Oregon
Theodore R. Kulongoski, Governor

Department of Land Conservation and Development
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NOTICE OF ADOPTED AMENDMENT

07/26/2013

TO: Subscribers to Notice of Adopted Plan or Land Use Regulation Amendments

FROM: Plan Amendment Program Specialist

SUBJECT: City of Oregon City Plan Amendment
DLCD File Number 001-13

The Department of Land Conservation and Development (DLCD) received the attached notice of adoption. Due to the size of amended material submitted, a complete copy has not been attached. A Copy of the adopted plan amendment is available for review at the DLCD office in Salem and the local government office. This amendment was submitted without a signed ordinance.

Appeal Procedures*

DLCD ACKNOWLEDGMENT or DEADLINE TO APPEAL: Friday, August 09, 2013

This amendment was submitted to DLCD for review prior to adoption pursuant to ORS 197.830(2)(b) only persons who participated in the local government proceedings leading to adoption of the amendment are eligible to appeal this decision to the Land Use Board of Appeals (LUBA).

If you wish to appeal, you must file a notice of intent to appeal with the Land Use Board of Appeals (LUBA) no later than 21 days from the date the decision was mailed to you by the local government. If you have questions, check with the local government to determine the appeal deadline. Copies of the 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). Please call LUBA at 503-373-1265, if you have questions about appeal procedures.

*NOTE: The Acknowledgment or Appeal Deadline is based upon the date the decision was mailed by local government. A decision may have been mailed to you on a different date than it was mailed to DLCD. As a result, your appeal deadline may be earlier than the above date specified. NO LUBA Notification to the jurisdiction of an appeal by the deadline, this Plan Amendment is acknowledged.

Cc: John Lewis, City of Oregon City
Gordon Howard, DLCD Urban Planning Specialist
Jennifer Donnelly, DLCD Regional Representative
Gary Fish, DLCD Transportation Planner

<paa> YA

FORM 2 DLCD

Notice of Adoption

This Form 2 must be mailed to DLCD within **20-Working Days after the Final Ordinance is signed** by the public Official Designated by the jurisdiction and all other requirements of ORS 197.615 and OAR 660-018-000

Jurisdiction: **City of Oregon City**

Local file number: **L 13-01 and L 13-02**

Date of Adoption: **7/17/2013**

Date Mailed: **7/18/2013**

Was a Notice of Proposed Amendment (Form 1) mailed to DLCD? ☒ Yes ☐ No Date:

☐ Comprehensive Plan Text Amendment

☐ Comprehensive Plan Map Amendment

☐ Land Use Regulation Amendment

☐ Zoning Map Amendment

☐ New Land Use Regulation **Amendment**

☒ Other: **Updated TSP and Code**

Summarize the adopted amendment. Do not use technical terms. Do not write "See Attached".

The City of Oregon City adopted an updated Transportation System Plan (TSP) as well as associated amendments to the Oreogn City Municipal Code to implement the TSP.

Does the Adoption differ from proposal? Yes, Please explain below:

There were mionr changes made to the TSP projects and code amendments during review by the Planning and City Commission.

Plan Map Changed from: to:

Zone Map Changed from: to:

Location: **City of Oregon City** Acres Involved:

Specify Density: Previous: New:

Applicable statewide planning goals:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒	☒	☐	☐	☐	☐	☐	☐	☐

Was an Exception Adopted? ☐ YES ☒ NO

Did DLCD receive a Notice of Proposed Amendment...

35-days prior to first evidentiary hearing? ☒ **Yes** ☐ **No**

If no, do the statewide planning goals apply? ☐ **Yes** ☐ **No**

If no, did Emergency Circumstances require immediate adoption? ☐ **Yes** ☐ **No**

001-13 (19707) [17549]

DLCD file No. ______________________

Please list all affected State or Federal Agencies, Local Governments or Special Districts:

Local Contact:		Phone: ( ) -	Extension:
Address:		Fax Number: - -	
City:	Zip:	E-mail Address:	

ADOPTION SUBMITTAL REQUIREMENTS

This Form 2 must be received by DLCD no later than 20 working days after the ordinance has been signed by the public official designated by the jurisdiction to sign the approved ordinance(s)

per ORS 197.615 and OAR Chapter 660, Division 18

1. This Form 2 must be submitted by local jurisdictions only (not by applicant).
2. When submitting the adopted amendment, please print a completed copy of Form 2 on light green paper if available.
3. Send this Form 2 and **one complete paper copy** (documents and maps) of the adopted amendment to the address below.
4. Submittal of this Notice of Adoption must include the final signed ordinance(s), all supporting finding(s), exhibit(s) and any other supplementary information (ORS 197.615).
5. Deadline to appeals to LUBA is calculated **twenty-one (21) days** from the receipt (postmark date) by DLCD of the adoption (ORS 197.830 to 197.845).
6. In addition to sending the Form 2 - Notice of Adoption to DLCD, please also remember to notify persons who participated in the local hearing and requested notice of the final decision. (ORS 197.615).
7. Submit **one complete paper copy** via United States Postal Service, Common Carrier or Hand Carried to the DLCD Salem Office and stamped with the incoming date stamp.
8. Please mail the adopted amendment packet to:

ATTENTION: PLAN AMENDMENT SPECIALIST
DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT
635 CAPITOL STREET NE, SUITE 150
SALEM, OREGON 97301-2540

9. **Need More Copies?** Please print forms on 8½ -1/2x11 **green paper** only if available. If you have any questions or would like assistance, please contact your DLCD regional representative or contact the DLCD Salem Office at (503) 373-0050 x238 or e-mail **plan.amendments@state.or.us**.

Amendments to the Oregon City Municipal Code

June 18, 2013

The following are proposed amendments with code sections numbered as they would be in the OCMC and are presented in adoption-ready format. Where new language is proposed to be added, it is underlined; where it is proposed to be removed, it is ~~struck through~~.

OCMC CHAPTER 12.04 - STREETS, SIDEWALKS AND PUBLIC PLACES

12.04.003 Applicability

A. Compliance with this chapter is required for all Land Divisions, Site Plan and Design Review, Master Plan, Detailed Development Plan and Conditional Use applications and all public improvements.

B. Compliance with this chapter is also required for new construction or additions which exceed 50 percent of the existing square footage, of all single and two-family dwellings. All applicable single and two-family dwellings shall provide any necessary dedications, easements or agreements as identified in the Transportation System Plan and this Chapter. In addition, the frontage of the site shall comply with the following prioritized standards identified in this chapter:

1. Improve street pavement, construct curbs, gutters, sidewalks and planter strips; and
2. Plant street trees

The cost of compliance with the standards identified in 12.04.003.B.1 and 12.04.003.B.2 is limited to ten (10%) percent of the total construction costs. The value of the alterations and improvements as determined by the Community Development Director is based on the entire project and not individual building permits. It is the responsibility of the applicant to submit to the Community Development Director the value of the required improvements. Additional costs may be required to comply with other applicable requirements associated with the proposal such as access or landscaping requirements.

12.04.007 Modifications.

The review body may consider modification of this standard resulting from constitutional limitations restricting the City's ability to require the dedication of property or for any other reason, based upon the criteria listed below and other criteria identified in the standard to be modified. All modifications shall be processed through a Type II Land Use application and may require additional evidence from a transportation engineer or others to verify compliance. Compliance with the following criteria is required:

A. The modification meets the intent of the standard;

B. The modification provides safe and efficient movement of pedestrians, motor vehicles, bicyclists and freight;

C. The modification is consistent with an adopted plan; and

D. The modification is complementary with a surrounding street design; or, in the alternative,

E. If a modification is requested for constitutional reasons, the applicant shall demonstrate the constitutional provision or provisions to be avoided by the modification and propose a modification that complies with the state or federal constitution. The City shall be under no obligation to grant a modification in excess of that which is necessary to meet its constitutional obligations.

12.04.025 - Street design—Driveway Curb Cuts.

A. One driveway shall be allowed per frontage. In no case shall more than two driveways be allowed on any single or two-family residential property with multiple frontages.

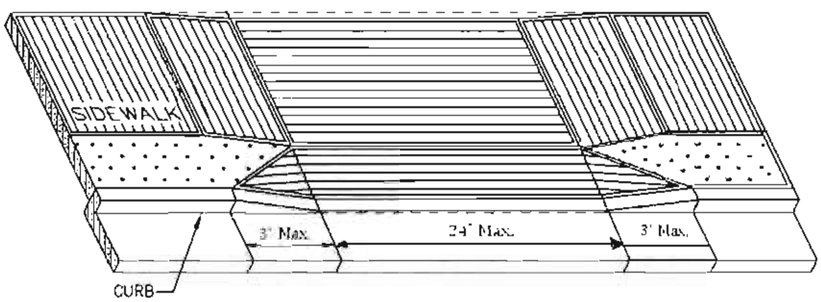
B~~A~~. With the exception of the limitations identified in 12.04.025.C, all driveway curb cuts shall be limited to the following dimensions.

Property Use	Minimum Driveway Width at sidewalk or property line	Maximum Driveway Width at sidewalk or property line
Single or Two-Family Dwelling with one Car Garage/Parking Space	10 feet	12 feet
Single or Two-Family Dwelling with two Car Garage/Parking Space	12 feet	24 feet
Single or Two-Family Dwelling with three or more Car Garages/Parking Space	18 feet	30 feet
Non Residential or Multi-Family Residential Driveway Access	15 feet	40 feet

The driveway width abutting the street pavement may be extended 3 feet on either side of the driveway to accommodate turn movements. Driveways may be widened onsite in locations other than where the driveway meets sidewalk or property line (for example between the property line and the entrance to a garage).

Figure 12.04.025: Example Driveway Curb Cut

Single-Family Dwelling with a Two Car Garage



CA. ~~To assure public safety, reduce traffic hazards and promote the welfare of pedestrians, bicyclists and residents of the subject area, such as a cul-de-sac or dead-end street, t~~The decision maker shall be authorized through a Type II process, unless another procedure applicable to the proposal applies, to minimize the number and size of curb cuts (including driveways) as far as practicable for any of the following purposes ~~where any of the following conditions are necessary~~:

1. To provide adequate space for on-street parking;
2. To facilitate street tree planting requirements;
3. To assure pedestrian and vehicular safety by limiting vehicular access points; and
4. To assure that adequate sight distance requirements are met.

~~Where the decision maker determines any of these situations exist or may occur due to approval of a proposed development, driveway curb cuts shall be limited to those widths as approved by the public works street standard drawings.~~

a. Where the decision maker determines any of these situations exist or may occur due to the approval of a proposed development for non-residential uses or attached or multi-family housing, a shared driveway shall be required and limited to twenty-four feet in width adjacent to the sidewalk or property line and may extend to a maximum of thirty feet abutting the street pavement to facilitate turning movements.

~~Shared residential driveways shall be limited to twenty-four feet in width adjacent to the sidewalk and property line and may extend to a maximum of thirty feet abutting the street pavement to facilitate turning movements. Non-residential development driveway curb cuts in these situations shall be limited to those widths as approved by the public works street standard drawings or as approved by the city engineer upon review of the vehicle turning radii~~

~~based on a professional engineer's design submittal.~~

b. Where the decision maker determines any of these situations exist or may occur due to approval of a proposed development for detached housing within the "R-5" Single –Family Dwelling District or "R-3.5" Dwelling District, driveway curb cuts shall be limited to twelve feet in width adjacent to the sidewalk or property line and may extend to a maximum of eighteen feet abutting the street pavement to facilitate turning movements.

D~~B~~. For all driveways, the following standards apply.

1. Each new or redeveloped curb cut shall have an approved concrete approach or asphalted street connection where there is no concrete curb and a minimum hard surface for at least ten feet and preferably twenty feet back into the lot as measured from the current edge of street pavement to provide for controlling gravel tracking onto the public street. The hard surface may be concrete, asphalt, or other surface approved by the city engineer.

2~~C. It shall be a code violation to drive~~ Driving vehicles, trailers, boats, or other wheeled objects across a sidewalk or roadside planter strip at a location other than an approved permanent or city-approved temporary driveway approach is prohibited. Damages caused by such action shall be corrected by the adjoining property owner.

3~~D~~. ~~It shall be a code violation to place~~ Placing soil, gravel, wood, or other material in the gutter or space next to the curb of a public street with the intention of using it as a permanent or temporary driveway is prohibited. Damages caused by such action shall be corrected by the adjoining property owner.

4~~E~~. Any driveway built within public street or alley right-of-way shall be built and permitted per city requirements as approved by the city engineer.

E~~F~~. Exceptions. The public works director reserves the right to waive this ~~policy in certain instances~~ standard, if it is determined through a Type II decision including written findings~~,~~ that it is in the best interest of the public to do so. ~~Examples of allowable exceptions include:~~

~~1. Corner properties or properties adjacent to more than one street frontage provided at least one on-street parking space on each frontage remains available after the installation of a second driveway.~~

~~2. Special needs for disabled access.~~

~~3. When the size of the lot or the length of the street frontage is adequate to support more than one driveway, the installation of a driveway will result in the loss of no more than one on-street parking space and there is no shortage of on-street parking available for neighboring property.~~

~~In no case shall more than two driveways be allowed on any single family residential property.~~

~~G. Appeals. Decisions made by the public works director are final unless appealed in writing to the transportation advisory committee for review and recommendation to the city commission.~~

~~H. Failure to Comply. Failure to meet the intent of this section shall be a violation of this Code and enforceable as a civil infraction.~~

~~12.04.045 - Street Design—Constrained local streets and/or rights-of-way.~~

~~Any accessway with a pavement width of less than thirty-two feet shall require the approval of the city engineer, community development director and fire chief and shall meet minimum life safety requirements, which may include fire suppression devices as determined by the fire marshal to assure an adequate level of fire and life safety. The standard width for constrained streets is twenty feet of paving with no on-street parking and twenty eight feet with on-street parking on one side only. Constrained local streets shall maintain a twenty-foot wide unobstructed accessway. Constrained local streets and/or right of way shall comply with necessary slope easements, sidewalk easements and altered curve radius, as approved by the city engineer and community development director.~~

~~Table 12.04.045~~

~~STREET DESIGN STANDARDS FOR LOCAL CONSTRAINED STREETS~~

	~~Minimum~~	~~Required~~

~~Type of Street~~	~~Right-of-way~~	~~Pavement Width~~
~~Constrained local street~~	~~20 to 40~~	~~20 to less than 32 feet~~

~~12.04.095 - Street Design—Curb Cuts.~~
~~To assure public safety, reduce traffic hazards and promote the welfare of pedestrians, bicyclists and residents of the subject area, such as a cul-de-sac or dead-end street, the decision maker shall be authorized to minimize the number and size of curb cuts (including driveways) as far as practicable where any of the following conditions are necessary:~~
~~A. To provide adequate space for on-street parking;~~
~~B. To facilitate street tree planting requirements;~~
~~C. To assure pedestrian and vehicular safety by limiting vehicular access points; and~~
~~D. To assure that adequate sight distance requirements are met.~~
~~Where the decision maker determines any of these situations exist or may occur due to approval of a proposed development, single residential driveway curb cuts shall be limited to twelve feet in width adjacent to the sidewalk and property line and may extend to a maximum of eighteen feet abutting the street pavement to facilitate turning movements. Shared residential driveways shall be limited to twenty-four feet in width adjacent to the sidewalk and property line and may extend to a maximum of thirty feet abutting the street pavement to facilitate turning movements. Non-residential development driveway curb cuts in these situations shall be limited to the minimum required widths based on vehicle turning radii based on a professional engineer's design submittal and as approved by the decision maker.~~

12.04.175 - Street design—Generally.
The location, width and grade of street shall be considered in relation to: existing and planned streets, topographical conditions, public convenience and safety for all modes of travel, existing and identified future transit routes and pedestrian/bicycle accessways, overlay districts, and the proposed use of land to be served by the streets. The street system shall assure an adequate traffic circulation system with intersection angles, grades, tangents and curves appropriate for the traffic to be carried considering the terrain. To the extent possible, proposed streets shall connect to all existing or approved stub streets that abut the development site. ~~Where location not shown in the development plan, t~~The arrangement of streets shall either:
A. Provide for the continuation or appropriate projection of existing principal streets in the surrounding area and on adjacent parcels or conform to a plan for the area approved or adopted by the city to meet a particular situation where topographical or other conditions make continuance or conformance to existing streets impractical;
B. Where necessary to give access to or permit a satisfactory future development of adjoining land, streets shall be extended to the boundary of the development and the resulting dead-end street (stub) may be approved with a temporary turnaround as approved by the city engineer. Notification that the street is planned for future extension shall be posted on the stub street until the street is extended and shall inform the public that the dead-end street may be extended in the future. Access control in accordance with section 12.04~~.200~~ shall be required to preserve the objectives of street extensions.

12.04.180 - Street design ~~Minimum right-of-way~~
~~All development shall provide adequate right-of-way and pavement width. Adequate right-of-way and pavement width shall be provided by:~~
~~A. Complying with the street design standards contained in the table provided in Chapter 12.04. The street design standards are based on the classification of streets that occurred in the Oregon City Transportation System Plan (TSP), in particular, the following TSP figures provide the appropriate classification for each street in Oregon City: Figure 5-1: Functional Classification System and New Roadway Connections; Figure 5-3: Pedestrian System Plan; Figure 5.6: Bicycle System Plan; and Figure 5.7: Public Transit System Plan. These TSP figures from the Oregon City Transportation System Plan are incorporated herein by reference in order to determine the classification of particular streets.~~

~~Type of Street~~	~~Maximum Right-of-Way Width~~	~~Pavement Width~~
~~Major arterial~~	~~124 feet~~	~~98 feet~~
~~Minor arterial~~	~~114 feet~~	~~88 feet~~
~~Collector street~~	~~86 feet~~	~~62 feet~~
~~Neighborhood Collector street~~	~~81 feet~~	~~59 feet~~
~~Local street*~~	~~54 feet~~	~~32 feet~~
~~Alley~~	~~20 feet~~	~~16 feet~~

~~B. The applicant may submit an alternative street design plan that varies from the street design standards identified above. An alternative street design plan may be approved by the city engineer if it is found the alternative allows for adequate and safe traffic, pedestrian and bicycle flows and transportation alternatives and protects and provides adequate multi-modal transportation services for the development as well as the~~

All development regulated by this Chapter shall provide street improvements in compliance with the standards in Figure 12.04.180 depending on the street classification set forth in the Transportation System Plan and the Comprehensive Plan designation of the adjacent property, unless an alternative plan has been adopted. The standards provided below are maximum design standards and may be reduced with an alternative street design which may be approved based on the modification criteria in 12.04.007. The steps for reducing the maximum design below are found in the Transportation System Plan.

Table 12.04.180 Street Design

To read the table below, select the road classification as identified in the Transportation System Plan and the Comprehensive Plan designation of the adjacent properties to find the maximum design standards for the road cross section. If the Comprehensive Plan designation on either side of the street differs, the wider right-of-way standard shall apply.

Road Classification	Comprehensive Plan Designation	Right-of-Way Width	Pavement Width	Public Access	Sidewalk	Landscape Strip	Bike Lane	Street Parking	Travel Lanes	Median
Major Arterial	Mixed Use, Commercial or Public/Quasi Public	116 ft.	94 ft.	0.5 ft.	10.5 ft. sidewalk including 5 ft.x5 ft. tree wells		6 ft.	8 ft.	(5) 12 ft. Lanes	6 ft.
	Industrial	120 ft.	88 ft.	0.5 ft.	5 ft.	10.5 ft.	6 ft.	N/A	(5) 14 ft. Lanes	6 ft.
	Residential	126 ft.	94 ft.	0.5 ft.	5 ft.	10.5 ft.	6 ft.	8 ft.	(5) 12 ft. Lanes	6 ft.

Road Classification	Comprehensive Plan Designation	Right-of-Way Width	Pavement Width	Public Access	Sidewalk	Landscape Strip	Bike Lane	Street Parking	Travel Lanes	Median
Minor Arterial	Mixed Use, Commercial or Public/Quasi Public	116 ft.	94 ft.	0.5 ft.	10.5 ft. sidewalk including 5 ft.x5 ft. tree wells		6 ft.	8 ft.	(5) 12 ft. Lanes	6 ft.
	Industrial	118 ft.	86 ft.	0.5 ft.	5 ft.	10.5 ft.	6 ft.	7 ft.	(5) 12 ft. Lanes	N/A
	Residential	100 ft.	68 ft.	0.5 ft.	5 ft.	10.5 ft.	6 ft.	7 ft.	(3) 12 ft. Lanes	6 ft.

Road Classification	Comprehensive Plan Designation	Right-of-Way Width	Pavement Width	Public Access	Sidewalk	Landscape Strip	Bike Lane	Street Parking	Travel Lanes	Median
Collector	Mixed Use, Commercial or Public/Quasi Public	86 ft.	64 ft.	0.5 ft.	10.5 ft. sidewalk including 5 ft.x5 ft. tree wells		6 ft.	8 ft.	(3) 12 ft. Lanes	N/A
	Industrial	88 ft.	62 ft.	0.5 ft.	5 ft.	7.5 ft.	6 ft.	7 ft.	(3) 12 ft. Lanes	N/A
	Residential	85 ft.	59 ft.	0.5 ft.	5 ft.	7.5 ft.	6 ft.	7 ft.	(3) 11 ft. Lanes	N/A

Road Classification	Comprehensive Plan Designation	Right-of-Way Width	Pavement Width	Public Access	Sidewalk	Landscape Strip	Bike Lane	Street Parking	Travel Lanes	Median
Local	Mixed Use, Commercial or Public/Quasi Public	62 ft.	40 ft.	0.5 ft.	10.5 ft. sidewalk including 5 ft.x5 ft. tree wells		N/A	8 ft.	(2) 12 ft. Lanes	N/A
	Industrial	60 ft.	38 ft.	0.5 ft.	5 ft.	5.5 ft.	(2) 19 ft. Shared Space			N/A
	Residential	54 ft.	32 ft.	0.5 ft.	5 ft.	5.5 ft.	(2) 16 ft. Shared Space			N/A

1. Pavement width includes, bike lane, street parking, travel lanes and median.
2. Public access, sidewalks, landscape strips, bike lanes and on-street parking are required on both sides of the street in all designations. The right-of-way width and pavement widths identified above include the total street section.
3. A 0.5~~'~~ foot curb is included in landscape strip or sidewalk width.
4. Travel lanes may be through lanes or turn lanes.
5. The 0.5~~'~~ foot public access provides access to adjacent public improvements.
6. Alleys shall have a minimum right-of-way width of 20 feet and a minimum pavement width of 16 feet. If alleys are provided, garage access shall be provided from the alley.

12.04.190 Street Design--Alignment.

The centerline of streets shall be:

A. Aligned with existing streets by continuation of the centerlines; or

B. Offset from the centerline by no more than five ~~10~~(5) feet, provided appropriate mitigation, in the judgment of the City Engineer, is provided to ensure that the offset intersection will not pose a safety hazard.

12.04.194 Traffic Sight Obstructions

All new streets shall comply with the Traffic Sight Obstructions in ~~c~~Chapter 10.32.

12.04.195 – ~~Minimum Street Intersection Spacing Standards~~ Spacing Standards

~~A. All new development and redevelopment shall meet the following Public intersection spacing standards~~

~~Table 12.04.040 - Public Street Intersection Spacing Standards~~

	~~Distance in Feet between Streets of Various Classifications~~								
	~~Between Arterial and Arterial~~	~~Between Arterial and Collector~~	~~Between Arterial and Neighborhood Collector~~	~~Between Arterial and Local Street~~	~~Between Collector Street and Collector Street~~	~~Between Collector Street and Neighborhood~~	~~Between Collector and Local Street~~	~~Between Neighborhood Collector and Local Street~~	~~Between two adjacent Local Streets~~
~~Measured along an Arterial Street~~	~~1320~~	~~800~~	~~600~~	~~300~~	~~600~~	~~300~~	~~150~~	~~150~~	~~150~~
~~Measured along a Collector Street~~	~~800~~	~~800~~	~~600~~	~~300~~	~~600~~	~~300~~	~~150~~	~~150~~	~~150~~
~~Measured along a Neighborhood Collector Street~~	~~800~~	~~600~~	~~300~~	~~300~~	~~300~~	~~150~~	~~150~~	~~150~~	~~150~~
~~Measured along a Local Street~~	~~600~~	~~600~~	~~300~~	~~300~~	~~300~~	~~150~~	~~150~~	~~150~~	~~150~~

~~Note: With regard to public intersection spacing standards, same distances apply to both major arterial and minor arterial streets. In this table, the term "arterial" applies to both major arterial and minor arterial streets.~~

~~or~~

~~B. A lesser distance between intersections may be allowed, provided appropriate mitigation, in the judgment of the City Engineer, is provided to ensure that the reduction in intersection spacing will not pose a safety hazard.~~

A. All new streets shall be designed as local streets unless otherwise designated as arterials and collectors in Figure 8 in the Transportation System Plan. The maximum block spacing between streets is 530 feet and the minimum block spacing between streets is 150 feet as measured between the right-of-way centerlines. If the maximum block size is exceeded, pedestrian accessways must be provided every 330 feet. The spacing standards within this section do not apply to alleys.

B. All new development and redevelopment shall meet the minimum driveway spacing standards identified in Table 12.04.195.B.

Table 12.04.195.B Minimum Driveway Spacing Standards

Street Functional Classification	**Minimum Driveway Spacing Standards**	**Distance**
Major Arterial Streets	Minimum distance from a street corner to a driveway for all uses and Minimum distance between driveways for uses other than single and two-family dwellings	175 ft.
Minor Arterial Streets	Minimum distance from a street corner to a driveway for all uses and Minimum distance between driveways for uses other than single and two-family dwellings	175 ft.
Collector Streets	Minimum distance from a street corner to a driveway for all uses and Minimum distance between driveways for uses other than single and two-family dwellings	100 ft.

Table 12.04.195.B Minimum Driveway Spacing Standards		
Street Functional Classification	Minimum Driveway Spacing Standards	Distance
Local Streets	Minimum distance from a street corner to a driveway for all uses and Minimum distance between driveways for uses other than single and two-family dwellings	25 ft.
The distance from a street corner to a driveway is measured along the right-of-way from the edge of the intersection right-of-way to the nearest portion of the driveway and the distance between driveways is measured at the nearest portions of the driveway at the right-of-way.		

12.04.199 Pedestrian and Bicycle Accessways

Pedestrian/bicycle accessways are intended to provide direct, safe and convenient connections between residential areas, retail and office areas, institutional facilities, industrial parks, transit streets, neighborhood activity centers, rights-of-way, and pedestrian/bicycle accessways which minimize out-of-direction travel, and transit-orientated developments where public street connections for automobiles, bicycles and pedestrians are unavailable. Pedestrian/bicycle accessways are appropriate in areas where public street options are unavailable, impractical or inappropriate. Pedestrian and bicycle accessways are required through private property or as right-of-way connecting development to the right-of-way at intervals not exceeding three-hundred-and-thirty feet of frontage; or where the lack of street continuity creates inconvenient or out of direction travel patterns for local pedestrian or bicycle trips.

A. Entry points shall align with pedestrian crossing points along adjacent streets and with adjacent street intersections.
B. Accessways shall be free of horizontal obstructions and have a nine-foot, six-inch high vertical clearance to accommodate bicyclists. To safely accommodate both pedestrians and bicycles, accessway right-of-way widths shall be as follows:

1. Accessways shall have a fifteen-foot-wide right-of-way with a seven-foot wide paved surface between a five foot planter strip and a three foot planter strip.
2. If an accessway also provides secondary fire access, the right-of-way width shall be at least twenty-three feet wide with a fifteen-foot paved surface a five foot planter strip and a three foot planter strip.

C. Accessways shall be direct with at least one end point of the accessway always visible from any point along the accessway. On-street parking shall be prohibited within fifteen feet of the intersection of the accessway with public streets to preserve safe sight distance and promote safety.
D. To enhance pedestrian and bicycle safety, accessways shall be lighted with pedestrian-scale lighting. Accessway lighting shall be to a minimum level of one-half foot-candles, a one and one-half foot-candle average, and a maximum to minimum ratio of seven-to-one and shall be oriented not to shine upon adjacent properties. Street lighting shall be provided at both entrances.
E. Accessways shall comply with Americans with Disabilities Act (ADA).
F. The planter strips on either side of the accessway shall be landscaped along adjacent property by installation of the following:

1. Within the three foot planter strip, an evergreen hedge screen of thirty to forty-two inches high or shrubs spaced no more than four feet apart on average;
2. Ground cover covering one hundred percent of the exposed ground. No bark mulch shall be allowed except under the canopy of shrubs and within two feet of the base of trees;
3. Within the five foot planter strip, two-inch minimum caliper trees with a maximum of thirty-five feet of separation between the trees to increase the tree canopy over the accessway;

4. In satisfying the requirements of this section, evergreen plant materials that grow over forty-two inches in height shall be avoided. All plant materials shall be selected from the Oregon City Native Plant List.

G. Accessways shall be designed to prohibit unauthorized motorized traffic. Curbs and removable, lockable bollards are suggested mechanisms to achieve this.

H. Accessway surfaces shall be paved with all-weather materials as approved by the city. Pervious materials are encouraged. Accessway surfaces shall be designed to drain stormwater runoff to the side or sides of the accessway. Minimum cross slope shall be two percent.

I. In parks, greenways or other natural resource areas, accessways may be approved with a five-foot wide gravel path with wooden, brick or concrete edgings .

J. The Community Development Director may approve an alternative accessway design due to existing site constraints through the modification process set forth in Section 12.04.007.

K. Ownership, liability and maintenance of accessways.

To ensure that all pedestrian/bicycle accessways will be adequately maintained over time, the hearings body shall require one of the following:

1 Dedicate the accessways to the public as public right-of-way prior to the final approval of the development; or
2 The developer incorporates the accessway into a recorded easement or tract that specifically requires the property owner and future property owners to provide for the ownership, liability and maintenance of the accessway.

~~12.04.200 Street Design--Constrained Local Streets and/or Rights-of-Way.~~

~~Any accessway with a pavement width of less than thirty-two feet shall require the approval of the City Engineer, Community Development Director and Fire Chief and shall meet minimum life safety requirements, which may include fire suppression devices as determined by the fire marshal to assure an adequate level of fire and life safety. The standard width for constrained streets is twenty feet of paving with no on-street parking and twenty-eight feet with on-street parking on one side only. Constrained local streets shall maintain a twenty-foot wide unobstructed accessway. Constrained local streets and/or right-of-way shall comply with necessary slope easements, sidewalk easements and altered curve radius, as approved by the City Engineer and Community Development Director.~~

~~Table 12.04.045~~ ~~STREET DESIGN STANDARDS FOR LOCAL CONSTRAINED STREETS~~		
	~~Minimum~~	~~Required~~
~~Type of Street~~	~~Right-of-Way~~	~~Pavement Width~~
~~Constrained local street~~	~~30 to 40 feet~~	~~20 to less than 32 feet~~

12.04.205 - ~~Intersection level of Service~~ Mobility Standards.

~~When reviewing new developments, the City of Oregon City requires all relevant intersections to be maintained at the minimum acceptable Level Of Service (LOS) upon full build-out of the proposed development. The minimum acceptable LOS standards are as follows:~~

~~A. For signalized intersection areas of the city that are located outside the Regional Center boundaries a LOS of "D" or better for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of critical movements.~~

~~B. For signalized intersections within the Regional Center boundaries a LOS "D" can be exceeded during the peak hour; however, during the second peak hour, LOS "D" or better will be required as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0.~~

~~C. For unsignalized intersection throughout the city a LOS "E" or better for the poorest approach and with no movement serving more than twenty peak hour vehicles operating at worse than LOS "F" will be tolerated for minor movements during a peak hour.~~

Development shall demonstrate compliance with intersection mobility standards. When evaluating the performance of the transportation system, the City of Oregon City requires all intersections, except for the facilities identified in subsection D below, to be maintained at or below the following mobility standards during the two-hour peak operating conditions. The first hour has the highest weekday traffic volumes and the second hour is the next highest hour before or after the first hour. Except as provided otherwise below, this may require the installation of mobility improvements as set forth in the Transportation System Plan or as otherwise identified by the City Transportation Engineer.

A. For intersections within the Regional Center, the following mobility standards apply:

1. During the first hour, a maximum v/c ratio of 1.10 shall be maintained. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.
2. During the second hour, a maximum v/c ratio of 0.99 shall be maintained at signalized intersections. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.
3. Intersections located on the Regional Center boundary shall be considered within the Regional Center.

B. For intersections outside of the Regional Center but designated on the Arterial and Throughway Network, as defined in the Regional Transportation Plan, the following mobility standards apply:

1. During the first hour, a maximum v/c ratio of 0.99 shall be maintained. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.
2. During the second hour, a maximum v/c ratio of 0.99 shall be maintained at signalized intersections. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.

C. For intersections outside the boundaries of the Regional Center and not designated on the Arterial and Throughway Network, as defined in the Regional Transportation Plan, the following mobility standards apply:

1. For signalized intersections:
   a. During the first hour, LOS "D" or better will be required for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of the critical movements.
   b. During the second hour, LOS "D" or better will be required for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of the critical movements.
2. For unsignalized intersections outside of the boundaries of the Regional Center:
   a. For unsignalized intersections, during the peak hour, all movements serving more than 20 vehicles shall be maintained at LOS "E" or better. LOS "F" will be tolerated at movements serving no more than 20 vehicles during the peak hour.

D. Until the City adopts new performance measures that identify alternative mobility targets, the City shall exempt proposed development that is permitted, either conditionally, outright, or through detailed development master plan approval, from compliance with the above-referenced mobility standards for the following state-owned facilities:

I-205 / OR 99E Interchange
I-205 / OR 213 Interchange
OR 213 / Beavercreek Road
State intersections located within or on the Regional Center Boundaries

1. In the case of conceptual development approval for a master plan that impacts the above references intersections:
   a. the form of mitigation will be determined at the time of the detailed development plan review for subsequent phases utilizing the Code in place at the time the detailed development plan is submitted; and
   b. only those trips approved by a detailed development plan review are vested.
2. Development which does not comply with the mobility standards for the intersections identified in 12.04.205.D shall provide for the improvements identified in the Transportation System Plan (TSP) in an effort to improve intersection mobility as necessary to offset the impact caused by development. Where required by other provisions of the Code, the applicant shall provide a traffic impact study that includes an assessment of the development's impact on the intersections identified in this exemption and shall construct the intersection improvements listed in the TSP or required by the Code.

12.04.220 Street Design--Half Street.
Half streets, while generally not acceptable, may be approved where essential to the development, when in conformance with all other applicable requirements, and where it will not create a safety hazard. When approving half streets, the decision maker must first determine that it will be practical to require the dedication of the other half of the street when the adjoining property is divided or developed. Where the decision maker approves a half street, the applicant must construct an additional ten feet of pavement width so as to make the half street safe and usable until such time as the other half is constructed. Whenever a half street is adjacent to property capable of being divided or developed, the other half of the street shall be provided and improved when that adjacent property divides or develops. Access Control ~~as described in 12.04.200~~ may be required to preserve the objectives of half streets.

When the remainder of an existing half-street improvement is made it shall include the following items: dedication of required right-of-way, construction of the remaining portion of the street including pavement, curb and gutter, landscape strip, sidewalk, street trees, lighting and other improvements as required for that particular street. It shall also include at a minimum the pavement replacement to the centerline of the street. Any damage to the existing street shall be repaired in accordance with the City's "Moratorium Pavement Cut Standard" or as approved by the City Engineer.

12.04.225 - Street design—Cul-de-sacs and dead-end streets.
The city discourages the use of cul-de-sacs and permanent dead-end streets except where construction of a through street is found by the decision maker to be impracticable due to topography or some significant physical constraint such as ~~unstable soils~~ geologic hazards, wetland, natural or historic resource areas, dedicated open space, existing development patterns, ~~or~~ arterial access restrictions or similar situation as determined by the Community Development Director. When permitted, access from new cul-de-sacs and permanent dead-end streets shall be limited to ~~have~~ a maximum of 25 dwelling units and a maximum street length of ~~three hundred fifty~~ two hundred feet, as measured from the right-of-way line of the nearest intersecting street to the back of the cul-de-sac curb face. In addition, cul-de-sacs and dead end roads shall ~~and~~ include pedestrian/bicycle accessways as ~~provided in Section 17.90.220 of~~ required in this ~~code and~~ Chapter ~~12.24~~. This section is not intended to preclude the use of curvilinear eyebrow widening of a street where needed ~~to provide adequate lot coverage~~.

Where approved, cul-de-sacs shall have sufficient radius to provide adequate turn-around for emergency vehicles in accordance with Fire District and City adopted street standards. Permanent dead-end streets other than cul-de-sacs shall provide public street right-of-way / easements sufficient to provide turn-around space with appropriate no-parking signs or markings for waste disposal, sweepers, and other long vehicles in the form of a hammerhead or other design to be approved by the decision maker. Driveways shall be encouraged off the turnaround to provide for additional on-street parking space.

12.04.260 - Street design—Transit.
Streets shall be designed and laid out in a manner that promotes pedestrian and bicycle circulation. The applicant shall coordinate with ~~Tri-Met~~ transit agencies where the application impacts transit streets as identified in 17.04.1310~~on Figure 5.7: Public Transit System Plan of the Oregon City Transportation System Plan~~. Pedestrian/bicycle access ways shall be provided as necessary in ~~conformance with the requirements in Section 17.90.220 of this code and~~ Chapter ~~12.24~~ 12.04 to minimize the travel distance to transit streets and stops and neighborhood activity centers. The decision maker may require provisions, including easements, for transit facilities along transit streets where a need for bus stops, bus pullouts or other transit facilities within or adjacent to the development has been identified.

OCMC CHAPTER 12.24 PEDESTRIAN/BICYCLE ACCESSWAYS
Delete entire chapter.

OCMC CHAPTER 16.12 - MINIMUM IMPROVEMENTS AND DESIGN STANDARDS FOR LAND DIVISIONS

16.12.015 - Street design—Generally.
~~Street design standards for all new development and land divisions shall comply with Chapter 12.04—Street Design Standards.~~ Development shall demonstrate compliance with Chapter 12.04 - Streets, Sidewalks and Public Places.

~~**16.12.025 - Blocks—Length.**~~
~~Block lengths for local streets and collectors shall not exceed five hundred feet between through streets, as measured between nearside right-of-way lines.~~

~~**16.12.035 - Blocks—Pedestrian and bicycle access.**~~
~~A. To facilitate the most practicable and direct pedestrian and bicycle connections to adjoining or nearby neighborhood activity centers, public rights-of-way, and pedestrian/bicycle accessways which minimize out-of-direction travel, subdivisions shall include pedestrian/bicycle access ways between discontinuous street right of way where the following applies:~~
~~1. Where a new street is not practicable;~~
~~2. Through excessively long blocks at intervals not exceeding five hundred feet of frontage as measured between nearside right-of-way lines;~~
~~3. Where the lack of street continuity creates inconvenient or out of direction travel patterns for local pedestrian or bicycle trips.~~
~~B. Pedestrian/bicycle accessways shall be provided:~~
~~1. To provide direct access to nearby neighborhood activity centers, transit streets and other transit facilities;~~
~~2. Where practicable, to provide direct access to other adjacent developments and to adjacent undeveloped property likely to be subdivided or otherwise developed in the future;~~
~~3. To provide direct connections from cul-de-sacs and internal private drives to the nearest available street or neighborhood activity center;~~
~~4. To provide connections from cul-de-sacs or local streets to arterial or collector streets.~~
~~C. An exception may be made where the community development director determines that construction of a separate accessway is not feasible due to physical or jurisdictional constraints. Such evidence may include but is not limited to:~~
~~1. That other federal, state or local requirements prevent construction of an accessway;~~
~~2. That the nature of abutting existing development makes construction of an accessway impracticable;~~
~~3. That the accessway would cross an area affected by an overlay district in a manner incompatible with the purposes of the overlay district;~~
~~4. That the accessway would cross topography consisting predominantly of slopes over twenty five percent;~~
~~5. That the accessway would terminate at the urban growth boundary and extension to another public right-of-way~~

~~is not part of an adopted plan.~~

~~D. Pedestrian/bicycle accessways shall comply with the development standards set out in Section 12.24 of this code, with the ownership, liability and maintenance standards in Section 12.24 of this code, and with such other design standards as the city may adopt.~~

16.12.095 Minimum Improvements--Public Facilities and Services.

The following minimum improvements shall be required of all applicants for a land division under Title 16, unless the decision-maker determines that any such improvement is not proportional to the impact imposed on the City's public systems and facilities:

A. Transportation System. Applicants and all subsequent lot owners shall be responsible for improving the city's planned level of service on all public streets, including alleys within the land division and those portions of public streets adjacent to but only partially within the land division. All applicants shall execute a binding agreement to not remonstrate against the formation of a local improvement district for street improvements that benefit the applicant's property. Applicants are responsible for designing and providing adequate vehicular, bicycle and pedestrian access to their developments and for accommodating future access to neighboring undeveloped properties that are suitably zoned for future development. Storm drainage facilities shall be installed and connected to off-site natural or man-made drainageways. Upon completion of the street improvement survey, the applicant shall reestablish and protect monuments of the type required by ORS 92.060 in monument boxes with covers at every public street intersection and all points or curvature and points of tangency of their center line, and at such other points as directed by the city engineer.

B. Stormwater Drainage System. Applicants shall design and install drainage facilities within land divisions and shall connect the development's drainage system to the appropriate downstream storm drainage system as a minimum requirement for providing services to the applicant's development. The applicant shall obtain county or state approval when appropriate. All applicants shall execute a binding agreement to not remonstrate against the formation of a local improvement district for stormwater drainage improvements that benefit the applicant's property. Applicants are responsible for extending the appropriate storm drainage system to the development site and for providing for the connection of upgradient properties to that system. The applicant shall design the drainage facilities in accordance with city drainage master plan requirements, Chapter 13.12 and the Public Works Stormwater and Grading Design Standards.

C. Sanitary Sewer System. The applicant shall design and install a sanitary sewer system to serve all lots or parcels within a land division in accordance with the city's sanitary sewer design standards, and shall connect those lots or parcels to the city's sanitary sewer system, except where connection is required to the county sanitary sewer system as approved by the county. All applicants shall execute a binding agreement to not remonstrate against the formation of a local improvement district for sanitary sewer improvements that benefit the applicant's property. Applicants are responsible for extending the city's sanitary sewer system to the development site and through the applicant's property to allow for the future connection of neighboring undeveloped properties that are suitably zoned for future development. The applicant shall obtain all required permits and approvals from all affected jurisdictions prior to final approval and prior to commencement of construction. Design shall be approved by the city engineer before construction begins.

D. Water System. The applicant shall design and install a water system to serve all lots or parcels within a land division in accordance with the city public works water system design standards, and shall connect those lots or parcels to the city's water system. All applicants shall execute a binding agreement to not remonstrate against the formation of a local improvement district for water improvements that benefit the applicant's property. Applicants are responsible for extending the city's water system to the development site and through the applicant's property to allow for the future connection of neighboring undeveloped properties that are suitably zoned for future development.

E. Sidewalks. The applicant shall provide for sidewalks on both sides of all public streets, on any private street if so required by the decision-maker, and in any special pedestrian way within the land division. Exceptions to this requirement may be allowed in order to accommodate topography, trees or some similar site constraint. In the case of major or minor arterials, the decision-maker may approve a land division without sidewalks where sidewalks are found to be dangerous or otherwise impractical to construct or are not reasonably related to the applicant's development. The decision-maker may require the applicant to provide sidewalks concurrent with the issuance of the initial building permit within the area that is the subject of the land division application. Applicants for partitions may be allowed to meet this requirement by executing a binding agreement to not remonstrate against the formation of a local improvement district for sidewalk improvements that benefit the applicant's property.

F. Bicycle Routes. If appropriate to the extension of a system of bicycle routes, existing or planned, the decision-maker may require the installation of separate bicycle lanes within streets and separate bicycle paths.

G. Street Name Signs and Traffic Control Devices. ~~The applicant shall pay the city and the city installs street name signs at all street intersections.~~ The applicant shall install street signs and traffic control devices as directed by the city engineer. Street name signs and traffic control devices shall be in conformance with all applicable city regulations and standards.

H. Street Lights. The applicant shall install street lights which shall be served from an underground source of supply. Street lights shall be in conformance with all city regulations.

I. Street Trees. Refer to Chapter 12.08, Street Trees.

J. Bench Marks. At least one bench mark shall be located within the subdivision boundaries using datum plane specified by the city engineer.

K. Other. The applicant shall make all necessary arrangements with utility companies or other affected parties for the installation of underground lines and facilities. Electrical lines and other wires, including but not limited to communication, street lighting and cable television, shall be placed underground.

L. Oversizing of Facilities. All facilities and improvements shall be designed to city standards as set out in the city's facility master plan, public works design standards, or other city ordinances or regulations. Compliance with facility design standards shall be addressed during final engineering. The city may require oversizing of facilities to meet standards in the city's facility master plan or to allow for orderly and efficient development. Where oversizing is required, the applicant may request reimbursement from the city for oversizing based on the city's reimbursement policy and funds available, or provide for recovery of costs from intervening properties as they develop.

M. Erosion Control Plan--Mitigation. The applicant shall be responsible for complying with all applicable provisions of Chapter 17.47 with regard to erosion control.

OCMC CHAPTER 17.04 – DEFINITIONS

17.04.030 "Accessway, pedestrian/bicycle" means any off-street path or way as described in Chapter ~~12.24~~ 12.04, intended primarily for pedestrians or bicycles and which provides direct routes within and from new developments to residential areas, retail and office areas, transit streets and neighborhood activity centers.

17.04.712 "Major transit stop" means transit centers, high capacity transit stations, major bus stops, inter-city bus passenger terminals, inter-city rail passenger terminals, and bike-transit facilities as shown in the Regional Transportation Plan.

17.04.800 "Neighborhood activity center" refers to land uses which attract or are capable of attracting a ~~greater than average level of pedestrian activity. Neighborhood activity centers include, but are not limited to, parks, schools, retail store and service areas, shopping centers, recreational centers, meeting rooms, theaters, museums, transit stops and other pedestrian oriented uses.~~ substantial amount of pedestrian use. Neighborhood activity centers include, but are not limited to, parks, schools, retail store and service areas, shopping centers, recreational centers, meeting rooms, theaters, museums and other pedestrian oriented uses.

17.04.1310 "Transit street" means any street identified as an existing or planned bus, rail or mass transit route by a transit agency or a street on which transit operates.~~any street identified as an existing or planned bus or light rail transit route as shown in the city's transportation master plan (1989 or as subsequently amended).~~

17.04.1312 "Transportation facilities" shall include construction, operation, and maintenance of travel lanes, bike lanes and facilities, curbs, gutters, drainage facilities, sidewalks, transit stops, landscaping, and related improvements located within rights-of-ways controlled by a public agency, consistent with the City Transportation System Plan.

TRANSPORTATION FACILITIES ARE TO BE IDENTIFIED AS A PERMITTED USE IN ALL ZONING DESIGNATIONS WITH THE ADDITION OF THE FOLLOWING CODE SECTIONS:

17.08.020.J. Transportation facilities
17.10.020.J. Transportation facilities
17.12.020.J. Transportation facilities
17.14.020.J. Transportation facilities
17.16.020.K. Transportation facilities
17.18.020.I. Transportation facilities
17.29.020.AA. Transportation facilities
17.31.020.Q. Transportation facilities
17.36.020.O. Transportation facilities
17.37.020.O. Transportation facilities
17.39.020.G. Transportation facilities

OCMC CHAPTER 17.34 "MUD"—MIXED-USE DOWNTOWN DISTRICT

~~**17.34.070.H** Parking Standards. The minimum number of off-street vehicular parking stalls required in Chapter 17.52 may be reduced by fifty percent.~~

OCMC CHAPTER 17.52 OFF-STREET PARKING AND LOADING

17.52.15 Planning Commission Adjustment of Parking Standards.

A. Purpose: The purpose of permitting a Planning Commission Adjustment to Parking Standards is to provide for flexibility in modifying parking standards in all zoning districts, without permitting an adjustment that would adversely impact the surrounding or planned neighborhood. The purpose of an adjustment is to provide flexibility to those uses which may be extraordinary, unique or to provide greater flexibility for areas that can accommodate a denser development pattern based on existing infrastructure and ability to access the site by means of walking, biking or transit. An adjustment to a minimum or maximum parking standard may be approved based on a determination by the Planning Commission that the adjustment is consistent with the purpose of this Code, and the approval criteria can be met.

B. Procedure: A request for a Planning Commission Parking Adjustment shall be initiated by a property owner or authorized agent by filing a land use application. The application shall be accompanied by a site plan, drawn to scale, showing the dimensions and arrangement of the proposed development and parking plan, the extent of the adjustment requested along with findings for each applicable approval criteria. A request for a parking adjustment shall be processed as a Type III application as set forth in Chapter 17.50.

C. Approval criteria for the adjustment are as follows:

1. Documentation: The applicant shall document that the individual project will require an amount of parking that is different from that required after all applicable reductions have been taken.
2. Parking analysis for surrounding uses and on- street parking availability- The applicant must show that there is a continued 15% parking vacancy in the area adjacent to the use during peak parking periods and that the applicant

has permission to occupy this area to serve the use pursuant to the procedures set forth by the Community Development Director.

a. For the purposes of demonstrating the availability of on street parking as defined in 17.52.020.B.3 , the applicant shall undertake a parking study during time periods specified by the Community Development Director. The time periods shall include those during which the highest parking demand is anticipated by the proposed use. Multiple observations during multiple days shall be required. Distances are to be calculated as traversed by a pedestrian that utilizes sidewalks and legal crosswalks or an alternative manner as accepted by the Community Development Director.

b. The onsite parking requirements may be reduced based on the parking vacancy identified in the parking study. The amount of the reduction in onsite parking shall be calculated as follows:
i. Vacant on-street parking spaces within 300 feet of the site will reduce onsite parking requirements by 0.5 parking spaces; and
ii. Vacant on-street parking spaces between 300 and 600 feet of the will reduce onsite parking requirements by 0.2 parking spaces.

3. Function and Use of Site: The applicant shall demonstrate that modifying the amount of required parking spaces will not significantly impact the use or function of the site and/or adjacent sites;

4. Compatibility: The proposal is compatible with the character, scale and existing or planned uses of the surrounding neighborhood;

5. Safety: The proposal does not significantly impact the safety of adjacent properties and Rights-of-Way.

6. Services: The proposal will not create a significant impact to public services, including fire and emergency services.

17.52.020 Number of automobile spaces required. *(replace section with the following)*

A. The number of parking spaces shall comply with the minimum and maximum standards listed in Table 17.52.020. The parking requirements are based on spaces per one thousand square feet ~~gross~~ net leasable area unless otherwise stated.

Table 17.52.020 Number of automobile spaces required. LAND USE	*PARKING REQUIREMENTS*	
	MINIMUM	*MAXIMUM*
~~Single-Family Dwelling~~	~~1.00 per unit~~	
Multi-Family: Studio	1.00 per unit	1.5 per unit
Multi-Family: 1 bedroom	1.25 per unit	2.00 per unit
Multi-Family: 2 bedroom	1.5 per unit	2.00 per unit
Multi-Family: 3 bedroom	1.75 per unit	2.50 per unit
Hotel,~~/~~Motel	1.0 per guest room	1.25 per guest room
~~Welfare/~~Correctional Institution	1 per 7 beds	1 per 5 beds
Senior housing, including congregate care, residential care and assisted living facilities; nursing homes and other types of group homes;	1 per 7 beds	1 per 5 beds
Hospital	2.00	4.00

~~Religious Assembly Building~~	~~0.25 per seat~~	~~0.5 per seat~~
Preschool Nursery/Kindergarten	2.00	3.00
Elementary/Middle School	1 per classroom	1 per classroom + 1 per administrative employee + 0.25 per seat in auditorium/assembly room/stadium
High School,~~/~~College,~~/~~Commercial School for Adults	0.20 per # staff and students	0.30 per # staff and students
Auditorium,~~/~~Meeting Room,~~/~~Stadium,~~/~~ Religious Assembly Building, ~~/~~movie theater,	.25 per seat	0.5 per seat
Retail Store,~~/~~Shopping Center,~~/~~Restaurants	4.10	5.00
Office	2.70	3.33
Medical or Dental Clinic	2.70	3.33
Sports Club,~~/~~Recreation Facilities	Case Specific	5.40
Storage Warehouse,~~/~~Freight Terminal	0.30 ~~per gross thousand square feet ft.~~	0.40 ~~per gross thousand square feet~~
Manufacturing,~~/~~Wholesale Establishment	1.60 ~~per gross thousand square feet~~	1.67 ~~per gross thousand square feet~~
Light Industrial,~~/~~Industrial Park	1.3	1.60

1. Multiple Uses. In the event several uses occupy a single structure or parcel of land, the total requirements for off-street parking shall be the sum of the requirements of the several uses computed separately.
2. Requirements for types of buildings and uses not specifically listed herein shall be determined by the community development director, based upon the requirements of comparable uses listed.
3. Where calculation in accordance with the above list results in a fractional space, any fraction less than one-half shall be disregarded and any fraction of one-half or more shall require one space.
4. The minimum required parking spaces shall be available for the parking of operable passenger automobiles of residents, customers, patrons and employees only, and shall not be used for storage of vehicles or materials or for the parking of vehicles used in conducting the business or use.
5. A Change in use within an existing building located in the MUD Design District is exempt from additional parking requirements. Additions to an existing building and new construction are required to meet the minimum parking requirements for the areas as specified in Table 17.52.020 for the increased square footage.

B. Parking requirements can be met either onsite, or offsite by meeting the following conditions:

1. Mixed uses. If more than one type of land use occupies a single structure or parcel of land, the total requirements for off-street automobile parking shall be the sum of the requirements for all uses, unless it can be shown that the peak parking demands are actually less (e.g. the uses operate on different days or at different times of the day). In that case, the total requirements shall be reduced accordingly, up to a maximum reduction of 50%, as determined by the community development director.
2. Shared parking. Required parking facilities for two or more uses, structures, or parcels of land may be satisfied by the same parking facilities used jointly, to the extent that the owners or operators show that the need for parking facilities does not materially overlay (e.g., uses primarily of a daytime versus nighttime nature), that the

shared parking facility is within 1,000 feet of the potential uses, and provided that the right of joint use is evidenced by a recorded deed, lease, contract, or similar written instrument authorizing the joint use.

3. On-Street Parking. On-street parking may be counted toward the minimum standards when it is on the street face abutting the subject land use. An on-street parking space must not obstruct a required clear vision area and it shall not violate any law or street standard. On-street parking for commercial uses shall conform to the following standards:

    a. Dimensions. The following constitutes one on-street parking space:

        1. Parallel parking, each [22] feet of uninterrupted and available curb;
        2. [45/60] degree diagonal, each with [15] feet of curb;
        3. 90 degree (perpendicular) parking, each with [12] feet of curb.

4. Public Use Required for Credit. On-street parking spaces counted toward meeting the parking requirements of a specific use may not be used exclusively by that use, but shall be available for general public use at all times. Signs or other actions that limit general public use of on-street spaces are prohibited.

C. Reduction of the Number of Automobile Spaces Required. The required number of parking stalls may be reduced in the

Downtown Parking Overlay District: 50% reduction in the minimum number of spaces required is allowed prior to seeking further reductions in sections 2 and 3 below

1. Transit Oriented Development. For projects not located within the Downtown Parking Overlay District, the Community Development Director may reduce the required number of parking stalls up to 25% when it is determined that a project in a commercial center (60,000 square feet or greater of retail or office use measured cumulatively within a 500 foot radius) or multi-family development with over 80 units, is adjacent to or within 1,320 feet of an existing or planned public transit street and is within 1,320 feet of the opposite use (commercial center or multi-family development with over 80 units)
2. Reduction in Parking for Tree Preservation. The Community Development Director may grant an adjustment to any standard of this requirement provided that the adjustment preserves a regulated tree or grove so that the reduction in the amount of required pavement can help preserve existing healthy trees in an undisturbed, natural condition. The amount of reduction must take into consideration any unique site conditions and the impact of the reduction on parking needs for the use, and must be approved by the Community Development Director. This reduction is discretionary.
3. Transportation Demand Management. The Community Development Director may reduce the required number of parking stalls up to 25% when a parking-traffic study prepared by a traffic engineer demonstrates:
    a. Alternative modes of transportation, including transit, bicycles, and walking, and/or special characteristics of the customer, client, employee or resident population will reduce expected vehicle use and parking space demand for this development, as compared to standard Institute of Transportation Engineers vehicle trip generation rates and further that the Transportation Demand Management Program promotes or achieves parking utilization lower than minimum city parking requirements.
    b. Transportation Demand Management (TDM) Program has been developed for approval by, and is approved by the City Engineer. The plan will contain strategies for reducing vehicle use and parking demand generated by the development and will be measured annually. If, at the annual assessment, the City determines the plan is not successful, the plan may be revised. If the City determines that no good-faith effort has been made to implement the plan, the City may take enforcement actions.

17.52.030.E Carpool and Vanpool Parking. New ~~office and industrial~~ developments with seventy-five or more parking spaces, and new hospitals, government offices, group homes, nursing and retirement homes, schools and transit park-and-ride facilities with fifty or more parking spaces, shall identify the spaces available for employee, student and commuter parking and designate at least five percent, but not fewer than two, of those spaces for exclusive carpool and vanpool parking. Carpool and vanpool parking spaces shall be located closer to the main employee, student or commuter entrance than all other employee, student or commuter parking spaces with the exception of ~~handicapped~~ ADA accessible parking spaces. The carpool/vanpool spaces shall be clearly marked "Reserved - Carpool/Vanpool Only."

17.52.040 - Bicycle parking standards.

A. Purpose-Applicability. To encourage bicycle transportation to help reduce principal reliance on the automobile, and to ensure bicycle safety and security, bicycle parking shall be provided in conjunction with all uses other than single-family dwellings or duplexes.

B. Number of Bicycle Spaces Required. For any use not specifically mentioned in Table A, the bicycle parking requirements shall be the same as the use which, as determined by the Community Development Director, is most similar to the use not specifically mentioned. Calculation of the number of bicycle parking spaces required shall be determined in the manner established in Section 17.52.020 for determining automobile parking space requirements. Modifications to bicycle parking requirements may be made through the Site Plan and Design, Conditional Use, or Master Plan review process.

TABLE A Required Bicycle Parking Spaces*

Where two options for a requirement are provided, the option resulting in more bicycle parking applies. Where a calculation results in a fraction, the result is rounded up to the nearest whole number.

USE	MINIMUM BICYCLE PARKING	MINIMUM BICYCLE PARKING – COVERED – The following percentage of bicycle parking is required to be covered
~~Multiple~~ Multi-family (three or more units)	1 per 10 units (minimum of 2)	50% (minimum of 1)
Institutional		
~~Welfare institution~~	~~1 per 2010 auto spaces~~	
Correctional institution	1 per ~~30~~15 auto spaces (minimum of 2)	30% (minimum of 1)
Nursing home or care facility, ~~sanitarium~~	1 per 30 auto spaces (minimum of 2)	30% (minimum of 1)
Hospital	1 per 20 auto spaces (minimum of 2)	30% (minimum of 1)
Park-and-ride lot	~~5~~ 1 per 5 auto spaces ~~acre, at least one of which is a locker~~ (minimum of 2)	50% (minimum of 1)
Transit center	~~5~~1 per 5 auto spaces ~~center at least one of which is a locker~~ (minimum of 2)	50% (minimum of 1)
Parks and open space	~~2, or~~ 1 per 10 auto spaces (minimum of 2)	0%
Public parking lots	1 per ~~20~~10 auto spaces (minimum of 2)	50% (minimum of 1)
Automobile parking structures	1 per ~~20~~10 auto spaces (minimum of 4)	80% (minimum of 2)

USE	MINIMUM BICYCLE PARKING	MINIMUM BICYCLE PARKING – COVERED – The following percentage of bicycle parking is required to be covered
Religious institutions, movie theater, auditorium or meeting room	1 per ~~20~~10 auto spaces (minimum of 2)	30% (minimum of 1)
Libraries, museums	1 per ~~10~~5 auto spaces (minimum of 2)	30% (minimum of 1)
Preschool, nursery, kindergarten	2 per classroom (minimum of 2)	50% (minimum of 1)
Elementary~~, junior high~~	4 per classroom (minimum of 2)	50% (minimum of 1)
Junior high and High school	2 per classroom (minimum of 2)	50% (minimum of 2)
College, business/commercial schools	2 per classroom (minimum of 2)	50% (minimum of 1)
~~Other auditorium/meeting room~~	~~1 per 20 auto spaces (minimum of 2)~~	
Swimming pools, gymnasiums, ball courts	1 per 10 auto spaces (minimum of 2)	30% (minimum of 1)
Retail stores and shopping centers	1 per 20 auto spaces (minimum of 2)	50% (minimum of 2)
Retail stores handling exclusively bulky merchandise such as automobile, boat or trailer sales or rental	1 per 40 auto spaces (minimum of 2)	0%
Bank, office	1 per 20 auto spaces (minimum of 2)	50% (minimum of 1)
Medical and dental clinic	1 per 20 auto spaces (minimum of 2)	50% (minimum of 1)
~~Convenience food store~~	~~1 per 10 auto spaces~~	
~~Furniture and appliance stores~~	~~1 per 40 auto spaces~~	
Eating and drinking establishment,	1 per 20 auto spaces (minimum of 2)	0%
Gasoline service station	1~~2~~ per 10 auto spaces (minimum of 2)	0%

*Covered bicycle parking is not required for developments with 2 or fewer stalls.

C. Security of Bicycle Parking ~~Location of Bicycle Parking~~

Bicycle parking facilities shall be secured. Acceptable secured bicycle parking area shall be in the form of a lockable enclosure onsite, secure room in a building onsite, a covered or uncovered rack onsite, bicycle parking within the adjacent right-of-way or another form of secure parking where the bicycle can be stored, as approved by the decision maker. All bicycle racks and lockers shall be securely anchored to the ground or to a structure. Bicycle racks shall be designed so that bicycles may be securely locked to them without undue inconvenience and, when in the right-of-way shall comply with clearance and ADA requirements.

~~1. Bicycle parking shall be located on-site, in one or more convenient, secure and accessible location. The City~~

~~Engineer and the community development director may permit the bicycle parking to be provided within the public right-of-way. If sites have more than one building, bicycle parking shall be distributed as appropriate to serve all buildings. If a building has two or more main building entrances, the review authority may require bicycle parking to be distributed to serve all main building entrances, as it deems appropriate.~~

~~2. Bicycle parking areas shall be clearly marked or visible from on-site buildings or the street. If a bicycle parking area is not plainly visible from the street or main building entrance, a sign must be posted indicating the location of the bicycle parking area. Indoor bicycle parking areas shall not require stairs to access the space unless approved by the community development director.~~

~~3. All bicycle parking areas shall be located to avoid conflicts with pedestrian and motor vehicle movement.~~

~~a. Bicycle parking areas shall be separated from motor vehicle parking and maneuvering areas and from arterial streets by a barrier or a minimum of five feet.~~

~~b. Bicycle parking areas shall not obstruct pedestrian walkways; provided, however, that the review authority may allow bicycle parking in the public sidewalk where this does not conflict with pedestrian accessibility.~~

~~4. Accessibility.~~

~~a. Outdoor bicycle areas shall be connected to main building entrances by pedestrian accessible walks.~~

~~b. Outdoor bicycle parking areas shall have direct access to a public right-of-way.~~

D. Bicycle parking facilities shall offer security in the form of either a lockable enclosure or a stationary rack to which the bicycle can be locked. All bicycle racks and lockers shall be securely anchored to the ground or to a structure. Bicycle racks shall be designed so that bicycles may be securely locked to them without undue inconvenience.

Location of Bicycle Parking

1. Bicycle parking shall be located on-site, in one or more convenient, secure and accessible location. The City Engineer and the Community Development Director may permit the bicycle parking to be provided within the right-of-way provided adequate clear zone and ADA requirements are met. If sites have more than one building, bicycle parking shall be distributed as appropriate to serve all buildings. If a building has two or more main building entrances, the review authority may require bicycle parking to be distributed to serve all main building entrances, as it deems appropriate.
2. Bicycle parking areas shall be clearly marked or visible from on-site buildings or the street. If a bicycle parking area is not plainly visible from the street or main building entrance, a sign must be posted indicating the location of the bicycle parking area. Indoor bicycle parking areas shall not require stairs to access the space unless approved by the community development director.
3. All bicycle parking areas shall be located to avoid conflicts with pedestrian and motor vehicle movement.

a. Bicycle parking areas shall be separated from motor vehicle parking and maneuvering areas and from arterial streets by a barrier or a minimum of five feet.

b. Bicycle parking areas shall not obstruct pedestrian walkways; provided, however, that the review authority may allow bicycle parking in the right-of-way where this does not conflict with pedestrian accessibility.

4. Accessibility.

a. Outdoor bicycle areas shall be connected to main building entrances by pedestrian accessible walkways.

b. Outdoor bicycle parking areas shall have direct access to a right-of-way.

c. Outdoor bicycle parking should be no farther from the main building entrance than the distance to the closest vehicle space, or 50 feet, whichever is less, unless otherwise determined by the community development director, city engineer, or planning commission.

17.52.090 - Loading Areas

A. Purpose.

1. The purpose of this section is to provide adequate loading areas for commercial, office, retail and industrial uses that do not interfere with the operation of adjacent streets.

B. Applicability.

1. Section 17.52.090 applies to uses that are expected to have service or delivery truck visits with a 40-foot or longer

wheelbase, at a frequency of one or more vehicles per week. The City Engineer and decision maker shall determine through Site Plan and Design Review the number, size, and location of required loading areas, if any.

C. Standards.

1. The off-street loading space shall be large enough to accommodate the largest vehicle that is expected to serve the use without obstructing vehicles or pedestrian traffic on adjacent streets and driveways. Applicants are advised to provide complete and accurate information about the potential need for loading spaces because the City Engineer or decision maker may restrict the use of other public right-of-way to ensure efficient loading areas and reduce interference with other uses.

2. Where parking areas are prohibited between a building and the street, loading areas are also prohibited.

3. The City Engineer and decision maker, through Site Plan and Design Review, may approve a loading area adjacent to or within a street right-of-way when all of the following loading and unloading operations conditions are met:

a. Short in duration (*i.e.,* less than one hour);
b. Infrequent (less than three operations daily between 5:00 a.m. and 12:00 a.m. or all operations between 12:00 a.m. and 5:00 a.m. at a location that is not adjacent to a residential zone);
c. Does not obstruct traffic during peak traffic hours;
d. Does not interfere with emergency response services; and
e. Is acceptable to the applicable roadway authority.

OCMC CHAPTER 17.62 - SITE PLAN AND DESIGN REVIEW

17.62.050.A.2. Vehicular Access and Connectivity.

a. Parking areas shall be located behind buildings, below buildings, or on one or both sides of buildings.

b. Ingress and egress locations on ~~public~~ thoroughfares shall be located in the interest of public safety. Access for emergency services (fire and police) shall be provided.

c. Alleys or vehicular access easements shall be provided in the following Districts: R-2, MUC-1, MUC-2, MUD and NC zones unless other permanent provisions for access to off-street parking and loading facilities are approved by the decision-maker. The corners of alley intersections shall have a radius of not less than ten feet.

d. Sites abutting an alley shall be required to gain vehicular access from the alley unless deemed impracticable by the community development director.

e. Where no alley access is available, the development shall be configured to allow only one driveway per frontage. On corner lots, the driveway(s) shall be located off of the side street (unless the side street is an arterial) and away from the street intersection. Shared driveways shall be required as needed to accomplish the requirements of this section. The location and design of pedestrian access from the ~~public~~ sidewalk shall be emphasized so as to be clearly visible and distinguishable from the vehicular access to the site. Special landscaping, paving, lighting, and architectural treatments may be required to accomplish this requirement.

f. Driveways that are at least 24 feet wide shall align with existing or planned streets on adjacent sites.

g~~f~~. Development shall be required to provide existing or future connections to adjacent sites through the use of vehicular and pedestrian access easements where applicable. Such easements shall be required in addition to applicable street dedications as required in Chapter 12.04.

h. Vehicle and pedestrian access easements may serve in lieu of streets when approved by the decision maker only where dedication of a street is deemed impracticable by the city.

i. Vehicular and pedestrian easements shall allow for public access and shall comply with all applicable pedestrian access requirements.

j. In the case of dead-end stub streets that will connect to streets on adjacent sites in the future, notification that the street is planned for future extension shall be posted on the stub street until the street is extended and shall inform the public that the dead-end street may be extended in the future. k. Parcels larger than three acres shall provide streets as required in Chapter 12.04. The streets shall connect with existing or planned streets adjacent to the site.

lg. Parking garage entries ~~(both individual, private and shared parking garages)~~ shall not dominate the streetscape. They shall be designed and situated to be ancillary to the use and architecture of the ground floor. This standard applies to both public garages and any individual private garages, whether they front on a street or private interior access road.
mh. Buildings containing above-grade structured parking shall screen such parking areas with landscaping or landscaped berms, or incorporate contextual architectural elements that complement adjacent buildings or buildings in the area. Upper level parking garages shall use articulation or fenestration treatments that break up the massing of the garage and/or add visual interest.

17.62.050.A.15.
Adequate right-of-way and improvements to streets, pedestrian ways, bike routes and bikeways, and transit facilities shall be provided and be consistent with the city's transportation master plan and design standards and this title. Consideration shall be given to the need for street widening and other improvements in the area of the proposed development impacted by traffic generated by the proposed development. This shall include, but not be limited to, improvements to the right-of-way, such as installation of lighting, signalization, turn lanes, median and parking strips, traffic islands, paving, curbs and gutters, sidewalks, bikeways, street drainage facilities and other facilities needed because of anticipated vehicular and pedestrian traffic generation. Compliance with 12.04 - Streets, Sidewalks and Public Places shall be sufficient to achieve right-of-way and improvement adequacy.

~~When approving land use actions, Oregon City requires all relevant intersections to be maintained at the minimum acceptable level of service (LOS) upon full build-out of the proposed land use action. The minimum acceptable LOS standards are as follows:~~
~~a. For signalized intersection areas of the city that are located outside the Regional Center boundaries a LOS of "D" or better for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of critical movements.~~
~~b. For signalized intersections within the Regional Center boundaries a LOS "D" can be exceeded during the peak hour; however, during the second peak hour, LOS "D" or better will be required as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0.~~
~~c. For unsignalized intersection throughout the city a LOS "E" or better for the poorest approach and with no movement serving more than twenty peak hour vehicles operating at worse than LOS "F" will be tolerated for minor movements during a peak hour.~~

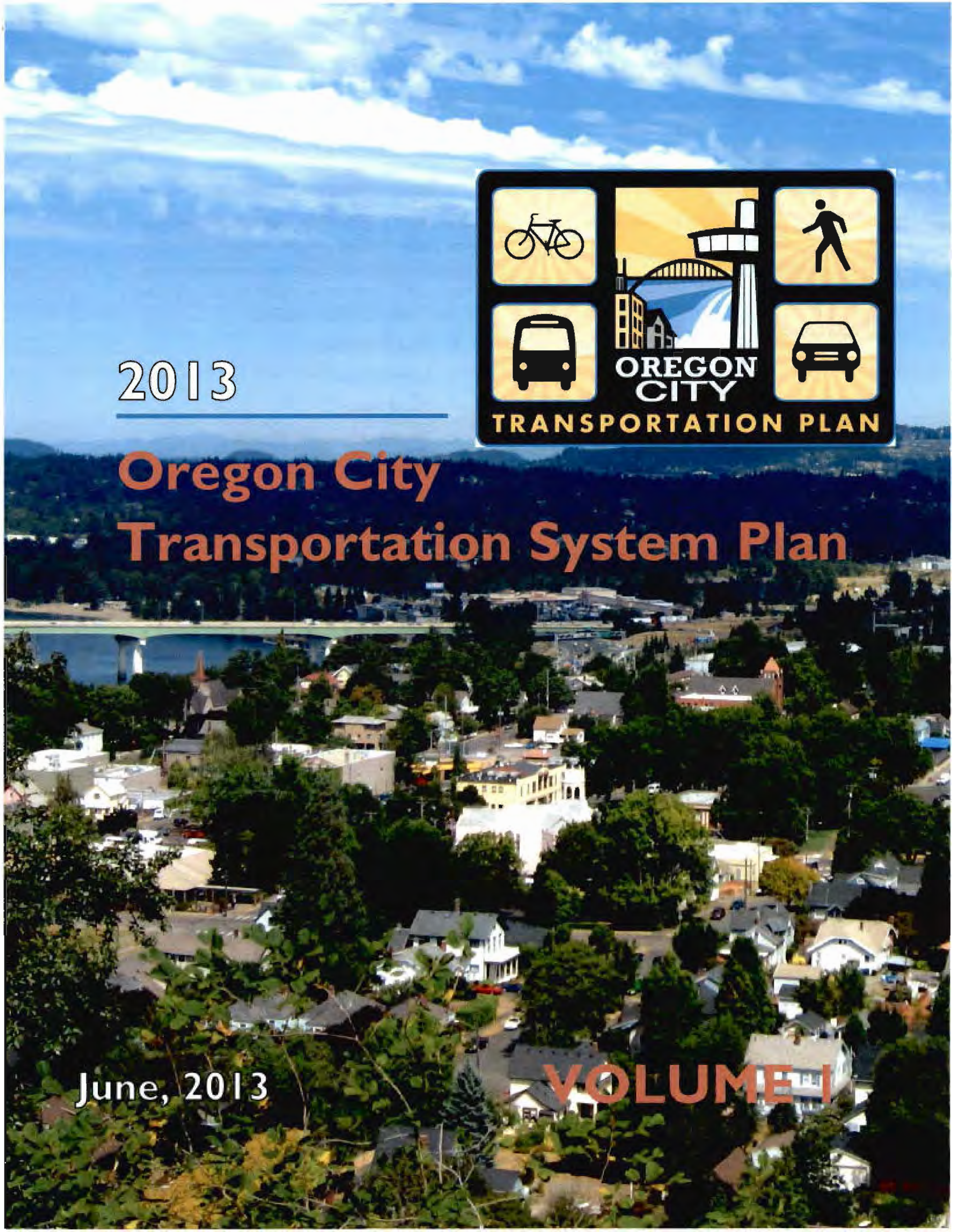
17.62.050.A.16. If a transit agency~~Tri Met~~, upon review of an application for an industrial, institutional, retail or office development, recommends that a bus stop, bus turnout lane, bus shelter, accessible bus landing pad, lighting, or transit stop connection be constructed, or that an easement or dedication be provided for one of these uses, consistent with an agency adopted or approved plan at the time of development, the review authority shall require such improvement, using designs supportive of transit use. Improvements at a major transit stop may include intersection or mid-block traffic management improvements to allow for crossings at major transit stops, as identified in the Transportation System Plan.

OCMC CHAPTER 17.65 – MASTER PLANS
17.65.050.C.2 ~~The transportation system has sufficient capacity based on the city's level of service standards and is capable of supporting the development proposed in addition to the existing and planned uses in the area, or will be made adequate~~ Development shall demonstrate compliance with Chapter 12.04 - Streets, Sidewalks and Public Places.

OCMC CHAPTER 17.56 – CONDITIONAL USE

17.56.010.A.3 ~~The site and proposed development are timely, considering the adequacy of transportation systems,~~

~~public facilities and services existing or planned for the area affected by the use.~~ Development shall demonstrate compliance with Chapter 12.04 - Streets, Sidewalks and Public Places.



OREGON CITY
TRANSPORTATION PLAN

2013

Oregon City Transportation System Plan

June, 2013

VOLUME I

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  Drew Meisel

- **Angelo Planning Group**

  Darci Rudzinski

  Shayna Rehberg

- **Stakeholder Advisory Team**
- **Technical Advisory Team**

A special acknowledgement goes out to all the Oregon City residents, business owners, and visitors who attended community meetings or submitted comments on the project website. Your input helped make this Plan possible.

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

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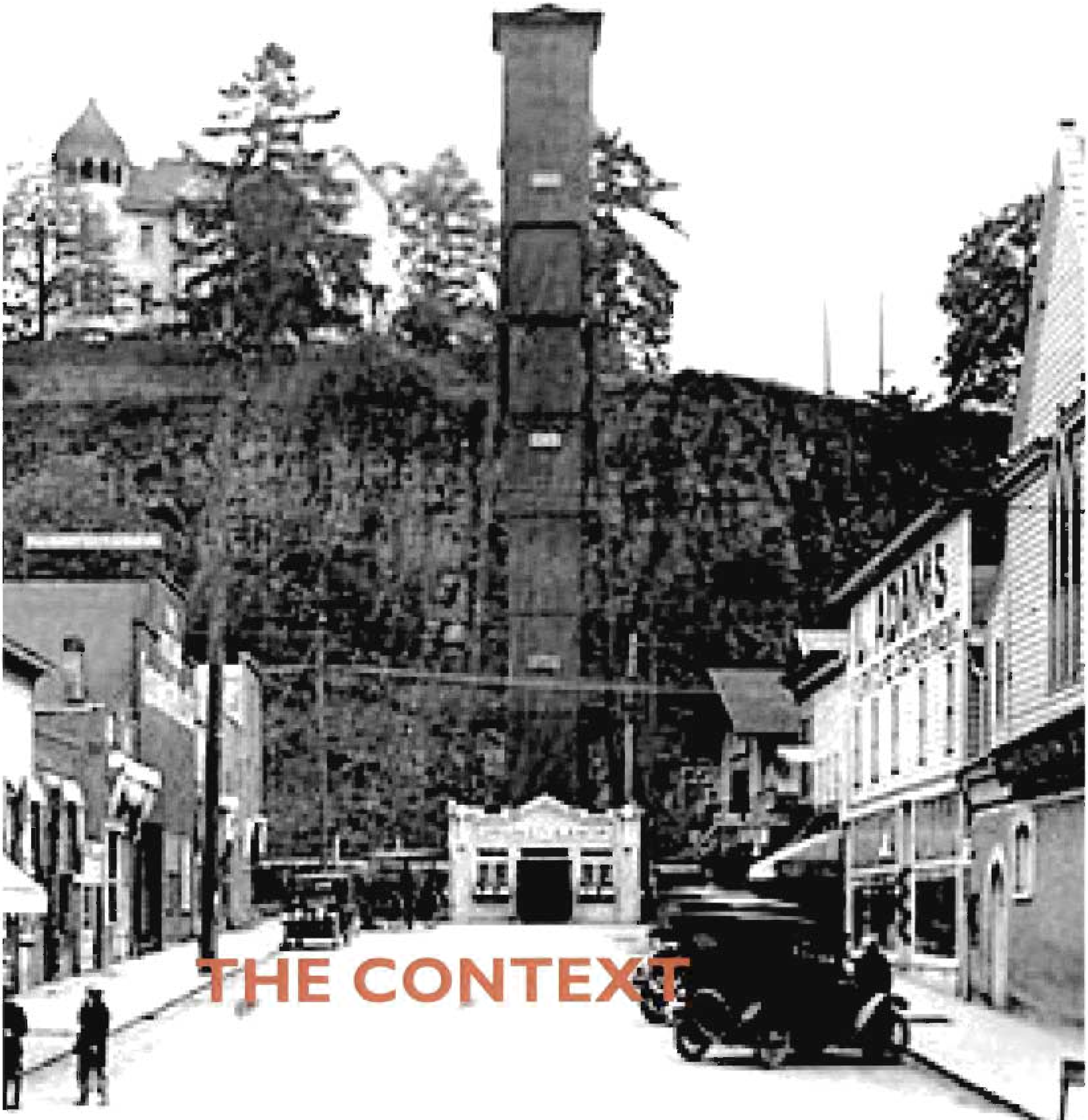
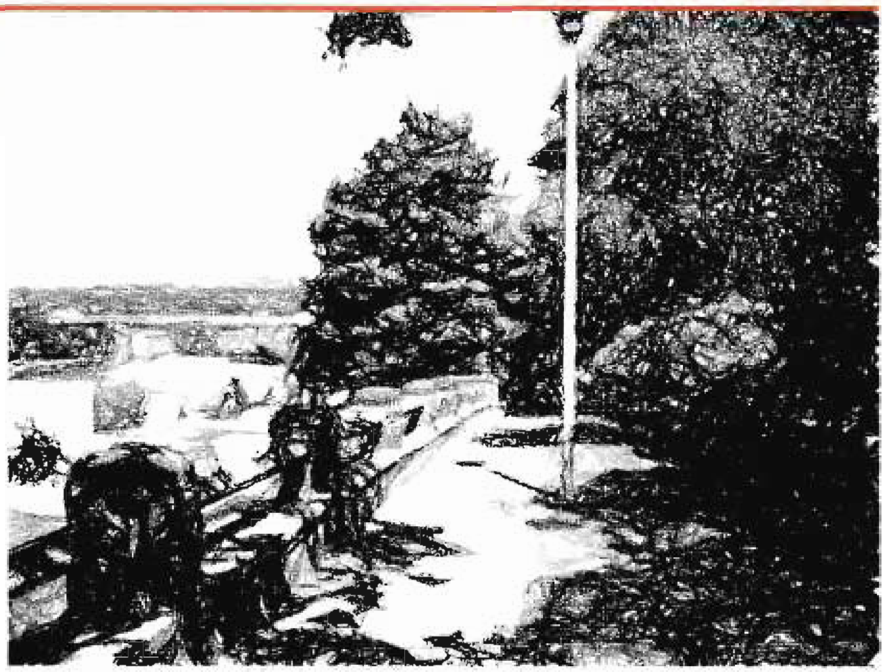


THE CONTEXT

the context



Located along the shores of the Willamette and Clackamas Rivers near the scenic Willamette Falls, Oregon City is the oldest incorporated City west of the Rockies. With a population of around 34,000, the City is characterized by topography that rises sharply from the riverfront and downtown to reach 250 feet, above the Willamette River. The two to three blocks wide downtown is located at the base of a basalt bluff where the McLoughlin Conservation District is found, one of two of the City's historic neighborhoods. At higher elevations and further south from downtown, newer neighborhoods and commercial development has developed over the past 50 years. Today, the City is comprised of 12 unique neighborhoods as illustrated by the Neighborhood Associations (see Figure in the TSP Volume 2, Section D).

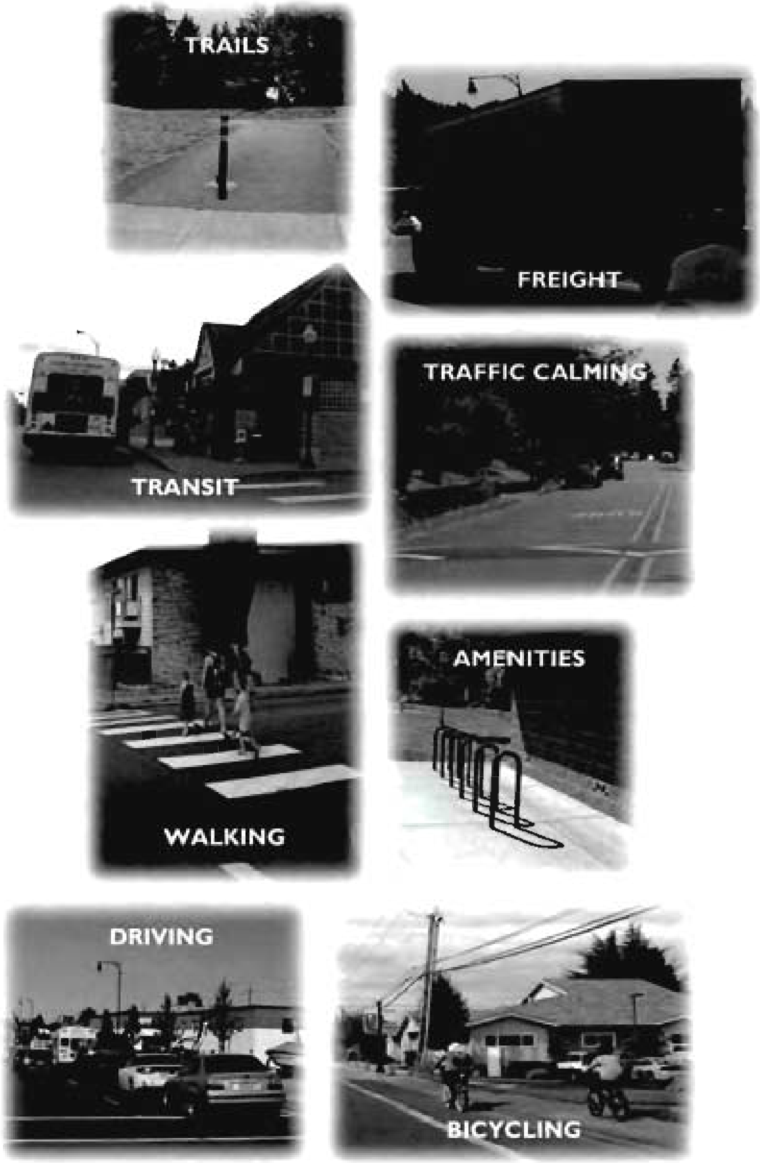
In recent years, the City has made great strides at investing in the Downtown Regional Center and the 7th Street-Molalla Avenue corridor and becoming a regional destination for employment, shopping and education. These characteristics make Oregon City unique, as well as define the key transportation issues that the City seeks to overcome.

The Challenge

Oregon City, like many jurisdictions, faces the challenge of accommodating population and employment growth while maintaining acceptable service levels on its transportation network. Moreover, the City must also balance its investments to ensure that the existing transportation system adequately serves all members of the community and is well maintained.

The Transportation System Plan

Oregon City is aware of these challenges and strives to keep the City's Transportation System Plan (TSP) up to date in an effort to prepare for and accommodate the future growth within the Urban Growth Boundary (UGB) in the most efficient manner possible. Without the big picture that the TSP provides, maintaining acceptable transportation network performance could not be achieved in an efficient manner.



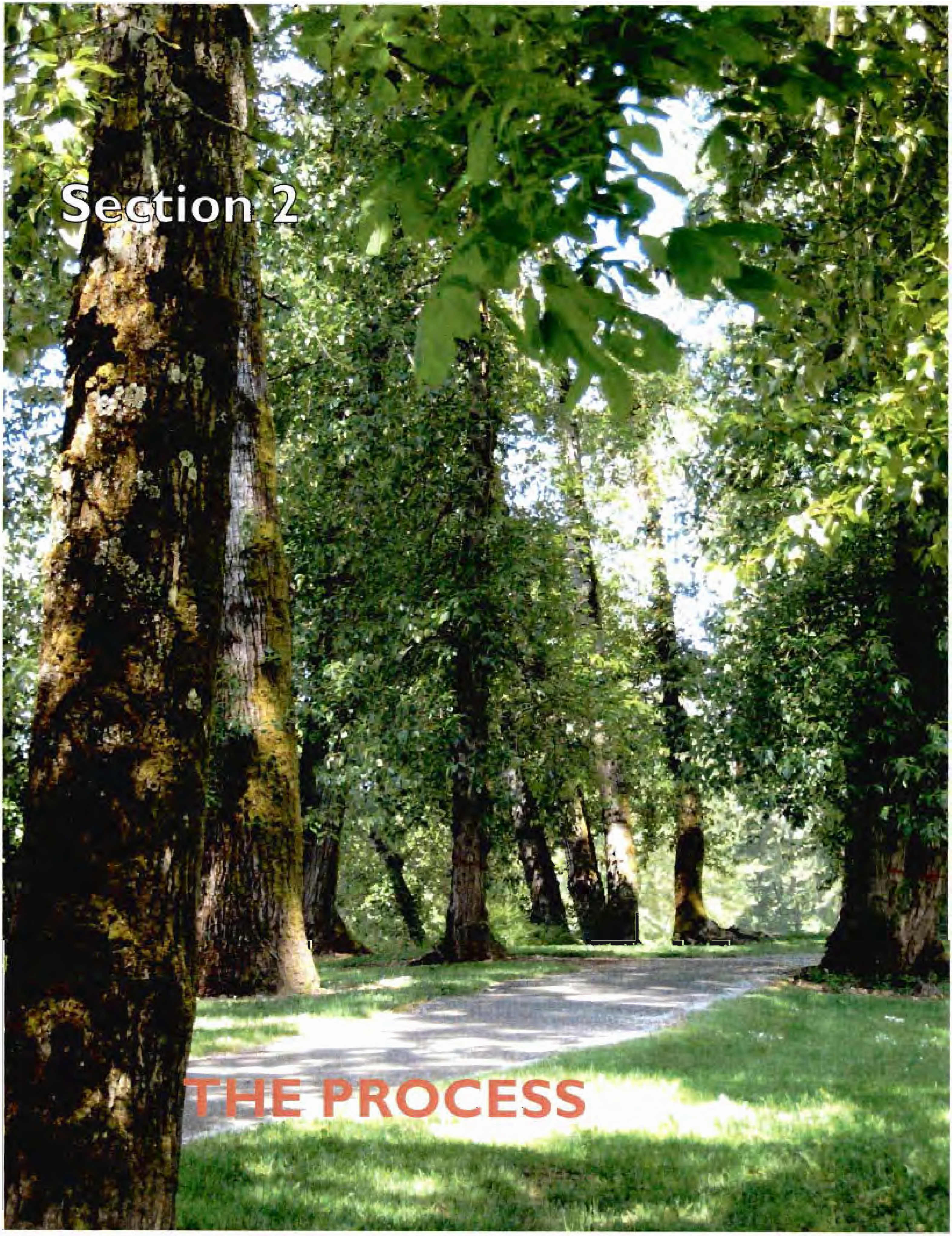
What is a TSP?

