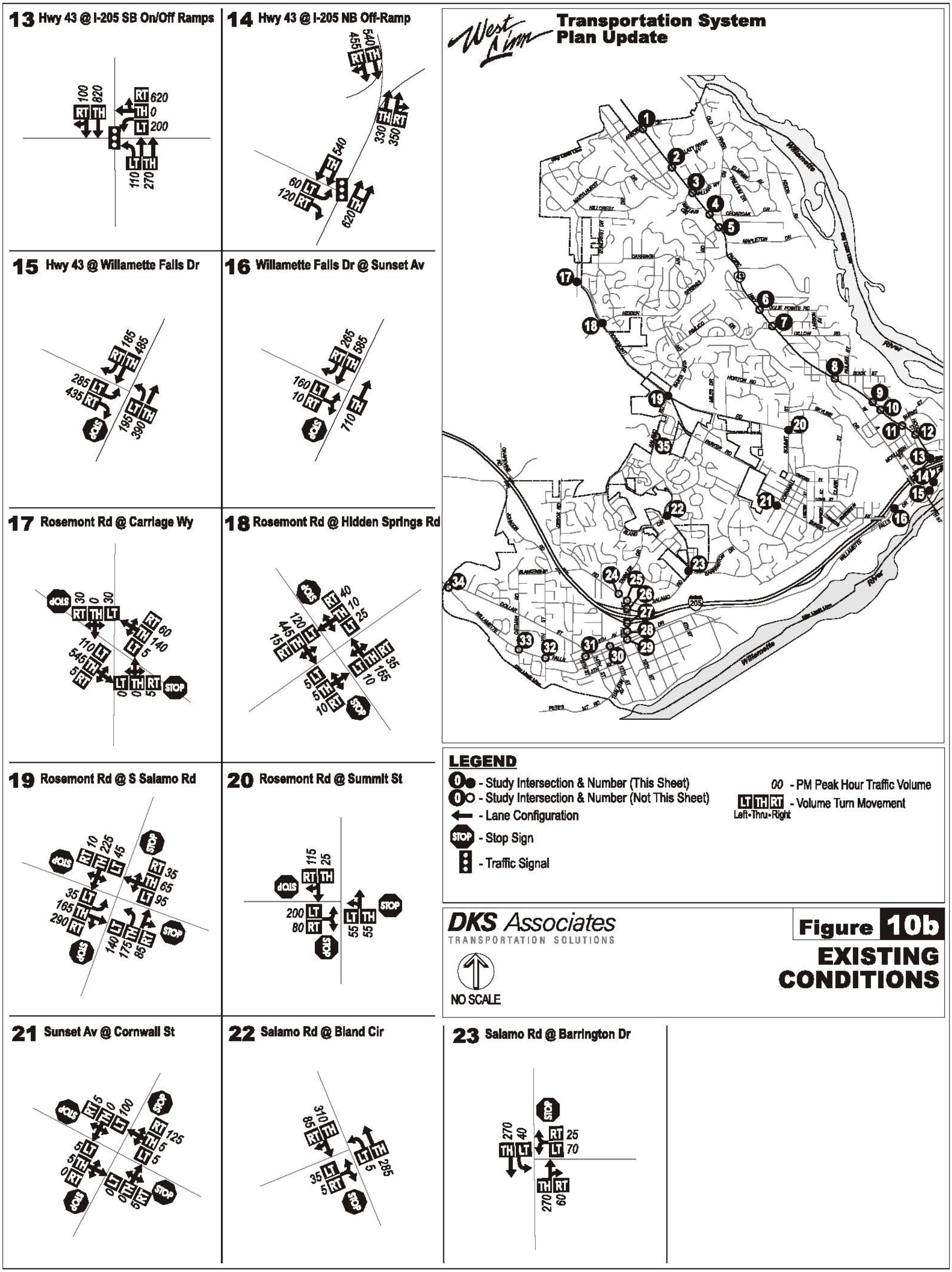
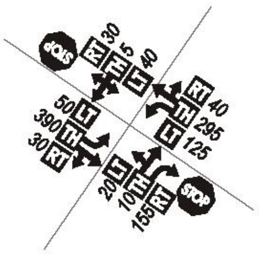
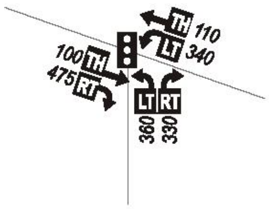


Figure 10b
EXISTING CONDITIONS

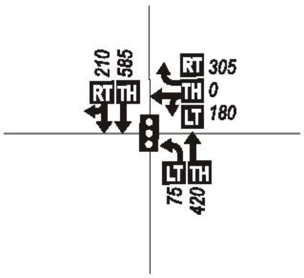
24 Blankenship Rd @ Tannler Dr



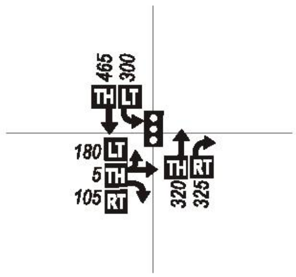
25 10th St @ Blankenship Rd



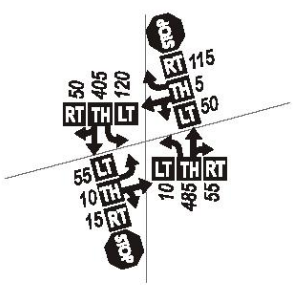
26 10th St @ I-205 SB Ramps



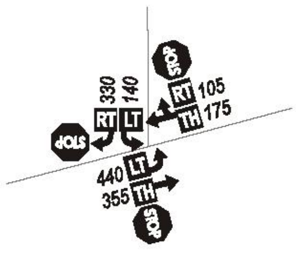
27 10th St @ I-205 NB Ramps



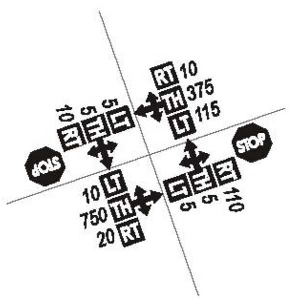
28 10th St @ 8th Av



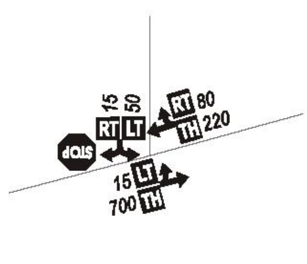
29 10th St @ Willamette Falls Dr



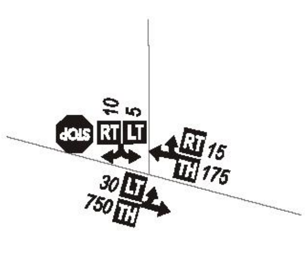
30 Willamette Falls Dr @ 12th St



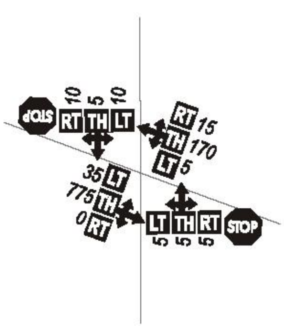
31 Willamette Falls Dr @ Dollar St E



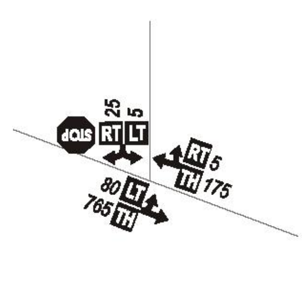
32 Willamette Falls Dr @ 19th St



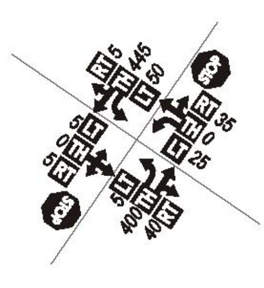
33 Willamette Falls Dr @ Ostman Rd



34 Willamette Falls Dr @ Dollar St W

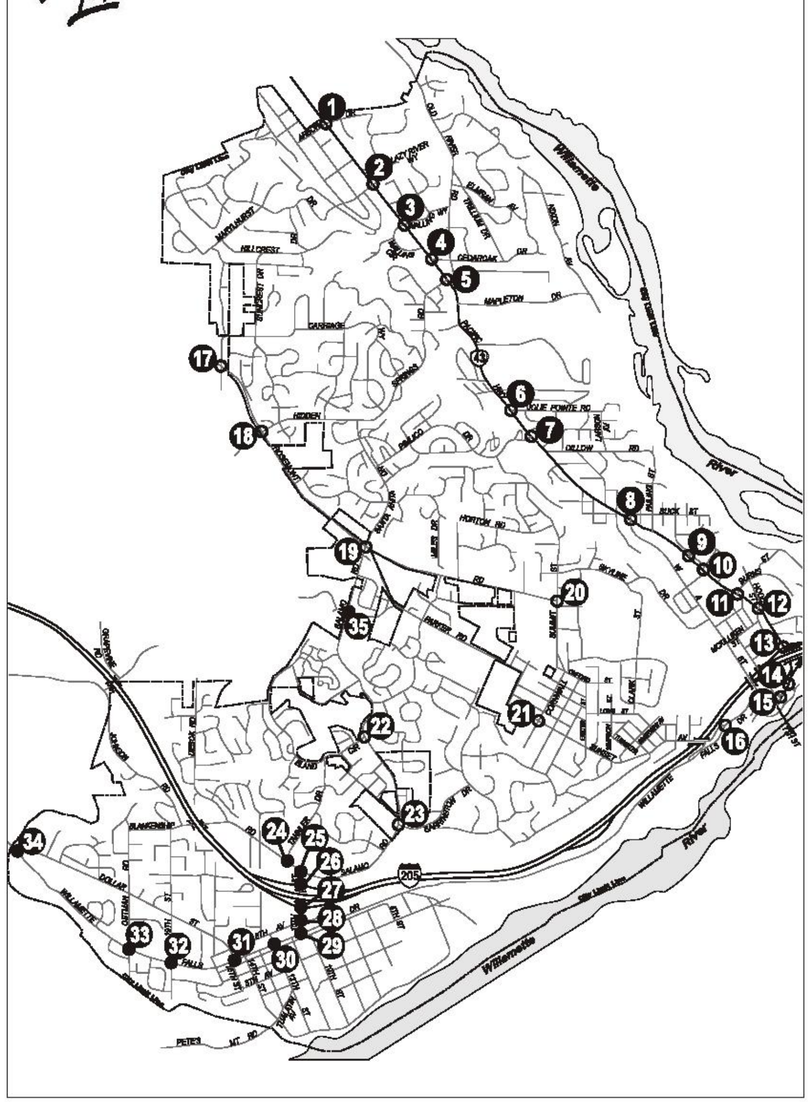


35 Salamo Rd @ Parker Rd



West Linn

Transportation System Plan Update



LEGEND

- Study Intersection & Number (This Sheet)
- Study Intersection & Number (Not This Sheet)
- Lane Configuration
- Stop Sign
- Traffic Signal

00 - PM Peak Hour Traffic Volume

LT TH RT - Volume Turn Movement
Left•Thru•Right

DKS Associates
TRANSPORTATION SOLUTIONS

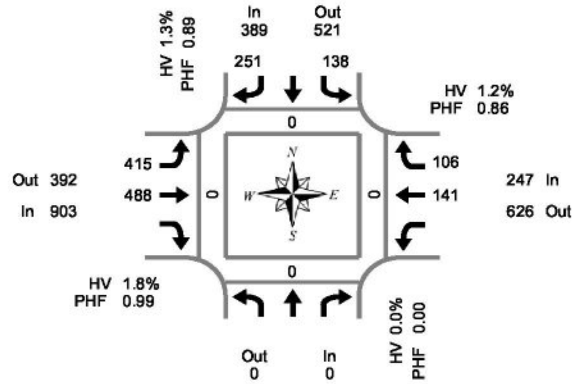
NO SCALE

Figure 10c

EXISTING CONDITIONS

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

10th St & Willamette Falls Dr

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes	
4:00 PM				0	28		54	0	74	91		0		35	13	0	295
4:15 PM				0	37		62	0	101	121		0		33	24	0	378
4:30 PM				0	47		50	0	104	123		1		30	26	0	380
4:45 PM				0	28		81	0	102	127		0		40	32	0	410
5:00 PM				0	26		58	0	108	117		0		38	24	0	371
5:15 PM				0	34		50	0	90	108		0		32	30	0	344
5:30 PM				0	30		64	0	107	106		0		39	34	0	380
5:45 PM				0	46		84	0	81	76		0		23	23	0	333
Total Survey				0	276		503	0	767	869		1		270	206	0	2,891

Interval Start Time	Pedestrians Crosswalk			
	North	South	East	West
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	2	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
Total Survey	2	0	0	0

Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	0	0	0	0	389	521	910	0	903	392	1,295	1	247	626	873	0	1,539
%HV	0.0%				1.3%				1.8%				1.2%				1.6%
PHF	0.00				0.89				0.99				0.86				0.94

	Pedestrians Crosswalk			
	North	South	East	West
Volume	0	0	0	0

By Movement	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	138		251	389	415	488		903		141	106	247	1,539
%HV	NA	NA	NA	0.0%	2.2%	NA	0.8%	1.3%	1.2%	2.3%	NA	1.8%	NA	0.0%	2.8%	1.2%	1.6%
PHF				0.00	0.73		0.77	0.89	0.96	0.96		0.99		0.88	0.83	0.86	0.94

Rolling Hour Summary
4:00 PM to 6:00 PM

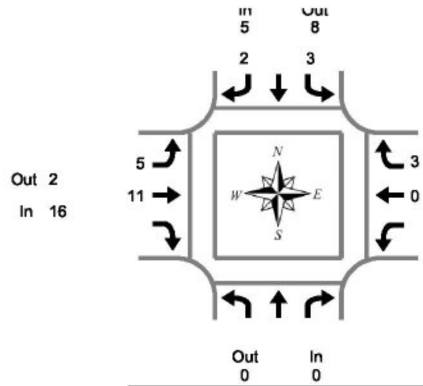
Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes	
4:00 PM				0	140		247	0	381	462		1		138	95	0	1,463
4:15 PM				0	138		251	0	415	488		1		141	106	0	1,539
4:30 PM				0	135		239	0	404	475		1		140	112	0	1,505
4:45 PM				0	118		253	0	407	458		0		149	120	0	1,505
5:00 PM				0	136		256	0	386	407		0		132	111	0	1,428

Interval Start Time	Pedestrians Crosswalk			
	North	South	East	West
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	2	0	0	0
4:45 PM	2	0	0	0
5:00 PM	2	0	0	0

Heavy Vehicle Summary

All Traffic Data
Services Inc.

Clay Carney
(503) 833-2740



10th St & Willamette Falls Dr

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Peak Hour Summary
4:15 PM to 5:15 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
4:00 PM				0	1		1	2	3	1		4		0	0	0	6
4:15 PM				0	3		1	4	3	3		6		0	1	1	11
4:30 PM				0	0		0	0	2	4		6		0	1	1	7
4:45 PM				0	0		1	1	0	3		3		0	1	1	5
5:00 PM				0	0		0	0	0	1		1		0	0	0	1
5:15 PM				0	0		0	0	1	2		3		0	0	0	3
5:30 PM				0	0		2	2	0	0		0		0	0	0	2
5:45 PM				0	2		0	2	0	1		1		0	1	1	4
Total Survey				0	6		5	11	9	15		24		0	4	4	39

Heavy Vehicle Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	In	Out	Total		In	Out	Total		In	Out	Total		In	Out	Total		
Volume	0	0	0		5	8	13		16	2	18		3	14	17		24
PHF	0.00				0.21				0.25				0.25				0.25

By Movement	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	3		2	5	5	11		16		0	3	3	24
PHF				0.00	0.19		0.25	0.21	0.16	0.28		0.25		0.00	0.25	0.25	0.25

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

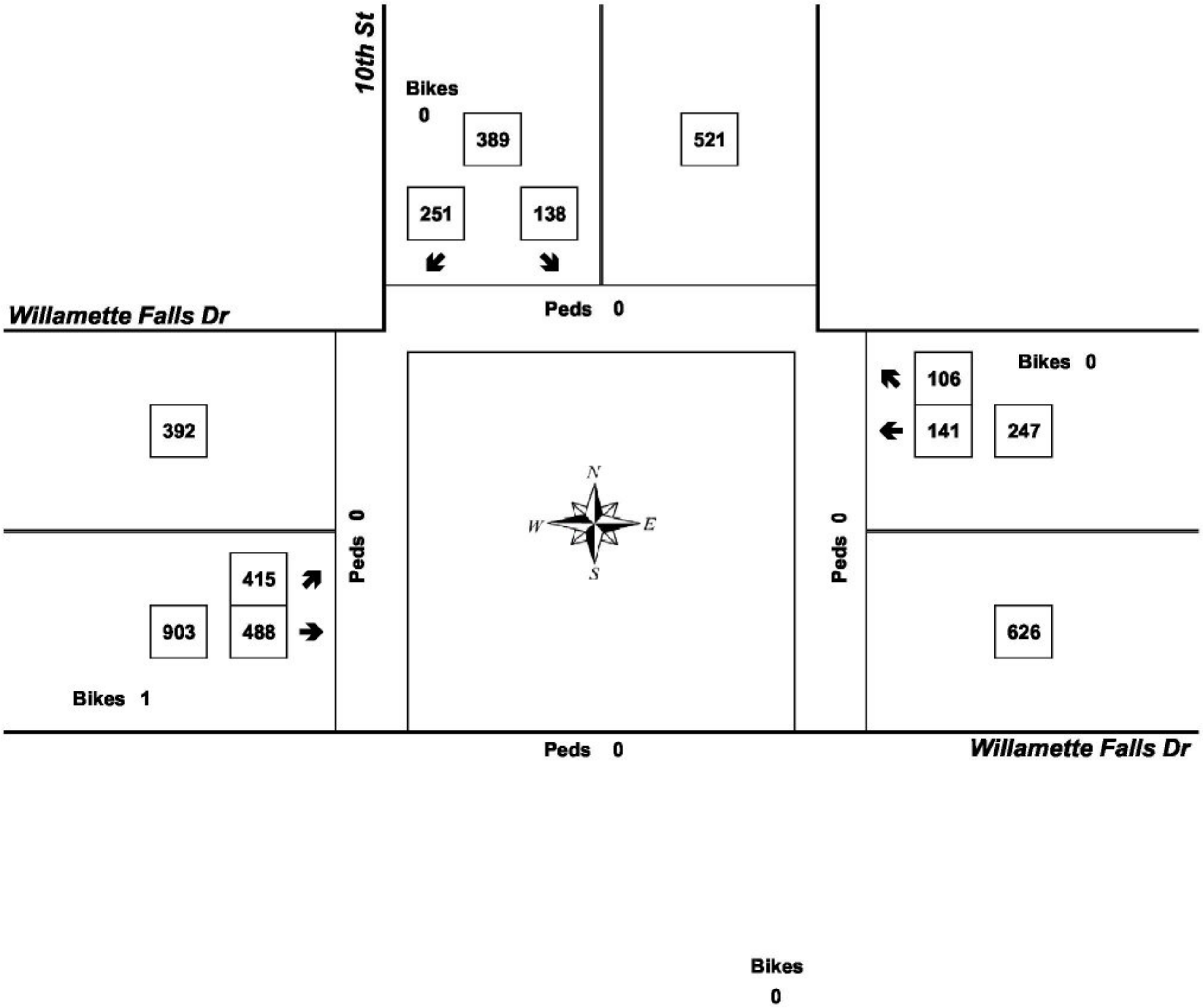
Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
4:00 PM				0	4		3	7	8	11		19		0	3	3	29
4:15 PM				0	3		2	5	5	11		16		0	3	3	24
4:30 PM				0	0		1	1	3	10		13		0	2	2	16
4:45 PM				0	0		3	3	1	6		7		0	1	1	11
5:00 PM				0	2		2	4	1	4		5		0	1	1	10

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

10th St & Willamette Falls Dr

4:15 PM to 5:15 PM
Wednesday, April 16, 2014

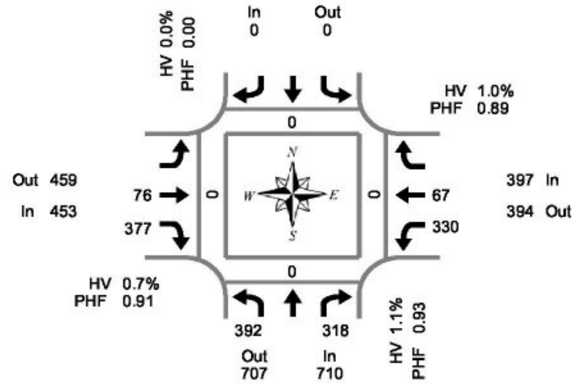


Approach	PHF	HV%	Volume
EB	0.99	1.8%	903
WB	0.86	1.2%	247
NB	0.00	0.0%	0
SB	0.89	1.3%	389
Intersection	0.94	1.6%	1,539

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

10th St & Salamo Rd

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes		T	R	Bikes	L	T		Bikes		North	South	East	West
4:00 PM	98		84	0				0		32	113	0	80	11		0	418	0	0	0	0
4:15 PM	76		70	0				0		24	105	0	93	15		0	383	0	0	0	0
4:30 PM	73		74	0				0		25	100	1	61	19		0	352	0	0	0	0
4:45 PM	83		87	0				0		27	102	0	74	19		0	392	0	0	0	0
5:00 PM	88		70	0				0		18	104	0	83	14		0	377	0	0	0	0
5:15 PM	105		77	0				0		26	87	0	81	21		0	397	0	0	0	0
5:30 PM	90		89	0				0		12	82	0	91	20		0	384	0	0	0	0
5:45 PM	109		82	0				0		20	104	0	75	12		0	402	0	0	0	0
Total Survey	722		633	0				0		184	797	1	638	131		0	3,105	0	0	0	0

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	710	707	1,417	0	0	0	0	0	453	459	912	0	397	394	791	0	1,560	0	0	0	0
%HV	1.1%				0.0%				0.7%				1.0%				1.0%				
PHF	0.93				0.00				0.91				0.89				0.97				

By Movement	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	392		318	710				0		76	377	453	330	67		397	1,560
%HV	1.0%	NA	1.3%	1.1%	NA	NA	NA	0.0%	NA	0.0%	0.8%	0.7%	1.2%	0.0%	NA	1.0%	1.0%
PHF	0.90		0.89	0.93				0.00		0.73	0.91	0.91	0.91	0.80		0.89	0.97

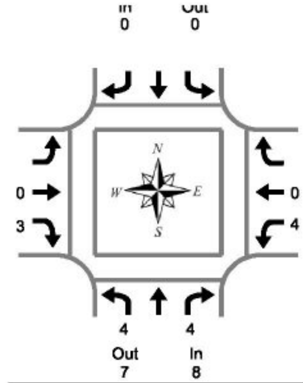
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes		T	R	Bikes	L	T		Bikes		North	South	East	West
4:00 PM	330		315	0				0		108	420	1	308	64		0	1,545	0	0	0	0
4:15 PM	320		301	0				0		94	411	1	311	67		0	1,504	0	0	0	0
4:30 PM	349		308	0				0		96	393	1	299	73		0	1,518	0	0	0	0
4:45 PM	366		323	0				0		83	375	0	329	74		0	1,550	0	0	0	0
5:00 PM	392		318	0				0		76	377	0	330	67		0	1,560	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

10th St & Salamo Rd

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	2		1	3				0		0	3	3	2	0		2	8
4:15 PM	1		0	1				0		0	4	4	4	0		4	9
4:30 PM	2		0	2				0		0	0	0	1	0		1	3
4:45 PM	0		2	2				0		0	1	1	0	0		0	3
5:00 PM	1		3	4				0		0	2	2	0	0		0	6
5:15 PM	0		1	1				0		0	0	0	2	0		2	3
5:30 PM	1		0	1				0		0	0	0	1	0		1	2
5:45 PM	2		0	2				0		0	1	1	1	0		1	4
Total Survey	9		7	16				0		0	11	11	11	0		11	38