The TSP provides a long term guide for City transportation investments by incorporating the vision of the community into an equitable and efficient transportation system.

The plan evaluates the current transportation system and outlines policies and projects that are important to protecting and enhancing the quality of life in Oregon City through 2035. Plan elements can be implemented by the City, private developers, and state or federal agencies.

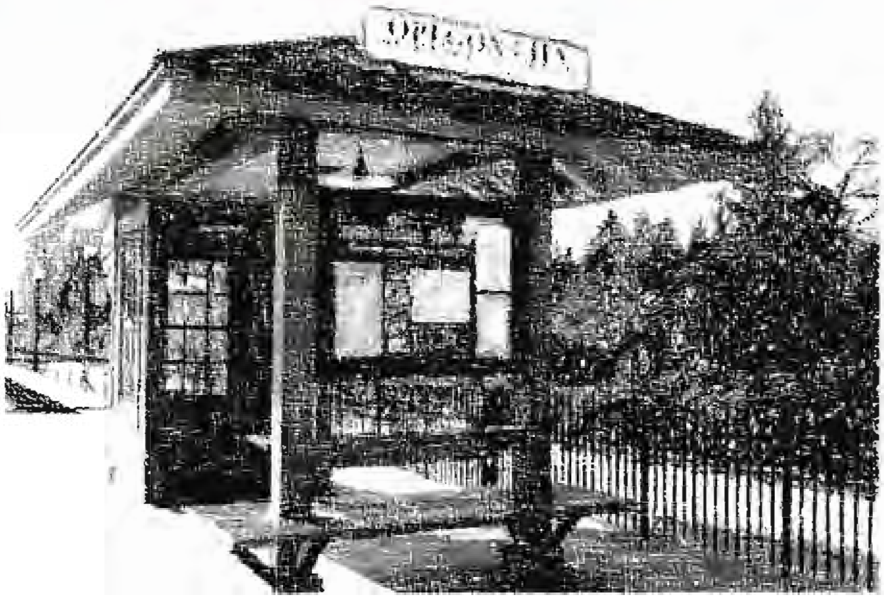
A TSP is required by the State of Oregon, to help integrate our plans into the statewide transportation system. The plan balances the needs of walking, bicycling, driving, transit and freight into an equitable and efficient transportation system. The TSP can also be a tool for reflecting community values and protecting what makes Oregon City a great place to call home, do business, and visit.

The TSP provides a long term guide for City transportation investments.


Section 2
THE PROCESS

the process

The Oregon City TSP Update was a collaborative process among various public agencies, key stakeholders and the community. Throughout this project, the project team took time to understand multiple points of view, obtain fresh ideas and resources, and encourage participation from the community.



Project staff conducted over a dozen small group meetings, hosted stakeholder and technical group meetings, held regular meetings with decision makers, and conversed informally with members of the community.

At key stages, project staff also held four community meetings that gave residents an opportunity to learn about the project and contribute their concerns on how the transportation system might be improved (as shown in Figure 1).

Goals and Objectives	Transportation Conditions	Alternatives Evaluation	Draft TSP	Final TSP
Develop project goals, objectives and evaluation criteria	Review the transportation system to identify current conditions and problems, and determine future needs through 2035	Identify and evaluate solutions and projects for the identified needs of the transportation system through 2035	The solutions and projects that best meet the project goals, objectives and evaluation criteria were incorporated into a Draft TSP	City adoption of Final TSP
Community Meeting #1	Community Meeting #2	Community Meeting #3	Community Meeting #4	Public Hearings

Early 2012 · Mid 2012 · Late 2012 · Early 2013

Figure 1: TSP Update Process

TSP Website

Throughout the project, a website was maintained for the TSP where all project news, documents and meeting notices were posted. The website also featured a comment map, where residents could tell the project team what they thought about the transportation system in the city. Nearly 200 comments were submitted to the project team with this feature.

The Public Review Process

The development of the Transportation System Plan involved gathering information and ideas from residents, business owners and stakeholders in Oregon City.

The process was been broken into 12 manageable pieces. Each piece entailed a Technical Memorandum discussing specific topic areas and key findings ranging from existing transportation conditions to funding assumptions to transportation solutions.

Each memorandum was posted to the project website (as shown in Figure 2), giving residents an opportunity to provide feedback and keep up to date with the project.

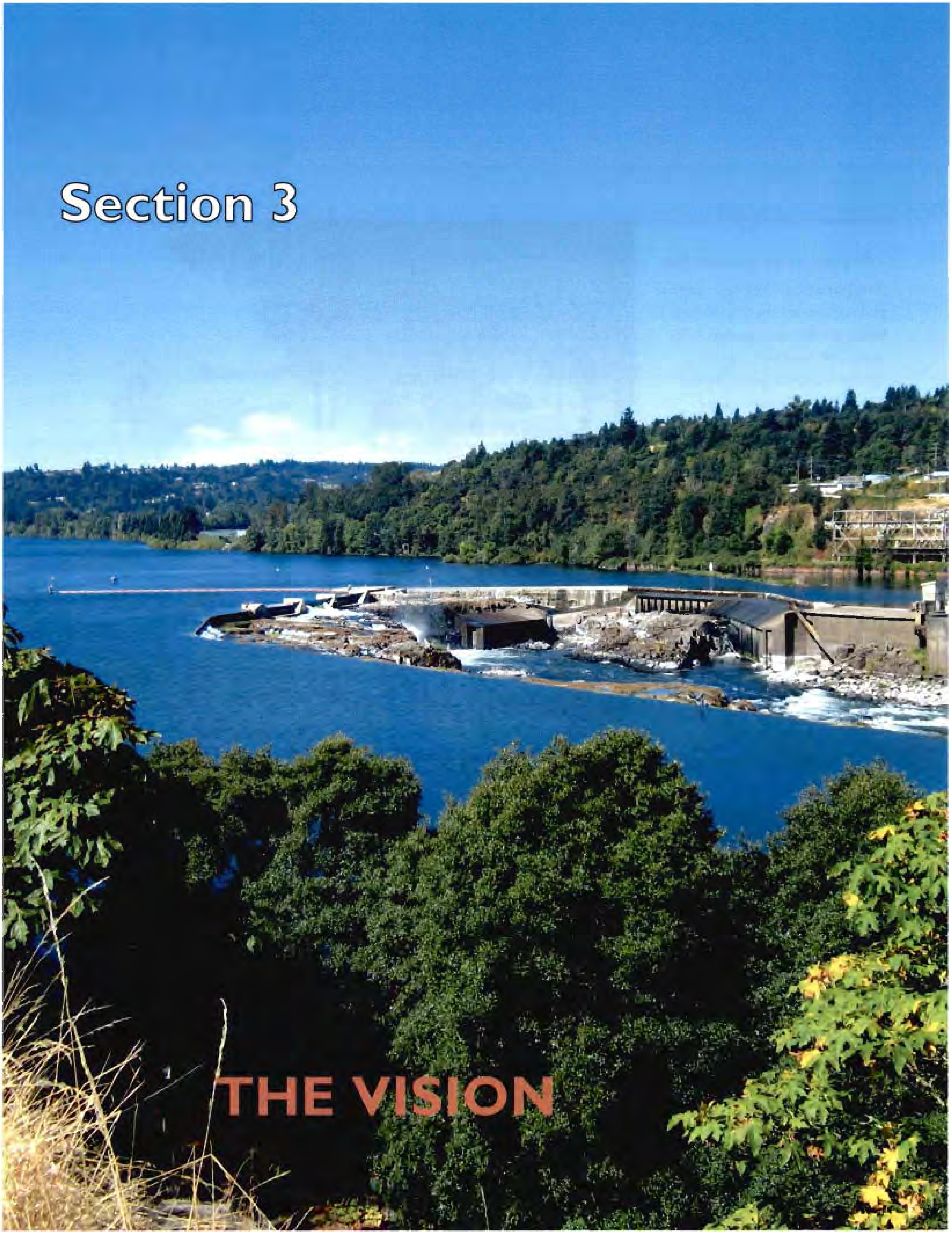
A project technical advisory team, comprised of agency technical staff, and a stakeholder advisory team, with local residents and business representatives, was also formed. These groups represented the interests and perspectives of their constituencies by reviewing and commenting on each of the memorandums and meeting with the project team at key stages during the project. These groups also helped the project team find consensus agreement on project issues.

The project team would then revise the Draft Memorandums based on the feedback received from these groups and the public and the documents were reposted to the TSP website. These memorandums were ultimately utilized to create the Draft TSP.

Subsequent public hearings with the Planning Commission and City Commission on the Draft TSP ultimately led to adoption of the 2013 Oregon City Transportation System Plan.

Figure 2: Public Review Process

Section 3



THE VISION

the vision

Oregon City understands that transportation funding is limited and recognizes the importance in being fiscally responsible in its approach to enhancing the transportation system. In the past, a typical response to congestion was to expand streets to add additional travel lanes, etc. This created significant barriers to walking and biking and detracted from the livability, health, safety and fiscal wellbeing of the community.

Oregon City's approach to the TSP placed more value on investments in smaller cost-effective solutions for the transportation system rather than larger, more costly ones where practical. As required by the Metro Regional Transportation Functional Plan, the approach emphasized a multi-modal network-wide approach to identifying transportation system solutions by following a five-step process, as shown in Figure 3, that considered solutions from top to bottom until a viable solution was identified.

This enabled more cost-effective solutions to increase transportation system capacity and helped to encourage multiple

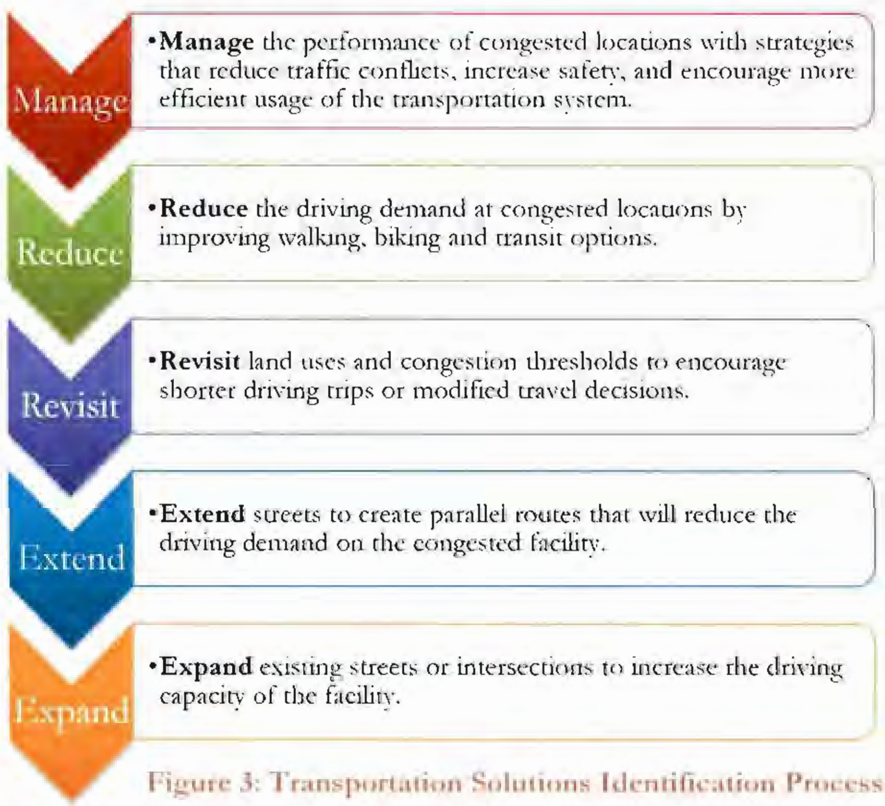


Figure 3: Transportation Solutions Identification Process

travel options, increase street connectivity and promote a more sustainable transportation system.

How do we reflect our Vision in the Plan?

Eight transportation goals and associated objectives were developed for the TSP to provide direction for the future of the transportation system. The goals were ranked by project stakeholders from most valuable to least valuable. Using the weighted goals, the transportation solutions were evaluated and compared to one another, placing more value on those project stakeholders felt were most important to the community. The following goals (listed in order of importance to the community), were utilized to assess the performance of the transportation solutions:

- Enhance the health and safety of residents
- Emphasize effective and efficient management of the transportation system
- Foster a sustainable transportation system
- Provide an equitable, balanced and connected multi-modal transportation system
- Identify solutions and funding to meet system needs
- Increase the convenience and availability of pedestrian, bicycle, and transit modes
- Ensure the transportation system supports a prosperous and competitive economy
- Comply with state and regional transportation plans

Each transportation solution was assigned a time frame for the expected investment need, based on a project's contribution to achieving the transportation goals of Oregon City. The investment recommendations balanced implementation considerations with available funding. Complex and costly capital projects were disfavored compared with implementation of low cost projects that can have more immediate impacts and can spread investment benefits citywide.

Figure 4: Reflecting our vision in the Plan

Goal 1: Health and Safety

Objectives

Objective A. Identify improvements to address high collision locations.

Objective B. Identify necessary changes to street design guidelines to support context sensitive design solutions.

Objective C. Reduce impervious street surfaces through "Green Streets."

Objective D. Provide a network of family-friendly walking and biking routes.

Goal1. Enhance the health and safety of residents

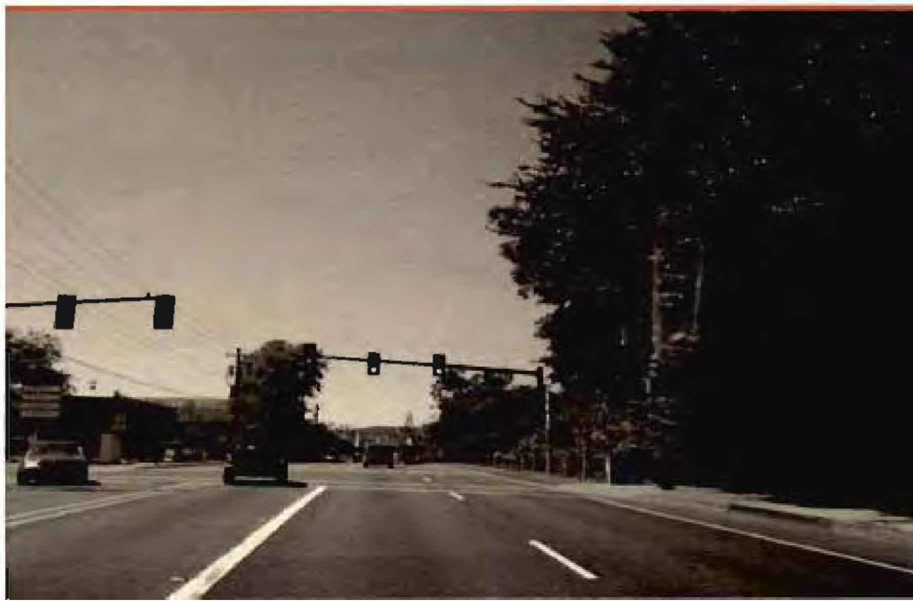
Ensure that the transportation system maintains and improves individual health, safety and security by maximizing the comfort and convenience of walking, biking and transit transportation options, public safety and service access.

Evaluation Criteria

The evaluation criteria implementing the goal and objectives include:

- Improves safety of the transportation system.
- Encourages active living and physical activity.
- Minimizes transportation related pollution.

Goal 2: Effective and Efficient



Objectives

Objective A. Identify opportunities to reduce the use of state facilities and arterials for local trips.

Objective B. Seek to shift vehicle travel to off-peak periods.

Objective C. Maintain the existing transportation system assets.

Objective D. Identify opportunities to improve travel reliability and safety with TSMO solutions.

Goal 2. Emphasize effective and efficient management of the transportation system

Optimize travel capacity and improve travel conditions by better managing our own travel demands, meeting more of our daily needs within our own community, making our existing transportation facilities as smart and efficient as possible, and being strategic about transportation investments. The City should seek to find innovations and fine tuning of existing systems and policies and avoid or forestall costly major roadway capacity improvements.

Evaluation Criteria

The evaluation criteria implementing the goal and objectives include:

- Reduces need for major highway project construction.
- Implements Transportation Demand Management (TDM) or other strategies to create greater mobility, reduce auto trips, make more efficient use of the roadway system, and minimize air pollution.
- Improvement makes daily traffic capacity more reliable.
- Enhances travel for local trips off the state highway system.

Goal 3: Sustainable

Objectives

Objective A. Support alternative vehicle types by identifying potential electric vehicle plug-in stations and developing implementing code provisions.

Objective B. Identify existing and future expected VMT levels within the City of Oregon City, and consider opportunities and actions needed to meet RTP targets.

Objective C. Encourage alternatives to daily single-occupancy vehicle commuting.

Objective D. Develop and support alternative mobility standards on state facilities and City streets where necessary.

Objective E. Identify areas where alternative land use types would significantly shorten trip lengths or reduce the need for motor vehicle travel within the City.

Objective F. Minimize impacts to the natural environment.

Goal 3. Foster a sustainable transportation system

Build a transportation system that is environmentally and fiscally sustainable and that focuses on decreasing vehicle emissions and transportation related greenhouse gas emissions.

Evaluation Criteria

The evaluation criteria implementing the goal and objectives include:

- Emphasizes the movement of people over vehicles, which reduces the citywide vehicle-miles-travelled (VMT).
- Minimizes impact to the natural environment.
- Supports alternative land use types.

Goal 4: Equitable, Balanced and Connected

Goal 4. Provide an equitable, balanced and connected multi-modal transportation system

Provide a complete transportation system throughout Oregon City that provides travel options and connects people to jobs, schools, services, recreation, social and cultural institutions within the City.

Evaluation Criteria

The evaluation criteria implementing the goal and objectives include:

- Improves access to underserved or vulnerable populations.
- Reduces total transportation and housing costs.
- Enhances system efficiency.
- Satisfies multiple objectives.

Objectives

Objective A. Ensure that the transportation system provides equitable access to underserved and vulnerable populations.

Objective B. Reduce total housing and transportation costs for residents.

Objective C. Identify new or improved system connections to enhance system efficiency.

Objective D. Give priority to connections that help to advance other goal areas.

Objective E. Assure the Oregon City Municipal Code supports a balanced and connected multi-modal transportation system.

Goal 5: Fundable

Objectives

Objective A. Identify stable revenue sources for transportation investments to meet the needs of the City, as documented in the updated TSP.

Objective B. Consider costs and benefits when identifying project solutions and prioritizing public investments.

Objective C. Identify new funding sources to leverage high priority transportation projects.

Goal 5. Identify solutions and funding to meet system needs

The City will identify transportation investments that can be made with available funding to ensure that system needs can be delivered for growth planned within the community.

Evaluation Criteria

The evaluation criteria implementing the goal and objectives include:

- Available funding sources exist to implement projects in a timely fashion.
- Assumed project benefits exceed project costs.

Goal 6: Convenient and Available

Objectives

Objective A. Identify projects to close gaps and address deficiencies in the pedestrian and bicycle system.

Objective B. Provide safe, comfortable and convenient transportation options.

Objective C. Identify necessary changes to land development code to ensure connectivity between compatible land uses for pedestrian and bicycle trips.

Objective D. Identify areas that support additional transit services, and coordinate with transit providers to improve the coverage, quality and frequency of services.

Objective E. Consider the potential access needs for candidate High Capacity Transit and frequent service bus routes.

Goal 6. Increase the convenience and availability of pedestrian, bicycle, and transit modes

Strengthen the pedestrian and bicycle systems in all areas of the City. In addition, identify areas that have existing or future transit-supportive densities and amenities and work with local transit providers such as TriMet, Canby Area Transit (CAT), South Clackamas Transportation District (SCTD), etc. to cost-effectively improve coverage and frequency to achieve greater ridership productivity.

Evaluation Criteria

The evaluation criteria implementing the goal and objectives include:

- Adds bikeway and walkways that fill in system gaps, improve system connectivity, and are accessible to all users.
- Improves access to transit facilities. Promotes transit as a viable alternative to the single occupant vehicle.
- Improves the basic provision of services to encourage higher levels of usage for walking and biking trips.

Goal 7: Prosperity

Objectives

Objective A. Freight access and truck travel reliability.

Objective B. Increase the distribution of travel information to maximize the reliability and effectiveness of existing major roadway facilities.

Objective C. Reinforce growth and multi-modal access to 2040 Target Areas.

Objective D. Seek to advance travel strategies that are identified in the Metro Regional Mobility Corridors.

Goal 7. Ensure the transportation system supports a prosperous and competitive economy

Support a prosperous and competitive economy by preserving and enhancing business opportunities, and ensuring the efficient movement of people and goods.

Evaluation Criteria

The evaluation criteria implementing the goal and objectives include:

- Improves freight access/connectivity.
- Implements strategies to provide stable and reliable auto and truck traffic flows on major facilities.
- Improves access in the Metro 2040 Target Areas.

Goal 8: Compliant

Objectives

Objective A. Meet the mobility standards for state highways, or develop and propose alternative standards, consistent with Oregon Highway Plan provisions.

Objective B. Develop TSP policy and municipal code language to implement the TSP update.

Objective C. Consider regional needs identified in the Metro RTP, including those identified with the mobility corridors.

Objective D. Consider and evaluate transportation solutions and strategies consistent with the guidelines and priorities of the Metro RFTP.

Goal 8. Comply with state and regional transportation plans

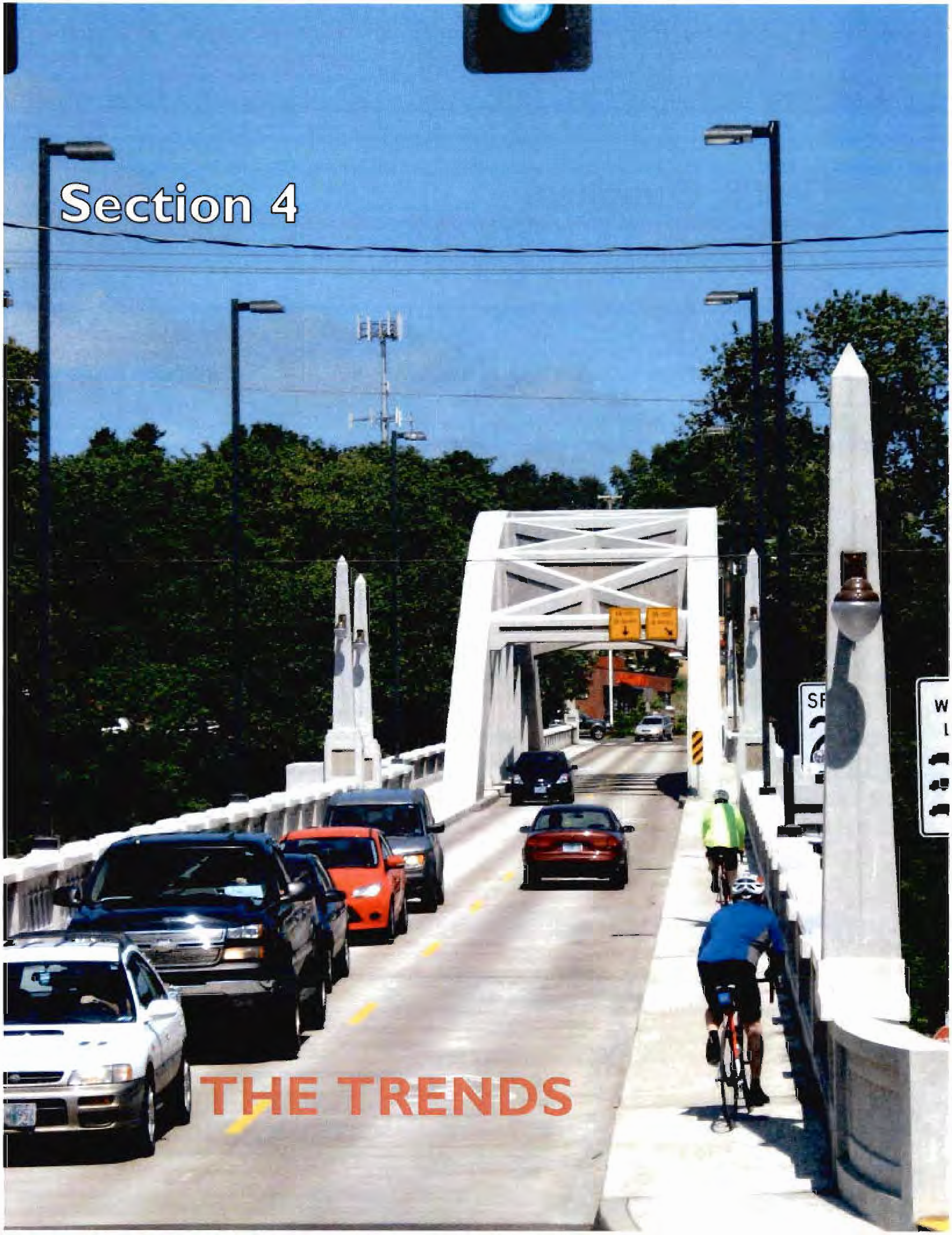
The City will meet the requirements of the Oregon Transportation Planning Rule, the Oregon Highway Plan, the Metro 2035 Regional Transportation Plan (RTP) and the Metro Regional Functional Transportation Plan (RFTP).

Evaluation Criteria

The evaluation criteria implementing the goal and objectives include:

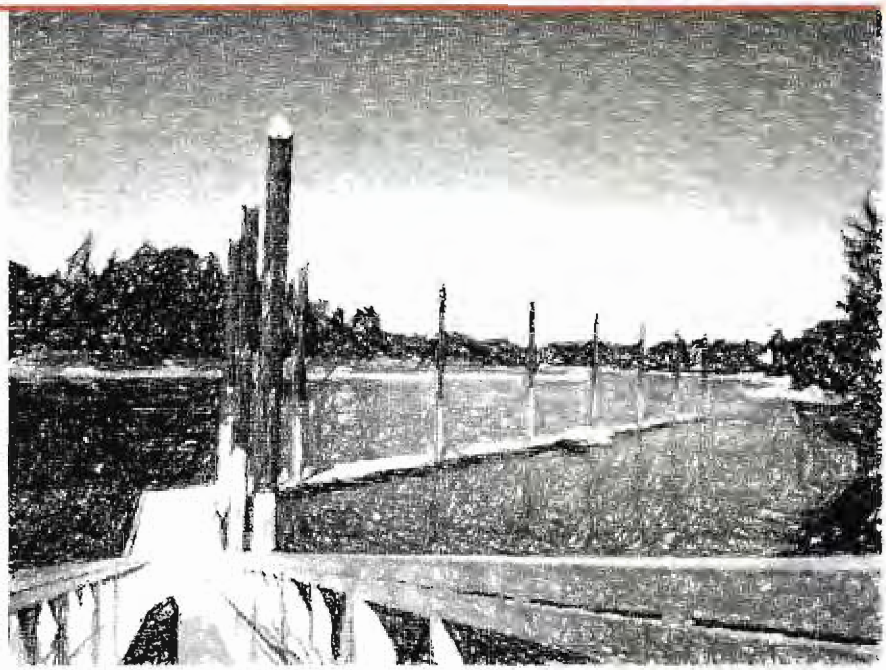
- Compatible with other jurisdiction's plans and policies, (including adjacent cities, counties, Metro or ODOT).
- Consistent with the standards of the City, Region, and State as a whole.

Section 4



THE TRENDS

the trends



Before it was determined what investments were needed for the City's transportation system, the current travel conditions were reviewed and future growth and travel trends were forecasted through 2035. It was assumed that only the likely to be funded short-term construction projects would be built and no further investments would be made. The following sections explain where growth is expected, how the transportation system will perform, and where solutions will be needed.

Snapshot of Oregon City in 2035

Today, Oregon City is home to over 13,000 households and accounts for over 14,500 jobs. Between now and 2035, household growth is expected to increase nearly 2.4 percent a year, slightly outpacing the rate of employment growth over the same period (2.3 percent). The City is expected to be home to over 23,000 jobs and almost 21,000 households by 2035, a 58 and 61 percent increase respectively from 2010. With more people and more jobs in Oregon City, the transportation network will face increased demands.

More People, More Jobs

As shown in Figure 5, much of the population and employment growth is expected to occur around the undeveloped edges of Oregon City. Employment growth is expected to be highest around the Oregon City Regional Center, including downtown Oregon City and the area bounded by the Clackamas River to the north, Abernethy Road on the south, OR 213 on the east and the Willamette River to the west. High employment growth is also anticipated to occur at the southeast end of the City, around OR 213 and Beavercreek Road.

Household growth is expected to be highest towards the south west end of the City, along South End Road, Central Point Road, Leland Road and Meyers Road. High household growth is also expected to occur on the north and east side of the City, along Maple Lane Road, Holcomb Boulevard and Redland Road. Much of the planned growth along the edge of the City requires voter approval to bring these lands into the city limits. This represents roughly one quarter of the planned growth by 2035.

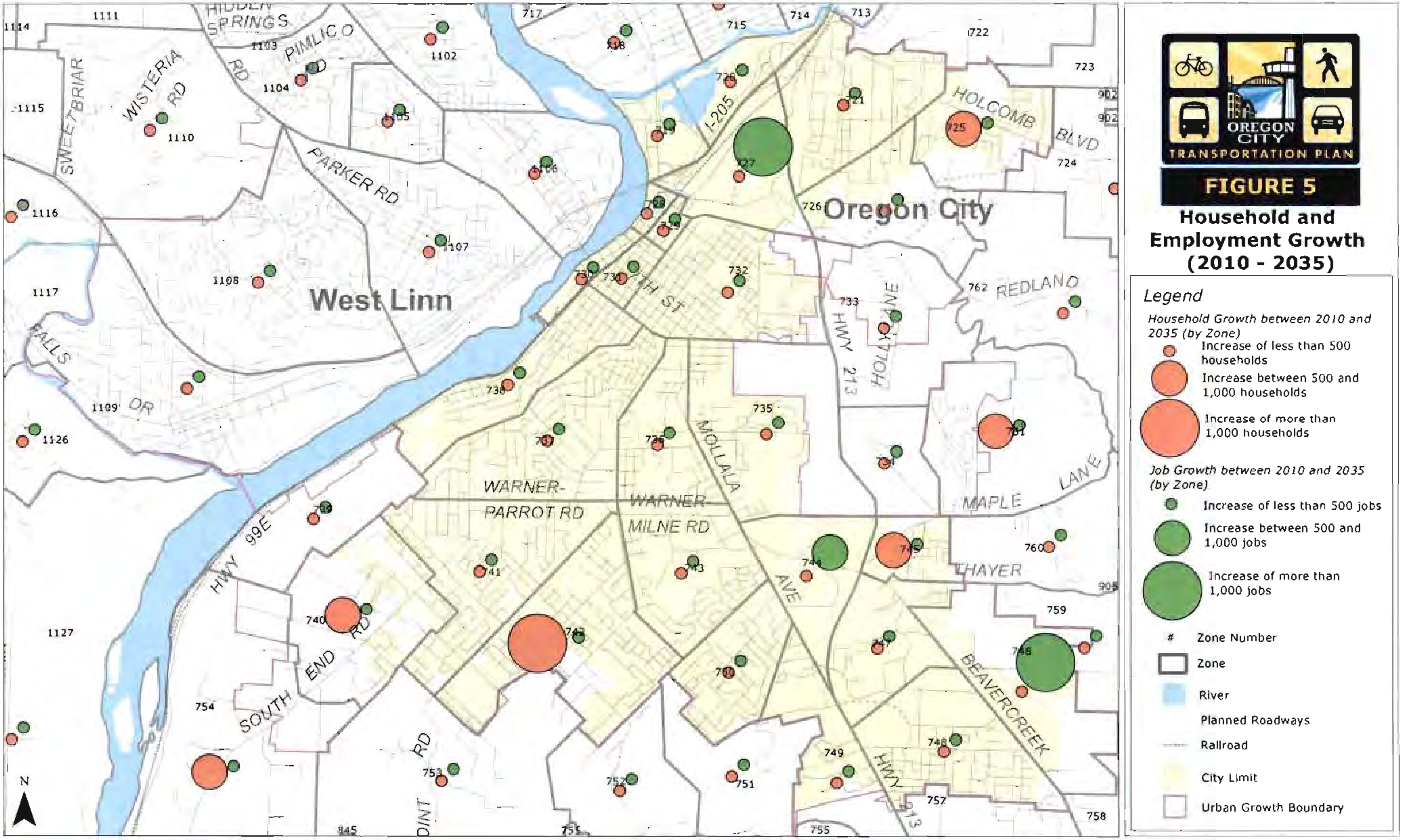
More Walking, Biking and Transit Usage

The traditional travel demand methodology used for predicting motor vehicle activity does not easily apply to bicycle and pedestrian travel for a number of reasons. Since the number of daily biking and walking trips in a community tends to be much smaller than the number of vehicular trips, data on walking and biking is typically too small to develop accurate models. Additionally, the method of choosing routes when walking or biking tends to be much more complicated than driving (i.e., motorists tend to take the shortest routes while bicycles may trade directness to avoid a hill or travel on a less busy street). The nature of bicycle and pedestrian travel and decision-making is not well understood, and is the subject of current national and local research efforts to incorporate bicycle and pedestrian travel into future traditional travel models.

Other sources of information on bicycle and pedestrian activity, such as the U.S. Census tend to undercount the actual number of walking and biking trips made in a community. This is because Census data focuses on the mode of travel used for work trips, which typically make up less than 20 percent of an individual's travel. The Census also requires that respondents choose the one travel mode used most often during the survey week. As a result, the Census does not capture the bicycle and pedestrian activity of people who bicycle or walk to access transit, to conduct personal business, to socialize, or for recreation.

Therefore, the future needs for walking, biking and transit in Oregon City were determined by reviewing major growth areas of the City and seeing how they were served by existing facilities. In addition, the areas of the City in close proximity to key destinations (such as schools, parks, transit stops, shopping and employment) with potential to attract significant walking and biking trips and areas with existing deficiencies were identified and reviewed by the project team and the community to determine locations for prioritized walking, biking or transit investments.

Areas of the City in close proximity to key destinations (such as schools, parks, transit stops, shopping and employment) that have the potential to attract significant walking and biking trips and areas with existing deficiencies were reviewed to determine locations for prioritized walking, biking or transit investments.



OREGON CITY
TRANSPORTATION PLAN
FIGURE 5
Household and Employment Growth (2010 - 2035)
Legend
Household Growth between 2010 and 2035 (by Zone)
Increase of less than 500 households
Increase between 500 and 1,000 households
Increase of more than 1,000 households
Job Growth between 2010 and 2035 (by Zone)
Increase of less than 500 jobs
Increase between 500 and 1,000 jobs
Increase of more than 1,000 jobs
Zone Number
Zone
River
Planned Roadways
Railroad
City Limit
Urban Growth Boundary
Oregon City
West Linn
HIDDEN SPRINGS RD
PIMLICO RD
WISTERIA RD
SWEETBRIAR
PARKER RD
FALLS DR
HOLCOMB BLVD
REDLAND
HOLLY LANE
HWY 213
MOLLALA AVE
WARNER-PARROT RD
WARNER-MILNE RD
MAPLE LANE
THAYER
BEAVERCREEK
HWY 99E
SOUTH END RD
I-205
7TH ST
N

Estimating Future Travel

A determination of future transportation system needs in Oregon City required the ability to accurately forecast travel demand resulting from estimates of future population and employment for the City and the rest of the Metro region.

The travel demand forecasting process generally involves estimating travel patterns for new development based on the decisions and preferences demonstrated by existing residents, employers and institutions around the region.

More information on the travel demand forecasting process can be found in the TSP Volume 2, Sections E and F.

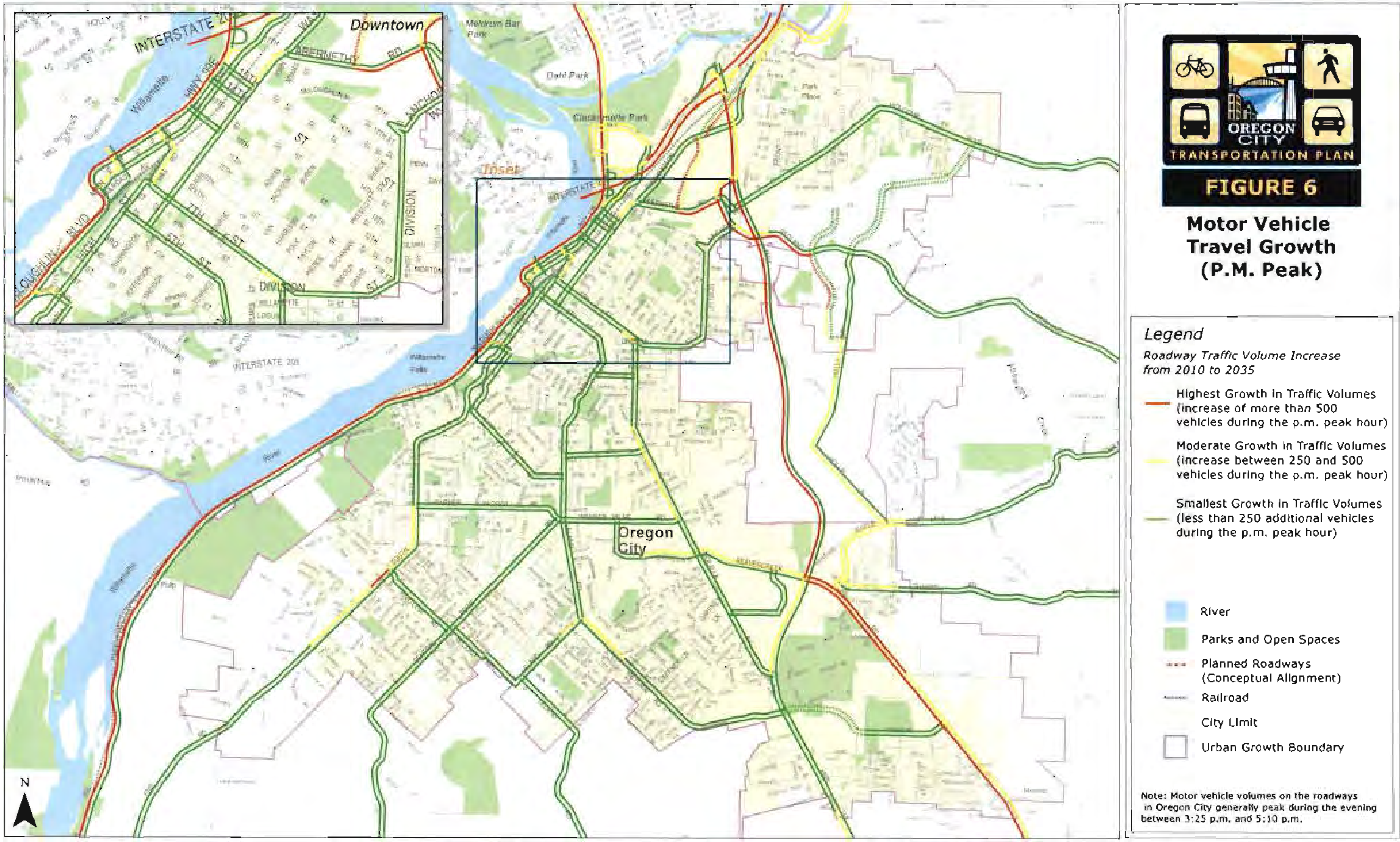
More Driving

With more jobs and people, the street network in Oregon City must accommodate an additional 21,000 motor vehicle trips during the evening peak hour (see Table A1 in the TSP Volume 2, Section G). Today, the street network in Oregon City is generally able to handle the estimated 33,000 evening peak hour vehicle trips. However, these trips are expected to increase by 3 percent a year, surpassing 54,000 trips by 2035.

Figure 6 shows the estimated increase in motor vehicle trips on the street network during the evening peak hour. As shown, much of the increased demand is expected along the regional roadways, such as I-205, OR 99E and OR 213. These roadways generally connect the Portland metropolitan area to the employment areas in Oregon City. Other roadways that are expected to see significant traffic increases (according to the Metro travel demand model) include Abernethy Road, Beavercreek Road, Holly Lane, Maple Lane Road, Molalla Avenue, Redland Road and South End Road. Each of these roadways connects a major residential and/or employment growth area in the City to the regional roadway network.

More Congestion

More travel means more congestion. Evening peak hour motor vehicle trips beginning or ending in Oregon City, is expected to increase by 75 percent through 2035. Through travel, or trips that do not begin or end in Oregon City, is also expected to increase through 2035 and is generally representative of growth in Cities such as Molalla and Canby. Figure 7 shows the expected locations that will experience average travel speeds well below the posted limits on the street network in Oregon City if no additional investments are made to the transportation system, including along the regional roadways, such as I-205, OR 99E and OR 213. Congestion on I-205 and OR 213 would generally have less of an impact on Oregon City compared to that on OR 99E, which impacts surface street circulation around Downtown Oregon City and could potentially detract from shopping or other retail uses in the area. Other roadways that are expected to experience average travel speeds well below the posted limits during the evening include Beavercreek Road, Maple Lane Road, Redland Road and Washington Street.



OREGON CITY
TRANSPORTATION PLAN
FIGURE 6
Motor Vehicle Travel Growth (P.M. Peak)
Legend
Roadway Traffic Volume Increase from 2010 to 2035
Highest Growth in Traffic Volumes (increase of more than 500 vehicles during the p.m. peak hour)
Moderate Growth in Traffic Volumes (increase between 250 and 500 vehicles during the p.m. peak hour)
Smallest Growth in Traffic Volumes (less than 250 additional vehicles during the p.m. peak hour)
River
Parks and Open Spaces
Planned Roadways (Conceptual Alignment)
Railroad
City Limit
Urban Growth Boundary
Note: Motor vehicle volumes on the roadways in Oregon City generally peak during the evening between 3:25 p.m. and 5:10 p.m.
Downtown
Inset
Oregon City
INTERSTATE 205
DIVISION
Dahl Park
Clackamette Park
Willamette
River
N

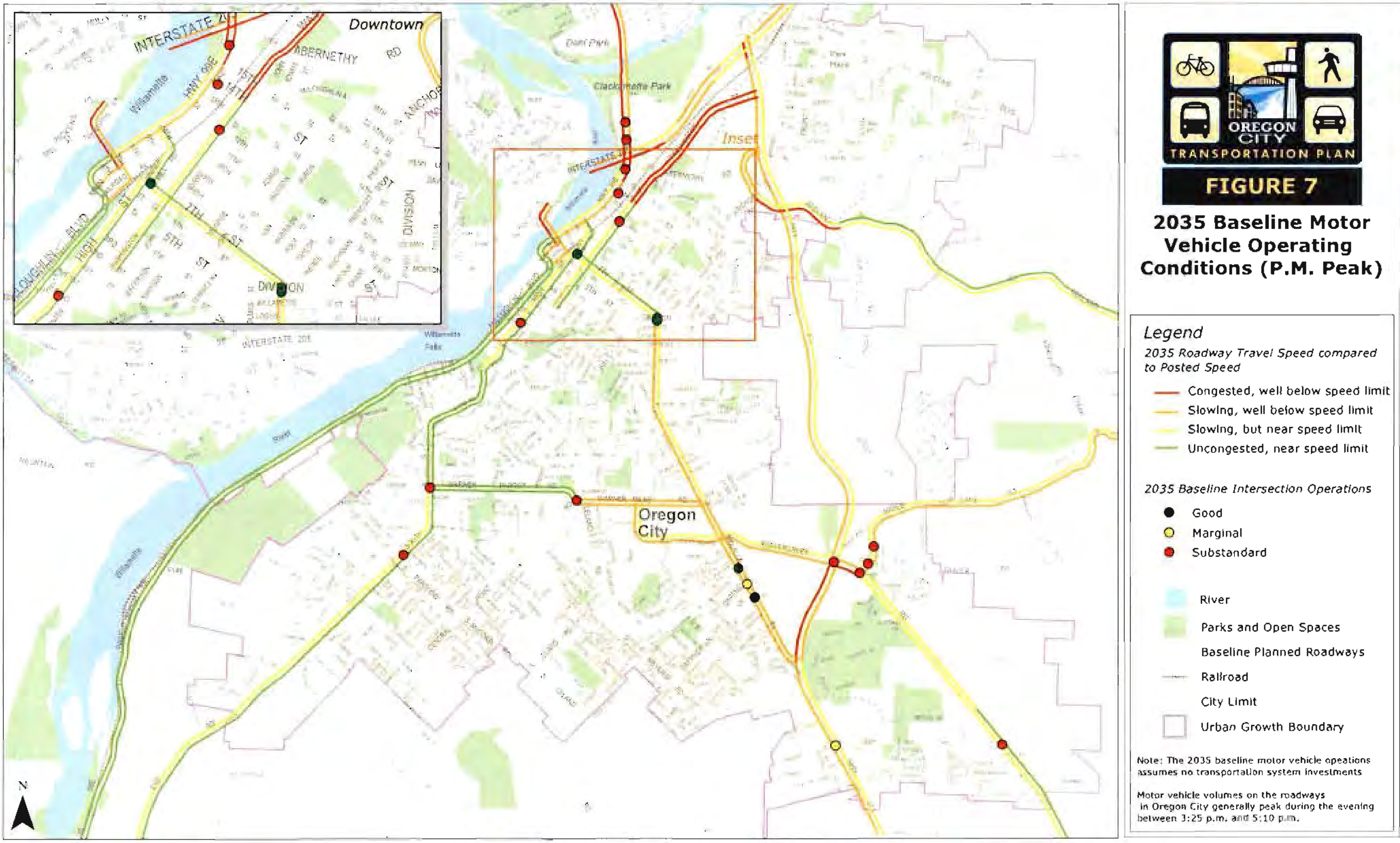
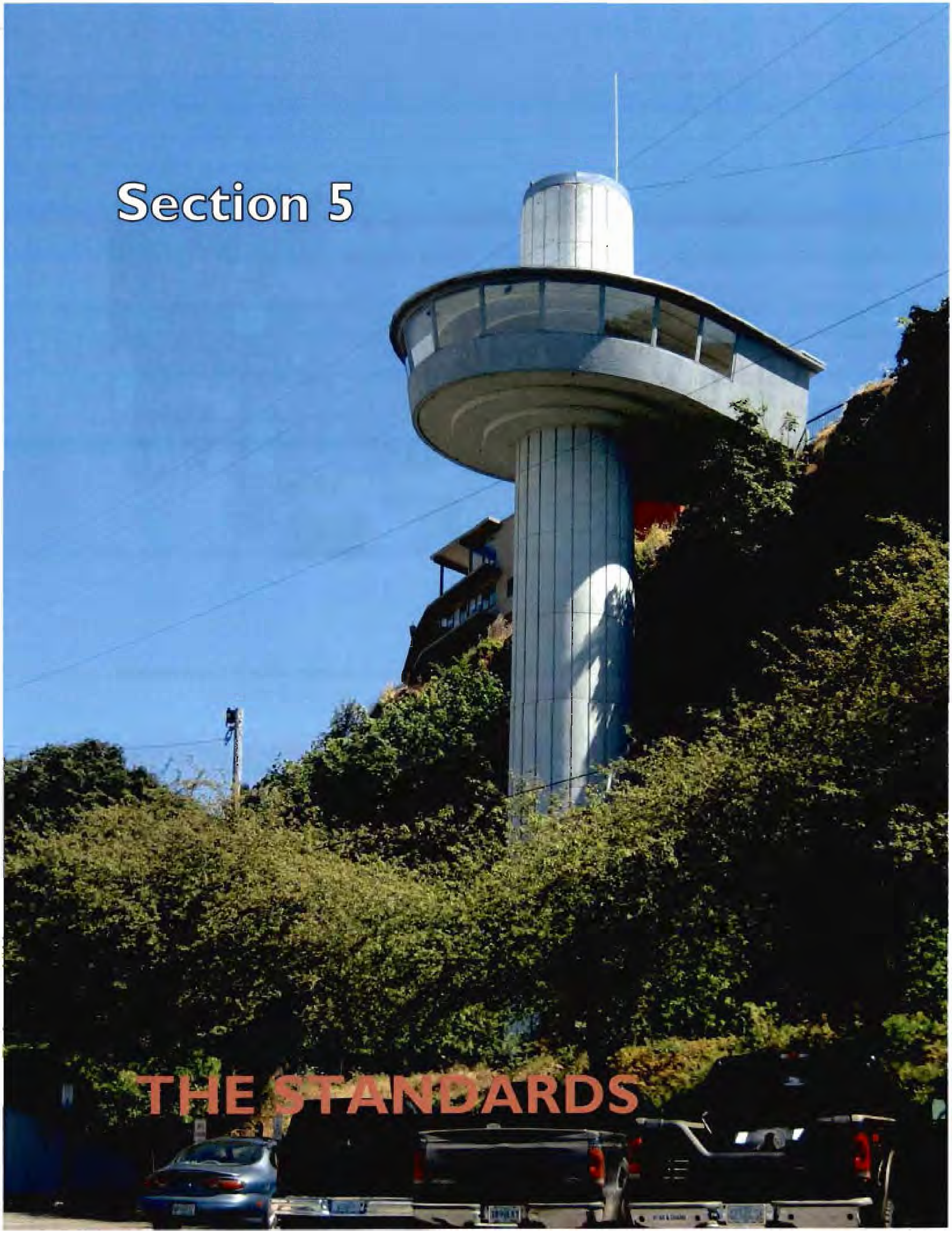


FIGURE 7

2035 Baseline Motor Vehicle Operating Conditions (P.M. Peak)

Section 5

THE STANDARDS



the standards

Now that the vision for the transportation system in Oregon City has been established, standards and regulations must be developed to ensure future development or redevelopment of property is consistent with the vision.

Multi-Modal Street System

Traditional roadway designs focus on the safety and flow of motor vehicle traffic. The one size fits all design approach is less effective at integrating the roadway with the character of the surrounding area and addressing the needs of other users of a roadway. For instance, the design of an arterial roadway through a commercial area has often traditionally been the same as one through a residential neighborhood, both primarily focused on the movement of motor vehicles.

Oregon City recognizes that all roadways within the City should be multi-modal or complete streets, with each street serving the needs of the various travel modes. The City also realizes that not all streets should be designed the same. To account for this, Oregon City classified the street system into a hierarchy organized by function and street type (representative of their places). These classifications ensure that the streets reflect the neighborhood through which they pass, consisting of a scale and design appropriate to the character of the abutting properties and land uses. The classifications also provide for and balance the needs of all travel modes including pedestrians, bicyclists, transit riders, motor vehicles and freight. Within these street classifications, context sensitive design may result in alternative cross-sections. The Oregon City multi-modal street system can be seen in Figure 8.

More detail on the multi-modal street system and design type of streets can be found in the TSP Volume 2, Section C.

Multi-Modal Street Function

The functional classification of roadways is a common practice in the United States. Traditionally, roadways are classified based on the type of vehicular travel it is intended to serve (local versus through traffic). In Oregon City, the functional classification of a roadway (shown in Figure 8) determines the level of mobility for all travel modes, defining its design characteristics (such as minimum amount of travel lanes), level of access and usage within the City and region. The street functional classification system recognizes that individual streets do not act independently of one another but instead form a network that works together to serve travel needs on a local and regional level. From highest to lowest intended usage, the classifications are freeway, expressway, major arterials, minor arterials, collectors and local streets. Roadways with a higher intended usage generally provide more efficient motor vehicle traffic movement (or mobility) through the City, while roadways with lower intended usage provide greater access for shorter trips to local destinations.

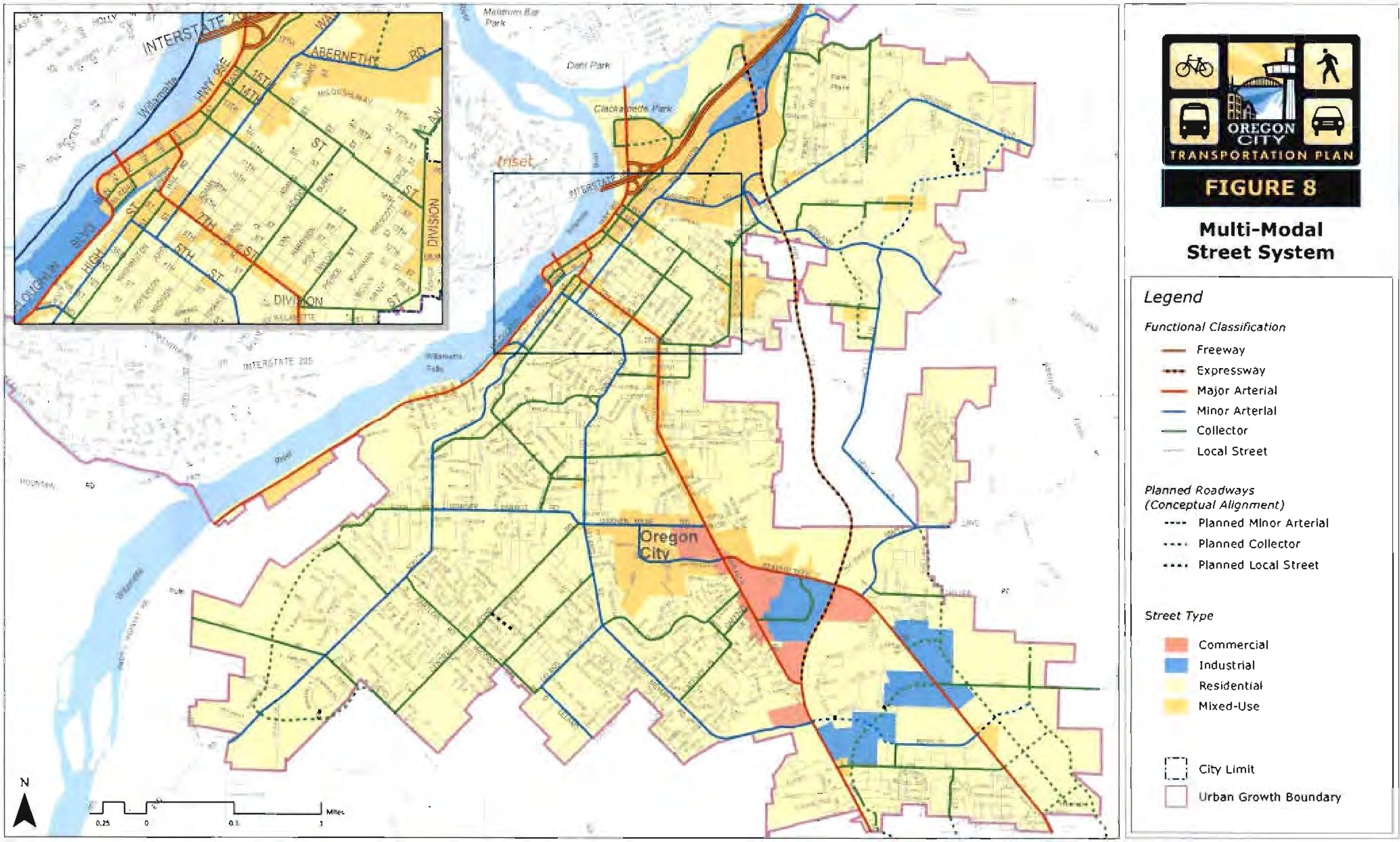
Multi-Modal Street Type

Oregon City further classifies the roadways within the City based on the neighborhood it serves and the intended function for pedestrians, bicyclists and transit riders in that specific area. Within the context of Oregon City's complete street system that will serve all modes, the street type of a roadway defines its cross-section characteristics and determines how users of a roadway interact with the surrounding land use. Since the type and intensity of adjacent land uses and zoning directly influence the level of use by pedestrians, bicyclists and transit riders, the design of a street (including its intersections, sidewalks, and transit stops) should reflect its surroundings.

The street types strike a balance between street functional classification, adjacent land use, zoning designation and the competing travel needs by prioritizing various design elements. Five street types were designated in Oregon City:

- **Mixed-Use Streets** typically have a higher amount of pedestrian activity and are often on a transit route. These streets should emphasize a variety of travel choices such as pedestrian, bicycle and transit use to complement the development along the street. Since mixed-use streets typically serve pedestrian oriented land uses, walking should receive the highest priority of all the travel modes. They should be designed with features such as wider sidewalks, traffic calming (see the traffic calming section later in this document), pedestrian amenities, transit amenities, attractive landscaping, on-street parking, pedestrian crossing enhancements and bicycle lanes.
- **Residential Streets** are generally surrounded by residential uses, although various small shops may be embedded within the neighborhood. These streets often connect neighborhoods to local parks, schools and mixed-use areas. They should be designed to emphasize walking, while still accommodating the needs of bicyclists and motor vehicles. A high priority should be given to design elements such as traffic calming (see the traffic calming section later in this document), landscaped buffers, walkways/ pathways/ trails, on-street parking and pedestrian safety enhancements.

- **Commercial Streets** are primarily lined with retail and large employment complexes. These uses serve customers throughout the City and region and may not have a direct relationship with nearby residential neighborhoods. These streets are somewhat more auto-oriented, but should still accommodate pedestrians and bicyclists safely and comfortably. Design features should include landscaped medians or a two-way left turn lane, sidewalks and bike lanes, pedestrian crossing enhancements and a buffer between the roadway and the sidewalk.
- **Industrial Streets** serve industrial areas. These streets are designed to accommodate a high volume of large vehicles such as trucks, trailers and other delivery vehicles. Pedestrians and bicyclists may be less frequent in these areas, but should still be accommodated safely and comfortably. Roadway widths are typically wider to accommodate larger vehicles. On-street parking should be discouraged.
- **Constrained Streets** are generally located in steep, environmentally sensitive, rural, historic, or development limited areas of the City. These streets may require different design elements that may not be to scale with the adjacent land use. Constrained elements may include narrower or limited travel lanes, and pedestrian and bicycle facilities, or accommodations that generally match those provided by the surrounding developed land uses. To the extent possible, pedestrian and bicycle accommodations should be provided on an adjacent roadway, via a shared-use path or shared within the right-of-way using distinctive design details.



OREGON CITY
TRANSPORTATION PLAN
FIGURE 8
Multi-Modal Street System
Legend
Functional Classification
Freeway
Expressway
Major Arterial
Minor Arterial
Collector
Local Street
Planned Roadways (Conceptual Alignment)
Planned Minor Arterial
Planned Collector
Planned Local Street
Street Type
Commercial
Industrial
Residential
Mixed-Use
City Limit
Urban Growth Boundary
Oregon City
Inset
Clackamette Park
Dahl Park
INTERSTATE 205
INTERSTATE 205
ABERNETHY
RD
HWY 99E
14TH
15TH
7TH
5TH
ST
DIVISION
BLVD
HIGH
N
0.25
0
0.5
1
Miles

Design Types of Streets

Design of the streets in Oregon City requires attention to many elements of the public right-of-way and considers how the street interacts with the adjoining properties. The four zones that comprise the cross-section of streets in Oregon City, including the context zone, walking zone, biking/on-street parking zone and driving zone, are shown in Figure 9. The design of these zones varies based on the functional classification and street type. Overall, there are 16 different design types, ranging from Mixed-Use Major Arterial to Residential Local Street. Note that a design type is not available for limited access roadways classified as Freeway or Expressway. The maximum design criteria for streets can be seen in Section 12.04.180 of the Oregon City Municipal Code. The City may also reduce or eliminate lower- priority design elements of the street along constrained streets located in steep, environmentally sensitive, rural, historic, or development limited areas of the City.

- **Context Zone:** The context zone is the point at which the sidewalk interacts with the adjacent buildings or private property. The purpose of this zone is to provide a buffer between land use adjacent to the street and to ensure that all street users have safe interactions.
- **Walking Zone**: This is the zone in which pedestrians travel. The walking zone is determined by the street type and should be a high priority in mixed-use and residential areas. It includes a clear throughway for walking, an area for street furnishings or landscaping (e.g. benches, transit stops and/or plantings) and a clearance distance between curbside on-street parking and the street furnishing area or landscape strip (so parking vehicles or opening doors do not interfere with street furnishings and/or landscaping). Streets located along a transit route should incorporate furnishings to support transit ridership, such as transit shelters and benches, into the furnishings/landscape strip adjacent to the biking/on-street parking zone.
- **Biking/On-Street Parking Zone:** This is the zone for biking and on-street parking, and is the location where users will access transit. It should include bike lanes or buffered bike lanes. The biking/on-street parking zone is determined by the street type and should be a high priority in mixed-use and residential areas.
- **Driving Zone:** This is the throughway zone for drivers, including cars, buses and

Figure 9: The Components of Oregon City Streets

trucks and should be a high priority in commercial/ employment and industrial areas. The functional classification of the street generally determines the number of through lanes, lane widths, and median and left-turn lane requirements. However, the route designations (such as transit street or freight route) take presentence when determining the appropriate lane width in spite of the functional classification. Wider lanes should only be used for short distances as needed to help buses and trucks negotiate right-turns without encroaching into adjacent or opposing travel lanes. Streets that require a raised median should include a pedestrian refuge at marked crossings. Otherwise, the median can be narrowed at midblock locations, before widening at intersections for left-turn lanes (where required or needed).

Determining Optimum Street Designs

The following steps should be used to determine the optimum cross-section for a street:

Step 1: Determine the functional classification and street type based on Figure 8.

Step 2: Determine the maximum street design as shown in Section 12.04.180 of the Oregon City Municipal Code.

Step 3: Determine if the street is located along a regional truck route, local truck route, or a transit route. If so, the through lane width should be a minimum of 12 feet along a truck route or 11 feet along a transit route. If not, the lane width can be reduced a minimum of 12 feet along major arterials, 11 feet on minor arterials, and 10 feet along collectors and local streets, as determined by the City.

Step 4: Determine if more than two through lanes are needed. More than two through lanes should only be considered if the street and parallel routes cannot effectively accommodate the travel demand.

Step 5: Determine if left-turn lanes are needed at intersections. Intersection design should generally try to minimize pedestrian crossing distance. If turn-lanes are warranted, consider the trade-offs between improved driving mobility and increased crossing distance.

Step 6: Compare the optimum street design to the available right-of-way. If the cross-section is wider than the right-of-way, identify whether right-of-way acquisition is necessary or reduce the width of or eliminate lower-priority elements as determined by the City.

Spacing Standards

Access spacing along Oregon City streets will be managed through access spacing standards. Access management is a broad set of techniques that balance the need to provide efficient, safe, and timely travel with the ability to allow access to individual destinations. Proper implementation of access management techniques will promote reduced congestion and accident rates, and may lessen the need for additional highway capacity.

Table 1 identifies the minimum and maximum street intersection and minimum driveway spacing standards for streets in Oregon City. Within developed areas of the City, streets not complying with these standards could be improved with strategies that include shared access points, access restrictions (through the use of a median or channelization islands) or closed access points as feasible. New streets or redeveloping properties must comply with these standards, to the extent practical (as determined by the City).

Table 1: Spacing Standards

	Mixed-Use or Residential				Commercial or Industrial			
	Major Arterial	Minor Arterial	Collector	Local	Major Arterial	Minor Arterial	Collector	Local
Maximum Block Size (Street to Street)*	530 ft.	530 ft.	530 ft.	530 ft.	530 ft.	530 ft.	530 ft.	530 ft.
Minimum Block Size (Street to Street)	150 ft.	150 ft.	150 ft.	150 ft.	150 ft.	150 ft.	150 ft.	150 ft.
Minimum Driveway Spacing (Street to Driveway and Driveway to Driveway)**	175 ft.	175 ft.	100 ft.	25 ft.	225 ft.	225 ft.	150 ft.	25 ft.

* If the maximum block size is exceeded, mid-block pedestrian and bicycle accessways must be provided at spacing no more than 330 feet, unless the connection is impractical due to existing development, topography, or environmental constraints.

** Single and two-family dwellings are exempt from the driveway to driveway spacing standard.

Traffic Calming

Traffic calming refers to street design techniques used to re-create safe, slow residential and mixed-use streets without significantly changing vehicle capacity and to mitigate the impacts of traffic on neighborhoods and business districts where a greater balance between safety and mobility is needed. Traffic calming seeks to influence driver behavior through physical and psychological means, resulting in lower vehicle speeds or through traffic volumes. Physical traffic calming techniques include:

- Narrowing the street by providing curb extensions or bulbouts, or mid-block pedestrian refuge islands
- Deflecting the vehicle path vertically by installing speed humps, speed tables, or raised intersections
- Deflecting the vehicle path horizontally with chicanes, roundabouts, and mini-roundabouts

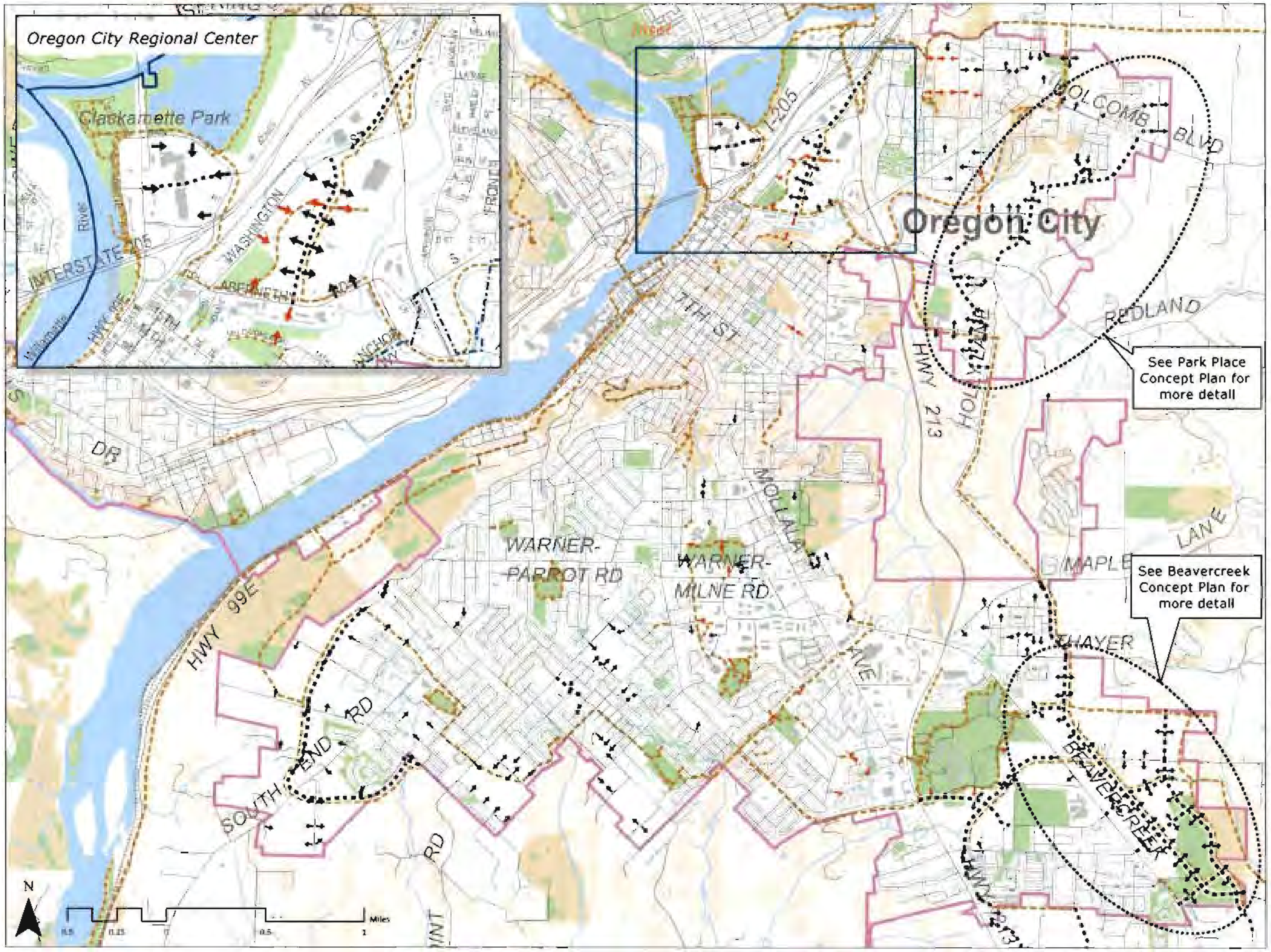
Narrowing travel lanes and providing visual cues such as placing buildings, street trees, on-street parking, and landscaping next to the street also create a sense of enclosure that prompts drivers to reduce vehicle speeds.

Multi-Modal Connectivity

The aggregate effect of local street design impacts the effectiveness of the regional system when local travel is restricted by a lack of connecting routes, and local trips are forced onto the regional network.[1] Therefore, streets should be designed to keep through motor vehicle trips on arterial streets and provide local trips with alternative routes. Street system connectivity is critical because roadway networks provide the backbone for bicycle and pedestrian travel in the region. Metro's local street connectivity principal encourages communities to develop a connected network of local streets to provide a high level of access, comfort, and convenience for bicyclists and walkers that travel to and among centers.

A multi-modal connectivity plan for Oregon City is shown in Figure 10. It specifies the general location where new streets or shared-use paths could potentially be installed as nearby areas are developed or as the opportunity arises. The purpose of the plan is to ensure that new developments accommodate circulation between adjacent neighborhoods to improve connectivity for all modes of transportation.

[1] Metro 2035 Regional Transportation Plan, Local Street Network Concept



OREGON CITY TRANSPORTATION PLAN

FIGURE 10

Multi-Modal Connectivity Plan

Legend

Street Connectivity

- Existing Street
- Planned Roadway Extension (Conceptual Alignment)
- Potential Street Extension

Trail Connectivity

- Existing Shared-Use Path
- Planned Shared-Use Path (Conceptual Alignment)
- Potential Trail Connection

- Steep Slope
- Building
- Stream
- River
- Park/Public Property
- Urban Growth Boundary
- Railroad

Mobility Standards

Establishing new mobility standards for streets and intersections in Oregon City will provide the City flexibility in the future with regards to how funds are allocated for intersection and roadway improvements. By allowing more flexibility in the mobility standards, the City will help encourage a sustainable transportation system (consistent with the TSP Update Goal 3) and will allow funds to be focused on higher priority multi-modal improvements rather than driving-focused improvements at locations that are operating below capacity but over the City standard.

In the past, streets were often designed to accommodate the traffic demand during a one-hour peak period without consideration given to the fact that they operated well below capacity for a majority of the day and to how wider streets and intersections may impact walking and biking. Having a mobility standard that encourages this is not sustainable, from a fiscal and environmental perspective. The new mobility standard will allow more congestion during the peak period of travel, but will also allow safer and more comfortable streets for multi-modal travel.

The following mobility standards are recommended for non-state owned streets in Oregon City. State owned streets should comply with the mobility targets included in the Oregon Highway Plan. However, for proposed development that is permitted, either conditionally, outright, or through detailed development master plan approval, the OR 99E/I-205 SB Ramps, OR 99E/I-205 NB Ramps, OR 213/Beavercreek Road, and I-205/OR 213 Interchange intersections shall be exempt from meeting the state mobility targets until further solutions (beyond those included in the TSP) or alternative mobility targets are explored for the intersections.

For streets located outside the Oregon City Regional Center, and not designated on the Arterial and Throughway Network in the Regional Transportation Plan, the following mobility standards should be applied:

Signalized intersections:

- During the highest one-hour period of the day (typically, but not always during the evening peak period between 4 and 6 p.m.): LOS "D" or better will be required for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of the critical movements.
- For the second hour (either the hour before or hour after the peak hour): LOS "D" or better will be required for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of the critical movements.

Unsignalized intersections:

- During the highest one-hour period of the day (typically, but not always during the evening peak period between 4 and 6 p.m.): All movements serving more than 20 vehicles shall be maintained at LOS "E" or better. LOS "F" will be tolerated at movements serving no more than 20 vehicles during the peak hour.

For streets located outside the Oregon City Regional Center, but designated on the Arterial and Throughway Network in the Regional Transportation Plan, the following mobility standards should be applied:

- During the highest one-hour period of the day (typically, but not always during the evening peak period between 4 and 6 p.m.): A maximum v/c ratio of 0.99 shall be maintained at all intersections. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to the worst movement.

- For the second hour (either the hour before or hour after the peak hour): A maximum v/c ratio of 0.99 shall be maintained at all intersections. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to the worst movement.

Since streets located in the Oregon City Regional Center should be designed to encourage walking, biking and transit usage, the following mobility standards should be applied:

- During the highest one-hour period of the day a maximum v/c ratio of 1.10 shall be maintained at all intersections. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to the worst movement.
- For the second hour (either the hour before or hour after the peak hour) a maximum v/c ratio of 0.99 shall be maintained at all intersections. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to the worst movement.

Truck Routes

Truck routes were designated in Oregon City to ensure trucks can efficiently travel through and access major destinations in the City. 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. ODOT has identified I-205 as a freight route through Oregon City. While OR 99E is not classified by ODOT as a freight route, it is designated as a truck route by the federal government.

Much of the freight activity in Oregon City is related to the employment land located near the southeast corner of the City along OR 213, Beavercreek Road and Molalla Avenue and within the Oregon City Regional Center. To allow for efficient movement between these designated areas and regional freight routes, Metro has classified several roadways in the City as freight connectors. The connector roadways link I-205 with the employment areas and include OR 213, Beavercreek Road and OR 99E. Oregon City will designate these streets as local truck routes to ensure freight is adequately accommodated in the City. The Oregon City truck routes can be seen in Figure 11.

OREGON CITY TRANSPORTATION PLAN

FIGURE 11

Truck Routes

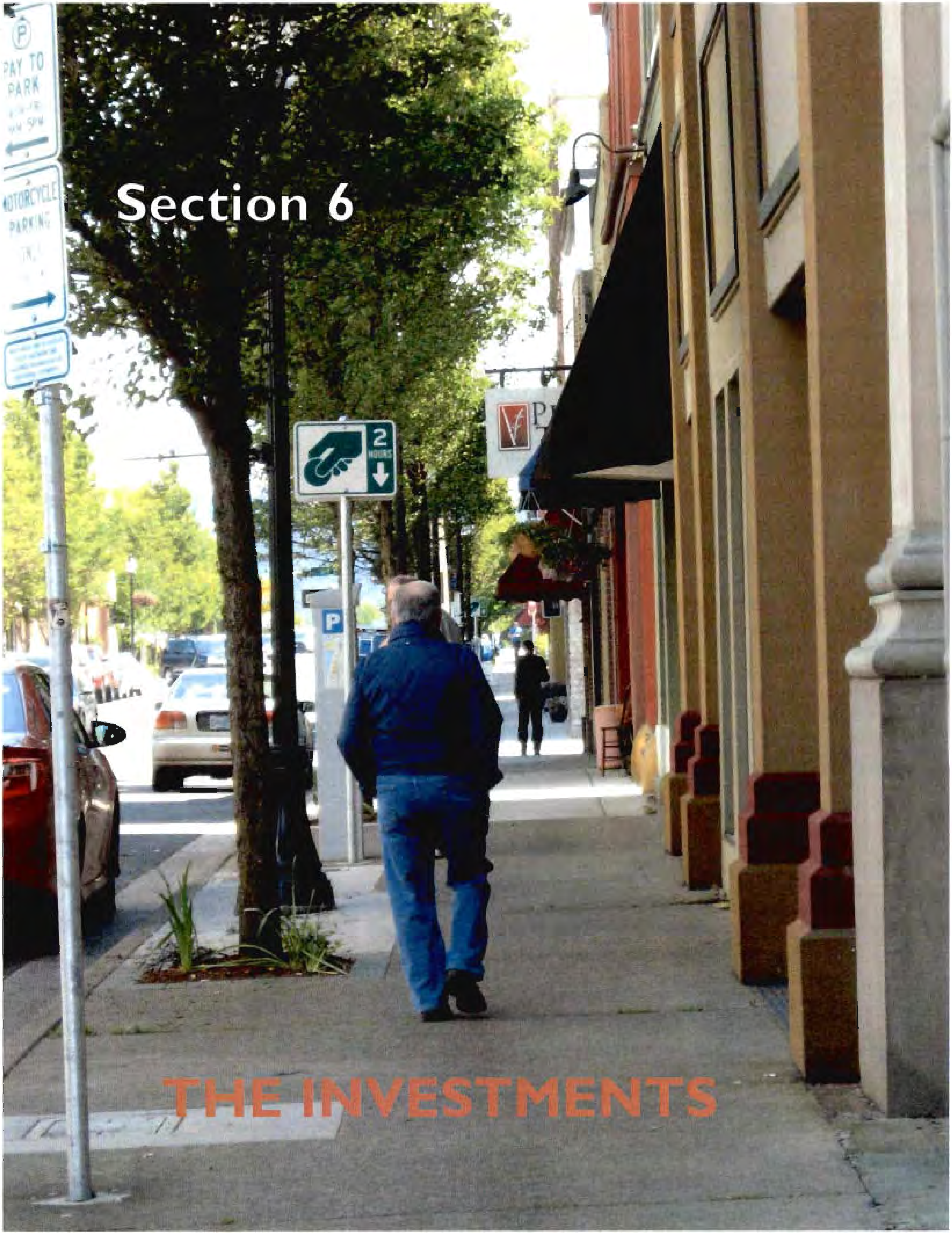
Legend

Truck Routes

- ODOT Freight Route
- Federal Truck Route
- Local Truck Route
- Planned Local Truck Route (Conceptual Alignment)

- River
- Parks and Open Spaces
- Planned Street (Conceptual Alignment)
- Railroad
- City Limit
- Urban Growth Boundary

Section 6



THE INVESTMENTS

the investments

The Oregon City approach to developing transportation solutions placed more value on investments in smaller cost-effective solutions for the transportation system rather than larger, more costly ones. The approach helped to encourage multiple travel options, increase street connectivity and promote a more sustainable transportation system.

Taking the network approach to transportation system improvements, the projects in this plan fall within one of several categories:

- **Driving** projects to improve connectivity, safety and capacity throughout the City. Oregon City identified 95 driving projects that will cost an estimated $162.3 million to complete.
- **Walking** projects for sidewalk infill, providing seamless connections for pedestrians throughout the City. Oregon City identified 75 walking projects that will cost an estimated $14.7 million to complete.
- **Biking** projects including an integrated network of bicycle lanes and marked on-street routes that facilitates convenient travel citywide. Oregon City identified 66 biking projects that will cost an estimated $5.3 million to complete.
- **Shared-Use Path** projects providing local and regional off-street travel for walkers and bikers. The citywide shared-use path vision includes 53 projects totaling an estimated $30.2 million.
- **Transit** projects to enhance the quality and convenience for passengers. Oregon City identified four transit projects that will cost an estimated $1.3 million to complete.
- **Family Friendly** projects to fill gaps between shared-use paths, parks, and schools, offering a network of low-volume streets for more comfortable biking and walking throughout the City. The 33 family-friendly routes identified by the City will cost an estimated $5.2 million to complete.
- **Crossing** project solutions, proving safe travel across streets along key biking and walking routes. A total of

36 crossing projects were identified, totaling an estimated $2.8 million.

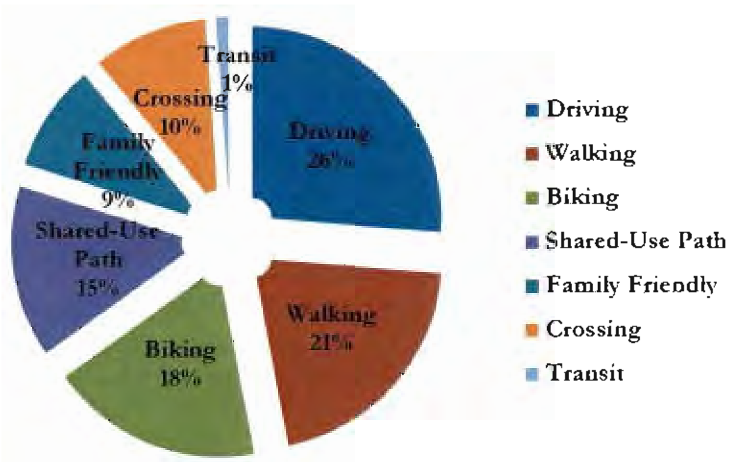
Overall, Oregon City identified 362 transportation solutions, totaling an estimated $222 million worth of investments. As shown in Fignre 12, only about 25 percent of the improvements in the Plan are driving projects, yet these projects account for nearly 75 percent of the total project expenses of the Plan.

Identifying Transportation System Investments

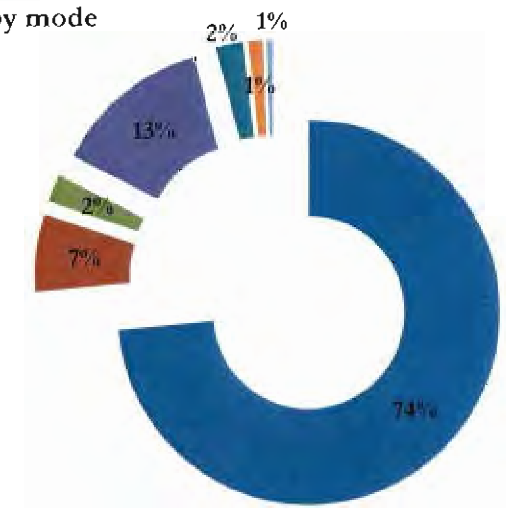
The Oregon City approach placed more value on investments in smaller cost-effective solutions for the transportation system rather than larger, more costly ones where practical. The approach identified solutions to accommodate future travel demand by following a five-step process (shown previously in Figure 3).

See Section 3 of this Plan for more information.

Figure 12: Breakdown of the Projects and Expenses in the Plan

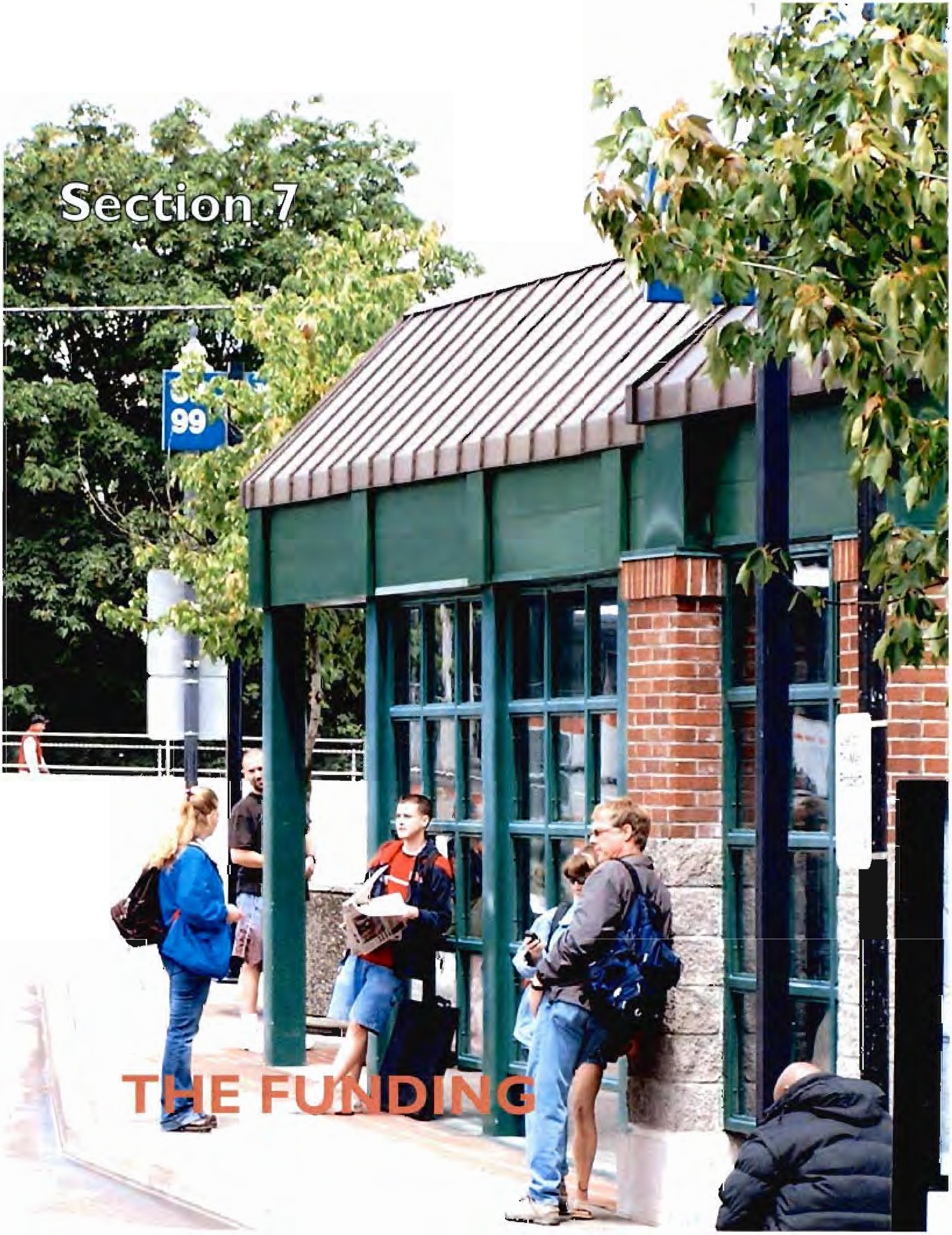


Projects in the TSP by mode



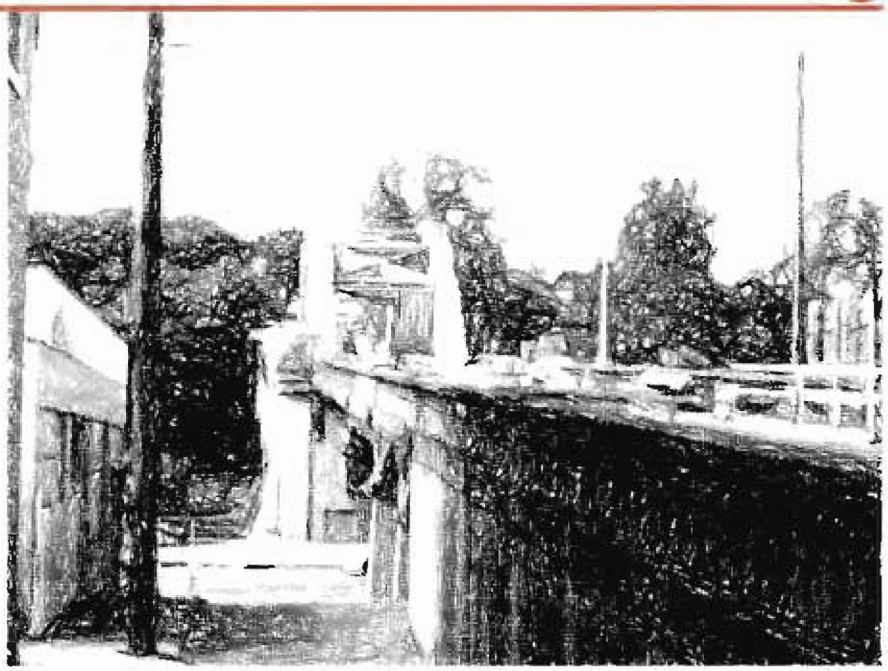
Project expenses in the TSP by mode

Section 7



THE FUNDING

the funding



With an estimated $222 million worth of transportation solutions identified, Oregon City must make investment decisions to develop a set of transportation improvements that will likely be funded to meet identified needs through 2035. Overall, Oregon City is expected to have the following funds available through 2035 after accounting for the expenditures (see Figure 13):

- Approximately $14.7 million is expected to be available for capital improvement needs after street operation and maintenance needs are met through 2035. These funds can be spent on non-SDC eligible project costs or other street improvements that are related to maintenance such as upgraded retaining walls and stairways, new guardrail, signal equipment replacement and upgrades, or curb and gutter.
- Over $109 million is expected to be available for System Development Charge (SDC) projects after reducing the planned SDC project expenditures through 2035. This includes about $2 million for pedestrian and bicycle SDC projects and over $107 million for street SDC projects. The improvement projects eligible for SDC funding may be continuously updated. It was assumed that the needed transportation system investments identified through the TSP update would be used to amend the existing SDC project list.

Figure 13: Expected Funding for the Plan

Funding Shortfall

Over $162 million worth of motor vehicle, over $50 million worth of pedestrian, bicycle and shared-use path improvements and $9 million worth of transit, street crossing and family-friendly route projects were identified by the City. Of those project costs (as shown in Figure 14), approximately $100 million of the motor vehicle and $23 million of the pedestrian, bicycle and shared-use path project costs are needed to accommodate new development, and therefore are eligible for SDC funding. This leaves about $63 million in motor vehicle and $27 million in pedestrian, bicycle and shared-use path project costs to serve existing transportation deficiencies. These project costs, in addition to the transit, street crossing and family-friendly route project costs, are not eligible to utilize SDC funds and must be funded through other means, such as the Street Fund or other State or Federal grants.

Unless additional funds are developed, Oregon City will be expected to have a little over $14.7 million (from the Street Fund) to cover the $63 million in motor vehicle, $27 million in pedestrian, bicycle and shared-use path, and $9 million in transit, street crossing and family-friendly route project costs that are not eligible for SDC funds (based on the current revenue and expenditure forecasts). In other words, about $84.3 million worth of projects would be unfunded.

Figure 14: Eligibility of Plan Investments for SDC Funding

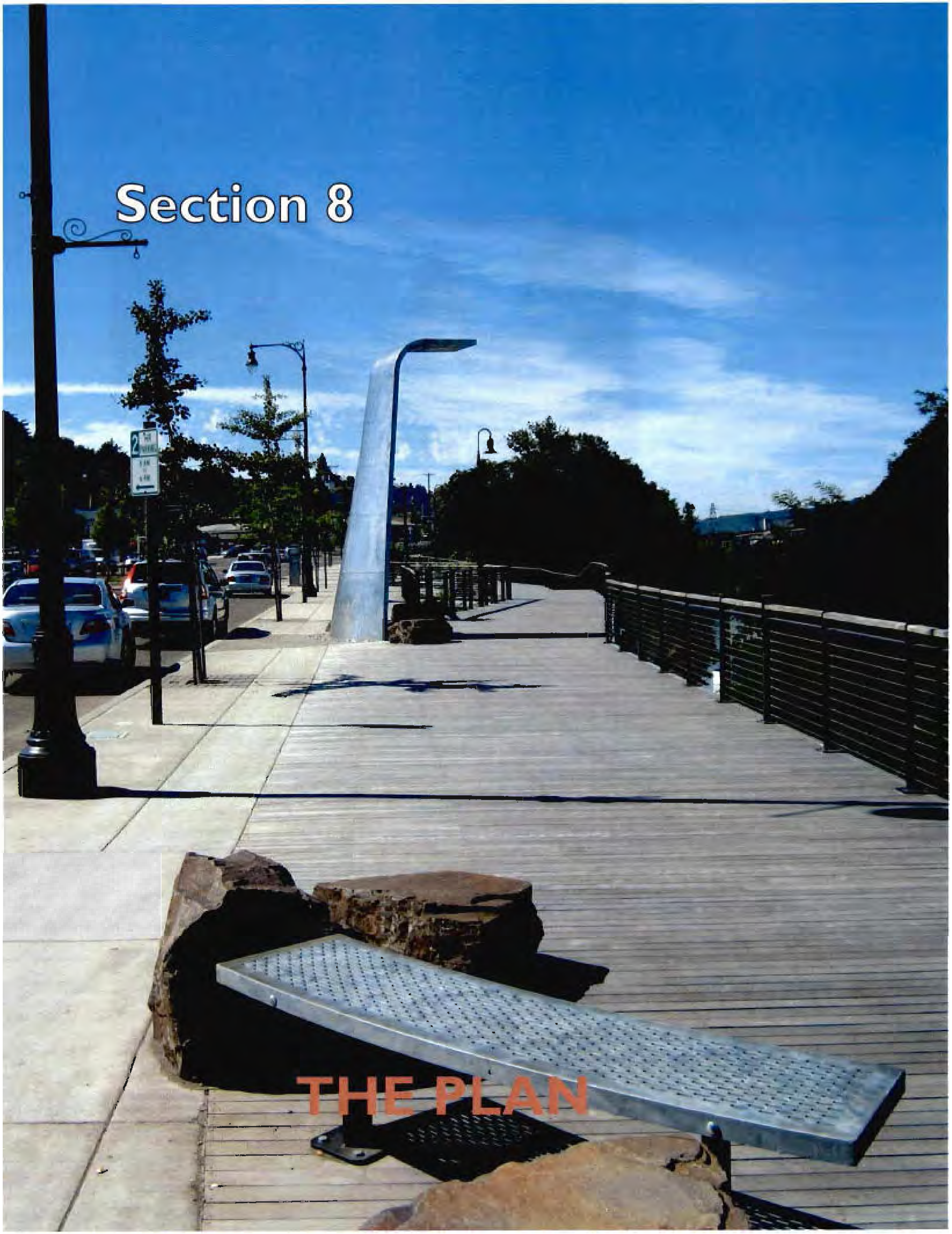
Funding Shortfall for Transportation System Investments

The total cost of transportation system projects needed is greater than the City's ability to raise funding.

Unless additional funds are developed, Oregon City will be expected to have $84.3 million worth of unfunded projects.

For more detailed funding information, see the TSP Volume 2, Section H.

Section 8



THE PLAN

the plan

As detailed in the Funding section, the City is expected to have approximately $14.7 million to cover the $99 million in project costs that are not eligible for SDC funds. Clearly, most of the transportation solutions identified for the City are not reasonably likely to be funded through 2035. For this reason, the transportation solutions were divided into two categories. Those reasonably expected to be funded by 2035 were included in the Likely to be Funded Transportation System, while the projects that are not expected to be funded by 2035 were included in the Not Likely to be Funded Transportation System.

Determining the investments that made the Likely to be Funded Plan

Using the eight goals (see Section 2), the transportation solutions were evaluated and compared to one another. Greater value was placed on the projects stakeholders felt were most important to the community.

Each transportation solution was assigned a time frame for the expected investment need, based on a projects contribution to achieving the transportation goals of Oregon City. The investment recommendations attempted to balance implementation considerations. Complex and costly capital projects were disfavored compared with implementation of low cost projects that can have more immediate impacts and can spread investment benefits citywide.

Project evaluation scores can be found in Table A1 of the TSP Volume 2, Section I.

Likely to be Funded Transportation System

The Likely to be Funded Plan identifies the transportation solutions reasonably expected to be funded by 2035 and have the highest priority for implementation. Transportation solutions within the Likely to be Funded Transportation System were recommended within several different priority/time horizons:

- Short-term: projects recommended for implementation in within 1 to 5 years.
- Medium-term: projects recommended for implementation in within 5 to 10 years.
- Long-term: projects likely to be implemented beyond 10 years from the adoption of this plan. These projects are important for the development of the City transportation network, but are unlikely to be funded in the next 10 years.

The Likely to be Funded Transportation solutions are summarized in Table 2 and illustrated in Figures 16 to 21. The projects numbered on Figures 16 to 21 correspond with the project numbers in Table 2. The project numbers are denoted as follows:

- Driving ("D")
- Walking ("W")
- Biking ("B")
- Shared-use path ("S")
- Transit ("T")
- Street crossing ("C")
- Family-Friendly route ("FF")

Planning level cost estimates for the projects can be found in Table A1 of the TSP Volume 2, Section I.

Over $73 million worth of investments are included in the Likely to be Funded Transportation System. As shown in Figure 15, about 80 percent (or $58.6 million) of these investments were eligible to utilize SDC funding. All expected City revenue for non-SDC eligible expenses (about $14.7 million) will be needed to fund the remaining 20 percent of the Likely to be Funded Transportation System investments.

The Likely to be Funded Transportation System includes over $73 million worth of investments.

Figure 15: Funding for the Likely to be Funded Transportation System

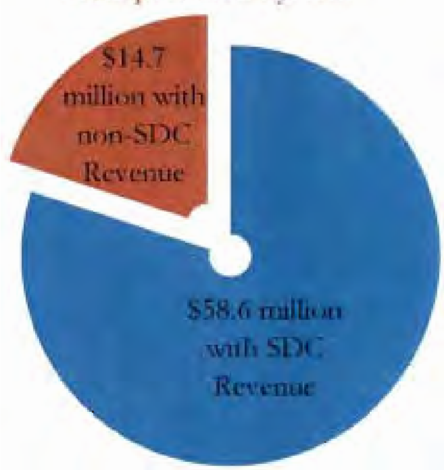


Table 2: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
Further Study				
D0	OR 213/Beavercreek Road Refinement Plan	OR 213 from Redland Road to Molalla Avenue	Identify and evaluate circulation options to reduce motor vehicle congestion along the corridor. Explore alternative mobility targets.	Short-term
D00	I-205 Refinement Plan	I-205 at the OR 99E and OR 213 Ramp Terminals	Identify and evaluate circulation options to reduce motor vehicle congestion at the interchanges. Explore alternative mobility targets, and consider impacts related to a potential MMA Designation for the Oregon City Regional Center.	Short-term
Driving Solutions (Intersection and Street Management- see Figure 16)				
D1	Molalla Avenue/ Beavercreek Road Adaptive Signal Timing	Molalla Avenue from Washington Street to Gaffney Lane; Beavercreek Road from Molalla Avenue to Maple Lane Road	Deploy adaptive signal timing that adjusts signal timings to match real-time traffic conditions.	Short-term
D7	Option 1: 14th Street Restriping	Option 1: OR 99E to John Adams Street	**Option 1:** Convert 14th Street to one-way eastbound between McLoughlin Boulevard and John Adams Street: • Convert the Main Street/14th Street intersection to all-way stop control (per project D13). • From McLoughlin Boulevard to Main Street, 14th Street would be restriped to include two 12-foot eastbound travel lanes, a six-foot eastbound bike lane, a six-foot westbound contra-flow bike lane, and an eight-foot landscaping buffer on the north side • From Main Street to Washington Street, 14th Street would be restriped to include two 11-foot eastbound travel lanes, a five-foot eastbound bike lane, a five-foot westbound contra-flow bike lane, and an eight-foot on-street parking lane on the north side • From Washington Street to John Adams Street, 14th Street would be restriped to include one 12-foot eastbound travel lane, a six-foot eastbound bike lane, a six-foot westbound contra-flow bike lane, and an eight-foot on-street parking lane on the north and south side • Add a bicycle signal, with detection at the McLoughlin Boulevard/14th Street intersection. Add bicycle detection to the traffic signal at the Washington Street/14th Street intersection.	Short-term

Table 2: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
	Option 2: Main Street/14th Street Intersection Widening	Option 2: Main Street/14th Street	**Option 2:** Convert the Main Street/14th Street intersection to all-way stop control (per project D13). Widen 14th Street to include shared through/left-turn and through/right-turn lanes in both directions	
D8	15th Street Restriping	OR 99E to John Adams Street	Convert 15th Street to one-way westbound between Washington Street and McLoughlin Boulevard: • From John Adams Street to Washington Street, 15th Street would be striped as a shared-roadway (per project B6). • From Washington Street to Main Street, 15th Street would be restriped to include two 11-foot westbound travel lanes, a five-foot westbound bike lane, a five-foot eastbound contra-flow bike lane, and an eight-foot on-street parking lane on the south side. Complete the sidewalk gaps on the north side of 15th Street between Main Street and Center Street, and on the south side between Center Street and Washington Street (per project W75). • From Main Street to McLoughlin Boulevard, 15th Street would be restriped to include two 12-foot travel lanes, a six-foot westbound bike lane, and an eight-foot on-street parking lane on the south side. Add a 12-foot shared-use path with a two-foot buffer adjacent to the on-street parking lane. Add bicycle detection to the traffic signal at the Washington Street/15th Street intersection.	Included with project D7
D11	Optimize existing traffic signals	Citywide	Optimize the existing traffic signals by updating the existing coordinated signal timing plans, upgrading traffic signal controllers or communication infrastructure or cabinets.	Short-term
D12	Protected/permitted signal phasing	Citywide	Incorporate protected/permitted phasing for left turn movements at traffic signals.	Short-term
D13	Main Street/14th Street Safety Enhancement	Main Street/14th Street	Convert to all-way stop control to be consistent with the traffic control at surrounding intersections on Main Street.	Included with project D7
D14	Southbound OR 213 Advanced Warning System	Southbound OR 213, north of the Beavercreek Road intersection	Install a queue warning system for southbound drivers on OR 213 to automatically detect queues and warn motorists in advance via a Variable Message Sign	Short-term
D27	OR 213/Beavercreek Road Operational Enhancement	OR 213/Beavercreek Road	Lengthen the dual left-turn lanes along Beavercreek Road to provide an additional 200 feet of storage for the eastbound	Short-term

Table 2: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
			approach	
D28	Washington Street/12th Street Safety Enhancement	Washington Street/12th Street	Install a traffic signal with dedicated left turn lanes for the 12th Street approaches to Washington Street.	Medium-term
D30	Molalla Avenue/Division Street-Taylor Street Safety Enhancement	Molalla Avenue/Division Street-Taylor Street	Install a single-lane roundabout	Medium-term
D32	South End Road/Warner Parrott Road Operational Enhancement	South End Road/Warner Parrott Road	Install a traffic signal with dedicated left turn lanes for the South End Road approaches to Warner Parrott Road	Medium-term
D33	South End Road/Lafayette Avenue-Partlow Road Operational Enhancement	South End Road/Lafayette Avenue-Partlow Road	Install a single-lane roundabout	Medium-term
D40	Main Street/Dunes Drive Extension Operational Enhancement	Main Street/Dunes Drive Extension	Install a single-lane roundabout	Long-term
D41	South End Road/Buetel Road Extension Operational Enhancement	South End Road/Buetel Road Extension	Install a single-lane roundabout	Medium-term
D42	South End Road/Deer Lane Extension Operational Enhancement	South End Road/Deer Lane Extension	Install a single-lane roundabout	Long-term
D43	Holcomb Boulevard/Holly Lane North Extension Operational Enhancement	Holcomb Boulevard/Holly Lane North Extension	Install a single-lane roundabout	Long-term
D44	Beavercreek Road/Loder Road Extension Operational Enhancement	Beavercreek Road/Loder Road Extension	Install a roundabout	Medium-term
D45	Meyers Road Extension/ Loder Road Extension Operational Enhancement	Meyers Road Extension/ Loder Road Extension	Install a single-lane roundabout	Medium-term
Driving Solutions (Street Extensions- see Figure 17)				
D46	Meyers Road West extension	OR 213 to High School Avenue	Extend Meyers Road from OR 213 to High School Avenue as an Industrial Minor Arterial. Create a local street connection to Douglas Loop.	Short-term
D47	Meyers Road East extension	Beavercreek Road to the Meadow Lane Extension	Extend Meyers Road from Beavercreek Road to the Meadow Lane Extension as an Industrial Minor Arterial. Between the Holly Lane and Meadow Lane extensions, add a sidewalk and bike lane to the south side of the street, with a shared-use path to be added on north side per project S19. Modify the existing traffic signal at Beavercreek Road	Medium-term
D48	Holly Lane North extension	Redland Road to Holcomb Boulevard	Extend Holly Lane from Redland Road to Holcomb Boulevard as a Residential Minor Arterial. Create local street	Long-term

Table 2: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
			connections to Cattle Drive and Journey Drive.	
D49	Swan Avenue extension	Livesay Road to Redland Road	Extend Swan Avenue from Livesay Road to Redland Road as an Residential Collector	Long-term
D50		Redland Road to Morton Road	Extend Swan Avenue from Redland Road to Morton Road as an Residential Collector	Long-term
D51	Deer Lane extension	Rose Road to Buetel Road	Extend Deer Lane from Rose Road to Buetel Road as a Residential Collector. Add a sidewalk and bike lane to the east side of the street, with a shared-use path to be added on west side per project S32.	Long-term
D52		Buetel Road to Parrish Road	Extend Deer Lane from Buetel Road to Parrish Lane as a Residential Collector. Add a sidewalk and bike lane to the east/north side of the street, with a shared-use path to be added on west/south side per project S33. Create a local street connection to Finnegans Way Install a roundabout at South End Road (per project D42).	Long-term
D53	Madrona Drive extension	Madrona Drive to Deer Lane	Extend Madrona Drive to Deer Lane as a Constrained Residential Collector	Long-term
D54	Clairmont Drive extension	Beavercreek Road to Holly Lane South Extension	Extend Clairmont Drive from Beavercreek Road to the Holly Lane South extension as an Industrial Collector. Add a sidewalk and bike lane to the south side of the street, with a shared-use path to be added on north side per project S17.	Long-term
D55	Glen Oak Road extension	Beavercreek Road to the Meadow Lane Extension	Extend Glen Oak Road from Beavercreek Road to the Meadow Lane Extension as a Residential Collector. Install a roundabout at Beavercreek Road (per project D39)	Long-term
D56	Timbersky Way extension	Beavercreek Road to the Meadow Lane Extension	Extend Timbersky Way from Beavercreek Road to the Meadow Lane Extension as a Residential Collector. Add a sidewalk and bike lane to the south side of the street, with a shared-use path to be added on north side per project S20.	Long-term
D57	Holly Lane South extension	Maple Lane Road to Thayer Road	Extend Holly Lane from Maple Lane Road to Thayer Road as a Residential Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S14. Install a roundabout at Maple Lane Road (per project D37).	Medium-term

Table 2: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
D58		Thayer Road to Meyers Road	Extend Holly Lane from Thayer Road to the Meyers Road extension as an Industrial Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S15.	Medium-term
D59		Meyers Road to the Meadow Lane Extension	Extend Holly Lane from the Meyers Road extension to the Meadow Lane Extension as a Mixed-Use Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S16.	Long-term
D60	Meadow Lane extension	Meadow Lane to Meyers Road	Extend Meadow Lane to the Meyers Road Extension as a Mixed-Use Collector. Between Old Acres Lane and the Glen Oak Road extension, add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S21.	Long-term
D61		Meyers Road to UGB (north of Loder Road)	Extend Meadow Lane from the Meyers Road Extension to the UGB (north of Loder Road) as an Industrial Collector	Medium-term
D62	Dunes Drive Extension	OR 99E to Agnes Avenue	Extend Dunes Drive from OR 99E to Agnes Avenue as a Mixed-Use Collector. Install a roundabout at the Dunes Drive/Agnes Avenue intersection (per project D40). Will require redevelopment of the Oregon City Shopping Center.	Medium-term
D63	Washington Street to Abernethy Road Connection	Washington Street to Abernethy Road	Connect Washington Street to Abernethy Road with a Mixed-Use Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S5. This street should be a public access road built to City standards but maintained by a private entity.	Long-term
D64	Loder Road Extension	Beavercreek Road to Glen Oak Road	Extend Loder Road from Beavercreek Road to Glen Oak Road as an Industrial Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S18. Create a local street connection to Douglas Loop. Install a roundabout at Meyers Road (per project D45).	Short-term
D65	Parrish Road Extension	From Parrish Road east to Kolar Drive	Complete the gap between Parrish Road as a Constrained Residential Collector.	Long-term
D66	Washington Street Realignment	Home Depot Driveway to Clackamas River	Washington Street Realignment associated with the OR	Under

Table 2: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
		Drive	213/Washington Street Jug-handle Project.	Construction
D72	Hampton Drive Extension	Hampton Drive to Atlanta Drive	Extend Hampton Drive to Atlanta Drive as a Residential Local Street.	Long-term
Driving Solutions (Street and Intersection Expansions- see Figure 18)				
D73	McLoughlin Boulevard Improvements - Phase 2	Dunes Drive to Clackamas River Bridge	Boulevard and gateway improvements, including pedestrian and bicycle facilities. Access management improvements just north of the I-205 southbound ramps.	Under Construction
D80	Division Street Upgrade	7th Street to 18th Street	Improve to Collector cross-section, as a constrained street	Long-term
D81	Beavercreek Road Upgrade	Clairmont Drive (CCC Entrance) to Meyers Road	Improve to Industrial Major Arterial cross-section	Medium-term
D82		Meyers Road to UGB	Improve to Residential Major Arterial cross-section	Long-term
D89	South End Road Upgrade	Partlow Road-Lafayette Road to UGB	Improve to Residential Minor Arterial cross-section	Medium-term
D92	Washington Street Upgrade	11th Street to 7th Street	Improve to Minor Arterial cross-section, as a constrained street. Add curb-ramps at intersections	Medium-term
Walking Solutions (see Figure 19)				
W5	Washington Street Sidewalk Infill	Washington Street-Abernethy Road Extension to Abernethy Road	Complete sidewalk gaps on both sides of the street	Short-term
W11	Holcomb Boulevard (East of OR 213) Sidewalk Infill	OR 213 overcrossing to Swan Avenue	Complete sidewalk gaps on both sides of the street	Medium-term
W12		Longview Way to Winston Drive	Complete sidewalk gaps on both sides of the street	Medium-term
W13		Barlow Drive to UGB	Complete sidewalk gaps on both sides of the street	Medium-term
W34	Molalla Avenue Sidewalk Infill	Gaffney Lane to Sebastian Way	Complete sidewalk gaps on both sides of the street	Included with project W74
W35	Leland Road Sidewalk Infill	Warner Milne Road to Meyers Road	Complete sidewalk gaps on both sides of the street	Short-term
W41	Warner Milne Road Sidewalk Infill	Leland Road to west of Molalla Avenue	Complete sidewalk gaps on both sides of the street	Short-term
W42	Beavercreek Road Sidewalk Infill	Warner Milne Road to east of Kaen Road	Complete sidewalk gaps on the east side of the street	Short-term
W47	South End Road (south of Partlow) Sidewalk Infill	Partlow Road to Buetel Road	Complete sidewalk gaps on both sides of the street	Included with project D89
W48		Buetel Road to UGB	Complete sidewalk gaps on both sides of the street	Included with project D89
W54	South End Road (north of Partlow) Sidewalk Infill	Partlow Road to Barker Avenue	Complete sidewalk gaps on both sides of the street	Short-term
W56	Warner Parrott Road Sidewalk Infill	King Road to Marshall Street	Complete sidewalk gaps on the north side of the street	Short-term

Table 2: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
W62	Linn Avenue Sidewalk Infill	Ella Street to Charman Avenue	Complete sidewalk gaps on both sides of the street	Short-term
W64	Brighton Avenue-Creed Street Sidewalk Infill	Charman Avenue to Waterboard Park Road	Complete sidewalk gaps on both sides of the street	Short-term
W65	Brighton Avenue-Park Drive Sidewalk Infill	Charman Avenue to Linn Avenue	Complete sidewalk gaps on both sides of the street	Short-term
W70	Division Street Sidewalk Infill	7th Street to 18th Street	Complete sidewalk gaps on both sides of the street	Included with project D80
W73	Molalla Avenue Streetscape Improvements Phase 3	Holmes Lane to Warner Milne Road	Streetscape improvements including widening sidewalks, sidewalk infill, ADA accessibility, bike lanes, reconfigure travel lanes, add bus stop amenities.	Medium-term
W74	Molalla Avenue Streetscape Improvements Phase 4	Beavercreek Road to OR 213	Streetscape improvements including widening sidewalks, sidewalk infill, ADA accessibility, bike lanes, reconfigure travel lanes, add bus stop amenities.	Medium-term
W75	15th Street Sidewalk Infill	OR 99E to Washington Street	Complete sidewalk gaps on both sides of the street, with a shared-use path to be added on south side between OR 99E and Main Street per project S53.	Included with project D8
Biking Solutions (see Figure 20)				
B1	7th Street Shared Roadway	OR 43 Bridge to Railroad Avenue	Add wayfinding and shared lane markings	Short-term
B2	Railroad Avenue-9th Street Shared Roadway	OR 99E to Main Street	Add wayfinding and shared lane markings	Short-term
B3	Main Street Shared Roadway	OR 99E to 15th Street	Add wayfinding and shared lane markings	Short-term
B5	12th Street (west of Washington Street) Shared Roadway	OR 99E to Washington Street	Add wayfinding and shared lane markings	Short-term
B6	15th Street (west of John Adams) Shared Roadway	Washington Street to John Adams Street	Add wayfinding and shared lane markings	Included with project D8
B12	Holcomb Boulevard (East of OR 213) Bike Lanes	Longview Way to UGB	Add bike lanes to both sides of the street	Medium-term
B29	Beavercreek Road Bike Lanes	Pebble Beach Drive to UGB	Add bike lanes to both sides of the street	Included with project D82
B32	Fir Street Bike Lanes	Molalla Avenue to 1,500 feet east	Add bike lanes to both sides of the street	Medium-term
B33	Leland Road Bike Lanes	Marysville Lane to Meyers Road	Add bike lanes to both sides of the street	Medium-term
B35	Meyers Road Bike Lanes	Leland Road to Autumn Lane	Add bike lanes to both sides of the street	Medium-term

Table 2: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
B37	Molalla Avenue Bike Lanes	Gales Lane to Adrian Way	Complete bike lane gaps on both sides of the street	Included with project W73
B42	South End Road (south of Partlow) Bike Lanes	Buetel Road to UGB	Add bike lanes to both sides of the street	Included with project D89
B53	Holmes Lane Bike Lanes	Linn Avenue to Rilance Lane	Add bike lanes to both sides of the street	Medium-term
B55	Pearl Street Bike Lanes	Linn Avenue to Molalla Avenue	Add bike lanes to both sides of the street	Medium-term
B60	Division Street Bike Lanes	7th Street to 18th Street	Add bike lanes to both sides of the street	Included with project D80
B65	14th Street Bike Lanes	OR 99E to John Adams Street	Add an eastbound bike lane and a westbound contra-flow bike lane	Included with project D7
B66	15th Street Bike Lanes	OR 99E to Washington Street	Add a westbound bike lane and an eastbound contra-flow bike lane, with a shared-use path to be added on south side of 15th Street between OR 99E and Main Street per project S53.	Included with project D8
Shared-Use Path Solutions (see Figure 21)				
S14	Maple Lane-Thayer Shared-Use Path	Maple Lane Road to Thayer Road	Add a shared-use path on the east side of the Holly Lane extension between Maple Lane and Thayer.	Long-term
S15	Thayer-Loder Shared-Use Path	Thayer Road to Loder Road	Add a shared-use path on the east side of the Holly Lane extension between Thayer and Loder.	Long-term
S18	Loder Road Shared-Use Path	Glen Oak Road to Holly Lane Extension	Add a shared-use path on the south/east side of the Loder Road extension between Glen Oak Road and the Holly Lane extension.	Long-term
S24	Gaffney Lane Elementary Shared-Use Path	Eastborne Drive to Falcon Drive	Add a shared-use path along the northern boundary of Gaffney Lane Elementary School between the Eastborne Drive path and Falcon Drive	Long-term
S36	Tumwater-4th Shared-Use Path	Tumwater Drive to 4th Avenue	Add a shared-use path through Old Canemah Park connecting 4th Avenue to the Tumwater/South 2nd intersection	Long-term
S53	15th Street Shared-Use Path	OR 99E to Main Street	Add a shared-use path on the south side of 15th Street between OR 99E and Main Street.	Included with project D8
Transit Solutions				
T1	Molalla Avenue Transit Signal Priority	Washington Street to Gaffney Lane	Provide priority at traffic signals for buses behind schedule. This includes the use and deployment of Opticom detectors	Short-term

Table 2: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
			at traffic signals and emitters on buses.	
T2	OR 99E Transit Signal Priority	Dunes Drive to 10th Street		Short-term
T3	Bus Stop Amenity Enhancement	Citywide	Add amenities at bus stops as needed, including bus shelters, landing pads, benches, trash/recycling receptacles and lighting	Short-term
Street Crossing Solutions (see Figure 21)				
C11	Beavercreek Road/Loder Road Shared-Use Path Crossing	Beavercreek Road/Loder Road intersection	Install crosswalk and pedestrian activated flasher on Beavercreek Road	Long-term
C35	John Adams/7th Family Friendly Route Crossing	7th Street/John Adams Street intersection	Install crosswalk and pedestrian activated flasher on 7th Street	Long-term
Family-Friendly Routes (see Figure 19 or 20)				
FF13	Leland-Warner Parrot Family Friendly Route	Leland Road to Warner Parrot Road	Add sidewalks on both sides of the street. Add wayfinding, traffic calming and shared lane markings. Route via Hampton Drive, Atlanta Drive, Auburn Drive and Boynton Street. Includes Hampton Drive extension to Central Point Road	Long-term
FF19	Warner Parrot-Barker Family Friendly Route	Warner Parrot Road to Barker Avenue	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings. Route via Woodlawn Avenue and Woodfield Court.	Long-term
FF20	Barker Avenue Family Friendly Route	South End Road to Telford Road	Add sidewalks on both sides of the street. Add wayfinding, traffic calming and shared lane markings. Route via Barker Avenue	Long-term
FF23	Charman Avenue Family Friendly Route	Telford Road to Linn Avenue	Add sidewalks and bike lanes on both sides of the street. Add wayfinding and traffic calming	Long-term
Citywide and Programmatic Improvements				
N/A	Family Friendly Routes	Citywide	Program to systematically implement the Neighborhood Greenway network on a yearly basis	N/A
N/A	Sidewalk Infill Program	Citywide	Capital program to systematically design and construct missing sidewalks along prioritized pedestrian routes. Provide sidewalks on local, residential streets that lead to roadways with transit service.	N/A
N/A	Develop Bicycle and Pedestrian Design Guidelines	Citywide	Develop bicycle and pedestrian design guidelines that establish preferred designs that represent best practices. Key	N/A

Table 2: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
			treatments include pedestrian crossing design and bicycle accommodation at intersections (i.e. bike boxes, bicycle detection, etc.).	
N/A	ADA/Curb Ramp Upgrade Program	Citywide	Upgrade curb ramps and eliminate gaps in ADA access along prioritized pedestrian routes near key destinations.	N/A
N/A	Pedestrian Wayfinding Signage	Citywide	Pedestrian wayfinding tools can include signs and walking maps indicating walking routes to destinations and transit stops, as well as digital applications for smart phones.	N/A
N/A	Bicycle Parking Program	Citywide	Implement bicycle rack design and placement standards; review development applications for compliance; coordinate with sidewalk installation by developments or in city projects.	N/A
N/A	Bike Lane Re-striping Schedule	Citywide	Develop a bike lane re-striping schedule.	N/A
N/A	Bicycle Wayfinding Signage	Citywide	Implement a bicycle wayfinding signage program to assist bicyclists in choosing comfortable routes and to help visiting bicyclists navigate through the city.	N/A
N/A	Stop Here For Pedestrians signage	Citywide	Add Stop Here For Pedestrians signage at existing and new crosswalks. State standards require installation of a stop line in advance of the crosswalk to use this sign.	N/A
N/A	Bicycle/Pedestrian Connections to Transit	Citywide	Coordinate infrastructure upgrades near transit stops and park and rides to improve access and amenities targeted at increasing ridership.	N/A
N/A	Repaving policy	Citywide	Ensure repaving projects extend the full width of the road, including the full shoulder or bike lane.	N/A
N/A	Streetscape Enhancements	Citywide	Develop projects to create a pedestrian buffer zone on key pedestrian routes, including those that provide access to transit. Streets that would benefit from a buffer zone include Molalla Ave and Warner Milne Rd.	N/A
N/A	Safe Routes to Schools Curriculum	Citywide	Leverage ODOT Safe Routes Program with local investment to bring Safe Routes curriculum to all area K-8 schools.	N/A

Not Likely to be Funded Transportation System

The projects and actions outlined within the Likely to be Funded System will significantly improve Oregon City's transportation system. If the City is able to implement a majority of the Likely to be Funded System, nearly two decades from now Oregon City residents will have access to a safer, more balanced multimodal transportation network.

The Not Likely to be Funded Transportation System identifies those transportation solutions that are not reasonably expected to be funded by 2035, but many of which are critically important to the transportation system. Some of the projects will require funding and resources beyond what is available in the time frame of this plan. Others are contingent upon redevelopment that makes it possible to create currently missing infrastructure, such as street connections.

The Not Likely to be Funded Transportation System solutions are illustrated in Figures 16 to 21 and summarized in the TSP Volume 2, Section I. The project numbers are denoted as follows:

- Driving ("D")
- Walking ("W")
- Biking ("B")
- Shared-use path ("S")
- Transit ("T")
- Street crossing ("C")
- Family-Friendly route ("FF")

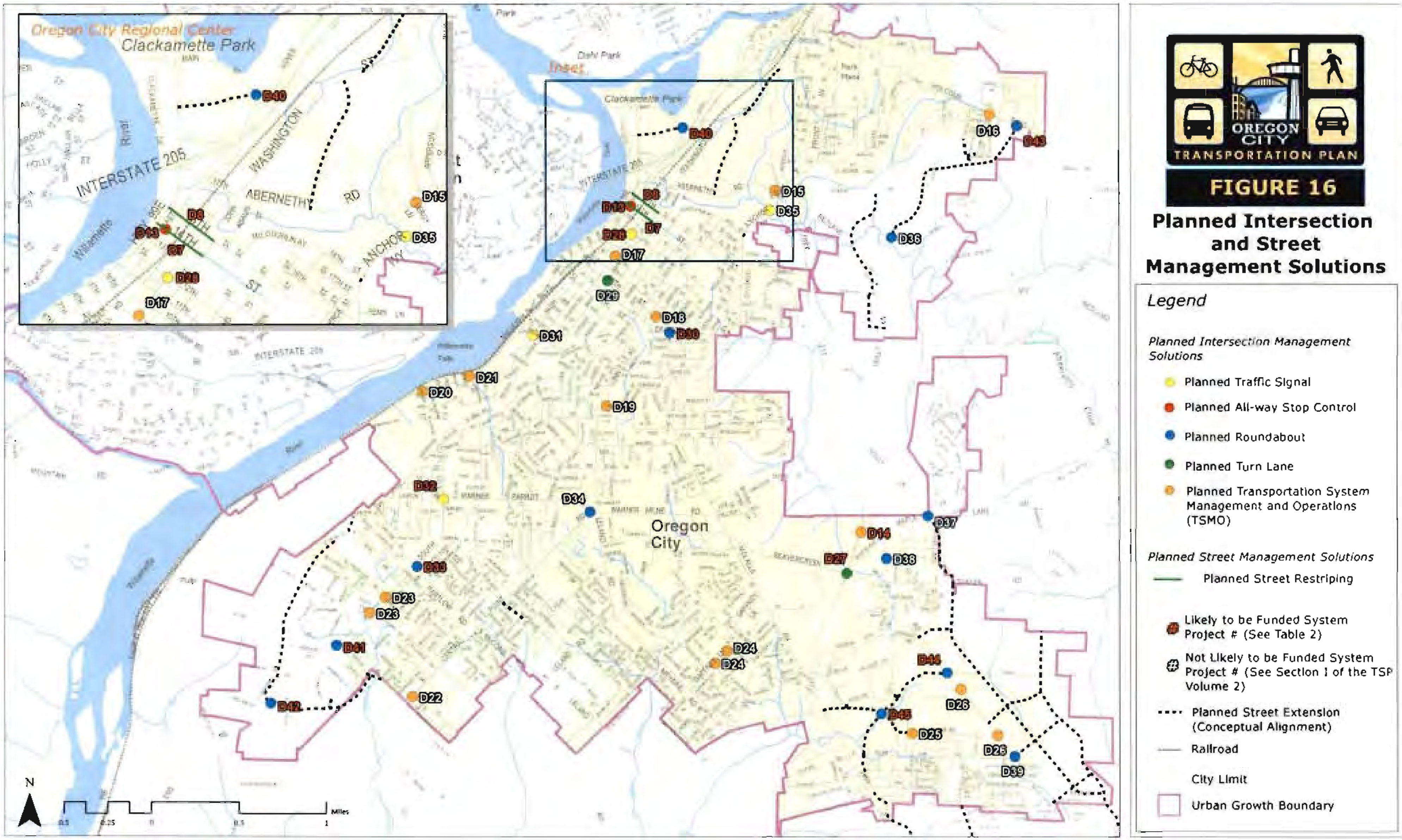
The Not Likely to be Funded Transportation System includes about $149 million worth of investments. Planning level cost estimates for the projects can be found in Table A1 of the TSP Volume 2, Section I.

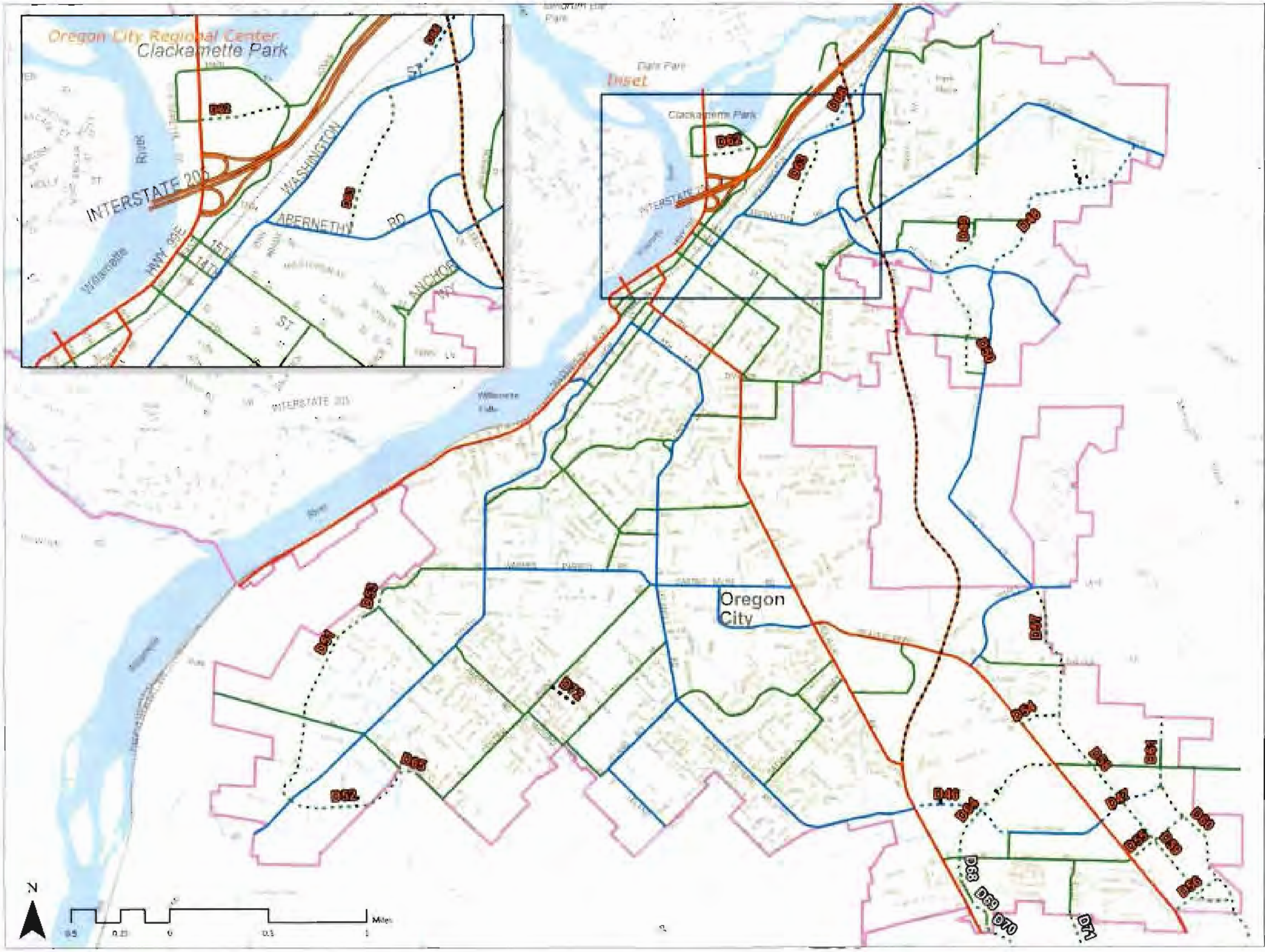
Transportation solutions within the Not Likely to be Funded Transportation System were recommended within several different priority/time horizons:

- Long-term Phase 2: Projects with the highest priority for implementation beyond the projects included in the Likely to be Funded Transportation System, should additional funding become available.
- Long-term Phase 3: Projects with the next highest priority for implementation beyond the projects included in the Likely to be Funded Transportation System, should additional funding become available.
- Long-term Phase 4: The last phase of projects to be implemented, should additional funding become available.

The Not Likely to be Funded Transportation System includes about $149 million worth of investments.

Detailed descriptions for investments included in the Not Likely to be Funded Transportation System can be found in Section I of the TSP Volume 2.


OREGON CITY
TRANSPORTATION PLAN
FIGURE 16
Planned Intersection and Street Management Solutions
Legend
Planned Intersection Management Solutions
Planned Traffic Signal
Planned All-way Stop Control
Planned Roundabout
Planned Turn Lane
Planned Transportation System Management and Operations (TSMO)
Planned Street Management Solutions
Planned Street Restriping
Likely to be Funded System Project # (See Table 2)
Not Likely to be Funded System Project # (See Section I of the TSP Volume 2)
Planned Street Extension (Conceptual Alignment)
Railroad
City Limit
Urban Growth Boundary
Oregon City Regional Center
Clackamette Park
Inset
Oregon City
INTERSTATE 205
ABERNETHY RD
WASHINGTON
Miles



OREGON CITY TRANSPORTATION PLAN

FIGURE 17

Planned Street Extensions

Legend

Existing Functional Classification

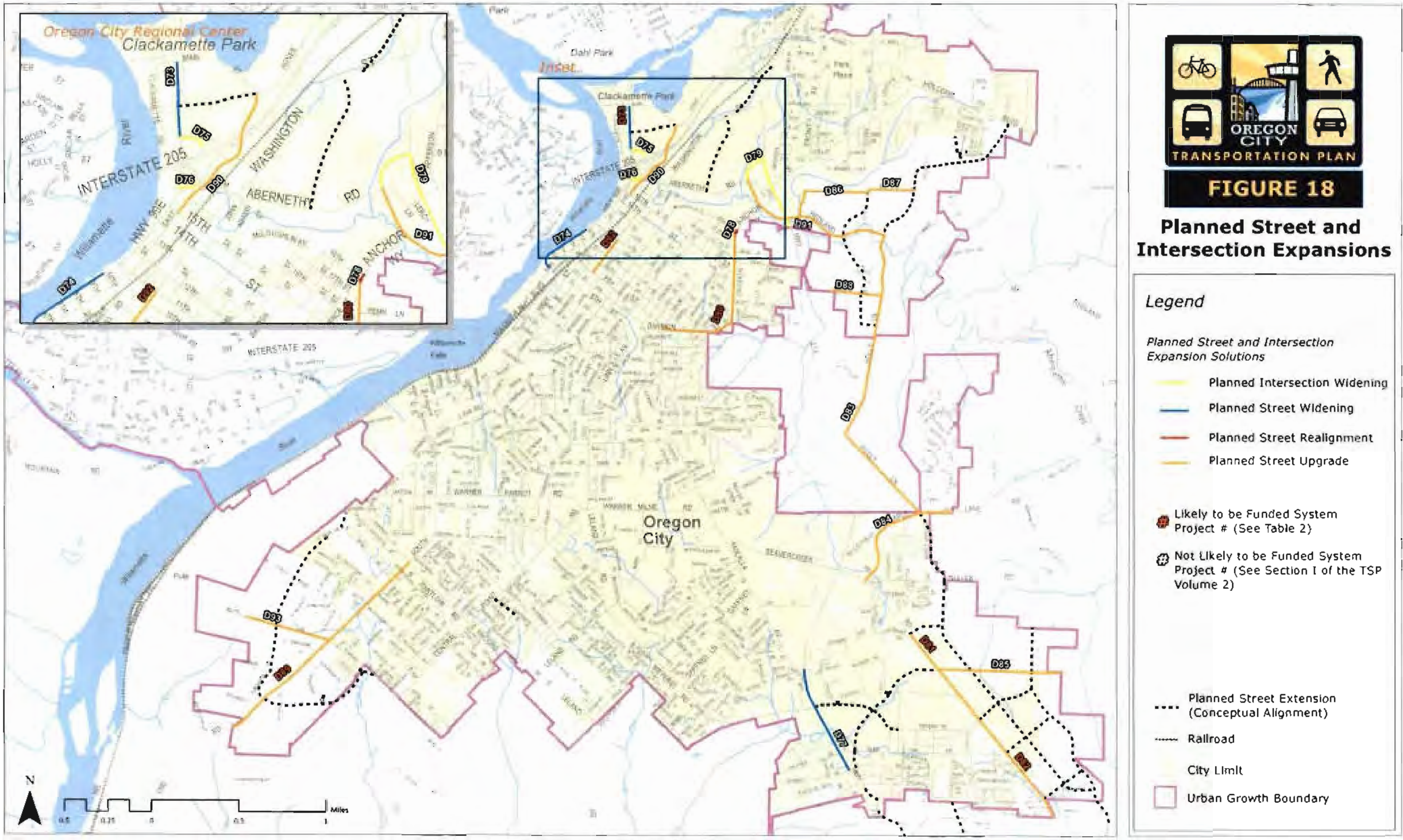
- Freeway
- Expressway
- Major Arterial
- Minor Arterial
- Collector
- Local Roadway

Planned Street Extensions (Conceptual Alignment)

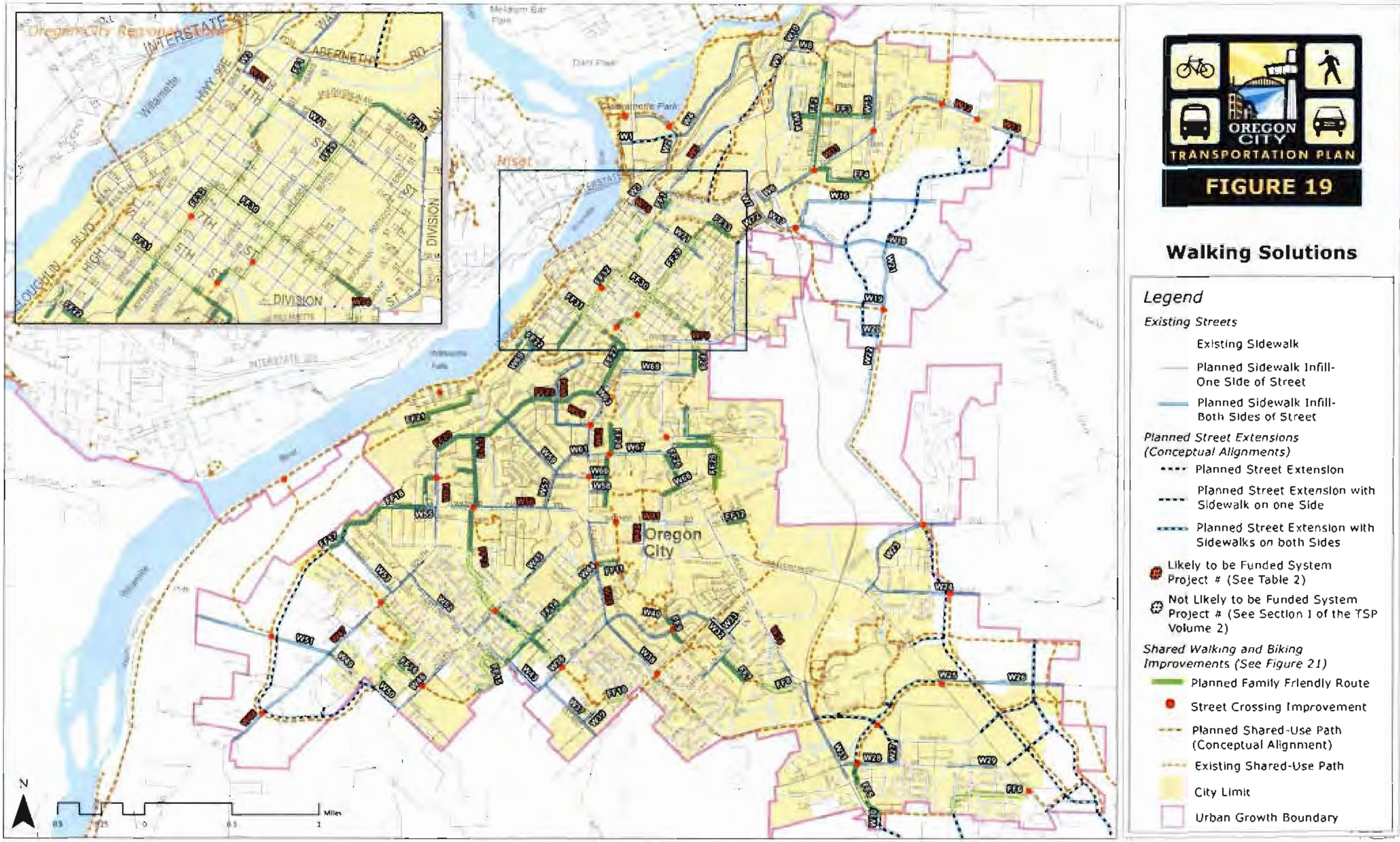
- Planned Minor Arterial
- Planned Collector
- Planned Local Street

- Likely to be Funded System Project # (See Table 2)
- Not Likely to be Funded System Project # (See Section I of the TSP Volume 2)

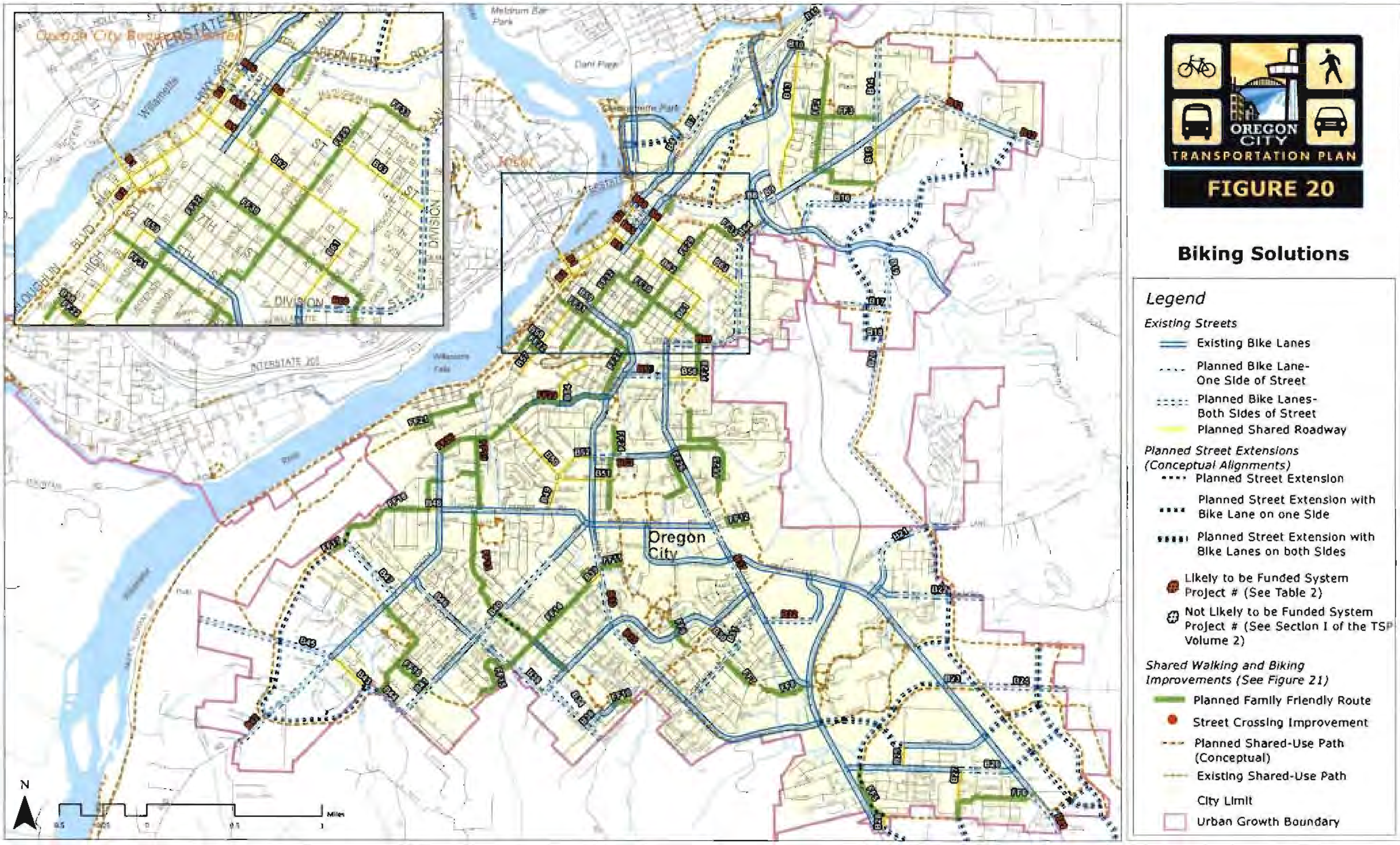
- Railroad
- City Limit
- Urban Growth Boundary



OREGON CITY
TRANSPORTATION PLAN
FIGURE 18
Planned Street and Intersection Expansions
Legend
Planned Street and Intersection Expansion Solutions
Planned Intersection Widening
Planned Street Widening
Planned Street Realignment
Planned Street Upgrade
Likely to be Funded System Project # (See Table 2)
Not Likely to be Funded System Project # (See Section I of the TSP Volume 2)
Planned Street Extension (Conceptual Alignment)
Railroad
City Limit
Urban Growth Boundary
Oregon City Regional Center
Clackamette Park
Inset
Oregon City
INTERSTATE 205
WASHINGTON
ABERNETHY
RD
Miles



OREGON CITY
TRANSPORTATION PLAN
FIGURE 19
Walking Solutions
Legend
Existing Streets
Existing Sidewalk
Planned Sidewalk Infill- One Side of Street
Planned Sidewalk Infill- Both Sides of Street
Planned Street Extensions (Conceptual Alignments)
Planned Street Extension
Planned Street Extension with Sidewalk on one Side
Planned Street Extension with Sidewalks on both Sides
Likely to be Funded System Project # (See Table 2)
Not Likely to be Funded System Project # (See Section I of the TSP Volume 2)
Shared Walking and Biking Improvements (See Figure 21)
Planned Family Friendly Route
Street Crossing Improvement
Planned Shared-Use Path (Conceptual Alignment)
Existing Shared-Use Path
City Limit
Urban Growth Boundary
Oregon City
Miles

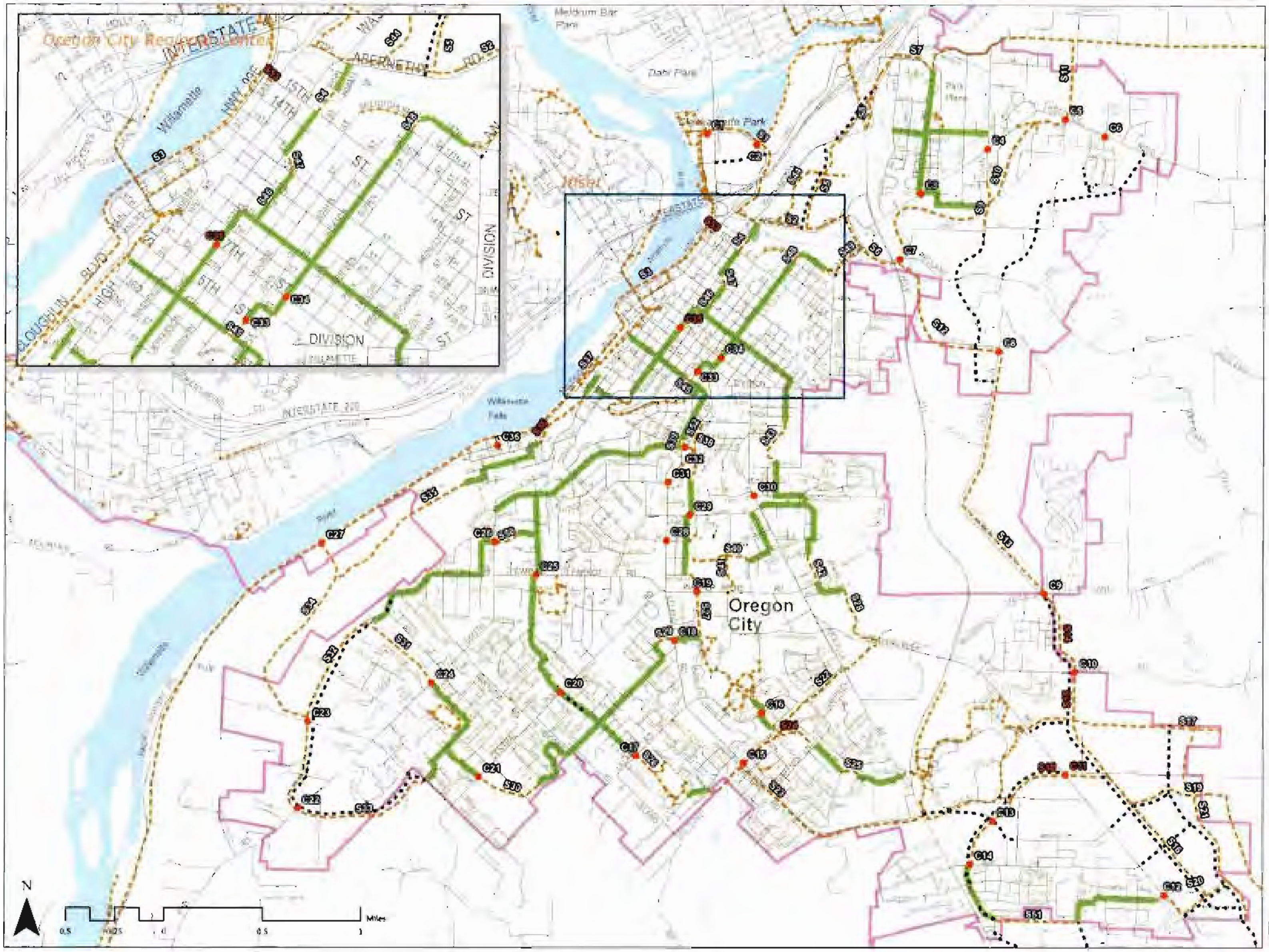


OREGON CITY
TRANSPORTATION PLAN
FIGURE 20
Biking Solutions
Legend
Existing Streets
Existing Bike Lanes
Planned Bike Lane- One Side of Street
Planned Bike Lanes- Both Sides of Street
Planned Shared Roadway
Planned Street Extensions (Conceptual Alignments)
Planned Street Extension
Planned Street Extension with Bike Lane on one Side
Planned Street Extension with Bike Lanes on both Sides
Likely to be Funded System Project # (See Table 2)
Not Likely to be Funded System Project # (See Section I of the TSP Volume 2)
Shared Walking and Biking Improvements (See Figure 21)
Planned Family Friendly Route
Street Crossing Improvement
Planned Shared-Use Path (Conceptual)
Existing Shared-Use Path
City Limit
Urban Growth Boundary
Oregon City
Miles

OREGON CITY TRANSPORTATION PLAN

FIGURE 21

Shared Walking and Biking Solutions



Legend

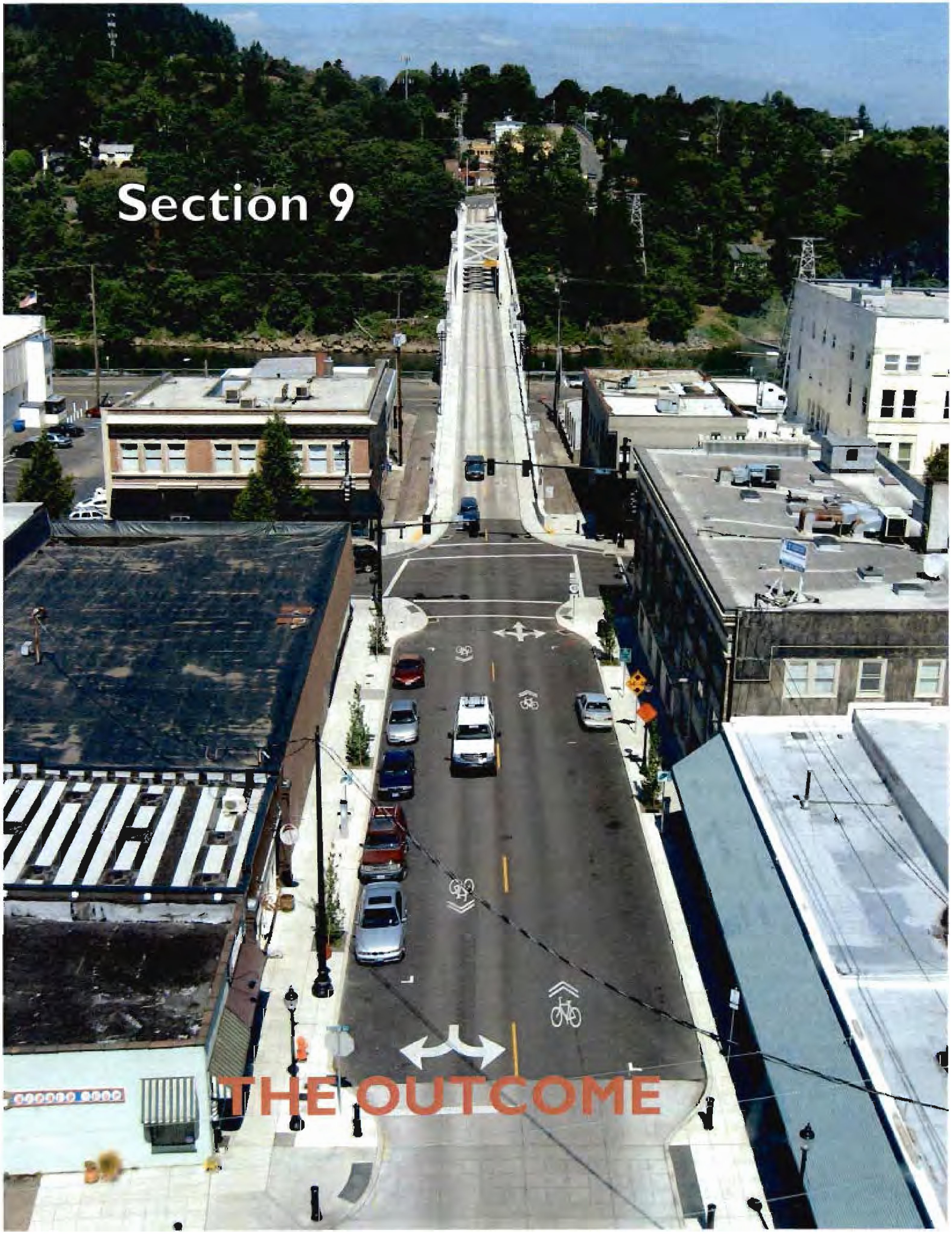
Shared Walking and Biking Improvements

- Planned Family Friendly Route
- Street Crossing Improvement

Shared-Use Paths

- Existing Shared-Use Path
- Planned Shared-Use Path (Conceptual)
- Likely to be Funded System Project # (See Table 2)
- Not Likely to be Funded System Project # (See Section I of the TSP Volume 2)
- Planned Street Extension (Conceptual Alignment)
- City Limit
- Urban Growth Boundary

Section 9



THE OUTCOME

the outcome

The Oregon City TSP employed a performance based approach, focusing on measurable outcomes of investments to the transportation system. The approach allows the City to measure the degree to which its investments support regional and City-wide priorities. In this manner, the City is able to track how its investment decisions impact a set of performance objectives through 2035. While the performance objectives do not represent the complete picture, they do offer a baseline against which to assess how the policies, investments and planning decisions made in this plan may affect the future.

Tracking Performance of Transportation System Investments

Oregon City developed measures for safety, congestion, freight reliability, walking, biking, transit and non-single occupant vehicle (SOV), and climate change to help translate investment decisions to the community priorities of the TSP update. The performance measures included the following:

Safety

- Reduce fatalities and serious injuries by 50% from 2010 for drivers, walkers and bikers.

Congestion

- Reduce vehicle hours of delay per person by 10% from 2010.
- Work towards meeting mobility targets for streets and intersections.[2]

Freight Reliability

- Reduce vehicle hours of delay for truck trips by 10% from 2010.

Walking, Biking, Transit and Non-SOV

- Work toward achieving the non-SOV mode share targets of 45 to 55 percent for the Oregon City Regional Center and the 7th Street-Molalla Avenue Corridor and 40 to 45 percent for other areas of the City.
- Triple walking, biking and transit mode share from 2010.

[2] The Metro Regional Transportation Functional Plan includes Mid-day and PM peak mobility standards in the Regional Mobility Policy, Table 3.08-2

Climate Change

- Reduce vehicle miles traveled (VMT) per capita by 10 percent compared to 2010.

Putting the Plan to the Test

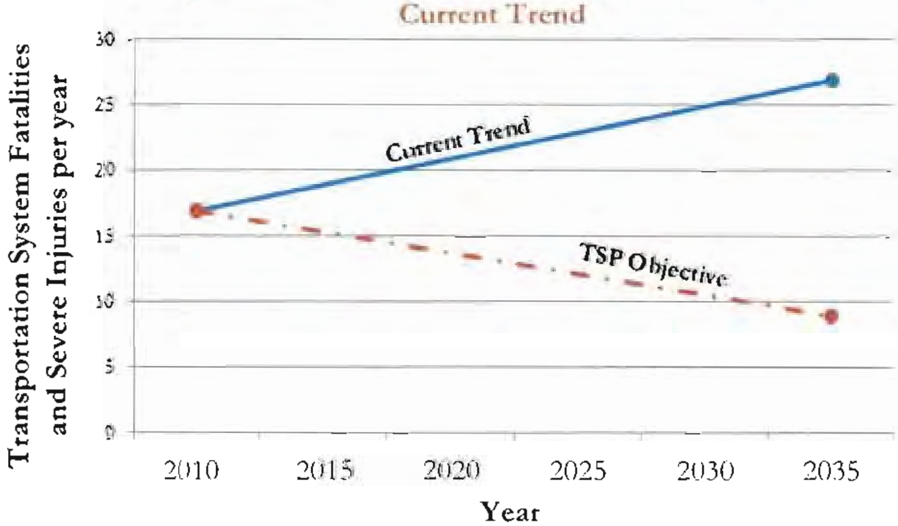
How will investment decisions of the TSP, an estimated $222 million worth, improve the performance of the transportation network in Oregon City? To answer this question, the plan's investment decisions were evaluated against the performance measures to identify long-term trends through 2035. The results are presented in the following sections.

Safety is expected to improve despite the Current Trend

The future trend for total fatalities and severe injuries resulting from collisions along the transportation system in Oregon City is expected to decrease despite what recent collision data suggests.[3] Although we are unable to forecast future collisions along the transportation system, with investments in improved street crossings, walking and biking facilities, and to high collision locations and congested intersections, the trend is expected to be more in line with the safety objective of the TSP (reducing fatalities and serious injuries by 50% from 2010).

Overall, there were two fatalities and 15 severe injuries in 2010. Pedestrians were involved in eight collisions, with two pedestrians sustaining severe injuries. While there were nine collisions involving a bicyclist in 2010, none of the cyclists sustained severe injuries. By 2035, Oregon City hopes to limit total fatalities and severe injuries to less than 10 in a year.

Figure 22: Safety is expected to improve despite the Current Trend



[3] The current trend was developed based on collision data between 2005 and 2010

Progress is expected to be made towards meeting the Congestion Targets

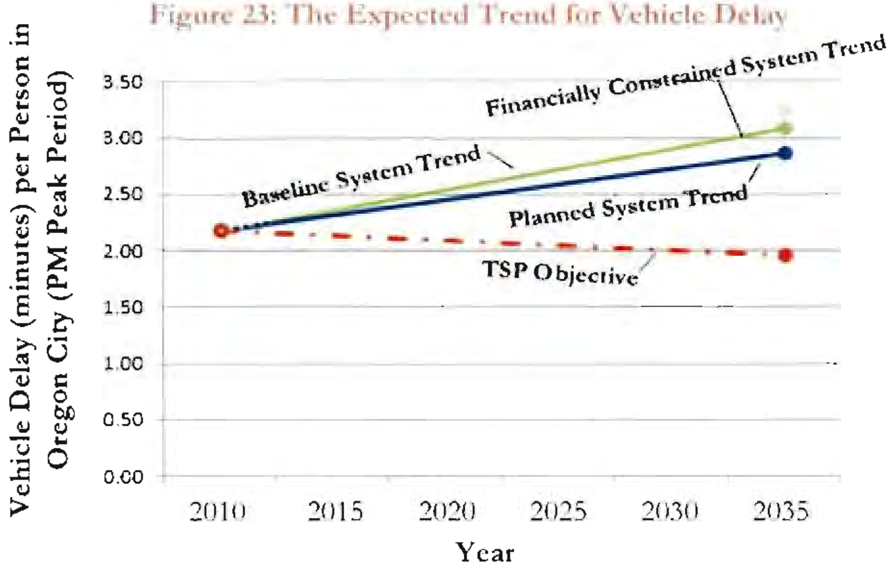
To reduce congestion, Oregon City identified over $162 million worth of projects to improve driving, and approximately $60 million to enhance walking, biking and transit usage.

Vehicle hours of Delay[4]: The same dynamics that make Oregon City an attractive place to live and open a business- its access to major regional transportation routes including I-205, OR 213, OR 99E, and OR 43- pose a challenge for meeting this performance measure. The TSP objective envisions decreasing delay by approximately ten percent through 2035, to fewer than two minutes per person during the evening peak period. However, the future trend for delay along Oregon City streets during the evening peak period (after assuming the planned system investments) is expected to increase slightly through 2035, from about two minutes to just under three minutes per person. This is generally associated with increased delay along the regional routes (such as OR 99E and OR 213), a side effect of local and regional population and employment growth. Since these routes serve outlying communities such as Molalla and Canby, trips that have origins and destinations outside of Oregon City are expected to significantly contribute to the increased delay in Oregon City.

With delay increasing, even after nearly $222 million worth of transportation system investments, the limitations of relying on infrastructure improvements as a means of meeting this objective are evident as the benefits are difficult to assess.

However, the City is working towards meeting this objective by decreasing delay nearly 15 percent from what would be expected without the transportation system investments (see the Baseline System Trend).

Figure 23: The Expected Trend for Vehicle Delay



[4] Delay is defined as the amount of time spent in congestion greater than 0.90 v/c, page 5-7, 2035 Metro RTP

Mobility Targets for Streets: Metro's regional travel demand model was used to estimate if streets in Oregon City could handle the increased travel demand through 2035 assuming the TSP investments.[5] While transportation system investments were recommended throughout the City, financially feasible solutions could not be identified for the routes connecting Oregon City across the Willamette and Clackamas Rivers. These routes, including the Oregon City-West Linn Arch Bridge, OR 99E and I-205, are expected to be congested by 2035 (operating above a v/c of 1.00), and will likely meter traffic coming into the City during peak hours. Once demand exceeds the available capacity along these routes, drivers will be forced to adjust their travel to directly before or after the evening peak hour. Therefore, the evening peak hour congestion that Metro's regional travel demand model is forecasting throughout the Oregon City Regional Center and along routes connecting to it, including OR 99E, OR 213, South End Road, Singer Hill Road and Redland Road, is not expected to occur since the travel demand across the rivers will be spread over more than one hour. Even with the excess travel demand across the rivers, the remaining streets in the City (beyond those mentioned above) are forecasted to comply with the Metro Regional Transportation Functional Plan mobility targets during the evening peak period. Overall, the street system investments in the TSP are expected to help the City work towards meeting mobility targets during the evening peak period.

During the midday peak hour[6], all streets in Oregon City are expected to comply with the mobility targets of the Metro Regional Transportation Functional Plan, with the exception of the routes connecting Oregon City across the Willamette River, including the southbound direction of the Oregon City-West Linn Arch Bridge and portions of I-205.

Mobility Targets at Intersections: 2035 intersection operations assuming the transportation system investments (Likely to be Funded and Not Likely to be Funded Systems) are shown in Table A1 in TSP Volume 2, Section J. With over $162 million worth of improvements to the street system, nearly all intersections reviewed are expected to meet mobility targets through 2035 during the evening peak period. Despite the investments in the transportation system, three of the intersections reviewed are still expected to be substandard by 2035 during the evening peak period (see Section J of the TSP Volume 2 for more detail), including the OR 99E/I-205 SB Ramps, OR 99E/I-205 NB Ramps and OR 213/Beavercreek Road intersections.

With the recommended improvements to the OR 99E/I-205 SB Ramp and OR 99E/I-205 NB Ramp intersections, compliance with the mainline mobility target (v/c of 1.10) is expected; however, the intersections would still be expected to operate above the freeway ramp terminal mobility target (v/c of 0.85). The investment decisions of the TSP allow these intersections to work towards meeting mobility targets and reduce the vehicle spillback onto the off-ramps from I-205 during the evening peak period,

[5] The raw model v/c plots for the mid-day and evening peak periods were reviewed as a qualitative assessment for this objective but detailed link capacity analysis was not performed.

[6] Metro's regional travel demand model was reviewed with RTP investments only during the midday peak period. Not all improvements from the Oregon City TSP were included, however, they will likely not impact travel patterns during the midday period due to limited congestion.

meeting the congestion objective of the TSP.

In addition, several projects have been previously planned that would reduce congestion at the OR 213/Beavercreek Road intersection. A planned project to replace the OR 213/Beavercreek Road intersection with an interchange was eliminated due to livability, multi-modal access and funding constraints within the 2035 planning horizon. The project should be reconsidered beyond the planning horizon since the intersection is expected to operate above the mobility target by 2035. The investment decisions of the TSP allow this intersection to work towards meeting mobility targets, satisfying the congestion objective of the TSP.

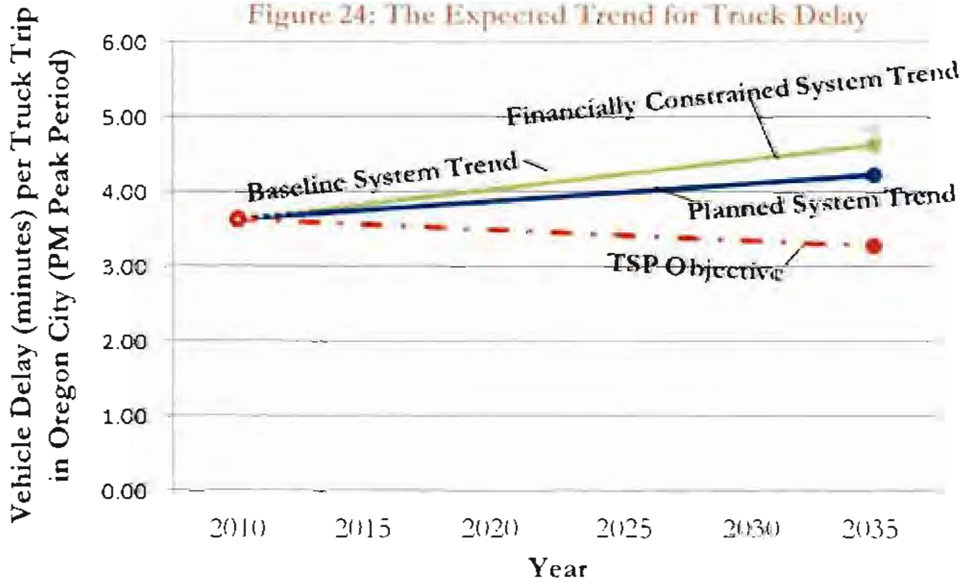
Progress is expected to be made towards reducing Freight Delay

Oregon City's access to major regional transportation routes including I-205, OR 213, OR 99E, and OR 43- pose a challenge for meeting this performance measure (similar to the vehicle hours of delay measure). The TSP objective envisions decreasing delay by approximately ten percent through 2035, to just over three minutes per truck trip during the evening peak period. However, the future trend for truck delay in Oregon City during the evening peak period (after assuming the planned system investments) is expected to increase slightly through 2035, from about three and a half minutes to four minutes per person. This is generally associated with increased delay along the regional routes, where most trucks trips occur. Since these routes serve outlying communities such as Molalla and Canby, drivers that have origins and destinations outside of Oregon City are expected to significantly contribute to the increased truck delay in Oregon City. However, the City is working towards meeting this objective by decreasing truck delay 15 percent from what would be expected without the transportation system investments (see the Baseline System Trend).

A Reduction in Single Occupant Vehicle Travel is expected

Non-single occupant vehicle (SOV) travel in Oregon City is expected to continue to increase through 2035.

Figure 24: The Expected Trend for Truck Delay



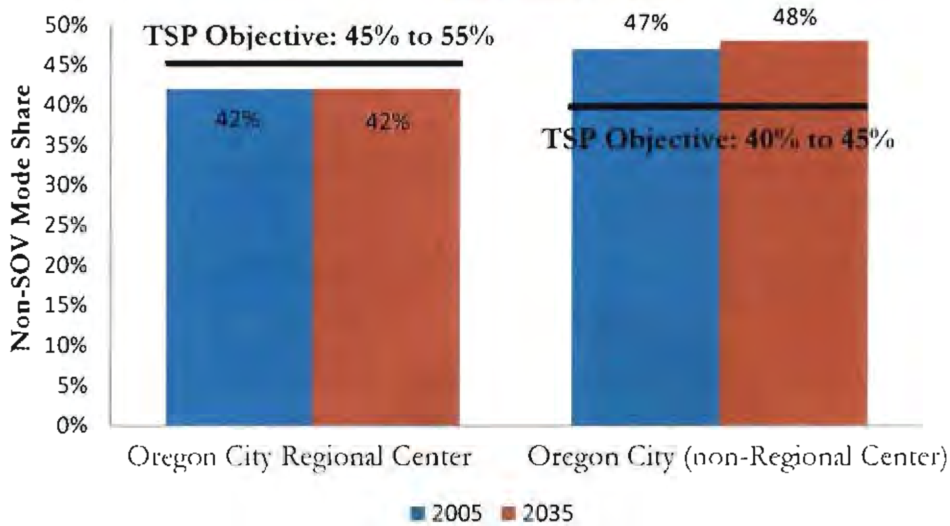
Non-Single Occupancy Vehicle (SOV) Travel: Metro's regional travel demand model was used to evaluate progress towards meeting transportation demand management (TDM) goals, specifically reducing reliance on the single occupancy vehicle.[7] Oregon City's non-SOV mode shares (outside of the Oregon City Regional Center) are expected to be above the TSP objective of 40 to 45 percent, with an estimated non-SOV mode share of 47 percent in 2005 and 48 percent in 2035. The non-SOV mode share in the Oregon City Regional Center is expected to remain steady through 2035, at around 42 percent, slightly below the TSP objective of 45 to 50 percent.

The TSP makes investment decisions that further help the City work towards achieving the non-SOV mode share targets. The City is expected to continue to increase trip share via walking, biking, carpooling or public transportation with investment decisions including a project that would help implement a Transportation Management Association (TMA) program with employers and residents within the Oregon City Regional Center.

The Oregon City TSP includes solutions to decrease single occupancy vehicle travel by focusing on investments that encourage multi-modal travel, including increased walking and bicycling facilities and transit stop access/amenity improvements.

The TSP also includes maximum public street spacing standards to allow for sufficiently spaced pedestrian crossings. Street connections to increase the convenience of walking and bicycling were also recommended throughout the City, including the Oregon City Regional Center.

Figure 25: Oregon City Non-Single Occupant Vehicle Mode Shares



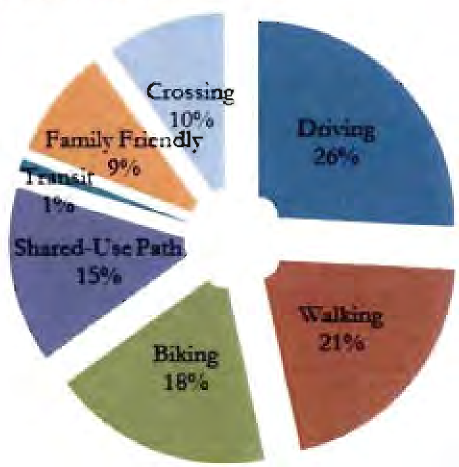
[7] The Metro RTP Financially Constrained Plan was utilized for the non-SOV mode share analysis; therefore, not all of the projects included in the TSP were captured in the analysis.

Walking, Biking and Transit Mode Share: Oregon City has identified nearly $60 million worth of investments with over 260 walking, biking, transit or other shared-use path projects in its TSP. This accounts for over 75 percent of the projects in the 2013 TSP and represents an increase of more than 25 percent when compared to the projects in the 2001 TSP. While no data is available to quantify the impact of these walking, biking and transit investments in the City, they are expected to help the City work towards tripling the walking, biking and transit mode share between 2010 and 2035.

The City identified investments to complete walking and biking gaps along the major street system, and identified a network of low-volume more comfortable walking and biking routes off the major street system to further encourage walking and biking to key destinations throughout the City.

Figure 26: Comparison of 2001 and 2013 TSP Investments

Percent of TSP Projects by Travel Mode (2001 TSP)



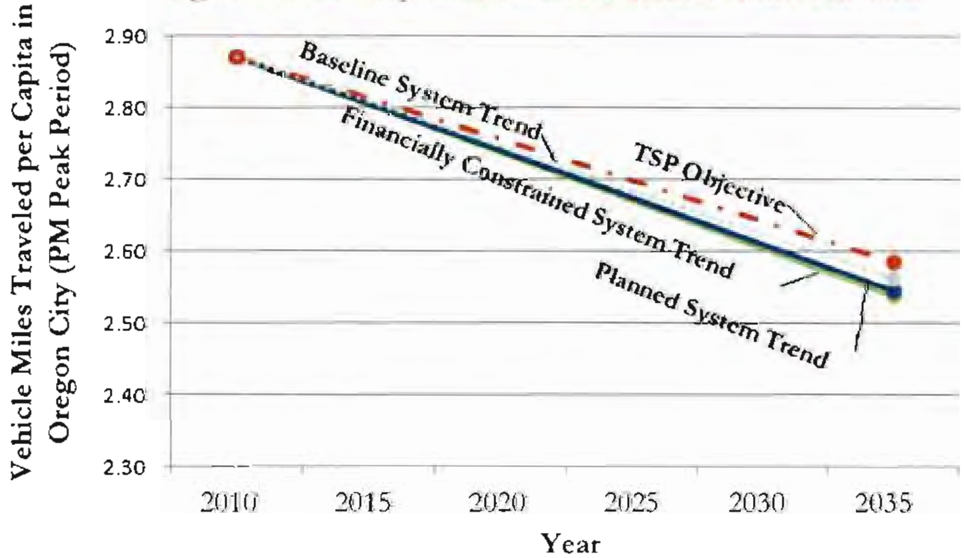
Percent of TSP Projects by Travel Mode (2013 TSP)

The Plan is expected to outperform the Climate Change Target

Despite healthy local and regional population and employment growth, vehicle miles traveled in Oregon City is expected to be reduced more than the TSP objective through 2035. The TSP objective envisions decreasing vehicle miles traveled by approximately ten percent through 2035, to about 2.6 miles per person during the evening peak period.

However, the future trend for vehicle miles traveled in Oregon City during the evening peak period (after assuming $222 million worth of investments) is expected to decrease nearly 13 percent through 2035, from about 3 miles to 2.5 miles per person. This is likely representative of job growth in Oregon City, as more residents have the option to work closer to home. In addition, the $60 million worth of investments in over 260 walking, biking, transit or other shared-use path projects in the 2013 TSP help reduce the need to drive for local trips in the City.

Figure 27: The Expected Trend for Vehicle Miles Traveled



To the Planning Horizon and Beyond

In addition to the investment decisions of the 2013 Oregon City TSP, further issues will need to be explored through 2035 and beyond.

Multi-Modal Mixed-Use Areas

Oregon City intends to explore a multi-modal mixed-use area designation within the Regional Center. This TSP was developed with a framework to encourage multi-modal travel and with the ultimate goal to allow for dense pedestrian oriented development in and around downtown Oregon City.

Conforming Land Use Development and Congested Intersections

Despite the investments to the transportation system, intersection operating conditions at a few intersections (including the OR 99E/I-205 Northbound, OR 99E/I-205 Southbound, OR 213/Beavercreek Road, and I-205/OR 213 intersections) will be over the operating standard by 2035.

For purposes of evaluating the impact of proposed development that is permitted, either conditionally, outright, or through detailed development master plan approval, the OR 99E/I-205 SB Ramps, OR 99E/I-205 NB Ramps, OR 213/Beavercreek Road, and I-205/OR 213 intersections shall be exempt from meeting the state mobility targets until solutions (beyond those included in the TSP) or alternative mobility targets are explored for the intersections.

Freeway Ramp Queuing

While the 2013 Oregon City TSP will not solve all the congestion issues at major regional intersections, it is important to note that by 2035 queues from the OR 99E/I-205 Northbound, OR 99E/I-205 Southbound intersections will at times, approach the mainline of I-205 and the area of the ramp needed for deceleration from freeway speeds. Further solutions will likely need to be explored during the next TSP update or within another interim study.

Parking Management Plan

The City should pursue implementation of the parking management plan for the Oregon City Regional Center as the opportunity arises. This will help ensure that development within the Regional Center aligns with the objectives of this Plan and Region as a whole.