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound 10th St			Southbound 10th St			Eastbound Salamo Rd			Westbound Salamo Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	8	7	15	0	0	0	3	4	7	4	4	8	15
PHF	0.25			0.00			0.11			0.14			0.19

By Movement	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	4		4	8				0		0	3	3	4	0		4	15
PHF	0.20		0.17	0.25				0.00		0.00	0.11	0.11	0.14	0.00		0.14	0.19

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

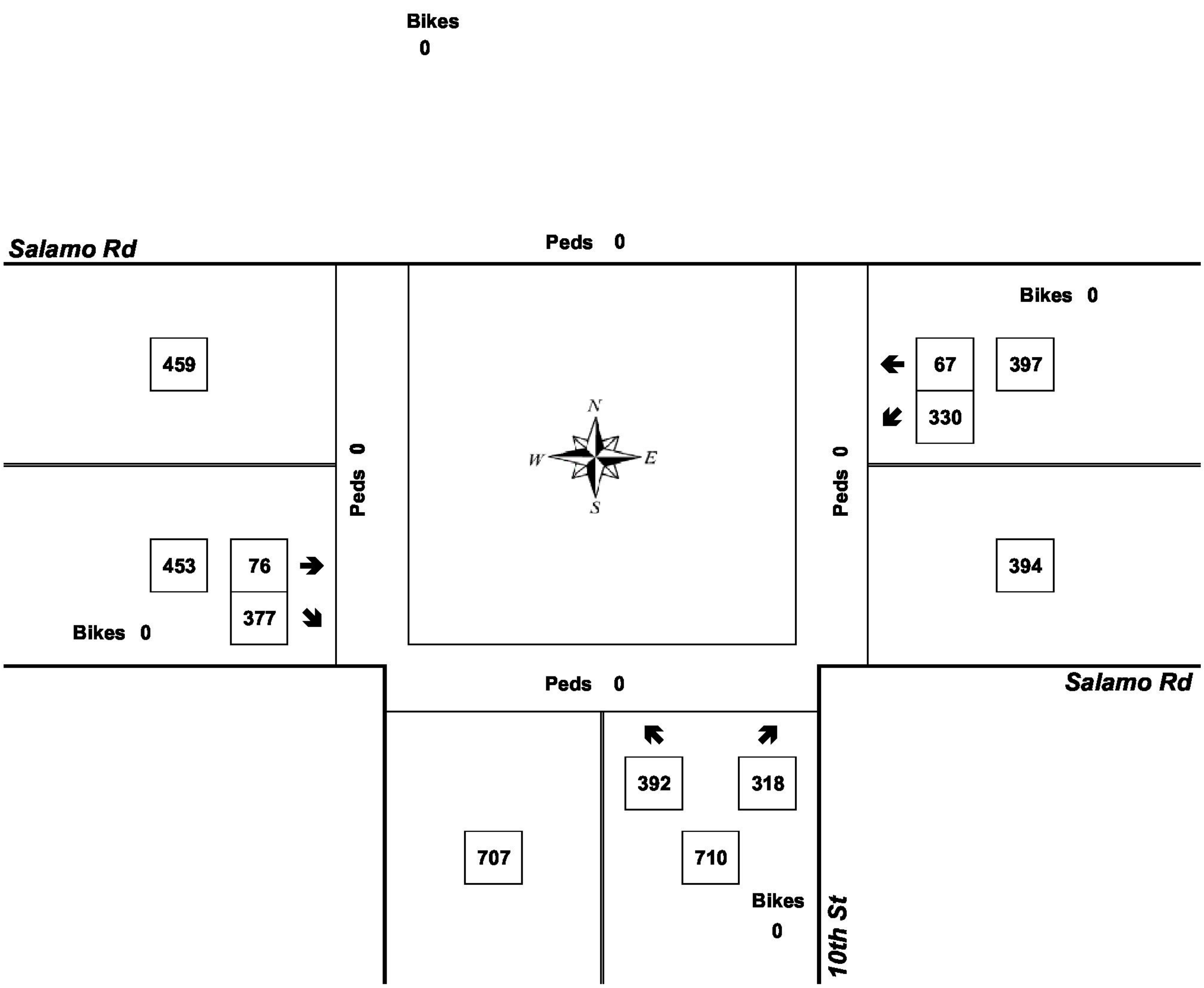
Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	5		3	8				0		0	8	8	7	0		7	23
4:15 PM	4		5	9				0		0	7	7	5	0		5	21
4:30 PM	3		6	9				0		0	3	3	3	0		3	15
4:45 PM	2		6	8				0		0	3	3	3	0		3	14
5:00 PM	4		4	8				0		0	3	3	4	0		4	15

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

10th St & Salamo Rd

5:00 PM to 6:00 PM
Wednesday, April 16, 2014

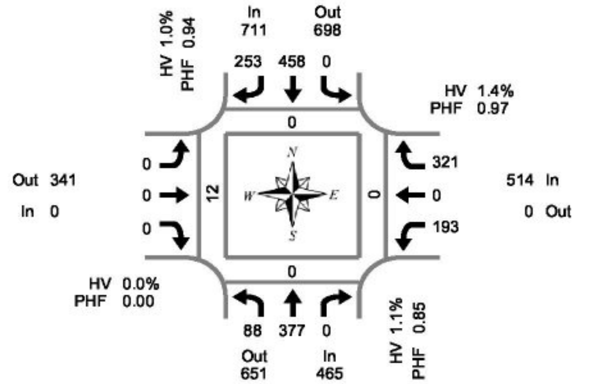


Approach	PHF	HV%	Volume
EB	0.91	0.7%	453
WB	0.89	1.0%	397
NB	0.93	1.1%	710
SB	0.00	0.0%	0
Intersection	0.97	1.0%	1,560

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



10th St & I-205 SB Ramps

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Peak Hour Summary
5:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St L	T	R	Bikes	Southbound 10th St L	T	R	Bikes	Eastbound I-205 SB Ramps L	T	R	Bikes	Westbound I-205 SB Ramps L	T	R	Bikes	Interval Total
4:00 PM	18	107	0	0	0	136	56	0	0	0	0	0	42	0	71	0	430
4:15 PM	31	81	0	0	0	139	61	0	0	0	0	0	41	0	75	0	428
4:30 PM	23	80	0	0	0	109	53	1	0	0	0	0	43	0	56	0	364
4:45 PM	24	104	0	0	0	120	56	0	0	0	0	0	53	0	80	0	437
5:00 PM	23	72	0	0	0	121	69	0	0	0	0	0	46	0	82	0	413
5:15 PM	22	96	0	0	0	120	53	0	0	0	0	0	35	0	86	0	412
5:30 PM	18	97	0	0	0	101	65	0	0	0	0	0	52	0	80	0	413
5:45 PM	25	112	0	0	0	116	66	0	0	0	0	0	60	0	73	0	452
Total Survey	184	749	0	0	0	962	479	1	0	0	0	0	372	0	603	0	3,349

Interval Start Time	Pedestrians Crosswalk North	South	East	West
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	3
5:30 PM	0	0	0	5
5:45 PM	0	0	0	4
Total Survey	0	0	0	12

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound 10th St In	Out	Total	Bikes	Southbound 10th St In	Out	Total	Bikes	Eastbound I-205 SB Ramps In	Out	Total	Bikes	Westbound I-205 SB Ramps In	Out	Total	Bikes	Total
Volume	465	651	1,116	0	711	698	1,409	0	0	341	341	0	514	0	514	0	1,690
%HV	1.1%				1.0%				0.0%				1.4%				1.1%
PHF	0.85				0.94				0.00				0.97				0.93

	Pedestrians Crosswalk North	South	East	West
Volume	0	0	0	12

By Movement	Northbound 10th St L	T	R	Total	Southbound 10th St L	T	R	Total	Eastbound I-205 SB Ramps L	T	R	Total	Westbound I-205 SB Ramps L	T	R	Total	Total
Volume	88	377	0	465	0	458	253	711	0	0	0	0	193	0	321	514	1,690
%HV	2.3%	0.8%	0.0%	1.1%	0.0%	0.4%	2.0%	1.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	1.6%	1.4%	1.1%
PHF	0.88	0.84	0.00	0.85	0.00	0.95	0.92	0.94	0.00	0.00	0.00	0.00	0.80	0.00	0.93	0.97	0.93

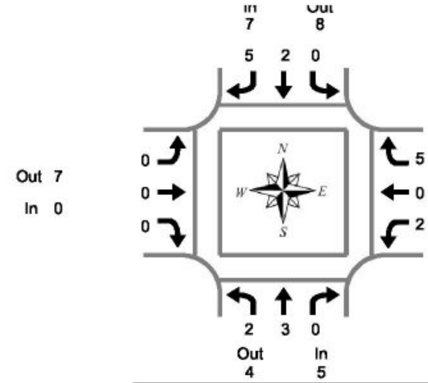
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St L	T	R	Bikes	Southbound 10th St L	T	R	Bikes	Eastbound I-205 SB Ramps L	T	R	Bikes	Westbound I-205 SB Ramps L	T	R	Bikes	Interval Total
4:00 PM	96	372	0	0	0	504	226	1	0	0	0	0	179	0	282	0	1,659
4:15 PM	101	337	0	0	0	489	239	1	0	0	0	0	183	0	293	0	1,642
4:30 PM	92	352	0	0	0	470	231	1	0	0	0	0	177	0	304	0	1,626
4:45 PM	87	369	0	0	0	462	243	0	0	0	0	0	186	0	328	0	1,675
5:00 PM	88	377	0	0	0	458	253	0	0	0	0	0	193	0	321	0	1,690

Interval Start Time	Pedestrians Crosswalk North	South	East	West
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	3
4:45 PM	0	0	0	8
5:00 PM	0	0	0	12

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



10th St & I-205 SB Ramps

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Peak Hour Summary
5:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	2	0	2	0	3	1	4	0	0	0	0	1	0	0	1	7
4:15 PM	2	0	0	2	0	3	5	8	0	0	0	0	0	0	1	1	11
4:30 PM	1	3	0	4	0	1	0	1	0	0	0	0	1	0	0	1	6
4:45 PM	1	1	0	2	0	0	1	1	0	0	0	0	1	0	1	2	5
5:00 PM	0	1	0	1	0	0	2	2	0	0	0	0	0	0	3	3	6
5:15 PM	0	0	0	0	0	0	2	2	0	0	0	0	0	0	1	1	3
5:30 PM	0	1	0	1	0	0	1	1	0	0	0	0	1	0	0	1	3
5:45 PM	2	1	0	3	0	2	0	2	0	0	0	0	1	0	1	2	7
Total Survey	6	9	0	15	0	9	12	21	0	0	0	0	5	0	7	12	48

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound 10th St			Southbound 10th St			Eastbound I-205 SB Ramps			Westbound I-205 SB Ramps			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	5	4	9	7	8	15	0	7	7	7	0	7	19
PHF	0.16			0.13			0.00			0.29			0.20

By Movement	Northbound 10th St				Southbound 10th St				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	3	0	5	0	2	5	7	0	0	0	0	2	0	5	7	19
PHF	0.13	0.15	0.00	0.16	0.00	0.07	0.21	0.13	0.00	0.00	0.00	0.00	0.25	0.00	0.25	0.29	0.20

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

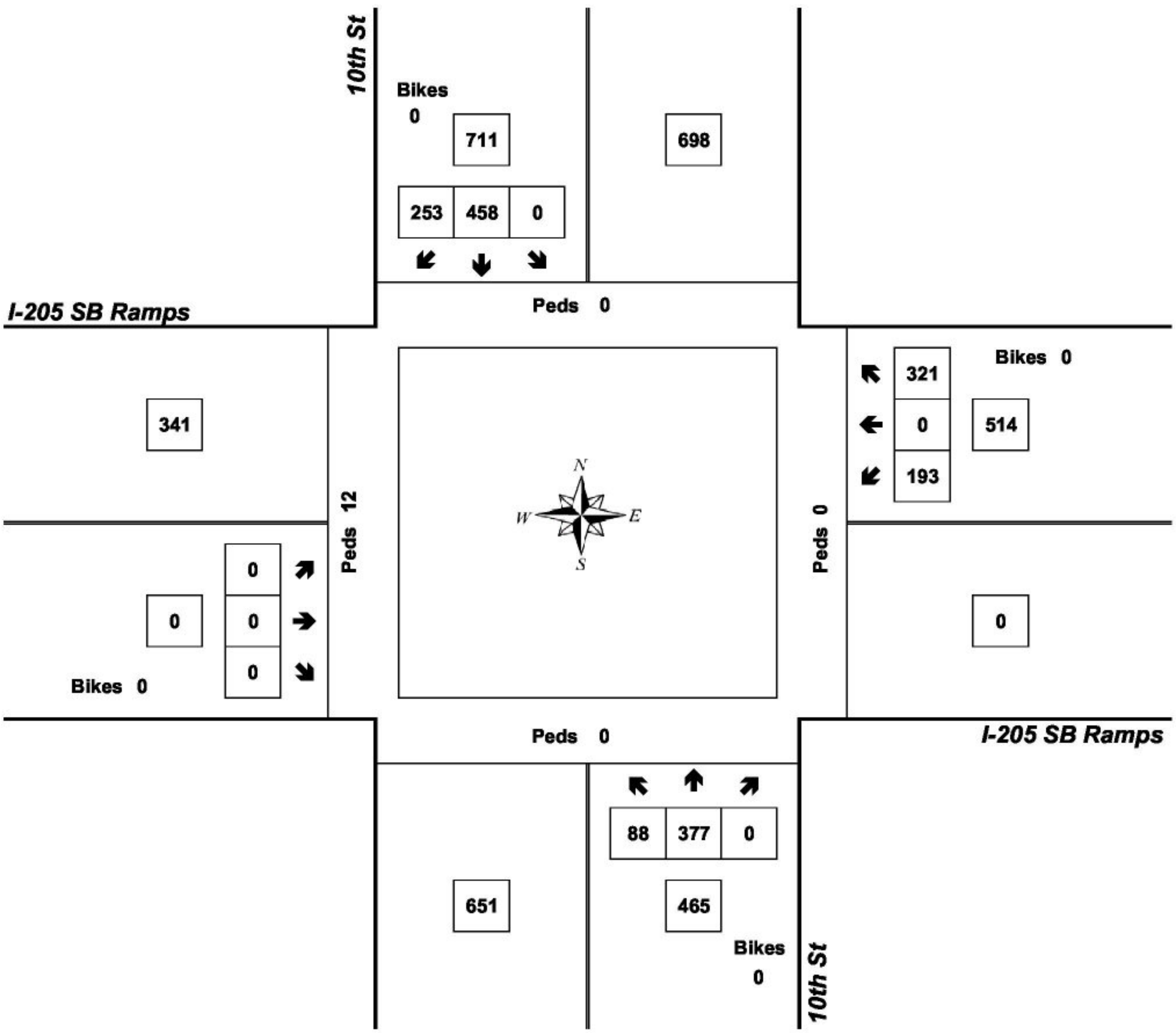
Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	4	6	0	10	0	7	7	14	0	0	0	0	3	0	2	5	29
4:15 PM	4	5	0	9	0	4	8	12	0	0	0	0	2	0	5	7	28
4:30 PM	2	5	0	7	0	1	5	6	0	0	0	0	2	0	5	7	20
4:45 PM	1	3	0	4	0	0	6	6	0	0	0	0	2	0	5	7	17
5:00 PM	2	3	0	5	0	2	5	7	0	0	0	0	2	0	5	7	19

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

10th St & I-205 SB Ramps

5:00 PM to 6:00 PM
Wednesday, April 16, 2014

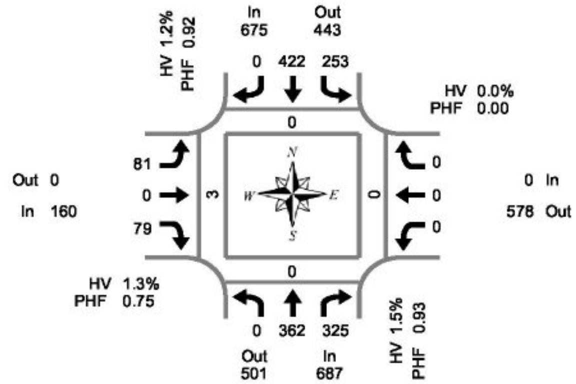


Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.97	1.4%	514
NB	0.85	1.1%	465
SB	0.94	1.0%	711
Intersection	0.93	1.1%	1,690

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

10th St & I-205 NB Ramps

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	94	46	0	73	100	0	0	30	0	18	0	0	0	0	0	361	0	0	0	1
4:15 PM	0	87	84	0	69	114	0	0	27	0	16	0	0	0	0	0	397	0	0	0	1
4:30 PM	0	83	77	0	56	99	0	1	23	0	30	0	0	0	0	0	368	0	0	0	1
4:45 PM	0	104	67	0	62	111	0	0	13	0	21	0	0	0	0	0	378	0	0	0	1
5:00 PM	0	88	97	0	66	98	0	0	18	0	12	0	0	0	0	0	379	0	0	0	0
5:15 PM	0	86	65	0	65	91	0	0	30	0	14	0	0	0	0	0	351	0	0	0	3
5:30 PM	0	82	94	0	43	112	0	0	31	0	25	0	0	0	0	0	387	0	0	0	5
5:45 PM	0	95	53	0	44	126	0	0	47	1	35	0	0	0	0	0	401	0	0	0	4
Total Survey	0	719	583	0	478	851	0	1	219	1	171	0	0	0	0	0	3,022	0	0	0	16

Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound 10th St				Southbound 10th St				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	687	501	1,188	0	675	443	1,118	1	160	0	160	0	0	578	578	0	1,522	0	0	0	3
%HV	1.5%				1.2%				1.3%				0.0%				1.3%				
PHF	0.93				0.92				0.75				0.00				0.96				

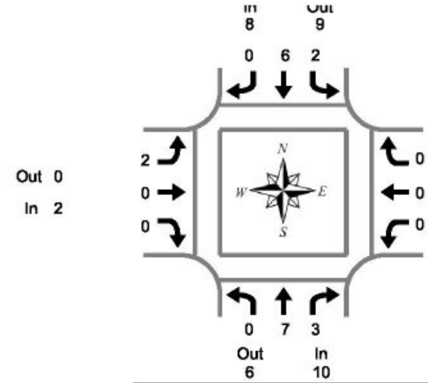
By Movement	Northbound 10th St				Southbound 10th St				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	362	325	687	253	422	0	675	81	0	79	160	0	0	0	0	1,522
%HV	0.0%	1.9%	0.9%	1.5%	0.8%	1.4%	0.0%	1.2%	2.5%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%	1.3%
PHF	0.00	0.87	0.84	0.93	0.92	0.93	0.00	0.92	0.75	0.00	0.66	0.75	0.00	0.00	0.00	0.00	0.96

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	368	274	0	260	424	0	1	93	0	85	0	0	0	0	0	1,504	0	0	0	4
4:15 PM	0	362	325	0	253	422	0	1	81	0	79	0	0	0	0	0	1,522	0	0	0	3
4:30 PM	0	361	306	0	249	399	0	1	84	0	77	0	0	0	0	0	1,476	0	0	0	5
4:45 PM	0	360	323	0	236	412	0	0	92	0	72	0	0	0	0	0	1,495	0	0	0	9
5:00 PM	0	351	309	0	218	427	0	0	126	1	86	0	0	0	0	0	1,518	0	0	0	12

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

10th St & I-205 NB Ramps

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	3	0	3	1	3	0	4	0	0	0	0	0	0	0	0	7
4:15 PM	0	2	2	4	1	4	0	5	0	0	0	0	0	0	0	0	9
4:30 PM	0	2	1	3	1	1	0	2	1	0	0	1	0	0	0	0	6
4:45 PM	0	3	0	3	0	1	0	1	0	0	0	0	0	0	0	0	4
5:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
5:15 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	1	0	1	1	0	0	1	0	0	0	0	2
5:45 PM	0	2	0	2	0	2	0	2	0	0	2	2	0	0	0	0	6
Total Survey	0	12	4	16	3	12	0	15	3	0	2	5	0	0	0	0	36

Heavy Vehicle Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound 10th St			Southbound 10th St			Eastbound I-205 NB Ramps			Westbound I-205 NB Ramps			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	10	6	16	8	9	17	2	0	2	0	5	5	20
PHF	0.25			0.18			0.17			0.00			0.23

By Movement	Northbound 10th St				Southbound 10th St				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	7	3	10	2	6	0	8	2	0	0	2	0	0	0	0	20
PHF	0.00	0.25	0.25	0.25	0.17	0.19	0.00	0.18	0.25	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.23

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

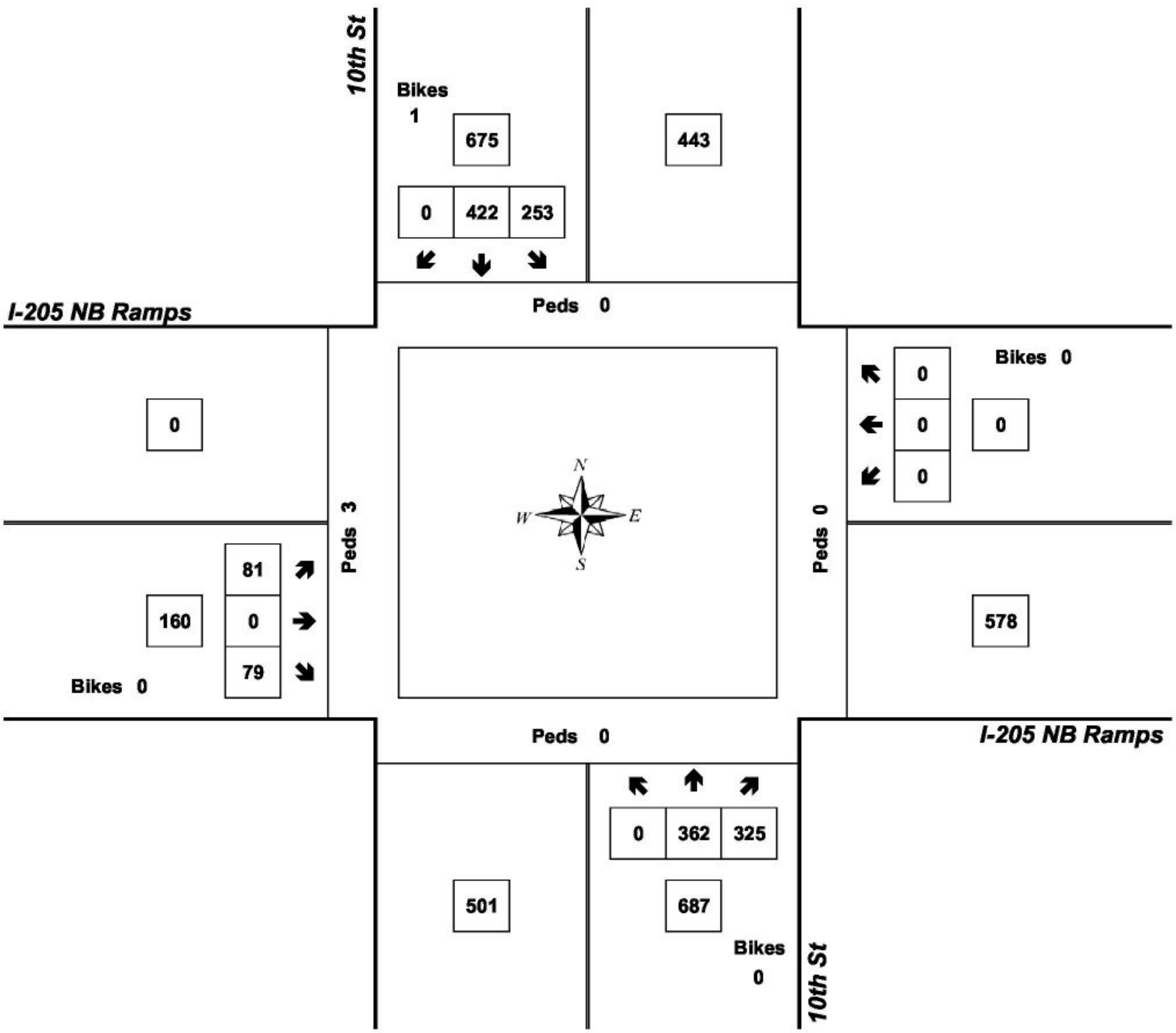
Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	10	3	13	3	9	0	12	1	0	0	1	0	0	0	0	26
4:15 PM	0	7	3	10	2	6	0	8	2	0	0	2	0	0	0	0	20
4:30 PM	0	5	2	7	1	2	0	3	2	0	0	2	0	0	0	0	12
4:45 PM	0	3	1	4	0	2	0	2	2	0	0	2	0	0	0	0	8
5:00 PM	0	2	1	3	0	3	0	3	2	0	2	4	0	0	0	0	10