Geologic Hazards

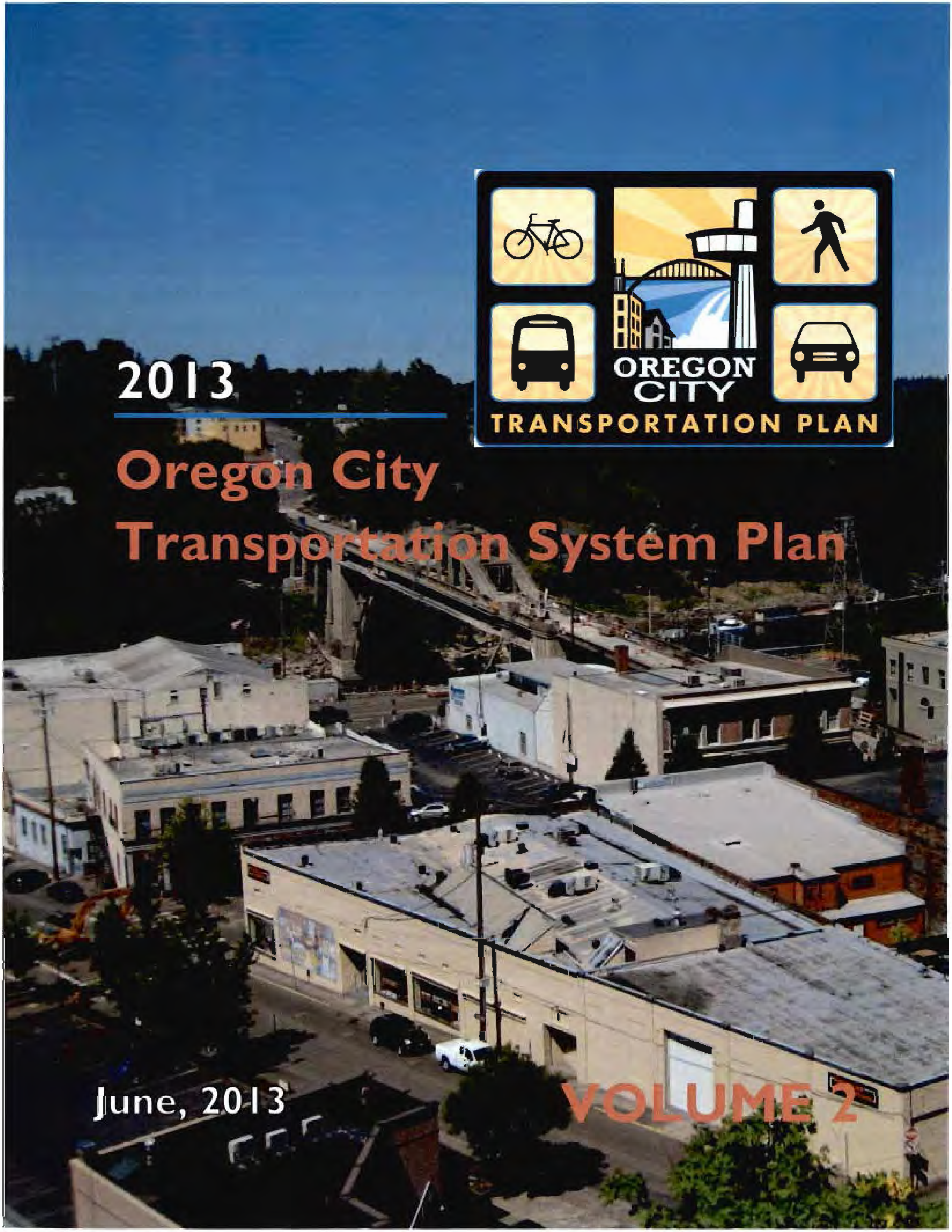
All proposed street extensions included in this Plan are shown with conceptual alignments. These conceptual street alignments represent a planning level illustration that street connectivity enhancements are needed in these areas. Before construction of any of the projects can begin, more detailed surveys will need to be undertaken to identify hydrologic, topographic or other geological constraints that could hinder the alignment of the planned streets. Final street alignments will be identified after these surveys have been completed.

2013

Oregon City Transportation System Plan

June, 2013

VOLUME 2



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  Shayna Rehberg

- **Stakeholder Advisory Team**
- **Technical Advisory Team**

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

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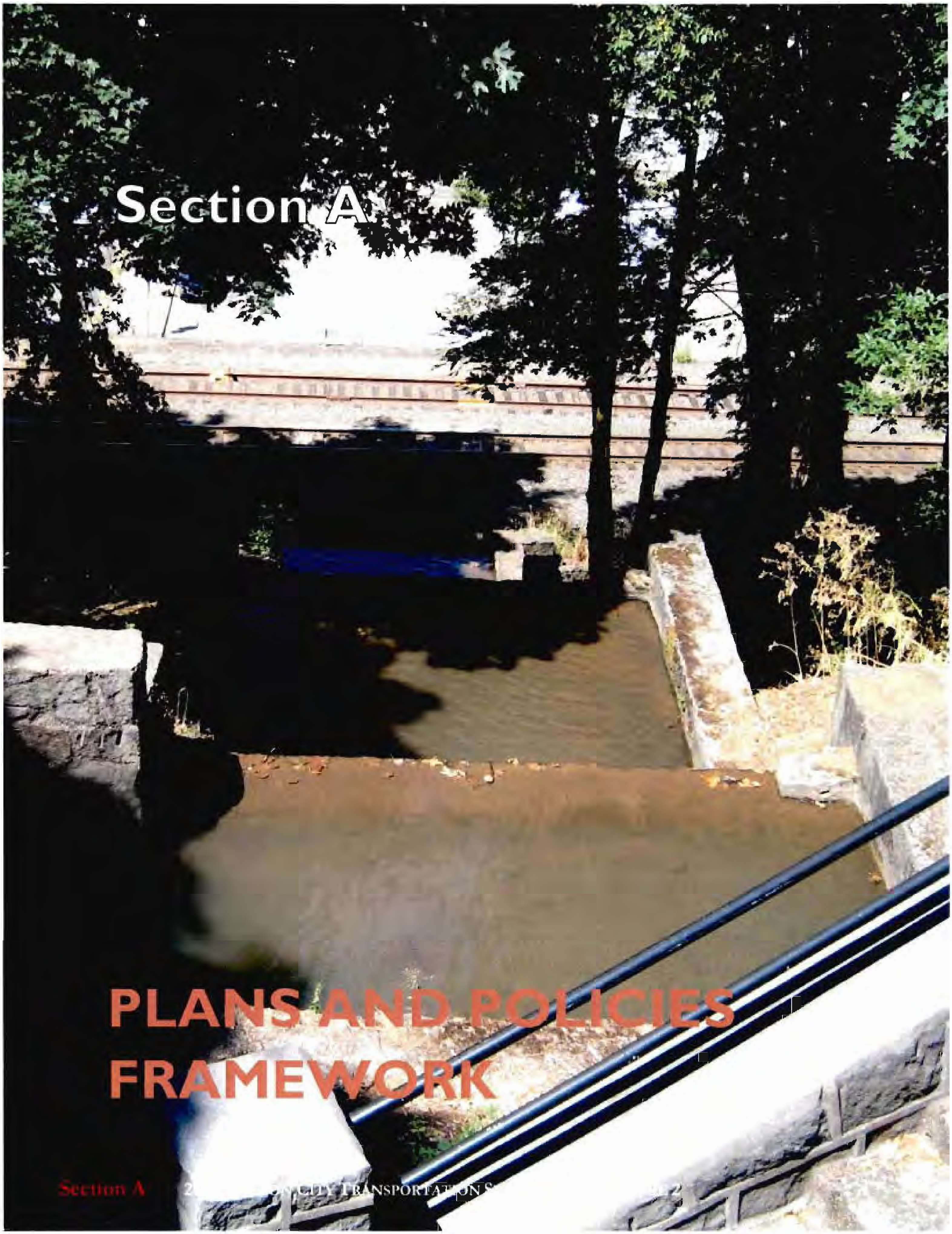


Section A

PLANS AND POLICIES FRAMEWORK

This memorandum summarizes the planning documents, policies, and regulations that are applicable to the 2012 Oregon City Transportation System Plan (TSP) update (see Appendix A for a complete list). The City's current TSP will serve as the foundation for the update process, upon which new information obtained from system analysis and stakeholder input will be applied to address changing transportation needs through the year 2035. As new strategies for addressing transportation needs are proposed, compliance and coordination with the plans, policies, and regulations described in this document will be required.

Transportation System Planning in Oregon

Transportation System Planning in Oregon is required by state law as one of the 19 statewide planning goals[1] (Goal 12- Transportation). The Transportation Planning Rule (TPR), OAR 660-012[2], defines how to implement State Planning Goal 12. Specifically, the TPR requires:

- The state to prepare a TSP, referred to as the Oregon Transportation Plan (OTP);
- Metropolitan planning organizations (MPOs) to prepare a Regional Transportation Plan (RTP) that is consistent with the OTP (the Metro RTP[3] applies to Oregon City); and
- Counties and cities to prepare local TSPs that are consistent with the OTP and RTP.

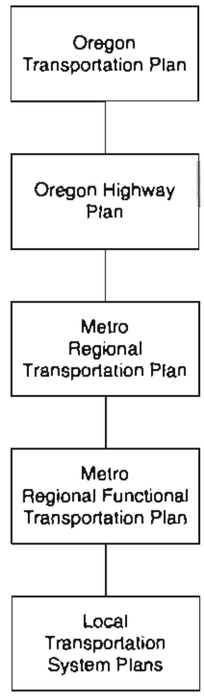
The TPR directs TSPs to integrate comprehensive plan land use with transportation needs and to promote systems that serve statewide, regional and local transportation needs. These requirements aim to improve community livability by encouraging land use patterns and transportation systems that make it more convenient for people to walk, bicycle, use transit and drive less to meet their daily needs.

As the guiding document for regional and local TSPs, the OTP[4] establishes goals, policies, strategies and initiatives that address the core challenges and opportunities facing transportation in Oregon. These are further implemented with the Oregon Highway Plan (OHP)[5] and the RTP, which is adopted to meet Federal requirements.

[1] Statewide Planning Goals: http://www.oregon.gov/LCD/goals.shtml
[2] Transportation Planning Rule: http://arcweb.sos.state.or.us/rules/OARS_600/OAR_660/660_012.html
[3] Metro Regional Transportation Plan: http://www.oregonmetro.gov/index.cfm/go/by.web/id=25038
[4] Oregon Transportation Plan: http://www.oregon.gov/ODOT/TD/TP/ortransplanupdate.shtml
[5] Oregon Highway Plan: http://www.oregon.gov/ODOT/TD/TP/orhwyplan.shtml

Why does Oregon City need an Updated TSP?

The City's current TSP was adopted in 2001. Since then new requirements have been integrated into the OTP, OHP and Metro RTP, many key transportation projects have been completed, the local Urban Growth Boundary and Urban Reserve areas have changed, and the City's Comprehensive Plan and Municipal Code was updated. The last 10 years of regulatory, land use and transportation system changes will be considered in this TSP update.



ODOT's Transportation System Plan Guidelines[6] direct TSP updates to address recent policy and regulatory changes, and calls out recent changes to the OTP, OHP, TPR, and federal changes implemented into the RTP. Since adoption of the 2001 Oregon City TSP, the OTP was updated (2006) to emphasize maintaining assets in place, optimizing existing system performance through technology and better system integration, creating sustainable funding, and investing in strategic capacity enhancements. Policy 1F (Mobility Standards) of the OHP was amended to allow for the adoption of alternative mobility standards where "practical difficulties make conformance with the highway mobility standards infeasible." Appendix C of the OHP (Access Management Spacing Standards) was also modified to be consistent with amendments to the Access Management Rule, OAR 734-051.

Metro's Regional Transportation Functional Plan[7] **(RTFP)** directs how Oregon City should implement the RTP through the TSP and other land use regulations. The RTFP codifies existing and new requirements which local plans must comply with to be consistent with the RTP. If a TSP is consistent with the RTFP, Metro will find it to be consistent with the RTP.

The RTFP provides guidance on several areas including transportation design for various modal facilities, system plans, regional parking management plans and amendments to comprehensive plans. The following directives specifically pertain to updating local TSPs:

- Include regional and state transportation needs identified in the 2035 RTP along with local needs
- Local needs must be consistent with RTP in terms of land use, system maps and non-SOV modal targets
- When developing solutions, local jurisdictions shall consider a variety of strategies, in the following order:
    - TSMO (Transportation System Management Operations)
    - Transit, bicycle and pedestrian projects
    - Traffic calming

[6] ODOT Transportation System Plan Guidelines: http://www.oregon.gov/ODOT/TD/TP/TSP.shtml
[7] Metro Regional Transportation Functional Plan: http://www.oregonmetro.gov/index.cfm/go/by.web/id=274

    - Land use strategies in OAR 660-012-0035(2)[8]
    - Connectivity, including pedestrian and bicycle facilities
    - Motor vehicle capacity projects
- Local jurisdictions can propose regional projects as part of RTP process
- Local jurisdictions can propose alternate performance and mobility standards, however, changes must be consistent with regional and statewide planning goals
- Local parking regulations shall be consistent with the RTFP

[8] This section of the Transportation Planning Rule requires Metro area jurisdictions to evaluate land use designations, densities, and design standards to meet local and regional transportation needs.

How is the Transportation System Defined?

The following sections summarize the state highway classifications and land use designations for areas of Oregon City derived from these regulatory documents. This information ultimately determines the adopted standards and regulations that apply to state highways in Oregon City.

ODOT Classifications for State Highways in Oregon City

OHP Policy 1A (State Highway Classification System) categorizes state highways for planning and management decisions. Within Oregon City, state highways are classified as Interstate Highway, Regional Highway, District Highway, or Expressway (see summary at the end of this section).

Special Designations: OHP Policy 1B identifies special highway segment designations for specific types of land use patterns to foster compact development on state highways in which the need for appropriate local access outweighs the considerations of highway mobility. Within Oregon City, portions of OR 99E and OR 43 have Special Transportation Area (STA) designations.

State Highway Freight System: OHP Policy 1C addresses the need to balance the movement of goods and services with other uses. It states that the timeliness of freight movements should be considered when developing and implementing plans and projects on freight routes. Within Oregon City, I-205 and OR 99E are classified as Federal Truck Routes, while I-205 is also classified as an Oregon Freight Route.

Updates to the TSP will support the existing highway classifications and will enhance the ability of the highways in Oregon City to serve in their defined functions. The following summarizes the classifications of state highways in Oregon City:

- I-205 (East Portland Freeway, No. 64) is classified as an Interstate Highway, part of the National Highway System (NHS), a Freight Route, and a Truck Route.
- OR 99E (Pacific Highway East, No. 81) is classified as a District Highway and a Truck Route from the north City limits (at the Clackamas River) to I-205. From I-205 to the south City limits it is classified as a Regional Highway and a Truck Route. It also has a STA designation from 14th Street to Railroad Avenue.
- OR 213 (Cascade Highway South, No. 160) is classified as a District Highway. From I-205 to Molalla Avenue it also has an Expressway and Bypass designation.
- OR 43 (Oswego Highway, No. 03) is classified as a District Highway, and has a Special Transportation Area (STA) designation from the Oregon City-West Linn Bridge to OR 99E.

Metro Land Use Designations for Oregon City

Metro's 2040 Growth Concept[9] in the RTP applies land use designations to the Portland region. The 2040 Growth Concept is the region's long range plan for managing growth by integrating land use and transportation. The concept concentrates mixed use and higher density development in areas of the region designated as "Centers", "Station Communities", and "Main Streets". The 2040 Growth Concept land uses are arranged in a hierarchy, with the primary and secondary land uses, referred to as 2040 Target Areas, as the focus of RTP investments. The hierarchy also serves as a framework for prioritizing RTP investments.

Primary land uses in Oregon City include:

- The "Oregon City Regional Center" which generally includes the area bounded by the Clackamas River to the north, 7th Street to the south, Washington Street to the east and the Willamette River to the west. In addition, the downtown core of Oregon City, or roughly the area between the Willamette River and Railroad Avenue, from 7th Street to Tumwater Drive, and the area east of Washington Street and north of Abernethy Road to OR 213 is also included in the Regional Center.

Secondary land uses in Oregon City include:

- The "7th Street and Molalla Avenue Corridor" from Washington Street to OR 213
- The "OR 99E Corridor" from Railroad Avenue to around 3rd Avenue (including the Canemah neighborhood)
- The "Employment Land" in the southeast portion of Oregon City, generally bounded by Beavercreek Road to the north and east, Glen Oak Road to the south, and Molalla Avenue/OR 213 to the west

The remaining areas of Oregon City are designated as Neighborhood land uses. These areas have the lowest priority for RTP investments.

[9] Metro 2040 Growth Concept: http://www.oregonmetro.gov/index.cfm/go/by.web/id=29882

Figure 1: Metro Land Use Designations in Oregon City

How is the Transportation System Managed?

State Highway Mobility Standards: OHP Policy 1F sets mobility standards for ensuring a reliable and acceptable level of mobility on the highway system. The following mobility standards are applicable to state highways in Oregon City (pursuant to Policy 1F, Table 7):

- State highways in **Regional Centers** (including portions of OR 99E, OR 213, and OR 43) have a mobility standard requiring that the highway operate at or below a volume to capacity (v/c) ratio of 1.1 during the peak first hour, and 0.99 during the peak second hour.
- All other state highways in Oregon City (including those through Corridor, Employment, or Neighborhood land use areas) have a mobility standard requiring that the highway operate at or below a volume to capacity (v/c) ratio of 0.99 during the peak first and second hours.

City and County Mobility Standards: The City of Oregon City Transportation System Plan (TSP)[10] identifies LOS D as the minimum performance standard for both signalized and unsignalized intersections under Oregon City jurisdiction. In addition, the transportation element of the Clackamas County Comprehensive Plan[11] requires a Level-of-Service "D" as the minimum acceptable performance standard for signalized and unsignalized intersections on arterial and collector roadways under Clackamas County jurisdiction. The traditional approach to mobility standards will likely be adjusted in response to many evolving conditions such as transportation funding for projects, economic viability, livability, and funding priorities.

Access Management on State Highways: The Oregon Access Management Rule[12] (OAR 734-051) attempts to balance the safety and mobility needs of travelers along state highways with the access needs of property and business owners. ODOT's rule sets guidelines for managing access to the state's highway facilities in order to maintain highway function, operations, safety, and the preservation of public investment consistent with the policies of the 1999 OHP. Access management rules allow ODOT to control the issuing of permits for access to state highways, state highway rights of way and other properties under the State's jurisdiction

In addition, the ability to close existing approaches, set spacing standards and establish a formal appeals process in relation to access issues is identified. These rules enable the State to set policy and direct location and spacing of intersections and approaches on state highways, ensuring the relevance of the functional classification system and preserving the efficient operation of state routes.

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[10] Oregon City TSP, p.2-56, Adopted April 2001.

[11] Clackamas County Comprehensive Plan, Chapter 5- Transportation

[12] Access Management Rule: http://arcweb.sos.state.or.us/rules/OARS_700/OAR_734/734_051.html

OHP Policy 3A sets access spacing standards for driveways and approaches to the state highway system.[13] The standards are based on state highway classification and differ based on posted speed.

Access Management on Local Roadways: The Oregon City TSP identified minimum intersection spacing standards for public roadways under Oregon City jurisdiction. Access spacing guidelines from the TSP are shown in Table 1.

Table 1: Minimum Oregon City Intersection Spacing Standards

Functional Classification	Major Arterial	Minor Arterial	Collector	Neighborhood Collector	Local Street
Major Arterial	2 miles	1 mile	¼ mile	1,000 feet	500 feet
Minor Arterial	1 mile	½ mile	1,000 feet	800 feet	400 feet
Collector	¼ mile	1,000 feet	800 feet	600 feet	300 feet
Neighborhood Collector	1,000 feet	800 feet	600 feet	500 feet	200 feet
Local Street	500 feet	400 feet	300 feet	200 feet	150 feet

RTP Performance targets: The Metro RTP established new performance targets (see Table 2) for safety, congestion, freight reliability, climate change, active transportation, sidewalk/trail/transit infrastructure, clean air, travel, affordability, and access to daily needs. The performance targets are regional goals that Oregon City TSP should work toward achieving.

Table 2: 2035 RTP Performance Targets

Objective	Target by 2035
Safety	Reduce serious injuries and fatalities in all modes of travel by 50% (vs. 2005)
Congestion	Reduce vehicle hours of delay (VHD) by 10% per person (vs. 2005)
Freight reliability	Reduce VHD per truck trip by 10% (vs. 2005)
Climate change	Reduce transportation greenhouse gas emissions by 40% (vs. 1990)
Active transportation	Triple walking, biking and transit mode share (vs. 2005)
Basic infrastructure	Increase by 50% access times to sidewalks, trails and transit (vs. 2005)
Clean air	Ensure 0% population exposure to at-risk levels of pollution
Travel	Reduce vehicle miles traveled per person by 10% (vs. 2005)
Affordability	Reduce average household combined cost of housing and transportation by 25% (vs. 2000)

[13] ODOT Access Management Standards (Appendix C): http://www.oregon.gov/ODOT/TD/TP/orhwyplan.shtml

Access to daily needs	Increase by 50% the number of essential destinations within 30 minutes by bike, transit for low-income, minority, disabled pop. (vs. 2005)

* Interim volume-to-capacity ratio (v/c) measures still apply

In addition to supporting the performance targets, the TSP will need to incorporate transportation system management and operations (TSMO) into planning. The following RTP policies provide the foundation for TSMO in the region:

- 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 and incent change

RTP Non-Single Occupancy Vehicle (SOV) Target: The RTP established regional mode share targets that are intended to be goals for cities and counties to work toward during implementation of the 2040 Growth Concept at the local level. Increases in walking, bicycling, ridesharing and transit mode shares will be used to demonstrate compliance with per capita travel reductions required by the state Transportation Planning Rule. The following modal targets apply to RTP land uses in Oregon City:

- Regional Centers and Corridors: Non-drive alone modal target of 45 to 55 percent
- Employment areas and Neighborhoods: Non-drive alone modal target of 40 to 45 percent

As required by the RTP and the TPR, jurisdictions within the Metro region must adopt policies and actions that encourage a shift towards non-SOV modes. The Metro Non-Single Occupancy Vehicle (SOV) Target Actions Study summarizes the required non-SOV strategy requirements for local jurisdictions to implement:

- Adopt 2040 modal targets in TSP policies
- Adopt street connectivity plans and implementing ordinances
- Adopt maximum parking ratios to implement the parking requirements of Title 2 of the Urban Growth Management Functional Plan
- Adopt transit strategies, including planning for adequate transit facilities and service; pedestrian facility planning and infrastructure that support transit use; location and design of buildings in transit zones that encourages transit use; and adoption of a transit system map, consistent with Metro requirements.

The Metro Non-Single Occupancy Vehicle (SOV) Target Actions Study recommends the following measures as additional strategies to be considered in the Oregon City TSP:

- Continue to require transportation-efficient development through efforts to meet density and other land use targets in centers and corridors as part of compliance with Metro Functional Plan and related requirements.
- Construct bicycle and pedestrian projects, consistent with state, federal and local government requirements. Local governments and Metro should prioritize projects that enhance connectivity of the bicycle and pedestrian system and access to transit.
- Continue to support TriMet and other transit agencies in providing frequent, reliable and comprehensive transit service, and local implementation of pedestrian and bicycle infrastructure to improve access to transit. Credit local jurisdictions with efforts to support transit agencies in these efforts.
- Support and encourage efforts to implement employer-based TDM strategies. Coordinate with employers even in areas where the formation of TMAs is not required.
- Encourage and assist in implementing parking cash-out programs or other techniques to eliminate employer subsidies for parking. Consider requiring local governments to eliminate free employee parking and provide informational materials and technical assistance to employers interested in implementing such programs.
- Support and coordinate Safe Routes to School programs and projects. Local jurisdictions and Metro should support and help coordinate these efforts through project funding and technical assistance.

Major Projects: OHP Policy 1G requires maintaining performance and improving safety by improving efficiency and management before adding capacity. The intent of policy 1G and Action 1G.2 is to ensure that major improvement projects to state highway facilities have been through a planning process that involves coordination between state, regional, and local stakeholders and the public, and that there is substantial support for the proposed improvement.

Off-System Projects: OHP Policy 2B establishes ODOT's interest in projects on local roads that maintain or improve safety and mobility performance on state roadways, and supports local jurisdictions in adopting land use and access management policies. The TSP will include sections describing existing and future land use patterns, access management, and implementation measures.

Traffic Safety: OHP Policy 2F identifies the need for projects in the state to improve safety for all users of the state highway system through engineering, education, enforcement, and emergency services. One component of the TSP is to identify existing crash patterns and rates and to develop strategies to address safety issues. Proposed projects will aim to reduce the vehicle crash potential and/or improve bicycle and pedestrian safety by providing upgraded facilities that meet current standards.

Alternative Passenger Modes: OHP Policy 4B, Action 4B.4 requires that highway projects encourage the use of alternative passenger modes to reduce local trips. The TSP will develop ways to support and increase the use of alternative passenger modes to reduce trips on highways and other facilities. This will include improvement to bicycle and pedestrian facilities and consideration of transit movement along roadways.

Projects on State Highways: The Highway Design Manual[14] (HDM) provides uniform standards and procedures for ODOT and is in general agreement with the 2001 American Association of State Highway and Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets*. Some key areas where guidance is provided are the location and design of new construction, major reconstruction, and resurfacing, restoration or rehabilitation (3R) projects. The HDM should be used for all projects on state highways in Oregon City to determine design requirements, including the maximum allowable volume to capacity ratios for use in the design of highway projects.

Other Background Information for the TSP Update

The following sections summarize additional background information or guidance documents that will be used in updating the Oregon City TSP.

Projects to be considered in Future Transportation Analysis

Several of the documents reviewed identified transportation improvement projects that will be considered in future transportation analysis in Oregon City. The projects include:

2010-2013 Statewide Transportation Improvement Program[15] (STIP) projects:

- Intersection projects on OR 213 at the Washington Street and Redland Road intersections
- Bike and pedestrian projects on Main Street between 5th Street and 10th Street
- Motor vehicle access, transit stop, bike lane, pedestrian crossing, and sidewalk projects on McLoughlin Boulevard between the Clackamas River bridge and Dunes Drive
- Construction of a jughandle intersection on OR 213 at Washington Street

Metro RTP: Projects were identified along Metro Mobility Corridors, including Tualatin/Oregon City (Mobility Corridor #7), Oregon City/Gateway (Mobility Corridor #8), and Oregon City/Willamette Valley (Mobility Corridor #14).

Near-term (1-4 years)

- System and demand management along mobility corridor and parallel facilities for all modes of travel (Mobility Corridor #7, 8, and 14).
- Practical design solutions for bike and pedestrian connections to transit (Mobility Corridor #7).

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[14] ODOT Highway Design Manual: http://www.oregon.gov/ODOT/HWY/ENGSERVICES/hwy_manuals.shtml

[15] ODOT STIP: http://www.oregon.gov/ODOT/HWY/STIP/

- Practical design solutions for bikes/pedestrians for safety and to connect to transit (Mobility Corridor #8).
- Address arterial connectivity and crossings (Mobility Corridor #8, and 14).
- I-205/OR 213 Interchange (Mobility Corridor #14).
- Project development for regional trails, Oregon City Loop and Newell Canyon (Mobility Corridor #14).

Medium-term (5-10 years)

- Complete gaps in the arterial network (Mobility Corridor #7, 8, and 14).
- Complete corridor refinement plan (Mobility Corridor #7 and 8).
- Develop congestion pricing methodologies for I-205 (Mobility Corridor #7 and 8).
- Develop plan and implement SEP to connect Oregon City Regional Center with high capacity transit (Mobility Corridor #7 and 8).
- Identify funding solutions for alternative mode options (Mobility Corridor #7 and 8).
- Project development for regional infrastructure to serve Park Place and Beavercreek Road concept plan UGB expansion areas (Mobility Corridor #14).

Long-term (10-25 years)

- Construct high capacity transit connection to Oregon City Regional Center (Mobility Corridor #7).
- Identify funding solutions for alternative mode options, including high capacity transit to Oregon City (Mobility Corridor #8).
- Construct regional trails and access in Newell Creek and Oregon City Loop (Mobility Corridor #14).

Metro Regional Trails and Greenways Plan[16]: This Plan recommended three regional trails through Oregon City.

- The Oregon City Loop Trail, creating a loop around the perimeter of Oregon City. The trail will cut through Newell Creek Canyon, connect to the Beaver Lake Trail, and skirt the southern edge of the city on its way back to the Willamette River across from its confluence with the Tualatin River.
- The Beaver Lake Trail which will begin at the End of the Oregon Trail Center in Oregon City and head south on the east side of Newell Creek Canyon and east to Beaver Lake.
- The Oregon Trail-Barlow Road Trail which will follow the pioneer wagon train route from the Cascades west to the End of the Oregon Trail Center in Oregon City.

[16] Metro Regional Trails and Greenways: http://www.oregonmetro.gov/index.cfm/go/by.web/id=595

TriMet Transit Investment Plan, TIP (2011)[17]**:** The TIP details the investments TriMet will make in the region to expand transit service. The following projects are applicable to Oregon City.

- Walkability assessment at Molalla Avenue / County Red Soils Campus for pedestrian obstacles and recommendations for any needed projects.
- Portland to Milwaukie Light Rail Project, which will connect downtown Portland to Milwaukie and connect to Frequent Service buses from the Oregon City Regional Center.
- A proposed Bus Rapid Transit (BRT) corridor following I-205 between Clackamas Town Center possibly stretching as far as Beaverton, with service to Oregon City, Tualatin, and Tigard.
- Frequent bus service line expansion to and from Oregon City, primarily around the Oregon City Transit Center.

Oregon City Capital Improvement Plan (2008): The Oregon City Capital Improvement Plan recommended various street modernization projects to comply with City standards, projects at several intersections, and several intersection or roadway capacity or operational projects.

Oregon City Trails Master Plan (2004): The Oregon City Trails Master Plan recommends seven regional trails, 25 community trails, and 34 local trails to be constructed over the next 25+ years.

Oregon City McLoughlin Boulevard Enhancement Plan (2005): The McLoughlin Boulevard Enhancement Plan illustrates motor vehicle, pedestrian and bicycle projects on OR 99E (McLoughlin Boulevard) from Railroad Avenue to the Clackamas River Bridge.

Oregon City Downtown Community Plan (1999): The Downtown Community Plan updated the comprehensive plan and zoning code and established a vision and implementing strategies for growth and improvement of the designated Metro Regional Center in the downtown Oregon City vicinity. The plan emphasizes the creation of pedestrian-friendly places, varied mixed use developments, new open space, and civic amenities. The plan had the following transportation recommendations:

- Widening of McLoughlin Boulevard near I-205
- Widening the I-205 southbound on-ramp
- Connecting 12th Street to McLoughlin Boulevard
- Modifying the Main Street/7th Street intersection
- Widening 14th Street
- Improving and signalizing several intersections

[17] TriMet Transit Improvement Plan: http://trimet.org/tip/index.htm

- Creating new linkages that improve local circulation in the landfill area near OR 213 and Washington Street
- Creating McLoughlin Boulevard and Washington Street as bicycle corridors
- Creating Main Street and Washington Street as primary pedestrian corridors
- Constructing the multi-purpose pathway from the Cove to downtown
- Preserving pedestrian facilities and completing missing links
- Enhancing local transit service to the study area and other parts of Oregon City
- Establishing a Transportation Management Association with assistance from Tri-Met.

Oregon City Downtown Circulation Plan and Parking Study (2010): The Downtown Circulation Plan recommended restoring two-way traffic to Main Street between 6th and 9th Streets, along 7th Street between Main and Railroad, and on Railroad Avenue between 6th and 7th Streets, maximizing curbside and off-street parking, and opportunities for pedestrian and bike projects that connect the downtown and adjacent neighborhoods.

Actions or Strategies to be considered in Updating the TSP

Several of the documents reviewed identified transportation actions or strategies that will be considered in updated the Oregon City TSP. The actions or strategies include:

Oregon City Comprehensive Plan (2004): The Oregon City Comprehensive Plan ("Comprehensive Plan") is intended to meet the requirements of the Statewide Planning Goals and the regional Urban Growth Management Functional Plan and to guide the community's vision for the future growth and development of the city. The plan is founded on six principals: promote sustainability and sustainable development; contain urban development; promote redevelopment; protect natural resources; foster economic vitality; provide efficient and cost-effective services, and; ensure a sense of history and place. Comprehensive Plan goals and policies are organized under the same headings as the Statewide Planning Goals. Section 12, Transportation, includes background information and key policy points for the following long-range plans, considered "ancillary plans" to the Comprehensive Plan: Oregon City Transportation Plan (2001, to be updated with this planning project); Oregon City Downtown Community Plan (1999), 7th Street Corridor Design Plan (1996), and Molalla Avenue Boulevard and Bikeway Improvements Plan (2001). This section of the Comprehensive Plan also notes that the city was working on plans for the OR 99E corridor to improve access control, landscaping, pedestrian safety, and the connection to the riverfront (*Oregon City McLoughlin Boulevard Enhancement Plan*) and a Street Connectivity Plan that would comply with the RTP design standards. Information contained in Section 12 pertaining to roadway design standards, multi-modal transportation, rail, marine, and air transportation has been summarized from the 2001 TSP. This information, as well as subsections summarizing information technologies, infrastructure funding, and parking, will need to be updated to be consistent with the information developed for the updated TSP.

In addition to descriptions of the existing transportation system, Section 12 contains the City's adopted transportation goals and policies. Comprehensive Plan policies will need to be made consistent with modified and new transportation policies developed as part of the TSP update.

Oregon City Municipal Code (2010): The City of Oregon City's Zoning Map displays the type and location of land uses in the City. The land use section of the Code implements the Comprehensive Plan by providing descriptions of zone designations, allowable uses within those zones, and development regulations. In addition to these underlying zones, the City adopted a Natural Resources Overlay District (Chapter 17.49), Geologic Hazards Overlay (Chapter 17.44), Floodplain Overlay District (Chapter 17.42), Willamette River Greenway Overlay (Chapter 17.48) and a Historic Overlay District (Chapter 17.40). The following is an overview of code sections that may need to be updated, consistent with the findings and recommendations of the updated TSP.

Site Plan and Design Review is required for all new non-residential development and multi-family uses in all zones.

Standards are found in Chapter 17.62 and include requirements for building location, orientation and design as well as parking, ingress and egress, street connectivity and access to be obtained through an alley when feasible (see Section 17.62.050 – Standards). Sidewalks are required in accordance with the city's transportation master plan and street design standards (17.62.050.8) and code requirements include a number of standards to ensure a "well-marked, continuous and protected on-site pedestrian circulation system (17.62.050.9)" for safe pedestrian access through the parking lot, between building entrances and between the main entrance and the street.

Improvements to the right-of-way, pedestrian ways, bike routes and bikeways, and transit facilities must and be consistent with the TSP and design standards in Title 17. When approving land use actions, the City requires all relevant intersections to be maintained at the minimum acceptable level of service (LOS) upon full build-out (17.62.050.15).

To further promote transit (and pedestrian travel), there are additional development requirements pertaining to building orientation and entrance location for development on a transit street (Section 17.62.080). The Municipal Code provides Tri-Met the authority to require transit-related improvements to be constructed at the time of development (17.62.050.16).

Chapter 16.08 of the Municipal Code controls the process and approval standards applicable to subdivisions. The requirements for a preliminary subdivision plat include a Traffic/Transportation Plan with the following information (16.08.025.B):

- A detailed site circulation plan showing proposed vehicular, bicycle, transit and pedestrian access points and connections to the existing system, circulation patterns and connectivity to existing rights-of-way or adjacent tracts, parking and loading areas and any other transportation facilities in relation to the features illustrated on the site plan

- A traffic impact study prepared by a qualified professional transportation engineer, licensed in the state of Oregon, that assesses the traffic impacts of the proposed development on the existing transportation system and analyzes the adequacy of the proposed internal transportation network to handle the anticipated traffic and the adequacy of the existing system to accommodate the traffic from the proposed development. The City Engineer may waive any of the foregoing requirements if determined that the requirement is unnecessary in the particular case.

Chapter 16.12 details the minimum standards for land division approval. Transportation circulation and connectivity are supported through block length maximums (16.12.020) and pedestrian and bicycle access to activity centers, where this access is not provided via street right-of-way ("discontinuous street right-of-way," Section 16.12.035). Applicants are "responsible for improving the city's planned level of service on all public streets" and "for designing and providing adequate vehicular, bicycle and pedestrian access to their developments (16.12.095)." Chapter 16.08 of the Municipal Code controls the process and approval standards applicable to subdivisions. The requirements for a preliminary subdivision plat include a traffic/transportation plan prepared by a professional transportation engineer (16.08.025.B) showing onsite and nearby vehicular, pedestrian and bike circulation.

Development is also subject to compliance with Title 12 of the Municipal Code. Chapter 12.04 identifies standards for streets based on the classification in the TSP. TSP figures from the TSP are incorporated into the code by reference and include Figure 5-1: Functional Classification System and New Roadway Connections; Figure 5-3: Pedestrian System Plan; Figure 5.6: Bicycle System Plan; and Figure 5.7: Public Transit System Plan (Section 12.04.180). The City has a different design standard for "constrained" local streets and rights-of-way, as shown in Table 12.04.045, and requires that these narrower facilities meet minimum life safety requirements (Section 12.04.200). Minimum street intersection spacing standards are included in Table 12.04.040. Street design standards in Chapter 12.04 also address designing for pedestrian and bicycle safety (12.04.245) and transit (12.04.260). Requirements and standards for pedestrian and bicycle accessways (defined as an off-street path or way) are also found in Chapter 12.24, while street trees are discussed in Chapter 12.08.

Parks & Recreation Master Plan (2008): The Oregon City Parks and Recreation Master Plan Update is intended to help meet the needs of current and future residents by positioning Oregon City to build on the community's unique parks and recreation assets and identify new opportunities. The following are guiding themes expressed through the community planning process:

- Build on Oregon City's natural and recreational outdoor assets
- Support a pedestrian-friendly, "walkable" community, including bicycling
- Enhance the "quality of life" for residents through parks and recreation
- Create new funding mechanisms to sustain the level of standards the community supports

- Balance passive, self-directed, and active recreational opportunities through goals and strategies
- Maintain and upgrade the existing assets and expand park and recreation opportunities as opportunities arise
- Expand citywide events
- Further embrace the historical aspects of Oregon City

Oregon City Futures: A Strategy for Economic Development (2006): The Oregon City Economic Development report is a strategy to guide development and redevelopment of key opportunity areas in Oregon City with an emphasis on economic development. It recommends strategies to help Oregon City in implementing its Metro 2040 designation as one of seven Regional Centers in the Portland Metropolitan Area.

The report identifies the appropriate functions and land uses for the multiple districts within the Oregon City Regional Center, including the Historic Old Town, Blue Heron, Landfill, Clackamette Cove, Waterfront, and the Oregon City Shopping Center Districts. In addition, the key characteristics of several local oriented districts were identified outside of the Regional Center, including the Hospital, Seventh Street Corridor, Hilltop, College, and Industrial Districts.

Oregon City Urban Renewal Plan (2007): The Oregon City Urban Renewal Plan is intended to eliminate blighting influences and to implement goals and objectives of Oregon City's Comprehensive Plan. The boundary of the Renewal Area includes the Downtown, the Park Place Interchange, the Lagoon/Waterfront, the End of Trail, the Washington/7th Corridor, and the Heritage Center areas. Inadequate streets and traffic congestion, the lack of pedestrian and bicycle facilities, parking and other transportation deficiencies have been identified as issues contributing to the depressed conditions in the urban renewal area, and are considered constraints to the future development called for in the Oregon City Comprehensive Plan. Transportation improvements may include the construction, reconstruction, repair or replacement of streets, traffic control devices, bikeways, pedestrian ways and amenities, and multi-use paths.

Main Street Oregon City Program (2008): The Main Street Oregon City program[18] is designated as a Performing Main Street by the National Trust for Historic Preservation. The program works to facilitate, coordinate, and create an environment that generates a positive downtown image, preserves historic and cultural landmarks, and stimulates the economic vitality and investment in Oregon City's downtown area. The Main Street program gathers downtown stakeholders together to act as a catalyst for change in Oregon City's 167 year old downtown. This volunteer led initiative is working to make Oregon City a better place to live, work and visit.

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[18] Main Street Oregon City program: http://downtownoregoncity.org/

TriMet Bike Parking Design Standards: Access to transit via bicycle is a key element of the TriMet's desire for a total transit system. Providing convenient, visible, and secure bicycle parking is a cost-effective way to increase the catchment area of transit. This document supplements the TriMet Design Criteria and describes design considerations for bicycle parking at light rail transit (LRT) stations, commuter rail stations, and transit centers. These guidelines were developed using survey, inventory, and count data as well as research of best practices and recommendations. The following topics are addressed:

- Bike & Rides
- Bike parking access
- Urban & neighborhood stations: design & layout
- Community stations: design and layout
- Bike & Ride secure area layout
- Bike rack and locker layout
- Bike rack and locker spacing
- Bus stop considerations

TriMet Elderly and Disabled Transportation Plan (2009): The 2009 TriMet Elderly and Disabled Transportation Plan (EDTP) builds upon the 2006 EDTP, which recognized the increased and varied transportation needs for a growing population of elders and people with disabilities. The goal is to offer a range of services that match individual abilities and support customer independence and convenience, but also promote fixed route and other lower-cost options as the best use of scarce transportation resources while emphasizing coordination and reducing redundancy. The recommendations of the plan include:

- Make the RideWise consumer education and travel training program a standard and fully coordinate a new and different TriMet LIFT paratransit eligibility process with RideWise. This program gives people freedom, independence and choice.
- Neighborhood shuttles and shopper shuttles to take elders and people with disabilities (E&D) to fixed route transit and to activities, such as grocery shopping, that are difficult to do on the bus. These are hybrid fixed route/paratransit services, so trips can be grouped, but the service is personalized.
- Involving people with disabilities and elders in sensitivity awareness and training for fixed route and paratransit drivers, in fixed route customer service monitoring, in fixed route travel training, and in assisting people with disabilities make transfers from one route to another or use the system beyond an initial training period.
- Give organizations used accessible vans in exchange for providing rides to elders and people with disabilities and recruiting members to be volunteer drivers in the Ride Connection community-based transportation program.
- 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. The total fixed route transit system from the

waiting area, customer service by the operators, priority seating, and security will need to be continually monitored for accessibility and improvement.

- A truly multi-modal transportation system will have pedestrian-safe communities with sidewalks. This plan recommends beginning by developing a Pedestrian Master Plan for one suburban area that can be used as a model by other communities.
- The increase in fatal crashes involving drivers over age 75 can be attributed in part to the driving environment — complicated intersections, hard-to-read signs, badly timed traffic lights. This plan recommends Federal Highway Administration (FHWA) guidelines be adopted for signage, intersection design, pavement markings, lighting, merging lanes for entering freeways and many other roadway features that take into account the limitations of older drivers.
- Older drivers must deal with gradual changes in functioning, changes in their reflexes, their ability to make quick decisions, and their vision at night. This plan recommends older driver safety programs be regularly scheduled throughout the tri-county area and that the programs introduce people to their public transit options as well.

Goal 5 Inventory (2011): Oregon City completed Goal 5 inventory requirements by designating several wetland, open space, riparian corridors, and historically designated structures throughout the City and within the Canemah National Register Historic District and the McLoughlin Conservation District.

Major Developments since 2001: Major developments since the 2001 Oregon City TSP can be found at: http://www.orcity.org/planning/landuse

Transportation Funding Mechanisms: Oregon City has the following current transportation funding mechanisms:

- Transportation System Development Charges (SDCs)
- Metro regional flexible funds
- ODOT flexible funds
- ODOT Pedestrian/Bicycle grant program
- Federal Highway Administration Transportation Enhancement grant program administered by ODOT
- Federal Appropriation and Authorization funds
- Pavement Maintenance Utility Fund

Appendix A: Applicable Plan and Policies

The following plans and policies were reviewed for the Oregon City TSP Update:

State of Oregon

- Transportation System Planning Guidelines
- Transportation Planning Rule (OAR 660-012-0010)
- Oregon Statewide Planning Goals
- Oregon Access Management Rule (OAR 734-051)
- Oregon Transportation Plan
- Oregon Highway Plan
- ODOT Highway Design Manual
- 2010-2013 Statewide Transportation Improvement Program

Metro

- Metro 2035 Regional Transportation Plan
- Metro 2035 Regional Transportation Functional Plan
- Metro 2040 Growth Concept
- Metro Non-Single Occupancy Vehicle (SOV) Target Actions Study
- Metro Regional Trails and Greenways Plan

City of Oregon City

- 2001 Oregon City Transportation System Plan
- Oregon City Capital Improvement Plan
- Oregon City Comprehensive Plan
- Oregon City Municipal Code
- Oregon City McLoughlin Boulevard Enhancement Plan
- Oregon City Downtown Community (Regional Center) Plan
- Oregon City Urban Renewal Plan
- Oregon City Downtown Main Street Program
- Goal 5 Inventory and Map
- Inventory of all major development or transportation projects and annexations constructed since 2001
- List of current funding mechanisms including any City projections from System Development Charges or other existing funding mechanisms
- Oregon City Downtown Circulation Plan and Parking Study
- Parks and Recreation Master Trails Plan
- Parks and Recreation Master Plan

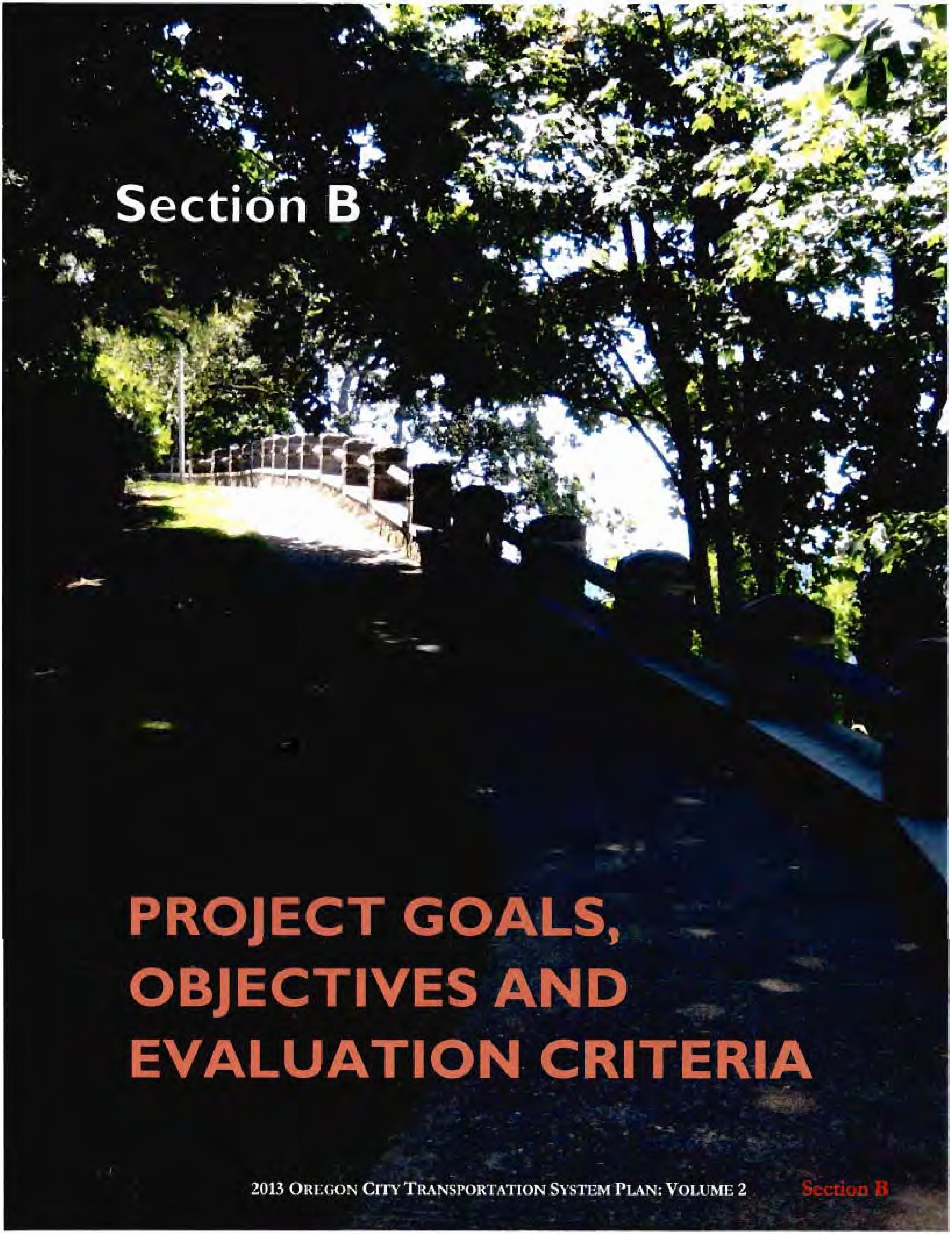
- Oregon City's Economic Opportunities Analysis Report

Clackamas County

- Clackamas County Transportation System Plan

TriMet

- TriMet Transit Investment Plan
- TriMet Bike Parking Design Standards
- TriMet Elderly and Disabled Transportation Plan



Section B

PROJECT GOALS, OBJECTIVES AND EVALUATION CRITERIA

PROJECT GOALS, OBJECTIVES AND EVALUATION CRITERIA

Project Goals and Objectives

The goals and objectives of the Transportation System Plan (TSP) should reflect the vision of the community and provide the policy foundation for the Oregon City TSP. The following recommended goals and objectives considered the past TSP goals and documents adopted after the TSP was completed in 2001. The update to the TSP will include several changes to State and Regional transportation plans and regulations. The TSP will also address and consider evolving transportation engineering, policy, and planning approaches such as active transportation, context sensitive design and Intelligent Transportation Systems.

Goal 1. Provide an equitable, balanced and connected multi-modal transportation system

Provide a "complete" transportation system throughout Oregon City that provides travel options and connects people to jobs, schools, services, recreation, social and cultural institutions within the City.

- **Objective A. Ensure that the transportation system provides equitable access to underserved and vulnerable populations**

  Provide a transportation system that offers people choices, regardless of age, ability, income level and geographic location, and allows them to respond and adapt to changing conditions.

- **Objective B. Reduce total housing and transportation costs for residents**

  Encourage transportation system investments that allow housing diversity and mixed land uses to help reduce the total housing and transportation costs for Oregon City residents.

- **Objective C. Identify new or improved system connections to enhance system efficiency**

  Complete a city-wide connectivity analysis and identify improvements to comply with Metro Regional Transportation Functional Plan, Title 1, section 3.08.110 and provide an efficient, multi-modal transportation system.

- **Objective D. Give priority to connections that help to advance other goal areas**

The priority of investing in new or improved connections is magnified where multiple objectives can be met, e.g., supporting transit, reducing reliance on state highway facilities, deferring major capacity improvements, etc.

- **Objective E. Assure the Oregon City Municipal Code supports a balanced and connected multi-modal transportation system.**

  Review the Municipal Code and make revisions as needed to support a balanced and connected multi-modal transportation system (such as removing barriers which create automobile congestion or impede connectivity among pedestrians or bicyclists.

Goal 2. Increase the convenience and availability of pedestrian, bicycle, and transit modes

Strengthen the pedestrian and bicycle systems in all areas of the city. In addition, identify areas that have existing or future transit-supportive densities and amenities and work with local transit providers such as TriMet, Canby Area Transit (CAT), South Clackamas Transportation District (SCTD), etc. to cost-effectively improve coverage and frequency to achieve greater ridership productivity.

- **Objective A. Identify projects to close gaps and address deficiencies in the pedestrian and bicycle system**

  A system gap analysis should consider proximity to major active transportation centers, such as shopping, schools, and public buildings to determine system gaps and deficiencies.

- **Objective B. Provide safe, comfortable and convenient transportation options**

  Consider active transportation user needs that complement the basic provision of services to encourage higher levels of usage (e.g., street lighting, arterial crossing treatments, bike parking).

- **Objective C. Identify necessary changes to land development code to ensure connectivity between compatible land uses for pedestrian and bicycle trips**

  Land development code provisions should be reviewed to ensure that compatible land uses do not erect barriers which prohibit pedestrian and bicycle connections that limit convenient access and create out-of-direction travel. An example includes borders between high-density residential uses and adjoining retail centers.

- **Objective D. Identify areas that support additional transit services, and coordinate with transit providers to improve the coverage, quality and frequency of services**

  Land uses in Oregon City should be reviewed to identify suitable sites for additional transit services. A mix of land uses and activities should be encouraged to support additional transit service in the City.

- **Objective E. Consider the potential access needs for candidate High Capacity Transit and frequent service bus routes**

  The alignments of the potential future High Capacity Transit (HCT) and existing and/or future frequent service bus routes in Oregon City should be reviewed to consider new or enhanced access needs for prospective station areas.

Goal 3. Enhance the health and safety of residents

Ensure that the transportation system maintains and improves individual health, safety and security by maximizing the comfort and convenience of walking, biking and transit transportation options, public safety and service access.

- **Objective A. Identify improvements to address high collision locations**

  Address high priority safety needs and identify improvements in order to minimize incidents and improve safety for walking, biking and driving trips in the City.

- **Objective B. Identify necessary changes to street design guidelines to support context sensitive design solutions**

  The City's street design guidelines should be responsive to practical needs of individual cases to limit environmental and cost impacts, and the city staff should have authority to approve design exceptions on construction projects that meet the basic needs of the system.

- **Objective C. Reduce impervious street surfaces through "Green Streets"**

  Minimize negative environmental impacts of impervious streets in the City by incorporating "Green Street" techniques to transform streets into landscaped linear park like spaces that capture storm water runoff.

- **Objective D. Provide a network of family-friendly walking and hiking routes**

  Encourage less experienced users to access destinations throughout Oregon City via foot or bike by developing a linked network of shared-use streets and paths that provide more comfortable walking and biking routes. The comfort of the routes should be increased by applying green street features and traffic calming techniques and markings.

Goal 4. Emphasize effective and efficient management of the transportation system

Optimize travel capacity and improve travel conditions by better managing our own travel demands, meeting more of our daily needs within our own community, making our existing transportation facilities as smart and efficient as possible, and being strategic about transportation investments. The City should seek to find innovations and fine tuning of existing systems and policies and avoid or forestall costly major roadway capacity improvements.

- **Objective A. Identify opportunities to reduce the use of state facilities and arterials** for local trips

Areas of the city that have few or no options to traveling on state facilities or arterials should be reviewed to identify possible new or improved local connections.

- **Objective B. Seek to shift vehicle travel to off-peak periods**

  Explore programs to encourage more travel in off-peak hours to better use the existing roadway system. This will include consideration of possible financial incentives for major use sites (e.g., parking pricing, fee discounts), and other travel demand management techniques.

- **Objective C. Maintain the existing transportation system assets.**

  Adequately maintain transportation facilities to preserve their intended function and maintain their useful life.

- **Objective D. Identify opportunities to improve travel reliability and safety with TSMO solutions**

  Seek to advance system management operations strategies that are identified in the Metro Transportation System Management and Operation (TSMO) plan and Metro Regional Travel Options Strategic Plan in helping to preserve the function and quality of operations on state highway facilities and arterials in the City.

- **Objective E. Demand Management**

  Encourage and support the implementation of Transportation Demand Management (TDM) programs.

Goal 5. Foster a sustainable transportation system

A key approach to building a sustainable community requires a transportation system that is environmentally and fiscally sustainable that focuses on decreasing vehicle emissions and transportation related greenhouse gas emissions.

- **Objective A. Support alternative vehicle types by identifying potential electric vehicle plug-in stations and developing implementing code provisions**

  Identify potential supporting locations for electric vehicle plug-in stations and develop changes to building codes to include electric services to support future at home and at work plug in stations.

- **Objective B. Identify existing and future expected VMT levels within the City of Oregon City, and consider opportunities and actions needed to meet RTP targets**
- **Objective C. Encourage alternatives to daily single-occupancy vehicle commuting.**

  Encourage and support technology that encourages carpooling, cooperatives, walking, bicycling, etc.

- **Objective D. Develop and support alternative mobility standards on state facilities and City streets where necessary**

  Identify where alternative mobility standards on state facilities may be necessary for potential future action, consistent with Oregon Highway Plan provisions and explore alternative mobility standards for City streets located in constrained areas.

- **Objective E. Identify areas where alternative land use types would significantly shorten trip lengths or reduce the need for motor vehicle travel within the city**

  The proximity between existing and future land uses may be reviewed to encourage land use patterns and transportation systems that make it more convenient for people to walk, bicycle, use transit and drive less to meet their daily needs.

- **Objective F. Minimize impacts to the natural environment.**

  Avoid adverse impacts to the scenic, natural and cultural resources in Oregon City.

Goal 6. Ensure the transportation system supports a prosperous and competitive economy

Support a prosperous and competitive economy by preserving and enhancing business opportunities, and ensuring the efficient movement of people and goods.

- **Objective A. Freight access and truck travel reliability**

  Improve the freight system efficiency, access, capacity and reliability.

- **Objective B. Increase the distribution of travel information to maximize the reliability and effectiveness of existing major roadway facilities**

  Identify solutions to increase the distribution of travel information through active management (TSMO) techniques and Intelligent Transportation Systems (ITS) solutions.

- **Objective C. Reinforce growth and multi-modal access to 2040 Target Areas**

  Transportation investments should be consistent with and support development within the Oregon City Regional Center, the 7th Street/Molalla Avenue corridor, the OR 99E corridor and the Employment land in the southeast portion of Oregon City.

- **Objective D. Seek to advance travel strategies that are identified in the Metro Regional Mobility Corridors**

Goal 7. Identify solutions and funding to meet system needs

The City will identify transportation investments that can be made with available funding to ensure that system needs can be delivered for growth planned within the community.

- **Objective A. Identify stable revenue sources for transportation investments to meet** the needs of the City, as documented in the updated TSP.

- Objective B. Consider costs and benefits when identifying project solutions and prioritizing public investments.
- Objective C. Identify new funding sources to leverage high priority transportation projects.

Goal 8. Comply with state and regional transportation plans

The City will meet the requirements of the Oregon Transportation Planning Rule, the Oregon Highway Plan, and the Metro 2035 Regional Transportation Plan (RTP) and Regional Functional Transportation Plan (RFTP).

- Objective A. Meet the mobility standards for state highways, or develop and propose alternative standards, consistent with Oregon Highway Plan provisions.
- Objective B. Develop TSP policy and municipal code language to implement the TSP update.
- Objective C. Consider regional needs identified in the Metro RTP, including those identified with the mobility corridors.
- Objective D. Consider and evaluate transportation solutions and strategies consistent with the guidelines and priorities of the Metro RFTP.

Evaluation Criteria

Project alternatives developed through this update will be evaluated by criteria that are an extension from the goals and objectives. These project level criteria provide a point-based technical rating method that will be used to evaluate how well proposed design alternatives meet the measure of effectiveness criteria. By summing ratings (and weighting if desired), alternatives can be compared. In this way, a consistent method will be used to evaluate and rank the alternatives.

Evaluation Criteria and Scoring Methodology

The evaluation criteria were selected based on the City's existing and proposed transportation related goals and objectives. The criteria focuses on compliance with state and local plans and policies, engineering design requirements, and a desire to maximize positive (and minimize negative) economic, social (livability), and environmental impacts. Table 1 lists the evaluation criteria and the corresponding scoring methodology.

Table 1: Oregon City TSP Evaluation Criteria and Scoring

Measure of Effectiveness	Evaluation Score	
Goal 1. Provide an equitable, balanced and connected multi-modal transportation system		
Equitable Access Improves access to underserved or vulnerable populations	+1	Increases access to underserved or vulnerable populations
	0	No change
	-1	Decreases access to underserved or vulnerable populations
Transportation and Housing Cost Reduces total transportation and housing costs	+1	Reduces transportation and housing costs
	0	No change
	-1	Increases transportation and housing costs
Connectivity Connection enhances system efficiency	+1	Improves system efficiency
	0	No change
	-1	Negative impact on system efficiency
Multiple Objectives Connection or improvement satisfies multiple objectives	+1	Satisfies multiple objectives
	0	Satisfies single objective
	-1	Satisfies single objective, but has negative impact on another
Goal 2. Increase the convenience and availability of pedestrian, bicycle, and transit modes		
Pedestrian and Bicycle Facilities Adds bikeway and walkways that fill in system gaps, improve system connectivity, and are accessible to all users.	+1	Improves pedestrian or bicycle connectivity or accessibility
	0	No change
	-1	Reduces connectivity or accessibility
Transit Facilities Improves access to transit facilities. Promotes transit as a viable alternative to the single occupant vehicle.	+1	Improves transit facilities
	0	No change
	-1	Negative impact on provision of services
Provision of services Improves the basic provision of services to encourage higher levels of usage for walking and biking trips	+1	Improves provision of services
	0	No change
	-1	Negative impact on provision of services
Goal 3. Enhance the health and safety of residents		
Safety Improves safety of the transportation system.	+1	Increases safety of the transportation system
	0	No change
	-1	Has potential geometric or user safety concerns
Health	+1	Encourages active living and physical

Measure of Effectiveness		Evaluation Score
Encourages active living and physical activity.		activity
	0	No change
	-1	Discourages active living and physical activity
Pollution Impact Minimizes transportation related pollution.	+1	Reduces transportation related pollution
	0	No change
	-1	Increases transportation related pollution
Goal 4. Emphasize effective and efficient management of the transportation system		
Deferred Investment Reduces need for major highway project construction	+1	Reduces need for major investment
	0	No change
	-1	Accelerates need for major investment
Improved Roadway Efficiency Implements Transportation Demand Management (TDM) or other strategies to create greater mobility, reduce auto trips, make more efficient use of the roadway system, and minimize air pollution.	+1	Improves roadway efficiency
	0	No change
	-1	Negative impact on roadway efficiency
Daily Traffic Capacity Improvement makes daily traffic capacity more reliable.	+1	More reliable daily traffic capacity
	0	No change
	-1	Less reliable daily traffic capacity
Alternative Routes Enhances travel for local trips off the state highway system	+1	Reduces the use of state facilities for local trips
	0	No change
	-1	Increases the use of state facilities for local trips
Goal 5. Foster a sustainable transportation system		
Non-Single Occupancy Vehicle (SOV) Focus Emphasizes the movement of people over vehicles, which reduces the citywide vehicle-miles-travelled (VMT)	+1	Improves non-SOV targets
	0	No change
	-1	Negative impact on non-SOV targets
Environment Minimizes impact to the natural environment	+1	Enhances the natural environment
	0	No change
	-1	Negatively impacts the natural environment
Land Use Supports alternative land use types	+1	Greater potential for mixed land uses
	0	No change

Measure of Effectiveness	Evaluation Score	
	-1	Less potential for mixed land uses
Goal 6. Ensure the transportation system supports a prosperous and competitive economy		
Freight Improves freight access/connectivity	+1	Improves freight facilities
	0	No change
	-1	Negative impact on freight facilities
Corridor Reliability Implements strategies to provide stable and reliable auto and truck traffic flows on major facilities.	+1	Improves roadway reliability
	0	No change
	-1	Negative impact on roadway reliability
2040 Target Areas Improves access in the Metro 2040 Target Areas	+1	Improves access in 2040 Target Area
	0	No change
	-1	Negative impact on access in 2040 Target Area
Goal 7. Identify solutions and funding to meet system needs		
Fundability Available funding sources exist to implement projects in a timely fashion.	+1	Funding sources are available
	0	Feasible costs, but no identified funding
	-1	High costs and no funding expected
Cost Effectiveness Assumed project benefits exceed project costs	+1	Cost effective solution
	0	Average cost solution
	-1	Not a cost effective solution
Goal 8. Comply with state and regional transportation plans		
Compatibility Compatible with other jurisdiction's plans and policies, (including adjacent cities, counties, Metro or ODOT).	+1	Compatible with other plans and contributes to their implementation
	0	Compatible with other plans, but does not necessarily contribute to their implementation
	-1	Not compatible with other plans
Agency Standards Consistent with the standards of the City, Region, and State as a whole.	+1	Consistent with all standards
	0	May require some deviations to standards, but likely to be approved
	-1	Inconsistent with standards and not expected that deviations would be approved

Appendix

Table A1: Comparison of City TSP Goals and Objectives with Metro 2035 RTP Goals

Metro 2035 RTP Goal and Policy	Oregon City TSP Goal / Objective
1.1 Compact Urban Form and Design - use transportation investments to reinforce growth in and multi-modal access to 2040 Target Areas and ensure that envelopment in 2040 Target Areas is consistent with and supports the transportation investments.	Goal 1 / Objective C
1.2 Parking Management - minimize the amount and promote the efficient use of land dedicated to vehicle parking	Goal 3/ Objective B
2.2 Regional Passenger Connectivity - ensure reliable and efficient connections between passenger intermodal facilities and destinations in and beyond the region to improve non-auto access to and from the region and promote the region's function as a gateway for tourism	Goal 2/ Objective D & E
2.3 Metropolitan mobility - maintain sufficient total person-trip and freight capacity to allow reasonable and reliable travel times	Goal 2/ Objective F Goal 3/ Objectives A, B, C & D
3.1 Travel Choices - achieve modal targets for increased walking, bicycling, use of transit and shared ride and reduced reliance on the automobile and drive alone trips	Goal 2/ Objective A, B, C, D & F Goal 4/ Objective B
3.2 Vehicle Miles of Travel - reduce vehicle miles traveled per capita	Goal 5/ Objective A, B, C & D
3.3 Equitable access and barrier free transportation - provide affordable and equitable access to travel choices and serve the needs of all people and businesses, including people with low income, children, elders and people with disabilities	Goal 1/ Objectives A & C Goal 2/ Objectives A, B & D
4.1 Traffic Management - Apply technology solutions to activity manage the transportation system.	Goal 4/ Objective A Goal 5/ Objective A
4.4 Demand management - implement services, incentives and supportive infrastructure to increase telecommuting, walking, biking, taking transit, and carpooling, and shift travel to off-peak periods	Goal 3/ Objective B Goal 4/ Objective C Goal 5/ Objective C
4.5 Value Pricing - consider a wide range of value pricing strategies and techniques as a management tool	Goal 3/ Objective B
5.1 Operational and public safety - reduce fatalities, serious injuries and crashes per capita for all modes of travel	Goal 4/ Objective D Goal 2/ Objective B
6.5 Climate Change - Reduce transportation related greenhouse gas emissions	Goal 5/ Objective A, B, C & D
7.1 Active Living - Provide safe, comfortable and convenient transportation options that support active living and physical activity to meet daily needs and access services	Goal 2/ All
9.2 Maximize return on public investment - make transportation investment decisions that use public resource effectively and efficiently, using performance-based planning	Goal 6/ Objective B
9.3 Stable and innovating funding - stabilize existing transportation revenue while securing new and innovative long-term sources to build, operate and maintain the system for all modes	Goal 6/ Objectives A, C

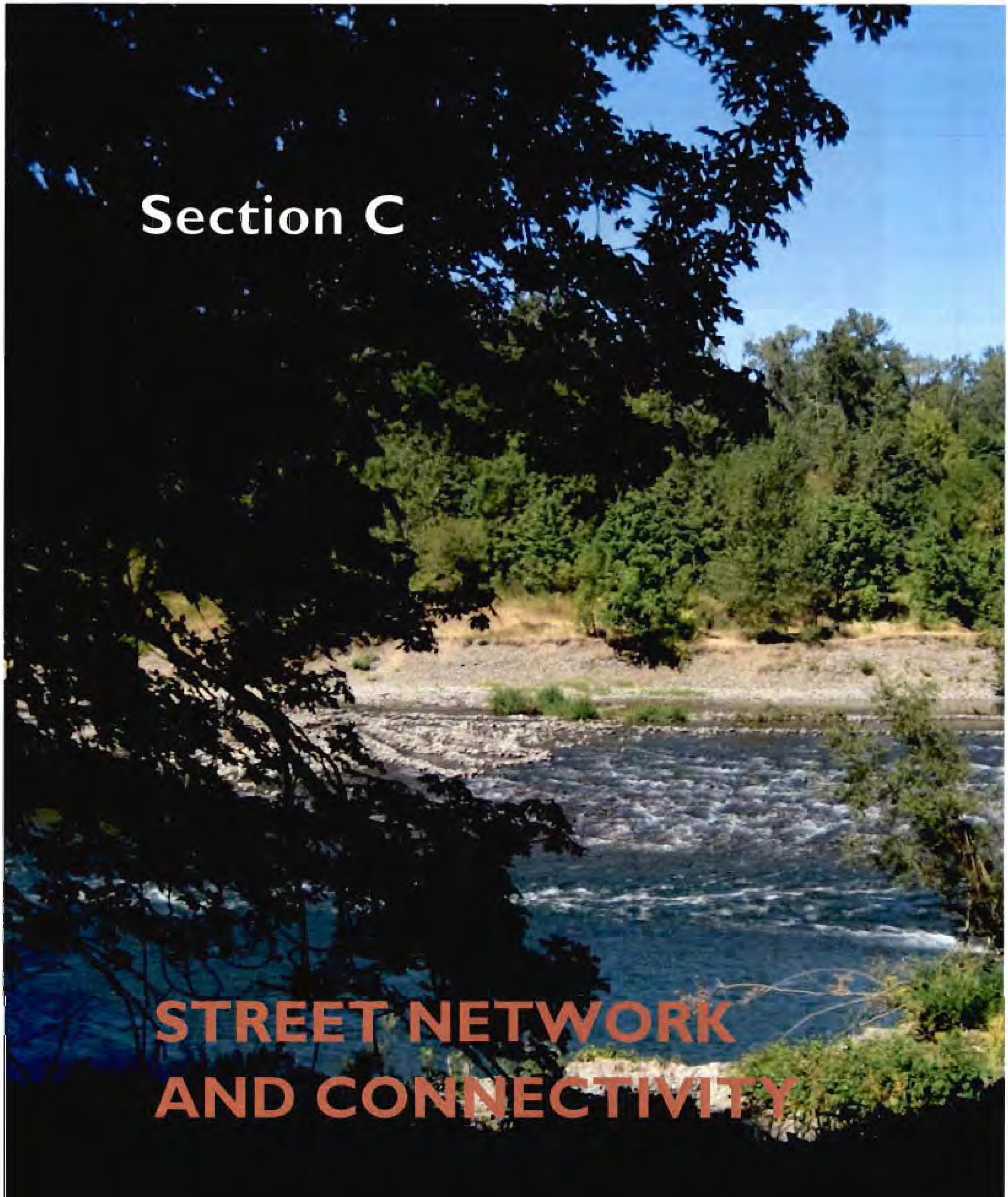
Reference: Metro RTP 2035 Goals and Policies

Ultimately, the goals and objectives of this TSP update will be modified to allow for consistency and updating of the Oregon City Comprehensive Plan, Section 12. Table A2 identifies the existing goals of the Comprehensive Plan and details how the concepts of each goal are addressed in the Goals and Objectives of this TSP Update:

Table A2: Comparison of Existing City TSP Goals and Objectives with Comprehensive Plan

Comprehensive Plan Goal	Oregon City TSP Goal / Objective where Addressed
Goal 12.1 Land Use-Transportation Connection- Ensure that the mutually supportive nature of land use and transportation is recognized in planning for the future of Oregon City.	Goal 1/ Objective A & B Goal 2/ Objective A, B, C & D Goal 4/ Objective B
Goal 12.2 Local and Regional Transit- Promote regional mass transit (South Corridor bus, Bus Rapid Transit, and light rail) that will serve Oregon City.	Goal 2/ Objective D & E Goal 4/ Objective B
Goal 12.3 Multi-Modal Travel Options- Develop and maintain a transportation system that provides and encourages a variety of multi-modal travel options to meet the mobility needs of all Oregon City residents.	Goal 1/ All Goal 2/ All Goal 3/ All Goal 5/ Objective C & D
Goal 12.4 Light Rail- Promote light rail that serves Oregon City and locate park-and-ride facilities at convenient neighborhood nodes to facilitate access to regional transit.	Goal 2/ Objective A, B, C, D & E Goal 4/ Objective B
Goal 12.5 Safety- Develop and maintain a transportation system that is safe.	Goal 2/ Objective A & B Goal 4/ Objective A & D
Goal 12.6 Capacity- Develop and maintain a transportation system that has enough capacity to meet users' needs.	Goal 1/ Objective A Goal 2/ Objective A, B & F Goal 3/ All Goal 4/ Objective A & C
Goal 12.7 Sustainable Approach- Promote a transportation system that supports sustainable practices.	Goal 1/ Objective A & D Goal 2/ All Goal 4/ Objective B Goal 5/ All
Goal 12.8 Implementation/Funding- Identify and implement needed transportation system improvements using available funding.	Goal 4/ All Goal 5/ Objective A Goal 6/ All

Section C



STREET NETWORK AND CONNECTIVITY

This document provides an overview of the street system in Oregon City. Included is a detail of the multi-modal street system, an overview of multi-modal connectivity and an outline of recommended implementation measures required to update the street system as part of the TSP update.

Multi-Modal Street System

Traditional roadway designs focus on the safety and flow of motor vehicle traffic. The one size fits all design approach is less effective at integrating the roadway with the character of the surrounding area and addressing the needs of other users of a roadway. For instance, the design of an arterial roadway through a commercial area has often traditionally been the same as one through a residential neighborhood, both primarily focused on the movement of motor vehicles.

Oregon City recognizes that all roadways within the City should be multi-modal or "complete streets", with each street serving the needs of the various travel modes. The City also realizes that not all streets should be designed the same. To account for this, Oregon City classifies the street system into a hierarchy organized by function and street type (representative of their places). These classifications ensure that the streets reflect the neighborhood through which they pass, consisting of a scale and design appropriate to the character of the abutting properties and land uses. The classifications also provide for and balance the needs of all travel modes including pedestrians, bicyclists, transit riders, motor vehicles and freight. Within these street classifications, context sensitive design may result in alternative cross-sections.

Multi-Modal Street Function

Functional classification of roadways is a common practice in the United States. Traditionally, roadways are classified based on the type of vehicular travel it is intended to serve (local versus through traffic). In Oregon City, the functional classification of a roadway (shown in Figure 1) determines the level of mobility for all travel modes, defining its design characteristics (such as minimum amount of travel lanes), level of access and usage within the City and region. The street functional classification system recognizes that individual streets do not act independently of one another but instead form a network that works together to serve travel needs on a local and regional level. From highest to lowest intended usage, the classifications are freeway, expressway, major arterials, minor arterials, collectors and local streets. Roadways with a higher intended usage generally provide more efficient motor vehicle traffic movement (or mobility) through the City, while roadways with lower intended usage provide greater access for shorter trips to local destinations.

Freeways and Expressways are limited access state roadways. These roadways serve the highest volume of motor vehicle traffic and are primarily utilized for longer distance regional trips. Both OR 213 and I-205 have posted speed limits of 55 miles per hour.

Major Arterial Roadways are intended to move traffic through Oregon City. These roadways generally experience higher traffic volumes and often connect to locations outside of the City (such as Beavercreek Road) or act as a corridor connecting many parts of the City (such as Molalla Avenue). Posted speed limits on these roadways are generally between 30 to 40 miles per hour, with the higher speeds posted in less urbanized areas and lower speeds in areas with more congestion such as downtown.

Minor Arterial Roadways are intended to serve local traffic traveling to and from major arterial roadways. These roadways provide greater accessibility to neighborhoods, often connecting to major activity generators and provide efficient through movement for local traffic. Posted speeds on minor arterial roadways typically range between 25 and 45 miles per hour.

Collector Roadways often connect the neighborhoods to the minor arterial roadways. These roadways serve as major neighborhood routes and generally provide more direct property access or driveways than arterial roadways. Posted speeds on collector roadways generally range between 25 and 35 miles per hour.

Local Roadways provide more direct access to residences in Oregon City. These roadways are often lined with residences and are designed to serve lower volumes of traffic with a statutory speed limit of 25 miles per hour.

Functional Classification Changes

The functional classifications of transportation routes in Oregon City were reviewed to determine the appropriateness of the classification and connectivity. The Metro Regional Transportation Functional Plan requires that, to the extent possible, arterials be spaced at one-mile intervals and collectors to be spaced at half-mile intervals[1]. Overall, most areas in Oregon City comply with the spacing standards to the extent possible. Existing development, topography, environmental areas, the Urban Growth Boundary (UGB) and OR 213 each pose a significant constraint in further improving the arterial and collector connectivity in Oregon City. The functional classifications of several roadways throughout the City were modified to address the connectivity gaps identified below, or due to adequate connections in the immediate area. The updated functional classifications can be seen in Figure 1, while the classification changes are shown in the Appendix.

[1] Metro Regional Transportation Functional Plan, Section 3.08.110 Street System Design Requirements

Arterial Connectivity gaps were identified in the following areas (see Figure 2):

1. An east to west gap between OR 99E and South End Road. *Connectivity hindered by topography and alignment would be outside of the UGB.*
2. An east to west gap between South End Road and OR 213 (near the south City limits). *Connectivity hindered by existing development, topography and alignment would be outside of the UGB.*
3. An east to west gap between Molalla Avenue and Holly Lane, south of Redland Road and north of Maple Lane Road. *Connectivity hindered by existing development, topography, OR 213 and portions of the alignment would be outside of the UGB.*
4. An east to west gap between OR 213 and Beavercreek Road, near Glen Oak Road. *New arterial classification designated in the area (Meyers Road).*
5. A north to south gap between Holcomb Boulevard and Maple Lane Road, east of OR 213. *New arterial classification designated in the area (Holly Lane).*

Collector Connectivity gaps were identified in the following areas (see Figure 2):

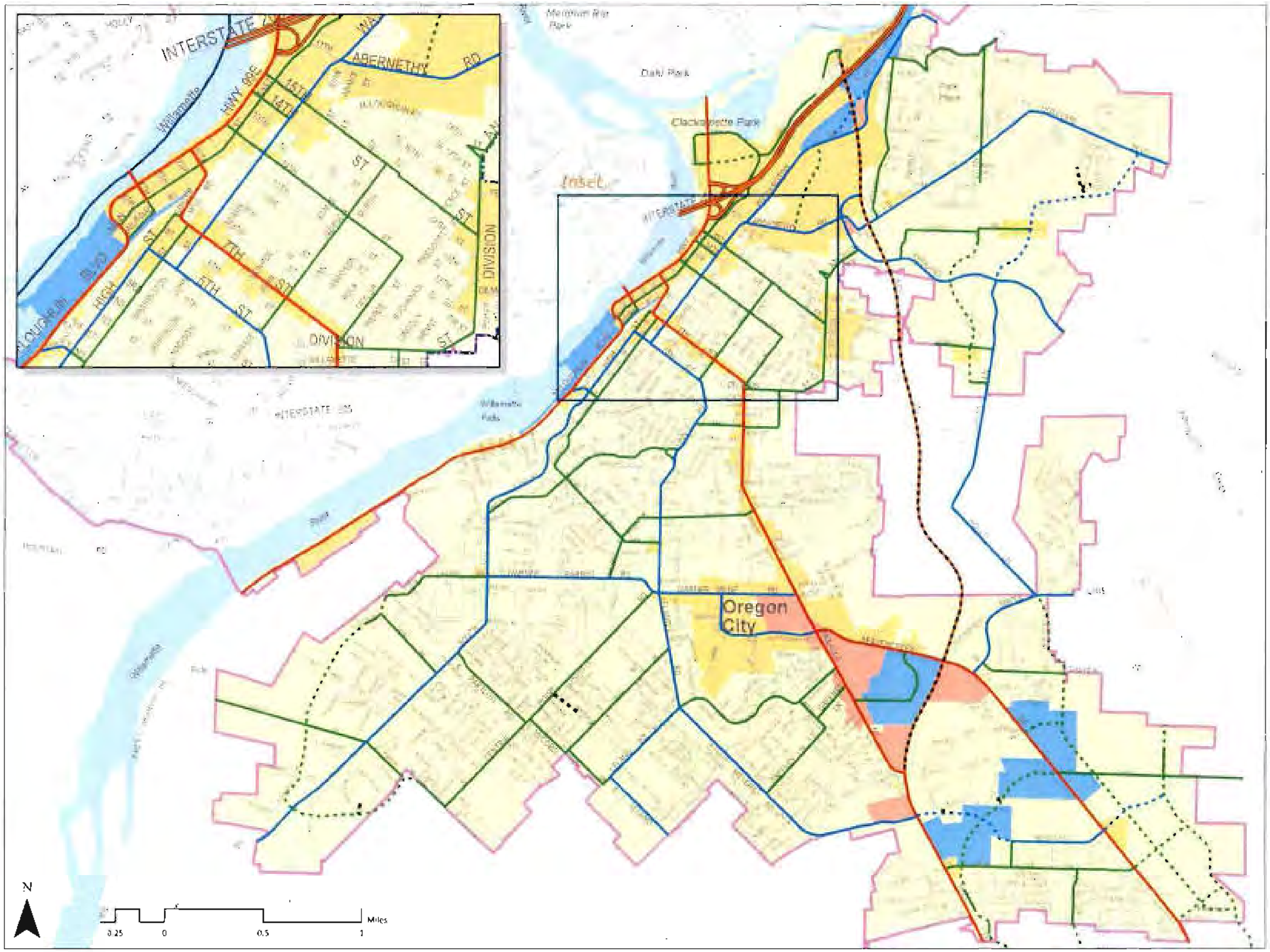
6. An east to west gap between Molalla Avenue and Holly Lane, south of Redland Road and north of Maple Lane Road. *Connectivity hindered by existing development, topography, OR 213 and portions of the alignment would be outside of the UGB.*
7. An east to west gap between OR 99E and South End Road. *Connectivity hindered by existing development, topography and alignment would be outside of the UGB.*
8. A north to south gap between Division Street and Beavercreek Road, west of OR 213. *Connectivity hindered by existing development, topography and alignment would be outside of the UGB.*
9. North to south and east to west gaps between Holcomb Boulevard and Redland Road. *New collector classifications designated in the area.*
10. A north to south gap between Holcomb Boulevard and Maple Lane Road, east of Holly Lane. *Connectivity hindered by topography and alignment would be outside of the UGB.*
11. North to south and east to west gaps to the west of South End Road. *New collector classifications designated in the area.*
12. North to south and east to west gaps, southeast of the Beavercreek Road/ Maple Lane Road intersection. *New collector classifications designated in the area.*

Multi-Modal Street Type

Oregon City further classifies the roadways within the City based on the neighborhood it serves and the intended function for pedestrians, bicyclists and transit riders in that specific area. Within the context of Oregon City's complete street system that will serve all modes, the street type of a roadway defines its cross-section characteristics and determines how users of a roadway interact with the surrounding land use. Since the type and intensity of adjacent land uses and zoning directly influence the level of use by pedestrians, bicyclists and transit riders, the design of a street (including its intersections, sidewalks, and transit stops) should reflect its surroundings.

The street types strike a balance between street functional classification, adjacent land use, zoning designation and the competing travel needs by prioritizing various design elements. Five street types were designated in Oregon City:

- **Mixed-Use Streets** typically have a higher amount of pedestrian activity and are often on a transit route. These streets should emphasize a variety of travel choices such as pedestrian, bicycle and transit use to complement the development along the street. Since mixed-use streets typically serve pedestrian oriented land uses, walking should receive the highest priority of all the travel modes. They should be designed with features such as wider sidewalks, traffic calming (see the traffic calming section later in this document), pedestrian amenities, transit amenities, attractive landscaping, on- street parking, pedestrian crossing enhancements and bicycle lanes.
- **Residential Streets** are generally surrounded by residential uses, although various small shops may be embedded within the neighborhood. These streets often connect neighborhoods to local parks, schools and mixed-use areas. They should be designed to emphasize walking, while still accommodating the needs of bicyclists and motor vehicles. A high priority should be given to design elements such as traffic calming (see the traffic calming section later in this document), landscaped buffers, walkways/ pathways/ trails, on-street parking and pedestrian safety enhancements.
- **Commercial Streets** are primarily lined with retail and large employment complexes. These uses serve customers throughout the City and region and may not have a direct relationship with nearby residential neighborhoods. These streets are somewhat more auto-oriented, but should still accommodate pedestrians and bicyclists safely and comfortably. Design features should include landscaped medians or a two-way left turn lane, sidewalks and bike lanes, pedestrian crossing enhancements and a buffer between the roadway and the sidewalk.
- **Industrial Streets** serve industrial areas. These streets are designed to accommodate a high volume of large vehicles such as trucks, trailers and other delivery vehicles. Pedestrians and bicyclists may be less frequent in these areas, but should still be accommodated safely and comfortably. Roadway widths are typically wider to accommodate larger vehicles. On-street parking should be discouraged.
- **Constrained Streets** are generally located in steep, environmentally sensitive, rural, historic, or development limited areas of the City. These streets may require different design elements that may not be to scale with the adjacent land use. Constrained elements may include narrower or limited travel lanes, and pedestrian and bicycle facilities, or accommodations that generally match those provided by the surrounding developed land uses. To the extent possible, pedestrian and bicycle accommodations should be provided on an adjacent roadway, via a shared-use path or shared within the right-of-way using distinctive design details.



OREGON CITY TRANSPORTATION PLAN

FIGURE 1

Multi-Modal Street System

Legend

Functional Classification

- Freeway
- Expressway
- Major Arterial
- Minor Arterial
- Collector
- Local Street

Planned Roadways (Conceptual Alignment)

- Planned Minor Arterial
- Planned Collector
- Planned Local Street

Street Type

- Commercial
- Industrial
- Residential
- Mixed-Use

- City Limit
- Urban Growth Boundary

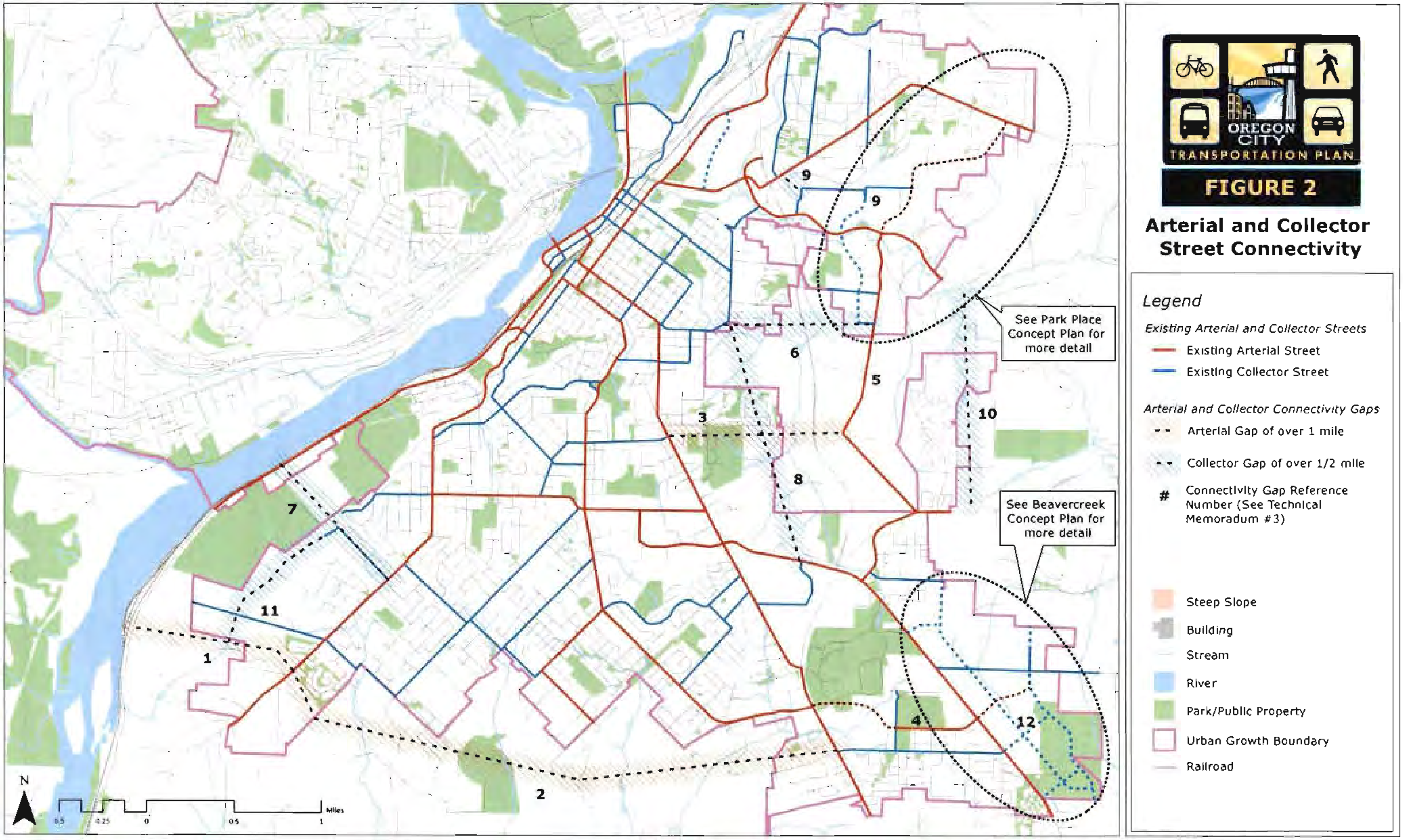


FIGURE 2

Arterial and Collector Street Connectivity

Design Types of Streets

Design of the streets in Oregon City requires attention to many elements of the public right-of-way and considers how the street interacts with the adjoining properties. The four zones that comprise the cross-section of streets in Oregon City, including the context zone, walking zone, biking/on-street parking zone and driving zone, are shown in Figure 9. The design of these zones varies based on the functional classification and street type. Overall, there are 16 different design types, ranging from Mixed-Use Major Arterial to Residential Local Street. Note that a design type is not available for limited access roadways classified as Freeway or Expressway. The maximum design criteria for streets can be seen in Section 12.04.180 of the Oregon City Municipal Code. The City may also reduce or eliminate lower- priority design elements of the street along constrained streets located in steep, environmentally sensitive, rural, historic, or development limited areas of the City.

- **Context Zone:** The context zone is the point at which the sidewalk interacts with the adjacent buildings or private property (see Figure 4). The purpose of this zone is to provide a buffer between land use adjacent to the street and to ensure that all street users have safe interactions.
- **Walking Zone**: This is the zone in which pedestrians travel (see Figure 4). The walking zone is determined by the street type and should be a high priority in mixed-use and residential areas. It includes a clear throughway for walking, an area for street furnishings or landscaping (e.g. benches, transit stops and/or plantings) and a clearance distance between curbside on-street parking and the street furnishing area or landscape strip (so parking vehicles or opening doors do not interfere with street furnishings and/or landscaping). Streets located along a transit route should incorporate furnishings to support transit ridership, such as transit shelters and benches, into the furnishings/landscape strip adjacent to the biking/on-street parking zone.
- **Biking/On-Street Parking Zone:** This is the zone for biking and on-street parking, and is the location where users will access transit. It should include bike lanes or buffered bike lanes. The biking/on-street parking zone is determined by the street type and should be a high priority in mixed-use and residential areas.
- **Driving Zone:** This is the throughway zone for drivers, including cars, buses and trucks and should be a high priority in commercial/ employment and industrial areas. The functional classification of the street generally determines the number of through lanes, lane widths, and median and left-turn lane requirements. However, the route designations (such as transit street or freight route) take presentence when determining the appropriate lane width in spite of the functional classification. Wider lanes should only be used for short distances as needed to help buses and trucks negotiate right-turns without encroaching into adjacent or opposing travel lanes. Streets that require a raised median should include a pedestrian refuge at marked crossings. Otherwise, the median can be narrowed at midblock locations, before widening at intersections for left-turn lanes (where required or needed).

Figure 3: Components of Oregon City Streets

Figure 4: Up Close View of the Context and Walking Zones

Determining Optimum Street Designs

The following steps should be used to determine the optimum cross-section for a street:

Step 1: Determine the functional classification and street type based on Figure 8.

Step 2: Determine the maximum street design as shown in Section 12.04.180 of the Oregon City Municipal Code.

Step 3: Determine if the street is located along a regional truck route, local truck route, or a transit route. If so, the through lane width should be a minimum of 12 feet along a truck route or 11 feet along a transit route. If not, the lane width can be reduced a minimum of 12 feet along major arterials, 11 feet on minor arterials, and 10 feet along collectors and local streets, as determined by the City.

Step 4: Determine if more than two through lanes are needed. More than two through lanes should only be considered if the street and parallel routes cannot effectively accommodate the travel demand.

Step 5: Determine if left-turn lanes are needed at intersections. Intersection design should generally try to minimize pedestrian crossing distance. If turn-lanes are warranted, consider the trade-offs between improved driving mobility and increased crossing distance.

Step 6: Compare the optimum street design to the available right-of-way. If the cross-section is wider than the right-of-way, identify whether right-of-way acquisition is necessary or reduce the width of or eliminate lower-priority elements as determined by the City.

Multi-Modal Connectivity

The aggregate effect of local street design impacts the effectiveness of the regional system when local travel is restricted by a lack of connecting routes, and local trips are forced onto the regional network.[2] Therefore, streets should be designed to keep through motor vehicle trips on arterial streets and provide local trips with alternative routes. Street system connectivity is critical because roadway networks provide the backbone for bicycle and pedestrian travel in the region. Metro's local street connectivity principal encourages communities to develop a connected network of local streets to provide a high level of access, comfort, and convenience for bicyclists and walkers that travel to and among centers.

Connectivity of the existing transportation system was reviewed to identify current deficiencies. These locations will be further addressed in the pedestrian, bicycle and motor vehicle plans Topography, environmental constraints, railroads and existing development may be limiting the connectivity in areas of Oregon City. These factors may not stop the possible connections from being made in the noted areas lacking connectivity, but will affect what modes could be accommodated and the financial viability. The major areas lacking connectivity include:

- East and west connectivity across OR 213 between Redland Road and Beavercreek Road, a distance of over two miles
- East to west connectivity between OR 99E (south of the Canemah neighborhood) and the South End neighborhood, with greater than four miles between connections

A multi-modal connectivity plan for Oregon City is shown in Figure 5. It specifies the general location where new streets or shared-use paths could potentially be installed as nearby areas are developed or as the opportunity arises. The purpose of the plan is to ensure that new developments accommodate circulation between adjacent neighborhoods to improve connectivity for all modes of transportation. The criteria used for providing connections are as follows (as required in the Metro Regional Transportation Functional Plan[3]):

- Provide a full local street connection at least every 530 feet (or 1/10 of a mile), if possible
- Provide a pedestrian and bicycle connection every 330 feet if a full-street connection is not possible

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[2] Metro 2035 Regional Transportation Plan, Local Street Network Concept

[3] Metro Regional Transportation Functional Plan, Section 3.08.110, Subsection E, Street System Design Requirements

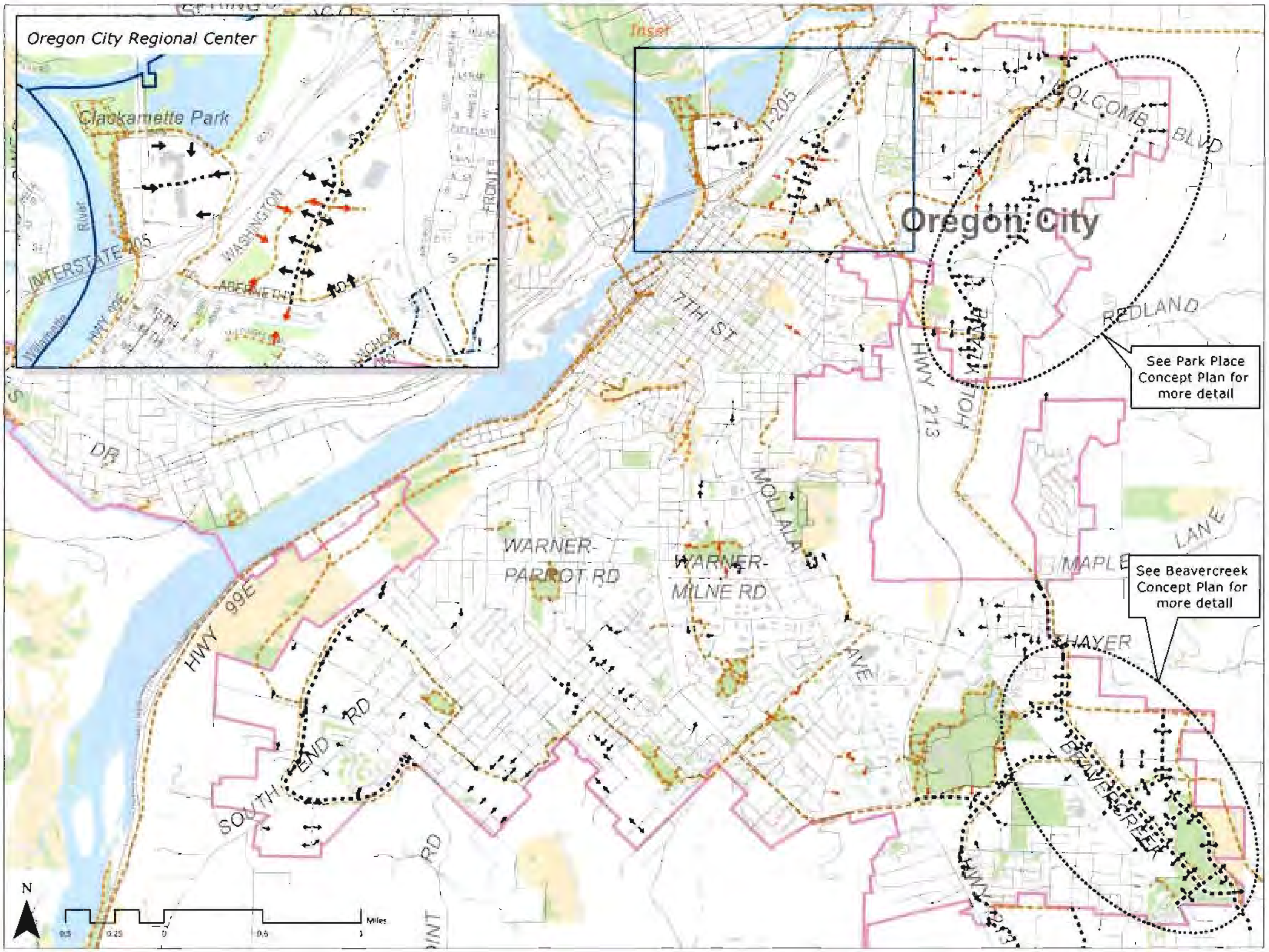


FIGURE 5

Multi-Modal Connectivity Plan

OREGON CITY TRANSPORTATION PLAN

Legend

Street Connectivity

- Existing Street
- Planned Roadway Extension (Conceptual Alignment)
- Potential Street Extension

Trail Connectivity

- Existing Shared-Use Path
- Planned Shared-Use Path (Conceptual Alignment)
- Potential Trail Connection

- Steep Slope
- Building
- Stream
- River
- Park/Public Property
- Urban Growth Boundary
- Railroad

To protect existing neighborhoods from the potential traffic impacts caused by extending stub end streets, connector roadways should incorporate neighborhood traffic management into design and construction. In addition, when a development constructs stub streets, they shall install signs indicating the potential for future connectivity to increase the awareness of residents.

In order to ensure that new development complies with the objectives of the multi-modal street plan, applicants of residential or mixed-use developments of five or more acres will be required to provide a proposed street map as part of the development approval process. The street map must be consistent with the requirements of the Metro Regional Transportation Functional Plan[4] and should be reviewed to ensure the development does the following:

- Provide full street connections with spacing of no more than 530 feet between connections, except where prevented by barriers
- If full street connections are prevented, provides bike and pedestrian accessways with spacing of no more than 330 feet, except where prevented by barriers
- Limit use of cul-de-sacs and other closed-end street systems to situations where barriers prevent full street connections or to locations where pedestrian/bike accesses are to be provided at 330 feet intervals
- Include no cul-de-sacs and other closed-end street longer than 200 feet or having no more than 25 dwelling units
- Include street cross-sections demonstrating dimensions of right-of-way improvements, and posted or expected speed limits

Applicants of residential or mixed-use developments of less than five acres should comply with the following standards[5].

- Provide full street connections with spacing of no more than 530 feet between connections, except where prevented by barriers
- Include no cul-de-sacs and other closed-end street longer than 350 feet[6]
- If full street connections are prevented, provides bike and pedestrian accessways with spacing of no more than 350 feet, except where prevented by barriers

[4] Metro Regional Transportation Functional Plan, Section 3.08.110, Subsection E, Street System Design Requirements
[5] Metro Regional Transportation Functional Plan, Section 3.08.110, Subsection F, Street System Design Requirements
[6] Oregon City Municipal Code, Title 12, Section 12.04.225

Recommended TSP and Code Revisions

The following documents the implementation measures required for the street network and connectivity as part of the TSP update:

- Adopt the Multi-Modal Street System: This will replace the functional classification system for the City.
- Adopt the Design Types for Streets: This will replace the typical cross-sections for streets in the City.
- Adopt the Context Zone Standards for Streets: This includes new/updated standards for frontage, block size, access spacing and pedestrian crossings.
- Adopt the Multi-modal Connectivity Plan: This specifies the general locations where new streets or shared-use paths could potentially be installed as nearby areas are developed or as the opportunity arises.
- Develop local truck routes. Create figures that identify the streets located along a regional truck route, local truck route or a transit route.
- Adopt language that identifies when the City can consider constrained design options for streets.
- The arterial and collector connectivity gaps must be considered when developing solutions for the transportation system.

Appendix

Table A1: Oregon City Functional Classification Changes

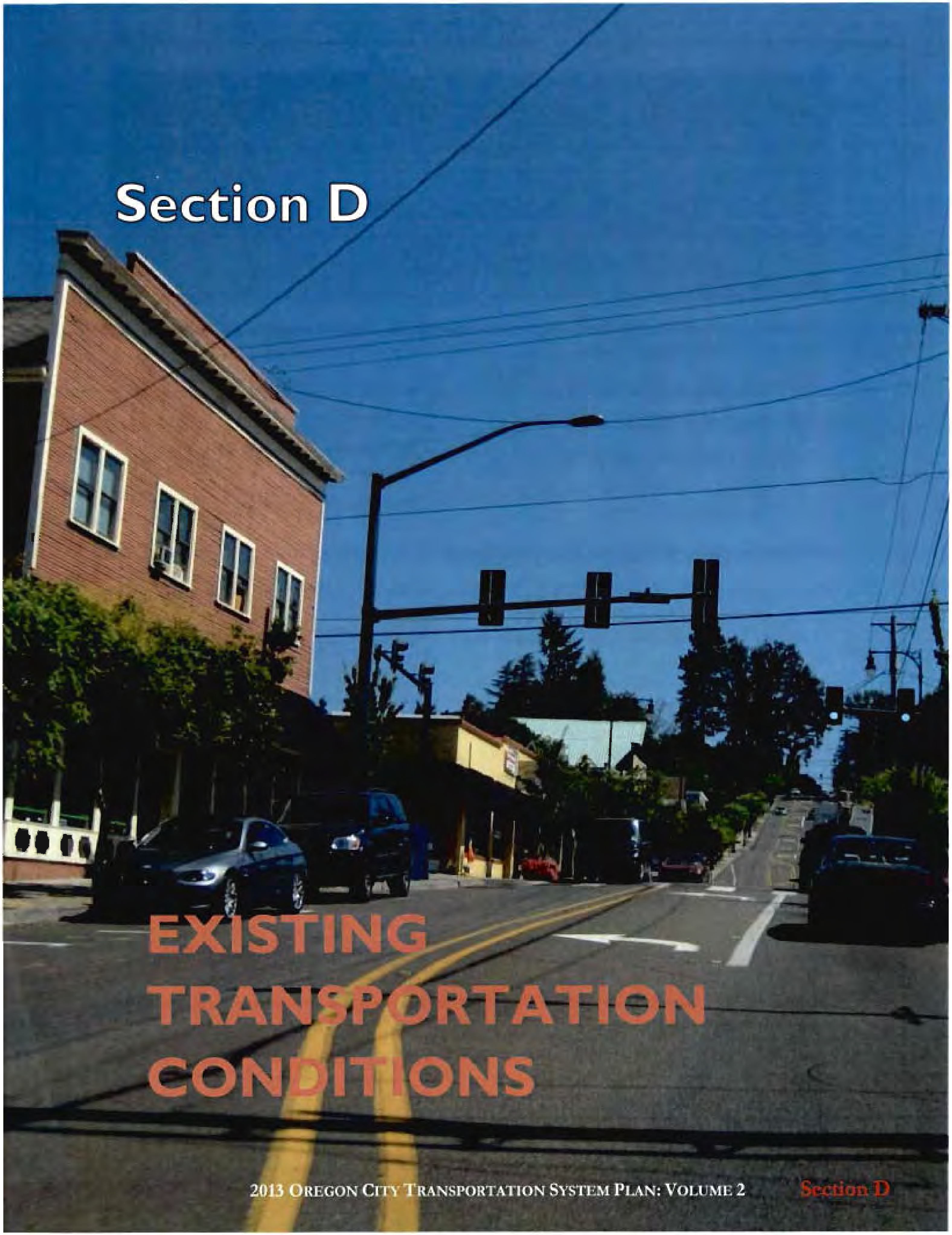
Roadway	From	To	Change from Prior Classification	Reason for Change
Beutel Road	South End Road	End of Beutel Road	Upgrade from Local to Collector	Collector connectivity gap
Lawton Road / Madrona Drive	South End Road	End of Madrona Drive	Upgrade from Local to Collector	Collector connectivity gap
Rose Road / Deer Lane	South End Road	End of Deer Lane	Upgrade from Local to Collector	Collector connectivity gap
Meyers Road	Beavercreek Road	High School Avenue	Upgrade from Local to Minor Arterial	Arterial connectivity gap
High School Avenue	End of High School Avenue	Glen Oak Road	Upgrade from Local to Collector	Collector connectivity gap
Chanticleer Place/ Chanticleer Drive	Russ Wilcox Way	Edgemont Drive	Upgrade from Local to Collector	Collector connectivity gap
Loder Road	UGB	Beavercreek Road	Upgrade from Local to Collector	Collector connectivity gap
Holly Lane	Redland Road	Maple Lane Road	Upgrade from Local to Minor Arterial	Arterial connectivity gap
Donovan Road	Holly Lane	End of Donovan Road	Upgrade from Local to Collector	Collector connectivity gap
Livesay Road	West of Frank Avenue	Redland Road	Upgrade from Local to Collector	Collector connectivity gap
Swan Avenue	Holcomb Boulevard	End of Swan Avenue	Upgrade from Local to Collector	Collector connectivity gap
Pearl Street	Eluria Street	Molalla Avenue	Upgrade from Local to Collector	Collector connectivity gap
Pearl Street	Molalla Avenue	Linn Avenue	Upgrade from Local to Collector	Collector connectivity gap
7th Street	OR 99E	Taylor Street	Upgrade from Minor Arterial to Major Arterial	Consistency with Metro functional classification
Center Street	5th Street	South 2nd Street	Upgrade from Local to Collector	Collector connectivity gap
Railroad Avenue / 7th Street	Main Street	OR 99e	Upgrade from Local to Collector	Collector connectivity gap
12th Street	OR 99e	Main Street	Upgrade from Local to Collector	Collector connectivity gap
14th Street	OR 99e	Washington Street	Upgrade from Local to Collector	Collector connectivity gap
15th Street	OR 99e	Main Street	Upgrade from Local to Collector	Collector connectivity gap

Clackamette Drive/ Dunes Drive	Main Street	OR 99E	Upgrade from Local to Collector	Collector connectivity gap
Agnes Avenue/ Washington Street	Main Street	I-205	Upgrade from Local to Collector	Collector connectivity gap
Skellenger Way/ Salmonberry Drive/ Hazel Grove Drive/ Fibert Drive	Central Point Road	South End Road	Downgrade from Collector to Local Streets	Adequate nearby connection
Spring Valley Drive	Boynton Street	Partlow Road	Downgrade from Collector to Local Street	Adequate nearby connection
Boynton Street	Warner Parrott Road	Central Point Road	Downgrade from Collector to Local Street	Adequate nearby connection
Shenandoah Drive	Warner Parrott Road	Central Point Road	Downgrade from Collector to Local Street	Adequate nearby connection
Woodlawn Avenue	Barker Avenue	Warner Parrott Road	Downgrade from Collector to Local Street	Adequate nearby connection
Central Point Road	Warner Parrott Road	UGB	Downgrade from Minor Arterial to Collector	Collector connectivity gap
Haven Road/ Prospector Terrace	Frontier Parkway	Leland Road	Downgrade from Collector to Local Street	Adequate nearby connection
Frontier Parkway	Meyers Road	Leland Road	Downgrade from Collector to Local Street	Adequate nearby connection
South Fir Street	Fir Street	Molalla Avenue	Downgrade from Minor Arterial to Collector	Collector connectivity gap
Marjorie Lane	Beavercreek Road	End of Marjorie Lane	Downgrade from Minor Arterial to Local Street	Adequate nearby connection
Caufield Road	OR 213	End of Caufield Road	Downgrade from Collector to Local Street	Adequate nearby connection
Ethel Street	Hood Street	Linn Avenue	Downgrade from Collector to Local Street	Adequate nearby connection
Laurel Lane	Holmes Lane	End of Laurel Lane	Downgrade from Collector to Local Street	Adequate nearby connection
May Street	Molalla Avenue	End of May Street	Downgrade from Collector to Local Street	Adequate nearby connection
Warner Street	Molalla Avenue	End of Warner Street	Downgrade from Collector to Local Street	Adequate nearby connection
Holmes Lane	Molalla Avenue	Linn Avenue	Downgrade from Minor Arterial to Collector	Collector connectivity gap
Barclay Hills Drive/Alden Street/Hilda Street	Newell Ridge Drive	Molalla Avenue	Downgrade from Collector to Local Street	Adequate nearby connection
Roosevelt Street	Eluria Street	Molalla Avenue	Downgrade from Collector	Adequate nearby

			to Local Street	connection
Division Street/ Anchor Way	Redland Road	7th Street	Downgrade from Minor Arterial to Collector	Collector connectivity gap
Monroe Street	12th Street	7th Street	Downgrade from Collector to Local Street	Adequate nearby connection
Cleveland Street	Swan Avenue	Apperson Boulevard	Downgrade from Collector to Local Street	Adequate nearby connection

Section D

EXISTING TRANSPORTATION CONDITIONS



EXISTING CONDITIONS

This document introduces the transportation conditions in the City of Oregon City. Questions to be answered in this document include:

- What makes Oregon City unique?
- Where do people want to go?
- Where do people come from?
- What parts of the City do people come from?
- What factors determine how people travel?
- What transportation infrastructure is available?
- What travel conditions do people face?

What makes Oregon City unique?

Located along the shores of the Willamette and Clackamas Rivers near the scenic Willamette Falls, Oregon City is the oldest incorporated City west of the Rockies. With a population of around 34,000, the City is characterized by topography that rises sharply from the riverfront and downtown to reach 250 feet, above the Willamette River. The two to three blocks wide downtown is located at the base of a basalt bluff where the McLoughlin Conservation District is found, one of two of the City's historic neighborhoods. At higher elevations and further south from downtown, newer neighborhoods and commercial development has developed over the past 50 years. The City is now comprised of 12 unique neighborhoods as illustrated by the Neighborhood Associations (see Figure in appendix).

View from the Oregon City hillside

In recent years, the City has made great strides at inventing in the Downtown and the 7th Street-Molalla Avenue corridor and becoming a regional destination for employment, shopping and education. These characteristics make Oregon City unique, as well as define the key transportation issues that the City seeks to overcome.

Where do people want to go?

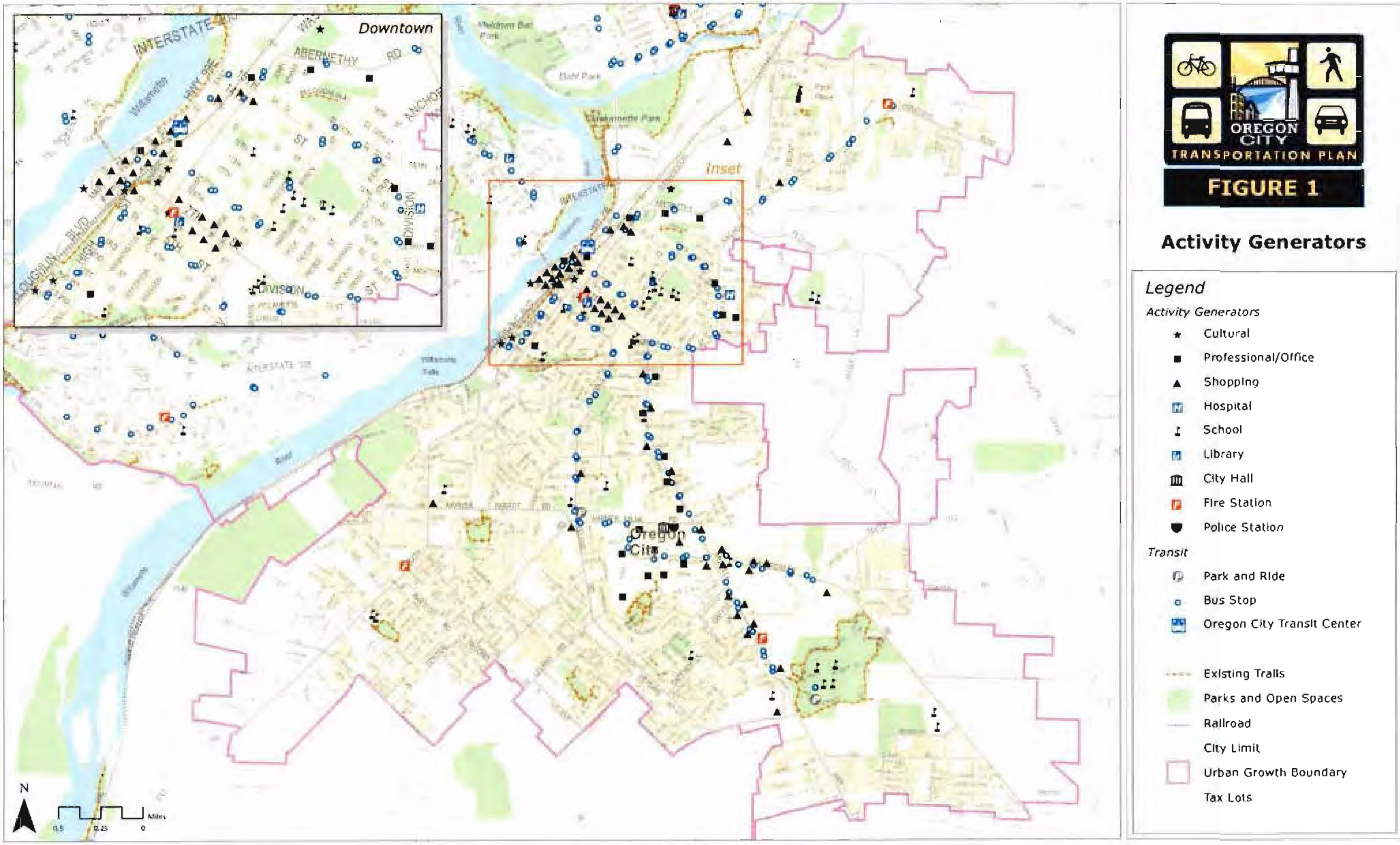
One of the first steps in planning for an effective transportation system is gaining an understanding of the key destinations that people currently travel to throughout the City. These destination points are referred to as activity generators (or trip attractors).

As the oldest incorporated City west of the Rockies, Oregon City is home to several cultural or recreational destinations that attract tourists and residents alike. Major destinations include the End of the Oregon Trail Interpretive Center, Museum of the Oregon Territory, Willamette Falls and the Willamette River waterfront, Carnegie Center, Municipal Elevator, McLoughlin House, Ermatinger House, and Barclay House.

Oregon City is also home to a regional educational institution, Clackamas Community College, in addition to several other major employment and shopping areas, including the historic downtown core. The most common categories of activity generators in the City include (see Figure 1 on the following page for the general locations of some of these activity generators):

- Recreational/Entertainment (e.g. Boat docks, parks, Willamette River Regional Trail, Oregon City Swimming Pool, McLoughlin Promenade)
- Schools (e.g. Clackamas Community College, Holcomb Elementary, Gaffney Lane Elementary, Gardiner Middle, Oregon City High)
- Places of employment (e.g. Oregon City Regional Center, Clackamas County Red Soils Business Park, business areas, industrial areas, offices)
- Shopping (e.g. downtown, grocery stores, shopping centers, restaurants)
- Cultural (e.g. End of the Trail Interpretive Center, McLoughlin House, Museum of the Oregon Territory, Main Street evens, other community events)
- Public Transportation (e.g. Bus stops, Oregon City Transit Center, park and ride, Amtrak)

Each of these categories of activity generators represents importanr starting and ending points for travel and provides a good basis for planning ideal routes.



Downtown
Inset
OREGON CITY
TRANSPORTATION PLAN
FIGURE 1
Activity Generators
Legend
Activity Generators
Cultural
Professional/Office
Shopping
Hospital
School
Library
City Hall
Fire Station
Police Station
Transit
Park and Ride
Bus Stop
Oregon City Transit Center
Existing Trails
Parks and Open Spaces
Railroad
City Limit
Urban Growth Boundary
Tax Lots
Miles

How do people get there?

Most Oregon City residents commuted to work between the years 2005 and 2009 via single occupant motor vehicles (about 76 percent), or carpooling (about 10 percent)[1]. Approximately four percent of residents walked, four percent used public transportation, and two percent biked to work.

Table 1 compares the commute patterns of Oregon City residents to other Cities in the region. Commuting to work via public transportation was fairly similar in Oregon City and West Linn (four percent versus three percent), but accounted for four percent fewer trips in Oregon City than Milwaukie (four percent to eight percent). Fewer residents worked at home in both Oregon City and Milwaukie compared to West Linn (about five percent less), while more walked or biked to work (six percent in Oregon City, five percent in Milwaukie and three percent in West Linn).

Table 1: Transportation Modes Used to Commute to Work

Transportation Mode	Percent of Commuters: Oregon City	West Linn	Milwaukie
Workers over 16 years	*14,861*	*12,821*	*10,751*
Motor Vehicle- Single Occupant	76%	76%	74%
Motor Vehicle- Carpool	10%	8%	9%
Walked	4%	2%	4%
Biked	2%	1%	1%
Public Transportation	4%	3%	8%
Worked at Home	4%	9%	4%
Other	0%	1%	0%

Source: US Census Bureau, 2005-2009 American Community Survey

While the U.S. Census Bureau is a valuable source of information for work commute patterns in Oregon City, it does not truly represent the transportation modes utilized to other activity generators like schools, recreation, shopping or access to transit. Non-motor vehicle transportation modes are likely higher in Oregon City for these types of trips.

How transportation modes are used in the City

Pedestrian, bicycle, and motor vehicle activity at key intersections throughout Oregon City was reviewed during the evening peak period (3:15 p.m. to 6:15 p.m.) on a typical weekday in the late spring and early fall of 2011.[2] It was found that during the summer months, activity levels generally increase due to the overall pleasant weather and longer days enticing residents of Oregon City to get out and about in the City. It should be noted that although weekend pedestrian and bicycle activity levels were not measured, they would generally be expected to be higher than the activity levels of a typical weekday.

[1] 2005-2009 American Community Survey, US Census Bureau

[2] Based on counts conducted April 12th, April 13th, April 14th, April 21st and September 7th 2011

- **Pedestrian volumes** are generally highest in Downtown Oregon City and along 7th Street and Molalla Avenue. The highest hourly pedestrian activity during the evening peak occurred at the Molalla Avenue intersection with Clairmont Way, with over 50 pedestrian crossings in the one-hour period between 3:55 p.m. and 4:55 p.m. The highest hourly pedestrian activity levels at the reviewed intersections during the evening peak period are displayed in Figure A1 in the appendix.
- **Bicycle volumes** are generally low during the evening peak period, with no more than nine bicyclists traveling through any of the intersections reviewed during a single one-hour period between 3:15 and 6:15 p.m. The highest volumes occurred on Washington Street between 5th Street and 15th Street, with hourly volumes ranging between eight and nine cyclists. The highest hourly bicycle activity levels at the reviewed intersections during the evening peak period are displayed in Figure A1 in the appendix.
- **Motor vehicle volumes** on the roadways in Oregon City peak during the evening between 3:25 p.m. and 5:10 p.m., but generally vary depending on the time of year. During the summer months, traffic volumes increase due to an influx of recreational and leisure travelers taking advantage of the nice weather. For this reason, the traffic count data was adjusted upward to represent peak seasonal traffic conditions. The peak seasonal traffic volumes developed for the reviewed intersections can be found in Figure A2 in the appendix. Peak seasonal motor vehicle volumes are highest along OR 99E, generally ranging between 1,000 and 2,000 vehicles in each direction during the evening peak hour. Evening peak hour traffic volumes are also high along OR 213, Molalla Avenue, Washington Street and Beavercreek Road, generally ranging between 500 and 1,000 vehicles in each direction.

Where do people come from?

Much of the traffic in Oregon City is often related to employment travel. As shown in Table 2, half of the workers in Oregon City live in another City. The commute mode for employees that travel into the City is often dependent on the regional transportation system. If there is walking, biking, transit or other facility deficits outside the City, then a commuter may be discouraged from utilizing those travel modes.

Table 2: Where Oregon City Workers Live

Oregon City workers who:	Percent of Oregon City Workers	Distance from Oregon City
Live in Oregon City	**50%**	-
Live outside Oregon City	**50%**	-
Live in Portland	*20%*	*12+ miles*
Live in West Linn	*7%*	*1+ miles*
Live in Milwaukie	*4%*	*7+ miles*
Live in Gresham	*4%*	*17+ miles*
Live in Other City in Oregon	*15%*	*2+ miles*

Source: Census Transportation Planning Package (CTPP), 2006-2008 American Community Survey

Oregon City Employee Commute Mode

More than three quarters (75 percent) of the commuters in northeast, south-central, southeast and southwest Oregon City and 70 percent in central Oregon City commute to work via single occupant motor vehicle (see Table 3). The greatest percent of residents walking to their place of employment occurs in the southeast part of Oregon City (6 percent of residents) while the highest bicycle commuting to work occurs in central Oregon City (5 percent). The highest usage of public transportation to work occurs in the central and southeast part of the City (4 percent).

Table 3: Work Commute Mode by area of Oregon City

Transportation Mode	Northeast Oregon City (1)	Central Oregon City (2)	South- Central Oregon City (3)	Southeast Oregon City (4)	Southwest Oregon City (5)
Motor Vehicle-Single Occupant	78%	71%	78%	75%	86%
Motor Vehicle-Carpool	6%	12%	11%	11%	8%
Walked	3%	3%	2%	6%	0%
Biked	0%	5%	2%	0%	0%
Public Transportation	2%	4%	3%	4%	2%
Motorcycle/Other	1%	1%	0%	1%	0%
Worked at Home	10%	3%	4%	4%	4%

Source: US Census Bureau, 2005-2009 American Community Survey

1. Includes the Park Place and part of the Caufield (north of Beavercreek Road) neighborhoods
2. Includes Downtown and the McLoughlin neighborhood
3. Includes the Canemah, Barclay Hills, Rivercrest and part of the South End (northeast of the South End Road/Warner Parrott Road intersection) neighborhoods
4. Includes the Towervista, Hillendale, Gaffney Lane and part of the Caufield (south of Beavercreek Road) neighborhoods
5. Includes the Hazel Grove/ Westling Farm and part of the South End (west of South End Road) neighborhoods

What factors determine how people travel?

Travelers often weigh a variety of factors when deciding how to commute to their destination. Whether the trip will be via motor vehicle, walking, bicycle, or public transportation, the choice is often a balance between ease and convenience of travel, travel cost, and travel time.

Where are you going? Whether you are going to work, school, shopping, or to a park, your trip type (or your destination point) often determines your mode of transportation. If you are destined for a park or school you generally have a higher likelihood to walk or bicycle, as opposed to work or shopping in which travel via motor vehicle is generally more convenient. In addition, the distance of that destination would play a role in mode choice. Trips that are shorter generally present a greater opportunity to walk or bicycle, as opposed to longer distance trips that often require transit or motor vehicle to reach the destination.

Will you have to cross a busy road or walk along a road without sidewalks? The availability of sidewalks, curb ramps to provide wheelchair access, crosswalks, and bicycle lanes increase the comfort and access of walking and biking. A lack of these facilities, particularly on higher volume/speed roadways, discourages people from utilizing non-motor vehicle modes of transportation.

Where you work and how long it takes you to get there. Oregon City residents who work outside of the City are likely to commute via motor vehicle due to travel distance and commute time. As seen in Table 4, about 58 percent of Oregon City residents commute outside the City to work. Over 40 percent of these commuters travel to employment locations at least 10 miles outside of the City.

Table 4: Where Oregon City Residents Work

Oregon City residents who:	Percent of Oregon City Workers	Distance from Oregon City
Work in Oregon City	**42%**	-
Work outside Oregon City	**58%**	-
Work in Portland	*35%*	*12+ miles*
Work in Milwaukie	*4%*	*7+ miles*
Work in Tigard	*4%*	*13+ miles*
Work in Salem	*3%*	*35+ miles*
Work in Other City in Oregon	*12%*	*6+ miles*

Source: Census Transportation Planning Package (CTPP), 2006-2008 American Community Survey

Age and income. Demographic characteristics such as age and income play a key role in determining mode of transportation. Oregon City residents with lower incomes, as well as the youngest and oldest residents often account for more trips via walking, biking, and public transportation. As seen in Table 5, about a quarter (25 percent) of Oregon City residents living in the neighborhoods south of Downtown (e.g. Barclay Hills, Rivercrest, South End, Towervista, Hillendale, Gaffney Lane, Caufield, Hazel Grove and Canemah) are school-aged children, while about 10 percent of Oregon City residents throughout the City are above the retirement age. The central part of Oregon City (Downtown and McLoughlin neighborhood) accounts for the lowest median household incomes (around $43,000), which is approximately $10,000 to $30,000 less than the other parts of the City.

Table 5: Key Demographics in Oregon City

	Northeast Oregon City	Central Oregon City	South- Central Oregon City	Southeast Oregon City	Southwest Oregon City
Age (by percent of residents)					
School aged (Under 18)	21%	17%	24%	26%	24%
Middle Aged (18 to 66)	68%	71%	68%	64%	63%
Retired Aged (67+)	11%	12%	9%	10%	13%
Median Household Income	$68,110	$42,988	$52,041	$58,362	$70,000

Source: US Census Bureau, 2005-2009 American Community Survey

Is it cold or raining? Weather could potentially play a role in determining how trips are made. Oregon City experiences cool, rainy winters, with mild and generally dry summers. According to the national weather service, average temperatures in the winter months (November to March) are around 45 degrees Fahrenheit, with measurable rainfall occurring about 17 days each winter month. The spring and fall months (April, May, and October) are slightly warmer and dryer, with average temperatures around 55 degrees Fahrenheit, and about 14 days of measurable rainfall. The summer months (June to September) are typically very pleasant, with average temperatures around 65 degrees Fahrenheit, and less than 10 days of measurable rainfall each month.[3] The rainy weather could discourage walking and biking trips, forcing users to potentially make a trip via motor vehicle or other means, when they would otherwise walk or bike.

Are you able to walk or bike on a steep hill? Topography, one of the things that makes Oregon City a unique place with the sloping and hilly terrain, is generally a deterrent to walking and bicycling. The terrain makes these trips more difficult and potentially creates barriers for those with disabilities.

Steep hill without pedestrian or bicycle facilities

[3] Climate Summary for Portland area, National Weather Service

What transportation infrastructure is available?

Oregon City has an abundance of existing transportation infrastructure that residents use on a daily basis. The infrastructure includes sidewalks, bike lanes, multi-use trails, roadways and transit.

Walking

Walking plays a key role in Oregon City's transportation network. Planning for pedestrians not only helps the City provide a complete, multi-modal transportation system, it addresses a social equity issue, ensuring that the young, the elderly, and those not financially able to afford motorized transport have access to goods, services, employment, and education. Approximately four percent of commuters in the City walk to work, with another four percent utilizing public transportation (which generally include a walking trip at the beginning or end) to get to work. In addition to the work commute trips, walking trips are made to and from recreational or shopping areas, schools, or other activity generators. In general, it is desirable to provide continuous sidewalk connections between all activity generators and arterial/collector roadways to allow for safe and attractive non-motorized travel options. Oregon City's walking network, shown in Figure 2, is composed of sidewalks, stairs, and multi-use paths.

Sidewalks are located along roadways, are separated from the roadway with a curb and/or planting strip, and have a hard, smooth surface, such as concrete. The Oregon Department of Transportation (ODOT) standard for sidewalk width is six feet, with a minimum width of five feet acceptable on local streets. Oregon City requires sidewalks to be at least five feet wide. Most of the roadways in downtown Oregon City have sidewalks on both sides, while continuous sidewalks along 7th Street and Molalla Avenue link downtown Oregon City with Clackamas Community College. Beyond these areas, continuous sidewalks are generally limited throughout the City.

Stairway/Elevator: The Oregon City Municipal Elevator, located at the 7th Street/Railroad Avenue intersection and the Grand Staircase provide alternative connections for pedestrians to the top of the bluff above downtown.

Multi-use paths are used by a variety of non-motorized users, including pedestrians, bicyclists, skateboarders, and runners. Multi-use paths are typically paved (asphalt or concrete) but may also consist of an unpaved smooth surface as long as it meets Americans with Disabilities Act (ADA) standards. Multi-use paths are usually wider than an average sidewalk (i.e. 10 – 14 feet).

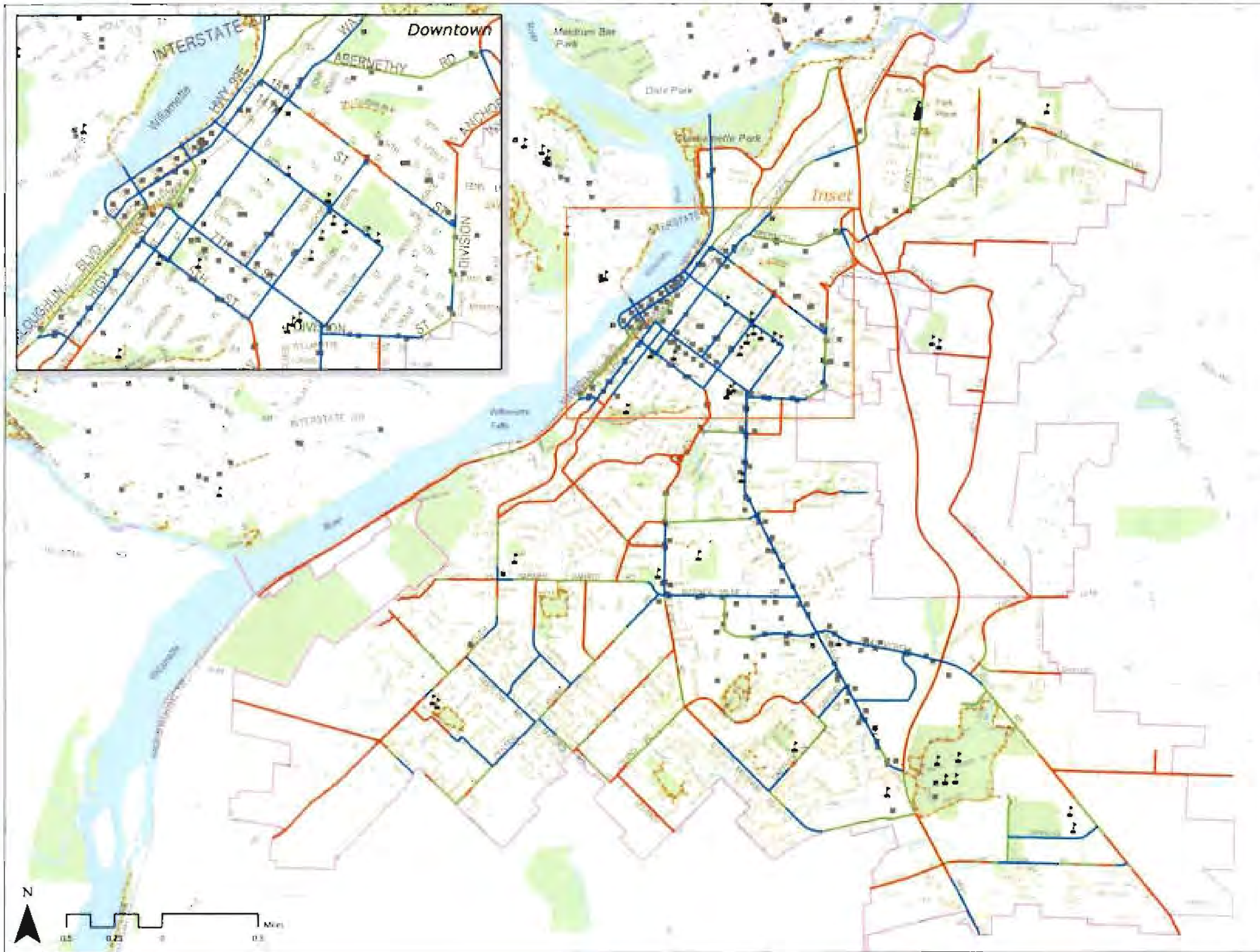
View of the Municipal Elevator from Main Street

- The I-205 multi-use path crosses the Clackamas River from Gladstone to the north of Oregon City via the 82nd Drive/Park Place Bridge. Here the path travels into Oregon City to Clackamette Park where it joins the Willamette River Trail. North of the Clackamas River, the I-205 multi-use path generally runs for 16.5 miles paralleling I-205, connecting downtown Oregon City to Marine Drive near the Portland International Airport. The path also interests with other regional trails such as the Springwater Corridor Trail and the Trolley Trail.

- The McLoughlin Promenade runs for approximately a half-mile along the bluff above downtown Oregon City. The path provides a connection from the McLoughlin House on Center Street to Tumwater Drive near OR 99E. A pedestrian bridge over OR 99E (McLoughlin Boulevard) links the west side of OR 99E with the south end of the McLoughlin Promenade.
- The Willamette River Trail, located between OR 99E and the Willamette River, connects Clackamette Park to downtown Oregon City via Jon Storm Park and the newly enhanced pedestrian accessible Willamette Terrace located near 12th Street.

Willamette Terrace

- Several short multi-use paths connect adjacent roadways to City parks, such as the path connecting Hillendale City Park near Clairmont Way to Red Soils Court, just to the south of Beavercreek Road. These are generally used for recreational purposes.
- A number of natural surface trails, such as the Waterboard Park walking path, are also located in Oregon City. These trails are mostly used by pedestrians, primarily for recreational purposes.



OREGON CITY TRANSPORTATION PLAN

FIGURE 2

Existing Pedestrian Facilities

Legend

Sidewalk Facilities

- Sidewalk Both Sides
- Sidewalk One Side
- No Sidewalk
- School
- Activity Generator
- Existing Trails
- Parks and Open Spaces
- Railroad
- City Limit
- Urban Growth Boundary
- City Limit

Pedestrian facilities were not inventoried on all local streets.

Bicycling

Oregon City's bicycling network, shown in Figure 3, is composed of bikelanes, shared roadways and multi-use paths.

Shared Roadway: Shared roadways include roadways on which bicyclists and motorists share the same travel lane. The most suitable roadways for shared bicycle use are those with low speeds (25 mph or less) and low traffic volumes (3,000 vehicles per day or fewer). Signed shared roadways are shared roadways that are designated and signed as bicycle routes and serve to provide continuity to other bicycle facilities (e.g. bicycle lanes) or designate a preferred route through the community. Common practice is to sign the route with standard Manual on Uniform Traffic Control Devices (MUTCD) green bicycle route signs with directional arrows. Shared roadways can also have signing that highlights a special route or provides directional information in bicycling minutes or distance (e.g., "Library, 3 minutes, ½ mile").

Signed bike route in Oregon City

- There are a few signed bike routes in the City, such as the OR 99E/Washington Street and Molalla Avenue bike routes.
- Sharrows are used on Main Street in downtown Oregon City
- Many local streets in Oregon City are low speed/low volume roadways that could be classified as shared roadways. Although there are no signs or pavement markings to indicate that a particular local street is a shared roadway or part of a bicycle route, these low traffic roadways often connect residential neighborhoods to commercial areas—allowing bicyclists to bypass heavily trafficked thoroughfares in favor of quieter streets.

Multi-use paths such as those around Clackamas Community College and I-205 multi-use path provide off-street travel for bicyclists.

Path adjacent to OR 213 near Clackamas Community College

Shoulder Bikeway: These are paved roadways that have striped shoulders wide enough for bicycle travel. ODOT recommends a six-foot paved shoulder to adequately provide for bicyclists, and a four-foot minimum width in constrained areas. Roadways with shoulders less than four feet are considered shared roadways. Sometimes shoulder bikeways are signed to alert motorists to expect bicycle travel along the roadway.

- OR 213 has a wide roadway shoulder available to bicyclists from Washington Street to Beavercreek Road. It does have bicycle markings in a few locations, good pavement quality and sufficient width to accommodate bicycle travel.

Wide shoulders along OR 213

Bicycle Lanes: Bike lanes are portions of the roadway designated specifically for bicycle travel via a striped lane and pavement stencils. ODOT standard width for a bicycle lane is six feet. The minimum width of a bicycle lane against a curb or adjacent to a parking lane is five feet. A bicycle lane may be as narrow as four feet, but only in very constrained situations. Bike lanes are most appropriate on arterials and collectors, where high traffic volumes and speeds warrant greater separation of the travel modes. Existing bicycle facilities in Oregon City can be seen in Figure 3.

- Bike lanes are generally available along many arterial and collector roadways in the City including Molalla Avenue, Beavercreek Road, Linn Avenue, South End Road, Warner Milne Road, Warner Parrott Road and Washington Street. In addition, a bike connection to the regional I-205 multi-use trail is provided via OR 213 and Washington Street.

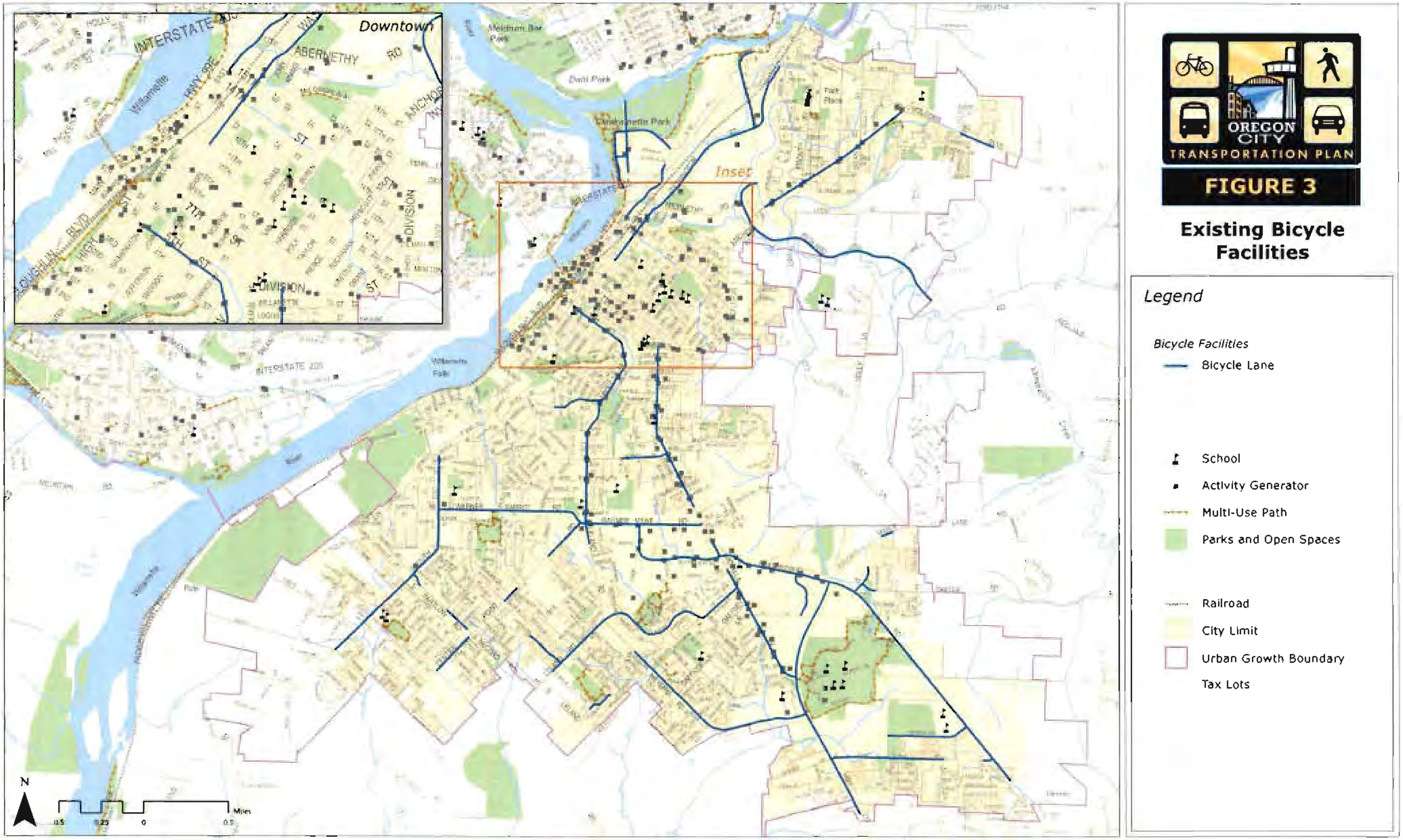
Bicycle Parking: End-of-trip bicycle facilities are a fundamental component of a bicycle network. In addition, a lack of safe and secure parking facilities can be an obstacle to promoting bicycle riding. Bicycle parking can be broadly defined as either short-term or long-term parking.

Short-term bike parking near Jon Storm Park

Short-term parking meant to accommodate visitors, customers, messengers and others expected to depart within two hours; requires approved standard rack, appropriate location and placement, and weather protection.

Long-term parking meant to accommodate employees, students, residents, commuters, and others expected to park more than two hours. This parking is to be provided in a secure, weather-protected manner and location.

- Long-term bike parking is available at Oregon City Hall and the Oregon City Transit Center via bike lockers.


Downtown
Inset
OREGON CITY
TRANSPORTATION PLAN
FIGURE 3
Existing Bicycle Facilities
Legend
Bicycle Facilities
Bicycle Lane
School
Activity Generator
Multi-Use Path
Parks and Open Spaces
Railroad
City Limit
Urban Growth Boundary
Tax Lots
N
Miles

Transit

Transit service is provided in Oregon City by TriMet via seven fixed bus routes connecting Oregon City to the rest of the Portland Metropolitan area, and an Americans with Disabilities Act (ADA) paratransit service. The fixed transit routes in Oregon City can be seen in Figure 4. In addition, seasonal transit service is provided to residents and tourists via the Oregon City Trolley, and regional service is provided via the Canby Area Transit system, South Clackamas Transportation District and Amtrak.

Transit Access and Amenities: The Oregon City Transit Center, located on Main Street between Moss Street and 11th Street, offers a transfer point between the seven TriMet fixed bus routes, the Oregon City Trolley and the regional bus service to Canby. The transit center offers a shelter, bench and rentable bike lockers for riders.

Oregon City Transit Center in Downtown

Bus stops in Oregon City are located along Main Street, Railroad Avenue, 2nd Street, High Street, 5th Street, Linn Avenue, 7th Street, Molalla Avenue, Division Street, 9th Street, 16th Street, Jackson Street, Abernethy Road, Holcomb Boulevard, Longview Way, Warner Milne Road and Beavercreek Road. Only some of the bus stops offer benches and shelter and some lack sidewalk connections to the surrounding neighborhoods and businesses. While transit users in the Park Place, McLoughlin, Barclay Hills, Hillendale, Gaffney Lane and Rivercrest neighborhoods are generally in close proximity to a bus stop, those in the Caufield, Canemah, South End, Tower Vista and Hazel Grove/Westling Farm neighborhoods could potentially be over two miles from a bus stop (greater than the typical trip length for the average walking or biking trip).

Park and ride facilities are provided for transit users at two locations in Oregon City, near the Linn Avenue/Williams Avenue intersection (just north of Warner Milne Road) and at Clackamas Community College.

All TriMet buses are equipped with either a boarding ramp or a lift to allow wheelchair access, and include bicycle racks. Riders are only permitted to load their bicycle inside the bus if they can collapse to the size of a standard piece of luggage.

TriMet's LIFT paratransit service provides public transportation to persons with disabilities who are unable to use regular fixed route buses. Curb to curb paratransit service, in wheelchair lift equipped mini-buses, is available generally between 4:30 a.m. and 2:30 a.m. seven days a week.

Frequent bus service to Downtown Portland is provided by Route 33 (McLoughlin) and Route 99 (McLoughlin Express), which run from the transit mall in Downtown Portland to the Oregon City Transit Center or Clackamas Community College. Route 33 runs with 15 minute headways during the a.m., midday, and p.m. peak periods, and offers service between 4:30 a.m. and 1:45 a.m. Monday through Friday. On weekends, Route 33 offers service between 6:00 a.m. and 1:30 a.m. The busiest stops along this route include the Oregon City Transit Center and Clackamas Community College, with nearly 700 and 500 daily boardings and de-boardings respectively.

Route 99 departs Oregon City every 15 minutes between 5:30 a.m. and 8:00 a.m. destined for Downtown Portland and arrives in Oregon City from Downtown Portland every 15 minutes between 3:30 p.m. and 6:30 p.m. Monday through Friday. Some of the busiest stops include the Oregon City Transit Center (131 daily ons/offs), Clackamas Community College (94 daily ons/offs) and Molalla/Clairmont (58 daily ons/offs).

Bus Service to Clackamas Community College is provided by Route 32 (Oatfield), which runs from the transit mall in Downtown Portland or the Milwaukie City Center to Clackamas Community College. Key destinations along this route include the Willamette Falls Hospital, Oregon City Transit Center and the Cities of Portland, Gladstone and Milwaukie. TriMet Route 32 offers bus service between 5:30 a.m. and 7:00 p.m. Monday through Friday, generally with 15 to 30 minute headways. Bus service is also provided on Saturday between the Oregon City Transit Center and Clackamas Community College only, between 10:00 a.m. and 5:30 p.m. with one hour headways. Some of the busiest stops include the Oregon City Transit Center (249 daily ons/offs), Clackamas Community College (174 daily ons/offs) and Molalla/Mountain View (48 daily ons/offs).

Bus Service to Milwaukie is provided by Route 34 (River Road), connecting the Park Place neighborhood (along Holcomb Avenue) to Milwaukie. TriMet Route 34 offers bus service between 5:30 a.m. and 6:45 p.m. Monday through Friday, generally with one to three hour headways. The busiest stop along this route includes the Oregon City Transit Center with 84 daily boardings and de-boardings.

Bus Service to Lake Oswego and the University of Portland is provided by Route 35 (Macadam/Greeley). Route 35 offers bus service between 4:45 a.m. and 1:30 a.m. Monday through Friday, generally with 10 to 30 minute headways. On weekends, Route 35 generally offers service between 6:00 a.m. and 1:15 p.m., approximately every 30 to 60 minutes.

Bus Service to the Clackamas Town Center is provided by Route 79 (Clackamas/Oregon City). Route 79 offers bus service between 6:00 a.m. and 10:30 p.m. Monday through Friday, generally with 30 to 40 minute headways. On weekends, Route 79 offers service between 8:00 a.m. and 10:30 p.m., approximately every 30 to 60 minutes. The Oregon City Transit Center has nearly 700 daily boardings and de-boardings for this route.

Bus Service to West Linn is provided by Route 154 (Willamette). Route 154 provides weekday service between West Linn's Willamette neighborhood and Oregon City approximately every hour between 6:30 a.m. and 7:30 p.m.

The Oregon City Trolley provides free service seven days a week during the summer months for residents and tourists. Key destinations along the route include the McLoughlin House, End of the Oregon Trail Center, Jon Storm Park, Clackamette Park, Ermatinger House, Downtown and the Willamette Falls overlook.

Oregon City Trolley

Bus Service to Canby is provided by Canby Area Transit (CAT). CAT provides weekday service connecting the Oregon City Transit Center to Canby, Aurora, Hubbard and Woodburn.

Bus Service to Molalla is provided via the South Clackamas Transportation District (SCTD). SCDT provides weekday service connecting Clackamas Community College with Carus, Mulino, Liberal and Molalla.

Amtrak provides passenger rail service connecting Oregon City to Seattle and Eugene. The Amtrak station in Oregon City is located on Washington Street, just north of Abernethy Road.

Downtown
Inset
OREGON CITY
TRANSPORTATION PLAN
FIGURE 4
Existing Transit Routes
Legend
Transit Facilities
Bus Stop
Transit Center
Park and Ride
Bus Route
032
033
034
035
079
099
154
School
Activity Generator
Multi-Use Path
Parks and Open Spaces
Railroad
City Limit
Urban Growth Boundary
Tax Lots
Miles

Driving

Despite the hilly terrain, the roadways in the Downtown area of Oregon City are generally well connected and follow a gridded pattern. At the top of the hill, many of the roadways are generally windier, not continuous, and have larger blocks despite the relatively flat terrain. In addition, the steep slopes between the Downtown and the other parts of the City allow only limited connections up the hill. For these reasons, it becomes necessary to manage the existing roadways by determining how the traffic from various parts of Oregon City can be channelized within the network in a logical and efficient manner.

How do we manage the roadway network in Oregon City? To manage the roadway network, the City classified the roadways based on a hierarchy according to the intended purpose of each road (as shown in Figure 5). From highest to lowest intended usage, the classifications are freeway, expressway, major arterial, minor arterial, collector, and local streets. Roadways with a higher intended usage generally provide more efficient traffic movement (or mobility) through the City, while roadways with lower intended usage provide greater access for shorter trips to local destinations such as businesses or residences.

Freeways and Expressways are limited access state roadways. These roadways serve the highest volume of motor vehicle traffic and are primarily utilized for longer distance regional trips. Both OR 213 and I-205 have posted speed limits of 55 miles per hour.

Major Arterial Roadways are intended to move traffic through Oregon City. These roadways generally experience higher traffic volumes and often connect to locations outside of the City (such as Beavercreek Road) or act as a corridor connecting many parts of the City (such as Molalla Avenue). Posted speed limits on these roadways are generally between 30 to 45 miles per hour, with the higher speeds posted in less urbanized areas and lower speeds in areas with more congestion such as downtown.

OR 99E is an example of a major arterial roadway.

Minor Arterial Roadways are intended to serve local traffic traveling to and from major arterial roadways. These roadways provide greater accessibility to neighborhoods, often connecting to major activity generators and provide efficient through movement for local traffic. Posted speeds on minor arterial roadways typically range between 25 and 45 miles per hour.

Linn Avenue is an example of a minor arterial roadway.

Collector Roadways often connect the neighborhoods to the minor arterial roadways. These roadways serve as major neighborhood routes and generally provide more direct property access or driveways than arterial roadways. Posted speeds on collector roadways generally range between 25 and 35 miles per hour.

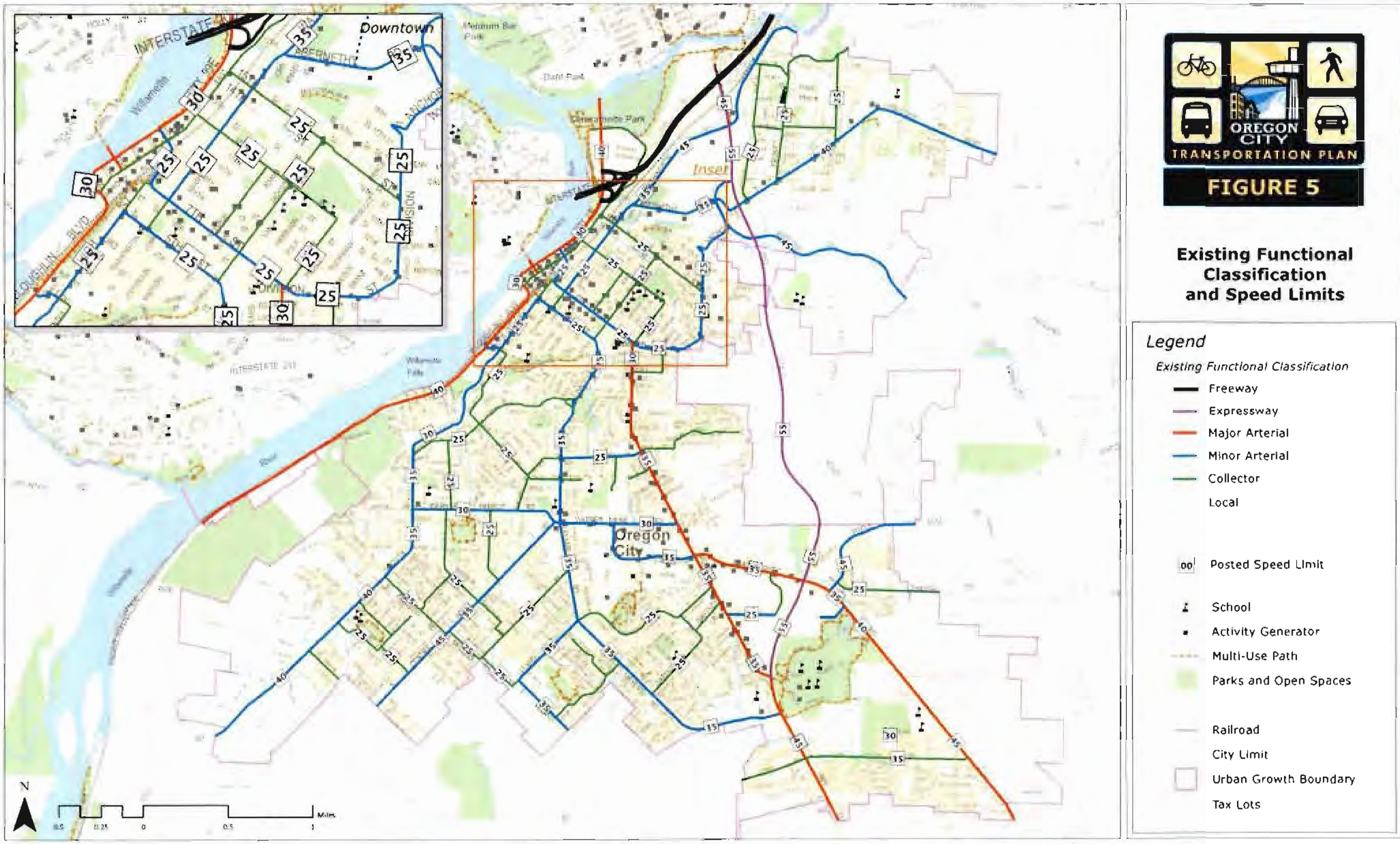
Local Roadways provide more direct access to residences in Oregon City. These roadways are often lined with residences and are designed to serve lower volumes of traffic with a statutory speed limit of 25 miles per hour.

ODOT also classifies roadways in Oregon City under their jurisdiction. Roadways under ODOT jurisdiction (see Figure A3 in the appendix) include the roadways that the City classified as Freeway (I-205), Expressway (OR 213) and several major arterials (i.e. OR 99E, and OR 213). The major characteristics of ODOT roadways in Oregon City are summarized in Table 6. Most of the ODOT roadways in the City are classified by ODOT as District Highways. The exception is I-205, which is classified as an Interstate Highway and OR 99E south of I-205 which is classified as a Regional Highway.

Table 6: ODOT Roadway Characteristics

Roadway (limits)	ODOT Classification*	Special Designations*	Cross section	Posted Speed
I-205 (Willamette River to Clackamas River)	Interstate Highway	Freight Route; Truck Route	4 to 6 lanes	65 mph
OR 213 (I-205 to Molalla Avenue)	District Highway	Expressway; Bypass	4 to 5 lanes	45 to 55 mph
OR 213 (Molalla Avenue to south City limits)	District Highway	N/A	3 to 5 lanes	45 mph
OR 99E (Clackamas River to I-205)	District Highway	Truck Route	4 to 7 lanes	40 mph
OR 99E (I-205 to south City limits)	Regional Highway	Truck Route; Special Transportation Area (STA)**	3 to 5 lanes	30 to 40 mph
OR 43 (Oregon City-West Linn Bridge to OR 99E)	District Highway	STA	2 lanes	25 mph

Source: * Oregon Highway Plan (OHP), Appendix D
**STA designation on OR 99E from 14th Street to Railroad Avenue



OREGON CITY
TRANSPORTATION PLAN
FIGURE 5
Existing Functional Classification and Speed Limits
Legend
Existing Functional Classification
Freeway
Expressway
Major Arterial
Minor Arterial
Collector
Local
Posted Speed Limit
School
Activity Generator
Multi-Use Path
Parks and Open Spaces
Railroad
City Limit
Urban Growth Boundary
Tax Lots
Downtown
Inset
Oregon City
Miles

Bridges

Five bridges connect Oregon City to areas north and west of the City. The bridges include:

- **Oregon City-West Linn Arch Bridge** crosses the Willamette River to the northwest of Oregon City, connecting to West Linn. The bridge, constructed in 1922, is just under two tenths of a mile long and is iconic for the region. The bridge is open to motor vehicle, pedestrian and bicycle traffic only. Bicyclists must share the roadway with motor vehicles. In 2010, ODOT estimated 12,700 vehicles crossed the bridge each day.

View of the Arch Bridge from Downtown

- **Abernethy Bridge** opened in 1970 and carries I-205 traffic across the Willamette River between Oregon City and West Linn. The bridge is open to motor vehicle and freight traffic only. In 2010, ODOT estimated 98,100 vehicles crossed the bridge each day.
- **Clackamas River Bridge** opened in 1962 and carries I-205 traffic across the Clackamas River between Oregon City and Gladstone. The bridge is open to motor vehicle and freight traffic only. In 2010, ODOT estimated 129,100 vehicles crossed the bridge each day.
- **John McLoughlin Bridge** carries OR 99E traffic across the Clackamas River to the north of Oregon City, connecting to Gladstone. The bridge is open to motor vehicle, freight, pedestrian and bicycle traffic. Bicyclists must share the roadway with motor vehicles. In 2010, ODOT estimated 32,000 vehicles crossed the bridge each day.
- **82nd Drive/Park Place Bridge** crosses the Clackamas River to the north of Oregon City, connecting to Gladstone. The bridge, constructed in 1921, is open to pedestrians and bicyclists only and is part of the I-205 multi-use path.

View across the 82nd Drive/Park Place Bridge

Bridges are also located on OR 213, Anchor Way, Holcomb Boulevard, and Washington Street. In addition, an active railroad bridge crosses the Clackamas River, just to the east of the I-205 Clackamas River Bridge. A second railroad bridge crossing over the Clackamas River is located about midway between the John McLoughlin Bridge and the 82nd Drive/Park Place Bridge. The railroad tracks leading to this bridge have been removed on both sides and it currently sits unused, abandoned since 1968.

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. ODOT has identified I-205 as a freight route through Oregon City. While OR 99E is not classified by ODOT as a freight route, it is designated as a truck route by the federal government.

Much of the freight activity in Oregon City is related to the Metro designated employment land. Designated employment land is located near the southeast corner of the City along OR 213, Beavercreek Road and Molalla Avenue. Freight activity is also generated within the Metro designated Oregon City Regional Center. To allow for efficient movement between these designated areas and regional freight routes, Metro has classified several roadways in the City as freight connectors. The connector roadways link I-5 with the employment areas and include OR 213, Beavercreek Road and OR 99E. Freight accounts for approximately two percent of the traffic on OR 213, a little over one percent on Molalla Avenue and about one percent on Maple Lane Road.

Rail

Railroad tracks are available in Oregon City, just west of Clackamas River Drive and Washington Street at the north end of the City and just west of OR 99E along the Willamette River towards the south end of the City. The tracks are owned by Union Pacific Railroad and are currently utilized by freight and Amtrak passenger trains. ODOT estimates that about six passenger trains and between 20 and 25 freight trains pass through Oregon City each day.[4]

Gated at-grade railroad crossings are located at Forsythe Road and 10th Street, while grade separated crossings are located at OR 213, 15th Street, 14th Street, 13th Street, 12th Street and OR 99E.

Air

Portland International Airport (PDX), owned and operated by the Port of Portland, provides regional and international air service for passengers and freight. The airport is located approximately 18 miles (or about 25 minutes) to the north of Oregon City and is connected via I-205. In addition, the Aurora State Airport and Mulino Airport are located less than 15 miles (or 20 minutes) from Oregon City and provide local commercial service and private aircraft use.

Pipeline

A natural gas pipeline serving Oregon City generally crosses the southeast part of the City near Henrici Road. It is operated by Northwest Natural Gas. Several feeder lines from the main pipeline also serve Oregon City. There are no other major regional water or oil pipelines within the City limits.

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[4] ODOT Intercity Passenger Rail Study, ODOT Rail Division, June 2009 Draft.

Water

Oregon City is bordered by the Willamette River on the west side and Clackamas River on the north side of the City. These waterways generally only serve recreational needs. The Willamette Falls Locks, located just south of Downtown Oregon City on the west side of the Willamette River, provides a canal passage for boaters wishing to travel around Willamette Falls.

Transportation System Management and Operations

Transportation System Management and Operations (TSMO) is a set of integrated transportation solutions intended to improve the performance of existing transportation infrastructure through a combination of transportation system management (TSM) and transportation demand management (TDM) strategies and programs.

Transportation System Management (TSM): Oregon City has several regional roadway facilities that serve the City and neighboring communities (I-205, OR 213 and OR 99E). These roadways, along with parallel arterials including Washington Street, 7th Street-Molalla Avenue and Beavercreek Road benefit from TSM infrastructure. Current TSM infrastructure includes:

- Communications infrastructure is available along I-205 and portions of OR 99E, OR 213, Molalla Avenue, Washington Street and Beavercreek Road.
- Coordinated time of day traffic signal control plans at various intersections along OR 99E, OR 213, Molalla Avenue, Washington Street and Beavercreek Road.
- Ramp meters on the OR 99E and OR 213 eastbound and westbound on ramps to I-205
- Cameras at the I-205 interchanges with OR 99E and OR 213 for monitoring travel conditions.
- Road and weather sensor along OR 99E in the Canemah neighborhood.
- Video detection at the Washington Street/Abernethy Road intersection.

The Portland Regional TSMO Plan calls for Arterial Corridor Management (ACM) along OR 213, Beavercreek Road (south of OR 213), OR 213 (to Henrici Road), Washington Street and 7th Street in Oregon City. The project would improve operations by expanding traveler information and upgrading traffic signal equipment and timings.

The Regional TSMO Plan also calls for ACM with adaptive signal timing along Molalla Avenue between 7th Street and OR 213 and Beavercreek Road between Molalla Avenue and OR 213. This project includes the ACM project with signal systems that automatically adapt to current arterial roadway conditions

Transportation Demand Management: Oregon City implements a variety of TDM measures. They include:

- Parking Management
- Roadway Connectivity

- Investing in pedestrian/bicycle facilities

Metro's regional travel demand model was used to evaluate progress towards meeting transportation demand management (TDM) goals, specifically reducing reliance on the single occupancy vehicle (SOV). Metro sets non-SOV targets for areas throughout the region based on 2040 design type. In Oregon City, the Oregon City Regional Center, the 7th Street-Molalla Avenue Corridor and the OR 99E Corridor are required to meet the non-drive alone modal target of 45 to 55 percent. The employment land and the neighborhood land uses in the City are required to meet the non-drive alone modal target of 40 to 45 percent. As shown in Figure A4 in the appendix, the Oregon City Regional Center, as well as much of the northeast, southeast and southwest portions of the City have experienced an increase in non-SOV trips since 2005. These locations are expected to continue to increase trip share via walking, biking, carpooling or public transportation. A few of the more established neighborhoods outside of Downtown will see a slight decline in non-SOV trips through 2035.

Environmental Justice

As stated by the Environmental Protection Agency, "Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.[5]" Within the context of the TSP, Environmental Justice is an effort to identify underserved and vulnerable populations so the City can improve transportation services while avoiding future impacts. Figure A5 in the appendix identifies the location of low-income populations (indicating populations most likely to be dependent on public transportation), minority groups and elderly persons. Significant populations of low-income residents are located in the Park Place neighborhood. Significant populations of minority groups are located around Molalla Avenue between Beavercreek Road and Division Street, while significant populations of the elderly are located around the 15th Street/Division Street intersection. There were no significant populations of non-English speakers and people with disabilities in the City.

Household Cost of Transportation

The financial burden of transportation costs is growing in the United States. This is generally due to rising costs associated with fuel, vehicle maintenance, insurance and in some cases, people seeking affordable homes greater distances from employment. To be considered affordable, housing costs should be no more than 30 percent of household income, transportation costs no more than 15 percent of household income, or the combination of housing and transportation expenses should be no more than 45 percent of household income. In the Oregon City area[6] the housing costs are currently estimated at 26.1 percent of household income (2006 data), transportation costs (2008 data) are estimated at 22.3 percent of household income, for a total of 48.4 percent of household

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[5] U.S. EPA, Environmental Justice, Compliance and Enforcement, Website, 2007

[6] Housing-Transportation Affordability Index, Center for Neighborhood Technology, http://htaindex.cnt.org/method.php

income spent on housing and transportation expenses. The relatively high percentage of income for transportation costs could be due to Oregon City's location at the south edge of the Metro Area and the need for workers to commute longer distances to employment. In addition, many low density neighborhoods lack retail and other community services within the neighborhood or vicinity.

Providing improved travel options, as well as increasing employment in or near Oregon City could help lower transportation costs. Creating opportunities for higher density mixed use areas, as well as neighborhood retail and services centers in or near low density residential areas could potentially reduce the need for driving.

What travel conditions do people face?

The transportation system in Oregon City is managed with a variety of measures to ensure that the transportation infrastructure in the City maintains acceptable quality for residents.

Safety Evaluation

The safety of the roadways and intersections in Oregon City were monitored through collision data as part of the TSP Update. The data was reviewed to identify potential patterns for motor vehicle, pedestrian, and bicyclist collisions.

Collision data from the most recent five years of available data (2005 to 2009) for all roadways in Oregon City was obtained from ODOT and reviewed. Over the past five years, 2,320 collisions (an average of over 464 collisions a year) occurred in Oregon City. A majority of these collisions (about 70 percent) were either rear-end or turning type collisions (see Figure 6). One percent of the collisions involved pedestrians (about five a year), and one percent involved bicycles (about five a year).

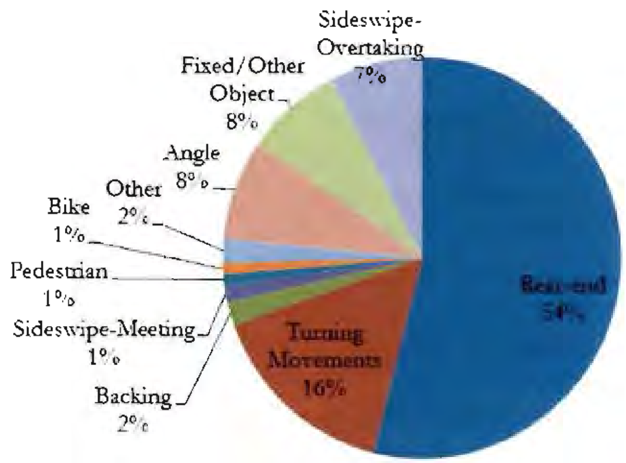


Figure 6: Collision Types (2005 to 2009)

Severities of the collisions in Oregon City over the past five years were generally low, with 58 percent involving property damage only (no injuries). There were four fatalities in the City over the past five years, although fatalities were involved in less than one percent of the collisions.

Pedestrian Safety: There were 22 collisions involving pedestrians over the past five years (eight in 2005, five in 2006, three in 2007, two in 2008 and four in 2009). Of the 22 collisions, six were along Molalla Avenue and 7th Street between Center Street and Warner Milne Road through an area with increased retail activity and a transit corridor. Five additional collisions occurred on OR 99E through Oregon City's downtown: two at 6th Street, one at 10th Street and two at the I-205 ramps. Three additional collisions occurred around downtown Oregon City, one at the Main Street/15th Street, Washington Street/12th Street and Jefferson Street/5th Street intersections. Beavercreek Road had three collisions involving a pedestrian, with one each at Red Soils Court, Fir Street and OR 213. Two occurred in the southwest part of the City, one in the Canemah neighborhood at the OR 99E/Hedges Street intersection and one just north of Canemah at the Tumwater Drive/2nd Street intersection. Two collisions occurred along Holcomb Boulevard through the Park Place neighborhood, one each at Apperson Boulevard and Longview Way, while one occurred towards the south end of the City along Meyers Road at Frontier Parkway. Most of the collisions involving pedestrians were caused by motorists failing to yield the right-of-way. The location of the pedestrian collisions can be seen in Figure 7.

Bicycle Safety: There were 20 collisions involving bicyclists over the past five years (three in 2005, six in 2006, five in 2007, three in 2008 and three in 2009). Of the 20 collisions, seven were on Molalla Avenue between Division Street and Clairmont Way through an area with a high frequency of driveways. Three collisions occurred along both OR 99E and OR 213, with one at Dunes Drive, 14th Street and 2nd Street along OR 99E and one at Washington Street, Redland Road and Meyers Road along OR 213. Linn Avenue had two collisions involving a bicyclist, one each at Eastfield Drive and AV Davis Road. The other collisions involving a bicycle occurred at the Washington Street/14th Street, South End Road/Salmonberry Drive, Beavercreek Road/Kaen Road and Barker Avenue/Clearbrook Drive intersections. Most of the bicycle collisions were caused by a motorist failing to yield the right-of-way when turning. The location of the bicycle collisions can be seen in Figure 7.

Intersection Safety: Collision rates were calculated (based on the past five years of collision data) for each of the 21 intersections reviewed in Oregon City (see Table A1 in the appendix) and summarized in Figure 7. The crash rates at two intersections (Main Street/14th Street and the OR 213/Beavercreek Road intersection) were identified as high collision locations. In addition, the OR 213/Caufield-Glen Oak Road and the Washington Street/12th Street intersections were identified as having above average collision rates. The collisions were further evaluated at these intersections to see if any trends exist.

- The Main Street/14th Street intersection is two-way stop controlled, while several of the adjacent intersections along Main Street are all-way stop controlled intersections. Most of the collisions at this intersection were angle type collisions (15 of the 23 collisions) meaning one vehicle pulled out in front of another. This may indicate that drivers on Main Street are unaware that traffic on 14th Street is not required to stop and consequently often fail to yield the right of way.
- The OR 213/Beavercreek Road signalized intersection is located within the 55 mile per hour speed zone and expressway segment of OR 213. This is the first at-grade intersection south of Redland Road for over two miles. Most of the collisions at this intersection were rear-end type (166 of the 212 collisions). This may indicate that drivers are caught off guard by queues from the intersection after traveling at uninterrupted higher speeds for an extended period of time. The severities of the collisions were generally low, with 85 percent involving property damage only (no injuries) or minor injuries. Major injuries were involved in about

seven percent of the collisions and there were no fatalities.

- The OR 213/Caufield-Glen Oak Road signalized intersection is located just south of the 55 mile per hour speed zone and the portion of OR 213 that narrows to one travel lane in each direction. Nearly all of the collisions at this intersection were rear-end type (33 of the 37 collisions). This may indicate that drivers are caught off guard by queues from the intersection or could be focused on maneuvering for position when the road narrows to one lane without noticing stopped vehicles ahead. During evening peak field reviews, queues were observed in the southbound direction extending nearly to Meyers Road.
- The Washington Street/12th Street intersection is two-way stop controlled, with 12th Street yielding the right-of-way. The intersection is characterized by steep topography on both Washington Street and 12th Street. Between 2005 and 2008, 13 collisions occurred at this intersection which is typical for the volume of traffic served. However, in 2009 14 collisions occurred, more than the previous four years combined and amounting to a collision rate more than double the average for the intersection. This may correspond with increased traffic flow on 12th Street after being extended from Main Street to OR 99E. Most of the collisions at this intersection were angle type collisions (17 of the 27 collisions), with eight occurring in 2009. This may indicate that drivers on 12th Street are not noticing the traffic control at the intersection or are unaware that traffic on Washington Street is not required to stop and consequently often fail to yield the right of way. During field reviews, it was noted that the stop sign for the southeast direction of 12th Street is obstructed by tree branches and an electric pole, although a flashing beacon is visible at the intersection. Note that six of the collisions which occurred in 2009 at this intersection were related to a single snow event (five rear-end and one sideswipe type collision).

Are there any areas in Oregon City that are identified as high collision locations by ODOT?
Yes, in Oregon City there are ten locations that rank among the top ten percent of state highways in Oregon for collision frequency.[7] The identified high collision locations are shown in Figure 7 and summarized in the appendix.

[7] 2010 ODOT Safety Priority Index System (SPIS) top 10 percent sites

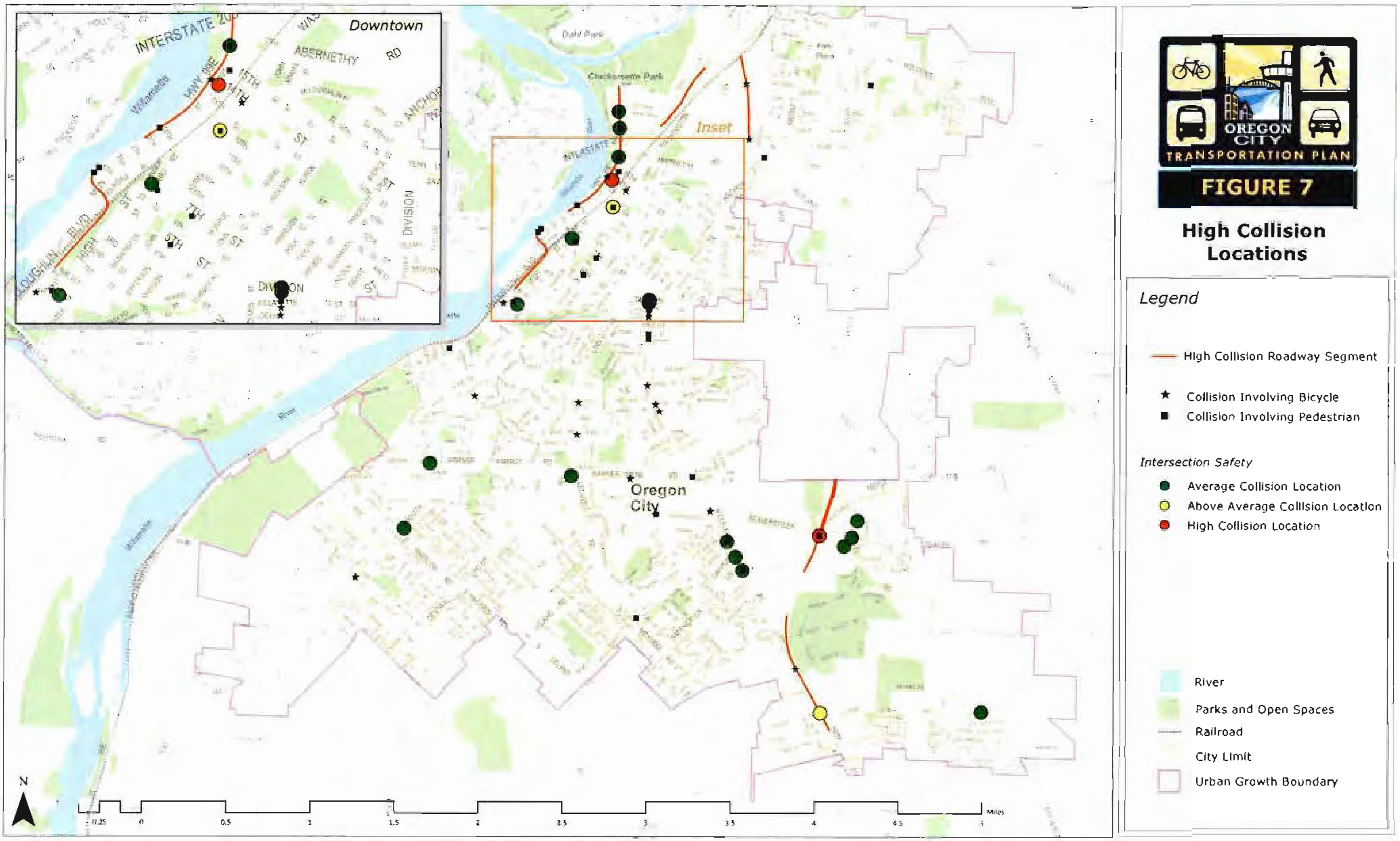


FIGURE 7

High Collision Locations

Pedestrian Conditions

The pedestrian facilities were reviewed as part of this TSP Update to identify facility deficits or potential connectivity or access improvement opportunities. The existing sidewalk system in downtown Oregon City encourages walking trips by providing a high level of connectivity to key destinations, such as shopping, schools, parks and museums. The continuous presence of sidewalks on Molalla Avenue, 7th Street, Warner Milne Road, Beavercreek Road and Meyers Road link much of the major shopping and employment areas of the City with Downtown. Despite the relatively linked walking routes, there are a number of conditions that provide challenges to pedestrians. These include:

Residential neighborhood sidewalk connectivity: While the City has a relatively built-out sidewalk network in much of the major employment and shopping areas, there are limited connections to and within the neighborhoods. Over the past few years, some of the sidewalk gaps throughout the City including portions of Beavercreek Road, Holcomb Boulevard and Central Point Road have been filled. Several major streets connecting to and within the residential neighborhoods of the City including OR 99E (south of Main Street), OR 213 (south of Molalla Avenue), Linn Avenue, Partlow Road, Clairmont Way, Leland Road, Meyers Road, Beavercreek Road, South End Road, Warner Parrot Road, Redland Road, Holcomb Boulevard and Maple Lane Road either lack sidewalks completely, or on one side for extended distances. Sidewalk gaps are most notable in the southern and southwest neighborhoods in the City including Tower Vista, South End, Hillendale, Rivercrest and Canemah. A few of these roadways are under the jurisdiction of ODOT (OR 99E) and Clackamas County (portion of South End Road). In addition, sidewalk gaps are evident around schools such as John McLoughlin Elementary, Holcomb Elementary, King Elementary, Gaffney Lane Elementary and Gardiner Middle. The City should work with developers and these jurisdictions to continue increasing the sidewalk coverage on all roadways in the City.