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

10th St & I-205 NB Ramps

4:15 PM to 5:15 PM
Wednesday, April 16, 2014

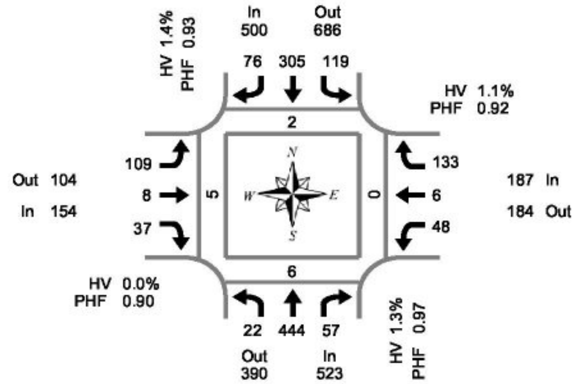


Approach	PHF	HV%	Volume
EB	0.75	1.3%	160
WB	0.00	0.0%	0
NB	0.93	1.5%	687
SB	0.92	1.2%	675
Intersection	0.96	1.3%	1,522

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

10th St & 8th Ave

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound 10th St				Southbound 10th St				Eastbound 8th Ave				Westbound 8th Ave				Interval
Time	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	Total
4:00 PM	3	76	9	0	32	70	18	0	27	1	5	0	6	1	36	0	284
4:15 PM	6	108	12	0	31	75	22	0	29	1	9	0	15	2	33	0	343
4:30 PM	4	109	17	0	33	76	14	1	20	3	11	0	10	1	33	0	331
4:45 PM	5	115	15	0	30	85	19	0	31	2	10	0	13	2	27	0	354
5:00 PM	7	112	13	0	25	69	21	0	29	2	7	0	10	1	40	0	336
5:15 PM	6	99	14	0	20	69	11	0	25	1	9	0	5	1	30	0	290
5:30 PM	5	122	19	0	29	77	27	0	22	5	3	0	13	1	35	0	358
5:45 PM	2	86	13	0	27	116	25	0	17	2	6	0	8	2	44	0	348
Total Survey	38	827	112	0	227	637	157	1	200	17	60	0	80	11	278	0	2,644

Pedestrians Crosswalk			
North	South	East	West
0	0	0	0
2	1	0	1
0	1	0	0
0	4	0	4
0	0	0	0
0	2	2	3
0	1	0	2
0	5	0	3
2	14	2	13

Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound 10th St				Southbound 10th St				Eastbound 8th Ave				Westbound 8th Ave				Total
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	523	390	913	0	500	686	1,186	1	154	104	258	0	187	184	371	0	1,364
%HV	1.3%				1.4%				0.0%				1.1%				1.2%
PHF	0.97				0.93				0.90				0.92				0.96

Pedestrians Crosswalk			
North	South	East	West
2	6	0	5

By Movement	Northbound 10th St				Southbound 10th St				Eastbound 8th Ave				Westbound 8th Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	22	444	57	523	119	305	76	500	109	8	37	154	48	6	133	187	1,364
%HV	0.0%	1.6%	0.0%	1.3%	1.7%	1.6%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	1.1%	1.2%
PHF	0.79	0.97	0.84	0.97	0.90	0.90	0.86	0.93	0.88	0.67	0.84	0.90	0.80	0.75	0.83	0.92	0.96

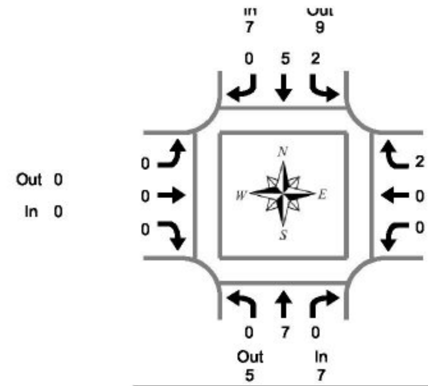
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start	Northbound 10th St				Southbound 10th St				Eastbound 8th Ave				Westbound 8th Ave				Interval
Time	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	Total
4:00 PM	18	408	53	0	126	306	73	1	107	7	35	0	44	6	129	0	1,312
4:15 PM	22	444	57	0	119	305	76	1	109	8	37	0	48	6	133	0	1,364
4:30 PM	22	435	59	0	108	299	65	1	105	8	37	0	38	5	130	0	1,311
4:45 PM	23	448	61	0	104	300	78	0	107	10	29	0	41	5	132	0	1,338
5:00 PM	20	419	59	0	101	331	84	0	93	10	25	0	36	5	149	0	1,332

Pedestrians Crosswalk			
North	South	East	West
2	6	0	5
2	6	0	5
0	7	2	7
0	7	2	9
0	8	2	8

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

10th St & 8th Ave

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound 8th Ave				Westbound 8th Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	3	0	3	0	2	1	3	0	0	0	0	0	0	0	0	6
4:15 PM	0	3	0	3	1	4	0	5	0	0	0	0	0	0	0	0	8
4:30 PM	0	3	0	3	1	0	0	1	0	0	0	0	0	0	1	1	5
4:45 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	1	1	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	1	2
5:45 PM	0	1	0	1	1	2	0	3	2	0	0	2	0	0	0	0	6
Total Survey	0	11	1	12	3	9	2	14	2	0	0	2	1	0	2	3	31

Heavy Vehicle Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound 10th St			Southbound 10th St			Eastbound 8th Ave			Westbound 8th Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	7	5	12	7	9	16	0	0	0	2	2	4	16
PHF	0.19			0.19			0.00			0.25			0.21

By Movement	Northbound 10th St				Southbound 10th St				Eastbound 8th Ave				Westbound 8th Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	7	0	7	2	5	0	7	0	0	0	0	0	0	2	2	16
PHF	0.00	0.19	0.00	0.19	0.25	0.21	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.25	0.21

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

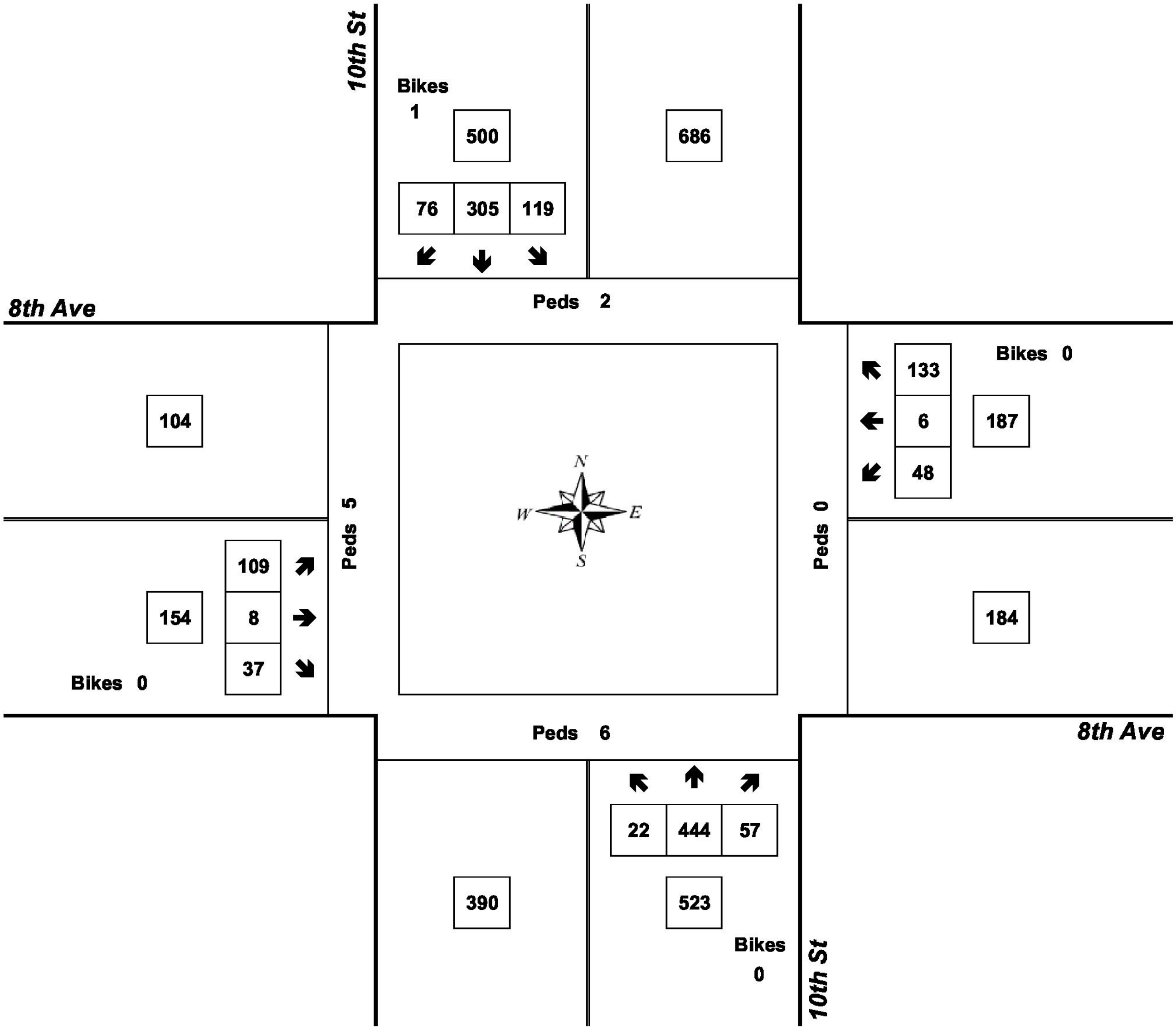
Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound 8th Ave				Westbound 8th Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	10	0	10	2	7	1	10	0	0	0	0	0	0	2	2	22
4:15 PM	0	7	0	7	2	5	0	7	0	0	0	0	0	0	2	2	16
4:30 PM	0	4	1	5	1	1	0	2	0	0	0	0	0	0	2	2	9
4:45 PM	0	1	1	2	0	1	1	2	0	0	0	0	1	0	1	2	6
5:00 PM	0	1	1	2	1	2	1	4	2	0	0	2	1	0	0	1	9

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

10th St & 8th Ave

4:15 PM to 5:15 PM
Wednesday, April 16, 2014

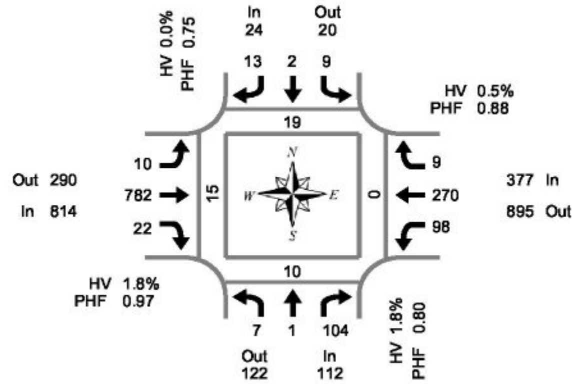


Approach	PHF	HV%	Volume
EB	0.90	0.0%	154
WB	0.92	1.1%	187
NB	0.97	1.3%	523
SB	0.93	1.4%	500
Intersection	0.96	1.2%	1,364

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



12th St & Willamette Falls Dr

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Peak Hour Summary
4:15 PM to 5:15 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 12th St				Southbound 12th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	
4:00 PM	2	0	23	0	2	1	1	0	3	135	2	0	14	61	3	1	247
4:15 PM	1	0	34	0	3	0	3	0	2	183	10	0	35	61	2	1	334
4:30 PM	3	1	23	0	2	0	3	0	1	201	4	0	18	53	3	0	312
4:45 PM	2	0	28	0	1	0	4	0	1	203	5	0	19	87	1	2	351
5:00 PM	1	0	19	0	3	2	3	0	6	195	3	0	26	69	3	0	330
5:15 PM	0	0	28	0	0	0	1	0	0	168	4	0	16	56	6	0	279
5:30 PM	0	0	27	0	0	0	5	0	0	186	5	0	24	69	2	0	318
5:45 PM	3	1	25	0	2	2	6	0	5	124	14	0	24	66	3	0	275
Total Survey	12	2	207	0	13	5	26	0	18	1,395	47	0	176	522	23	4	2,446

Interval Start Time	Pedestrians Crosswalk			
	North	South	East	West
4:00 PM	5	2	0	4
4:15 PM	3	1	0	6
4:30 PM	4	5	0	4
4:45 PM	8	1	0	3
5:00 PM	4	3	0	2
5:15 PM	3	7	0	0
5:30 PM	6	3	0	5
5:45 PM	8	4	0	7
Total Survey	41	26	0	31

Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound 12th St				Southbound 12th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	112	122	234	0	24	20	44	0	814	290	1,104	0	377	895	1,272	3	1,327
%HV	1.8%				0.0%				1.8%				0.5%				1.4%
PHF	0.80				0.75				0.97				0.88				0.95

By Approach	Pedestrians Crosswalk			
	North	South	East	West
Volume	19	10	0	15

By Movement	Northbound 12th St				Southbound 12th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	7	1	104	112	9	2	13	24	10	782	22	814	98	270	9	377	1,327
%HV	14.3%	0.0%	1.0%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%	0.0%	1.8%	0.0%	0.7%	0.0%	0.5%	1.4%
PHF	0.58	0.25	0.76	0.80	0.75	0.25	0.81	0.75	0.42	0.96	0.55	0.97	0.70	0.78	0.75	0.88	0.95

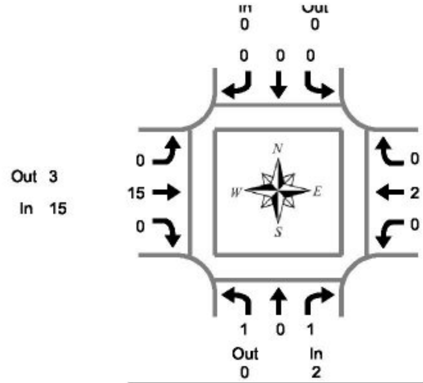
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 12th St				Southbound 12th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	
4:00 PM	8	1	108	0	8	1	11	0	7	722	21	0	86	262	9	4	1,244
4:15 PM	7	1	104	0	9	2	13	0	10	782	22	0	98	270	9	3	1,327
4:30 PM	6	1	98	0	6	2	11	0	8	767	16	0	79	265	13	2	1,272
4:45 PM	3	0	102	0	4	2	13	0	7	752	17	0	85	281	12	2	1,278
5:00 PM	4	1	99	0	5	4	15	0	11	673	26	0	90	260	14	0	1,202

Interval Start Time	Pedestrians Crosswalk			
	North	South	East	West
4:00 PM	20	9	0	17
4:15 PM	19	10	0	15
4:30 PM	19	16	0	9
4:45 PM	21	14	0	10
5:00 PM	21	17	0	14

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

12th St & Willamette Falls Dr

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound 12th St				Southbound 12th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval
Time	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	4	0	4	1	0	0	1	5
4:15 PM	0	0	1	1	0	0	0	0	0	4	0	4	0	1	0	1	6
4:30 PM	0	0	0	0	0	0	0	0	0	6	0	6	0	0	0	0	6
4:45 PM	1	0	0	1	0	0	0	0	0	4	0	4	0	1	0	1	6
5:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
5:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Survey	1	0	1	2	0	0	0	0	0	23	0	23	1	3	0	4	29

Heavy Vehicle Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound 12th St			Southbound 12th St			Eastbound Willamette Falls Dr			Westbound Willamette Falls Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	0	2	0	0	0	15	3	18	2	16	18	19
PHF	0.25			0.00			0.27			0.25			0.26

By Movement	Northbound 12th St				Southbound 12th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	0	1	2	0	0	0	0	0	15	0	15	0	2	0	2	19
PHF	0.25	0.00	0.25	0.25	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.27	0.00	0.25	0.00	0.25	0.26

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

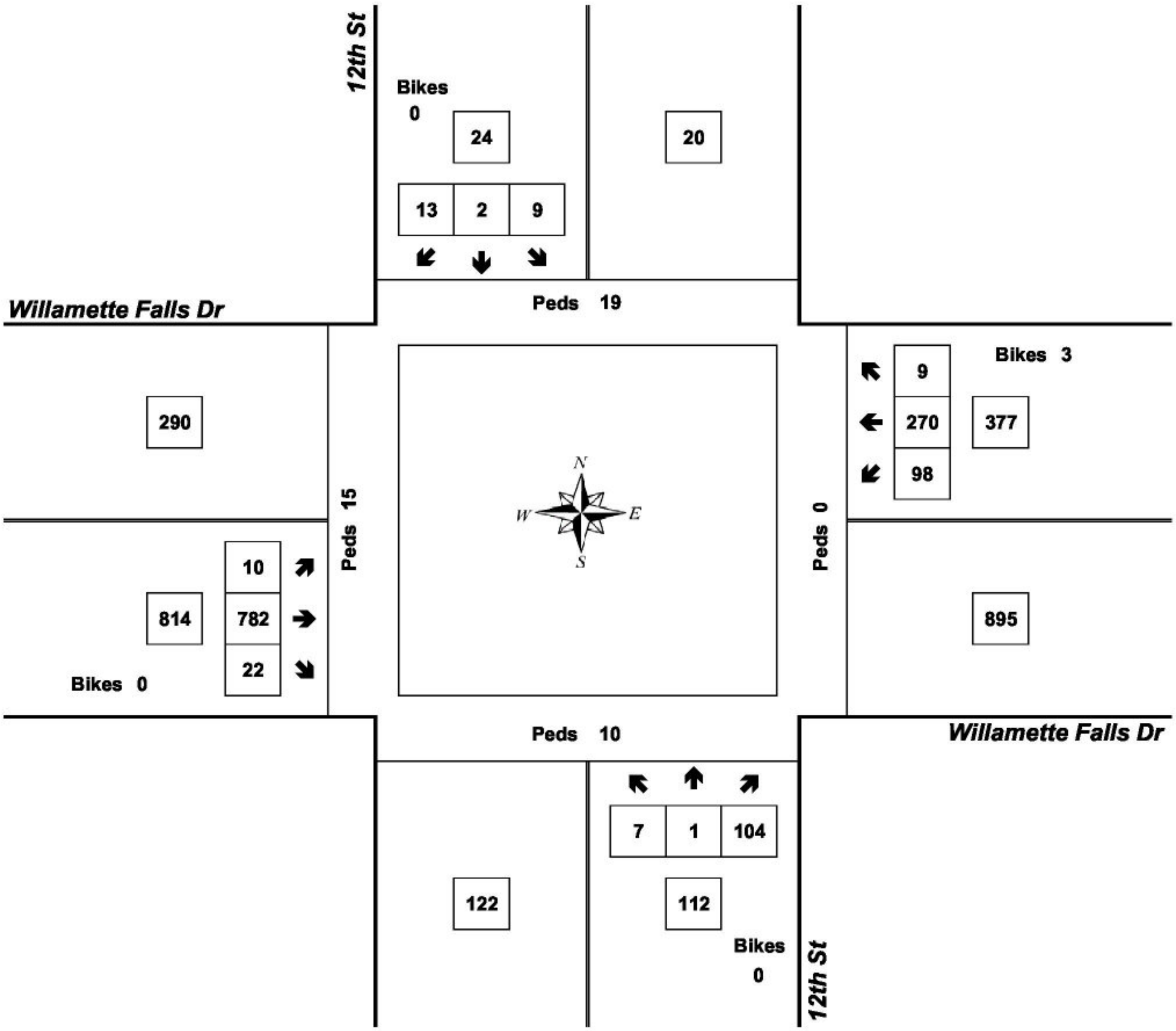
Interval Start	Northbound 12th St				Southbound 12th St				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval
Time	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	Total
4:00 PM	1	0	1	2	0	0	0	0	0	18	0	18	1	2	0	3	23
4:15 PM	1	0	1	2	0	0	0	0	0	15	0	15	0	2	0	2	19
4:30 PM	1	0	0	1	0	0	0	0	0	14	0	14	0	1	0	1	16
4:45 PM	1	0	0	1	0	0	0	0	0	8	0	8	0	2	0	2	11
5:00 PM	0	0	0	0	0	0	0	0	0	5	0	5	0	1	0	1	6

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

12th St & Willamette Falls Dr

4:15 PM to 5:15 PM
Wednesday, April 16, 2014

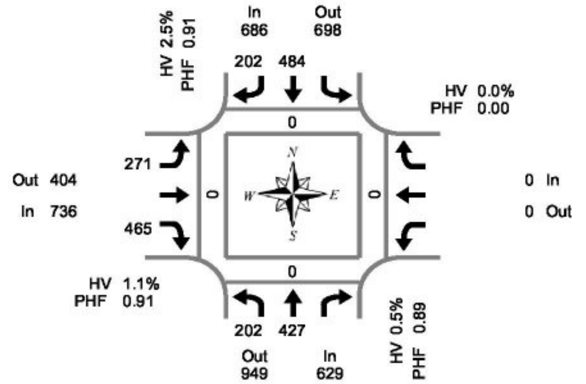


Approach	PHF	HV%	Volume
EB	0.97	1.8%	814
WB	0.88	0.5%	377
NB	0.80	1.8%	112
SB	0.75	0.0%	24
Intersection	0.95	1.4%	1,327

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:30 PM to 5:30 PM

Hwy 43 & Willamette Falls Dr

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 43				Southbound Hwy 43				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes		T	R	Bikes	L		R	Bikes				Bikes		North	South	East	West
4:00 PM	49	87		0		124	59	0	59		74	0				0	452	0	0	0	0
4:15 PM	42	69		0		121	74	0	91		116	0				0	513	0	0	0	0
4:30 PM	45	102		1		111	58	0	76		122	0				0	514	0	0	0	0
4:45 PM	44	97		0		121	43	0	71		131	0				0	507	0	0	0	0
5:00 PM	63	113		0		120	45	0	63		103	0				0	507	0	0	0	0
5:15 PM	50	115		0		132	56	0	61		109	1				0	523	0	0	0	0
5:30 PM	40	71		0		146	44	0	71		119	0				0	491	0	0	0	0
5:45 PM	42	107		0		101	48	0	66		85	0				0	449	0	0	0	0
Total Survey	375	761		1		976	427	0	558		859	1				0	3,956	0	0	0	0

Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound Hwy 43				Southbound Hwy 43				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	629	949	1,578	1	686	698	1,384	0	736	404	1,140	1	0	0	0	0	2,051	0	0	0	0
%HV	0.5%				2.5%				1.1%				0.0%				1.4%				
PHF	0.89				0.91				0.91				0.00				0.98				