Pedestrian walking along the shoulder of Main Street

Pedestrian access to Canemah: There are inadequate pedestrian connections between the Canemah neighborhood (along OR 99E at the bottom of the bluff) and the rest of the City. The neighborhood lies between OR 99E and South End Road, however, both lack comfortable well maintained pedestrian facilities and are generally not conductive for walking trips.

Pedestrian roadway crossings: There are pedestrian crosswalks at a large number of intersections in Oregon City, particularly in downtown where pedestrian activity is the highest. However, the need for further crossing enhancements was evident through field observations. Most notable is the need for additional or improved crossings of OR 99E, OR 213, 7th Street, Molalla Avenue and

Washington Street. Pedestrian crossing is difficult across many of these roadways due to high motor vehicle volumes and speeds.

Pedestrian refuge and crosswalk along Molalla Avenue

Signalized crossing opportunities across OR 99E are available at several intersections in downtown between 10th Street and 14th Street. Past 10th Street, a signalized crossing opportunity is not available for nearly a half mile at Main Street. South of downtown, a pedestrian bridge over OR 99E is available just to the north of Tumwater Drive (at the end of the McLoughlin Promenade) and a signalized pedestrian crossing is available at 2nd Street. No additional marked pedestrian crossings (signalized or unsignalized) of OR 99E are available south of 2nd Street through the Canemah neighborhood, a distance of over a half mile.

Crossing opportunities for pedestrians across OR 213 to the Park Place neighborhood (in the northeast portion of the City) are spaced approximately every half mile and available via Washington Street, Holcomb Boulevard and Redland Road. South of Redland Road, a crossing opportunity is not available for over two miles, at Beavercreek Road. Between Beavercreek Road and Caufield-Glen Oak Road, crossing opportunities are available at Molalla Avenue and Meyers Road, spaced about a half mile between each. South of Caufield-Glen Oak Road no additional crossing opportunities of OR 213 are available in the City.

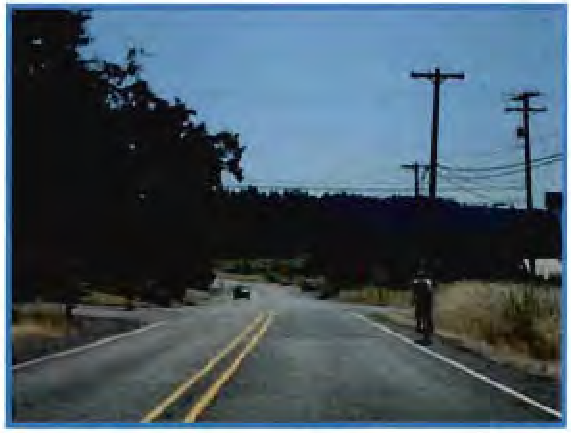
Additional crossing opportunities and enhancements for pedestrians across 7th Street, Molalla Avenue and Washington Street would be beneficial. Visibility issues and steady streams of traffic limit the available gaps for safe pedestrian crossings along these roadways. Marked crossing gaps of greater than a half mile exist on each of these roadways.

Pedestrian connectivity between Downtown and the top of the bluff: The Municipal Elevator and the Grand Staircase provide a pedestrian connection between the lower level and upper portion of 7th Street. Street connections to the top of the bluff from downtown are limited to South End Road, Center Street, 5th Street-Linn Avenue, Singer Hill Road-7th Street, 12th Street, 14th Street and 15th Street. Of these roadways, only Singer Hill Road-7th Street and 12th Street offer continuous pedestrian facilities up the hill, however these facilities are narrow and often impractical for ADA access. Several of these roadways are characterized by steep inclines and narrow winding roadways that are generally not supportive of safe pedestrian travel.

Bicycle Conditions

The bicycle facilities were reviewed as part of this TSP Update to identify facility deficits or potential connectivity or access improvement opportunities. There are two primary north/south routes (5th Street-Linn Avenue and 7th Street-Molalla Avenue) and several primary east/west routes (Warner Milne Road, Warner Parrot Road, Beavercreek Road and Washington Street) in the City with bicycle facilities.

Bicycle facility gaps: While the City has a few primary north/south and east/west routes, there are several facility gaps on major corridors and limited connections within the residential neighborhoods. Bike lane gaps on OR 99E, Washington Street, Leland Road, Meyers Road, Molalla Avenue, Maple Lane Road, Holcomb Boulevard, South End Road, Center Street, Central Point Road and Division Street should be addressed to provide connectivity for bicyclists throughout the City.



Bicyclist riding in the roadway

Bicycle connectivity between Downtown and the top of the bluff: Bicycle connections to the top of the bluff from downtown are limited to South End Road, Center Street, 5th Street-Linn Avenue, Singer Hill Road-7th Street, 12th Street, 14th Street and 15th Street. Of these roadways, only 5th Street-Linn Avenue offers continuous bicycle facilities up the hill. Singer Hill Road-7th Street offers an adjacent bike route between Washington Street and Division Street along 9th Street and Taylor Street. South of Division Street, Singer Hill Road-7th Street becomes Molalla Avenue, which has bike lanes. Several of these roadways are characterized by steep inclines and narrow winding roadways that are generally not supportive of safe bicycle travel.

McLoughlin Promenade: The McLoughlin Promenade could potentially be extended south to provide bicycle and pedestrian connections to the Canemah neighborhood and other areas at the south end of the City. The promenade is only five feet wide and would need to be widened to provide a multi-use trail for bicycle and pedestrian usage. However, the Museum of the Oregon Territory and several businesses lie in the potential path of an off-street multi-use trail in this area. Any potential widening would require historic review to assure it would not detract from the historic significance of the Promenade.

McLoughlin Promenade is only five feet wide

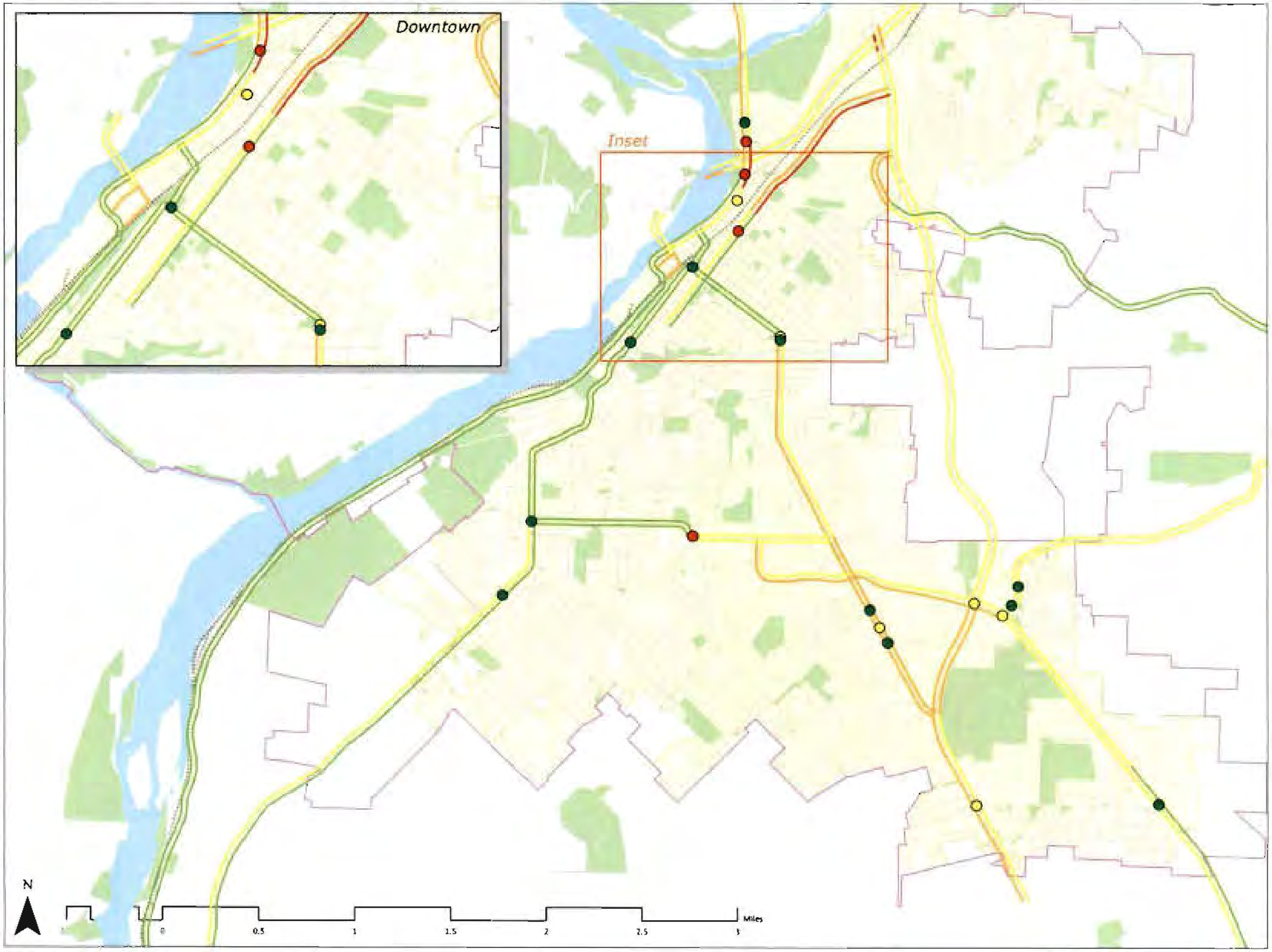
Link the regional trail network with the City network: The connectivity and access to the regional trail network including the I-205 multi-use trail and the potential Oregon City Loop Trail should be enhanced to encourage more biking and walking trips within the City. Bicycle and pedestrian users must currently access the I-205 multi-use trail via OR 99E or Main Street.

Motor Vehicle Conditions

The motor vehicle conditions in Oregon City vary based on the time of year. During the peak seasonal period (typically in August), traffic volumes are higher than those during the average weekday (typically in the spring or fall) and therefore intersection operations are often worse. For this reason, the intersection operations were evaluated at the 21 intersections reviewed during the peak seasonal period. The evaluation utilized 2000 Highway Capacity Manual methodology for all the intersections.

Peak seasonal intersection operations are summarized in Figure 8 and shown in Table A2 in the appendix. During the evening peak period, four of the intersections reviewed are substandard including the OR 99E/I-205 SB Ramps and OR 99E/I-205 NB Ramps intersections. In addition, two unsignalized intersections are substandard (Washington Street/12th Street and Central Point Road/Warner Parrott Road).The side streets at these intersections (12th Street and Central Point Road) generally experience high delay due to steady volumes on the uncontrolled roadway. These approaches typically require more time for an acceptable gap in traffic to make a left turn onto the mainline, therefore, the delay of the side street is high.

Evening peak period motor vehicle speeds were compared to posted speed limits on major roadways in the City. The motor vehicle speeds during the p.m. peak hour were assessed using INRIX historical traffic flows on major roadways. The data, obtained from ODOT, is based on multiple years of collected speed values. As shown in Figure 8, there are several roadways during the evening peak hour that experience travel speeds much lower than the posted speed. Portions of OR 213, OR 99E, Beavercreek Road, Molalla Avenue, and Washington Street experience average travel speeds well below the posted limits during the evening peak hour.



OREGON CITY TRANSPORTATION PLAN

FIGURE 8

Motor Vehicle Operating Conditions (P.M. Peak)

Legend

Roadway Travel Speed compared to Posted Speed

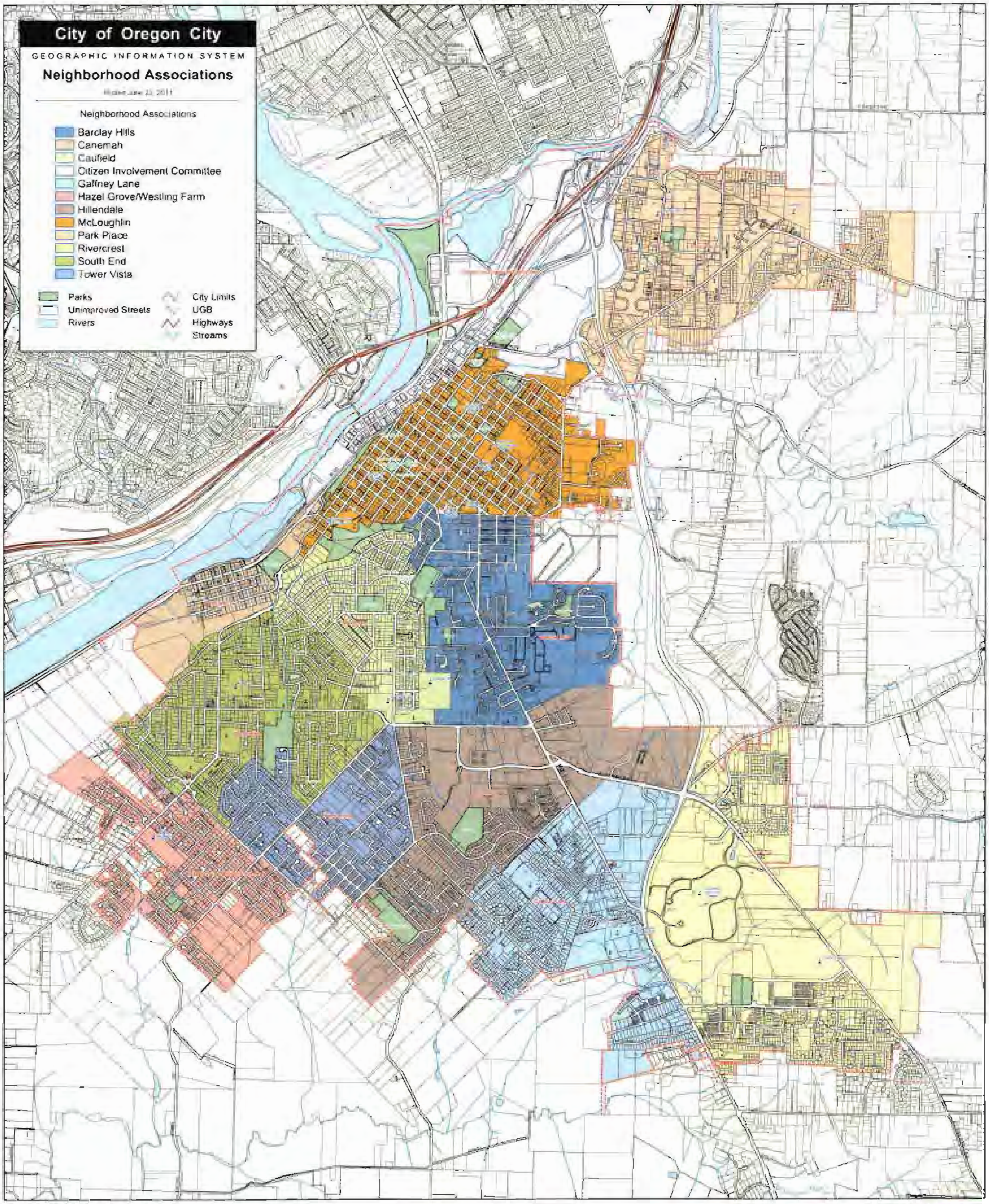
- Congested, well below speed limit
- Slowing, well below speed limit
- Slowing, but near speed limit
- Uncongested, near speed limit

Peak Seasonal Intersection Operations

- Good
- Marginal
- Substandard

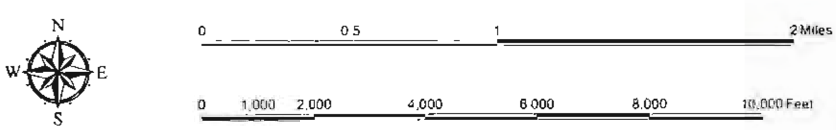
- River
- Parks and Open Spaces
- Railroad
- City Limit
- Urban Growth Boundary

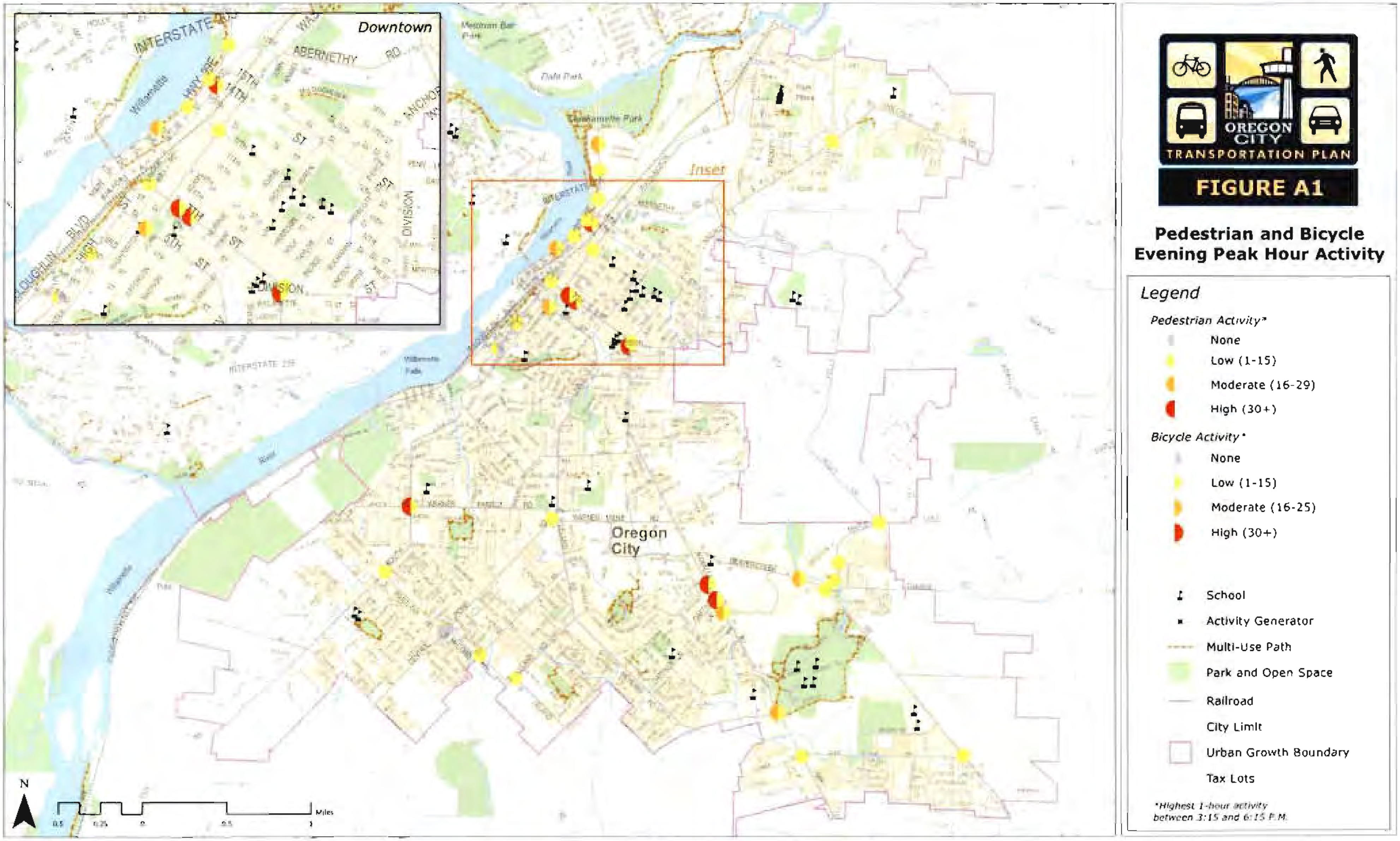
Appendix



MAP FOR REFERENCE PURPOSES ONLY
The information on this map is derived from Oregon City's digital database. However, there may be map errors or omissions. Please contact Oregon City directly to verify map information. Notification of any errors is appreciated.

Please recycle with colored office grade paper





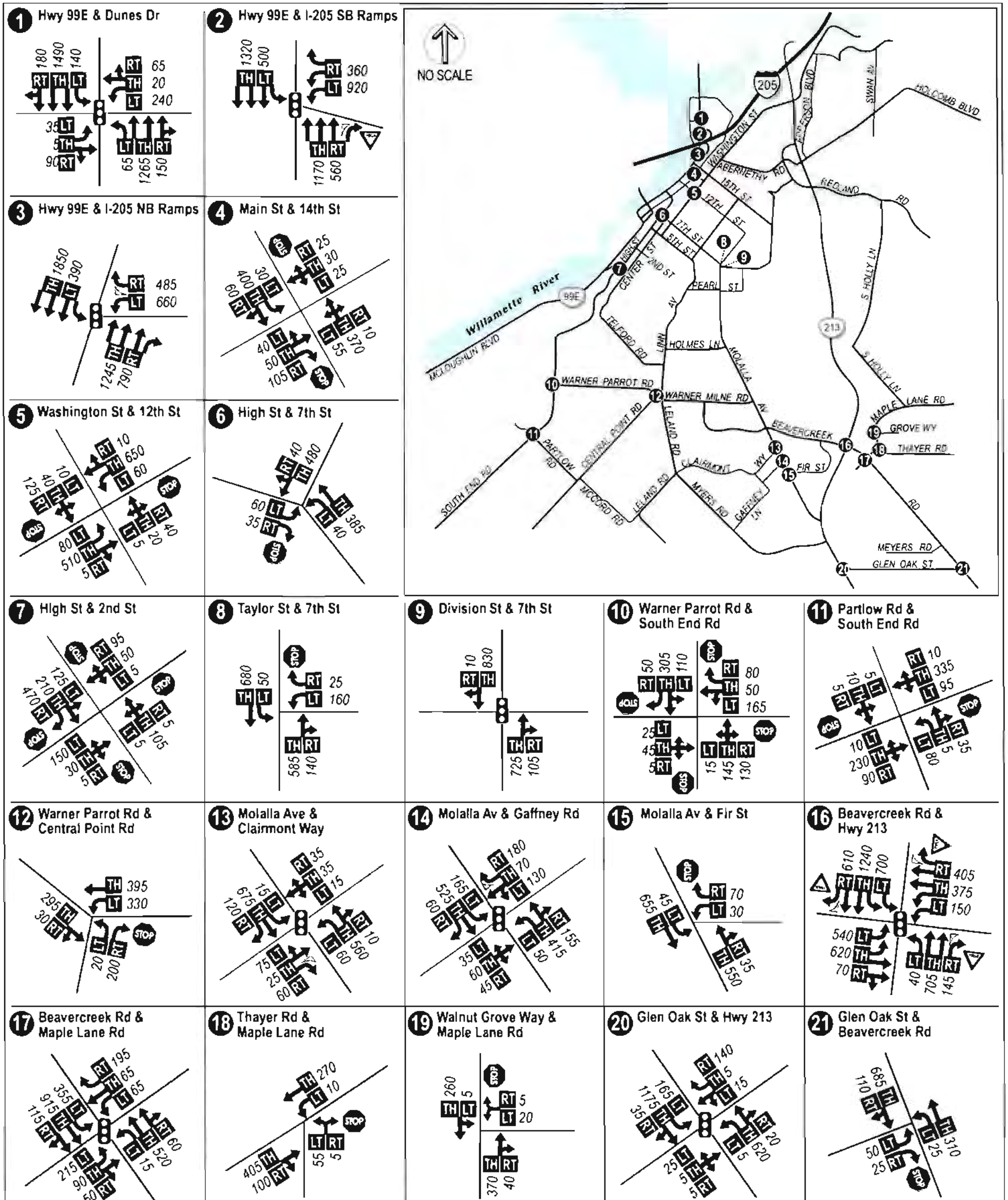
Downtown
Inset
Oregon City
INTERSTATE
ABERNETHY
DIVISION
N
Miles
OREGON CITY
TRANSPORTATION PLAN
FIGURE A1
Pedestrian and Bicycle Evening Peak Hour Activity
Legend
Pedestrian Activity*
None
Low (1-15)
Moderate (16-29)
High (30+)
Bicycle Activity*
None
Low (1-15)
Moderate (16-25)
High (30+)
School
Activity Generator
Multi-Use Path
Park and Open Space
Railroad
City Limit
Urban Growth Boundary
Tax Lots
*Highest 1-hour activity between 3:15 and 6:15 P.M.

Peak Seasonal Traffic Volumes (30HV)

During the summer months, traffic volumes increase due to an influx of recreational and leisure travelers taking advantage of the nice weather. For this reason, the traffic count data was adjusted upward using methodology from the ODOT Analysis Procedures Manual[1] to represent peak seasonal traffic conditions. Using the commuter trend various seasonal factors were developed and applied to the count data to represent peak seasonal (referred to as the 30th highest annual hour (30 HV) volume). The final p.m. peak seasonal traffic volumes developed for the reviewed intersections are displayed in Figure A2.

Peak Seasonal Volumes: The collected count data was factored up to replicate the conditions when traffic volumes are typically highest (August). Using the commuter trend, various seasonal factors were established for the traffic count data collected on April 12th, 13th, 14th, 21st and September 7th.

[1] Analysis Procedures Manual. Oregon Department of Transportation, July 2009.



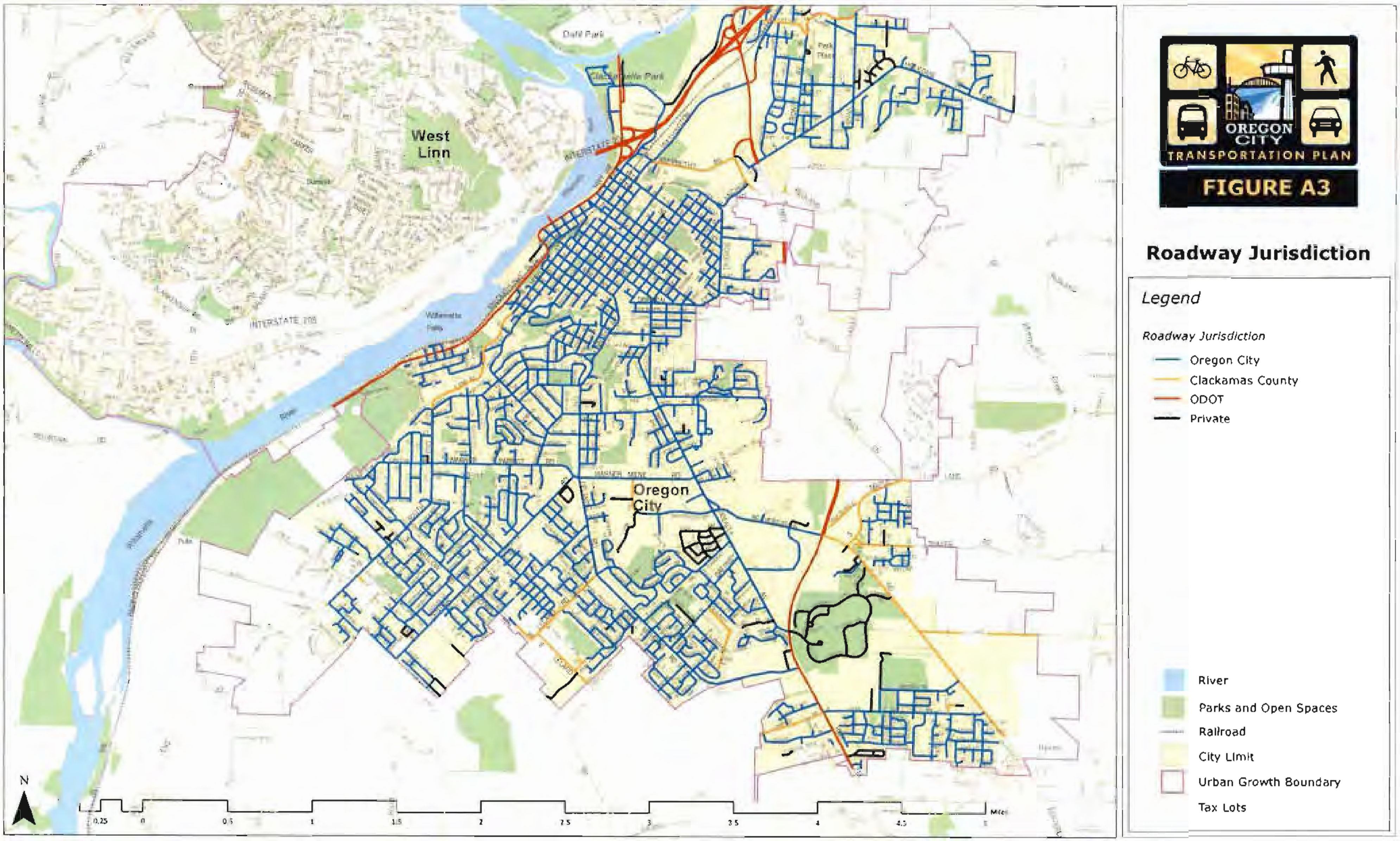
LEGEND

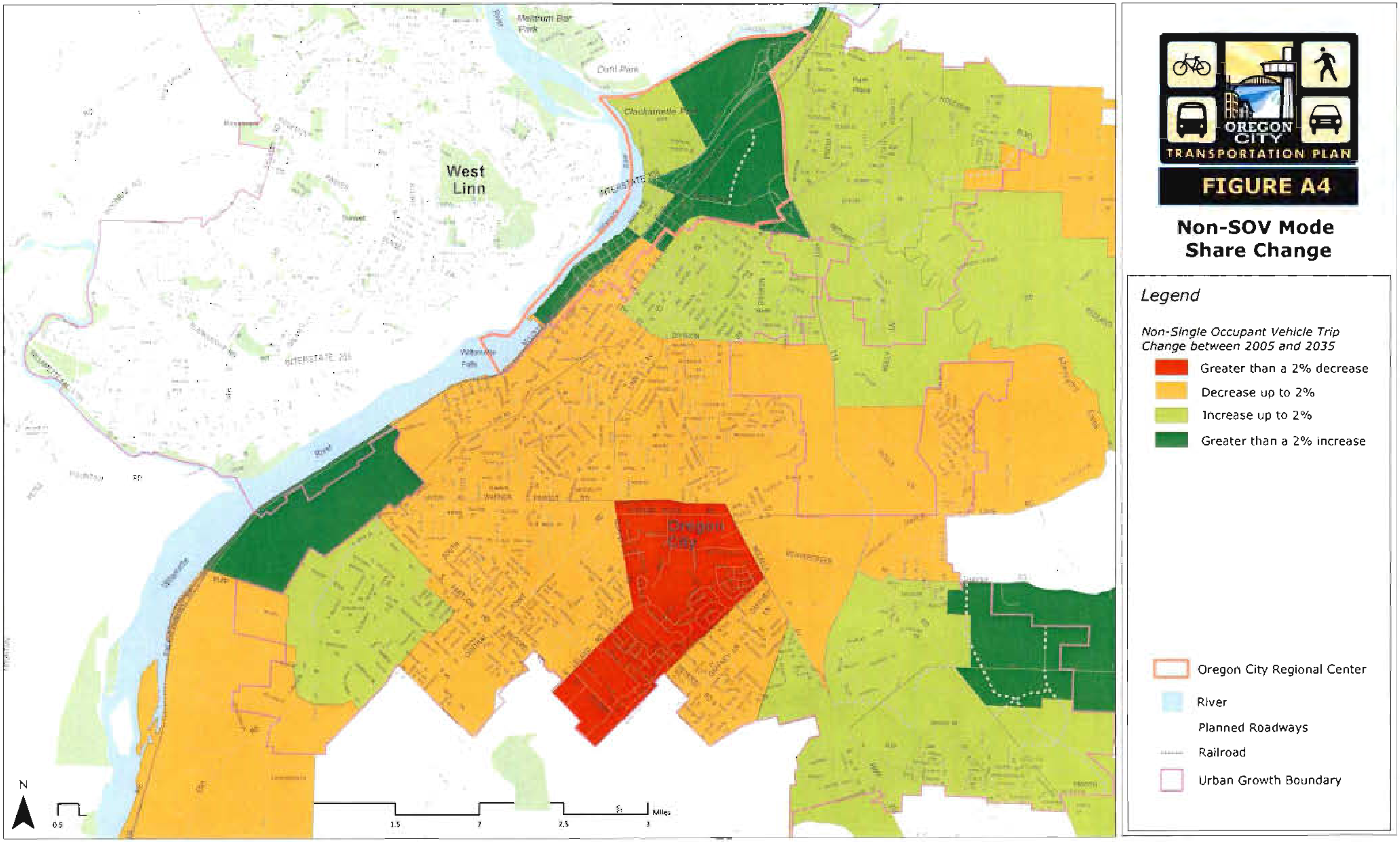
- 00 - Study Intersection & Number
- STOP - Stop Sign
- Traffic Signal
- Yield
- ← - Lane Configuration
- *00* - 30th Highest Hour Traffic Volume (PM)
- LT TH RT - Volume Turn Movement (Left-Thru-Right)

DKS Associates

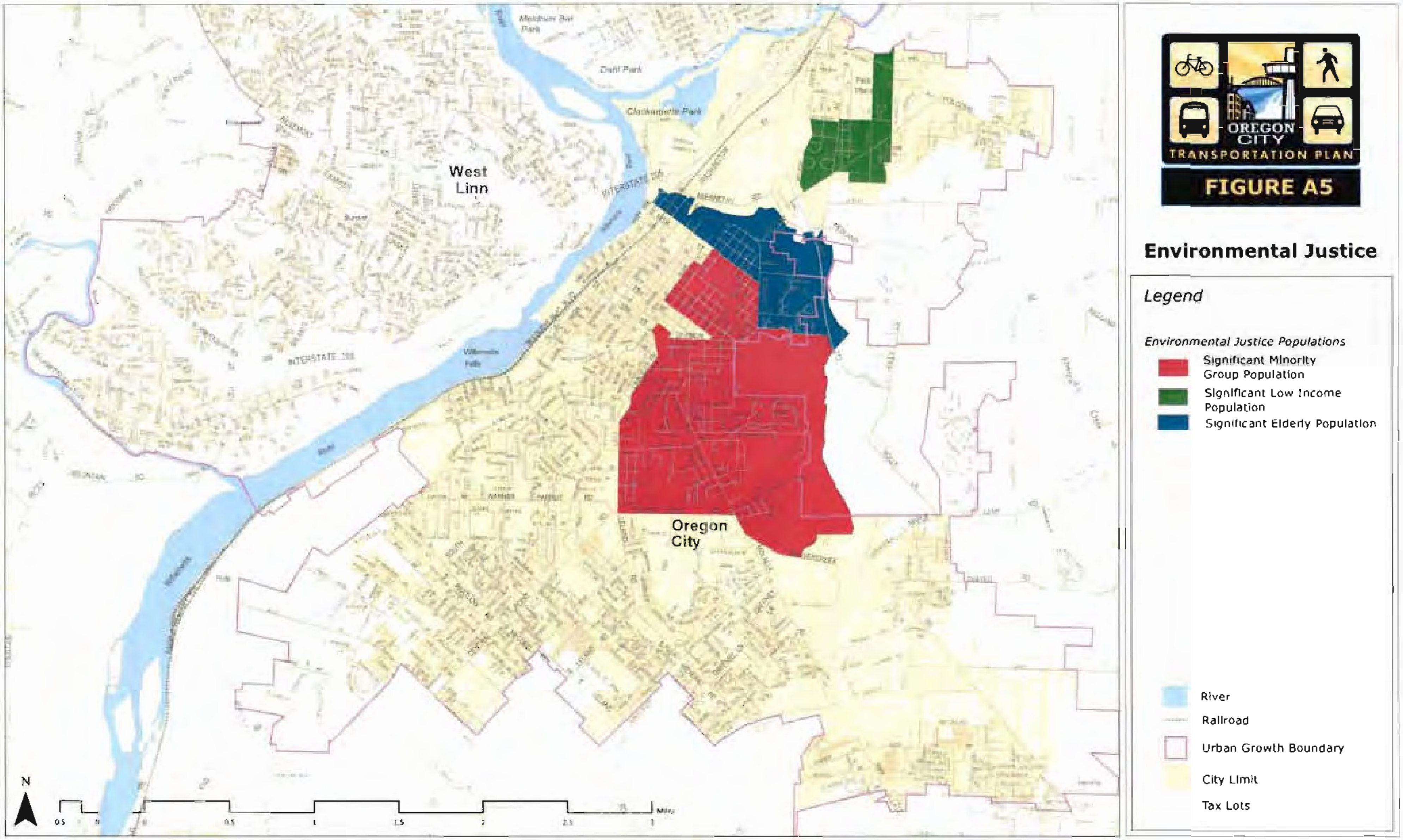
Figure A2

2011 EXISTING 30HV MOTOR VEHICLE VOLUMES (PM Peak Hour)


OREGON CITY
TRANSPORTATION PLAN
FIGURE A3
Roadway Jurisdiction
Legend
Roadway Jurisdiction
Oregon City
Clackamas County
ODOT
Private
River
Parks and Open Spaces
Railroad
City Limit
Urban Growth Boundary
Tax Lots
West Linn
Oregon City
INTERSTATE 205
N
Miles



West Linn
Oregon City
OREGON CITY TRANSPORTATION PLAN
FIGURE A4
Non-SOV Mode Share Change
Legend
Non-Single Occupant Vehicle Trip Change between 2005 and 2035
Greater than a 2% decrease
Decrease up to 2%
Increase up to 2%
Greater than a 2% increase
Oregon City Regional Center
River
Planned Roadways
Railroad
Urban Growth Boundary
Miles



OREGON CITY
TRANSPORTATION PLAN
FIGURE A5
Environmental Justice
Legend
Environmental Justice Populations
Significant Minority Group Population
Significant Low Income Population
Significant Elderly Population
River
Railroad
Urban Growth Boundary
City Limit
Tax Lots
West Linn
Oregon City
Clackamette Park
INTERSTATE 205
N
Miles

Intersection Collisions

The total number of crashes experienced at an intersection is typically proportional to the number of vehicles entering it. Therefore, a crash rate describing the frequency of crashes per million entering vehicles (MEV) is used to determine if the number of crashes should be considered high. Using this technique, a collision rate of 1.0 MEV or greater is commonly used to identify when collision occurrences are higher than average and should be further evaluated.

As shown in Table A1, crash rates were calculated (based on the past five years of collision data) for each of the 21 intersections reviewed in Oregon City.

Table A1: Intersection Collision Evaluation

Intersection	Collision Rate
OR 99E/Dunes Drive	0.51
OR 99E/I-205 WB Ramps	0.43
OR 99E/I-205 EB Ramps	0.34
Main Street/14th Street	**1.07**
Washington Street/12th Street	0.95*
7th Street-Singer Hill/High Street	0.11
High Street/2nd Street	0.31
Taylor Street/7th Street	0.03
Molalla Avenue/Division Street	0.16
South End Road/Warner Parrott Road	0.29
South End Road/Lafayette Avenue-Partlow Road	0.18
Central Point Road/Warner Parrott Road	0.13
Molalla Avenue/Clairmont Way	0.59
Molalla Avenue/Gaffney Lane	0.73
Molalla Avenue/Fir Street	0.28
OR 213/Beavercreek Road	**2.05**
Maple Lane Road/Beavercreek Road	0.38
Maple Lane Road/Thayer Road	0.19
Maple Lane Road/Walnut Grove Way	0.00
OR 213/Caufield-Glen Oak Road	0.92
Beavercreek Road/Glen Oak Road	0.36

*Collision rate at this intersection would be 0.74 if the six collisions that occurred during a single snow event in 2009 are not considered.

Bolded Red and Shaded indicates collision rate exceeds 1.0 MEV

High Collision Locations

The following locations were identified as a high collision location (top ten percent of state highways in Oregon) on the ODOT SPIS:

- I-205 Northbound just past the on-ramp from OR 99E

  This high collision segment experiences an increase in traffic from the OR 99E on-ramp and is impacted by traffic exiting I-205 at OR 213. These factors could be contributing to the amount of collisions.

- OR 99E from one-tenth of a mile north of Dunes Drive to I-205

  This high collision segment includes two congested intersections (I-205 Westbound Ramps and Dunes Drive) and is often impacted by queues from the I-205 interchange.

- OR 99E from I-205 to 12th Street

  This high collision segment includes several signalized intersections and is often impacted by queues from the I-205 interchange.

- OR 99E from 11th Street to 9th Street

This high collision segment generally includes several accesses over a short distance, a narrow tunnel and two curves which could be contributing to the amount of collisions.

- OR 99E from 6th Street to one-tenth of a mile south of Railroad Avenue

This high collision segment generally includes several accesses over a short distance which could be contributing to the amount of collisions.

- OR 213 from I-205 to one-tenth of a mile south of Clackamas River Drive

This high collision segment will be mitigated with a planned jug handle at the OR 213/Washington Street-Clackamas River Drive intersection. Washington Street will be extended to undercrosss OR 213 and connect to Clackamas River Drive.

- OR 213 surrounding the Beavercreek Road intersection

  This segment includes the high collision location at the OR 213/Beavercreek Road intersection exceeding the statewide average collision rate. This segment is located within the 55 mile per hour speed zone and expressway segment of OR 213 and is the first at-grade intersection south of Redland Road for over two miles.

- OR 213 surrounding the Molalla Avenue intersection

  This segment is located within the 55 mile per hour speed zone and expressway segment of OR 213. Congestion at surrounding intersections may be impacting this segment.

- OR 213 surrounding the Meyers Road intersection

  This segment is located just south of the 55 mile per hour speed zone on OR 213. Queues in the southbound direction from the Caufield-Glen Oak Road intersection impact this intersection at times.

- OR 213 surrounding the Caufield-Glen Oak Road intersection

  This segment includes the high collision location at the OR 213/ Caufield-Glen Oak Road intersection that was just under the statewide average collision rate. This segment is located just south of the 55 mile per hour speed zone and the portion of OR 213 that narrows to one travel lane in each direction.

Motor Vehicle Operations

Intersection Mobility Standards: The intersections in Oregon City are monitored through mobility standards (or performance measures). Two methods to gauge intersection operations include volume-to-capacity (v/c) ratios and level of service (LOS).

Volume-to-capacity (V/C) ratio: A decimal representation (between 0.00 and 1.00) of the proportion of capacity that is being used (i.e., the saturation) at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00, congestion increases and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays. ODOT mobility standards are based on v/c ratios.

Level of service (LOS): A "report card" rating (A through F) based on the average delay experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity. This condition is typically evident in long queues and delays.

All intersections in Oregon City must operate at or below the adopted performance measures or mitigation would be necessary to approve future growth. The adopted intersection mobility standards vary by jurisdiction of the roadways. All intersections under State jurisdiction in Oregon City must comply with the v/c ratios in the 1999 Oregon Highway Plan (OHP). The OHP specifies v/c thresholds based on place type. The standards in Oregon City range from a v/c ratio of 0.85 to 1.10. Intersections under City or County jurisdiction must comply with a LOS D mobility standard for signalized and unsignalized intersections.

Peak seasonal intersection operations can be seen in Table A2.

Table A2: Intersection Operations (2011 p.m. peak)

Intersection	Mobility Standard	v/c Ratio	Peak Seasonal LOS	Delay
Signalized Intersections under ODOT Jurisdiction				
OR 99E/Dunes Drive	v/c 1.10	0.65	B	19.9
OR 99E/I-205 WB Ramps	v/c 0.85	**0.95**	C	29.9
OR 99E/I-205 EB Ramps	v/c 0.85	**0.99**	D	54.3
OR 213/Beavercreek Road	v/c 0.99	0.83	D	40.7
OR 213/Caufield-Glen Oak Road	v/c 0.99	0.79	C	23.7
Signalized or All-way Stop Intersections under Oregon City or Clackamas County Jurisdiction				
High Street/2nd Street*	LOS D	0.70	C	15.0
Molalla Avenue/Division Street	LOS D	0.62	A	3.5
South End Road/Warner Parrott Road*	LOS D	0.85	C	23.5
Molalla Avenue/Clairmont Way	LOS D	0.55	B	16.3
Molalla Avenue/Gaffney Lane	LOS D	0.67	C	27.2
Maple Lane Road/Beavercreek Road	LOS D	0.65	C	32.8
Unsignalized Intersections under Oregon City or Clackamas County Jurisdiction**				
Main Street/14th Street	LOS D	0.64	A/D	34.8
Washington Street/12th Street	LOS D	0.88	**A/F**	83.0
7th Street-Singer Hill/High Street	LOS D	0.14	A/B	13.4
Taylor Street/7th Street	LOS D	0.53	A/D	26.4
South End Road/Lafayette Avenue-Partlow Road	LOS D	0.40	A/D	25.2
Central Point Road/Warner Parrott Road	LOS D	0.33	**A/F**	61.1
Molalla Avenue/Fir Street	LOS D	0.24	A/C	15.7
Maple Lane Road/Thayer Road	LOS D	0.17	A/C	16.6
Maple Lane Road/Walnut Grove Way	LOS D	0.06	A/B	14.0
Beavercreek Road/Glen Oak Road	LOS D	0.07	A/D	23.5

* All-way stop controlled intersection

** V/C ratio, LOS and delay reported for the worst stop controlled approach

Bolded Red and Shaded indicates intersection exceeds mobility standard

2011 HCM Capacity Analysis Results (30HV)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	5	90	240	20	65	65	1265	150	140	1490	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.86		1.00	0.89		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1645	1495		1767	1612		1719	4913		1770	4800	
Flt Permitted	0.69	1.00		0.67	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1200	1495		1253	1612		1719	4913		1770	4800	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	36	5	93	247	21	67	67	1304	155	144	1536	186
RTOR Reduction (vph)	0	70	0	0	51	0	0	10	0	0	10	0
Lane Group Flow (vph)	36	28	0	247	37	0	67	1449	0	144	1712	0
Confl. Peds. (#/hr)	10		2	2		10	3					3
Heavy Vehicles (%)	9%	0%	8%	2%	12%	0%	5%	4%	3%	2%	6%	6%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	26.5	26.5		26.5	26.5		7.2	56.5		13.5	62.8	
Effective Green, g (s)	27.0	27.0		27.0	27.0		7.2	57.5		13.5	63.8	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.07	0.52		0.12	0.58	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.3	4.8		2.3	4.8	
Lane Grp Cap (vph)	295	367		308	396		113	2568		217	2784	
v/s Ratio Prot		0.02			0.02		0.04	c0.30		0.08	c0.36	
v/s Ratio Perm	0.03			c0.20								
v/c Ratio	0.12	0.08		0.80	0.09		0.59	0.56		0.66	0.62	
Uniform Delay, d1	32.3	31.9		39.0	32.1		50.0	17.8		46.1	15.1	
Progression Factor	1.00	1.00		1.00	1.00		0.71	0.69		1.00	1.00	
Incremental Delay, d2	0.1	0.1		13.6	0.1		3.8	0.5		6.3	1.0	
Delay (s)	32.4	32.0		52.5	32.1		39.3	12.8		52.4	16.1	
Level of Service	C	C		D	C		D	B		D	B	
Approach Delay (s)		32.1			47.2			14.0			18.9	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	920	360	1170	560	500	1320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.91	1.00	1.00	0.91
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)	3367	1553	4988	1568	1736	4988
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3367	1553	4988	1568	1736	4988
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	979	383	1245	596	532	1404
RTOR Reduction (vph)	0	1	0	431	0	0
Lane Group Flow (vph)	979	382	1245	165	532	1404
Heavy Vehicles (%)	4%	4%	4%	3%	4%	4%
Turn Type	NA	pm+ov	NA	Perm	Prot	NA
Protected Phases	4	5	6		5	2
Permitted Phases		4		6		
Actuated Green, G (s)	34.3	67.5	30.0	30.0	33.2	67.2
Effective Green, g (s)	34.3	67.5	30.5	30.5	33.2	67.7
Actuated g/C Ratio	0.31	0.61	0.28	0.28	0.30	0.62
Clearance Time (s)	4.0	4.0	4.5	4.5	4.0	4.5
Vehicle Extension (s)	2.3	2.3	4.7	4.7	2.3	4.7
Lane Grp Cap (vph)	1050	1009	1383	435	524	3070
v/s Ratio Prot	c0.29	0.11	c0.25		c0.31	0.28
v/s Ratio Perm		0.13		0.11		
v/c Ratio	0.93	0.38	0.90	0.38	1.02	0.46
Uniform Delay, d1	36.7	10.7	38.3	32.1	38.4	11.3
Progression Factor	1.00	1.00	0.43	1.42	0.83	0.35
Incremental Delay, d2	14.2	0.1	5.2	1.3	40.0	0.4
Delay (s)	50.9	10.8	21.8	46.8	71.8	4.4
Level of Service	D	B	C	D	E	A
Approach Delay (s)	39.7		29.9			23.0
Approach LOS	D		C			C

Intersection Summary			
HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	660	485	1245	790	390	1850
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.91
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	1583	5036	1583	1736	5085
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	5036	1583	1736	5085
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	688	505	1297	823	406	1927
RTOR Reduction (vph)	0	0	0	450	0	0
Lane Group Flow (vph)	688	505	1297	373	406	1927
Heavy Vehicles (%)	2%	2%	3%	2%	4%	2%
Turn Type	NA	pm+ov	NA	Perm	Prot	NA
Protected Phases	4	5	6		5	2
Permitted Phases		4		6		
Actuated Green, G (s)	43.3	69.3	26.7	26.7	26.0	56.7
Effective Green, g (s)	44.3	69.3	27.7	27.7	26.0	57.7
Actuated g/C Ratio	0.40	0.63	0.25	0.25	0.24	0.52
Clearance Time (s)	5.0	4.0	5.0	5.0	4.0	5.0
Vehicle Extension (s)	2.3	2.3	4.8	4.8	2.3	4.8
Lane Grp Cap (vph)	713	1055	1268	399	410	2667
v/s Ratio Prot	c0.39	0.11	c0.26		c0.23	0.38
v/s Ratio Perm		0.21		0.24		
v/c Ratio	0.96	0.48	1.02	0.94	0.99	0.72
Uniform Delay, d1	32.1	10.8	41.1	40.3	41.9	20.0
Progression Factor	1.00	1.00	1.11	1.80	1.15	1.26
Incremental Delay, d2	25.0	0.2	27.7	25.6	36.2	1.3
Delay (s)	57.1	11.0	73.5	98.0	84.6	26.5
Level of Service	E	B	E	F	F	C
Approach Delay (s)	37.6		83.0			36.6
Approach LOS	D		F			D

Intersection Summary			
HCM Average Control Delay	54.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	30	400	60	55	370	10	40	50	105	5	30	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	34	455	68	62	420	11	45	57	119	6	34	28
Pedestrians		7			4			5			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			0			0	
Right turn flare (veh)									5			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		179										
pX, platoon unblocked												
vC, conflicting volume	434			528			1165	1121	498	1168	1149	435
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	434			528			1165	1121	498	1168	1149	435
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			94			65	69	79	94	81	95
cM capacity (veh/h)	1135			1045			130	185	562	96	179	621

Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1
Volume Total	34	523	494	222	68
Volume Left	34	0	62	45	6
Volume Right	0	68	11	119	28
cSH	1135	1700	1045	348	231
Volume to Capacity	0.03	0.31	0.06	0.64	0.30
Queue Length 95th (ft)	2	0	5	104	30
Control Delay (s)	8.3	0.0	1.7	34.8	27.0
Lane LOS	A		A	D	D
Approach Delay (s)	0.5		1.7	34.8	27.0
Approach LOS				D	D

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	10	40	125	5	20	40	80	510	5	60	650	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	42	132	5	21	42	84	537	5	63	684	11
Pedestrians		1						1			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1578	1527	691	1672	1530	542	696			542		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1578	1527	691	1672	1530	542	696			542		
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 %	83	58	71	84	79	92	91			94		
cM capacity (veh/h)	61	101	447	33	100	543	890			1037		

Direction, Lane #	SE 1	NW 1	NE 1	NE 2	SW 1	SW 2
Volume Total	184	68	84	542	63	695
Volume Left	11	5	84	0	63	0
Volume Right	132	42	0	5	0	11
cSH	208	153	890	1700	1037	1700
Volume to Capacity	0.88	0.45	0.09	0.32	0.06	0.41
Queue Length 95th (ft)	173	51	8	0	5	0
Control Delay (s)	83.0	46.5	9.5	0.0	8.7	0.0
Lane LOS	F	E	A		A	
Approach Delay (s)	83.0	46.5	1.3		0.7	
Approach LOS	F	E				

Intersection Summary				
Average Delay	12.1			
Intersection Capacity Utilization	62.0%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	60	35	40	385	480	40
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	38	43	418	522	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type				TWLTL	None	
Median storage veh)				2		
Upstream signal (ft)				424	1279	
pX, platoon unblocked	0.93					
vC, conflicting volume	1049	543	565			
vC1, stage 1 conf vol	543					
vC2, stage 2 conf vol	505					
vCu, unblocked vol	1013	543	565			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	86	93	96			
cM capacity (veh/h)	459	543	1017			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	103	43	418	565
Volume Left	65	43	0	0
Volume Right	38	0	0	43
cSH	727	1017	1700	1700
Volume to Capacity	0.14	0.04	0.25	0.33
Queue Length 95th (ft)	12	3	0	0
Control Delay (s)	13.4	8.7	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.4	0.8		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	125	210	470	5	105	5	150	30	5	5	50	95
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)	130	219	490	5	109	5	156	31	5	5	52	99

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	349	490	120	193	156
Volume Left (vph)	130	0	5	156	5
Volume Right (vph)	0	490	5	5	99
Hadj (s)	0.22	-0.68	0.01	0.15	-0.32
Departure Headway (s)	6.0	5.1	6.1	6.3	6.0
Degree Utilization, x	0.58	0.70	0.20	0.34	0.26
Capacity (veh/h)	583	685	540	523	552
Control Delay (s)	15.9	17.7	10.7	12.6	11.1
Approach Delay (s)	17.0		10.7	12.6	11.1
Approach LOS	C		B	B	B

Intersection Summary			
Delay	15.0		
HCM Level of Service	C		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	160	25	585	140	50	680
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	168	26	616	147	53	716
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)			97			
pX, platoon unblocked	0.82	0.82			0.82	
vC, conflicting volume	1511	689			763	
vC1, stage 1 conf vol	689					
vC2, stage 2 conf vol	821					
vCu, unblocked vol	1513	508			598	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	47	94			93	
cM capacity (veh/h)	318	465			808	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	168	26	763	53	716
Volume Left	168	0	0	53	0
Volume Right	0	26	147	0	0
cSH	318	465	1700	808	1700
Volume to Capacity	0.53	0.06	0.45	0.07	0.42
Queue Length 95th (ft)	73	4	0	5	0
Control Delay (s)	28.5	13.2	0.0	9.8	0.0
Lane LOS	D	B		A	
Approach Delay (s)	26.4		0.0	0.7	
Approach LOS	D				

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	0	0	0	725	105	0	830	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)								4.0			4.0	
Lane Util. Factor								1.00			1.00	
Frpb, ped/bikes								1.00			1.00	
Flpb, ped/bikes								1.00			1.00	
Frt								0.98			1.00	
Flt Protected								1.00			1.00	
Satd. Flow (prot)								1784			1839	
Flt Permitted								1.00			1.00	
Satd. Flow (perm)								1784			1839	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	0	0	0	0	797	115	0	912	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	909	0	0	923	0
Confl. Peds. (#/hr)			5	5			14		5	5		14
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	7%	0%	3%	12%
Turn Type								NA			NA	
Protected Phases								6			2	
Permitted Phases												
Actuated Green, G (s)								42.1			42.1	
Effective Green, g (s)								42.1			42.1	
Actuated g/C Ratio								0.83			0.83	
Clearance Time (s)								4.0			4.0	
Vehicle Extension (s)								0.2			0.2	
Lane Grp Cap (vph)								1473			1518	
v/s Ratio Prot								c0.51			0.50	
v/s Ratio Perm												
v/c Ratio								0.62			0.61	
Uniform Delay, d1								1.6			1.6	
Progression Factor								1.00			1.00	
Incremental Delay, d2								1.9			1.8	
Delay (s)								3.5			3.4	
Level of Service								A			A	
Approach Delay (s)		0.0			0.0			3.5			3.4	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	3.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	51.0	Sum of lost time (s)	8.9
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	25	45	5	165	50	80	15	145	130	110	305	50
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	27	49	5	181	55	88	16	159	143	121	335	55

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	82	236	88	319	456	55
Volume Left (vph)	27	181	0	16	121	0
Volume Right (vph)	5	0	88	143	0	55
Hadj (s)	0.03	0.42	-0.68	-0.22	0.15	-0.67
Departure Headway (s)	8.1	7.7	6.6	6.7	6.7	5.9
Degree Utilization, x	0.19	0.51	0.16	0.60	0.85	0.09
Capacity (veh/h)	393	438	512	508	520	587
Control Delay (s)	12.9	17.2	9.7	19.2	36.1	8.3
Approach Delay (s)	12.9	15.1		19.2	33.1	
Approach LOS	B	C		C	D	

Intersection Summary			
Delay	23.5		
HCM Level of Service	C		
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	5	10	5	80	5	35	10	230	90	95	335	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	11	6	89	6	39	11	256	100	106	372	11
Pedestrians		3										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	961	970	381	928	925	306	386			356		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	961	970	381	928	925	306	386			356		
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 %	97	95	99	60	98	95	99			91		
cM capacity (veh/h)	204	230	669	221	244	732	1180			1209		

Direction, Lane #	SE 1	NW 1	NW 2	NE 1	SW 1
Volume Total	22	89	44	367	489
Volume Left	6	89	0	11	106
Volume Right	6	0	39	100	11
cSH	265	221	586	1180	1209
Volume to Capacity	0.08	0.40	0.08	0.01	0.09
Queue Length 95th (ft)	7	46	6	1	7
Control Delay (s)	19.8	31.9	11.6	0.3	2.5
Lane LOS	C	D	B	A	A
Approach Delay (s)	19.8	25.2		0.3	2.5
Approach LOS	C	D			

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Volume (veh/h)	295	30	330	395	20	200
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	331	34	371	444	22	225
Pedestrians				1	5	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			370		1539	354
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			370		1539	354
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			69		74	67
cM capacity (veh/h)			1194		86	688

Direction, Lane #	EB 1	WB 1	WB 2	NE 1	NE 2
Volume Total	365	371	444	22	225
Volume Left	0	371	0	22	0
Volume Right	34	0	0	0	225
cSH	1700	1194	1700	86	688
Volume to Capacity	0.21	0.31	0.26	0.26	0.33
Queue Length 95th (ft)	0	33	0	24	35
Control Delay (s)	0.0	9.4	0.0	61.1	12.7
Lane LOS		A		F	B
Approach Delay (s)	0.0	4.3		17.1	
Approach LOS				C	

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	60	560	10	15	675	120	75	25	60	15	35	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	
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	0.96		1.00	0.94		0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.96	1.00		1.00	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		0.99	
Satd. Flow (prot)	1805	1875		1805	1863	1542		1753	1475		1704	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.64	1.00		0.94	
Satd. Flow (perm)	1805	1875		1805	1863	1542		1167	1475		1609	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	589	11	16	711	126	79	26	63	16	37	37
RTOR Reduction (vph)	0	0	0	0	0	20	0	0	55	0	26	0
Lane Group Flow (vph)	63	600	0	16	711	106	0	105	8	0	64	0
Confl. Peds. (#/hr)	7		13	13		7	27		10	10		27
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	0%	3%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases						2	8		8	4		
Actuated Green, G (s)	8.0	80.9		2.8	75.7	75.7		13.3	13.3		13.3	
Effective Green, g (s)	8.0	81.4		2.8	76.2	76.2		13.8	13.8		13.8	
Actuated g/C Ratio	0.07	0.74		0.03	0.69	0.69		0.13	0.13		0.13	
Clearance Time (s)	4.0	4.5		4.0	4.5	4.5		4.5	4.5		4.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0		2.5	2.5		2.5	
Lane Grp Cap (vph)	131	1388		46	1291	1068		146	185		202	
v/s Ratio Prot	0.03	c0.32		0.01	c0.38							
v/s Ratio Perm						0.07		c0.09	0.01		0.04	
v/c Ratio	0.48	0.43		0.35	0.55	0.10		0.72	0.04		0.32	
Uniform Delay, d1	49.0	5.5		52.7	8.4	5.6		46.2	42.3		43.8	
Progression Factor	1.12	0.90		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	1.7	0.8		3.3	1.7	0.2		14.6	0.1		0.7	
Delay (s)	56.6	5.7		56.0	10.1	5.8		60.8	42.4		44.5	
Level of Service	E	A		E	B	A		E	D		D	
Approach Delay (s)		10.6			10.3			53.9			44.5	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	50	415	155	165	525	60	35	60	45	130	70	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	0.95		0.98			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			0.98	1.00
Frt	1.00	0.96		1.00	1.00	0.85		0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.97	1.00
Satd. Flow (prot)	1805	1784		1787	1845	1509		1702			1779	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.80			0.63	1.00
Satd. Flow (perm)	1805	1784		1787	1845	1509		1371			1164	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	437	163	174	553	63	37	63	47	137	74	189
RTOR Reduction (vph)	0	11	0	0	0	14	0	16	0	0	0	148
Lane Group Flow (vph)	53	589	0	174	553	49	0	131	0	0	211	41
Confl. Peds. (#/hr)	9		16	16		9			16	16		
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	0%	6%	2%	1%	2%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases						2	8			4		4
Actuated Green, G (s)	7.0	52.1		21.8	66.9	66.9		23.1			23.1	23.1
Effective Green, g (s)	7.0	52.6		21.8	67.4	67.4		23.6			23.6	23.6
Actuated g/C Ratio	0.06	0.48		0.20	0.61	0.61		0.21			0.21	0.21
Clearance Time (s)	4.0	4.5		4.0	4.5	4.5		4.5			4.5	4.5
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0		2.5			2.5	2.5
Lane Grp Cap (vph)	115	853		354	1130	925		294			250	346
v/s Ratio Prot	0.03	c0.33		0.10	c0.30							
v/s Ratio Perm						0.03		0.10			c0.18	0.03
v/c Ratio	0.46	0.69		0.49	0.49	0.05		0.44			0.84	0.12
Uniform Delay, d1	49.7	22.4		39.2	11.8	8.5		37.5			41.4	34.8
Progression Factor	1.00	1.00		0.80	0.50	0.32		1.00			1.00	1.00
Incremental Delay, d2	2.1	4.6		0.7	1.3	0.1		0.8			21.8	0.1
Delay (s)	51.8	26.9		32.0	7.2	2.8		38.3			63.2	34.9
Level of Service	D	C		C	A	A		D			E	C
Approach Delay (s)		28.9			12.3			38.3			49.8	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	27.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	70	550	35	45	655
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	31	73	573	36	47	682
Pedestrians	6		1			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	1		0			
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						481
pX, platoon unblocked	0.83					
vC, conflicting volume	1374	597			615	
vC1, stage 1 conf vol	597					
vC2, stage 2 conf vol	777					
vCu, unblocked vol	1349	597			615	
tC, single (s)	6.4	6.2			4.3	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.4	
p0 queue free %	91	85			95	
cM capacity (veh/h)	349	498			878	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	104	609	47	682
Volume Left	31	0	47	0
Volume Right	73	36	0	0
cSH	441	1700	878	1700
Volume to Capacity	0.24	0.36	0.05	0.40
Queue Length 95th (ft)	23	0	4	0
Control Delay (s)	15.7	0.0	9.3	0.0
Lane LOS	C		A	
Approach Delay (s)	15.7	0.0	0.6	
Approach LOS	C			

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	540	620	70	150	375	405	40	705	145	700	1240	610
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	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	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3497		3502	3610	1583	1703	3505	1599	3433	3505	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3497		3502	3610	1583	1703	3505	1599	3433	3505	1583
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	581	667	75	161	403	435	43	758	156	753	1333	656
RTOR Reduction (vph)	0	8	0	0	0	290	0	0	113	0	0	345
Lane Group Flow (vph)	581	734	0	161	403	145	43	758	43	753	1333	311
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Prot	Prot	NA	Prot	Prot	NA	Prot
Protected Phases	7	4		3	8	8	1	6	6	5	2	2
Permitted Phases												
Actuated Green, G (s)	19.2	28.3		6.1	15.2	15.2	3.1	27.4	27.4	24.9	49.2	49.2
Effective Green, g (s)	20.7	29.8		7.6	16.7	16.7	4.6	30.4	30.4	26.4	52.2	52.2
Actuated g/C Ratio	0.19	0.27		0.07	0.15	0.15	0.04	0.28	0.28	0.24	0.47	0.47
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	645	946		242	547	240	71	967	441	822	1660	750
v/s Ratio Prot	c0.17	0.21		0.05	c0.11	0.09	0.03	0.22	0.03	c0.22	c0.38	0.20
v/s Ratio Perm												
v/c Ratio	0.90	0.78		0.67	0.74	0.60	0.61	0.78	0.10	0.92	0.80	0.41
Uniform Delay, d1	43.7	37.1		50.1	44.7	43.7	51.9	36.9	29.7	40.8	24.6	19.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.6	3.8		5.8	4.7	3.3	10.9	4.8	0.2	14.6	3.3	0.7
Delay (s)	59.4	40.9		55.8	49.3	47.0	62.8	41.6	29.9	55.4	27.9	19.7
Level of Service	E	D		E	D	D	E	D	C	E	C	B
Approach Delay (s)		49.0			49.4			40.7			33.5	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	40.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	355	915	115	15	520	60	215	90	50	65	65	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		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	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3479		1805	3491		1805	1799		1805	1900	1577
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3479		1805	3491		1805	1799		1805	1900	1577
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)	378	973	122	16	553	64	229	96	53	69	69	207
RTOR Reduction (vph)	0	6	0	0	5	0	0	15	0	0	0	95
Lane Group Flow (vph)	378	1089	0	16	612	0	229	134	0	69	69	112
Confl. Peds. (#/hr)			1	1			2					2
Heavy Vehicles (%)	2%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases												4
Actuated Green, G (s)	29.2	71.7		1.8	44.3		19.4	19.4		9.5	9.5	38.7
Effective Green, g (s)	29.2	72.2		1.8	44.8		19.9	19.9		10.0	10.0	38.7
Actuated g/C Ratio	0.24	0.60		0.02	0.37		0.17	0.17		0.08	0.08	0.32
Clearance Time (s)	4.0	4.5		4.0	4.5		4.5	4.5		4.5	4.5	4.0
Vehicle Extension (s)	2.5	4.0		2.5	4.0		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	431	2095		27	1304		300	299		151	158	509
v/s Ratio Prot	c0.21	c0.31		0.01	0.18		c0.13	0.07		c0.04	0.04	0.05
v/s Ratio Perm												0.02
v/c Ratio	0.88	0.52		0.59	0.47		0.76	0.45		0.46	0.44	0.22
Uniform Delay, d1	43.6	13.8		58.7	28.5		47.8	45.1		52.4	52.3	29.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	17.7	0.9		25.8	1.2		10.5	0.8		1.6	1.4	0.2
Delay (s)	61.4	14.7		84.5	29.7		58.2	45.8		54.0	53.7	29.7
Level of Service	E	B		F	C		E	D		D	D	C
Approach Delay (s)		26.7			31.1			53.4			39.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	32.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	119.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	55	5	405	100	10	270
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	58	5	426	105	11	284
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			391			
pX, platoon unblocked	0.97	0.97			0.97	
vC, conflicting volume	784	479			532	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	759	444			498	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	99			99	
cM capacity (veh/h)	361	598			1040	

Direction, Lane #	WB 1	NE 1	SW 1	SW 2
Volume Total	63	532	11	284
Volume Left	58	0	11	0
Volume Right	5	105	0	0
cSH	373	1700	1040	1700
Volume to Capacity	0.17	0.31	0.01	0.17
Queue Length 95th (ft)	15	0	1	0
Control Delay (s)	16.6	0.0	8.5	0.0
Lane LOS	C		A	
Approach Delay (s)	16.6	0.0	0.3	
Approach LOS	C			

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	5	370	40	5	260
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	5	389	42	5	274
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			982			
pX, platoon unblocked						
vC, conflicting volume	695	411			432	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	695	411			432	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	95	99			100	
cM capacity (veh/h)	392	645			1139	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	26	432	279
Volume Left	21	0	5
Volume Right	5	42	0
cSH	425	1700	1139
Volume to Capacity	0.06	0.25	0.00
Queue Length 95th (ft)	5	0	0
Control Delay (s)	14.0	0.0	0.2
Lane LOS	B		A
Approach Delay (s)	14.0	0.0	0.2
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	5	5	15	5	140	5	620	20	165	1175	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1638			1830	1599	1357	1804		1805	1835	
Flt Permitted		0.77			0.84	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1312			1593	1599	1357	1804		1805	1835	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	5	5	16	5	147	5	653	21	174	1237	37
RTOR Reduction (vph)	0	5	0	0	0	137	0	1	0	0	0	0
Lane Group Flow (vph)	0	31	0	0	21	10	5	673	0	174	1274	0
Heavy Vehicles (%)	4%	0%	50%	0%	0%	1%	33%	5%	0%	0%	3%	6%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4						
Actuated Green, G (s)		8.2			8.2	8.2	1.6	83.1		19.2	100.7	
Effective Green, g (s)		8.7			8.7	8.7	1.6	85.1		19.2	102.7	
Actuated g/C Ratio		0.07			0.07	0.07	0.01	0.68		0.15	0.82	
Clearance Time (s)		4.5			4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)		2.5			2.5	2.5	2.3	4.5		2.3	4.5	
Lane Grp Cap (vph)		91			111	111	17	1228		277	1508	
v/s Ratio Prot							0.00	0.37		c0.10	c0.69	
v/s Ratio Perm		c0.02			0.01	0.01						
v/c Ratio		0.34			0.19	0.09	0.29	0.55		0.63	0.84	
Uniform Delay, d1		55.4			54.8	54.5	61.1	10.2		49.6	6.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.26	2.11	
Incremental Delay, d2		1.7			0.6	0.3	5.6	1.8		3.1	5.2	
Delay (s)		57.1			55.4	54.7	66.7	11.9		65.7	19.0	
Level of Service		E			E	D	E	B		E	B	
Approach Delay (s)		57.1			54.8			12.3			24.6	
Approach LOS		E			D			B			C	

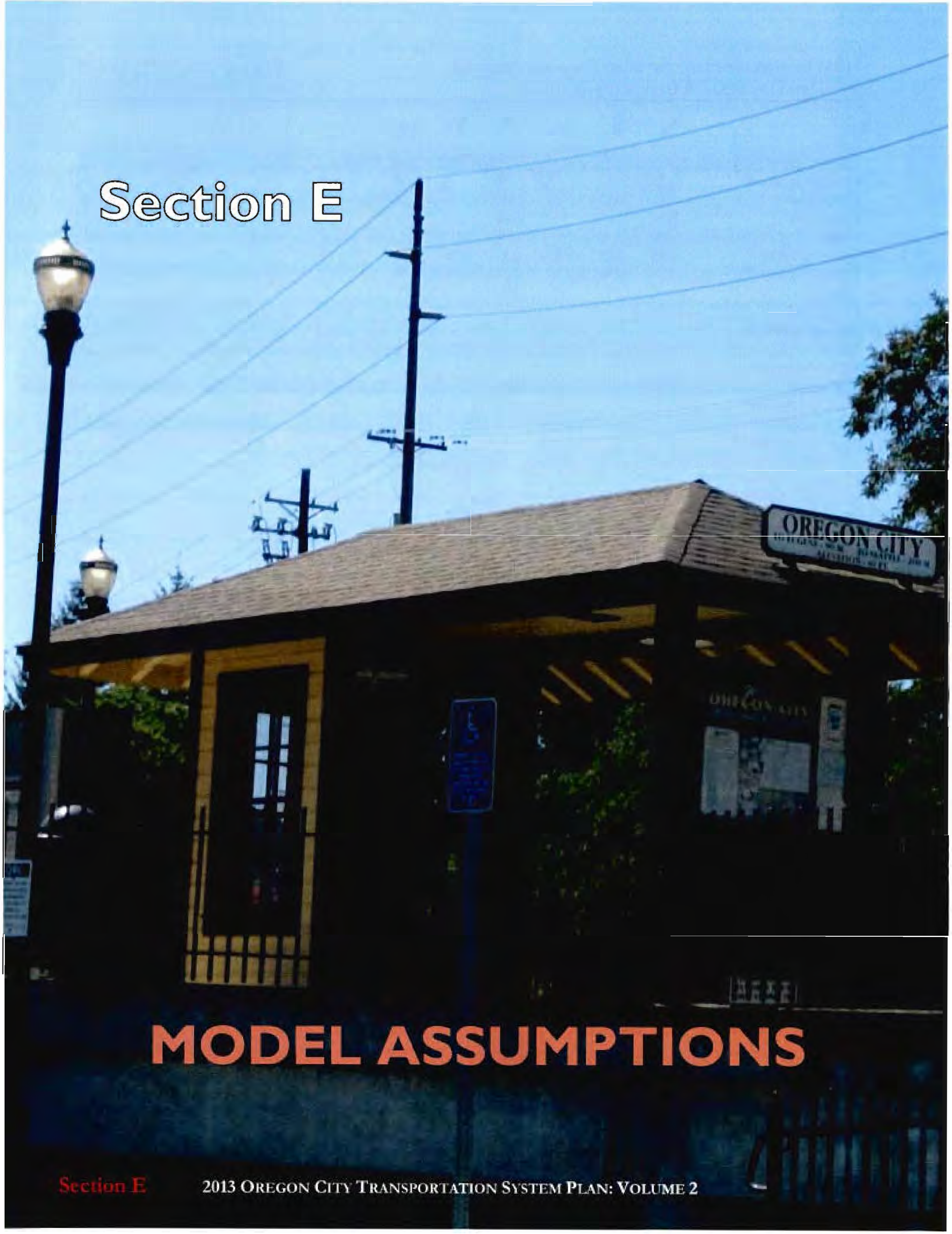
Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	685	110	25	310	50	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	721	116	26	326	53	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			837		1158	779
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			837		1158	779
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		75	93
cM capacity (veh/h)			806		210	393

Direction, Lane #	SE 1	NW 1	NW 2	NE 1	NE 2
Volume Total	837	26	326	53	26
Volume Left	0	26	0	53	0
Volume Right	116	0	0	0	26
cSH	1700	806	1700	210	393
Volume to Capacity	0.49	0.03	0.19	0.25	0.07
Queue Length 95th (ft)	0	3	0	24	5
Control Delay (s)	0.0	9.6	0.0	27.8	14.8
Lane LOS		A		D	B
Approach Delay (s)	0.0	0.7		23.5	
Approach LOS				C	

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		



Section E

MODEL ASSUMPTIONS

Future forecasting is an important step in the transportation planning process and provides estimates of future travel demand. This memorandum describes the forecasting methodology that will be used to project transportation growth and provide traffic volumes for study intersections in the 2035 TSP horizon year. This memorandum describes the assumptions used to project transportation growth through the 2035 horizon year.

Introduction

The travel demand model is based on the Metro regional travel demand model. The Oregon City TSP model applies trip generation and trip distribution data directly taken from the Metro model, but adds additional detail to more accurately represent local travel conditions and routing alternatives within the city. The Oregon City TSP model will include additional (mostly collector) roadways and refine how the regional model loads trips onto the travel network.

The following sections detail the travel forecast methodology. These components include the roadway network, transportation analysis zones (TAZs), land use, and travel demand.

Roadway Network

The VISUM[1] roadway network obtained from the Metro Regional Travel Demand Forecast Model includes regional level arterial streets, both within and outside of Oregon City.[2] The Oregon City model will be expanded to include all arterial and collector streets within the Oregon City City Limits and Urban Growth Boundary (UGB) at a minimum. The model will include regional roadways outside of the Oregon City UGB that influence study area travel, including the entire Portland metropolitan region, extending as south past Canby and Mulino and east past Estacada.

An existing model roadway network will be refined using Metro's regional model as the initial base. Network elements will be confirmed based on an existing conditions inventory of posted speeds, traffic control, lane geometries, and number of travel lanes. The existing conditions network is the starting point for development of the future model. The Metro 2010 model network is shown in Figure 1.

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[1] VISUM is a transportation travel demand modeling software developed by PTV Vision.

[2] Model data provided by Metro, November 2011.

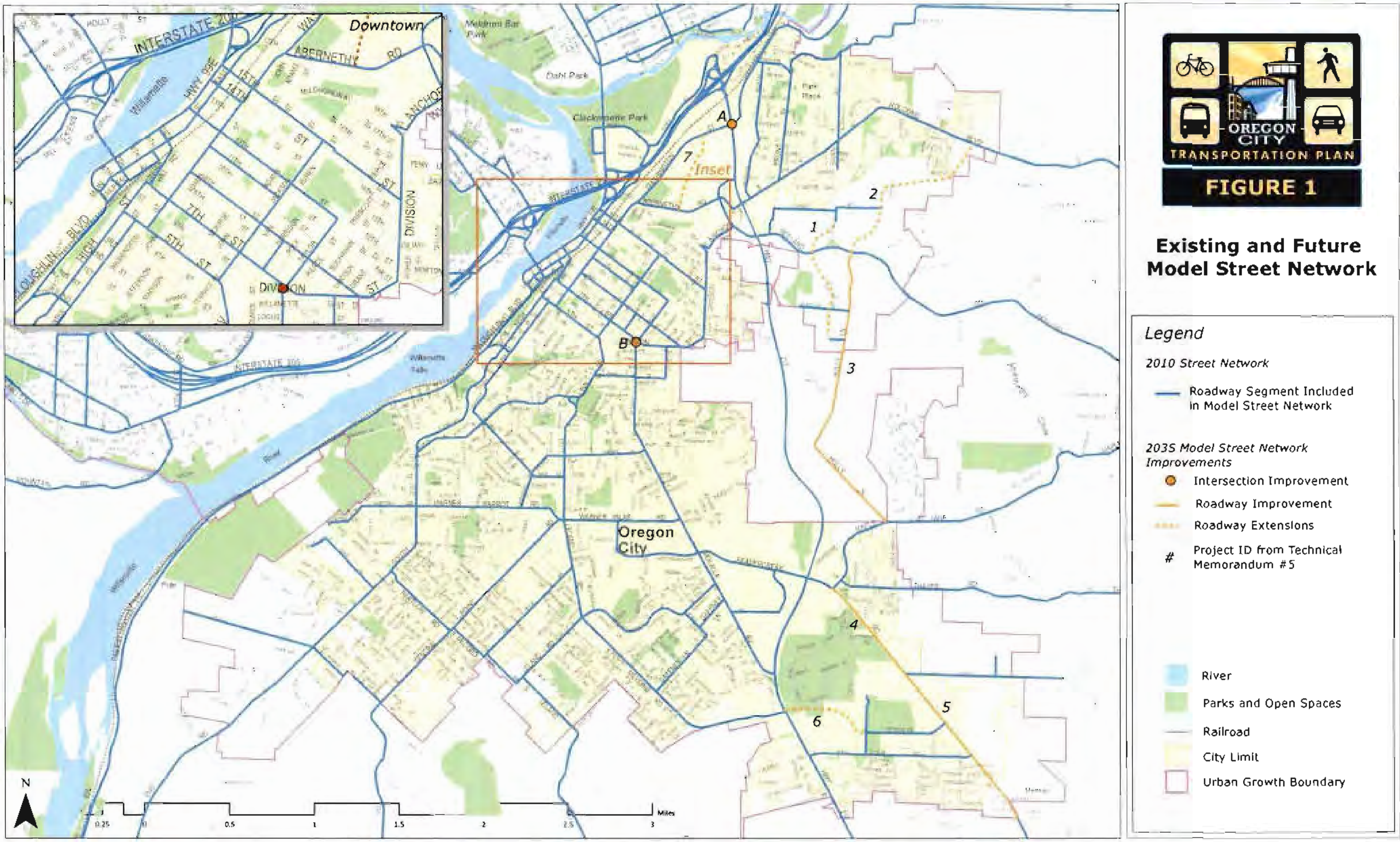
The 2035 future year baseline roadway network will be developed to use for the 2035 No-Build analysis. This network includes new roadways or roadway capacity improvement projects that have identified funding or are included in the following:

- Statewide Transportation Improvement Program (STIP)
- Metro Regional Transportation Plan (RTP – Financially Constrained)
- Oregon City Capital Improvement Plan (specifically identified projects only)

Additional scenarios will be developed to test the various transportation alternatives that will be considered for the Oregon City TSP Update. Table 1 summarizes roadway and intersection improvements that will be assumed in the 2035 network and Figure 1 shows the proposed Oregon City model 2035 base network.

Table 1: Oregon City CIP Financially Constrained Motor Vehicle Projects

Project ID	Source	Project/ Program Name	Start Location	End Location	Description
Roadway Segment Improvements					
1	RTP	Swan Extension	Livesay Rd	Holly Ln	Through lanes, sidewalks, bike lanes, turn lanes to serve UGB expansion area
2	RTP	Holly Lane	Redland Rd	Holcomb Rd	Through lanes, sidewalks, bike lanes, turn lanes to serve UGB expansion area
3	RTP	Holly Lane	Redland Rd	Maple Ln	Turn lanes, bike lanes, sidewalks, intersection improvements, bridge replacement
4	RTP	Beavercreek Rd Improvements Phase 2	Maple Lane	Clackamas Community College	Widen to 5 lanes with sidewalks and bike lanes
5	RTP	Beavercreek Rd Improvements Phase 3	Clackamas Community College	UGB	Widen to 4 lanes with sidewalks and bike lanes
6	City TSP	Meyers Road	High School Avenue	Beavercreek Road	Extension from current terminus at High School Avenue to Beavercreek Road
7	City TSP	Washington – Abernethy Connector	Abernethy Road	Washington Street	Extension from stub south of Washington to Abernethy Road
Intersection Improvements					
A	STIP/ City TSP	Jughandle at OR 213/Washington Street			Construct Jughandle Intersection at Washington Street
B	RTP	Molalla Avenue Roundabout (Taylor/Division)			Reconfigure intersection for safety and LOS into roundabout


OREGON CITY
TRANSPORTATION PLAN
FIGURE 1
Existing and Future Model Street Network
Legend
2010 Street Network
Roadway Segment Included in Model Street Network
2035 Model Street Network Improvements
Intersection Improvement
Roadway Improvement
Roadway Extensions
Project ID from Technical Memorandum #5
River
Parks and Open Spaces
Railroad
City Limit
Urban Growth Boundary
Downtown
Inset
Oregon City
Miles

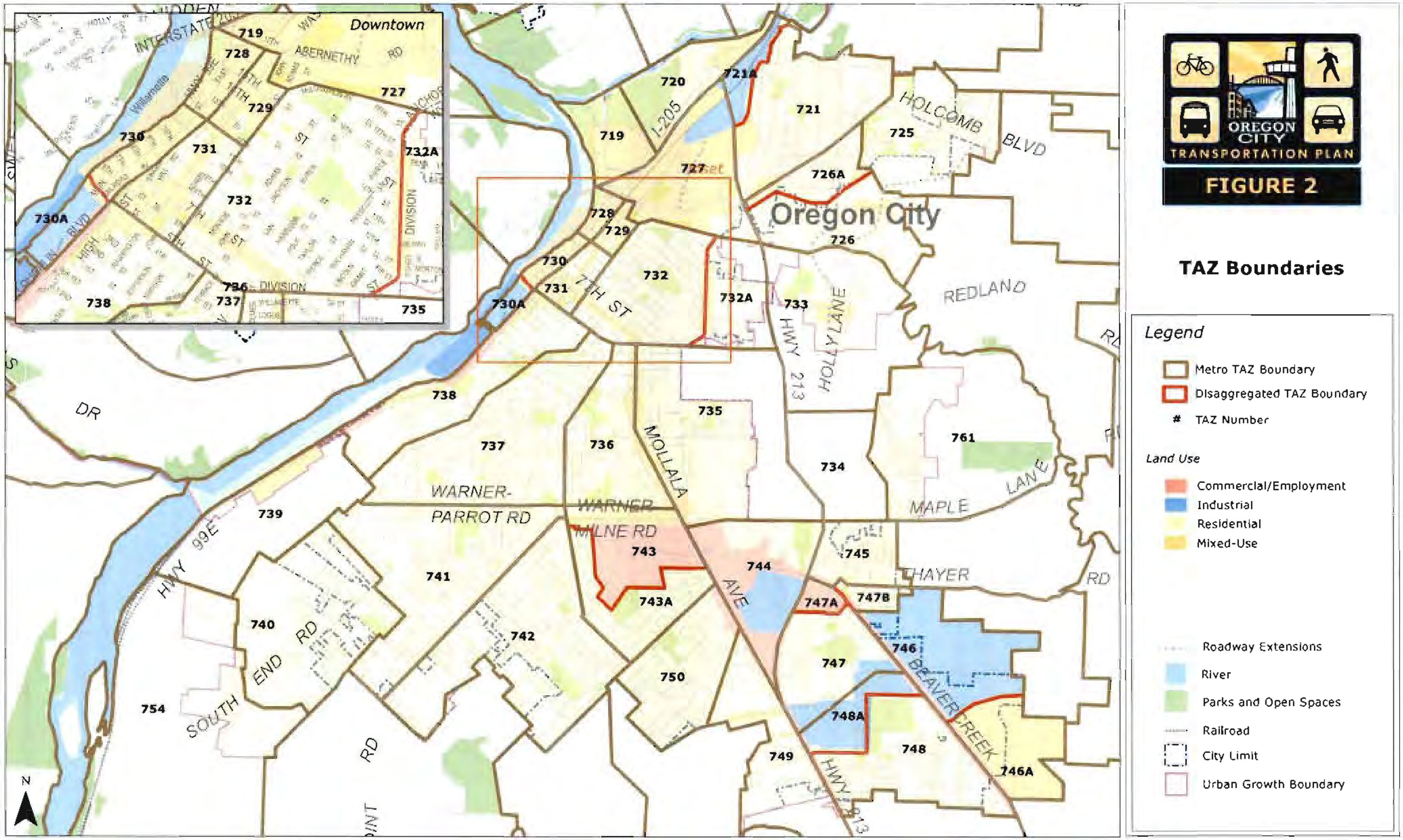
Transportation Analysis Zones

For transportation modeling purposes, the Metro travel demand model has divided the entire Portland metropolitan region into transportation analysis zones (TAZs). These TAZs represent the sources of vehicle trip generation within the region. Metro travel demand model TAZ boundaries do not align directly with the city limits or the Urban Growth Boundary (UGB). For purposes of identifying land use changes from 2010 to 2035, the model study area is defined by the Metro TAZs that most closely match with the UGB. There are approximately 28 Metro TAZs included in the model study area are illustrated in Figure 2. In addition to those 28 Metro TAZs, other Metro TAZs in the regional model were included as well since they directly or indirectly influence traffic on roadways in Oregon City.