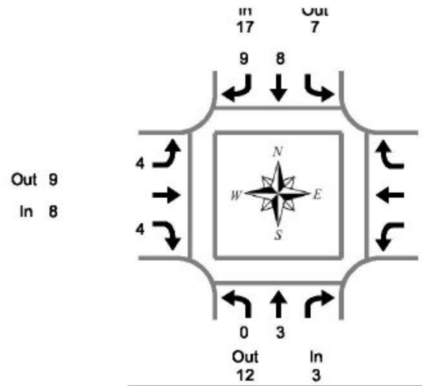
By Movement	Northbound Hwy 43				Southbound Hwy 43				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	L	T		Total		T	R	Total	L		R	Total				Total	
Volume	202	427		629		484	202	686	271		465	736				0	2,051
%HV	0.0%	0.7%	NA	0.5%	NA	1.7%	4.5%	2.5%	1.5%	NA	0.9%	1.1%	NA	NA	NA	0.0%	1.4%
PHF	0.80	0.93		0.89		0.92	0.87	0.91	0.89		0.89	0.91				0.00	0.98

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 43				Southbound Hwy 43				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes		T	R	Bikes	L		R	Bikes				Bikes		North	South	East	West
4:00 PM	180	355		1		477	234	0	297		443	0				0	1,986	0	0	0	0
4:15 PM	194	381		1		473	220	0	301		472	0				0	2,041	0	0	0	0
4:30 PM	202	427		1		484	202	0	271		465	1				0	2,051	0	0	0	0
4:45 PM	197	396		0		519	188	0	266		462	1				0	2,028	0	0	0	0
5:00 PM	195	406		0		499	193	0	261		416	1				0	1,970	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Hwy 43 & Willamette Falls Dr

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound Hwy 43				Southbound Hwy 43				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval
Time	L	T		Total		T	R	Total	L		R	Total				Total	Total
4:00 PM	0	2		2		4	1	5	3		1	4				0	11
4:15 PM	0	0		0		2	5	7	2		1	3				0	10
4:30 PM	0	0		0		1	3	4	1		0	1				0	5
4:45 PM	0	0		0		4	2	6	2		1	3				0	9
5:00 PM	0	2		2		1	4	5	1		2	3				0	10
5:15 PM	0	1		1		2	0	2	0		1	1				0	4
5:30 PM	0	0		0		1	2	3	1		1	2				0	5
5:45 PM	0	0		0		0	0	0	0		0	0				0	0
Total Survey	0	5		5		15	17	32	10		7	17				0	54

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound Hwy 43				Southbound Hwy 43				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	In	Out	Total		In	Out	Total		In	Out	Total		In	Out	Total		
Volume	3	12	15		17	7	24		8	9	17		0	0	0		28
PHF	0.25				0.25				0.25				0.00				0.27

By Movement	Northbound Hwy 43				Southbound Hwy 43				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	L	T		Total		T	R	Total	L		R	Total				Total	
Volume	0	3		3		8	9	17	4		4	8				0	28
PHF	0.00	0.25		0.25		0.29	0.23	0.25	0.17		0.25	0.25				0.00	0.27

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start	Northbound Hwy 43				Southbound Hwy 43				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval
Time	L	T		Total		T	R	Total	L		R	Total				Total	Total
4:00 PM	0	2		2		11	11	22	8		3	11				0	35
4:15 PM	0	2		2		8	14	22	6		4	10				0	34
4:30 PM	0	3		3		8	9	17	4		4	8				0	28
4:45 PM	0	3		3		8	8	16	4		5	9				0	28
5:00 PM	0	3		3		4	6	10	2		4	6				0	19

Peak Hour Summary

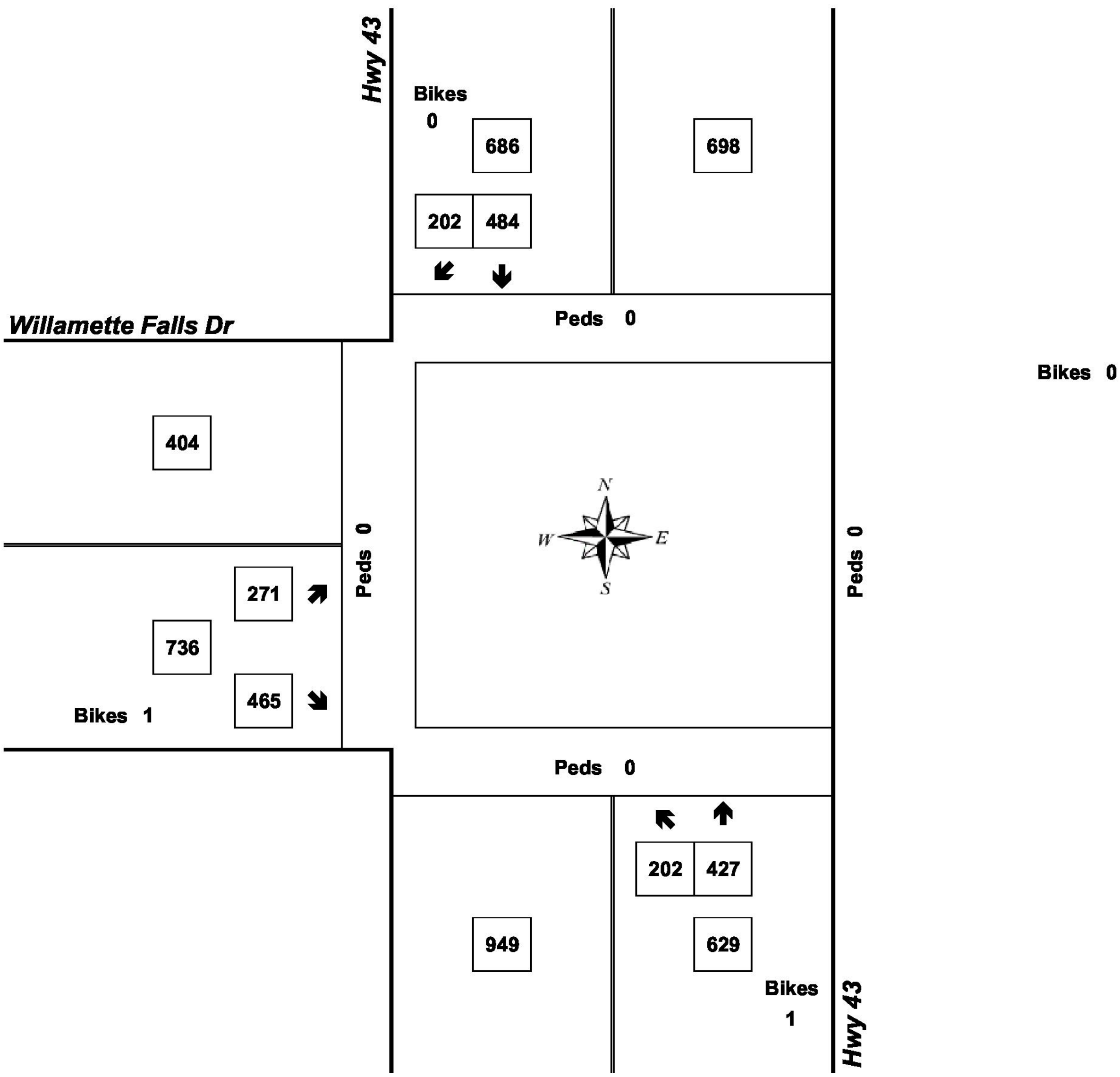
All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

Hwy 43 & Willamette Falls Dr

4:30 PM to 5:30 PM

Tuesday, April 15, 2014



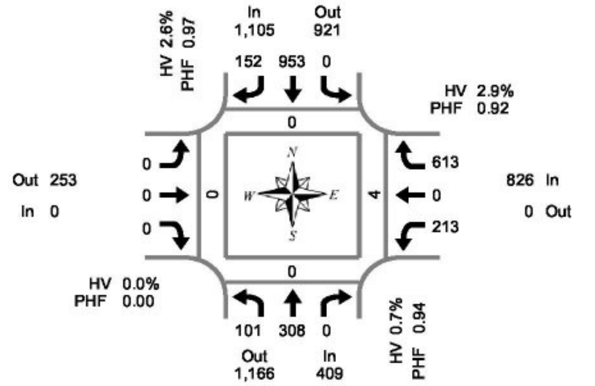
Approach	PHF	HV%	Volume
EB	0.91	1.1%	736
WB	0.00	0.0%	0
NB	0.89	0.5%	629
SB	0.91	2.5%	686
Intersection	0.98	1.4%	2,051

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

Hwy 43 & I-205 SB Ramps

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Interval	Pedestrians Crosswalk			
Time	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	Total	North	South	East	West
4:00 PM	23	84	0	0	0	218	38	0	0	0	0	0	65	0	148	0	576	0	0	0	0
4:15 PM	21	74	0	0	0	236	49	0	0	0	0	0	67	0	158	0	605	0	0	1	0
4:30 PM	32	66	0	0	0	238	43	0	0	0	0	0	60	0	136	1	575	0	0	2	0
4:45 PM	18	89	0	0	0	241	33	0	0	0	0	0	36	0	156	0	573	0	0	1	0
5:00 PM	30	79	0	3	0	238	27	0	0	0	0	0	50	0	163	0	587	0	0	0	0
5:15 PM	31	77	0	1	0	262	36	0	0	0	0	0	55	0	131	1	592	0	0	2	0
5:30 PM	28	58	0	1	0	263	34	0	0	0	0	0	45	0	149	0	577	0	0	1	0
5:45 PM	29	92	0	0	0	194	27	0	0	0	0	0	52	0	174	0	568	0	0	0	0
Total Survey	212	619	0	5	0	1,890	287	0	0	0	0	0	430	0	1,215	2	4,653	0	0	7	0

Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	409	1,166	1,575	3	1,105	921	2,026	0	0	253	253	0	826	0	826	1	2,340	0	0	4	0
%HV	0.7%				2.6%				0.0%				2.9%				2.4%				
PHF	0.94				0.97				0.00				0.92				0.97				

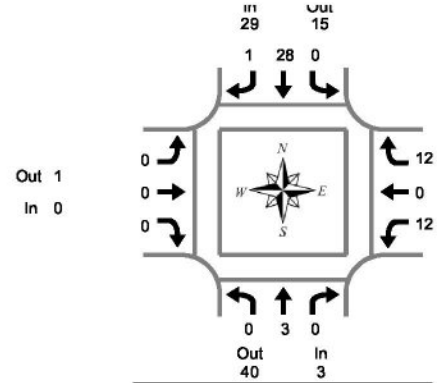
By Movement	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	101	308	0	409	0	953	152	1,105	0	0	0	0	213	0	613	826	2,340
%HV	0.0%	1.0%	0.0%	0.7%	0.0%	2.9%	0.7%	2.6%	0.0%	0.0%	0.0%	0.0%	5.6%	0.0%	2.0%	2.9%	2.4%
PHF	0.79	0.87	0.00	0.94	0.00	0.99	0.78	0.97	0.00	0.00	0.00	0.00	0.79	0.00	0.94	0.92	0.97

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Interval	Pedestrians Crosswalk			
Time	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	Total	North	South	East	West
4:00 PM	94	313	0	0	0	933	163	0	0	0	0	0	228	0	598	1	2,329	0	0	4	0
4:15 PM	101	308	0	3	0	953	152	0	0	0	0	0	213	0	613	1	2,340	0	0	4	0
4:30 PM	111	311	0	4	0	979	139	0	0	0	0	0	201	0	586	2	2,327	0	0	5	0
4:45 PM	107	303	0	5	0	1,004	130	0	0	0	0	0	186	0	599	1	2,329	0	0	4	0
5:00 PM	118	306	0	5	0	957	124	0	0	0	0	0	202	0	617	1	2,324	0	0	3	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

Hwy 43 & I-205 SB Ramps

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	2	3	0	5	0	6	1	7	0	0	0	0	2	0	6	8	20
4:15 PM	0	1	0	1	0	9	1	10	0	0	0	0	2	0	1	3	14
4:30 PM	0	0	0	0	0	6	0	6	0	0	0	0	3	0	2	5	11
4:45 PM	0	0	0	0	0	8	0	8	0	0	0	0	3	0	4	7	15
5:00 PM	0	2	0	2	0	5	0	5	0	0	0	0	4	0	5	9	16
5:15 PM	0	0	0	0	0	4	1	5	0	0	0	0	0	0	2	2	7
5:30 PM	0	0	0	0	0	4	0	4	0	0	0	0	2	0	1	3	7
5:45 PM	0	0	0	0	0	3	0	3	0	0	0	0	0	0	3	3	6
Total Survey	2	6	0	8	0	45	3	48	0	0	0	0	16	0	24	40	96

Heavy Vehicle Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound Hwy 43			Southbound Hwy 43			Eastbound I-205 SB Ramps			Westbound I-205 SB Ramps			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	3	40	43	29	15	44	0	1	1	24	0	24	56
PHF	0.13			0.30			0.00			0.29			0.31

By Movement	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	3	0	3	0	28	1	29	0	0	0	0	12	0	12	24	56
PHF	0.00	0.19	0.00	0.13	0.00	0.30	0.13	0.30	0.00	0.00	0.00	0.00	0.30	0.00	0.27	0.29	0.31

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 SB Ramps				Westbound I-205 SB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	2	4	0	6	0	29	2	31	0	0	0	0	10	0	13	23	60
4:15 PM	0	3	0	3	0	28	1	29	0	0	0	0	12	0	12	24	56
4:30 PM	0	2	0	2	0	23	1	24	0	0	0	0	10	0	13	23	49
4:45 PM	0	2	0	2	0	21	1	22	0	0	0	0	9	0	12	21	45
5:00 PM	0	2	0	2	0	16	1	17	0	0	0	0	6	0	11	17	36

Peak Hour Summary

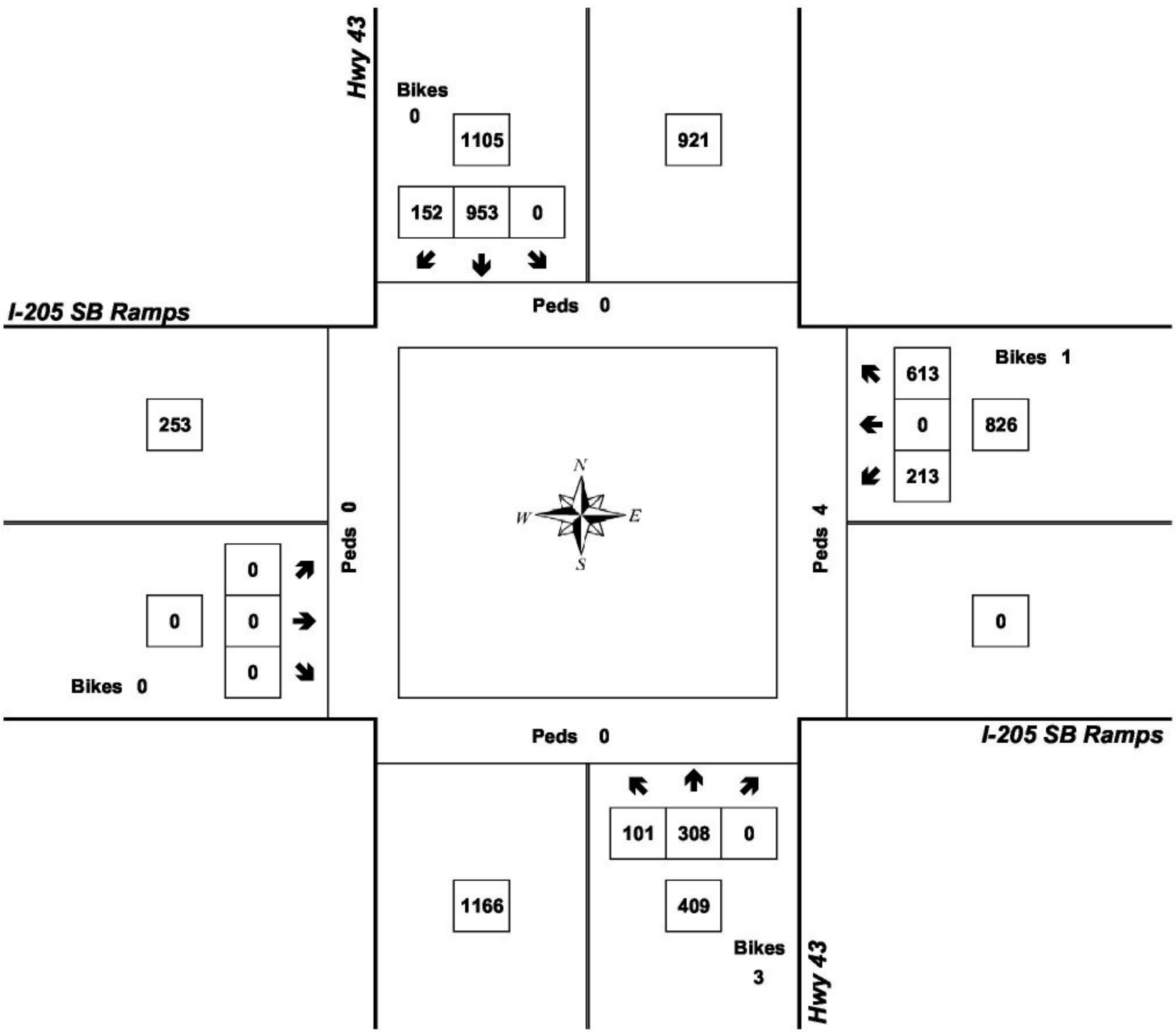
All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

Hwy 43 & I-205 SB Ramps

4:15 PM to 5:15 PM

Tuesday, April 15, 2014



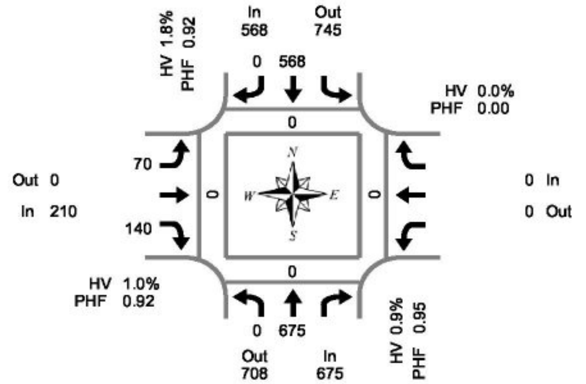
Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.92	2.9%	826
NB	0.94	0.7%	409
SB	0.97	2.6%	1,105
Intersection	0.97	2.4%	2,340

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

Hwy 43 & I-205 NB Ramps

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes		T	R	Bikes	L		R	Bikes				Bikes		North	South	East	West
4:00 PM	0	150		0		143	0	0	26		45	0				0	364	0	0	0	0
4:15 PM	0	161		0		156	0	0	26		37	0				0	380	0	0	0	0
4:30 PM	0	177		1		139	0	1	15		23	0				0	354	0	0	0	0
4:45 PM	0	159		0		126	0	0	24		36	0				0	345	0	0	0	0
5:00 PM	0	176		4		141	0	0	16		33	0				0	366	0	0	0	0
5:15 PM	0	177		1		151	0	0	13		38	0				0	379	0	0	0	0
5:30 PM	0	147		1		155	0	0	22		35	0				0	359	0	0	0	0
5:45 PM	0	175		0		121	0	0	19		34	0				0	349	0	0	0	0
Total Survey	0	1,322		7		1,132	0	1	161		281	0				0	2,896	0	0	0	0

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	675	708	1,383	6	568	745	1,313	0	210	0	210	0	0	0	0	0	1,453	0	0	0	0
%HV	0.9%				1.8%				1.0%				0.0%				1.2%				
PHF	0.95				0.92				0.92				0.00				0.96				

By Movement	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Total
	L	T		Total		T	R	Total	L		R	Total				Total	
Volume	0	675		675		568	0	568	70		140	210				0	1,453
%HV	0.0%	0.9%	NA	0.9%	NA	1.8%	0.0%	1.8%	2.9%	NA	0.0%	1.0%	NA	NA	NA	0.0%	1.2%
PHF	0.00	0.95		0.95		0.92	0.00	0.92	0.80		0.92	0.92				0.00	0.96

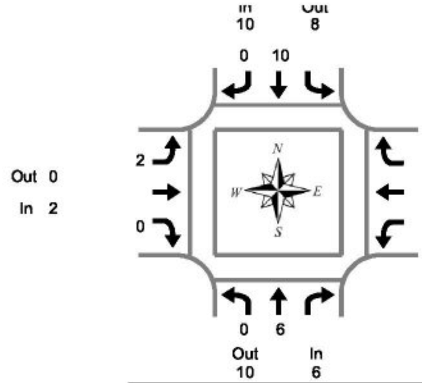
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes		T	R	Bikes	L		R	Bikes				Bikes		North	South	East	West
4:00 PM	0	647		1		564	0	1	91		141	0				0	1,443	0	0	0	0
4:15 PM	0	673		5		562	0	1	81		129	0				0	1,445	0	0	0	0
4:30 PM	0	689		6		557	0	1	68		130	0				0	1,444	0	0	0	0
4:45 PM	0	659		6		573	0	0	75		142	0				0	1,449	0	0	0	0
5:00 PM	0	675		6		568	0	0	70		140	0				0	1,453	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

Hwy 43 & I-205 NB Ramps

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Interval
Time	L	T		Total		T	R	Total	L		R	Total				Total	Total
4:00 PM	0	5		5		4	0	4	2		1	3				0	12
4:15 PM	0	1		1		7	0	7	1		0	1				0	9
4:30 PM	0	1		1		4	0	4	0		0	0				0	5
4:45 PM	0	1		1		5	0	5	0		1	1				0	7
5:00 PM	0	3		3		5	0	5	2		0	2				0	10
5:15 PM	0	1		1		2	0	2	0		0	0				0	3
5:30 PM	0	2		2		3	0	3	0		0	0				0	5
5:45 PM	0	0		0		0	0	0	0		0	0				0	0
Total Survey	0	14		14		30	0	30	5		2	7				0	51

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Hwy 43			Southbound Hwy 43			Eastbound I-205 NB Ramps			Westbound I-205 NB Ramps			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	6	10	16	10	8	18	2	0	2	0	0	0	18
PHF	0.21			0.16			0.13			0.00			0.17

By Movement	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Total
	L	T		Total		T	R	Total	L		R	Total				Total	
Volume	0	6		6		10	0	10	2		0	2				0	18
PHF	0.00	0.21		0.21		0.16	0.00	0.16	0.17		0.00	0.13				0.00	0.17

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 NB Ramps				Westbound I-205 NB Ramps				Interval
Time	L	T		Total		T	R	Total	L		R	Total				Total	Total
4:00 PM	0	8		8		20	0	20	3		2	5				0	33
4:15 PM	0	6		6		21	0	21	3		1	4				0	31
4:30 PM	0	6		6		16	0	16	2		1	3				0	25
4:45 PM	0	7		7		15	0	15	2		1	3				0	25
5:00 PM	0	6		6		10	0	10	2		0	2				0	18

Peak Hour Summary

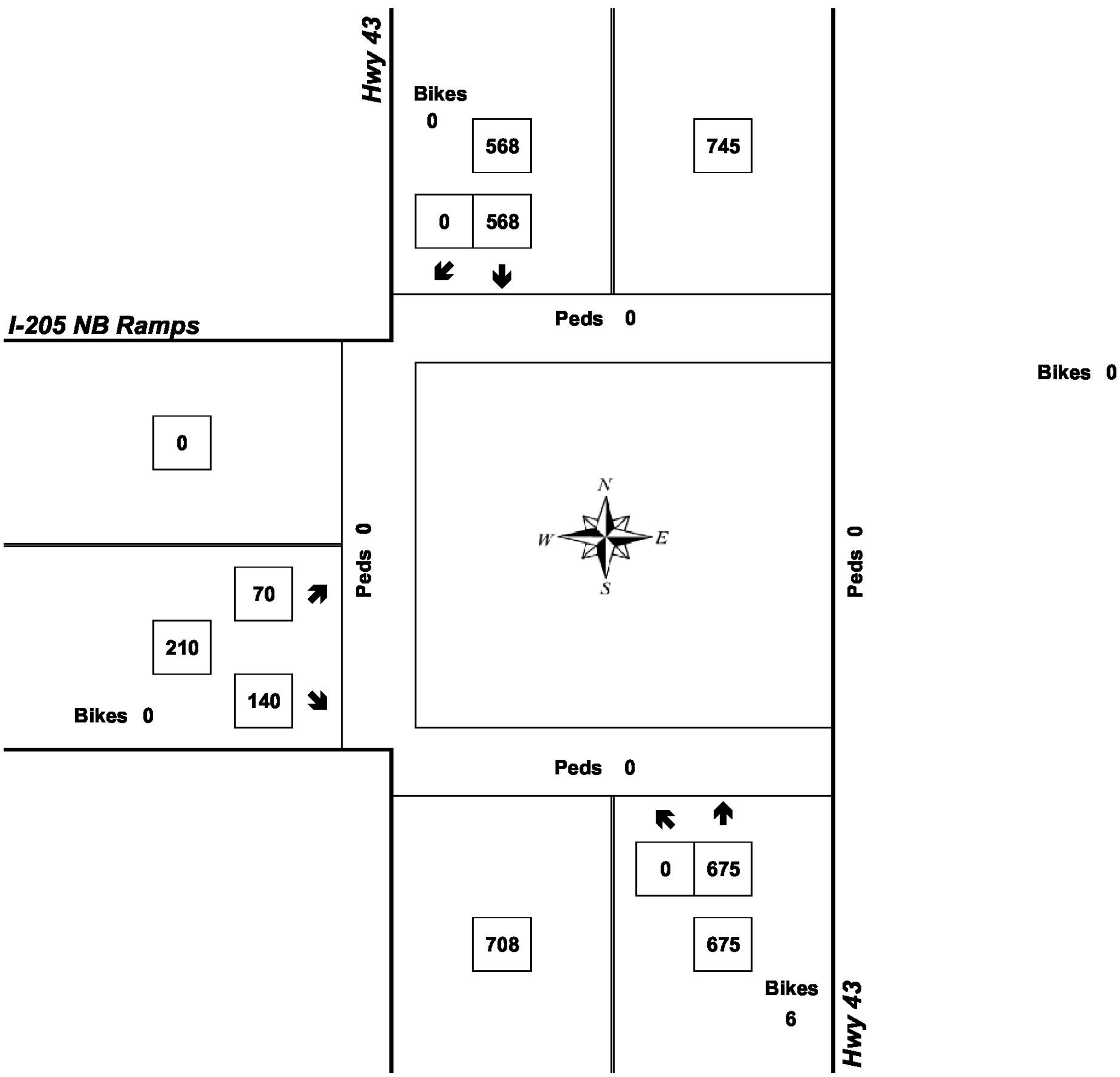
All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

Hwy 43 & I-205 NB Ramps

5:00 PM to 6:00 PM

Tuesday, April 15, 2014



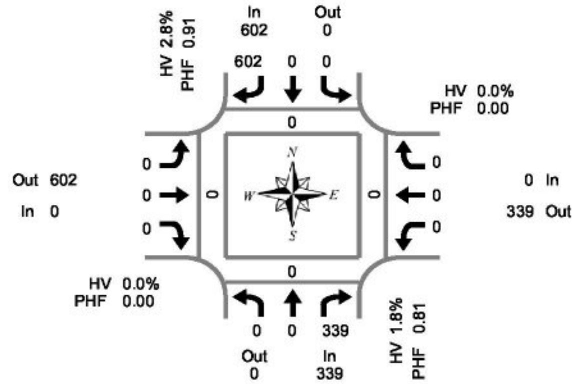
Approach	PHF	HV%	Volume
EB	0.92	1.0%	210
WB	0.00	0.0%	0
NB	0.95	0.9%	675
SB	0.92	1.8%	568
Intersection	0.96	1.2%	1,453

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Hwy 43 & I-205 NB On Ramps

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 NB On Ramps				Westbound I-205 NB On Ramps				Interval Total
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	
4:00 PM	0	0	71	0	0	0	138	0	0	0	0	0	0	0	0	0	209
4:15 PM	0	0	97	0	0	0	140	0	0	0	0	0	0	0	0	0	237
4:30 PM	0	0	105	0	0	0	155	0	0	0	0	0	0	0	0	0	260
4:45 PM	0	0	77	0	0	0	141	0	0	0	0	0	0	0	0	0	218
5:00 PM	0	0	78	0	0	0	140	0	0	0	0	0	0	0	0	0	218
5:15 PM	0	0	79	0	0	0	166	0	0	0	0	0	0	0	0	0	245
5:30 PM	0	0	83	0	0	0	157	0	0	0	0	0	0	0	0	0	240
5:45 PM	0	0	73	0	0	0	129	0	0	0	0	0	0	0	0	0	202
Total Survey	0	0	663	0	0	0	1,166	0	0	0	0	0	0	0	0	0	1,829

Pedestrians Crosswalk			
North	South	East	West
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 NB On Ramps				Westbound I-205 NB On Ramps				Total
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	339	0	339	0	602	0	602	0	0	602	602	0	0	339	339	0	941
%HV	1.8%				2.8%				0.0%				0.0%				2.4%
PHF	0.81				0.91				0.00				0.00				0.90

Pedestrians Crosswalk			
North	South	East	West
0	0	0	0

By Movement	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 NB On Ramps				Westbound I-205 NB On Ramps				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	339	339	0	0	602	602	0	0	0	0	0	0	0	0	941
%HV	0.0%	0.0%	1.8%	1.8%	0.0%	0.0%	2.8%	2.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%
PHF	0.00	0.00	0.81	0.81	0.00	0.00	0.91	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90

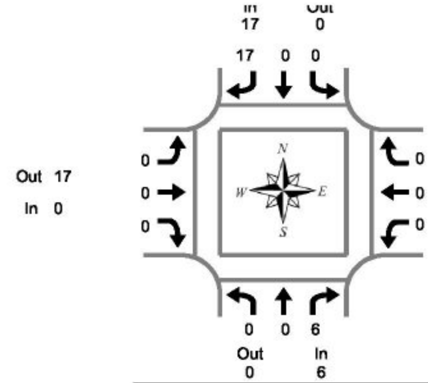
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 NB On Ramps				Westbound I-205 NB On Ramps				Interval Total
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	
4:00 PM	0	0	350	0	0	0	574	0	0	0	0	0	0	0	0	0	924
4:15 PM	0	0	357	0	0	0	576	0	0	0	0	0	0	0	0	0	933
4:30 PM	0	0	339	0	0	0	602	0	0	0	0	0	0	0	0	0	941
4:45 PM	0	0	317	0	0	0	604	0	0	0	0	0	0	0	0	0	921
5:00 PM	0	0	313	0	0	0	592	0	0	0	0	0	0	0	0	0	905

Pedestrians Crosswalk			
North	South	East	West
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:30 PM to 5:30 PM

Hwy 43 & I-205 NB On Ramps

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 NB On Ramps				Westbound I-205 NB On Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	2	2	0	0	4	4	0	0	0	0	0	0	0	0	6
4:15 PM	0	0	1	1	0	0	5	5	0	0	0	0	0	0	0	0	6
4:30 PM	0	0	1	1	0	0	5	5	0	0	0	0	0	0	0	0	6
4:45 PM	0	0	1	1	0	0	6	6	0	0	0	0	0	0	0	0	7
5:00 PM	0	0	3	3	0	0	4	4	0	0	0	0	0	0	0	0	7
5:15 PM	0	0	1	1	0	0	2	2	0	0	0	0	0	0	0	0	3
5:30 PM	0	0	2	2	0	0	3	3	0	0	0	0	0	0	0	0	5
5:45 PM	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	3
Total Survey	0	0	11	11	0	0	32	32	0	0	0	0	0	0	0	0	43

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound Hwy 43			Southbound Hwy 43			Eastbound I-205 NB On Ramps			Westbound I-205 NB On Ramps			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	6	0	6	17	0	17	0	17	17	0	6	6	23
PHF	0.25			0.27			0.00			0.00			0.29

By Movement	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 NB On Ramps				Westbound I-205 NB On Ramps				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	6	6	0	0	17	17	0	0	0	0	0	0	0	0	23
PHF	0.00	0.00	0.25	0.25	0.00	0.00	0.27	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 43				Southbound Hwy 43				Eastbound I-205 NB On Ramps				Westbound I-205 NB On Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	5	5	0	0	20	20	0	0	0	0	0	0	0	0	25
4:15 PM	0	0	6	6	0	0	20	20	0	0	0	0	0	0	0	0	26
4:30 PM	0	0	6	6	0	0	17	17	0	0	0	0	0	0	0	0	23
4:45 PM	0	0	7	7	0	0	15	15	0	0	0	0	0	0	0	0	22
5:00 PM	0	0	6	6	0	0	12	12	0	0	0	0	0	0	0	0	18

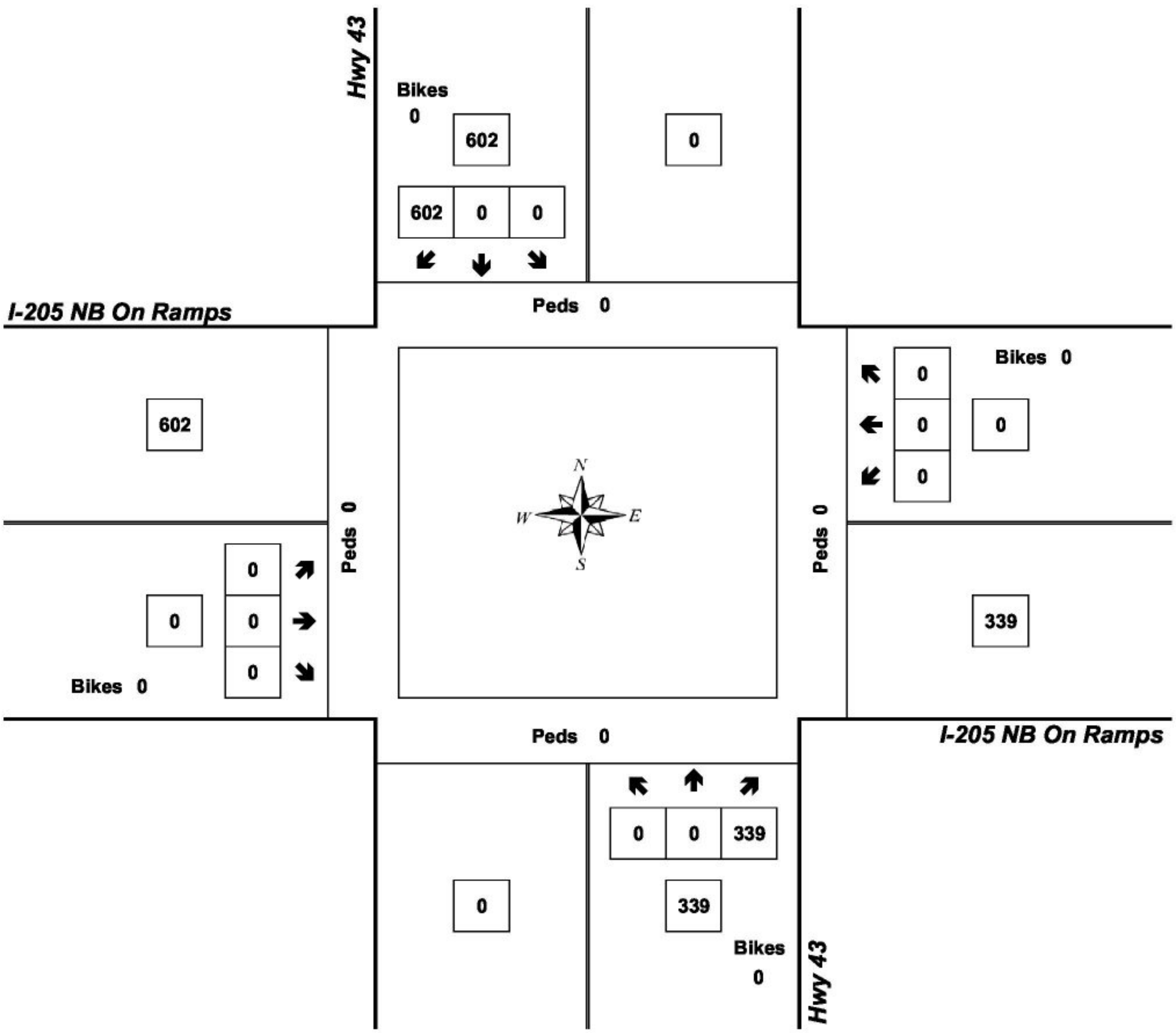
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

Hwy 43 & I-205 NB On Ramps

4:30 PM to 5:30 PM
Tuesday, April 15, 2014



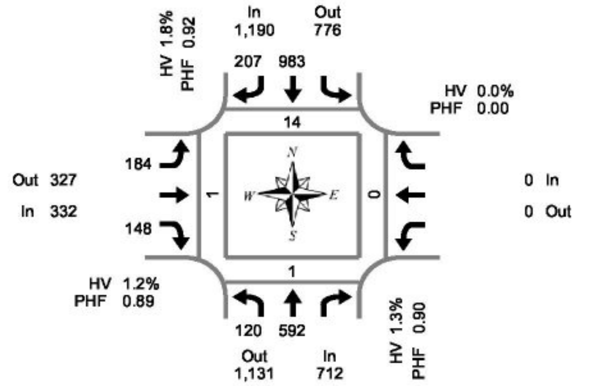
Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.00	0.0%	0
NB	0.81	1.8%	339
SB	0.91	2.8%	602
Intersection	0.90	2.4%	941

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data
Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:45 PM to 5:45 PM

Hwy 43 & Hidden Springs Rd

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 43 L	T		Bikes	Southbound Hwy 43	T	R	Bikes	Eastbound Hidden Springs Rd L		R	Bikes	Westbound Hidden Springs Rd			Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	29	119		0		210	37	0	44		28	0				0	467	1	1	0	1
4:15 PM	28	130		0		229	48	0	42		18	0				0	495	0	0	0	2
4:30 PM	27	133		0		219	47	0	44		35	0				0	505	1	0	0	4
4:45 PM	32	160		0		230	44	0	49		44	0				0	559	6	1	0	0
5:00 PM	37	160		0		250	70	0	41		34	0				0	592	0	0	0	1
5:15 PM	31	128		3		278	45	0	51		31	0				0	564	5	0	0	0
5:30 PM	20	144		1		225	48	0	43		39	0				0	519	3	0	0	0
5:45 PM	31	112		0		247	43	0	57		28	0				0	518	0	1	0	2
Total Survey	235	1,086		4		1,888	382	0	371		257	0				0	4,219	16	3	0	10

Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound Hwy 43 In	Out	Total	Bikes	Southbound Hwy 43 In	Out	Total	Bikes	Eastbound Hidden Springs Rd In	Out	Total	Bikes	Westbound Hidden Springs Rd In	Out	Total	Bikes	Total	Pedestrians Crosswalk North	South	East	West
Volume	712	1,131	1,843	4	1,190	776	1,966	0	332	327	659	0	0	0	0	0	2,234	14	1	0	1
%HV	1.3%				1.8%				1.2%				0.0%				1.5%				
PHF	0.90				0.92				0.89				0.00				0.94				

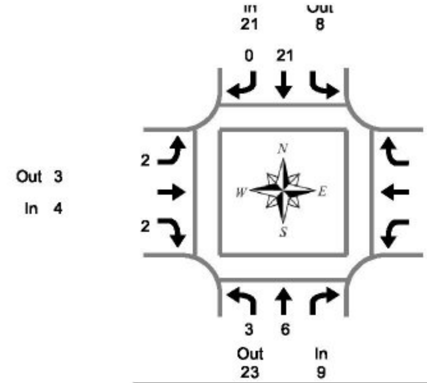
By Movement	Northbound Hwy 43 L	T		Total	Southbound Hwy 43	T	R	Total	Eastbound Hidden Springs Rd L		R	Total	Westbound Hidden Springs Rd			Total	Total
Volume	120	592		712		983	207	1,190	184		148	332				0	2,234
%HV	2.5%	1.0%	NA	1.3%	NA	2.1%	0.0%	1.8%	1.1%	NA	1.4%	1.2%	NA	NA	NA	0.0%	1.5%
PHF	0.81	0.93		0.90		0.88	0.74	0.92	0.90		0.84	0.89				0.00	0.94

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 43 L	T		Bikes	Southbound Hwy 43	T	R	Bikes	Eastbound Hidden Springs Rd L		R	Bikes	Westbound Hidden Springs Rd			Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	116	542		0		888	176	0	179		125	0				0	2,026	8	2	0	7
4:15 PM	124	583		0		928	209	0	176		131	0				0	2,151	7	1	0	7
4:30 PM	127	581		3		977	206	0	185		144	0				0	2,220	12	1	0	5
4:45 PM	120	592		4		983	207	0	184		148	0				0	2,234	14	1	0	1
5:00 PM	119	544		4		1,000	206	0	192		132	0				0	2,193	8	1	0	3

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
4:45 PM to 5:45 PM

Hwy 43 & Hidden Springs Rd

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound Hwy 43				Southbound Hwy 43				Eastbound Hidden Springs Rd				Westbound Hidden Springs Rd				Interval
Time	L	T		Total		T	R	Total	L		R	Total				Total	Total
4:00 PM	2	4		6		8	0	8	1		2	3				0	17
4:15 PM	1	3		4		5	1	6	0		0	0				0	10
4:30 PM	0	3		3		7	1	8	0		1	1				0	12
4:45 PM	1	1		2		7	0	7	0		2	2				0	11
5:00 PM	1	2		3		7	0	7	0		0	0				0	10
5:15 PM	0	2		2		4	0	4	2		0	2				0	8
5:30 PM	1	1		2		3	0	3	0		0	0				0	5
5:45 PM	0	2		2		4	0	4	1		0	1				0	7
Total Survey	6	18		24		45	2	47	4		5	9				0	80

Heavy Vehicle Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound Hwy 43				Southbound Hwy 43				Eastbound Hidden Springs Rd				Westbound Hidden Springs Rd				Total
	In	Out	Total		In	Out	Total		In	Out	Total		In	Out	Total		
Volume	9	23	32		21	8	29		4	3	7		0	0	0		34
PHF	0.17				0.24				0.25				0.00				0.22

By Movement	Northbound Hwy 43				Southbound Hwy 43				Eastbound Hidden Springs Rd				Westbound Hidden Springs Rd				Total
	L	T		Total		T	R	Total	L		R	Total				Total	
Volume	3	6		9		21	0	21	2		2	4				0	34
PHF	0.25	0.15		0.17		0.25	0.00	0.24	0.17		0.17	0.25				0.00	0.22

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

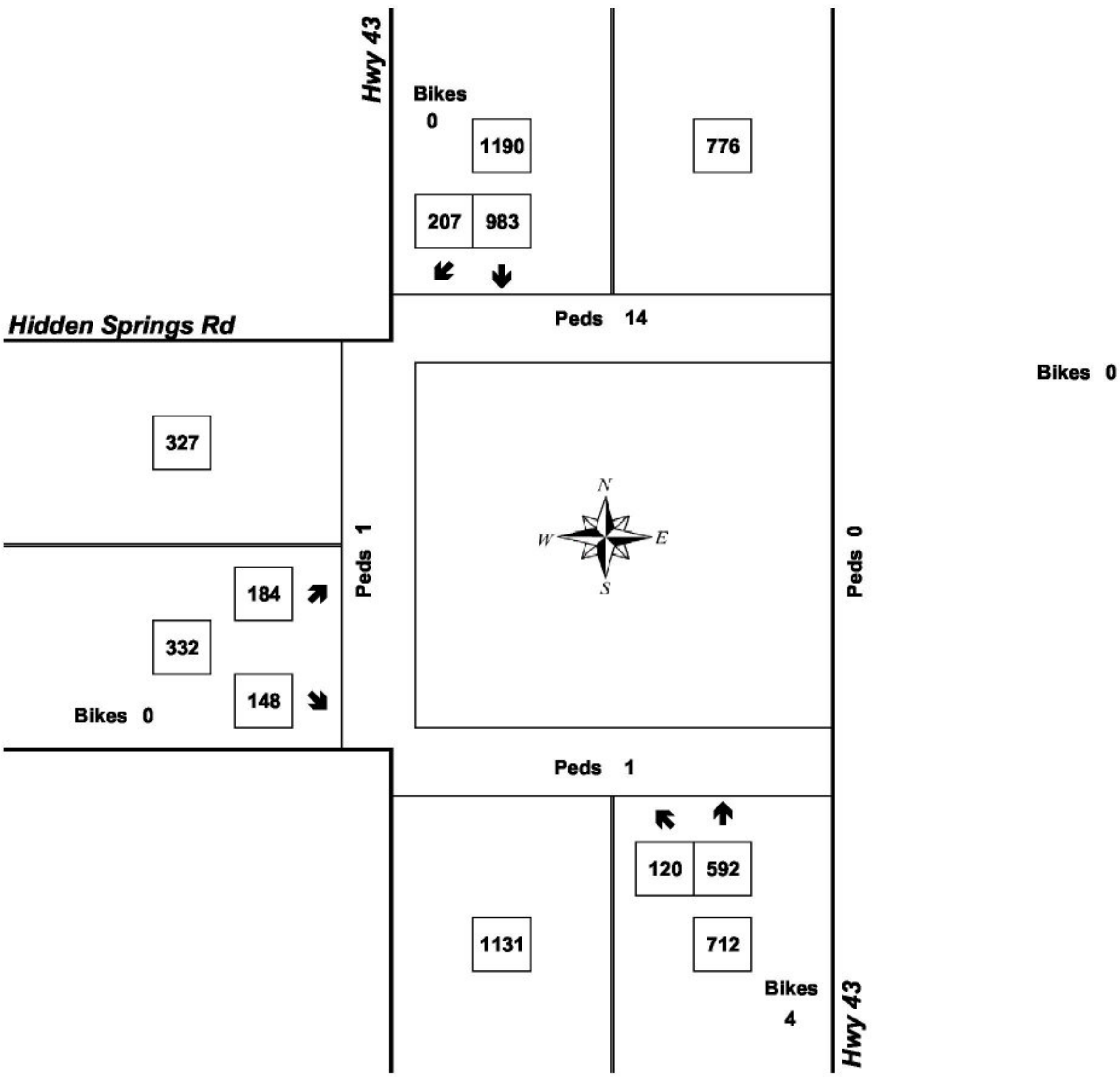
Interval Start	Northbound Hwy 43				Southbound Hwy 43				Eastbound Hidden Springs Rd				Westbound Hidden Springs Rd				Interval
Time	L	T		Total		T	R	Total	L		R	Total				Total	Total
4:00 PM	4	11		15		27	2	29	1		5	6				0	50
4:15 PM	3	9		12		26	2	28	0		3	3				0	43
4:30 PM	2	8		10		25	1	26	2		3	5				0	41
4:45 PM	3	6		9		21	0	21	2		2	4				0	34
5:00 PM	2	7		9		18	0	18	3		0	3				0	30

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Hwy 43 & Hidden Springs Rd

4:45 PM to 5:45 PM
Tuesday, April 15, 2014



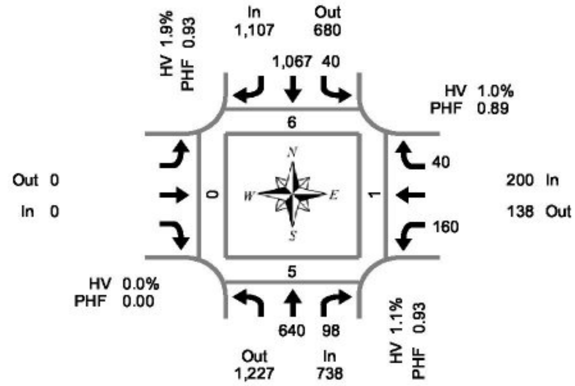
Approach	PHF	HV%	Volume
EB	0.89	1.2%	332
WB	0.00	0.0%	0
NB	0.90	1.3%	712
SB	0.92	1.8%	1,190
Intersection	0.94	1.5%	2,234