Transportation analysis zones are most effective when they represent homogeneous land use (i.e. retail employment or households) and access to the street network. To more effectively distribute traffic onto the Oregon City street network, a number of Metro's TAZs are proposed to be disaggregated, or broken from larger (parent) to smaller (child) TAZs to more accurately reflect the existing and planned land uses in Oregon City. The proposed disaggregation is also shown in Figure 2. Land use data associated with Metro's model is approved at the regional level and in order to be consistent with Metro, land use assumptions for each Metro TAZ must be maintained, as a control total. Updates to this land use data occur very infrequently and changes to this data would not occur once the modeling work has commenced.

Centroids represent the land use and trip generation associated with each TAZ. Centroid connectors are the means (links) by which that trip generation is loaded onto the street network in the model. For regional modeling purposes, where the concern is for regionally significant transportation facilities, relatively few centroid connectors are used. In addition to the TAZ disaggregation proposed, additional centroid connectors will be added to more accurately reflect land use access to the street network in Oregon City.

For the Oregon City TSP model, eight Metro TAZs are proposed to be subdivided into nine additional smaller zones. These disaggregated zones maintain the boundaries of the 'parent' Metro TAZs, but better represent homogeneous land use and traffic loading onto the model's more detailed roadway network. The disaggregated TAZ boundaries for the Oregon City TSP are shown in Figure 2, along with the original Metro TAZ system. The model network also retains TAZs external to Oregon City, but important in the relationship between Oregon City land use and that in the greater Portland metropolitan region, accounting for vehicle trips entering and exiting the TSP study area.


OREGON CITY
TRANSPORTATION PLAN
FIGURE 2
TAZ Boundaries
Legend
Metro TAZ Boundary
Disaggregated TAZ Boundary
TAZ Number
Land Use
Commercial/Employment
Industrial
Residential
Mixed-Use
Roadway Extensions
River
Parks and Open Spaces
Railroad
City Limit
Urban Growth Boundary
Downtown
Oregon City
719
720
721
721A
725
726
726A
727
728
729
730
730A
731
732
732A
733
734
735
736
737
738
739
740
741
742
743
743A
744
745
746
746A
747
747A
747B
748
748A
749
750
754
761
HOLCOMB BLVD
REDLAND RD
HOLLY LANE
HWY 213
MOLLALA AVE
7TH ST
WARNER-PARROT RD
WARNER MILNE RD
MAPLE LANE
THAYER RD
BEAVER CREEK
SOUTH END RD
HWY 99E
I-205
ABERNETHY RD
DIVISION
N

Land Use

Land use is a key factor affecting the traffic demands placed on Oregon City's transportation system. The location, density, type, and mixture of land uses have a direct impact on traffic levels and patterns. Existing 2010 land use inventories and future 2035 land use projections were provided by Metro.

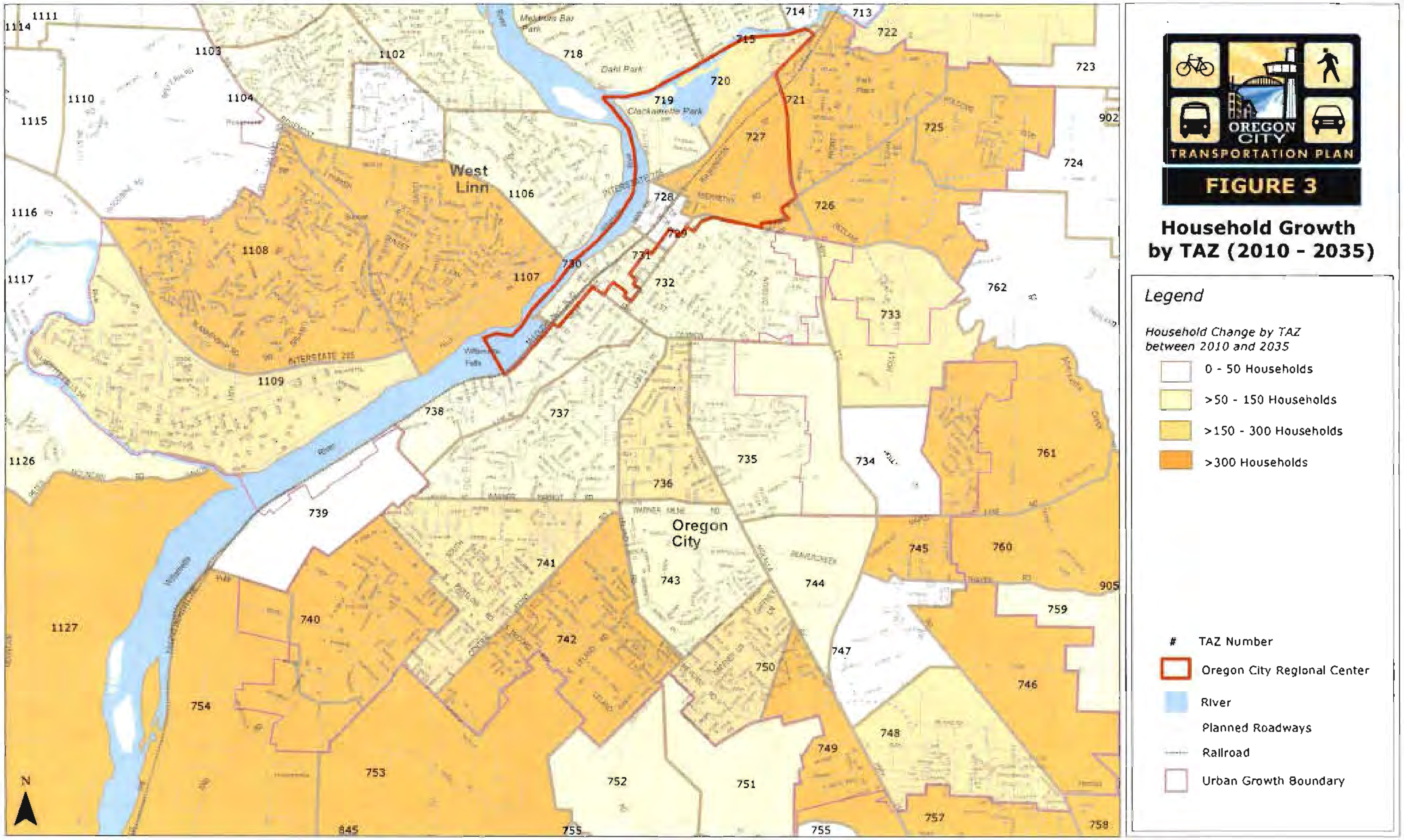
The existing 2010 land use inventory approximated the number of households and the amount of retail employment, service employment, and other employment that currently exist in each Metro TAZ. The Metro land use data will then be split into the smaller TAZ system identified for the Oregon City TSP model. Control totals for the 'parent' Metro TAZ will be maintained for the sum of the 'child' disaggregated TAZs. The allocation of land use totals between disaggregated TAZs will be based on existing aerial photography, tax lot data, and knowledge from previous studies in Oregon City.

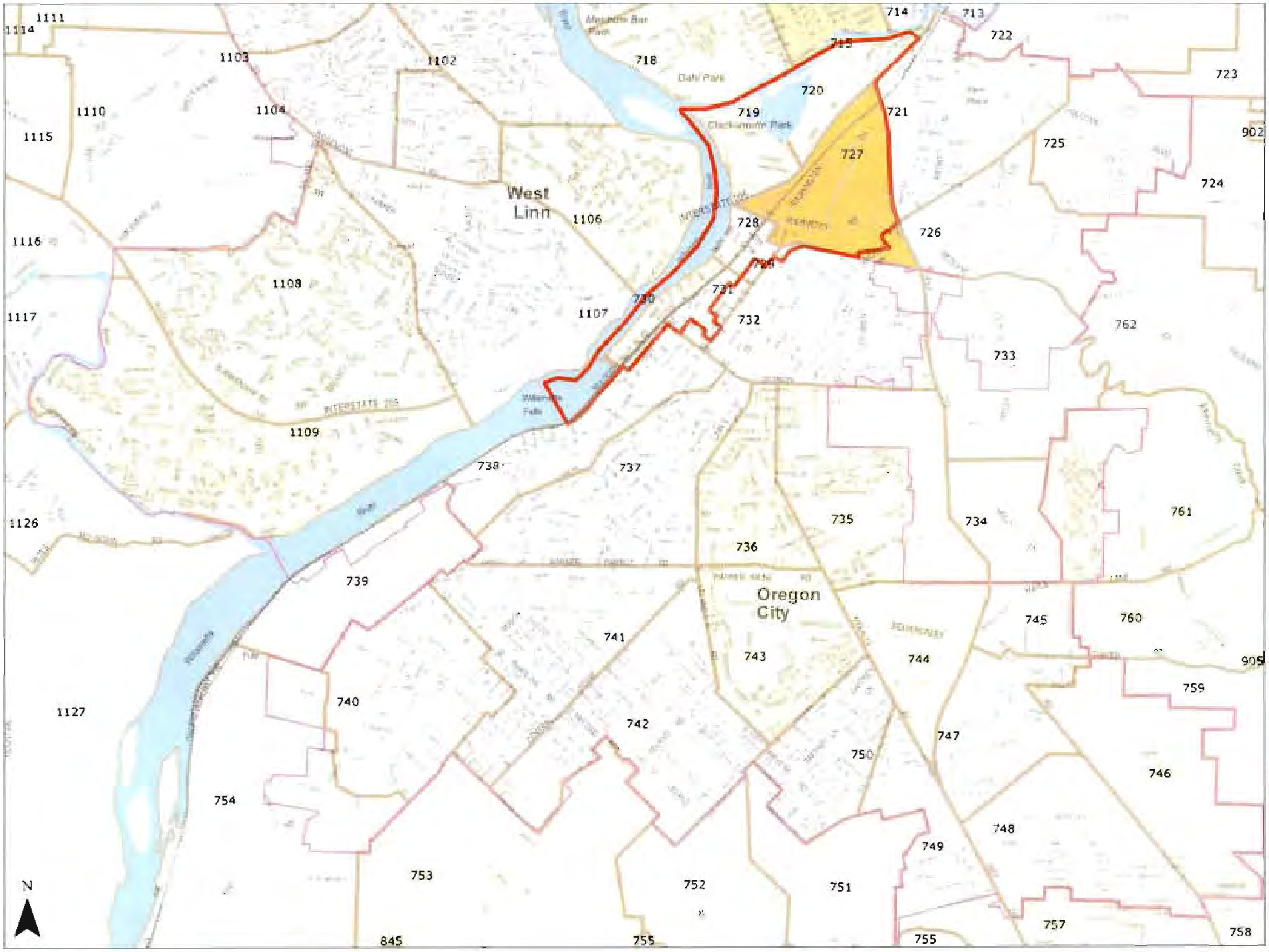
The future 2035 land use projection is an estimate of the amount of each land use that the TAZ could accommodate at expected build-out of vacant or underdeveloped lands assuming Comprehensive Plan designations. The allocation of future growth to Metro TAZs was modified based on input from City of Oregon City Staff. However, the control total was maintained for the sum of TAZs within the UGB area (as identified in Figure 2). Existing land use estimates and future projections for the UGB area are listed in Table 2.

Table 2: Oregon City UGB Area Land Use Summary

Land Use	2010 Land Use	Projected Growth from 2010 to 2035	Projected 2035 Land Use	Percent Growth (2010 – 2035)
Households				
Total Households	**13,022**	**7,963**	**20,985**	**61%**
Employees				
Retail Employees	3,089	2,052	5,141	66%
Service Employees	3,718	3,255	6,973	88%
Other Employees	7,914	3,300	11,214	42%
Total Employees	**14,721**	**8,607**	**23,328**	**58%**

A full set of detailed land use data by TAZ cannot be provided in this memo due to confidentiality of employment information. However, projected growth for households and employment (retail, service and other employment) is provided for each model TAZ in the Appendix. This information is summarized in Figures 3 through 6.


OREGON CITY
TRANSPORTATION PLAN
FIGURE 3
Household Growth by TAZ (2010 - 2035)
Legend
Household Change by TAZ between 2010 and 2035
0 - 50 Households
>50 - 150 Households
>150 - 300 Households
>300 Households
TAZ Number
Oregon City Regional Center
River
Planned Roadways
Railroad
Urban Growth Boundary
West Linn
Oregon City
N



OREGON CITY TRANSPORTATION PLAN

FIGURE 4

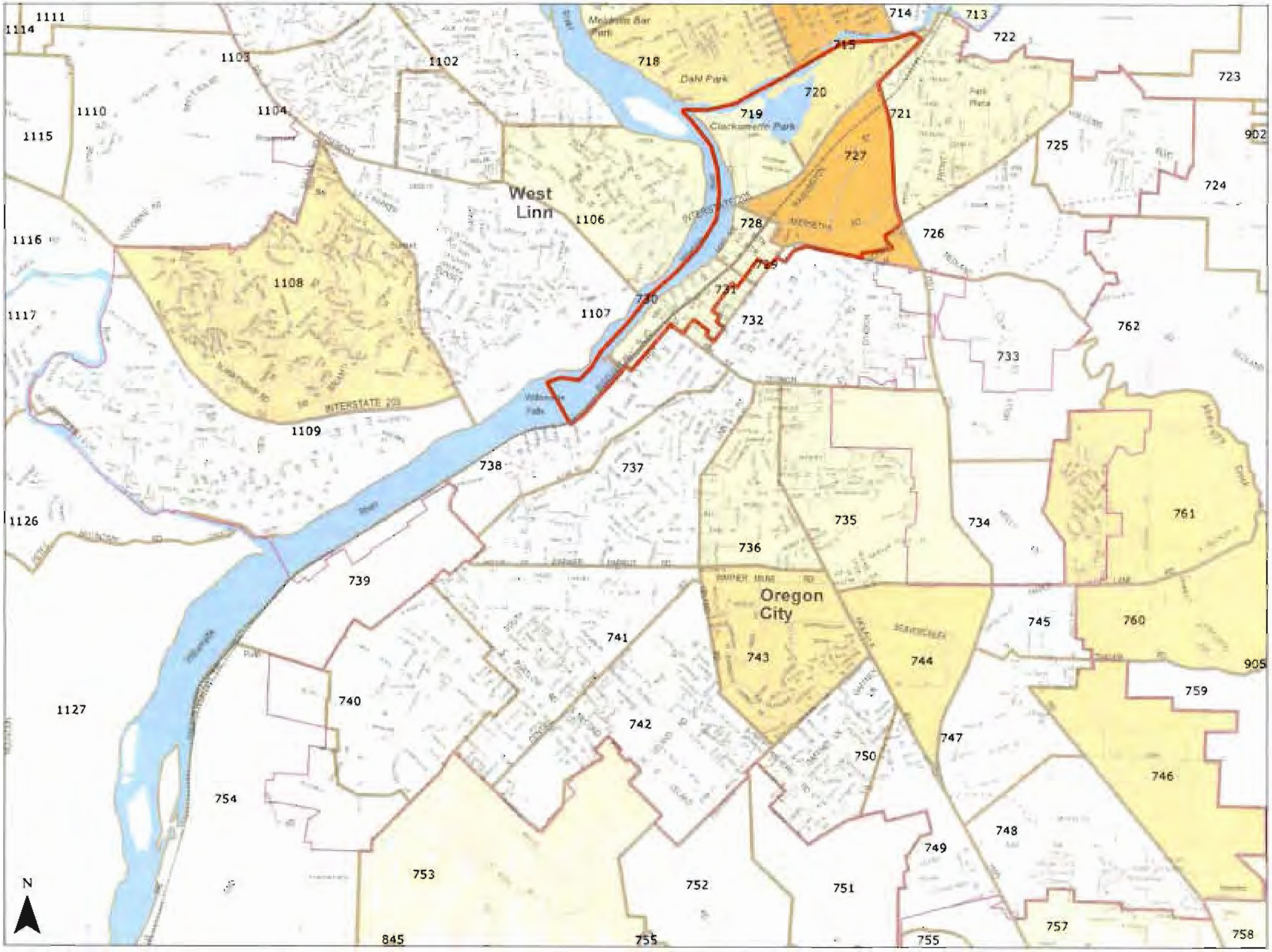
Retail Employment Growth by TAZ (2010 - 2035)

Legend

Service Employment Change by TAZ between 2010 and 2035

- 0 - 50 Employees
- >50 - 150 Employees
- >150 - 300 Employees
- >300 Employees

- # TAZ Number
- Oregon City Regional Center
- River
- Planned Roadways
- Railroad
- Urban Growth Boundary



OREGON CITY TRANSPORTATION PLAN

FIGURE 5

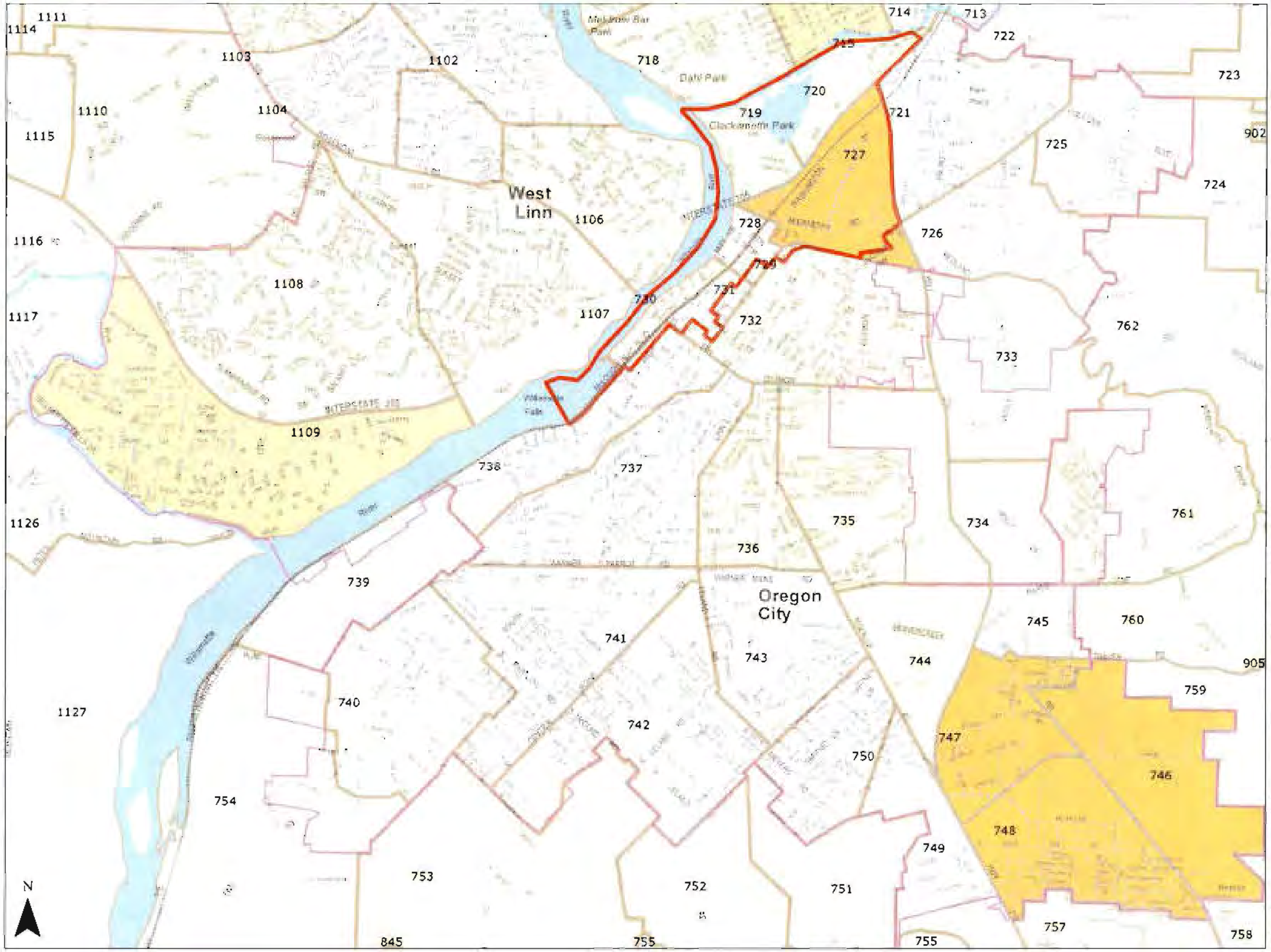
Service Employment Growth by TAZ (2010 - 2035)

Legend

Service Employment Change by TAZ between 2010 and 2035

- 0 - 50 Employees
- >50 - 150 Employees
- >150 - 300 Employees
- >300 Employees

- # TAZ Number
- Oregon City Regional Center
- River
- Planned Roadways
- Railroad
- Urban Growth Boundary



OREGON CITY TRANSPORTATION PLAN

FIGURE 6

Other Employment Growth by TAZ (2010 - 2035)

Legend

Other Employment Change by TAZ between 2010 and 2035

- 0 - 50 Employees
- >50 - 150 Employees
- >150 - 300 Employees
- >300 Employees

- # TAZ Number
- Oregon City Regional Center
- River
- Planned Roadways
- Railroad
- Urban Growth Boundary

Travel Demand

Future year (2035) travel demand on roadways and at intersections in Oregon City will be estimated based on the Oregon City TSP models for 2010 and 2035. Travel demand will be estimated for the weekday PM peak hour for both 2010 and 2035, consistent with the ODOT Analysis Procedures Manual,[3] which documents the typically accepted method of developing future forecasts from model volumes in Oregon. The purpose of the 2010 model is to calibrate the network in preparation for developing the 2035 model. The calibration process may include adjustments to street network elements (connectivity, capacities, speeds, etc.) or centroid connectors (reflecting how the land use accesses the street network). Similar adjustments would be considered for the 2035 model. In addition, the 2010 model will be used as baseline for estimating growth in the 2035 model.

Traffic forecasts will be based on using model post-processing, as identified in the ODOT Analysis Procedures Manual. This approach is derived from methodologies outlined in National Cooperative Highway Research Program Report 255, *Highway Traffic Data for Urbanized Area Project Planning and Design*. This process is based on adding the increment of growth identified between the base and future year PM peak travel demand models to PM peak hour intersection turn movements derived from traffic counts. The method creates future year forecasts that are calibrated to actual data.

The travel demand analysis includes the translation of Metro land use information into motor vehicle trips. This was done for each Oregon City TAZ based on the existing and projected land uses described previously in the Land Use section of this memorandum. This section of the memorandum describes the methodology used to determine how the trips were distributed and assigned to the roadway network.

Motor Vehicle Trip Generation and Distribution

Trip quantities for the Oregon City TSP models were derived directly from Metro's travel demand models for 2010 and 2035. Metro model trip tables will be used as a basis for the Oregon City TSP model. The initial number of trips in the Oregon City TSP model will be consistent with the Metro travel demand model for both external and internal zones. Trip totals identified for Metro TAZs were split proportionally into the disaggregated TAZ system based on land use data and aggregate Metro model trip rates. The sum of the trip totals for disaggregated 'child' zones equaled the trips for each Metro 'parent' zone. Further refinements to trip generation may be made to calibrate the base year Oregon City model to traffic counts. The growth in demand (difference between 2010 and 2035) identified in Metro's travel demand models will be maintained, as identical adjustments to demand will also be applied to the future year model, if need be.

By utilizing trip tables directly from the Metro travel demand models as a basis, the initial distribution of trips will be retained. Relative trip distribution for disaggregated 'child' TAZs reflect the distribution identified for the 'parent' Metro TAZ.

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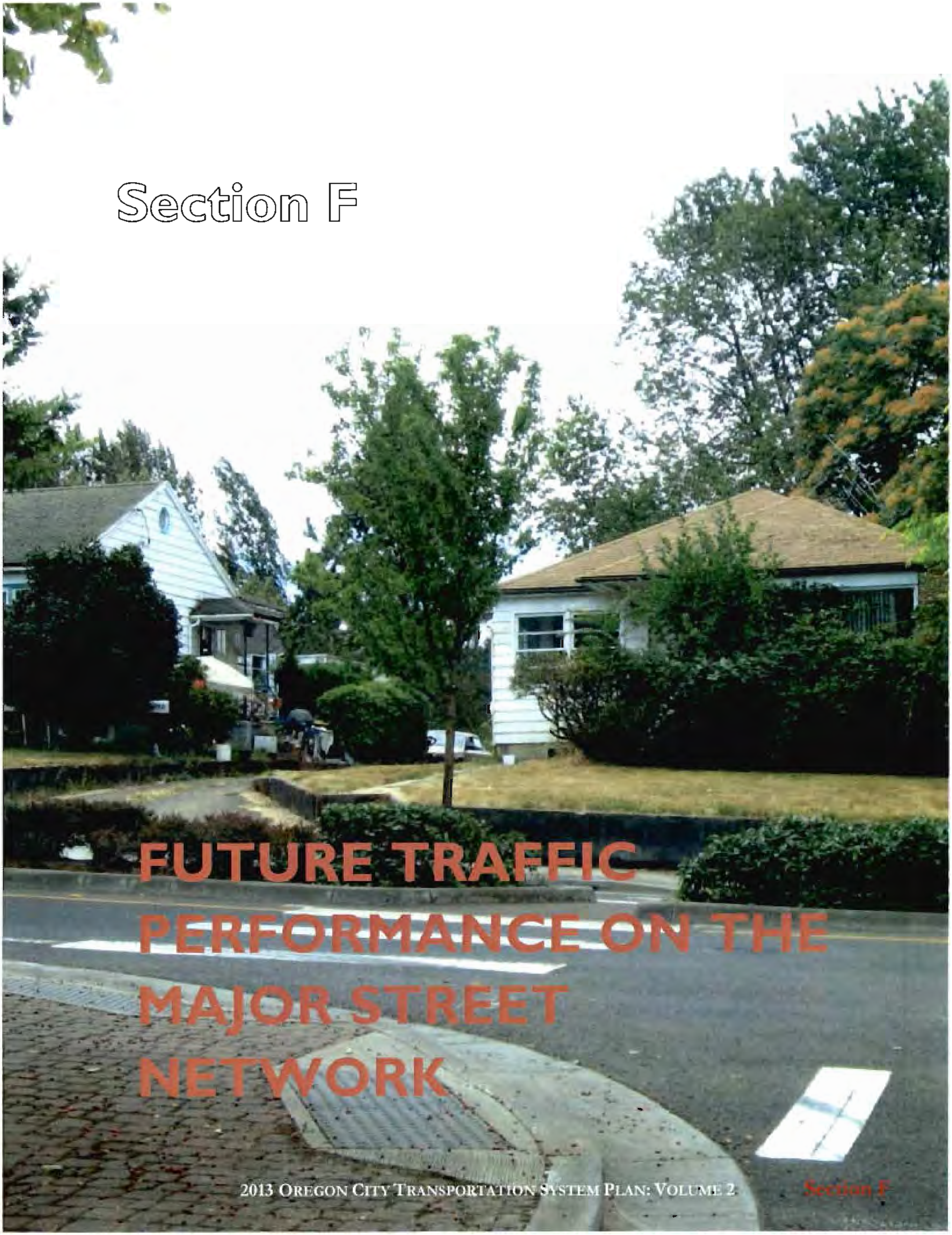
[3] *Analysis Procedures Manual (APM)*, Oregon Department of Transportation (ODOT) Transportation Planning Analysis Unit (TPAU), Last Updated June 2010.

Trip Assignment

Trip assignment involves the determination of the specific travel routes taken for all trips within the transportation network. Both the Oregon City TSP model and the Metro regional model perform trip assignment using VISUM. Model inputs included the transportation network (i.e., road and intersection locations and characteristics, as determined from maps and field inventories) and a trip distribution table (determined using methodology described previously in this memorandum). Iterated equilibrium assignment will be performed using estimated travel times along roadways as well as mid-block and approach capacities at intersections. The path choice for each trip will be based on minimal travel times available between locations in the model. Model outputs will include traffic volumes on roadway segments and at intersections. Model outputs will be reviewed for reasonableness and post-processed (as described previously) to develop forecasts.

Section F



FUTURE TRAFFIC PERFORMANCE ON THE MAJOR STREET NETWORK

FUTURE TRAFFIC PERFORMANCE ON THE MAJOR STREET NETWORK

Oregon City, like many jurisdictions, faces the challenge of accommodating future population and employment growth while keeping acceptable service levels on its transportation network. Oregon City is aware of this challenge and strives to keep the City's Transportation System Plan (TSP) up to date in an effort to prepare for and accommodate the future growth in the most efficient manner possible. Without the big picture that the TSP provides, maintaining acceptable street network performance could not be achieved in an efficient manner. For this reason, the City updated its forecast by reviewing the existing transportation network with growth through 2035 to better understand how the street network would be expected to operate. Using the existing zoning designations, this document explores the expected conditions of the Oregon City street network in 2035, assuming improvements are not pursued to accommodate future growth. Although this document focuses on the future growth and performance of the street system for driving, the forecasting process for future travel demand assumes increased travel via walking, biking and transit, in addition to driving. These modes will be further reviewed in Technical Memorandum #7.

Estimating Future Growth

Before we determine what investments are needed for a transportation network for all modes, we must first look at the existing travel conditions, and then use the latest planning assumptions to forecast what future growth and travel trends might look like in the planning horizon of 2035. This helps to establish future baseline street network conditions that show what the future might look like if no new improvements are made to accommodate growth in the community.

The Traffic Forecasting Process

A determination of future street network needs in Oregon City requires the ability to accurately forecast travel demand resulting from estimates of future population and employment for the City. A primary objective of the transportation planning process is to provide the information necessary for making decisions on when and where improvements should be made to the transportation system to meet travel demand as developed in an urban area travel demand model as part of the Regional Transportation Plan update process. Metro uses VISUM, a computer based program for transportation planning, to process the large amounts of data for the Portland Metropolitan area. The traffic forecasting process can be summarized in six steps (see Figure 1):

1. **Update street network data:** The street network for the Metro Travel Demand Model was expanded to include all arterial and collector streets in Oregon City. The model had previously included most major roadways in the region. The existing model street network was also refined based on the existing conditions inventory of posted speeds, traffic control, lane geometries, and number of travel lanes. The existing model street network was utilized as the starting point for the 2035 Baseline model. Projects with secured funding or that are reasonably likely to be funded by 2035 were added to the street network.

2. **Identify the land use:** Based on 2010[1] and 2035 land use, growth for Oregon City and the surrounding region was estimated.

3. **Group the land use data based on location:** The land use data was split into geographical areas called transportation analysis zones (TAZs), which represent the sources of vehicle trip generation. There are 31 Metro TAZs within or adjacent to the Oregon City. These TAZs were further subdivided into 40 TAZs to better represent land use in Oregon City. The TAZs in Oregon City are shown in Figure A1 in the appendix.

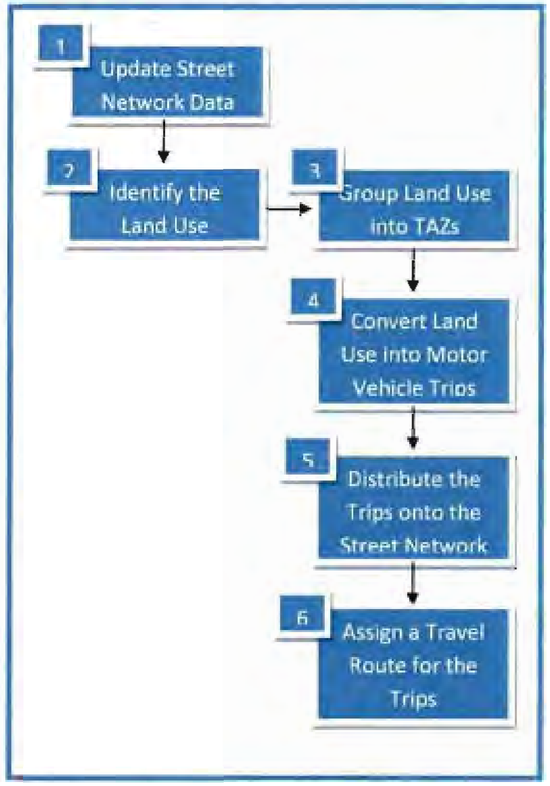


Figure 1: The Traffic Forecasting Process

4. **Convert the land use to motor vehicle trips:** The existing and projected land use is converted into motor vehicle trips. The trip generation process translates existing and projected land use quantities (number of dwelling units, retail, and other employment) into vehicle trip ends (number of vehicles entering or leaving a TAZ) using trip generation rates established during the model verification process.

5. **Distribute the trips onto the street network:** This step estimates how many trips travel from one TAZ in the model to any other TAZ. Distribution is based on the number of vehicles entering or leaving each TAZ pair, and on factors that relate the likelihood of travel between any two zones to the travel time between zones.

6. **Assign a travel route to the trips:** In this process, trips from one TAZ to another are assigned to specific travel routes on the street network, and resulting trip volumes are accumulated on links of the network until all trips are assigned.

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[1] 2010 land use is based on the most current inventory by Metro

Once the traffic forecasting process is complete, we utilize the 2035 traffic volumes to determine the areas of the street network that are expected to be congested and that may need future investments to accommodate growth.

Baseline Street Network Performance

Baseline reflects the street network performance assuming we build the transportation projects that already have secured funding or are reasonably likely to be funded but assumes no additional improvements. Major projects that are included in the Baseline street network are (see Table A1 in the appendix for more detail):

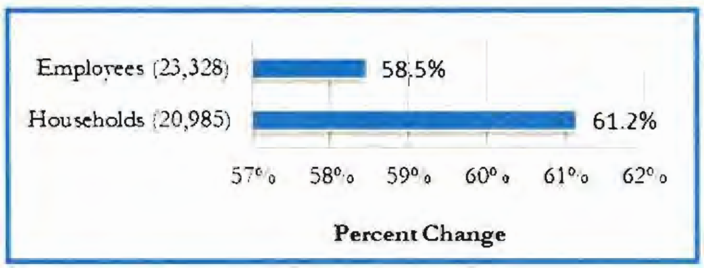
- Swan Avenue extension from Livesay Road to Holly Lane
- Holly Lane extension from Redland Road to Holcomb Boulevard
- Holly Lane improvements from Redland Road to Maple Lane Road
- Beavercreek Road widening from Maple Lane Road to Henrici Road
- Meyers Road extension from OR 213 to High School Avenue
- A roadway connection between Washington Street and Abernethy Road
- Intersection re-configuration at OR 213/Washington Street
- A roundabout at the Molalla Avenue/Division-Taylor Street intersection

Snapshot of Oregon City in 2035

Highlights of the 2035 Baseline performance are discussed below. While these summaries detail land use and growth in Oregon City, the travel demand forecasts that have been evaluated reflect the regional land use growth throughout the Portland metropolitan area.

More People, More Jobs

Today, Oregon City and the adjacent area are home to over 13,000 households and accounts for over 14,500 jobs. Between now and 2035, household growth is expected to increase nearly 2.4 percent a year, slightly outpacing the rate of job growth over the same period.[2] Oregon City and the adjacent area are expected to be home to 23,328 jobs by 2035, a



Oregon City and Adjacent Area Total Households and Employees in 2035 and Percent Change From 2010

[2] Household and Employment growth was estimated by Metro using 2010 and 2035 zoning data

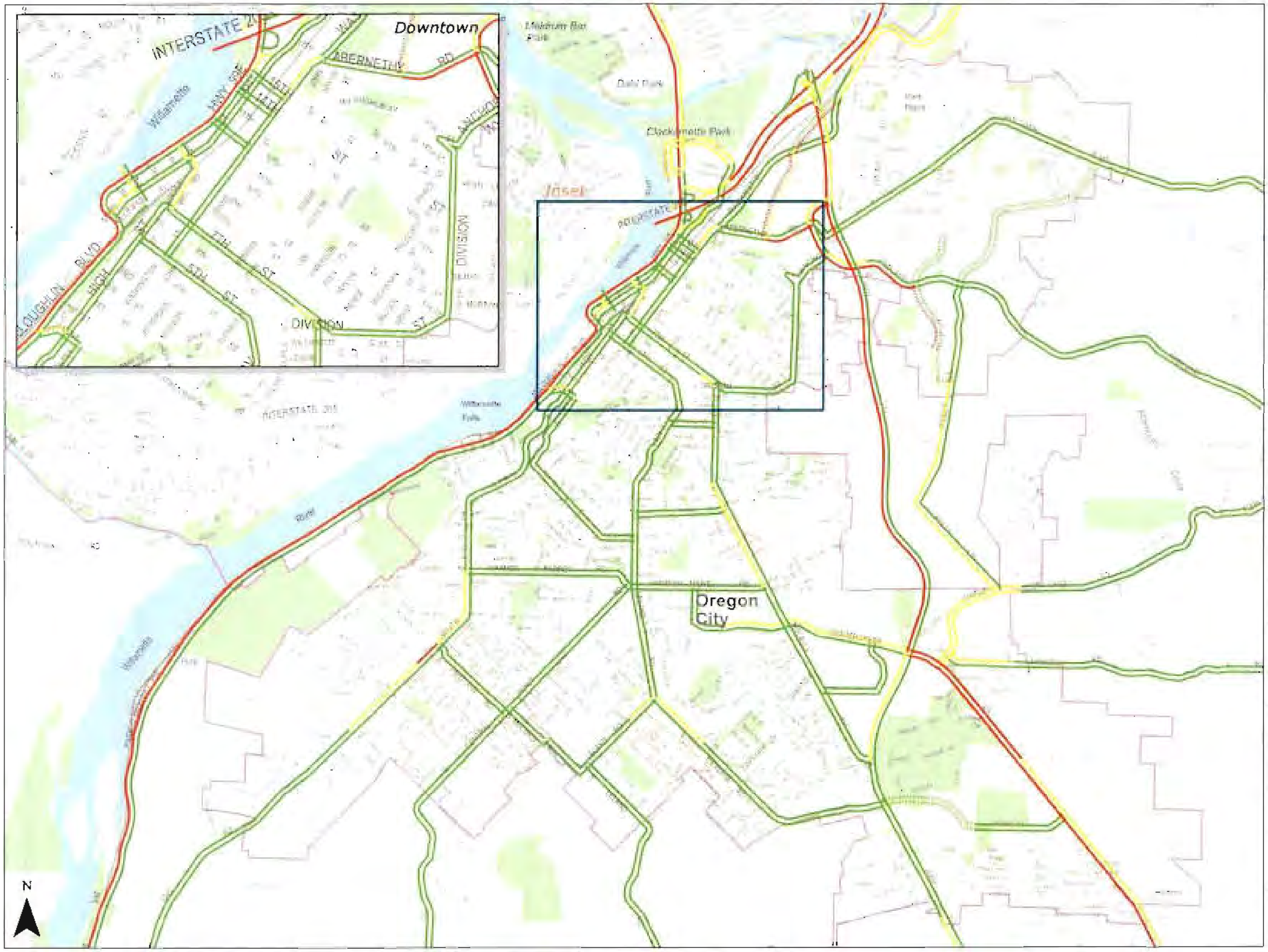
58 percent increase from 2010, or an average of 2.3 percent growth a year. Households are expected to grow to 20,985 by 2035, a 61 percent increase from 2010. With more people and more jobs in and around Oregon City, the street network will face increased demand through 2035. More detail on the land use by TAZ can be found in Table A3 in the appendix.

More Travel

With more jobs and people, the street network in Oregon City will face an additional 21,000 motor vehicle trips during the evening peak hour (see Table A2 in the appendix). Today, the street network in Oregon City is generally able to handle the estimated 33,000 evening peak hour trips. However, the evening peak hour motor vehicle trips are expected to increase 3 percent a year, surpassing 54,000 trips by 2035. Figure 2 shows the estimated increase in motor vehicle trips on the street network during the evening peak hour. As shown, much of the increased demand is expected along the regional roadways, such as I-205, OR 99E and OR 213. These roadways generally connect the Portland Metropolitan area to the employment areas in Oregon City. Other roadways that are expected to see significant traffic increases (according to the Metro travel demand model) include Abernethy Road, Beavercreek Road, Holly Lane, Maple Lane Road, Molalla Avenue, Redland Road and South End Road. Each of these roadways connects a major residential and/or employment growth area in the City to the regional roadway network.

More Congestion

More travel means more congestion. Travel activity as reflected by evening peak hour motor vehicle trips is expected to increase by 75 percent through 2035. Figure 3 shows the expected locations of congestion on the street network in Oregon City. As shown, most of the congestion is expected to be along the regional roadways that would experience the highest growth in evening peak hour motor vehicle volumes, such as I-205, OR 99E and OR 213. Congestion on I-205 and OR 213 would generally have less of an impact on Oregon City compared to that on OR 99E. When OR 99E is congested it has more of an impact on surface street circulation around Downtown Oregon City and could potentially detract from shopping or other retail uses in the area. Other roadways that are expected to experience congestion during the evening include Redland Road and Washington Street. It should be noted that major intersections along the congested roadways could potentially have operational issues based on this analysis. A detailed review of these intersections is forthcoming in Technical Memorandum #7.



OREGON CITY TRANSPORTATION PLAN

FIGURE 2

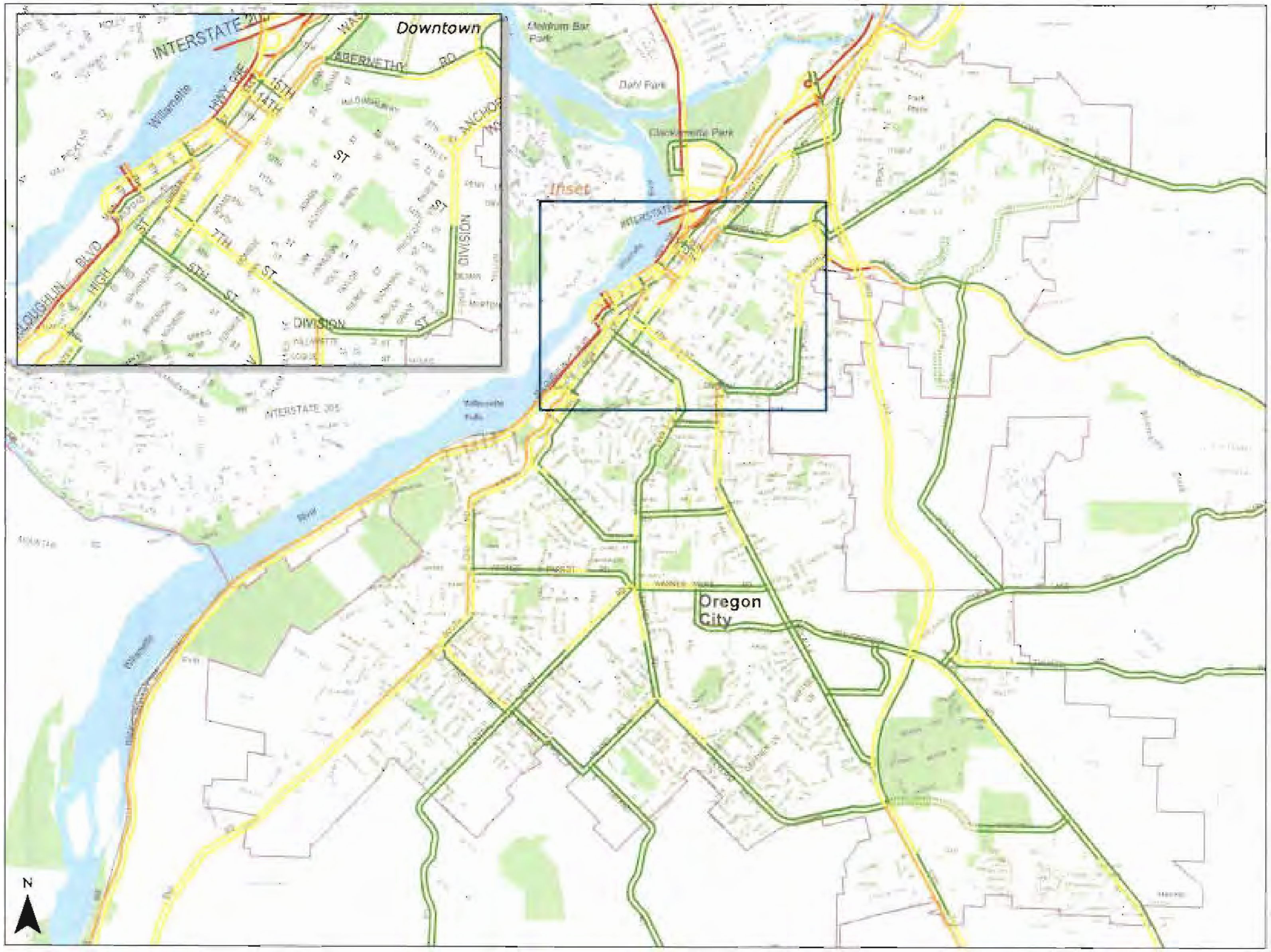
Motor Vehicle Travel Growth (P.M. Peak)

Legend

Roadway Travel Volume Increase between 2010 and 2035

- Highest Growth in Traffic Volumes (increase of more than 500 vehicles during the p.m. peak hour)
- Higher Growth in Traffic Volumes (increase between 250 and 500 vehicles during the p.m. peak hour)
- Smallest Growth in Traffic Volumes (less than 250 additional vehicles during the p.m. peak hour)

- River
- Parks and Open Spaces
- Planned Roadways
- Railroad
- City Limit
- Urban Growth Boundary



OREGON CITY TRANSPORTATION PLAN

FIGURE 3

2035 Motor Vehicle Congestion (P.M. Peak)

Legend

Roadway Traffic Volume compared to Available Capacity

- Congested, over capacity
- More Congestion, nearing capacity
- Slightly more Congestion, well under capacity
- Uncongested, well under capacity
- River
- Parks and Open Spaces
- Planned Roadways
- Railroad
- City Limit
- Urban Growth Boundary

Appendix

Table A1: Oregon City CIP Financially Constrained Motor Vehicle Projects

Project ID	Source	Project/ Program Name	Start Location	End Location	Description
Roadway Segment Improvements					
1	RTP	Swan Extension	Livesay Rd	Holly Ln	Through lanes, sidewalks, bike lanes, turn lanes to serve UGB expansion area
2	RTP	Holly Lane	Redland Rd	Holcomb Rd	Through lanes, sidewalks, bike lanes, turn lanes to serve UGB expansion area
3	RTP	Holly Lane	Redland Rd	Maple Ln	Turn lanes, bike lanes, sidewalks, intersection improvements, bridge replacement
4	RTP	Beavercreek Rd Improvements Phase 2	Maple Lane	Clackamas Community College	Widen to 5 lanes with sidewalks and bike lanes
5	RTP	Beavercreek Rd Improvements Phase 3	Clackamas Community College	UGB	Widen to 4 lanes with sidewalks and bike lanes
6	City TSP	Meyers Road	High School Avenue	Beavercreek Road	Extension from current terminus at High School Avenue to Beavercreek Road
7	City TSP	Washington – Abernethy Connector	Abernethy Road	Washington Street	Extension from stub south of Washington to Abernethy Road
Intersection Improvements					
A	STIP/ City TSP	Jughandle at OR 213/Washington Street	-	-	Construct Jughandle Intersection at Washington Street
B	RTP	Molalla Avenue Roundabout (Taylor/Division)	-	-	Reconfigure intersection for safety and LOS into roundabout

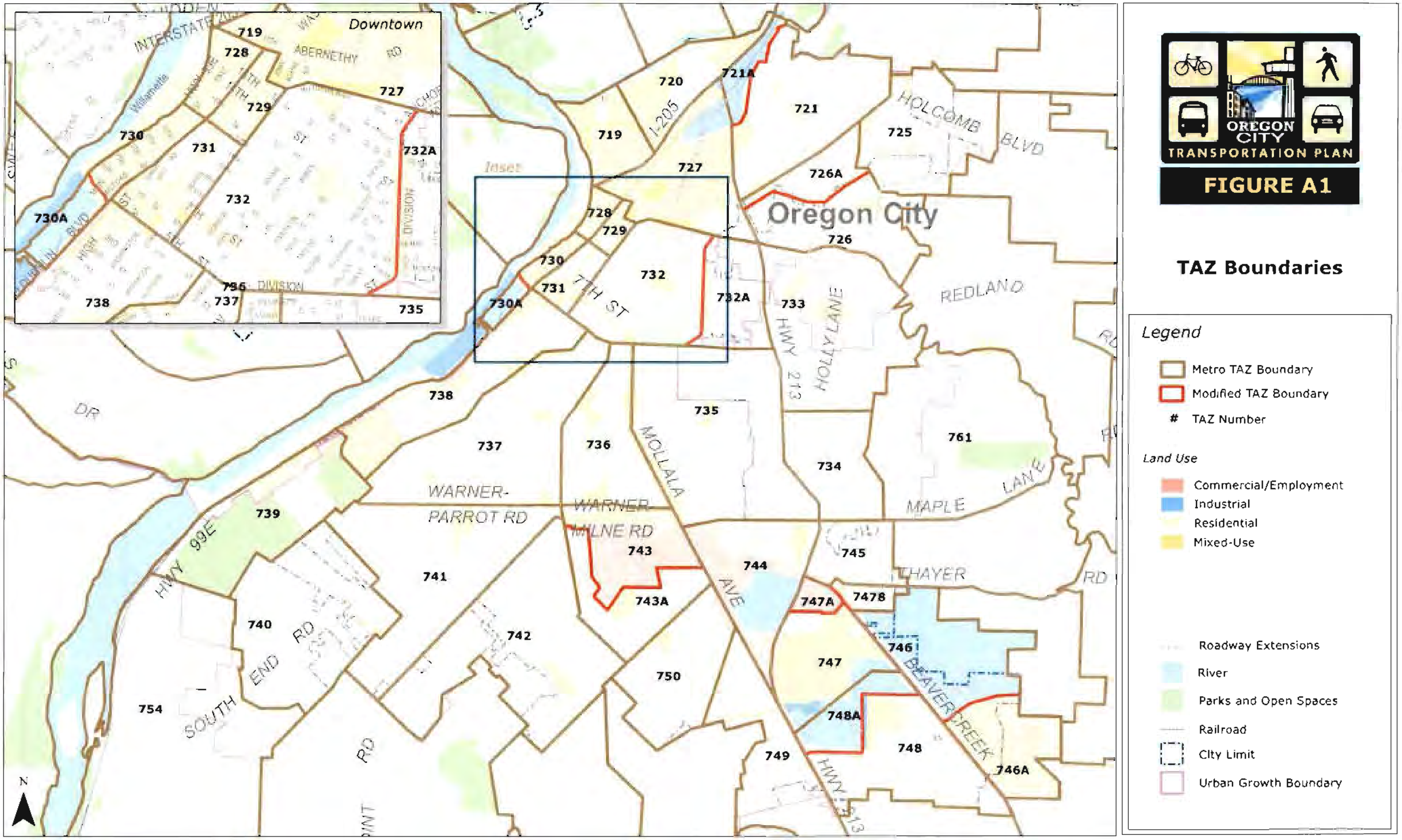

OREGON CITY
TRANSPORTATION PLAN
FIGURE A1
TAZ Boundaries
Legend
Metro TAZ Boundary
Modified TAZ Boundary
TAZ Number
Land Use
Commercial/Employment
Industrial
Residential
Mixed-Use
Roadway Extensions
River
Parks and Open Spaces
Railroad
City Limit
Urban Growth Boundary
Downtown
Inset
Oregon City
INTERSTATE
ABERNETHY RD
Willamette
DIVISION
DIVISION
HIGH
BLVD
7TH ST
I-205
HOLCOMB BLVD
REDLAND
HWY 213
HOLLY LANE
MOLLALA AVE
WARNER-PARROT RD
WARNER-MILNE RD
MAPLE LANE
THAYER RD
HWY 99E
SOUTH END RD
BEAVERCREEK
DR
RD
719
720
721A
721
725
726A
726
727
728
729
730
730A
731
732
732A
733
734
735
736
737
738
739
740
741
742
743
743A
744
745
746
746A
747
747A
747B
748
748A
749
750
754
761
N

Table A2: Oregon City Trip Generation by TAZ

	2010			2035			
TAZ	Trips Leaving	Trips Arriving	Total Trips	Trips Leaving	Trips Arriving	Total Trips	Change in Total Trips (2035-2010)
719	574	387	962	857	605	1,462	500
720	59	23	81	418	280	698	617
721	265	400	665	568	583	1,151	486
721A	137	73	209	103	315	417	208
725	185	307	492	424	824	1,248	755
726	30	62	92	165	330	495	403
726A	74	134	208	90	202	292	84
727	449	289	738	3,286	2,027	5,312	4,574
728	100	73	173	242	170	412	240
729	150	95	245	266	175	441	197
730	290	239	529	556	228	784	255
730A	362	94	456	280	235	515	58
731	275	242	517	390	329	719	202
732	904	1,170	2,074	1,435	786	2,221	147
732A	987	325	1,312	513	804	1,318	6
733	103	117	220	203	326	529	310
734	29	53	82	34	63	98	16
735	752	855	1,607	1,031	1,048	2,079	472
736	700	751	1,451	933	922	1,856	405
737	640	1,038	1,678	716	1,144	1,861	183
738	289	402	691	371	492	862	172
739	27	14	41	43	44	87	46
740	311	513	823	761	1,421	2,183	1,360
741	580	1,154	1,734	701	1,407	2,109	374
742	481	942	1,423	922	1,850	2,772	1,348
743	2,547	961	3,507	1,852	1,711	3,563	56
743A	468	889	1,357	1360	375	1,735	378
744	1,504	880	2,383	2,038	1,207	3,246	862

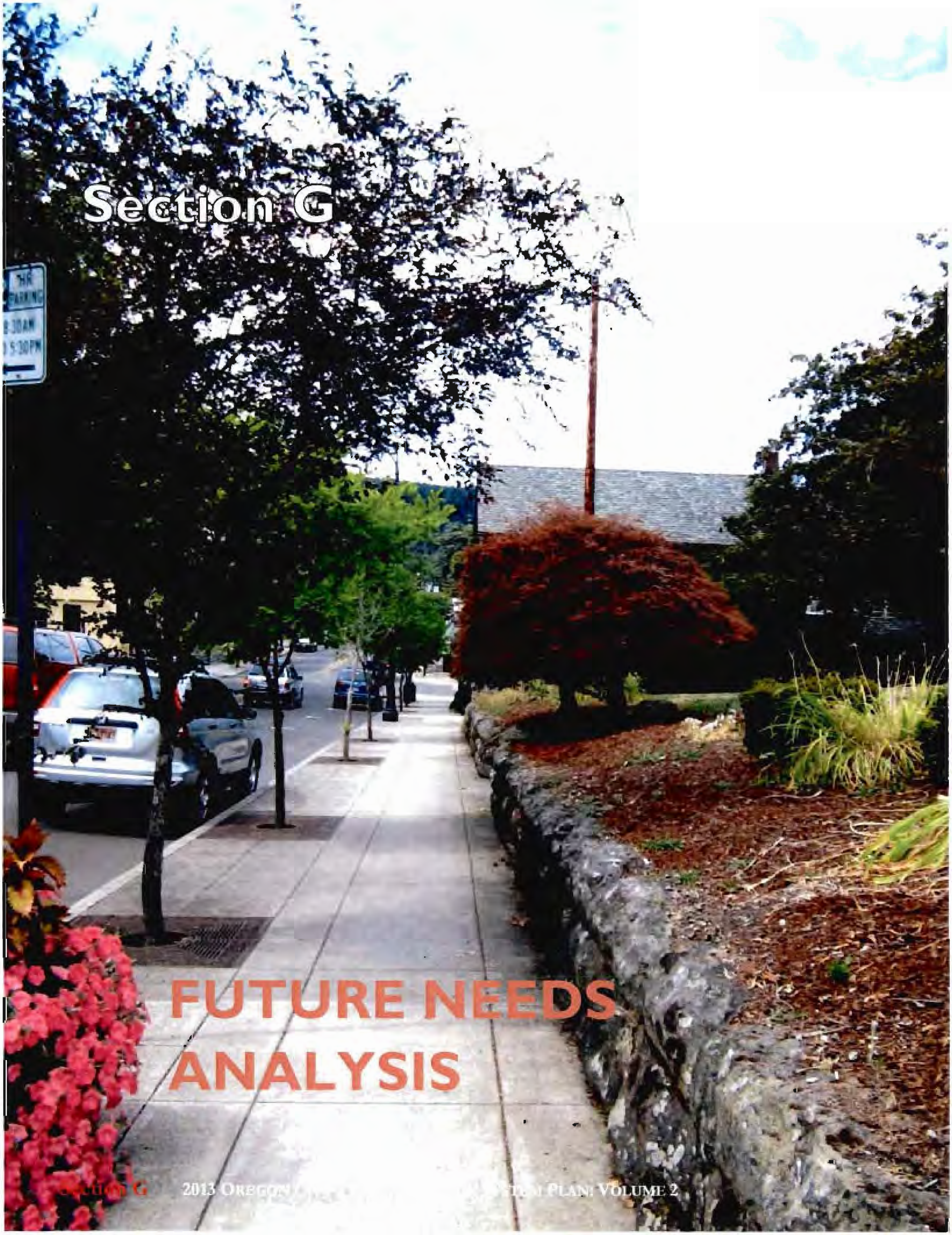
Table A2: Oregon City Trip Generation by TAZ

TAZ	2010 Trips Leaving	2010 Trips Arriving	2010 Total Trips	2035 Trips Leaving	2035 Trips Arriving	2035 Total Trips	Change in Total Trips (2035-2010)
745	119	144	263	369	701	1,070	807
746	47	44	91	1,101	672	1,772	1,682
747	897	300	1,197	952	764	1,717	520
747A	683	453	1136	773	399	1172	36
747B	192	294	486	570	128	697	211
748	384	663	1,047	642	571	1,213	166
748A	93	26	119	99	347	446	327
749	522	693	1,215	710	1,044	1,755	540
750	503	735	1,238	655	977	1,632	394
754	84	183	267	406	903	1,309	1,043
761	77	126	202	564	650	1,213	1,011
Total	**16,872**	**16,140**	**33,012**	**27,400**	**27,061**	**54,461**	**21,449**

Table A3: Oregon City TAZ Land Use Growth, 2010 to 2035

TAZ	Household Growth	Employment Growth
719	150	306
720	193	384
721	428	136
725	593	12
726	397	-1
727	370	3112
728	48	148
729	43	128
730	58	208
731	54	121
732	114	17
733	237	16
735	90	275
736	152	197
737	119	31
738	88	69
740	996	13
741	194	1
742	1055	11
743	79	-40
744	78	527
745	660	-15
746	355	1639
747	4	473
748	188	347
749	474	26
750	238	80
761	507	384
Subtotal	**7,962**	**8,605**

Source: Metro



Section G

FUTURE NEEDS ANALYSIS

This document details the 2035 transportation conditions in Oregon City if no new investments are made to the existing transportation system beyond currently funded projects. Included is a summary of how the future transportation needs are determined, a depiction of what travel in 2035 could look like in Oregon City, a detail of where transportation investments are needed and an outline of potential improvements to consider.

How do we Determine Future Transportation System Needs?

Before we determine what investments are needed for the City's transportation system, we must first look at the existing travel conditions, and then use the latest planning assumptions to forecast what future growth and travel trends might look like in 2035. We begin by assuming that no new investments will be made into the transportation system beyond what is already funded for construction and consider how the system will change with planned growth. The following sections explain where growth is expected, how the transportation system will perform and where solutions will be needed. Solutions for addressing the transportation system needs will be explored in Technical Memorandum #9.

Estimating Future Travel

A determination of future transportation system needs in Oregon City requires the ability to accurately forecast travel demand resulting from estimates of future population and employment for the City and the rest of the Metro region. The objective of the transportation planning process is to provide the information necessary for making decisions about how and where improvements should be made to provide a safe and efficient transportation system that provides travel options.

The travel demand forecasting process generally involves estimating travel patterns for new development based on the decisions and preferences demonstrated by existing residents, employers and institutions around the region. Travel demand models are mathematical tools that help us understand future commuter, school and recreational travel patterns including information about the length, mode and time of day a trip will be made. The latest travel models are suitable for motor vehicle and transit planning purposes, and can produce total volumes for autos, trucks and buses on each street and highway in the system. Comparing outputs with observed counts and behaviors on the local system refines model forecasts. This refinement step is completed before any evaluation of system performance is made. Once the traffic forecasting process is complete, the 2035 volumes are used to determine the areas of the street network that are expected to be congested and that may need future investments to accommodate growth. Additional details on the travel forecasting can be found in Figure A1 in the appendix and in Technical Memorandum #5: Modeling Assumptions.

Future Estimates of Walking, Biking and Transit

While there is great interest in developing forecasting models for bicycles and pedestrians, the traditional travel demand methodology used for predicting motor vehicle activity does not easily apply to bicycle and pedestrian travel for a number of reasons. Because the number of daily biking and walking trips in a community tend to be much smaller than the number of vehicular trips, data on walking and biking is typically too small to develop accurate models. Additionally, how people choose routes when they are walking or biking tends to be much more complicated than when they are driving (i.e., motorists tend to take the shortest routes while bicycles may trade directness to avoid a hill or travel on a lower volume street). The nature of bicycle and pedestrian travel and decision-making is not well understood, and is the subject of current national and local research efforts to incorporate bicycle and pedestrian travel into future traditional travel models.

Other sources of information on bicycle and pedestrian activity, such as the U.S. Census tend to undercount the actual number of walking and biking trips made in a community. This is because Census data focuses on the mode of travel used for work trips, which typically make up less than 20 percent of an individual's travel. In addition, the Census requires that respondents choose only one mode—the one used most often during the survey week. As a result, the Census does not capture the bicycle and pedestrian activity of people who bicycle or walk to access transit, to conduct personal business, to socialize, or for recreation.

Therefore, the future needs for walking, biking and transit in Oregon City were determined by reviewing major growth areas of the City and seeing how they were served by existing facilities. In addition, the areas of the City in close proximity to key destinations (such as schools, parks, transit stops, shopping and employment) that have the potential to attract significant walking and biking trips and areas with existing deficiencies were reviewed to determine locations for prioritized walking , biking or transit investments (see Figures 5, 6, and 7).

Snapshot of Oregon City in 2035

Today, Oregon City is home to over 13,000 households and accounts for over 14,500 jobs. Between now and 2035, household growth is expected to increase nearly 2.4 percent a year, slightly outpacing the rate of employment growth over the same period (2.3 percent). Oregon City is expected to be home to over 23,000 jobs almost 21,000 households by 2035, a 58 and 61 percent increase respectively from 2010. With more people and more jobs in Oregon City, the transportation network will face increased demand through 2035.

More People, More Jobs

As shown in Figure 1, much of the population and employment growth is expected to occur around the undeveloped edges of Oregon City. Employment growth is expected to be highest around the

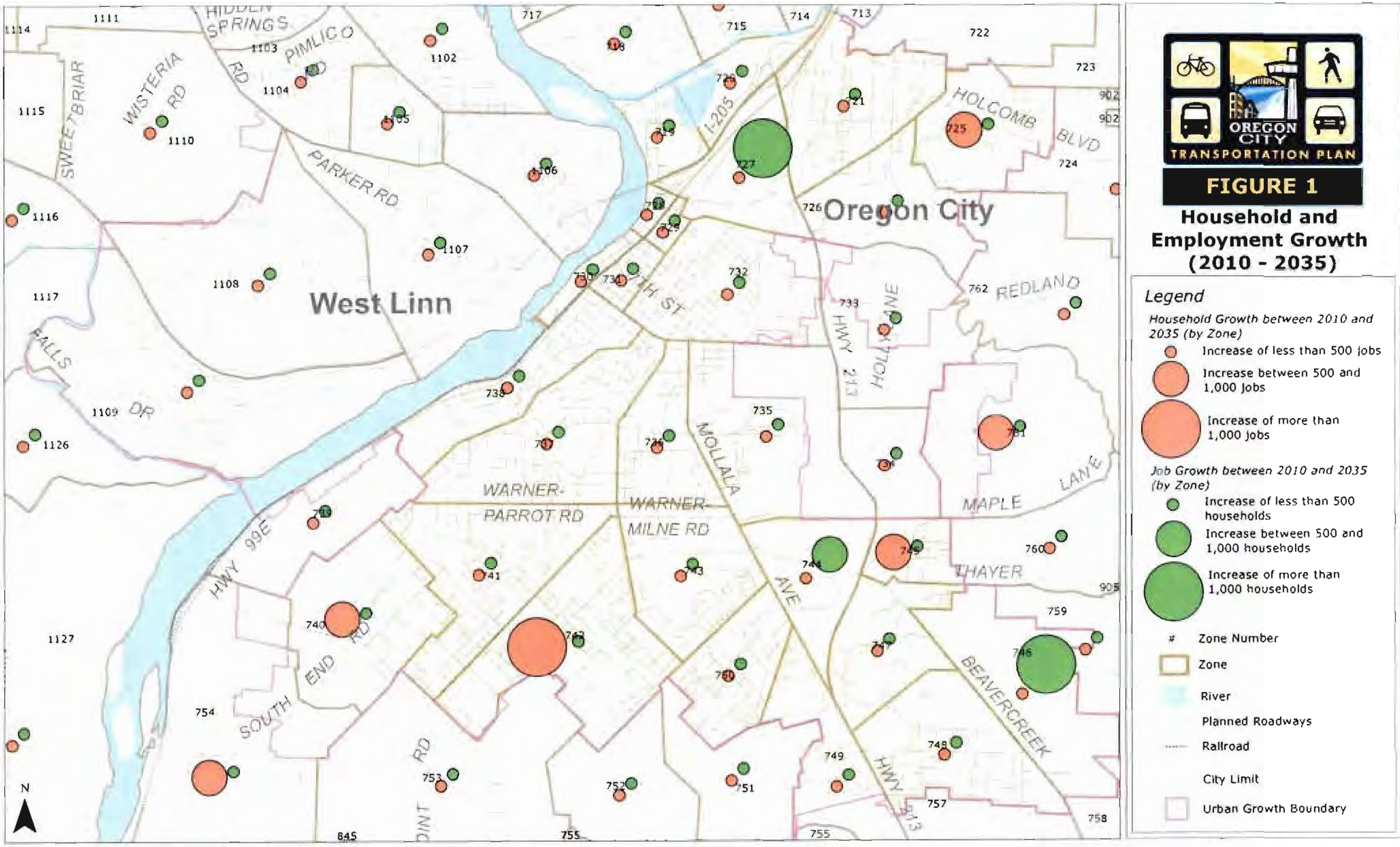
Oregon City Regional Center, including downtown Oregon City and the area bounded by the Clackamas River to the north, Abernethy Road on the south, OR 213 on the east and the Willamette River to the west. High employment growth is also anticipated to occur at the southeast end of the City, around OR 213 and Beavercreek Road.

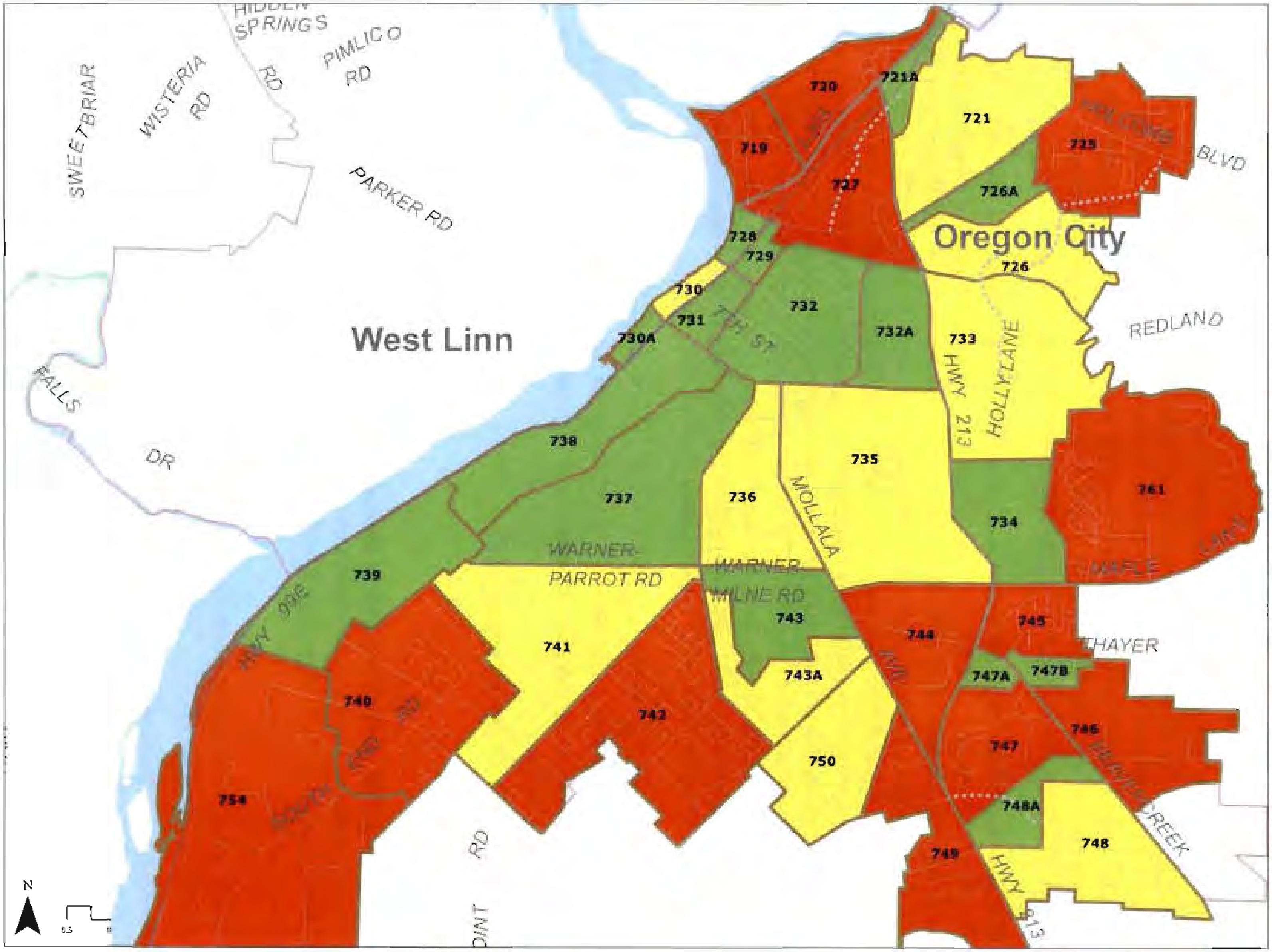
Household growth is expected to be highest towards the south end of the City, along South End Road, Central Point Road, Leland Road and Meyers Road. High household growth is also expected to occur on the north and east side of the City, along Maple Lane Road, Holcomb Boulevard and Redland Road.

More Travel

With more jobs and people, the street network in Oregon City must cope with an additional 21,000 motor vehicle trips during the evening peak hour (see Table A1 in the appendix). Today, the street network in Oregon City is generally able to handle the estimated 33,000 evening peak hour trips evening peak hour trips. However, the evening peak hour motor vehicle trips are expected to increase 3 percent a year, surpassing 54,000 trips by 2035. Figure 2 illustrates how the population and employment growth through 2035 translates into motor vehicle travel by zone during the evening peak hour. As shown, much of the increased travel is expected to begin or end in zones located in a major residential and/or employment growth area, including around Abernethy Road, Beavercreek Road, Maple Lane Road, Molalla Avenue, Redland Road and South End Road.

2035 motot vehicle volumes on the roadways in Oregon City were utilized to determine the areas of the street network that will be congested and may need future investments to accommodate growth. The street network was assessed under Baseline conditions, which reflects the street network performance assuming we build the transportation projects that already have secured funding or are reasonably likely to be funded but assumes no additional improvements. Major projects that are included in the Baseline street network can be seen in Table A2 in the appendix. The 2035 Baseline traffic volumes developed for the reviewed intersections can be found in Figure A3 in the appendix. Baseline 2035 motor vehicle volumes are expected to be highest along the regional roadways, such as I-205, OR 99E and OR 213. These roadways generally connect the Portland Metropolitan area to the employment areas in Oregon City and serve outlying communities such as Molalla and Canby. Other roadways that are expected to see significant traffic increases include Abernethy Road, Beavercreek Road, Holly Lane, Maple Lane Road, Molalla Avenue, Redland Road and South End Road. Each of these roadways connects a major residential and/or employment growth area in the City to the regional roadway network.


West Linn
Oregon City
OREGON CITY
TRANSPORTATION PLAN
FIGURE 1
Household and Employment Growth (2010 - 2035)
Legend
Household Growth between 2010 and 2035 (by Zone)
Increase of less than 500 jobs
Increase between 500 and 1,000 jobs
Increase of more than 1,000 jobs
Job Growth between 2010 and 2035 (by Zone)
Increase of less than 500 households
Increase between 500 and 1,000 households
Increase of more than 1,000 households
Zone Number
Zone
River
Planned Roadways
Railroad
City Limit
Urban Growth Boundary



OREGON CITY TRANSPORTATION PLAN

FIGURE 2

Traffic Volume Growth by Zone (2010 - 2035)

Legend

Change in Traffic Volumes to and from Zone between 2010 and 2035

- Highest Growth in Traffic Volumes to and from Zone (increase of more than 500 vehicles during the p.m. peak hour)
- Higher Growth in Traffic Volumes to and from Zone (increase between 250 and 500 vehicles during the p.m. peak hour)
- Smallest Growth in Traffic Volumes to and from Zone (less than 250 additional vehicles during the p.m. peak hour)

- # Zone Number
- Zone
- River
- Planned Roadways
- Railroad
- Urban Growth Boundary

More Congestion

More travel means more congestion. Travel activity as reflected by evening peak hour motor vehicle trips beginning or ending in Oregon City, is expected to increase by 75 percent through 2035. Through travel, or trips that do not begin or end in Oregon City, is also expected to increase through 2035 and is generally representative of growth in Cities such as Molalla and Canby. Figure 3 shows the expected locations that will experience average travel speeds well below the posted limits on the street network in Oregon City, where most of the congestion is expected to be along the regional roadways, such as I-205, OR 99E and OR 213. Congestion on I-205 and OR 213 would generally have less of an impact on Oregon City compared to that on OR 99E. When OR 99E is congested it has more of an impact on surface street circulation around Downtown Oregon City and could potentially detract from shopping or other retail uses in the area. Other roadways that are expected to experience average travel speeds well below the posted limits during the evening include Beavercreek Road, Maple Lane Road, Redland Road and Washington Street.

2035 Baseline intersection operations are summarized in Figure 3 and shown in Table A3 in the appendix. With the increased street network congestion, several of the intersections reviewed are expected to be substandard by 2035 during the evening peak period (see Appendix for more detail), including four signalized intersections (OR 99E/I-205 WB Ramps, OR 99E/I-205 EB Ramps, OR 213/Beavercreek Road and Maple Lane Road/Beavercreek Road) and two all-way stop intersections (High Street/2nd Street and South End Road/Warner Parrott Road). In addition, since many of the intersections along these routes are unsignalized, the side streets generally experience high delay due to steady volumes on the uncontrolled roadway. These approaches typically require more time for an acceptable gap in traffic to make a left turn onto the mainline, therefore, the delay of the side street is high and the intersection becomes substandard. The following seven unsignalized intersections are expected to be substandard by 2035 due to the delay of the side street:

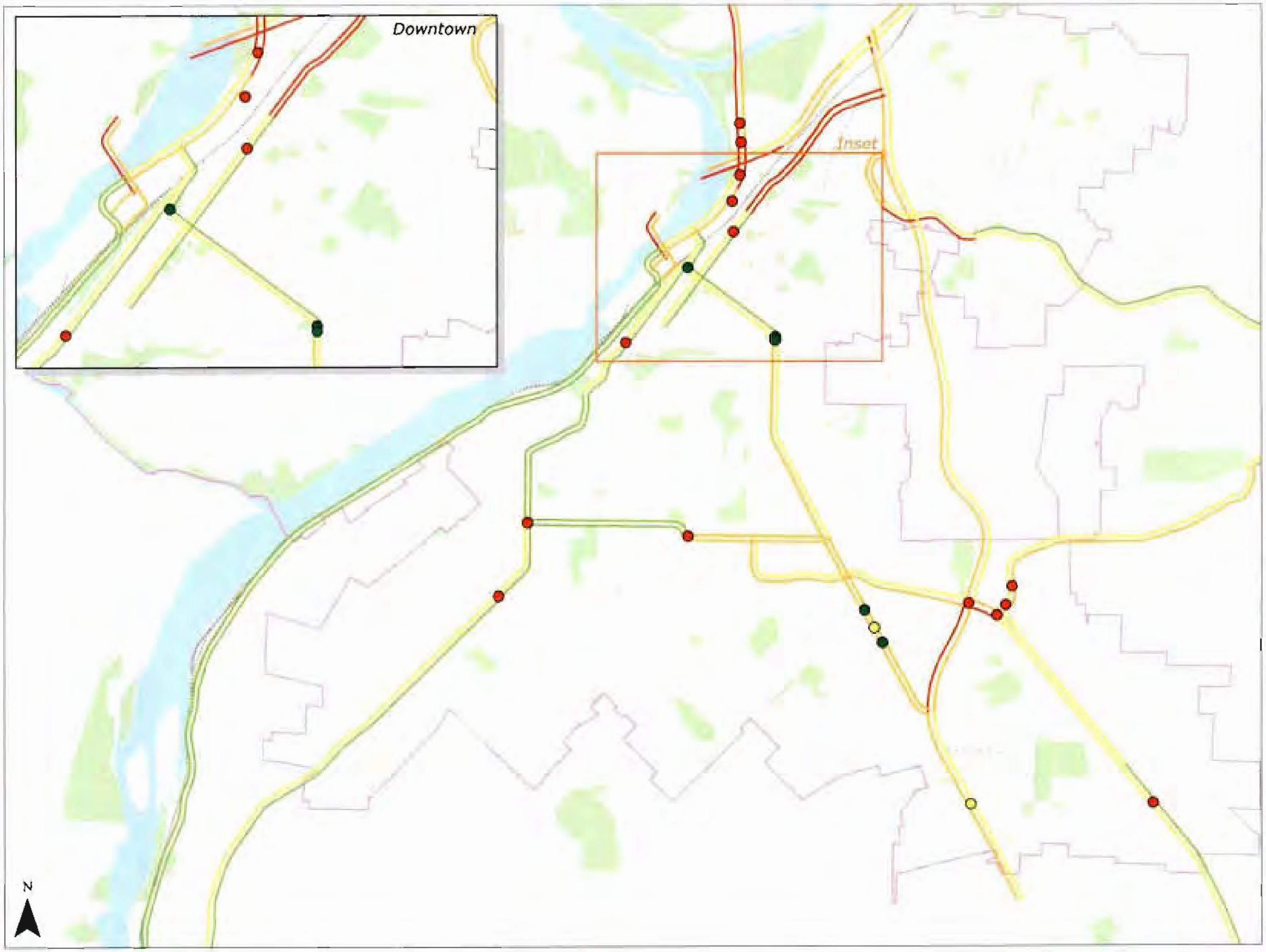
- Main Street/14th Street
- Washington Street/12th Street
- South End Road/Lafayette Avenue-Partlow Road
- Central Point Road/Warner Parrott Road
- Maple Lane Road/Thayer Road
- Maple Lane Road/Walnut Grove Way
- Beavercreek Road/Glen Oak Road

2035 peak period motor vehicle travel times per mile were estimated for major roadways in the City and compared to travel times of the existing street network. The motor vehicle travel times during the p.m. peak hour[1] were assessed using INRIX historical traffic flows[2] and increment

[1] The evening peak hour varies by intersection, but is generally between 4:30 and 5:30 p.m. in Oregon City

[2] INTIX Historical Traffic Flow Data, 2008-2010,data received from ODOT

growth in travel times gathered from the traffic forecasting process. As shown in Figure 4, travel times along several streets in the City are expected to get significantly longer through 2035 (with travel time increases of more than one minute per mile) including portions of I-205, Beavercreek Road, Redland Road and OR 43 (Oregon City-West Linn Bridge). Other roadways that are expected to have higher travel time increases per mile during the evening peak hour include OR 99E, South End Road and Main Street.



OREGON CITY TRANSPORTATION PLAN

FIGURE 3

2035 Baseline Motor Vehicle Operating Conditions (P.M. Peak)

Legend

2035 Roadway Travel Speed compared to Posted Speed

- Congested, well below speed limit
- Slowing, well below speed limit
- Slowing, but near speed limit
- Uncongested, near speed limit

2035 Baseline Intersection Operations

- Good
- Marginal
- Substandard

- River
- Parks and Open Spaces
- Planned Roadways
- Railroad
- City Limit
- Urban Growth Boundary

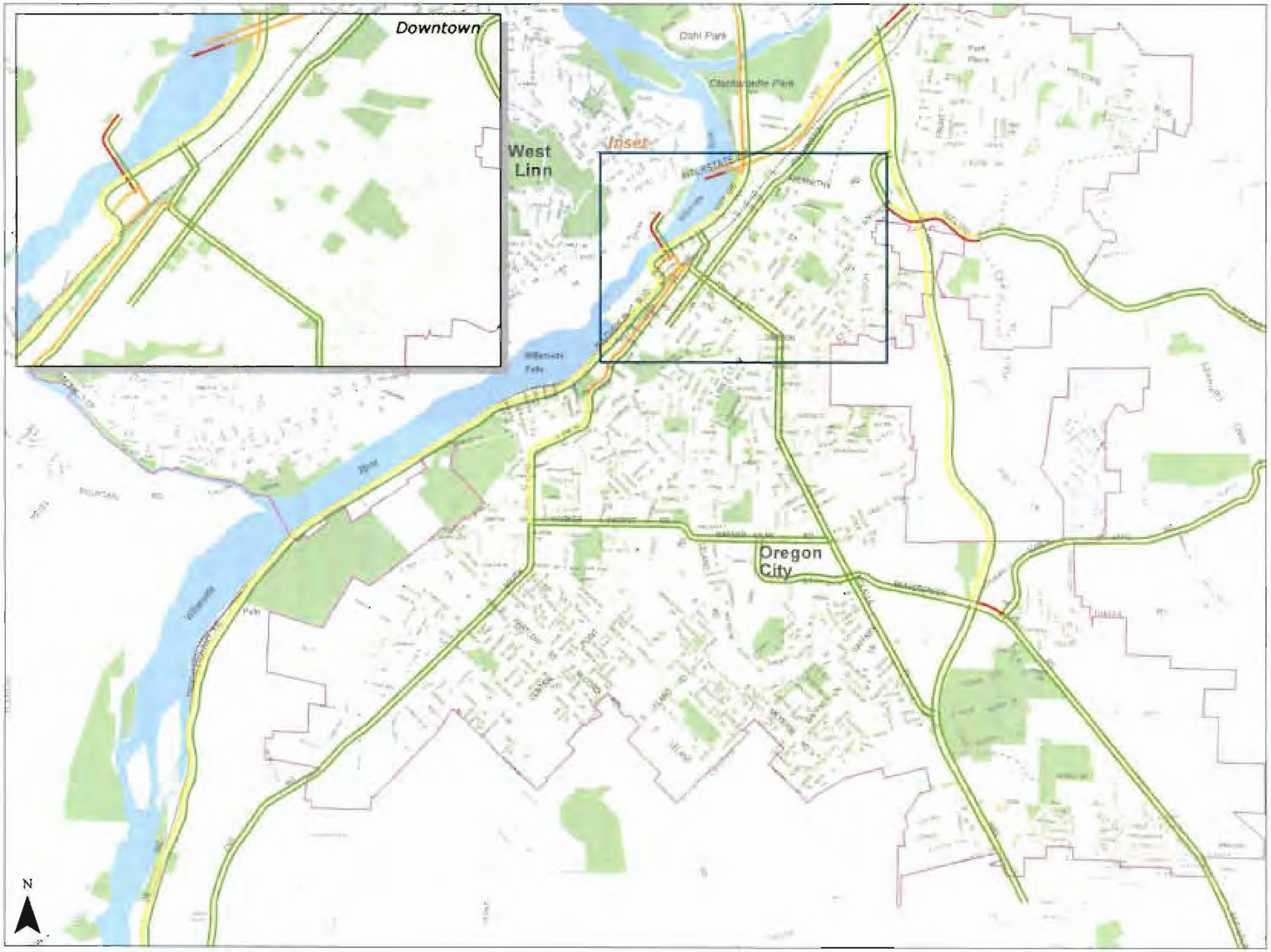


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FIGURE 4

2035 Motor Vehicle Travel Time (P.M. Peak)

Legend

Segment Travel Time Change Between 2012 and 2035 (per mile)

- Increase of More than one minutes per mile
- Increase Between 30 seconds and one minute per mile
- Increase Between 15 and 30 seconds per mile
- Increase of Less than 15 seconds per mile
- River
- Parks and Open Spaces
- Planned Roadways
- Railroad
- City Limit
- Urban Growth Boundary

Where are Transportation Improvements Needed?

After reviewing the expected growth throughout the City and considering existing gaps and deficiencies of the transportation system, locations needing improvements were identified to meet the expected travel demand.

Walking Needs

Key transportation system gaps for pedestrians in Oregon City include:

- Lack of sidewalks/crossings along key routes to schools (e.g. near John McLoughlin Elementary, Holcomb Elementary, Oregon City High School, Gardner Middle School, and Mt Pleasant Elementary)
- Lack of sidewalks along routes that provide access to parks and open space (e.g. Charman Avenue near Rivercrest Park, and Chapin and Wesley Linn Parks)
- Lack of transit service within walking distance to neighborhoods west of Linn Avenue and Leland Road.
- Gaps in the sidewalk network along portions of transit routes (e.g. Linn Avenue, Warne Milne Road, and Holcomb Boulevard)
- Lack of sidewalks connecting the Canemah neighborhood to downtown Oregon City
- Lack of sidewalk connections from the residential areas in the south and southwest portions of the City to downtown Oregon City (e.g. along Linn Avenue).
- Lack of pedestrian crossings across major roadways (e.g. near the southern portion of OR 213)

Deficiencies in the pedestrian network include:

- **Lack of pedestrian buffer zone:** There are usually many destinations along arterials and the roads are designed to handle large vehicles, like buses. However, from a pedestrian perspective arterials can be difficult to cross and uncomfortable, or even dangerous to walk along. This is particularly true when there are missing sidewalks, unprotected crossings, or very little buffer provided between fast moving traffic and pedestrians. A buffer can take the form of streetside furnishings, landscaping or on-street parking. Along roads such as OR 99E through the Canemah neighborhood and along Molalla Avenue, the lack of buffer

There is no buffer between the sidewalk and vehicular traffic on much of Molalla Avenue, creating an uncomfortable walking environment

creates an uncomfortable and potentially unsafe walking environment.

- **Pedestrian visibility at crossings:** Opportunities exist to increase pedestrian visibility at pedestrian crossings using treatments such as signage, pavement markings, flashing lights, and median refuge islands. For example, the pedestrian crossing near Garden Meadow Drive on Molalla Avenue (below) can be difficult to see.

The pedestrian refuge island on the left could be made more visible with additional signage and pavement markings.

- **Difficulties for Pedestrians with Mobility Impairments:** While curb ramps are present in much of Downtown, many intersections in other parts of the City lack curb ramps, creating difficulties for pedestrians with mobility impairments as well as people pushing strollers. Some marked crosswalks lead to sidewalks with no curb ramps (e.g., on Warner Parrot Road near Central Point Road).

Lack of curb ramps at a crossing on Warner Parrot Road (left) and in the Canemah neighborhood along OR 99E

- **Lack of pedestrian crossings on major roadways:** The Molalla Avenue-7th Street corridor is designated as a Corridor in the Metro Regional Transportation Plan. There is commercial activity along the length of this corridor, though development patterns along much of Molalla Avenue remain auto oriented, with most buildings separated from the roadway by parking lots. While 7th Street has been upgraded with frequent pedestrian crossing opportunities, the limited number of pedestrian crossings along Molalla Avenue requires pedestrians to travel long distances out of direction to reach a designated crossing.