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:45 PM to 5:45 PM

Hwy 43 & Cedar Oak Dr

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 43				Southbound Hwy 43				Eastbound Cedar Oak Dr				Westbound Cedar Oak Dr				Interval Total	Pedestrians Crosswalk			
		T	R	Bikes	L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
4:00 PM		134	27	0	7	223		0				0	31		6	0	428	4	2	1	0
4:15 PM		142	21	0	8	261		0				0	26		4	0	462	1	2	0	0
4:30 PM		138	25	0	5	241		0				0	36		6	0	451	2	1	0	0
4:45 PM		159	35	0	14	259		0				0	48		8	1	523	3	1	1	0
5:00 PM		180	19	0	8	283		0				0	30		9	0	529	2	0	0	0
5:15 PM		143	21	3	8	290		0				0	44		12	0	518	1	3	0	0
5:30 PM		158	23	1	10	235		0				0	38		11	0	475	0	1	0	0
5:45 PM		141	20	0	4	270		1				0	23		8	0	466	0	2	0	0
Total Survey		1,195	191	4	64	2,062		1				0	276		64	1	3,852	13	12	2	0

Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound Hwy 43				Southbound Hwy 43				Eastbound Cedar Oak Dr				Westbound Cedar Oak Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	738	1,227	1,965	4	1,107	680	1,787	0	0	0	0	0	200	138	338	1	2,045	6	5	1	0
%HV	1.1%				1.9%				0.0%				1.0%				1.5%				
PHF	0.93				0.93				0.00				0.89				0.97				

By Movement	Northbound Hwy 43				Southbound Hwy 43				Eastbound Cedar Oak Dr				Westbound Cedar Oak Dr				Total
		T	R	Total	L	T		Total				Total	L		R	Total	
Volume		640	98	738	40	1,067		1,107				0	160		40	200	2,045
%HV	NA	1.1%	1.0%	1.1%	0.0%	2.0%	NA	1.9%	NA	NA	NA	0.0%	1.3%	NA	0.0%	1.0%	1.5%
PHF		0.89	0.70	0.93	0.71	0.92		0.93				0.00	0.83		0.83	0.89	0.97

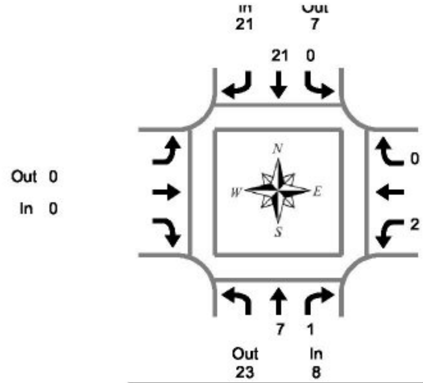
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 43				Southbound Hwy 43				Eastbound Cedar Oak Dr				Westbound Cedar Oak Dr				Interval Total	Pedestrians Crosswalk			
		T	R	Bikes	L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
4:00 PM		573	108	0	34	984		0				0	141		24	1	1,864	10	6	2	0
4:15 PM		619	100	0	35	1,044		0				0	140		27	1	1,965	8	4	1	0
4:30 PM		620	100	3	35	1,073		0				0	158		35	1	2,021	8	5	1	0
4:45 PM		640	98	4	40	1,067		0				0	160		40	1	2,045	6	5	1	0
5:00 PM		622	83	4	30	1,078		1				0	135		40	0	1,988	3	6	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:45 PM to 5:45 PM

Hwy 43 & Cedar Oak Dr

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 43				Southbound Hwy 43				Eastbound Cedar Oak Dr				Westbound Cedar Oak Dr				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
4:00 PM		5	0	5	0	6		6				0	2		1	3	14
4:15 PM		1	1	2	0	6		6				0	1		0	1	9
4:30 PM		2	1	3	0	4		4				0	3		0	3	10
4:45 PM		1	0	1	0	7		7				0	0		0	0	8
5:00 PM		1	1	2	0	5		5				0	2		0	2	9
5:15 PM		4	0	4	0	5		5				0	0		0	0	9
5:30 PM		1	0	1	0	4		4				0	0		0	0	5
5:45 PM		2	1	3	0	3		3				0	0		0	0	6
Total Survey		17	4	21	0	40		40				0	8		1	9	70

Heavy Vehicle Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound Hwy 43			Southbound Hwy 43			Eastbound Cedar Oak Dr			Westbound Cedar Oak Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	8	23	31	21	7	28	0	0	0	2	1	3	31
PHF	0.20			0.31			0.00			0.07			0.23

By Movement	Northbound Hwy 43				Southbound Hwy 43				Eastbound Cedar Oak Dr				Westbound Cedar Oak Dr				Total
		T	R	Total	L	T		Total				Total	L		R	Total	
Volume		7	1	8	0	21		21				0	2		0	2	31
PHF		0.22	0.13	0.20	0.00	0.31		0.31				0.00	0.08		0.00	0.07	0.23

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

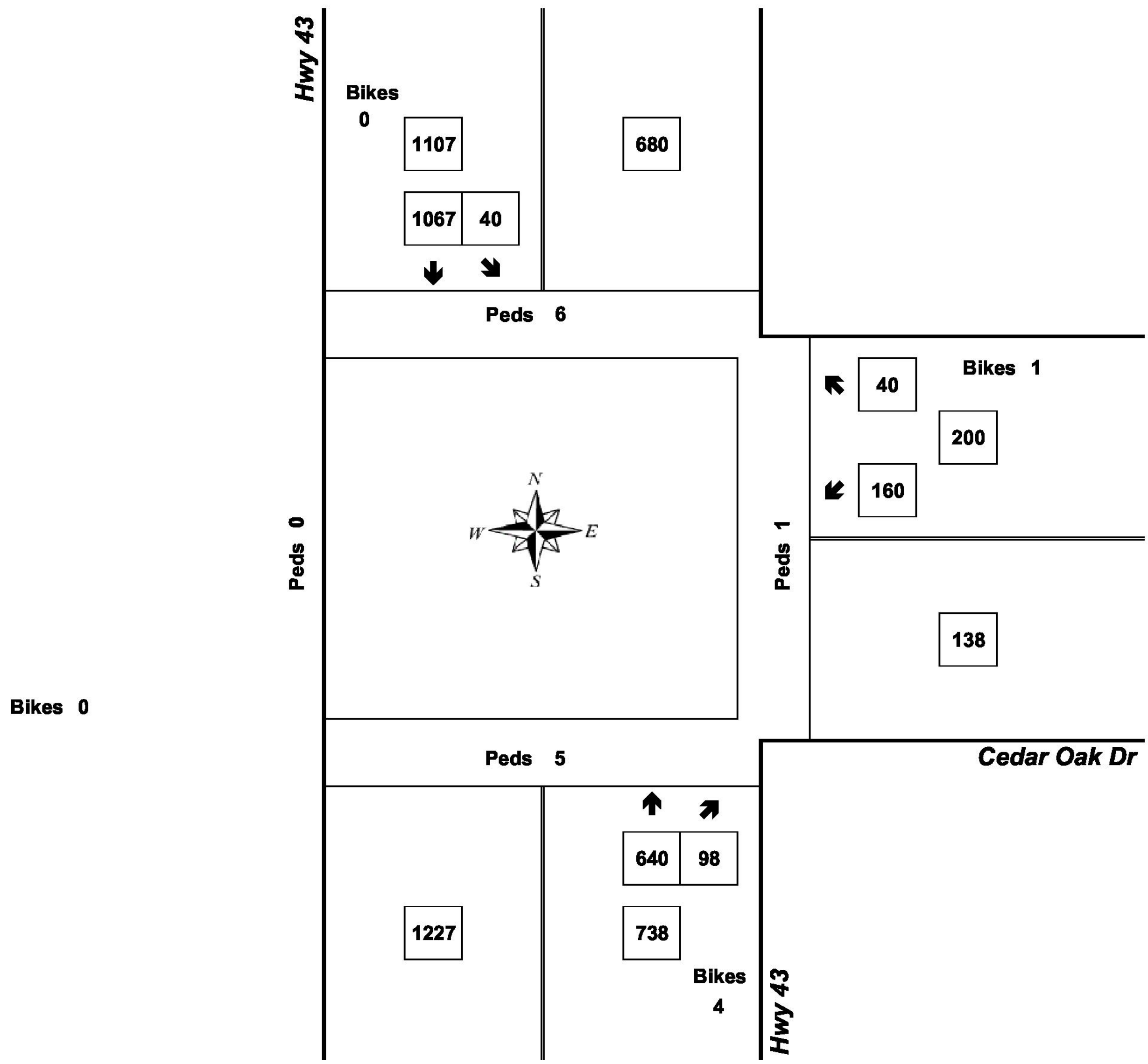
Interval Start Time	Northbound Hwy 43				Southbound Hwy 43				Eastbound Cedar Oak Dr				Westbound Cedar Oak Dr				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
4:00 PM		9	2	11	0	23		23				0	6		1	7	41
4:15 PM		5	3	8	0	22		22				0	6		0	6	36
4:30 PM		8	2	10	0	21		21				0	5		0	5	36
4:45 PM		7	1	8	0	21		21				0	2		0	2	31
5:00 PM		8	2	10	0	17		17				0	2		0	2	29

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Hwy 43 & Cedar Oak Dr

4:45 PM to 5:45 PM
Tuesday, April 15, 2014

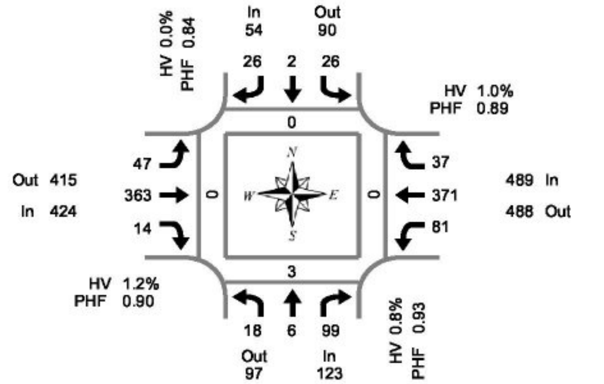


Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.89	1.0%	200
NB	0.93	1.1%	738
SB	0.93	1.9%	1,107
Intersection	0.97	1.5%	2,045

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

Tanler Dr & Blankenship Rd

Tuesday, April 22, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Tanler Dr				Southbound Tanler Dr				Eastbound Blankenship Rd				Westbound Blankenship Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	8	2	24	0	8	1	2	0	8	102	2	0	27	74	11	0	269	0	1	0	0
4:15 PM	2	3	20	0	10	1	5	0	11	88	2	1	24	71	2	0	239	0	0	0	0
4:30 PM	8	0	28	0	10	1	8	0	14	97	6	0	24	78	9	0	283	0	3	0	0
4:45 PM	3	1	29	0	5	0	7	0	6	94	3	0	22	77	9	0	256	0	0	0	0
5:00 PM	5	0	24	0	5	1	9	0	9	98	5	0	18	83	4	0	261	0	0	0	0
5:15 PM	3	1	29	0	4	0	4	0	16	86	1	0	26	93	5	0	268	0	0	0	0
5:30 PM	5	2	25	0	9	0	7	0	8	78	5	1	16	94	12	0	261	0	2	0	0
5:45 PM	5	3	21	0	8	1	6	0	14	101	3	0	21	101	16	0	300	0	1	0	0
Total Survey	39	12	200	0	59	5	48	0	86	744	27	2	178	671	68	0	2,137	0	7	0	0

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Tanler Dr				Southbound Tanler Dr				Eastbound Blankenship Rd				Westbound Blankenship Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	123	97	220	0	54	90	144	0	424	415	839	1	489	488	977	0	1,090	0	3	0	0
%HV	0.8%				0.0%				1.2%				1.0%				1.0%				
PHF	0.93				0.84				0.90				0.89				0.91				

By Movement	Northbound Tanler Dr				Southbound Tanler Dr				Eastbound Blankenship Rd				Westbound Blankenship Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	18	6	99	123	26	2	26	54	47	363	14	424	81	371	37	489	1,090
%HV	0.0%	0.0%	1.0%	0.8%	0.0%	0.0%	0.0%	0.0%	2.1%	1.1%	0.0%	1.2%	1.2%	1.1%	0.0%	1.0%	1.0%
PHF	0.90	0.50	0.85	0.93	0.72	0.50	0.72	0.84	0.73	0.90	0.70	0.90	0.78	0.92	0.58	0.89	0.91

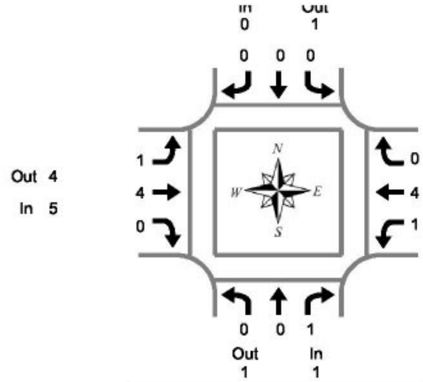
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Tanler Dr				Southbound Tanler Dr				Eastbound Blankenship Rd				Westbound Blankenship Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	21	6	101	0	33	3	22	0	39	381	13	1	97	300	31	0	1,047	0	4	0	0
4:15 PM	18	4	101	0	30	3	29	0	40	377	16	1	88	309	24	0	1,039	0	3	0	0
4:30 PM	19	2	110	0	24	2	28	0	45	375	15	0	90	331	27	0	1,068	0	3	0	0
4:45 PM	16	4	107	0	23	1	27	0	39	356	14	1	82	347	30	0	1,046	0	2	0	0
5:00 PM	18	6	99	0	26	2	26	0	47	363	14	1	81	371	37	0	1,090	0	3	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Tanler Dr & Blankenship Rd

Tuesday, April 22, 2014
4:00 PM to 6:00 PM

Peak Hour Summary
5:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound Tanler Dr				Southbound Tanler Dr				Eastbound Blankenship Rd				Westbound Blankenship Rd				Interval
Time	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	Total
4:00 PM	0	0	0	0	1	0	0	1	1	2	0	3	0	2	0	2	6
4:15 PM	0	0	0	0	1	0	0	1	1	1	0	2	0	3	0	3	6
4:30 PM	0	0	0	0	1	0	0	1	0	2	0	2	0	1	0	1	4
4:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
5:00 PM	0	0	1	1	0	0	0	0	0	2	0	2	1	1	0	2	5
5:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
5:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
Total Survey	0	0	1	1	3	0	0	3	3	10	0	13	1	11	0	12	29

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Tanler Dr			Southbound Tanler Dr			Eastbound Blankenship Rd			Westbound Blankenship Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1	1	2	0	1	1	5	4	9	5	5	10	11
PHF	0.25			0.00			0.18			0.21			0.17

By Movement	Northbound Tanler Dr				Southbound Tanler Dr				Eastbound Blankenship Rd				Westbound Blankenship Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	1	1	0	0	0	0	1	4	0	5	1	4	0	5	11
PHF	0.00	0.00	0.25	0.25	0.00	0.00	0.00	0.00	0.13	0.20	0.00	0.18	0.25	0.17	0.00	0.21	0.17

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

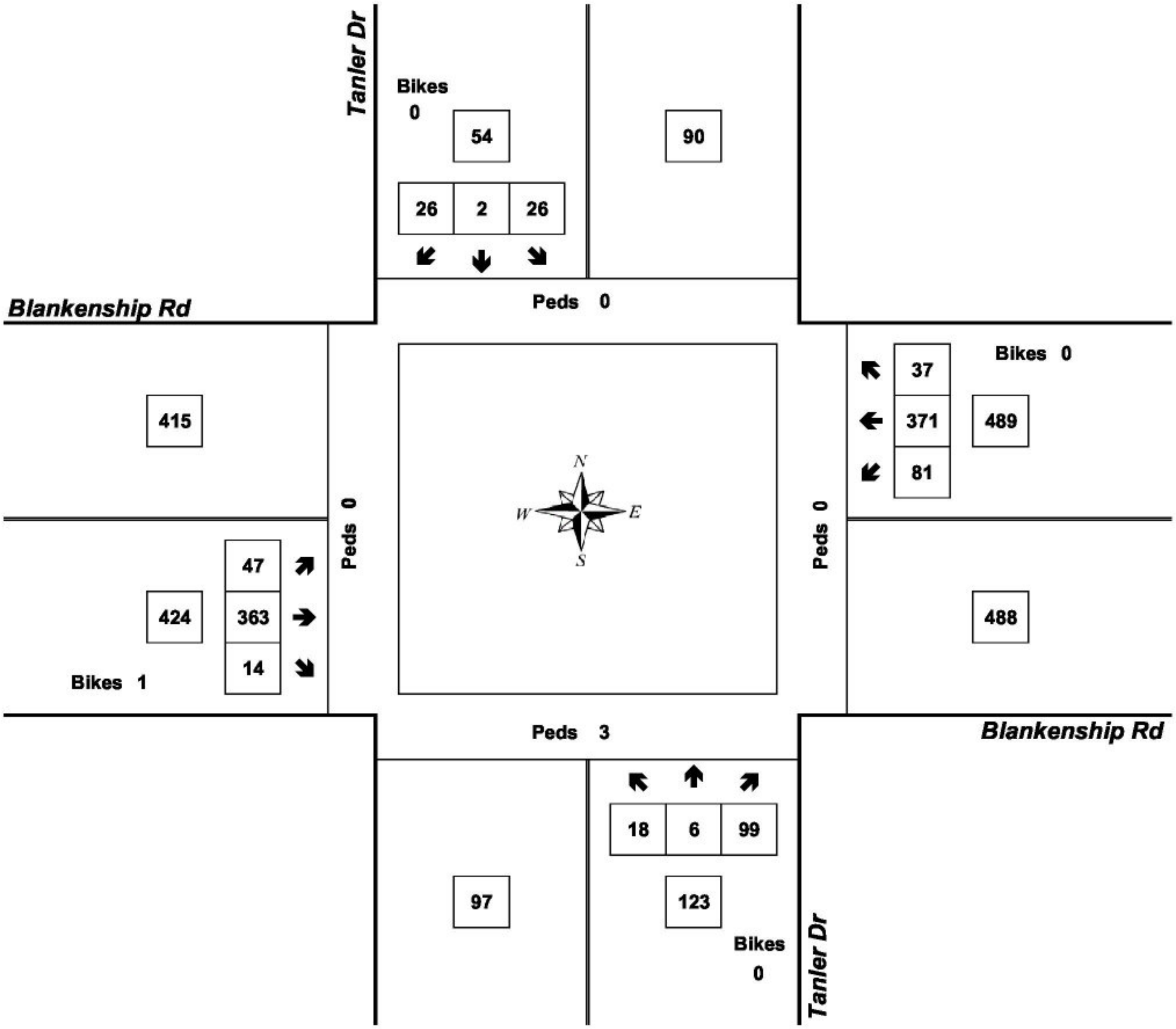
Interval Start	Northbound Tanler Dr				Southbound Tanler Dr				Eastbound Blankenship Rd				Westbound Blankenship Rd				Interval
Time	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	Total
4:00 PM	0	0	0	0	3	0	0	3	2	6	0	8	0	7	0	7	18
4:15 PM	0	0	1	1	2	0	0	2	1	6	0	7	1	6	0	7	17
4:30 PM	0	0	1	1	1	0	0	1	0	6	0	6	1	4	0	5	13
4:45 PM	0	0	1	1	0	0	0	0	1	4	0	5	1	3	0	4	10
5:00 PM	0	0	1	1	0	0	0	0	1	4	0	5	1	4	0	5	11

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Tanler Dr & Blankenship Rd

5:00 PM to 6:00 PM
Tuesday, April 22, 2014

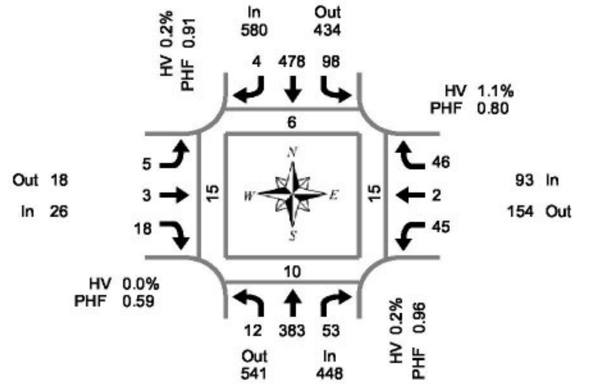


Approach	PHF	HV%	Volume
EB	0.90	1.2%	424
WB	0.89	1.0%	489
NB	0.93	0.8%	123
SB	0.84	0.0%	54
Intersection	0.91	1.0%	1,090

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

Salamo Rd & Parker Rd

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	4	79	7	0	16	94	1	0	3	1	3	0	16	1	7	0	232	0	2	4	0
4:15 PM	2	83	8	1	16	97	0	1	1	0	1	0	10	2	7	0	227	0	5	4	0
4:30 PM	4	86	14	0	17	110	2	0	2	0	3	0	13	0	13	0	264	0	6	6	0
4:45 PM	2	100	11	1	11	99	1	0	2	1	5	0	8	0	20	0	260	0	3	5	0
5:00 PM	4	92	15	0	21	111	0	0	1	2	8	0	16	2	11	0	283	2	5	3	9
5:15 PM	4	100	13	0	29	130	1	0	2	0	4	0	6	0	8	0	297	4	2	3	2
5:30 PM	1	92	13	0	21	107	2	1	2	1	4	0	10	0	14	0	267	0	2	6	2
5:45 PM	3	99	12	0	27	130	1	0	0	0	2	0	13	0	13	0	300	0	1	3	2
Total Survey	24	731	93	2	158	878	8	2	13	5	30	0	92	5	93	0	2,130	6	26	34	15

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	448	541	989	0	580	434	1,014	1	26	18	44	0	93	154	247	0	1,147	6	10	15	15
%HV	0.2%				0.2%				0.0%				1.1%				0.3%				
PHF	0.96				0.91				0.59				0.80				0.96				

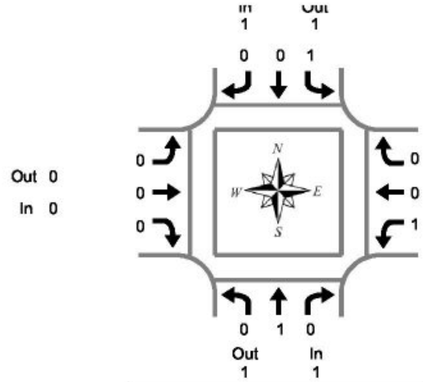
By Movement	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	12	383	53	448	98	478	4	580	5	3	18	26	45	2	46	93	1,147
%HV	0.0%	0.3%	0.0%	0.2%	1.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	0.0%	1.1%	0.3%
PHF	0.75	0.96	0.88	0.96	0.84	0.92	0.50	0.91	0.63	0.38	0.56	0.59	0.70	0.25	0.82	0.80	0.96

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	12	348	40	2	60	400	4	1	8	2	12	0	47	3	47	0	983	0	16	19	0
4:15 PM	12	361	48	2	65	417	3	1	6	3	17	0	47	4	51	0	1,034	2	19	18	9
4:30 PM	14	378	53	1	78	450	4	0	7	3	20	0	43	2	52	0	1,104	6	16	17	11
4:45 PM	11	384	52	1	82	447	4	1	7	4	21	0	40	2	53	0	1,107	6	12	17	13
5:00 PM	12	383	53	0	98	478	4	1	5	3	18	0	45	2	46	0	1,147	6	10	15	15

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Salamo Rd & Parker Rd

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

Peak Hour Summary
5:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	1	0	1	1	3	0	4	0	0	0	0	1	0	0	1	6
4:15 PM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2	2	4
4:30 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
4:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	2
Total Survey	0	6	0	6	2	4	0	6	0	0	0	0	3	0	2	5	17

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Salamo Rd			Southbound Salamo Rd			Eastbound Parker Rd			Westbound Parker Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1	1	2	1	1	2	0	0	0	1	1	2	3
PHF	0.06			0.05			0.00			0.08			0.06

By Movement	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	1	0	1	1	0	0	1	0	0	0	0	1	0	0	1	3
PHF	0.00	0.06	0.00	0.06	0.25	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.08	0.06

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

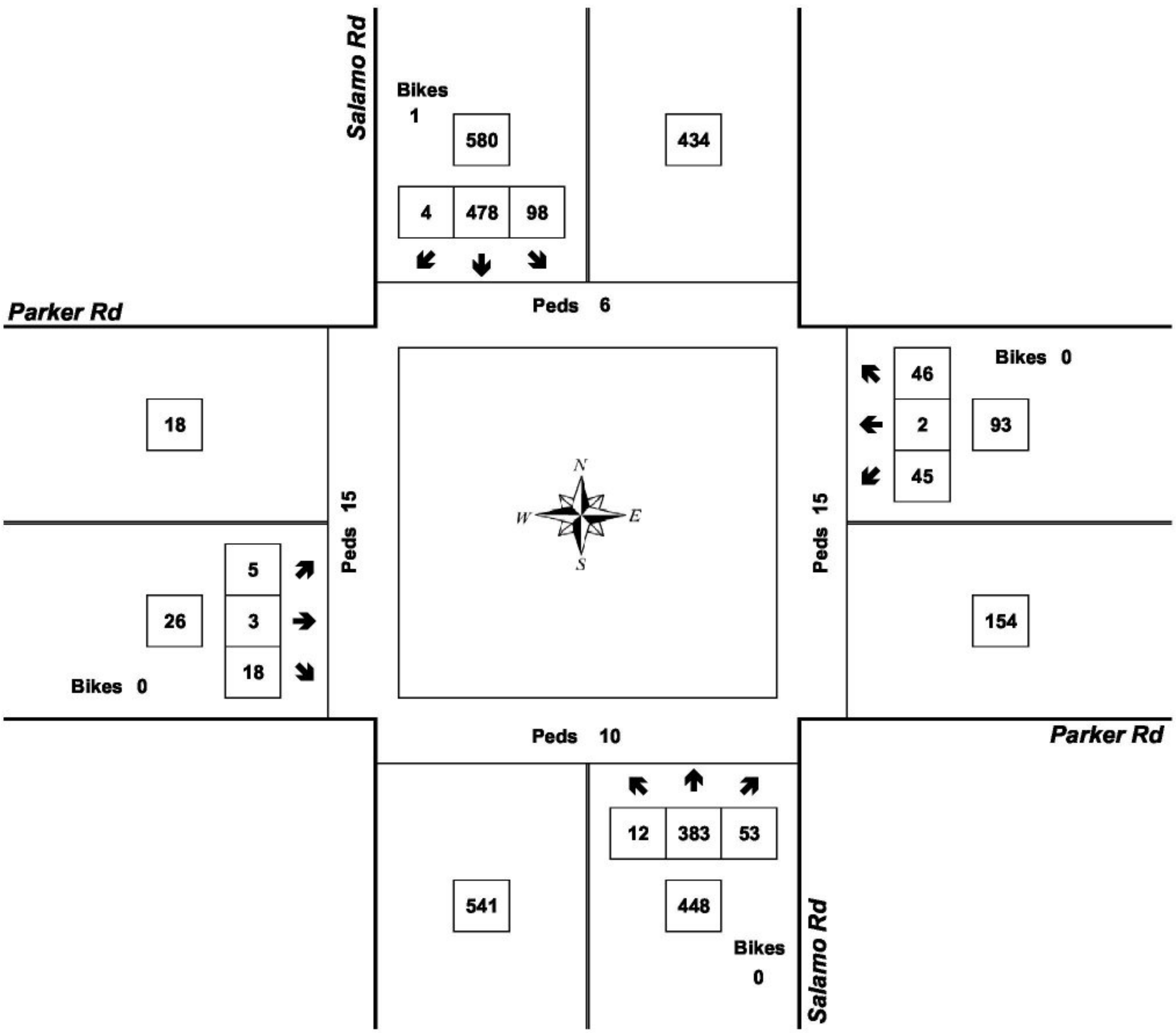
Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Parker Rd				Westbound Parker Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	5	0	5	1	4	0	5	0	0	0	0	2	0	2	4	14
4:15 PM	0	4	0	4	0	1	0	1	0	0	0	0	1	0	2	3	8
4:30 PM	0	2	0	2	0	1	0	1	0	0	0	0	2	0	0	2	5
4:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
5:00 PM	0	1	0	1	1	0	0	1	0	0	0	0	1	0	0	1	3

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Salamo Rd & Parker Rd

5:00 PM to 6:00 PM
Tuesday, April 15, 2014



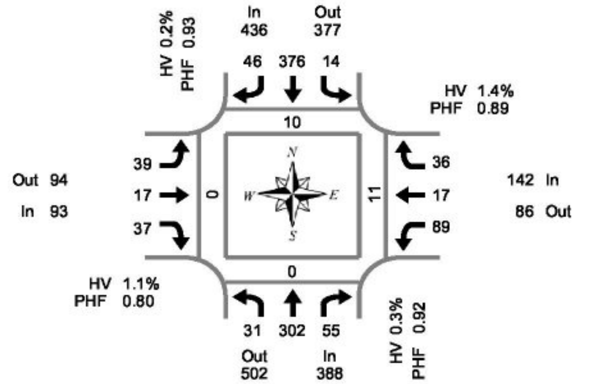
Approach	PHF	HV%	Volume
EB	0.59	0.0%	26
WB	0.80	1.1%	93
NB	0.96	0.2%	448
SB	0.91	0.2%	580
Intersection	0.96	0.3%	1,147

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

Salamo Rd & Day Rd

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Day Rd				Westbound Day Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	2	66	15	0	4	87	5	0	6	1	7	0	27	2	14	0	236	6	1	3	11
4:15 PM	4	67	13	0	4	72	9	1	11	1	10	0	21	2	10	1	224	2	0	5	1
4:30 PM	8	76	22	0	4	104	10	0	10	1	9	0	20	0	7	0	271	2	1	7	0
4:45 PM	9	79	15	0	4	76	9	0	5	1	7	0	18	1	11	0	235	1	0	2	1
5:00 PM	10	77	18	0	5	100	6	0	15	4	7	0	21	5	6	0	274	1	0	2	0
5:15 PM	5	75	13	0	2	92	14	0	9	6	14	0	23	3	8	0	264	4	0	5	0
5:30 PM	6	71	11	0	3	84	13	0	11	4	10	0	21	2	17	0	253	3	0	2	0
5:45 PM	10	79	13	0	4	100	13	0	4	3	6	0	24	7	5	0	268	2	0	2	0
Total Survey	54	590	120	0	30	715	79	1	71	21	70	0	175	22	78	1	2,025	21	2	28	13

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Day Rd				Westbound Day Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	388	502	890	0	436	377	813	0	93	94	187	0	142	86	228	0	1,059	10	0	11	0
%HV	0.3%				0.2%				1.1%				1.4%				0.5%				
PHF	0.92				0.93				0.80				0.89				0.97				

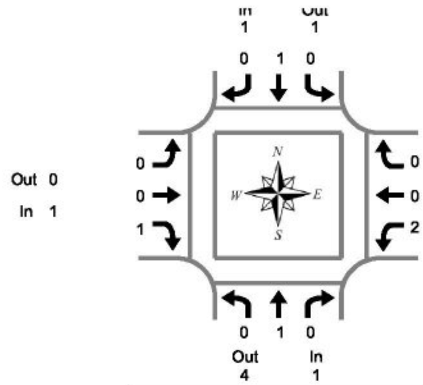
By Movement	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Day Rd				Westbound Day Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	31	302	55	388	14	376	46	436	39	17	37	93	89	17	36	142	1,059
%HV	0.0%	0.3%	0.0%	0.3%	0.0%	0.3%	0.0%	0.2%	0.0%	0.0%	2.7%	1.1%	2.2%	0.0%	0.0%	1.4%	0.5%
PHF	0.78	0.96	0.76	0.92	0.70	0.94	0.82	0.93	0.65	0.71	0.66	0.80	0.93	0.61	0.53	0.89	0.97

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Day Rd				Westbound Day Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	23	288	65	0	16	339	33	1	32	4	33	0	86	5	42	1	966	11	2	17	13
4:15 PM	31	299	68	0	17	352	34	1	41	7	33	0	80	8	34	1	1,004	6	1	16	2
4:30 PM	32	307	68	0	15	372	39	0	39	12	37	0	82	9	32	0	1,044	8	1	16	1
4:45 PM	30	302	57	0	14	352	42	0	40	15	38	0	83	11	42	0	1,026	9	0	11	1
5:00 PM	31	302	55	0	14	376	46	0	39	17	37	0	89	17	36	0	1,059	10	0	11	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

Salamo Rd & Day Rd

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Day Rd				Westbound Day Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	1	0	1	0	2	1	3	1	0	0	1	0	0	0	0	5
4:15 PM	0	3	0	3	0	2	0	2	0	0	0	0	0	0	0	0	5
4:30 PM	0	1	0	1	1	1	0	2	0	0	0	0	0	0	0	0	3
4:45 PM	0	1	0	1	0	1	0	1	0	1	0	1	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
5:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	1	2
5:30 PM	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	7	0	7	1	7	1	9	1	1	1	3	2	0	0	2	21

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Salamo Rd			Southbound Salamo Rd			Eastbound Day Rd			Westbound Day Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1	4	5	1	1	2	1	0	1	2	0	2	5
PHF	0.05			0.04			0.25			0.25			0.10

By Movement	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Day Rd				Westbound Day Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	1	0	1	0	1	0	1	0	0	1	1	2	0	0	2	5
PHF	0.00	0.05	0.00	0.05	0.00	0.05	0.00	0.04	0.00	0.00	0.25	0.25	0.25	0.00	0.00	0.25	0.10

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Salamo Rd				Southbound Salamo Rd				Eastbound Day Rd				Westbound Day Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	6	0	6	1	6	1	8	1	1	0	2	0	0	0	0	16
4:15 PM	0	5	0	5	1	4	0	5	0	1	0	1	1	0	0	1	12
4:30 PM	0	2	0	2	1	3	0	4	0	1	0	1	2	0	0	2	9
4:45 PM	0	2	0	2	0	2	0	2	0	1	1	2	2	0	0	2	8
5:00 PM	0	1	0	1	0	1	0	1	0	0	1	1	2	0	0	2	5

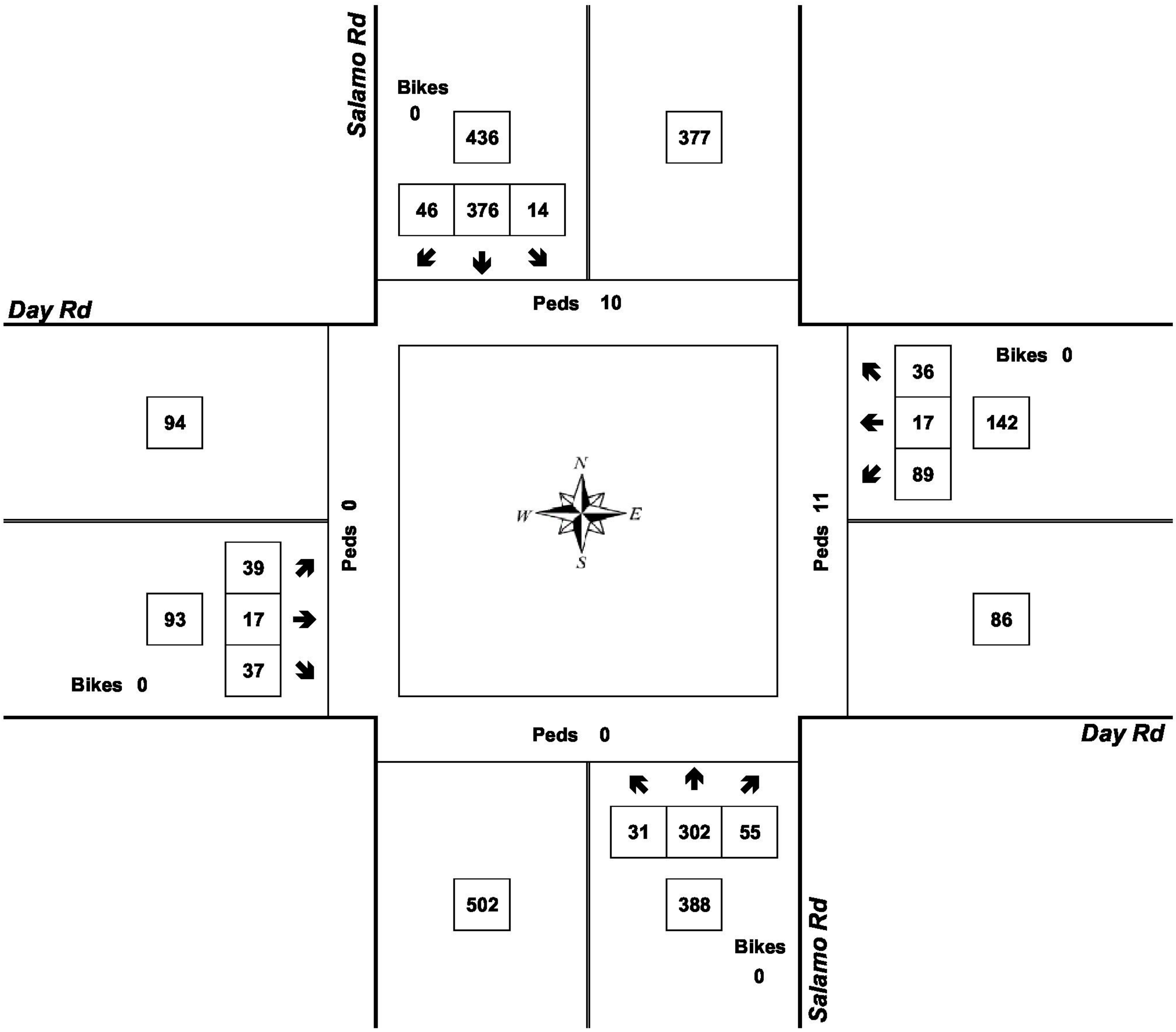
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

Salamo Rd & Day Rd

5:00 PM to 6:00 PM
Tuesday, April 15, 2014

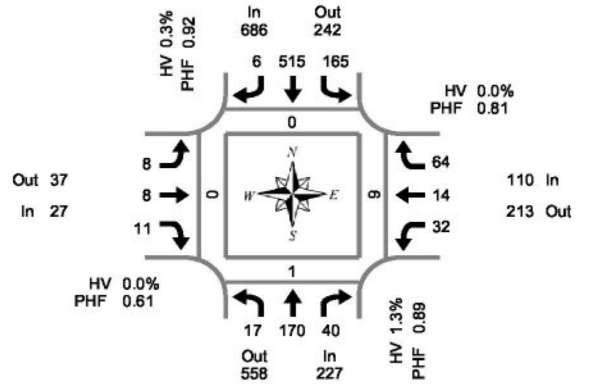


Approach	PHF	HV%	Volume
EB	0.80	1.1%	93
WB	0.89	1.4%	142
NB	0.92	0.3%	388
SB	0.93	0.2%	436
Intersection	0.97	0.5%	1,059

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



Rosemont Rd & Hidden Springs Rd

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

Peak Hour Summary
5:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Rosemont Rd				Southbound Rosemont Rd				Eastbound Hidden Springs Rd				Westbound Hidden Springs Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	7	55	9	0	25	74	2	0	1	1	2	0	5	5	14	0	200	0	1	1	0
4:15 PM	3	51	8	0	24	84	2	0	1	4	2	0	6	3	22	0	210	0	0	3	0
4:30 PM	2	49	10	0	29	104	2	0	1	2	3	0	6	2	13	0	223	3	1	1	0
4:45 PM	4	52	10	0	14	97	2	0	0	3	3	0	9	5	18	0	217	0	0	0	0
5:00 PM	3	52	9	0	41	120	1	0	1	2	2	0	11	5	18	0	265	0	1	5	0
5:15 PM	4	43	13	0	41	128	2	0	0	1	4	0	8	5	20	0	269	0	0	3	0
5:30 PM	6	41	9	0	45	121	1	0	5	3	3	0	5	2	11	0	252	0	0	0	0
5:45 PM	4	34	9	0	38	146	2	0	2	2	2	0	8	2	15	0	264	0	0	1	0
Total Survey	33	377	77	0	257	874	14	0	11	18	21	0	58	29	131	0	1,900	3	3	14	0

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Rosemont Rd				Southbound Rosemont Rd				Eastbound Hidden Springs Rd				Westbound Hidden Springs Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	227	558	785	0	686	242	928	0	27	37	64	0	110	213	323	0	1,050	0	1	9	0
%HV	1.3%				0.3%				0.0%				0.0%				0.5%				
PHF	0.89				0.92				0.61				0.81				0.98				

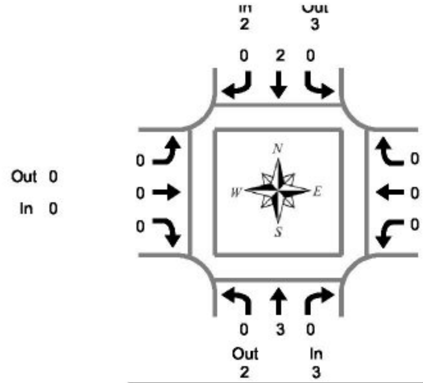
By Movement	Northbound Rosemont Rd				Southbound Rosemont Rd				Eastbound Hidden Springs Rd				Westbound Hidden Springs Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	17	170	40	227	165	515	6	686	8	8	11	27	32	14	64	110	1,050
%HV	0.0%	1.8%	0.0%	1.3%	0.0%	0.4%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%
PHF	0.71	0.82	0.77	0.89	0.92	0.88	0.75	0.92	0.40	0.67	0.69	0.61	0.73	0.70	0.80	0.81	0.98

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Rosemont Rd				Southbound Rosemont Rd				Eastbound Hidden Springs Rd				Westbound Hidden Springs Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	16	207	37	0	92	359	8	0	3	10	10	0	26	15	67	0	850	3	2	5	0
4:15 PM	12	204	37	0	108	405	7	0	3	11	10	0	32	15	71	0	915	3	2	9	0
4:30 PM	13	196	42	0	125	449	7	0	2	8	12	0	34	17	69	0	974	3	2	9	0
4:45 PM	17	188	41	0	141	466	6	0	6	9	12	0	33	17	67	0	1,003	0	1	8	0
5:00 PM	17	170	40	0	165	515	6	0	8	8	11	0	32	14	64	0	1,050	0	1	9	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

Rosemont Rd & Hidden Springs Rd

Tuesday, April 15, 2014
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound Rosemont Rd				Southbound Rosemont Rd				Eastbound Hidden Springs Rd				Westbound Hidden Springs Rd				Interval
Time	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	Total
4:00 PM	0	0	0	0	2	1	0	3	0	0	0	0	0	0	0	0	3
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3
4:30 PM	0	2	0	2	0	2	0	2	0	0	0	0	0	0	3	3	7
4:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:00 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
5:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total Survey	0	5	0	5	2	6	0	8	0	0	0	0	0	0	6	6	19

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Rosemont Rd			Southbound Rosemont Rd			Eastbound Hidden Springs Rd			Westbound Hidden Springs Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	3	2	5	2	3	5	0	0	0	0	0	0	5
PHF	0.25			0.10			0.00			0.00			0.10

By Movement	Northbound Rosemont Rd				Southbound Rosemont Rd				Eastbound Hidden Springs Rd				Westbound Hidden Springs Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	3	0	3	0	2	0	2	0	0	0	0	0	0	0	0	5
PHF	0.00	0.25	0.00	0.25	0.00	0.13	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

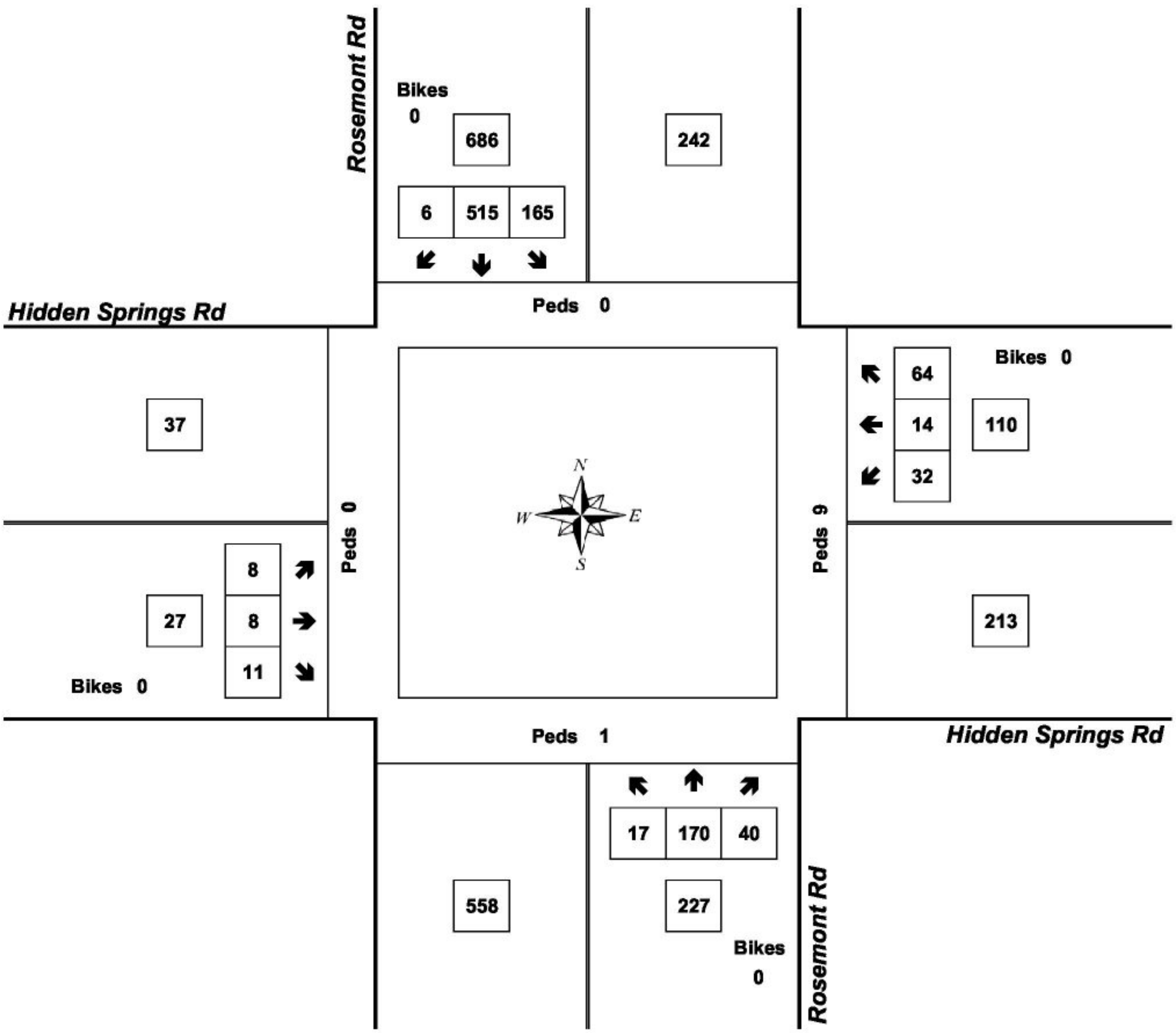
Interval Start	Northbound Rosemont Rd				Southbound Rosemont Rd				Eastbound Hidden Springs Rd				Westbound Hidden Springs Rd				Interval
Time	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	Total
4:00 PM	0	2	0	2	2	4	0	6	0	0	0	0	0	0	6	6	14
4:15 PM	0	3	0	3	0	4	0	4	0	0	0	0	0	0	6	6	13
4:30 PM	0	4	0	4	0	4	0	4	0	0	0	0	0	0	3	3	11
4:45 PM	0	3	0	3	0	2	0	2	0	0	0	0	0	0	0	0	5
5:00 PM	0	3	0	3	0	2	0	2	0	0	0	0	0	0	0	0	5

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Rosemont Rd & Hidden Springs Rd

5:00 PM to 6:00 PM
Tuesday, April 15, 2014

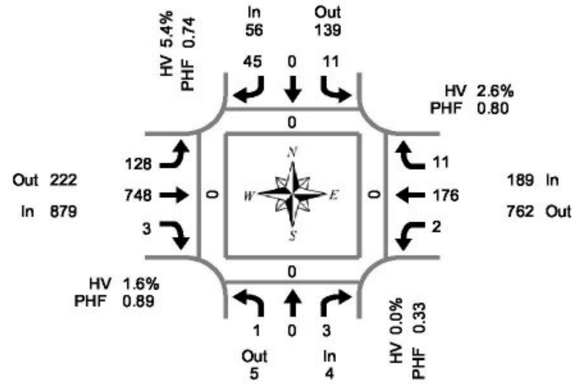


Approach	PHF	HV%	Volume
EB	0.61	0.0%	27
WB	0.81	0.0%	110
NB	0.89	1.3%	227
SB	0.92	0.3%	686
Intersection	0.98	0.5%	1,050

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:30 PM to 5:30 PM

Ostman Rd & Willamette Falls Dr

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	1	0	0	0	1	0	14	0	27	141	0	0	1	30	1	0	216	0	0	0	1
4:15 PM	0	0	1	0	2	0	17	0	33	172	0	0	0	40	7	1	272	0	0	0	1
4:30 PM	0	0	0	0	4	0	15	0	34	212	2	0	1	41	0	0	309	0	0	0	0
4:45 PM	0	0	0	0	3	0	12	0	23	171	0	0	0	55	4	1	268	0	0	0	0
5:00 PM	1	0	2	0	4	0	8	0	19	174	0	0	1	46	3	0	258	0	0	0	0
5:15 PM	0	0	1	0	0	0	10	0	52	191	1	0	0	34	4	0	293	0	0	0	0
5:30 PM	0	0	1	0	1	0	19	0	23	184	2	0	0	40	3	1	273	3	0	0	0
5:45 PM	0	1	1	0	4	0	12	0	31	93	2	0	1	44	6	0	195	0	0	0	0
Total Survey	2	1	6	0	19	0	107	0	242	1,338	7	0	4	330	28	3	2,084	3	0	0	2

Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	4	5	9	0	56	139	195	0	879	222	1,101	0	189	762	951	1	1,128	0	0	0	0
%HV	0.0%				5.4%				1.6%				2.6%				2.0%				
PHF	0.33				0.74				0.89				0.80				0.91				

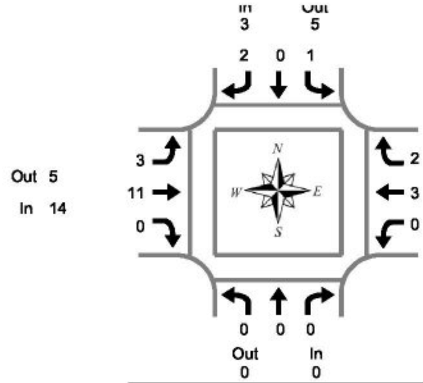
By Movement	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	0	3	4	11	0	45	56	128	748	3	879	2	176	11	189	1,128
%HV	0.0%	0.0%	0.0%	0.0%	9.1%	0.0%	4.4%	5.4%	2.3%	1.5%	0.0%	1.6%	0.0%	1.7%	18.2%	2.6%	2.0%
PHF	0.25	0.00	0.38	0.33	0.69	0.00	0.75	0.74	0.62	0.88	0.38	0.89	0.50	0.80	0.69	0.80	0.91

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	1	0	1	0	10	0	58	0	117	696	2	0	2	166	12	2	1,065	0	0	0	2
4:15 PM	1	0	3	0	13	0	52	0	109	729	2	0	2	182	14	2	1,107	0	0	0	1
4:30 PM	1	0	3	0	11	0	45	0	128	748	3	0	2	176	11	1	1,128	0	0	0	0
4:45 PM	1	0	4	0	8	0	49	0	117	720	3	0	1	175	14	2	1,092	3	0	0	0
5:00 PM	1	1	5	0	9	0	49	0	125	642	5	0	2	164	16	1	1,019	3	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Ostman Rd & Willamette Falls Dr

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	1	1	0	7	0	7	0	0	0	0	8
4:15 PM	0	0	0	0	0	0	0	0	0	4	0	4	0	1	0	1	5
4:30 PM	0	0	0	0	1	0	1	2	1	3	0	4	0	2	0	2	8
4:45 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	1	1	2	5
5:00 PM	0	0	0	0	0	0	1	1	1	3	0	4	0	0	1	1	6
5:15 PM	0	0	0	0	0	0	0	0	1	2	0	3	0	0	0	0	3
5:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
5:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Survey	0	0	0	0	2	0	3	5	3	23	0	26	0	5	2	7	38

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound Ostman Rd			Southbound Ostman Rd			Eastbound Willamette Falls Dr			Westbound Willamette Falls Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	3	5	8	14	5	19	5	12	17	22
PHF	0.00			0.25			0.23			0.25			0.26

By Movement	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	1	0	2	3	3	11	0	14	0	3	2	5	22
PHF	0.00	0.00	0.00	0.00	0.25	0.00	0.25	0.25	0.38	0.20	0.00	0.23	0.00	0.19	0.25	0.25	0.26

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	1	0	2	3	1	17	0	18	0	4	1	5	26
4:15 PM	0	0	0	0	1	0	2	3	2	13	0	15	0	4	2	6	24
4:30 PM	0	0	0	0	1	0	2	3	3	11	0	14	0	3	2	5	22
4:45 PM	0	0	0	0	0	0	1	1	2	9	0	11	0	2	2	4	16
5:00 PM	0	0	0	0	1	0	1	2	2	6	0	8	0	1	1	2	12

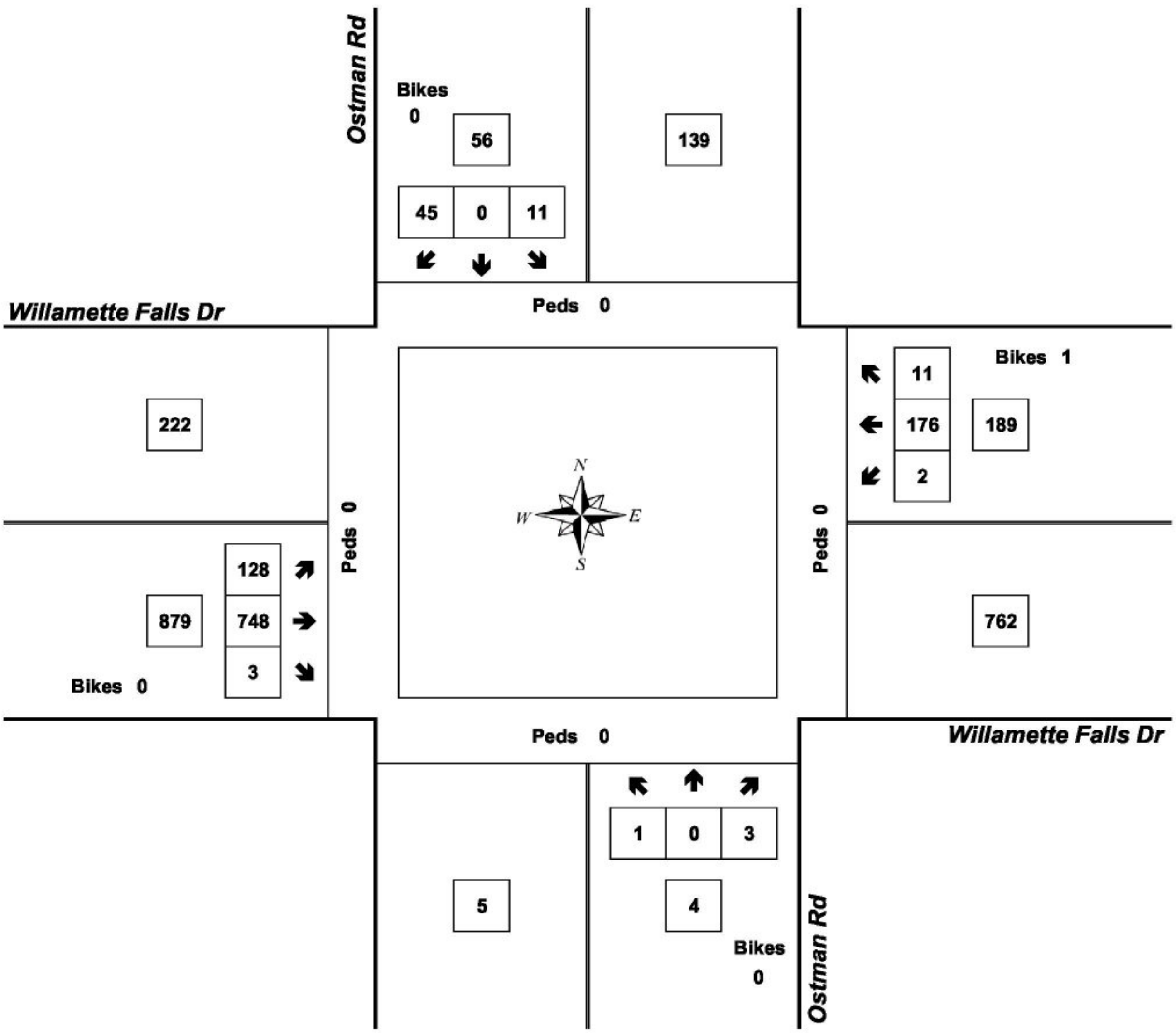
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

Ostman Rd & Willamette Falls Dr

4:30 PM to 5:30 PM
Wednesday, April 16, 2014

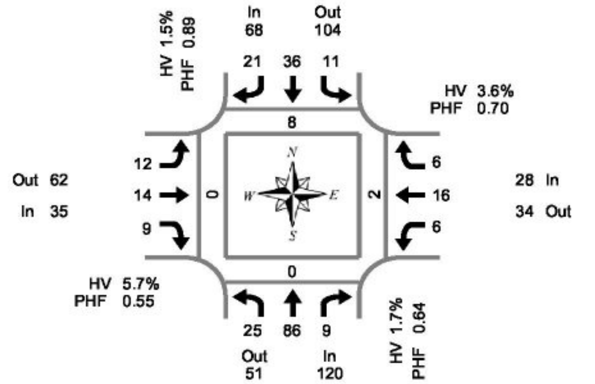


Approach	PHF	HV%	Volume
EB	0.89	1.6%	879
WB	0.80	2.6%	189
NB	0.33	0.0%	4
SB	0.74	5.4%	56
Intersection	0.91	2.0%	1,128

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

Ostman Rd & Dollar St

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	6	19	1	0	1	12	0	0	3	1	1	0	1	1	3	0	49	0	0	0	0
4:15 PM	9	23	0	0	7	14	3	0	2	8	4	0	0	3	5	0	78	0	0	0	0
4:30 PM	6	24	1	0	2	11	2	0	4	6	4	0	1	3	4	0	68	0	0	0	0
4:45 PM	1	21	2	0	2	14	1	0	0	2	0	0	1	4	5	0	53	1	0	2	0
5:00 PM	5	13	1	0	2	4	11	0	3	2	1	0	3	5	1	0	51	3	0	0	0
5:15 PM	5	39	3	0	2	9	3	0	1	3	4	1	0	3	1	0	73	0	0	0	0
5:30 PM	4	16	2	0	3	12	4	0	1	3	1	0	3	5	2	0	56	2	0	1	0
5:45 PM	11	18	3	0	4	11	3	0	7	6	3	0	0	3	2	0	71	3	0	1	0
Total Survey	47	173	13	0	23	87	27	0	21	31	18	1	9	27	23	0	499	9	0	4	0

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	120	51	171	0	68	104	172	0	35	62	97	1	28	34	62	0	251	8	0	2	0
%HV	1.7%				1.5%				5.7%				3.6%				2.4%				
PHF	0.64				0.89				0.55				0.70				0.86				

By Movement	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	25	86	9	120	11	36	21	68	12	14	9	35	6	16	6	28	251
%HV	4.0%	1.2%	0.0%	1.7%	0.0%	2.8%	0.0%	1.5%	8.3%	7.1%	0.0%	5.7%	0.0%	6.3%	0.0%	3.6%	2.4%
PHF	0.57	0.55	0.75	0.64	0.69	0.75	0.48	0.89	0.43	0.58	0.56	0.55	0.50	0.80	0.75	0.70	0.86

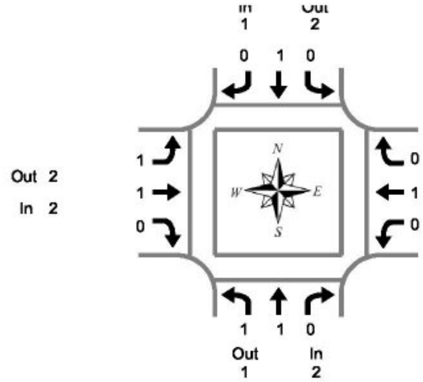
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	22	87	4	0	12	51	6	0	9	17	9	0	3	11	17	0	248	1	0	2	0
4:15 PM	21	81	4	0	13	43	17	0	9	18	9	0	5	15	15	0	250	4	0	2	0
4:30 PM	17	97	7	0	8	38	17	0	8	13	9	1	5	15	11	0	245	4	0	2	0
4:45 PM	15	89	8	0	9	39	19	0	5	10	6	1	7	17	9	0	233	6	0	3	0
5:00 PM	25	86	9	0	11	36	21	0	12	14	9	1	6	16	6	0	251	8	0	2	0

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Ostman Rd & Dollar St

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

Peak Hour Summary
5:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	1	0	0	1	0	1	0	1	0	1	0	1	0	0	0	0	3
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
5:45 PM	0	0	0	0	0	1	0	1	1	1	0	2	0	0	0	0	3
Total Survey	2	1	0	3	0	3	0	3	1	2	0	3	0	1	0	1	10

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Ostman Rd			Southbound Ostman Rd			Eastbound Dollar St			Westbound Dollar St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	1	3	1	2	3	2	2	4	1	1	2	6
PHF	0.17			0.13			0.25			0.25			0.30

By Movement	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	1	0	2	0	1	0	1	1	1	0	2	0	1	0	1	6
PHF	0.13	0.25	0.00	0.17	0.00	0.13	0.00	0.13	0.25	0.25	0.00	0.25	0.00	0.25	0.00	0.25	0.30

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	1	0	0	1	0	2	0	2	0	1	0	1	0	0	0	0	4
4:15 PM	2	1	0	3	0	1	0	1	0	1	0	1	0	0	0	0	5
4:30 PM	2	1	0	3	0	1	0	1	0	1	0	1	0	0	0	0	5
4:45 PM	1	1	0	2	0	0	0	0	0	0	0	0	0	1	0	1	3
5:00 PM	1	1	0	2	0	1	0	1	1	1	0	2	0	1	0	1	6

Peak Hour Summary

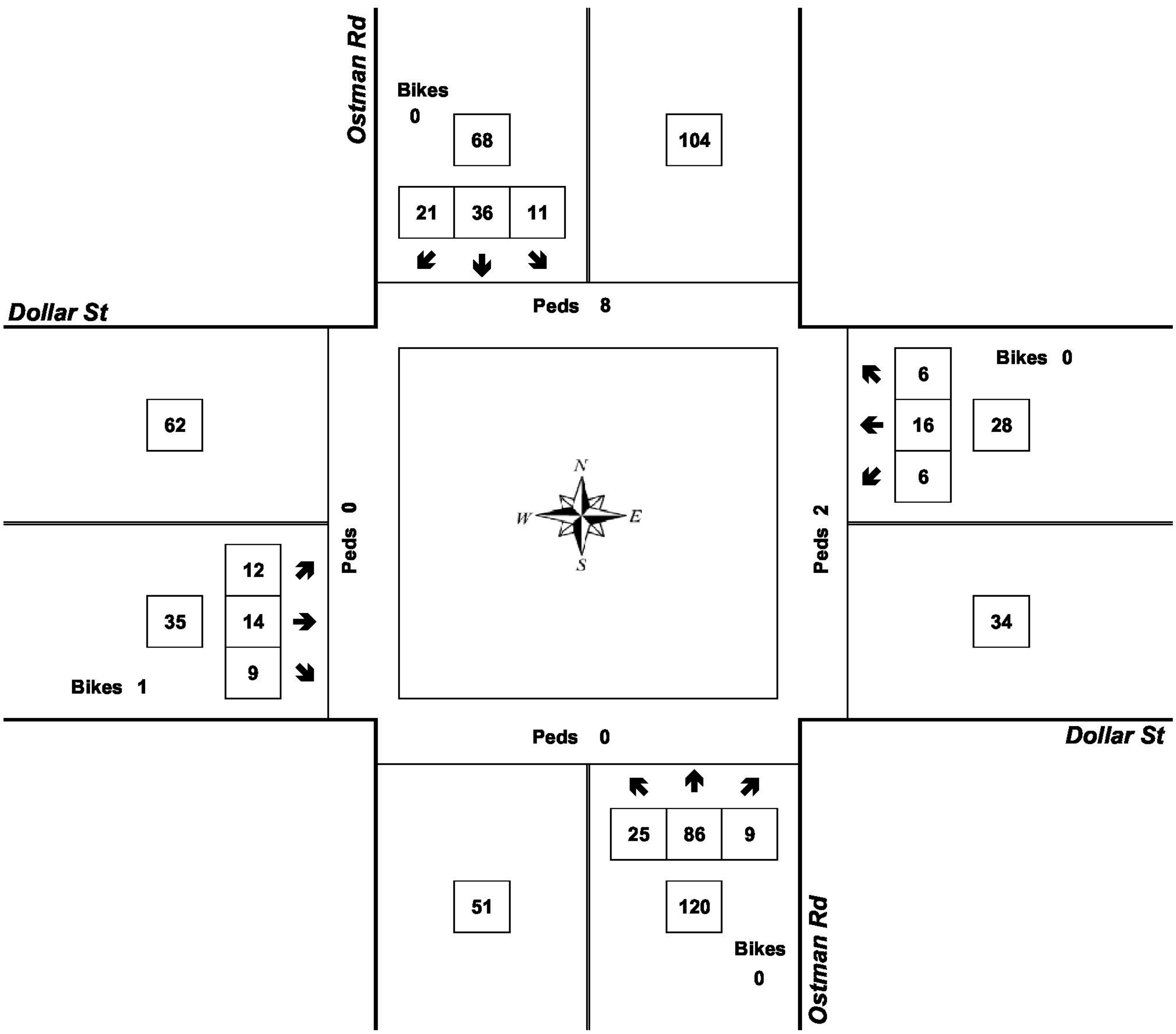
All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

Ostman Rd & Dollar St

5:00 PM to 6:00 PM

Wednesday, April 16, 2014



Approach	PHF	HV%	Volume
EB	0.55	5.7%	35
WB	0.70	3.6%	28
NB	0.64	1.7%	120
SB	0.89	1.5%	68
Intersection	0.86	2.4%	251

Count Period: 4:00 PM to 6:00 PM

Appendix C
Level-of-Service Descriptions

TRAFFIC LEVELS OF SERVICE

Analysis of traffic volumes is useful in understanding the general nature of traffic in an area, but by itself indicates neither the ability of the street network to carry additional traffic nor the quality of service afforded by the street facilities. For this, the concept of *level of service* has been developed to subjectively describe traffic performance. Level of service can be measured at intersections and along key roadway segments.

Level of service categories are similar to report card ratings for traffic performance. Intersections are typically the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is generally diminished in their vicinities. Levels of Service A, B and C indicate conditions where traffic moves without significant delays over periods of peak travel demand. Level of service D and E are progressively worse peak hour operating conditions and F conditions represent where demand exceeds the capacity of an intersection. Most urban communities set level of service D as the minimum acceptable level of service for peak hour operation and plan for level of service C or better for all other times of the day. The *Highway Capacity Manual* provides level of service calculation methodology for both intersections and arterials.[1] The following three sections provide interpretations of the analysis approaches.

---

1 *2000 Highway Capacity Manual*, Transportation Research Board, Washington D.C., 2000, Chapters 16 and 17.

ALL-WAY STOP CONTROLLED INTERSECTIONS

Unsignalized intersections and all-way stop controlled intersections are each subject to a separate capacity analysis methodology. All-way stop controlled intersection operations are reported by leg of the intersection.

This method calculates a delay value for each approach to the intersection. The *2000 Highway Capacity Manual* describes the detailed methodology. The following table describes the amount of delay associated with each level of service.

Delay (Seconds)	Level of Service
0 - 10	A
10 - 15	B
15 - 25	C
25 - 35	D
35 - 50	E
> 50	F

Source: 2000 *Highway Capacity Manual*, Transportation Research Board, Washington, D.C.

UNSIGNALIZED INTERSECTIONS (Two-Way Stop Controlled)

Unsignalized intersection level of service is reported for the major street and minor street (generally, left turn movements). The method assesses available and critical gaps in the traffic stream which make it possible for side street traffic to enter the main street flow. The *2000 Highway Capacity Manual* describes the detailed methodology. It is not unusual for an intersection to experience level of service E or F conditions for the minor street left turn movement. It should be understood that, often, a poor level of service is experienced by only a few vehicles and the intersection as a whole operates acceptably.

Unsignalized intersection levels of service are described in the following table.

Level of Service	Expected Delay	(Sec/Veh)
A	Little or no delay	0-10.0
B	Short traffic delay	>10.1-15.0
C	Average traffic delays	>15.1-25.0
D	Long traffic delays	>25.1-35.0
E	Very long traffic delays	>35.1-50.0
F	Extreme delays potentially affecting other traffic movements in the intersection	> 50

Source: 2000 *Highway Capacity Manual*, Transportation Research Board Washington, D.C.

SIGNALIZED INTERSECTIONS

For signalized intersections, level of service is evaluated based upon average vehicle delay experienced by vehicles entering an intersection. Control delay (or signal delay) includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. In previous versions of this chapter of the HCM (1994 and earlier), delay included only stopped delay. As delay increases, the level of service decreases. Calculations for signalized and unsignalized intersections are different due to the variation in traffic control. The *2000 Highway Capacity Manual* provides the basis for these calculations.

Level of Service	Delay (secs.)	Description
A	≤10.00	**Free Flow/Insignificant Delays:** No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Most vehicles do not stop at all. Progression is extremely favorable and most vehicles arrive during the green phase.
B	10.1-20.0	**Stable Operation/Minimal Delays:** An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles. This level generally occurs with good progression, short cycle lengths, or both.
C	20.1-35.0	**Stable Operation/Acceptable Delays:** Major approach phases fully utilized. Most drivers feel somewhat restricted. Higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, and the number of vehicles stopping is significant.
D	35.1-55.0	**Approaching Unstable/Tolerable Delays:** The influence of congestion becomes more noticeable. Drivers may have to wait through more than one red signal indication. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. The proportion of vehicles not stopping declines, and individual cycle failures are noticeable.
E	55.1-80.0	**Unstable Operation/Significant Delays:** Volumes at or near capacity. Vehicles may wait though several signal cycles. Long queues form upstream from intersection. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are a frequent occurrence.
F	≥80.0	**Forced Flow/Excessive Delays:** Represents jammed conditions. Queues may block upstream intersections. This level occurs when arrival flow rates exceed intersection capacity, and is considered to be unacceptable to most drivers. Poor progression, long cycle lengths, and v/c ratios approaching 1.0 may contribute to these high delay levels.

Source: *2000 Highway Capacity Manual*, Transportation Research Board, Washington D.C.