- **Lack of wayfinding tools:** Oregon City's pedestrian and bicycle system would benefit from additional signage and other wayfinding tools to orient users and direct them to and through major destinations like Downtown, schools, Clackamas Community College, and neighborhoods.
- **Limited street connectivity in some areas:** Although a well-connected street grid exists in Downtown and the McLoughlin neighborhood, discontinuous streets in other areas increase walking distances to reach destinations. A discontinuous street network is difficult for non-motorized users to navigate (i.e., know which streets will reach their destination) deterring bicycle and pedestrian travel.

Key Destinations for Walking Trips: Figure 5 shows the existing walking network and the locations of key destinations that have the potential to attract walking trips. Areas of the City within comfortable walking distance (assumed to be ¼ mile) to the greatest number of activity generators are indicated in red, while locations with lighter shading (green) are within walking distance of a single destination. Even though a location may only be within walking distance of a single destination (such as school or park), it will still be prioritized as a key walking route. Areas with no shading would be outside of the comfortable walking trip distance to any of the destinations. Pedestrian facility gaps located in areas with darker shading (red and yellow) indicate potential locations for prioritizing walking improvements. As shown in Figure 5, most of the areas of the City with the highest walking demand (such as Downtown and along Washington Street and 7th Street-Molalla Avenue) have existing sidewalks. A few streets with high walking demand that lack sidewalks include portions of 15th Street, Linn Avenue, Division Street, and Pearl Street. Residences in the southern and northeastern portion of Oregon City (including the Hazel Grove/Westling Farm, Tower Vista, Caufield, and portions of the South End and Park Place neighborhoods) tend to be located outside of an easy walking distance of destinations or transit stops. Gaps in the pedestrian network limit the ability to walk to key destinations such as Downtown as well as local destinations including schools and parks.

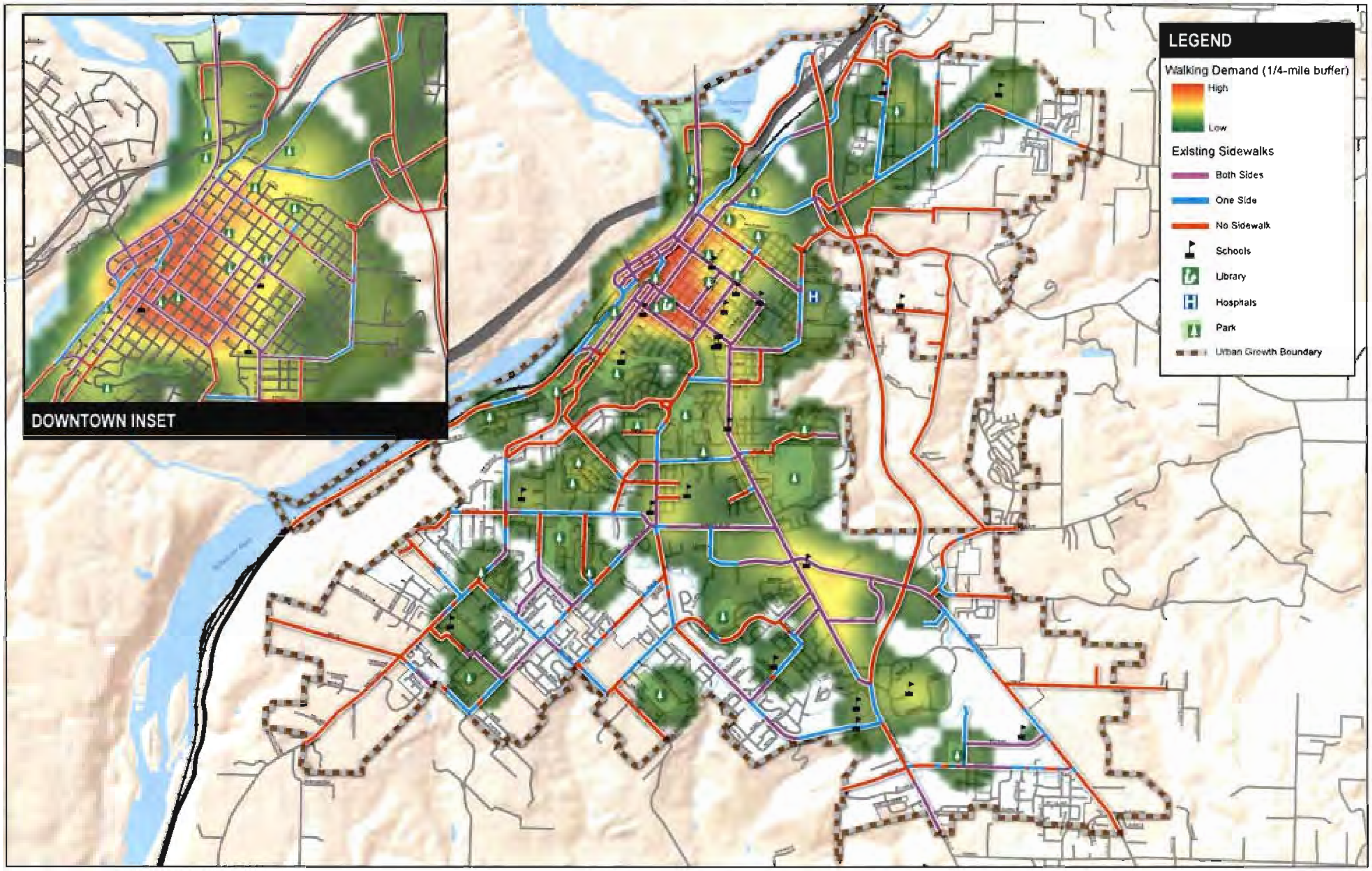

FIGURE 5: Pedestrian Demand Analysis

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Date: February 2012
Author: Alta Planning + Design

Biking Needs

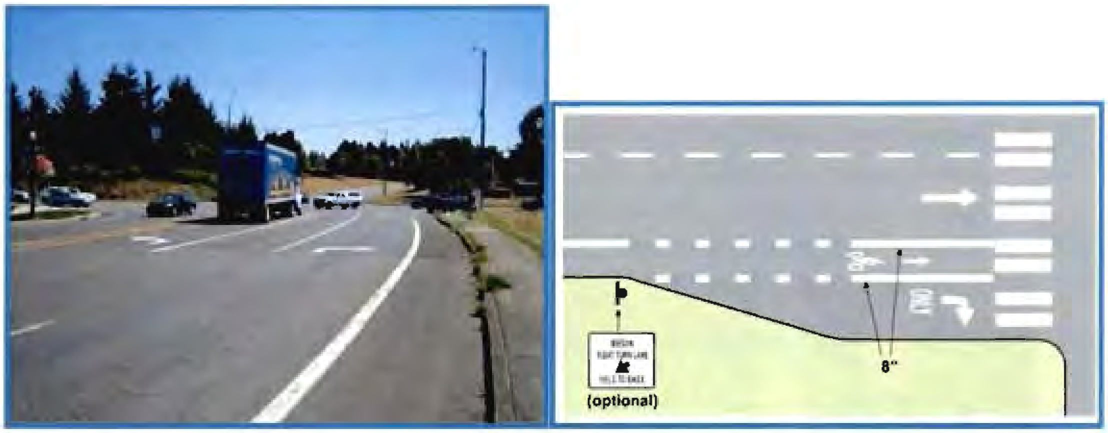
Key transportation system gaps for bicyclists in Oregon City include:

- Disconnected bicycle routes in Downtown and McLoughlin, South End, Tower Vista and Park Place neighborhoods, where biking demand is highest.
- Lack of bike lanes or wide shoulders on state highways (e.g. OR 99E)
- Lack of bike lanes or wide shoulders on arterial and collector streets in Oregon City (e.g. High Street, sections of South End Road and Abernethy Road)
- Lack of climbing bike lanes or other facilities to help bicyclists negotiate steep hills connecting downtown Oregon City with residential areas in the south and southwest portion of the City (e.g. Linn Avenue out of downtown would benefit from an uphill bike lane / downhill shared lane marking facility).
- Roadways periodically "drop" the bike lane, resulting in a discontinuous and uncomfortable experience, as occurs on Molalla Avenue between Warner Milne Road and Beavercreek Road, along Leland Road and along Central Point Road.
- Lack of low-traffic bicycle-friendly streets that are comfortable for children or new/inexperienced cyclists. Bicycle boulevards (also known as Neighborhood Greenways) are lower-volume and lower-speed streets that are optimized for bicycle travel through treatments such as traffic calming, bicycle wayfinding signage, pavement markings, and intersection crossing treatments. This treatment is particularly well suited to residential neighborhoods with good street connectivity, such as the McLoughlin neighborhood.

Deficiencies in the bicycle network include:

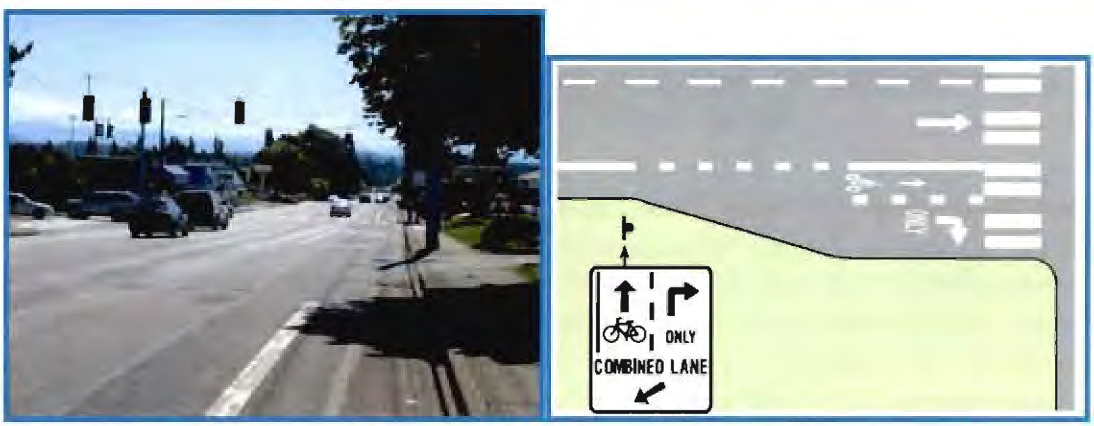
- **Limited bicycle parking near destinations**: Bicycle parking is generally not easy to find in Oregon City, yet it is an essential component to making the bicycle a viable transportation option. Excellent guidance on the provision of short term bicycle parking is found in the Bicycle Parking Guidelines produced by the Association for Pedestrian and Bicycle Professionals.
- **Lack of bicycle detection at traffic signals**: Signalized intersections in Oregon City generally do not detect bicycles. Methods of enabling cyclists to trigger a green signal phase include use of a push-button, loop detector or video detector. Loop detectors need to be regularly maintained to detect cyclists, and pavement stencils should be used to orient cyclists to the appropriate position within the roadway to trigger the signal.
- **Missing or improper bicycle accommodation at some intersections:** The majority of intersections along bike routes in Oregon City properly accommodate the bike lane through the intersection. However, there are a few examples of intersections where the bike lane drops at the intersection or is improperly situated on the outside of a right turn lane. At intersections with a dedicated right turn lane, the bike lane should generally be placed between the through lane and the right turn lane. Guidance on the lane configuration for

an intersection with a right turn lane and through bike lane can be found in the Oregon Bicycle and Pedestrian Plan[3] (see image below).



Bike lane on the outside of the right turn lane at the OR 213/ Molalla Avenue intersection (left). The Oregon Bicycle and Pedestrian Plan recommended placement of a bike lane at an intersection with a right turn lane (right).

If there is limited space to provide a bike lane through an intersection with a right turn lane, the Oregon Bicycle and Pedestrian Plan suggests the use of a combined right turn lane and through bike lane to accommodate both motorists and bicyclists, illustrated in the image below.



The bike lane drops in the southbound direction of Molalla Avenue at Gaffney Lane (left). The Oregon Bicycle and Pedestrian Plan includes the option of providing a combined right turn lane and through bike lane (right).

- **Maintenance issues**: Some bicycle facilities are difficult to see and in need of maintenance to address worn paint.

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[3] Oregon Bicycle and Pedestrian Plan, Chapter 6, Figure 6-2

- **Limited street connectivity in some areas:** Although a well-connected street grid exists in downtown and immediate surrounding neighborhoods, discontinuous streets in other areas require out of direction travel and increase bicycling travel time to key destinations. A discontinuous street network is difficult for non-motorized users to navigate when they are unfamiliar with the area, and thus impedes bicycle and pedestrian travel.
- **Limited amount of bicycle wayfinding signage**: Oregon City has very little signage to guide bicyclists to and along existing bicycle routes. The bicycle system would benefit from signage to orient users and direct them to and through major destinations like downtown, schools, Clackamas Community College, and neighborhoods.

An example of wayfinding signage in Oregon City (left). Example of wayfinding signage outside of the Oregon City limits (right)

Key Destinations for Biking Trips: Figure 6 shows the existing biking network and the locations of key destinations that have the potential to attract biking trips. Areas of the City within comfortable biking distance (assumed to be ½ mile) to the greatest number of activity generators are indicated in red, while locations with lighter shading (green) are within biking distance of a single destination. Even though a location may only be within biking distance of a single destination (such as school or park), it will still be prioritized as a key biking route. Areas with no shading would be outside of the comfortable biking trip distance to any of the destinations. Bicycle facility gaps located in areas with darker shading (red and yellow) indicate potential locations for prioritizing biking improvements. As shown in Figure 6, the existing bike network largely coincides with the roadways which have the highest biking demand, with the exception of several roadways in Downtown and the McLoughlin neighborhood. The busier roadways in these areas without bike lanes include OR 99E, Main Street, 10th Street, 12th Street, 14th Street, 15th Street, 7th Street, Division Street and portions of Washington Street. Other roadways lacking bike lanes in the City with high biking demand include portions of Molalla Avenue, Holcomb Boulevard, South End Road and Leland Road. Trip distances from most neighborhoods in Oregon City are reasonable for bicycling and most neighborhoods are located close to an existing bicycle route. However, the existence of gaps throughout the network effectively limits the ability for people to comfortably connect to destinations by bicycle. Future projects to increase the continuity of the bicycle network will increase the viability of traveling by bicycle.

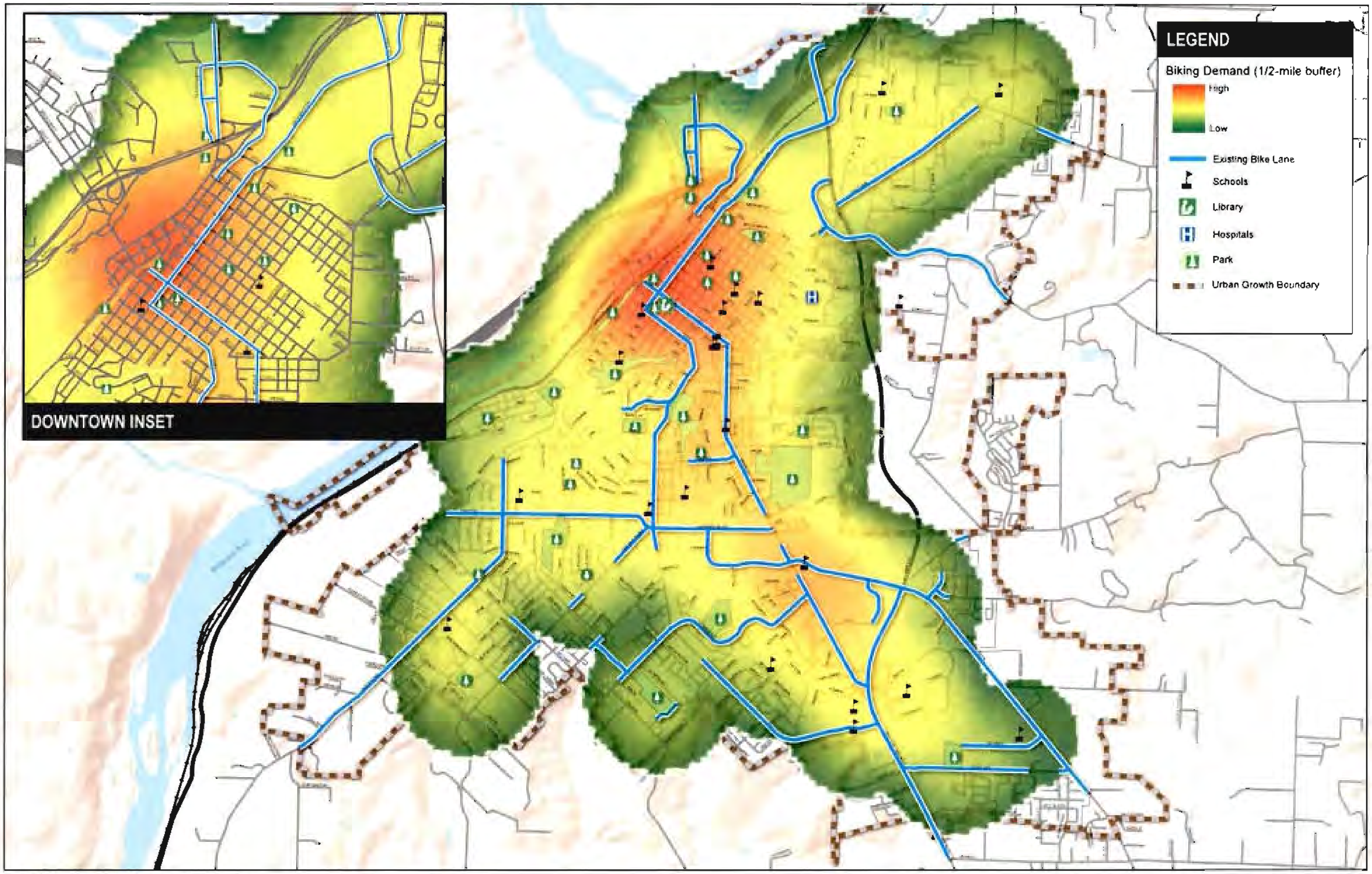

FIGURE 6: Bicycle Demand Analysis

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Date: February 2012
Author: Alta Planning + Design

Transit Needs

- **Lack of pedestrian crossings near bus stops:** The lack of pedestrian crossings near bus stops is most evident along Molalla Avenue, but is also true along other streets. Molalla Avenue is generally well-served by a sidewalk network, but generally lacks safe crossing opportunities for pedestrians. Figure 7 highlights those bus stops in Oregon City that do not have a marked crossing within 300 feet. Overall, 42% of Oregon City bus stops are not located within 300 feet of a marked crossing. The presence of a center turn lane along much of the Molalla Avenue corridor presents an opportunity to provide additional pedestrian refuge island crossings. Development of additional pedestrian crossings near bus stops should be done in consultation with TriMet, which has specific guidelines for the placement of bus stops in relation to crossings.

Additional transit stops with shelters would encourage more people to take transit.

- **Limited number of bus stops with shelters and other amenities:** Many bus stops in Oregon City consist of a simple pole indicating the bus route serving the stop. Seating that is sheltered from the weather is available at some stops. Given the rainy climate of the Pacific Northwest, route schedules on signs and additional sheltered bus stops would increase the comfort of existing riders and encourage others to take transit.

- **Transit service gaps and frequency:** The southwest and south portion of the City (including areas along South End Road, Central Point Road and Leland Road) is outside of a comfortable walking or biking trip to transit stops. In addition, the frequency of transit service to Clackamas Community College and to the Park Place neighborhood may need to be increased due to population growth.

- **Transit service in growth areas:** Areas of the City located in a major residential and/or employment growth area, including around Abernethy Road, Beavercreek Road, Maple Lane Road, Meyers Road, Redland Road and South End Road, should incorporate transit amenities and ensure pedestrian and bicycle connectivity in preparation for transit service.

- **Future high capacity transit service:** Prepare the pedestrian and bicycle network to integrate with potential future high capacity transit. Metro has identified several near phase regional priority corridors[4] for high capacity transit, three of which would connect to

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[4] Near phase priority corridors are corridors where future high capacity transit investments may be viable if recommended planning and policy actions are implemented.

Oregon City. One of the potential routes would extend the MAX green line along I-205, from the Clackamas Town Center to Washington Square Transit Center (with a stop in Oregon City). Another option would extend the MAX green line from the Clackamas Town Center to Oregon City. The last option would extend the Milwaukie MAX line along OR 99E to Oregon City.

Transit priority locations were identified to determine potential investments in the network that would enhance access to bus stops. Figure 7 shows the location of bus stops in Oregon City as well as the relative number of daily boardings to indicate the most frequently used stops. The figure also includes a ¼ mile buffer around each stop to indicate the areas of the City within comfortable walking distance to existing bus stops. As shown, many Oregon City residents live greater than ¼ mile walking distance from a bus stop. While biking can increase access to transit for people living in neighborhoods distant from bus stops, gaps in the existing bicycle network and a lack of bicycle parking near stops limits the attractiveness of biking to transit.

The availability of safe roadway crossing opportunities is another factor that could limit access to transit. The existing bus stops in Oregon City are not always located near a marked pedestrian crossing. While high usage stops, shown in Figure 7, are generally located close to a pedestrian crossing, other less frequently used bus stops throughout the City would benefit from crossings and would increase the general pedestrian friendliness of the streets.

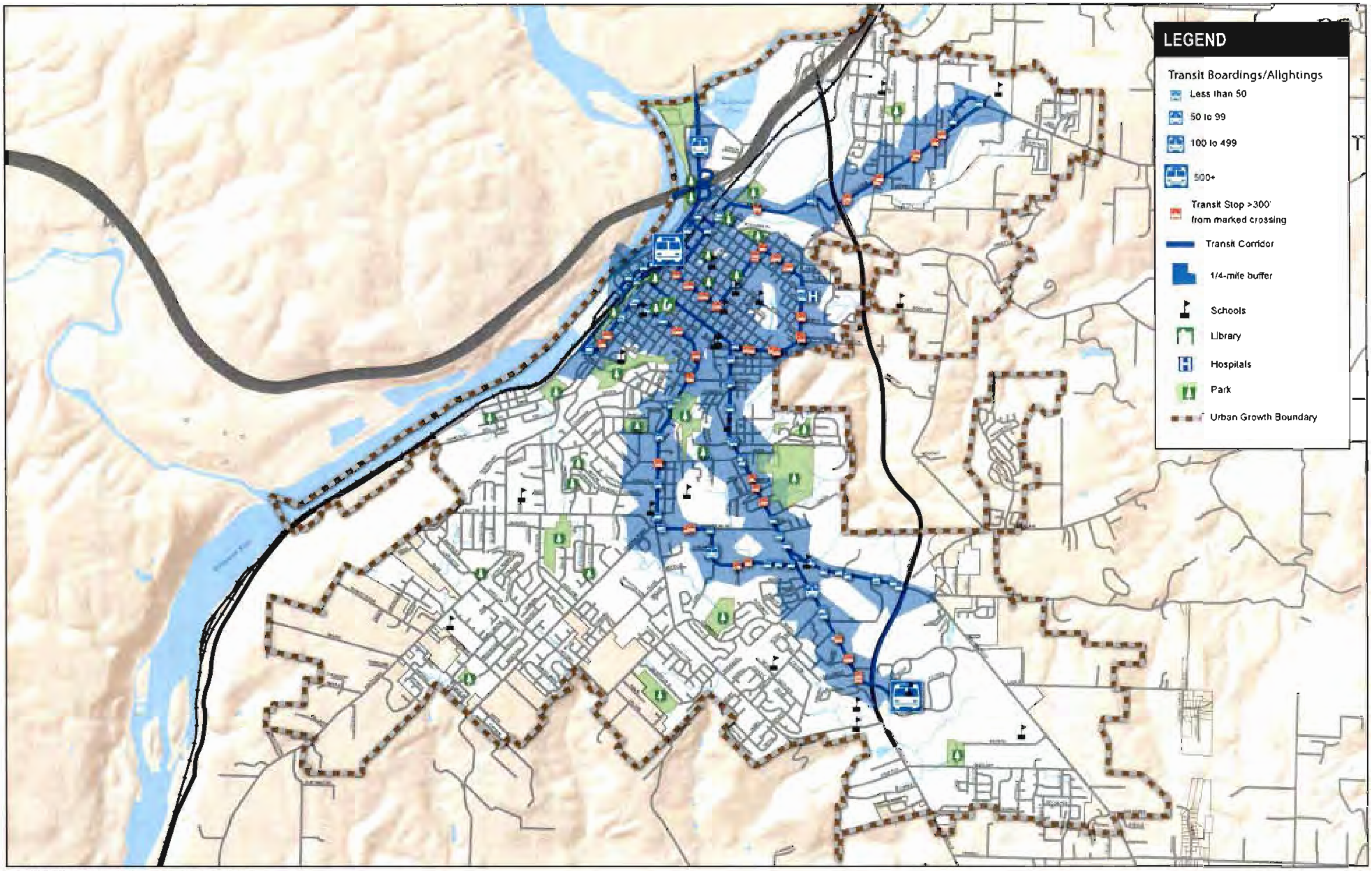

FIGURE 7: Transit Priority Locations

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Author: Alta Planning + Design

Driving Needs

Intersection capacity deficiencies (see Appendix for more detail) are expected at several intersections by 2035 (see Figure 8), including:

- OR 99E/I-205 WB Ramps
- OR 99E/I-205 EB Ramps
- OR 213/Beavercreek Road
- High Street/2nd Street
- South End Road/Warner Parrott Road
- Maple Lane Road/Beavercreek Road
- Main Street/14th Street
- Washington Street/12th Street
- South End Road/Lafayette Avenue-Partlow Road
- Central Point Road/Warner Parrott Road
- Maple Lane Road/Thayer Road
- Maple Lane Road/Walnut Grove Way

Street capacity deficiencies are expected by 2035 along portions of the following streets (see Figure 8):

- I-205
- OR 99E
- OR 43 (Oregon City-West Linn Bridge)
- OR 213
- Redland Road

Street Connectivity Needs

The Metro Regional Transportation Functional Plan requires that, to the extent possible, arterials be spaced at one-mile intervals, collectors to be spaced at half-mile intervals, and local streets either be spaced at 530 feet (or 1/10 of a mile) intervals, or provide a pedestrian and bicycle connection every 330 feet if a full local street connection is not possible.[5] Overall, most areas in Oregon City comply with the spacing standards to the extent possible, although several gaps were identified (see Figure 8). Existing development, topography, environmental areas, the Urban Growth Boundary (UGB) and OR 213 each pose a significant constraint in further improving connectivity in Oregon City.

Arterial Connectivity gaps were identified in the following areas:

1. An east to west gap between OR 99E and South End Road.
2. An east to west gap between South End Road and OR 213 (near the south City limits).

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[5] Metro Regional Transportation Functional Plan, Section 3.08.110 Street System Design Requirements

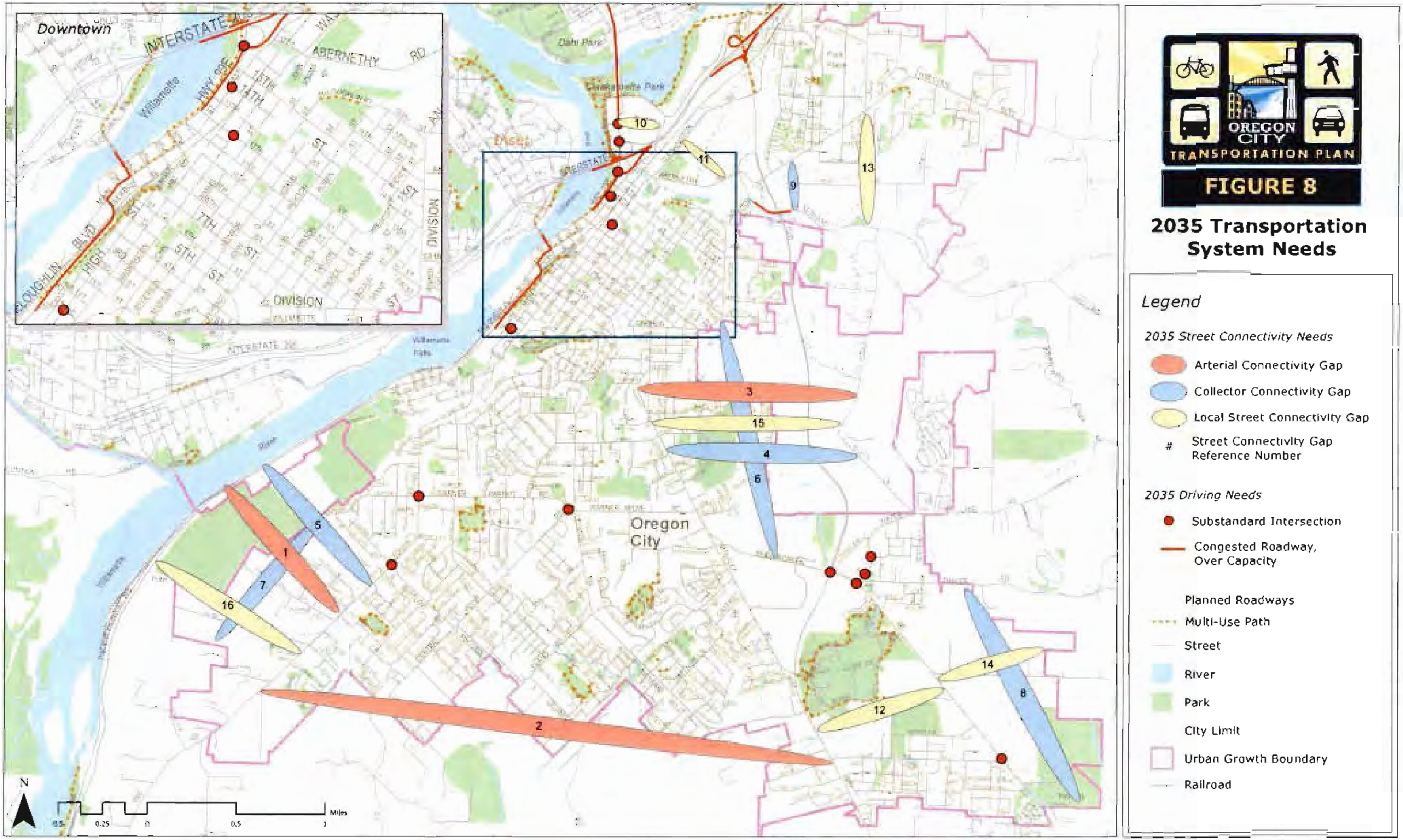
3. An east to west gap between Molalla Avenue and Holly Lane, south of Redland Road and north of Maple Lane Road.

Collector Connectivity gaps were identified in the following areas:

4. An east to west gap between Molalla Avenue and Holly Lane, south of Redland Road and north of Maple Lane Road.
5. An east to west gap between OR 99E and South End Road.
6. A north to south gap between Division Street and Beavercreek Road, west of OR 213.
7. North to south and east to west gaps to the west of South End Road.
8. North to south and east to west gaps, southeast of the Beavercreek Road/ Maple Lane Road intersection.
9. North to south gap between Holcomb Boulevard and Redland Road.

Local Street Connectivity gaps were identified in the following areas:

10. North to south and east to west gaps between OR 99E and Main Street, north of I-205.
11. North to south and east to west gaps between Washington Street and Abernethy Road.
12. North to south and east to west gaps between OR 213 and Beavercreek Road, north of Glen Oak Road.
13. North to south and east to west gaps between Holcomb Boulevard and Redland Road.
14. North to south and east to west gaps, southeast of the Beavercreek Road/ Maple Lane Road intersection.
15. East and west connectivity across OR 213 between Redland Road and Beavercreek Road.
16. East to west and north to south connectivity between OR 99E (south of the Canemah neighborhood) and the South End neighborhood.



OREGON CITY
TRANSPORTATION PLAN
FIGURE 8
2035 Transportation System Needs
Legend
2035 Street Connectivity Needs
Arterial Connectivity Gap
Collector Connectivity Gap
Local Street Connectivity Gap
Street Connectivity Gap Reference Number
2035 Driving Needs
Substandard Intersection
Congested Roadway, Over Capacity
Planned Roadways
Multi-Use Path
Street
River
Park
City Limit
Urban Growth Boundary
Railroad
Downtown
Oregon City
Miles

Mobility Corridor Needs

The Metro Regional Transportation Plan identified needs along the Metro Mobility Corridors, including Tualatin/Oregon City (Mobility Corridor #7), Oregon City/Gateway (Mobility Corridor #8), and Oregon City/Willamette Valley (Mobility Corridor #14).

Near-term (1-4 years) Needs

- System and demand management along mobility corridor and parallel facilities for all modes of travel (Mobility Corridor #7, 8, and 14).
- Practical design solutions for bike and pedestrian connections to transit (Mobility Corridor #7).
- Practical design solutions for bikes/pedestrians for safety and to connect to transit (Mobility Corridor #8).
- Address arterial connectivity and crossings (Mobility Corridor #8, and 14).
- I-205/OR 213 Interchange (Mobility Corridor #14).
- Project development for regional trails, Oregon City Loop and Newell Canyon (Mobility Corridor #14).

Medium-term (5-10 years) Needs

- Complete gaps in the arterial network (Mobility Corridor #7, 8, and 14).
- Complete corridor refinement plan (Mobility Corridor #7 and 8).
- Develop congestion pricing methodologies for I-205 (Mobility Corridor #7 and 8).
- Develop plan and implement system expansion policy guidelines to connect Oregon City Regional Center with high capacity transit (Mobility Corridor #7 and 8).
- Identify funding solutions for alternative mode options (Mobility Corridor #7 and 8).
- Project development for regional infrastructure to serve Park Place and Beavercreek Road concept plan UGB expansion areas (Mobility Corridor #14).

Long-term (10-25 years) Needs

- Construct high capacity transit connection to Oregon City Regional Center (Mobility Corridor #7).
- Identify funding solutions for alternative mode options, including high capacity transit to Oregon City (Mobility Corridor #8).
- Construct regional trails and access in Newell Creek and Oregon City Loop (Mobility Corridor #14).

Safety Needs

The crash rates at two intersections (Main Street/14th Street and the OR 213/Beavercreek Road intersection) were identified as high collision locations. In addition, the OR 213/Caufield-Glen Oak Road and the Washington Street/12th Street intersections were identified as having above average collision rates.

The following locations were identified as a high collision roadway segments (top ten percent of state highways in Oregon). All of the following roadways are owned and maintained by ODOT:

- I-205 Northbound just past the on-ramp from OR 99E

  This high collision segment experiences an increase in traffic from the OR 99E on-ramp and is impacted by traffic exiting I-205 at OR 213. These factors could be contributing to the amount of collisions.

- OR 99E from one-tenth of a mile north of Dunes Drive to I-205

  This high collision segment includes two congested intersections (I-205 Westbound Ramps and Dunes Drive) and is often impacted by queues from the I-205 interchange.

- OR 99E from I-205 to 12th Street

  This high collision segment includes several signalized intersections and is often impacted by queues from the I-205 interchange. OR 99E was recently improved along this segment and may no longer be a high collision segment.

- OR 99E from 11th Street to 9th Street

  This high collision segment generally includes several accesses over a short distance which could be contributing to the amount of collisions. The section from 10th Street to 11th Street was recently improved and may no longer be a high collision segment.

- OR 99E from 6th Street to one-tenth of a mile south of Railroad Avenue

  This high collision segment generally includes several accesses over a short distance, a narrow tunnel and two curves which could be contributing to the amount of collisions.

- OR 213 from I-205 to one-tenth of a mile south of Clackamas River Drive

  This high collision segment will be mitigated with the jug handle under construction at the OR 213/Washington Street-Clackamas River Drive intersection. Washington Street will be extended to cross under OR 213 and connect to Clackamas River Drive.

- OR 213 surrounding the Beavercreek Road intersection

  This segment includes the high collision location at the OR 213/Beavercreek Road intersection exceeding the statewide average collision rate. This segment is located within the 55 mile per hour speed zone and expressway segment of OR 213 and is the first at-grade intersection south of Redland Road for over two miles.

- OR 213 surrounding the Molalla Avenue intersection

  This segment is located within the 55 mile per hour speed zone and expressway segment of OR 213. Congestion at surrounding intersections may be impacting this area.

- OR 213 surrounding the Meyers Road intersection

  This segment is located just south of the 55 mile per hour speed zone on OR 213. Queues in the southbound direction from the Caufield-Glen Oak Road intersection impact this intersection at times.

- OR 213 surrounding the Caufield-Glen Oak Road intersection

  This segment includes the high collision location at the OR 213/ Caufield-Glen Oak Road intersection that was just under the statewide average collision rate. This segment is located just south of the 55 mile per hour speed zone and the portion of OR 213 that narrows to one travel lane in each direction.

Freight Needs

A portion of the I-205 state freight route and portions of the OR 99E federal truck route are expected to be near capacity during the evening peak hour by 2035 (as dictated by the forecasted 2035 traffic volumes). In addition, some congestion is expected along the Metro identified freight connectors (or connections to major employment areas), including OR 213 and Beavercreek Road. The freight activity could increase along these streets through 2035, as they connect to the Metro designated employment land along OR 213, Beavercreek Road and Molalla Avenue.

Transportation System Management and Operations Needs

Performance of the existing transportation infrastructure could in improved through a combination of transportation system management (TSM) and transportation demand management (TDM) strategies and programs.

Transportation System Management (TSM): Oregon City has several regional roadway facilities that serve the City and neighboring communities (I-205, OR 213 and OR 99E). These roadways, along with parallel arterials including Washington Street, 7th Street-Molalla Avenue and Beavercreek Road could benefit from improved TSM infrastructure. Opportunities include:

- Expanding the communications infrastructure along streets or at intersections concurrent with capacity or other improvements (such as fiber optic cable).
- Updating coordinated time of day traffic signal control plans at intersections along OR 99E, OR 213, Molalla Avenue, Washington Street and Beavercreek Road.
- The Portland Regional TSMO Plan calls for Arterial Corridor Management (ACM) along OR 213, Beavercreek Road (south of OR 213), OR 213 (to Henrici Road), Washington Street and 7th Street in Oregon City. The project would improve operations by expanding traveler information and upgrading traffic signal equipment and timings.

- The Regional TSMO Plan also calls for ACM with adaptive signal timing along Molalla Avenue between 7th Street and OR 213 and Beavercreek Road between Molalla Avenue and OR 213. This ACM project would include signal systems that automatically adapt to current arterial roadway conditions.
- Improving access spacing along major roadways. An access inventory was conducted along several of the major roadways in Oregon City comparing the number of existing approaches (driveways and public streets) to applicable ODOT and City access spacing standards. Table A4 in the appendix shows the number of existing approaches for each of the street segments reviewed, and compares it to the approximate number of driveway or public street approaches that would be allowed to fully comply with access spacing standards. Several of the segments along OR 99E, OR 213, Beavercreek Road, Molalla Avenue, South End Road and Washington Street have more driveway and public street approaches than allowed to comply with the access spacing standards. While in some cases, no alternative access exists for adjacent properties, there may be areas where the access is modified to a "right-in/right-out" configuration to improve safety.

Transportation Demand Management: Opportunities to expand TDM measures in Oregon City includes:

- Improved parking management
- Improved street connectivity
- Investing in pedestrian/bicycle facilities
- Improved amenities and access for transit stops
- Encouraging and supporting technology for carpooling, cooperatives, etc.
- Modifying land uses to shorten travel distances between residences, employment, shopping, schools and recreation.

Air, Rail, Pipeline and Water Needs

There are no system investments needed for the air and pipeline through 2035. Through 2035, there is the potential for High Speed Passenger Rail, extending from Portland to Eugene, to run through Oregon City. The line would generally follow the existing Union Pacific Railroad tracks. Refer to the ODOT Rail Study for more information.[6] If the High Speed Rail line is selected by the region through Oregon City, a future study will likely determine needed rail investments to support it. However, since the railroad tracks are currently used by Amtrak, new development near the station on Washington Street should be linked with walking and biking facilities.

The Willamette Falls Locks, located just south of Downtown Oregon City on the west side of the Willamette River, should continue to provide a canal passage for boaters wishing to travel around Willamette Falls. In addition, the transient floating tie-up dock at Jon Storm Park along the Willamette River (just north of Downtown) allows boaters to dock and explore the City. The City

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[6] ODOT Rail Study: http://www.oregon.gov/ODOT/RAIL/docs/Rail_Study/2010RailStudyBook.pdf

should continue to invest in the maintenance of the dock to ensure it is available to residents and visitors.

Menu of Potential Solutions

A variety of potential improvements to address the needs of the transportation system through 2035 are displayed in Table 1. Green shading indicates potential solutions for improving walking, blue shading indicates potential solutions for improving biking, orange shading indicates potential solutions for improving transit and brown shading indicates potential solutions for improving driving in Oregon City.

Table 1: Menu of Potential Solutions for the Transportation System

Crosswalks High-visibility markings, often consisting of a"zebra" striping pattern, can be effective at locations with high pedestrian crossing volumes, near schools, and/or areas where motorist awareness of pedestrian crossings may be poor.	
Pedestrian Refuge Islands Refuge islands allow pedestrians to cross one segment of the street to a relatively safe location out of the travel lanes, and then continue across the next segment in a separate gap in traffic. A median refuge island allows the pedestrian to tackle each direction of traffic separately.	
Sidewalks and Sidewalk Infill Good sidewalks are continuous, accessible to everyone, provide adequate travel width and feel safe. Sidewalks can provide social spaces for people to interact and contribute to quality of place. Completing sidewalk gaps improves the connectivity of the pedestrian network.	

Curb Extensions Curb extensions reduce the pedestrian crossing distance and improve motorists' visibility of pedestrians waiting to cross the street. Curb extensions can also serve as good locations for bike parking, benches, public art, and other streetscape features.	
Rectangular Rapid Flashing Beacon The RRFB is designed encourage greater motorist compliance at crosswalks. The RRFB is a rectangular shaped lightbar with two high intensity LED lightheads that flash in a wig-wag flickering pattern. The lights are installed below the pedestrian crosswalk sign (located on each side of the road near the crosswalk button) and are activated when a pedestrian pushes the crosswalk button.	
Streetscape Improvements Streetscape improvements are features that enhance the pedestrian experience. These include public art, pocket parks, ornamental lighting, gateway features and street furniture. Many of these improvements can easily integrate environmentally- friendly "green" elements.	

Pedestrian Countdown Signals

Countdown signals display the number of seconds remaining for a pedestrian to complete a crossing, enabling users to make their own judgment whether to cross or wait. The allotted time can be adjusted to accommodate slower pedestrians, such as seniors or children.

Curb Ramp Retrofits

Retrofitting ADA-compliant curb ramps to existing sidewalks greatly improves mobility and accessibility for mobility-impaired users. Curb ramps also improve the walking environment for pedestrians with strollers, delivery carts, and other "wheel" devices.

Bike Lanes

Designated exclusively for bicycle travel, bike lanes are separated from vehicle travel lanes with striping and also include pavement stencils.

Bike Box

A bike box is a designated area at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase.

Bike Box for Left-turns at Signalized Intersections

A bike box for left turns (otherwise known as a Copenhagen Left) allows bicyclists to make left-turns at intersections without having to veer across traffic. A bicyclist turns left by traveling through the intersection in the direction they are heading, and then waiting in the designated left-turn box before proceeding across the street on a green light.

Share the Road Signage

'Share the Road' signage can be used to raise awareness and legitimize the presence of bicycles on the roadways.

Shared Lane Marking

Shared-lane markings or "sharrows" are designed to inform motorists to expect cyclists to be in the middle of the travel lane, and to inform cyclists that they should be in the travel lane and away from parked cars. An uphill bike lane and downhill shared lane markings can be used on hilly routes that do not have room to accommodate bike lanes in both directions.

Bicycle Boulevard/Neighborhood Greenway

Traffic calming can be used to optimize neighborhood streets for bicycle and pedestrian travel. Intersection improvements can be made to assist bicyclists at difficult roadway crossings

Shared-use paths

Shared-use paths can provide a desirable facility particularly for novice riders, recreational trips, and cyclists of all skill levels preferring separation from traffic. Facilities may be constructed adjacent to roads, through parks, or along linear corridors such as active or abandoned railroad lines or waterways.

Wayfinding Signage and Pavement Markings

Directional signage indicating locations of destinations and travel time/distance to those destinations increases users' comfort and accessibility to the pedestrian and bicycle systems. Pavement markings can be used on bicycle boulevards, which are low-traffic bike routes without bike lanes.

Colored Bike Lanes

Colored bike lanes are used in areas where automobiles and bicycles cross paths and it is not clear who has the right-of-way. Colored bike lanes and accompanying signs assign priority to the bicyclist.

Bicycle Detection at Signalized Intersections

Bicycle-activated loop detectors are installed within the roadway to allow the presence of a bicycle to trigger a change in the traffic signal. Detectors that are sensitive enough to detect bicycles should have pavement markings to instruct cyclists how to trip them.

Bicycle Parking

Short-term parking: parking meant to accommodate visitors, customers and others expected to depart within two hours; requires approved standard rack, appropriate location and placement, and weather protection.

Long-term parking: parking meant to accommodate employees, students, residents, commuters, and others expected to park more than two hours. This parking should be provided in a secure, weather-protected manner and location.

Transit Stop Enhancements

Provision of passenger amenities at bus stops creates a more pleasant and attractive environment for bus riders and may encourage people to use the transit system. Common amenities include: shelters, benches, trash cans, and bus route information.

Shelters should be placed at least 2 feet from the curb when facing away from the street and at least 4 feet away when facing toward it. The adjacent sidewalk must still have a 5-foot clear passage. Orientation of the shelter should consider prevailing winter winds.

Construct Bus Pullouts

Bus pullouts allow transit vehicles to pick up and drop off passengers in an area outside the traveled way and are generally provided on high-volume and/ or high-speed roadways. They are frequently constructed at bus stops with

a high number of passenger boardings such as large shopping centers and office buildings. By removing stopped buses from travel lanes, delay to traffic is considerably reduced and safety is enhanced by removing an obstruction from the traveled way. They also help better define bus stop locations, can be used for bus layovers, and create a more relaxed environment for loading and unloading.	
Move Bus Stops to Far Side of Signalized Intersections On multi-lane streets or streets with wide shoulders where motor vehicles may pass uncontrolled around a stopped bus, bus stops located on the far side of intersections are preferred to provide needed sight distance. At signalized intersections, bus stops may be located on either the near side or far side of the intersection. However, in locations where bus pullouts are desired, far-side stops should be used. In general, far-side bus stops are desired because they reduce conflicts with right turning vehicles, encourage pedestrians to cross behind the bus, minimize the area needed for curbside bus zones, make it easier for buses to reenter traffic at signalized intersections, and have fewer impacts on roadway capacity. However, far-side stops also require passengers to access the bus further from the crosswalks, may interfere with right turns from the side street, and where pullouts are not used, can result in blockages of an intersection.	
Construct Turn Lanes to separate Turning Vehicles from Through Traffic The provision of turn lanes (left or right) removes slowing or stopped vehicles attempting to turn off of a roadway from faster moving through traffic. This not only provides significant safety benefits, but also enhances system capacity.	

Modernization to meet Design Standards The modernization of a roadway generally refers to upgrading elements to meet current design standards and capacity needs. Outdated roadway designs may not be serving present day demands due to insufficient number and width of lanes, poor geometry, or failure to accommodate a particular mode of travel (e.g., no bike lanes).	
Intersection or Roadway Capacity Enhancements Capacity improvements may include roadway widening, intersection control modification (such as installation of a roundabout), or other capacity enhancements.	
Modify Intersection Approach Geometry When the configuration of through and turn lanes at intersection approaches does not properly reflect the demand for these movements, the right of way at signalized intersections cannot be efficiently utilized. Also, poor alignment of opposing lanes or mismatched left turn treatments often require signal phasing that may not be the most effective option for maximizing through capacity. By reconfiguring the number and type of lanes approaching a signalized intersection, significant improvements in capacity can be achieved.	

Signal Timing Enhancements

The assignment of right of way to competing movements at an intersection plays a critical role in the overall capacity of that intersection and the roadway itself. Old signal timing plans may not be appropriately serving current demands or may not be designed to accommodate fluctuating demands throughout the day or week. Also, timing plans can be created based on specific priorities, such as giving preference to the mainline during peak travel periods. In some situations, signal timing may be adequate, but adjacent signals are not equipped to communicate with each other or are too close together to coordinate properly.

Intelligent Transportation Systems (ITS)

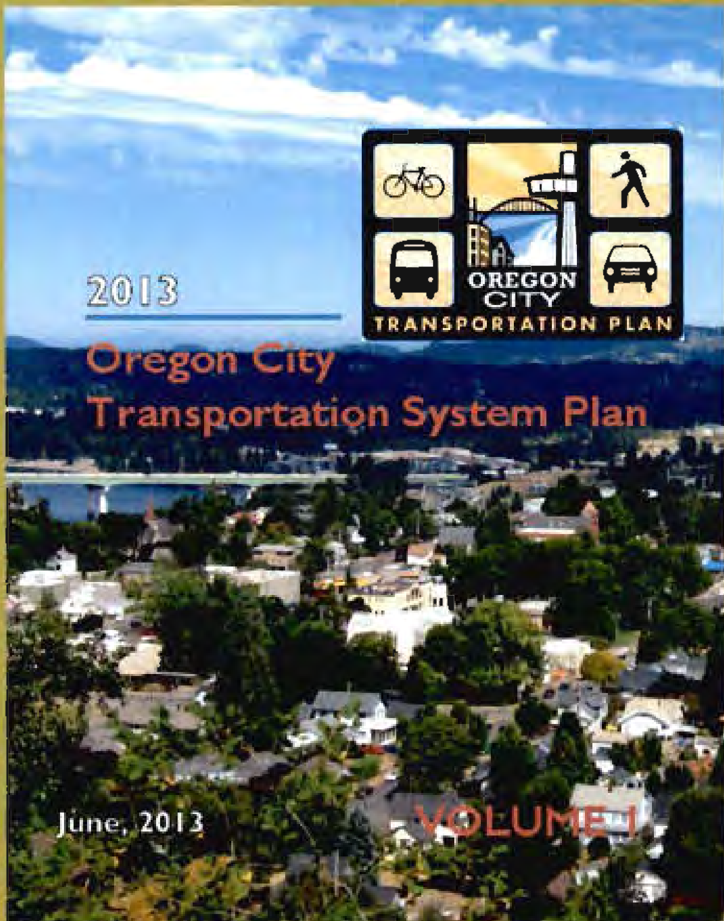
Intelligent Transportation Systems (ITS) come in many forms and have numerous applications. In general, they include any number of ways of collecting and conveying information regarding roadway operations to agency staff managing the facility or even to motorists. This can allow both operators and motorists to make informed decisions based on real-time information, leading to quicker responses to incidents, diversion away from congestion, and increased efficiencies in roadway operation.

Restriction of Left Turns at Traffic Signals

Because left turn and through movements are often competing for limited right of way, the removal of left turns from an intersection, either completely or during a specific time of day, can significantly improve through traffic capacity.

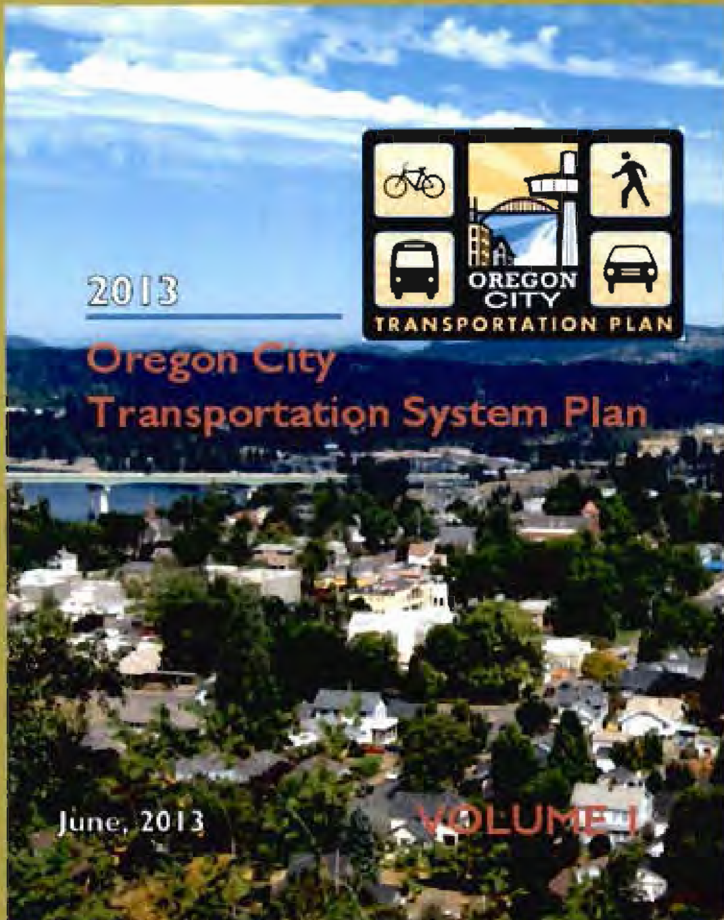
Restrict Turning Movements at Approaches

The number of conflict points on a roadway introduced by a particular approach can be significantly reduced by restricting turn movements, such as allowing only right-in and right-out movements, allowing only right-in movements, or prohibiting



Transportation System Plan and Municipal Code Amendments effective on August 16, 2013

An updated Transportation System Plan (TSP) and associated amendments to the Oregon City Municipal Code (OCMC) have been approved by the City Commission and are effective August 16, 2013. View the documents at **www.orcity.org.**



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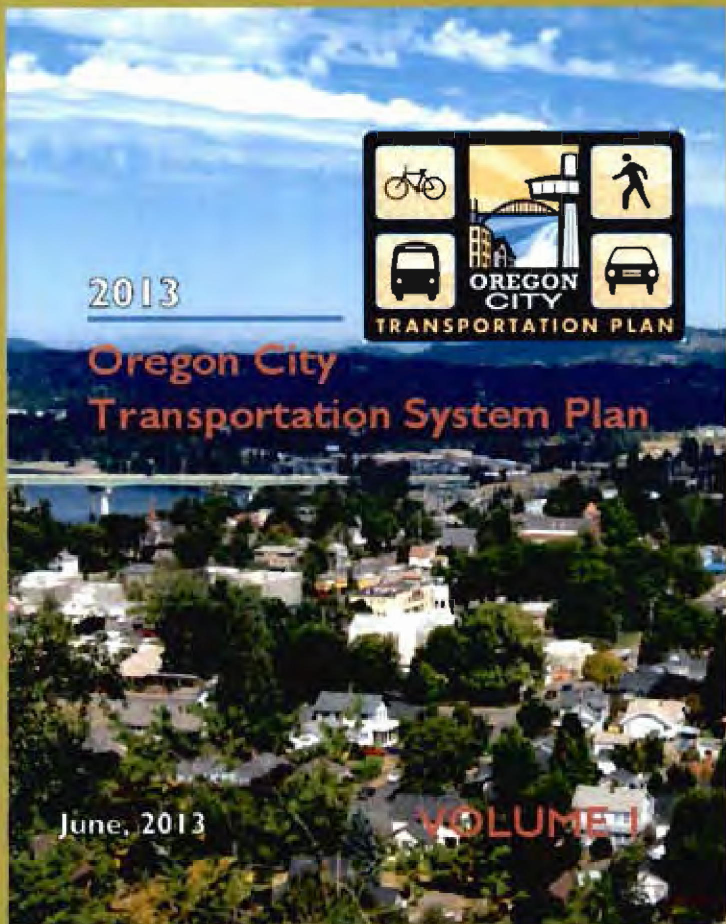

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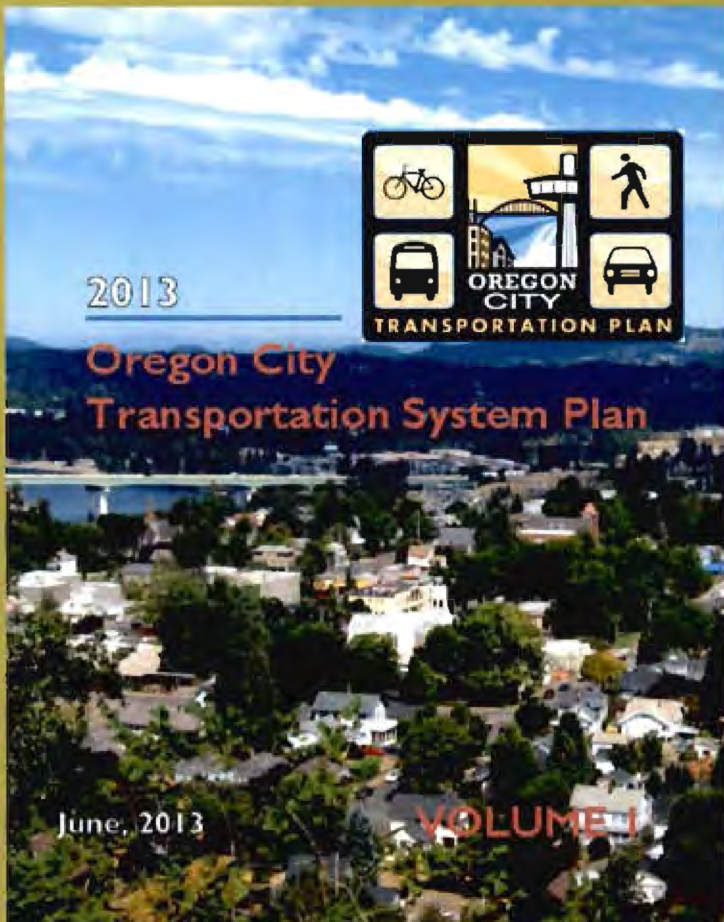
OREGON CITY



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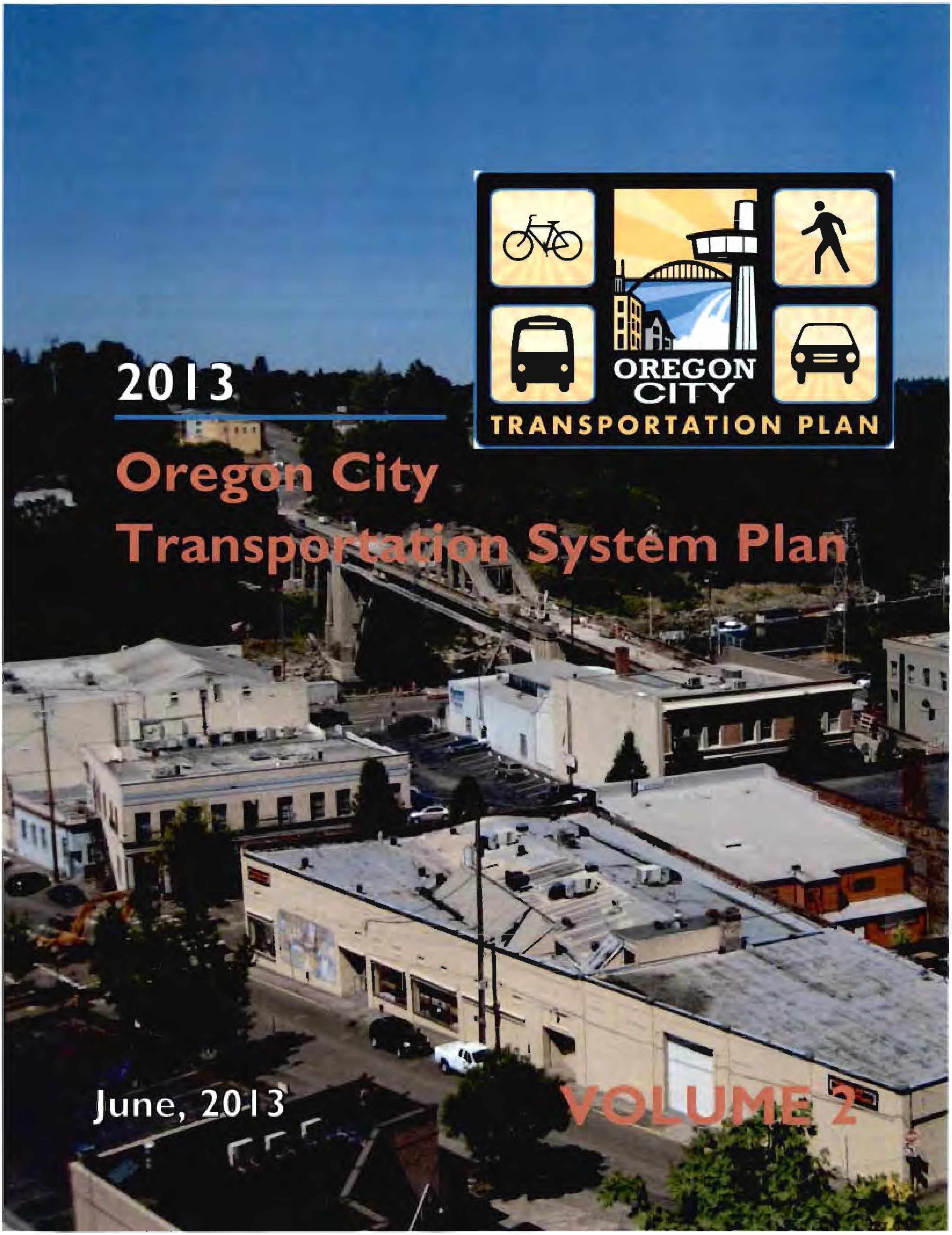

OREGON CITY
TRANSPORTATION PLAN

2013

Oregon City Transportation System Plan

June, 2013

VOLUME 2

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- **Technical Advisory Team**

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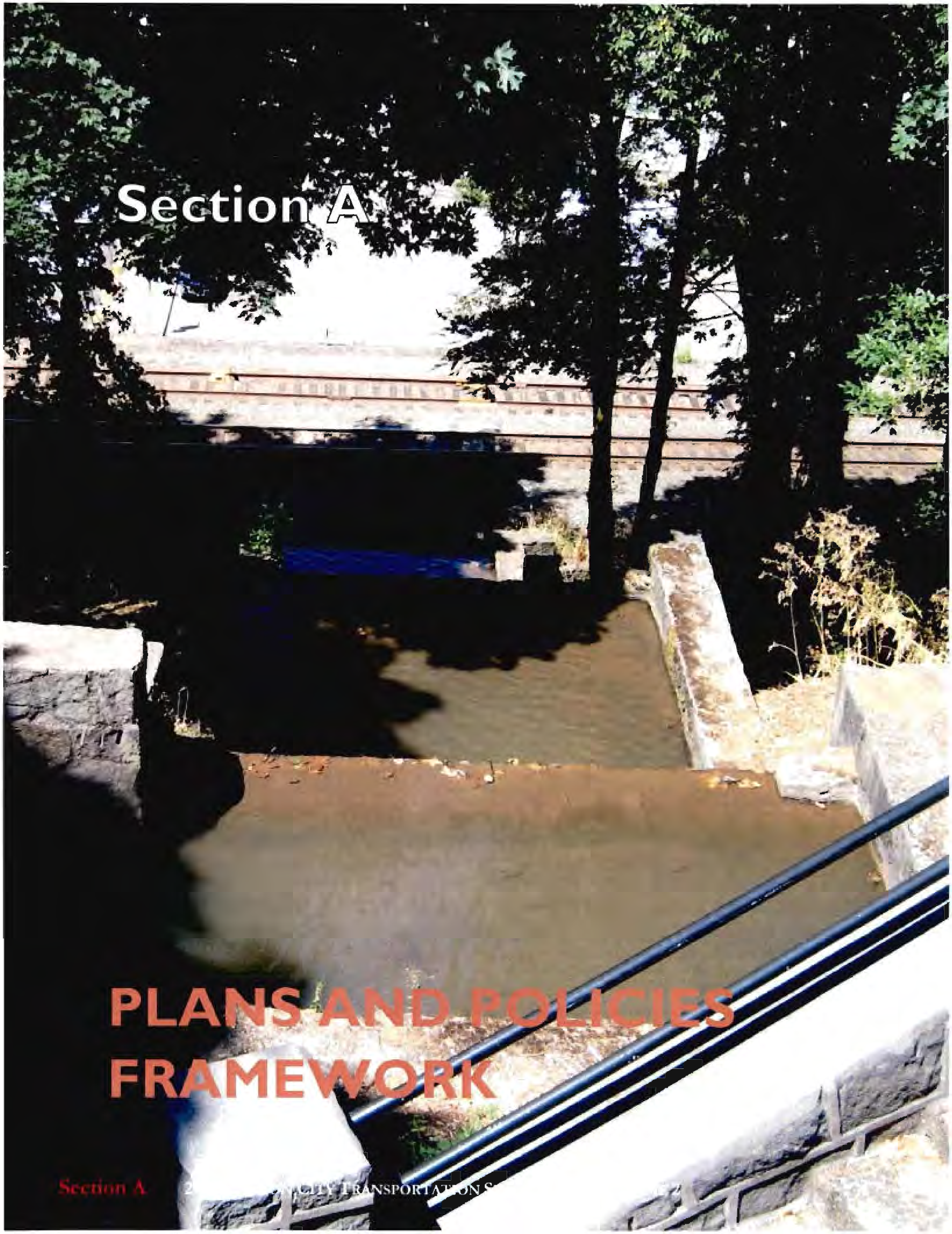
The contents of this document do not necessarily reflect views or policies of the State of Oregon.

Contents

Section A



PLANS AND POLICIES FRAMEWORK

This memorandum summarizes the planning documents, policies, and regulations that are applicable to the 2012 Oregon City Transportation System Plan (TSP) update (see Appendix A for a complete list). The City's current TSP will serve as the foundation for the update process, upon which new information obtained from system analysis and stakeholder input will be applied to address changing transportation needs through the year 2035. As new strategies for addressing transportation needs are proposed, compliance and coordination with the plans, policies, and regulations described in this document will be required.

Transportation System Planning in Oregon

Transportation System Planning in Oregon is required by state law as one of the 19 statewide planning goals[1] (Goal 12- Transportation). The Transportation Planning Rule (TPR), OAR 660-012[2], defines how to implement State Planning Goal 12. Specifically, the TPR requires:

- The state to prepare a TSP, referred to as the Oregon Transportation Plan (OTP);
- Metropolitan planning organizations (MPOs) to prepare a Regional Transportation Plan (RTP) that is consistent with the OTP (the Metro RTP[3] applies to Oregon City); and
- Counties and cities to prepare local TSPs that are consistent with the OTP and RTP.

The TPR directs TSPs to integrate comprehensive plan land use with transportation needs and to promote systems that serve statewide, regional and local transportation needs. These requirements aim to improve community livability by encouraging land use patterns and transportation systems that make it more convenient for people to walk, bicycle, use transit and drive less to meet their daily needs.

As the guiding document for regional and local TSPs, the OTP[4] establishes goals, policies, strategies and initiatives that address the core challenges and opportunities facing transportation in Oregon. These are further implemented with the Oregon Highway Plan (OHP)[5] and the RTP, which is adopted to meet Federal requirements.

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1 Statewide Planning Goals: http://www.oregon.gov/LCD/goals.shtml

2 Transportation Planning Rule: http://arcweb.sos.state.or.us/rules/OARS_600/OAR_660/660_012.html

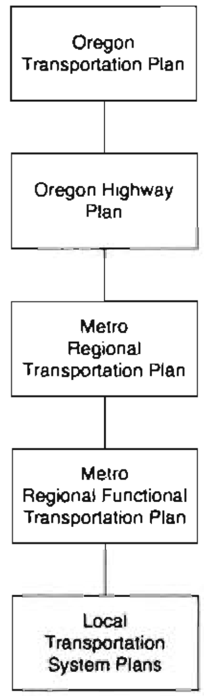
3 Metro Regional Transportation Plan: http://www.oregonmetro.gov/index.cfm/go/by.web/id=25038

4 Oregon Transportation Plan: http://www.oregon.gov/ODOT/TD/TP/ortransplanupdate.shtml

5 Oregon Highway Plan: http://www.oregon.gov/ODOT/TD/TP/orhwyplan.shtml

Why does Oregon City need an Updated TSP?

The City's current TSP was adopted in 2001. Since then new requirements have been integrated into the OTP, OHP and Metro RTP, many key transportation projects have been completed, the local Urban Growth Boundary and Urban Reserve areas have changed, and the City's Comprehensive Plan and Municipal Code was updated. The last 10 years of regulatory, land use and transportation system changes will be considered in this TSP update.



ODOT's Transportation System Plan Guidelines[6] direct TSP updates to address recent policy and regulatory changes, and calls out recent changes to the OTP, OHP, TPR, and federal changes implemented into the RTP. Since adoption of the 2001 Oregon City TSP, the OTP was updated (2006) to emphasize maintaining assets in place, optimizing existing system performance through technology and better system integration, creating sustainable funding, and investing in strategic capacity enhancements. Policy 1F (Mobility Standards) of the OHP was amended to allow for the adoption of alternative mobility standards where "practical difficulties make conformance with the highway mobility standards infeasible." Appendix C of the OHP (Access Management Spacing Standards) was also modified to be consistent with amendments to the Access Management Rule, OAR 734-051.

Metro's Regional Transportation Functional Plan[7] **(RTFP)** directs how Oregon City should implement the RTP through the TSP and other land use regulations. The RTFP codifies existing and new requirements which local plans must comply with to be consistent with the RTP. If a TSP is consistent with the RTFP, Metro will find it to be consistent with the RTP.

The RTFP provides guidance on several areas including transportation design for various modal facilities, system plans, regional parking management plans and amendments to comprehensive plans. The following directives specifically pertain to updating local TSPs:

- Include regional and state transportation needs identified in the 2035 RTP along with local needs
- Local needs must be consistent with RTP in terms of land use, system maps and non-SOV modal targets
- When developing solutions, local jurisdictions shall consider a variety of strategies, in the following order:
    - TSMO (Transportation System Management Operations)
    - Transit, bicycle and pedestrian projects
    - Traffic calming

[6] ODOT Transportation System Plan Guidelines: http://www.oregon.gov/ODOT/TD/TP/TSP.shtml
[7] Metro Regional Transportation Functional Plan: http://www.oregonmetro.gov/index.cfm/go/by.web/id=274

  - Land use strategies in OAR 660-012-0035(2)[8]
  - Connectivity, including pedestrian and bicycle facilities
  - Motor vehicle capacity projects
- Local jurisdictions can propose regional projects as part of RTP process
- Local jurisdictions can propose alternate performance and mobility standards, however, changes must be consistent with regional and statewide planning goals
- Local parking regulations shall be consistent with the RTFP

[8] This section of the Transportation Planning Rule requires Metro area jurisdictions to evaluate land use designations, densities, and design standards to meet local and regional transportation needs.

How is the Transportation System Defined?

The following sections summarize the state highway classifications and land use designations for areas of Oregon City derived from these regulatory documents. This information ultimately determines the adopted standards and regulations that apply to state highways in Oregon City.

ODOT Classifications for State Highways in Oregon City

OHP Policy 1A (State Highway Classification System) categorizes state highways for planning and management decisions. Within Oregon City, state highways are classified as Interstate Highway, Regional Highway, District Highway, or Expressway (see summary at the end of this section).

Special Designations: OHP Policy 1B identifies special highway segment designations for specific types of land use patterns to foster compact development on state highways in which the need for appropriate local access outweighs the considerations of highway mobility. Within Oregon City, portions of OR 99E and OR 43 have Special Transportation Area (STA) designations.

State Highway Freight System: OHP Policy 1C addresses the need to balance the movement of goods and services with other uses. It states that the timeliness of freight movements should be considered when developing and implementing plans and projects on freight routes. Within Oregon City, I-205 and OR 99E are classified as Federal Truck Routes, while I-205 is also classified as an Oregon Freight Route.

Updates to the TSP will support the existing highway classifications and will enhance the ability of the highways in Oregon City to serve in their defined functions. The following summarizes the classifications of state highways in Oregon City:

- I-205 (East Portland Freeway, No. 64) is classified as an Interstate Highway, part of the National Highway System (NHS), a Freight Route, and a Truck Route.
- OR 99E (Pacific Highway East, No. 81) is classified as a District Highway and a Truck Route from the north City limits (at the Clackamas River) to I-205. From I-205 to the south City limits it is classified as a Regional Highway and a Truck Route. It also has a STA designation from 14th Street to Railroad Avenue.
- OR 213 (Cascade Highway South, No. 160) is classified as a District Highway. From I-205 to Molalla Avenue it also has an Expressway and Bypass designation.
- OR 43 (Oswego Highway, No. 03) is classified as a District Highway, and has a Special Transportation Area (STA) designation from the Oregon City-West Linn Bridge to OR 99E.

Metro Land Use Designations for Oregon City

Metro's 2040 Growth Concept[9] in the RTP applies land use designations to the Portland region. The 2040 Growth Concept is the region's long range plan for managing growth by integrating land use and transportation. The concept concentrates mixed use and higher density development in areas of the region designated as "Centers", "Station Communities", and "Main Streets". The 2040 Growth Concept land uses are arranged in a hierarchy, with the primary and secondary land uses, referred to as 2040 Target Areas, as the focus of RTP investments. The hierarchy also serves as a framework for prioritizing RTP investments.

Primary land uses in Oregon City include:

- The "Oregon City Regional Center" which generally includes the area bounded by the Clackamas River to the north, 7th Street to the south, Washington Street to the east and the Willamette River to the west. In addition, the downtown core of Oregon City, or roughly the area between the Willamette River and Railroad Avenue, from 7th Street to Tumwater Drive, and the area east of Washington Street and north of Abernethy Road to OR 213 is also included in the Regional Center.

Secondary land uses in Oregon City include:

- The "7th Street and Molalla Avenue Corridor" from Washington Street to OR 213
- The "OR 99E Corridor" from Railroad Avenue to around 3rd Avenue (including the Canemah neighborhood)
- The "Employment Land" in the southeast portion of Oregon City, generally bounded by Beavercreek Road to the north and east, Glen Oak Road to the south, and Molalla Avenue/OR 213 to the west

The remaining areas of Oregon City are designated as Neighborhood land uses. These areas have the lowest priority for RTP investments.

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[9] Metro 2040 Growth Concept: http://www.oregonmetro.gov/index.cfm/go/by.web/id=29882

Figure 1: Metro Land Use Designations in Oregon City

How is the Transportation System Managed?

State Highway Mobility Standards: OHP Policy 1F sets mobility standards for ensuring a reliable and acceptable level of mobility on the highway system. The following mobility standards are applicable to state highways in Oregon City (pursuant to Policy 1F, Table 7):

- State highways in **Regional Centers** (including portions of OR 99E, OR 213, and OR 43) have a mobility standard requiring that the highway operate at or below a volume to capacity (v/c) ratio of 1.1 during the peak first hour, and 0.99 during the peak second hour.
- All other state highways in Oregon City (including those through Corridor, Employment, or Neighborhood land use areas) have a mobility standard requiring that the highway operate at or below a volume to capacity (v/c) ratio of 0.99 during the peak first and second hours.

City and County Mobility Standards: The City of Oregon City Transportation System Plan (TSP)[10] identifies LOS D as the minimum performance standard for both signalized and unsignalized intersections under Oregon City jurisdiction. In addition, the transportation element of the Clackamas County Comprehensive Plan[11] requires a Level-of-Service "D" as the minimum acceptable performance standard for signalized and unsignalized intersections on arterial and collector roadways under Clackamas County jurisdiction. The traditional approach to mobility standards will likely be adjusted in response to many evolving conditions such as transportation funding for projects, economic viability, livability, and funding priorities.

Access Management on State Highways: The Oregon Access Management Rule[12] (OAR 734-051) attempts to balance the safety and mobility needs of travelers along state highways with the access needs of property and business owners. ODOT's rule sets guidelines for managing access to the state's highway facilities in order to maintain highway function, operations, safety, and the preservation of public investment consistent with the policies of the 1999 OHP. Access management rules allow ODOT to control the issuing of permits for access to state highways, state highway rights of way and other properties under the State's jurisdiction

In addition, the ability to close existing approaches, set spacing standards and establish a formal appeals process in relation to access issues is identified. These rules enable the State to set policy and direct location and spacing of intersections and approaches on state highways, ensuring the relevance of the functional classification system and preserving the efficient operation of state routes.

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[10] Oregon City TSP, p.2-56, Adopted April 2001.

[11] Clackamas County Comprehensive Plan, Chapter 5- Transportation

[12] Access Management Rule: http://arcweb.sos.state.or.us/rules/OARS_700/OAR_734/734_051.html

OHP Policy 3A sets access spacing standards for driveways and approaches to the state highway system.[13] The standards are based on state highway classification and differ based on posted speed.

Access Management on Local Roadways: The Oregon City TSP identified minimum intersection spacing standards for public roadways under Oregon City jurisdiction. Access spacing guidelines from the TSP are shown in Table 1.

Table 1: Minimum Oregon City Intersection Spacing Standards

Functional Classification	Major Arterial	Minor Arterial	Collector	Neighborhood Collector	Local Street
Major Arterial	2 miles	1 mile	¼ mile	1,000 feet	500 feet
Minor Arterial	1 mile	½ mile	1,000 feet	800 feet	400 feet
Collector	¼ mile	1,000 feet	800 feet	600 feet	300 feet
Neighborhood Collector	1,000 feet	800 feet	600 feet	500 feet	200 feet
Local Street	500 feet	400 feet	300 feet	200 feet	150 feet

RTP Performance targets: The Metro RTP established new performance targets (see Table 2) for safety, congestion, freight reliability, climate change, active transportation, sidewalk/trail/transit infrastructure, clean air, travel, affordability, and access to daily needs. The performance targets are regional goals that Oregon City TSP should work toward achieving.

Table 2: 2035 RTP Performance Targets

Objective	Target by 2035
Safety	Reduce serious injuries and fatalities in all modes of travel by 50% (vs. 2005)
Congestion*	Reduce vehicle hours of delay (VHD) by 10% per person (vs. 2005)
Freight reliability	Reduce VHD per truck trip by 10% (vs. 2005)
Climate change	Reduce transportation greenhouse gas emissions by 40% (vs. 1990)
Active transportation	Triple walking, biking and transit mode share (vs. 2005)
Basic infrastructure	Increase by 50% access times to sidewalks, trails and transit (vs. 2005)
Clean air	Ensure 0% population exposure to at-risk levels of pollution
Travel	Reduce vehicle miles traveled per person by 10% (vs. 2005)
Affordability	Reduce average household combined cost of housing and transportation by 25% (vs. 2000)

[13] ODOT Access Management Standards (Appendix C): http://www.oregon.gov/ODOT/TD/TP/orhwyplan.shtml

Access to daily needs	Increase by 50% the number of essential destinations within 30 minutes by bike, transit for low-income, minority, disabled pop. (vs. 2005)

* Interim volume-to-capacity ratio (v/c) measures still apply

In addition to supporting the performance targets, the TSP will need to incorporate transportation system management and operations (TSMO) into planning. The following RTP policies provide the foundation for TSMO in the region:

- 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 and incent change

RTP Non-Single Occupancy Vehicle (SOV) Target: The RTP established regional mode share targets that are intended to be goals for cities and counties to work toward during implementation of the 2040 Growth Concept at the local level. Increases in walking, bicycling, ridesharing and transit mode shares will be used to demonstrate compliance with per capita travel reductions required by the state Transportation Planning Rule. The following modal targets apply to RTP land uses in Oregon City:

- Regional Centers and Corridors: Non-drive alone modal target of 45 to 55 percent
- Employment areas and Neighborhoods: Non-drive alone modal target of 40 to 45 percent

As required by the RTP and the TPR, jurisdictions within the Metro region must adopt policies and actions that encourage a shift towards non-SOV modes. The Metro Non-Single Occupancy Vehicle (SOV) Target Actions Study summarizes the required non-SOV strategy requirements for local jurisdictions to implement:

- Adopt 2040 modal targets in TSP policies
- Adopt street connectivity plans and implementing ordinances
- Adopt maximum parking ratios to implement the parking requirements of Title 2 of the Urban Growth Management Functional Plan
- Adopt transit strategies, including planning for adequate transit facilities and service; pedestrian facility planning and infrastructure that support transit use; location and design of buildings in transit zones that encourages transit use; and adoption of a transit system map, consistent with Metro requirements.

The Metro Non-Single Occupancy Vehicle (SOV) Target Actions Study recommends the following measures as additional strategies to be considered in the Oregon City TSP:

- Continue to require transportation-efficient development through efforts to meet density and other land use targets in centers and corridors as part of compliance with Metro Functional Plan and related requirements.
- Construct bicycle and pedestrian projects, consistent with state, federal and local government requirements. Local governments and Metro should prioritize projects that enhance connectivity of the bicycle and pedestrian system and access to transit.
- Continue to support TriMet and other transit agencies in providing frequent, reliable and comprehensive transit service, and local implementation of pedestrian and bicycle infrastructure to improve access to transit. Credit local jurisdictions with efforts to support transit agencies in these efforts.
- Support and encourage efforts to implement employer-based TDM strategies. Coordinate with employers even in areas where the formation of TMAs is not required.
- Encourage and assist in implementing parking cash-out programs or other techniques to eliminate employer subsidies for parking. Consider requiring local governments to eliminate free employee parking and provide informational materials and technical assistance to employers interested in implementing such programs.
- Support and coordinate Safe Routes to School programs and projects. Local jurisdictions and Metro should support and help coordinate these efforts through project funding and technical assistance.

Major Projects: OHP Policy 1G requires maintaining performance and improving safety by improving efficiency and management before adding capacity. The intent of policy 1G and Action 1G.2 is to ensure that major improvement projects to state highway facilities have been through a planning process that involves coordination between state, regional, and local stakeholders and the public, and that there is substantial support for the proposed improvement.

Off-System Projects: OHP Policy 2B establishes ODOT's interest in projects on local roads that maintain or improve safety and mobility performance on state roadways, and supports local jurisdictions in adopting land use and access management policies. The TSP will include sections describing existing and future land use patterns, access management, and implementation measures.

Traffic Safety: OHP Policy 2F identifies the need for projects in the state to improve safety for all users of the state highway system through engineering, education, enforcement, and emergency services. One component of the TSP is to identify existing crash patterns and rates and to develop strategies to address safety issues. Proposed projects will aim to reduce the vehicle crash potential and/or improve bicycle and pedestrian safety by providing upgraded facilities that meet current standards.

Alternative Passenger Modes: OHP Policy 4B, Action 4B.4 requires that highway projects encourage the use of alternative passenger modes to reduce local trips. The TSP will develop ways to support and increase the use of alternative passenger modes to reduce trips on highways and other facilities. This will include improvement to bicycle and pedestrian facilities and consideration of transit movement along roadways.

Projects on State Highways: The Highway Design Manual[14] (HDM) provides uniform standards and procedures for ODOT and is in general agreement with the 2001 American Association of State Highway and Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets.* Some key areas where guidance is provided are the location and design of new construction, major reconstruction, and resurfacing, restoration or rehabilitation (3R) projects. The HDM should be used for all projects on state highways in Oregon City to determine design requirements, including the maximum allowable volume to capacity ratios for use in the design of highway projects.

Other Background Information for the TSP Update

The following sections summarize additional background information or guidance documents that will be used in updating the Oregon City TSP.

Projects to be considered in Future Transportation Analysis

Several of the documents reviewed identified transportation improvement projects that will be considered in future transportation analysis in Oregon City. The projects include:

2010-2013 Statewide Transportation Improvement Program[15] (STIP) projects:

- Intersection projects on OR 213 at the Washington Street and Redland Road intersections
- Bike and pedestrian projects on Main Street between 5th Street and 10th Street
- Motor vehicle access, transit stop, bike lane, pedestrian crossing, and sidewalk projects on McLoughlin Boulevard between the Clackamas River bridge and Dunes Drive
- Construction of a jughandle intersection on OR 213 at Washington Street

Metro RTP: Projects were identified along Metro Mobility Corridors, including Tualatin/Oregon City (Mobility Corridor #7), Oregon City/Gateway (Mobility Corridor #8), and Oregon City/Willamette Valley (Mobility Corridor #14).

Near-term (1-4 years)

- System and demand management along mobility corridor and parallel facilities for all modes of travel (Mobility Corridor #7, 8, and 14).
- Practical design solutions for bike and pedestrian connections to transit (Mobility Corridor #7).

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[14] ODOT Highway Design Manual: http://www.oregon.gov/ODOT/HWY/ENGSERVICES/hwy_manuals.shtml

[15] ODOT STIP: http://www.oregon.gov/ODOT/HWY/STIP/

- Practical design solutions for bikes/pedestrians for safety and to connect to transit (Mobility Corridor #8).
- Address arterial connectivity and crossings (Mobility Corridor #8, and 14).
- I-205/OR 213 Interchange (Mobility Corridor #14).
- Project development for regional trails, Oregon City Loop and Newell Canyon (Mobility Corridor #14).

Medium-term (5-10 years)

- Complete gaps in the arterial network (Mobility Corridor #7, 8, and 14).
- Complete corridor refinement plan (Mobility Corridor #7 and 8).
- Develop congestion pricing methodologies for I-205 (Mobility Corridor #7 and 8).
- Develop plan and implement SEP to connect Oregon City Regional Center with high capacity transit (Mobility Corridor #7 and 8).
- Identify funding solutions for alternative mode options (Mobility Corridor #7 and 8).
- Project development for regional infrastructure to serve Park Place and Beavercreek Road concept plan UGB expansion areas (Mobility Corridor #14).

Long-term (10-25 years)

- Construct high capacity transit connection to Oregon City Regional Center (Mobility Corridor #7).
- Identify funding solutions for alternative mode options, including high capacity transit to Oregon City (Mobility Corridor #8).
- Construct regional trails and access in Newell Creek and Oregon City Loop (Mobility Corridor #14).

Metro Regional Trails and Greenways Plan[16]: This Plan recommended three regional trails through Oregon City.

- The Oregon City Loop Trail, creating a loop around the perimeter of Oregon City. The trail will cut through Newell Creek Canyon, connect to the Beaver Lake Trail, and skirt the southern edge of the city on its way back to the Willamette River across from its confluence with the Tualatin River.
- The Beaver Lake Trail which will begin at the End of the Oregon Trail Center in Oregon City and head south on the east side of Newell Creek Canyon and east to Beaver Lake.
- The Oregon Trail-Barlow Road Trail which will follow the pioneer wagon train route from the Cascades west to the End of the Oregon Trail Center in Oregon City.

[16] Metro Regional Trails and Greenways: http://www.oregonmetro.gov/index.cfm/go/by.web/id=595

TriMet Transit Investment Plan, TIP (2011)[17]: The TIP details the investments TriMet will make in the region to expand transit service. The following projects are applicable to Oregon City.

- Walkability assessment at Molalla Avenue / County Red Soils Campus for pedestrian obstacles and recommendations for any needed projects.
- Portland to Milwaukie Light Rail Project, which will connect downtown Portland to Milwaukie and connect to Frequent Service buses from the Oregon City Regional Center.
- A proposed Bus Rapid Transit (BRT) corridor following I-205 between Clackamas Town Center possibly stretching as far as Beaverton, with service to Oregon City, Tualatin, and Tigard.
- Frequent bus service line expansion to and from Oregon City, primarily around the Oregon City Transit Center.

Oregon City Capital Improvement Plan (2008): The Oregon City Capital Improvement Plan recommended various street modernization projects to comply with City standards, projects at several intersections, and several intersection or roadway capacity or operational projects.

Oregon City Trails Master Plan (2004): The Oregon City Trails Master Plan recommends seven regional trails, 25 community trails, and 34 local trails to be constructed over the next 25+ years.

Oregon City McLoughlin Boulevard Enhancement Plan (2005): The McLoughlin Boulevard Enhancement Plan illustrates motor vehicle, pedestrian and bicycle projects on OR 99E (McLoughlin Boulevard) from Railroad Avenue to the Clackamas River Bridge.

Oregon City Downtown Community Plan (1999): The Downtown Community Plan updated the comprehensive plan and zoning code and established a vision and implementing strategies for growth and improvement of the designated Metro Regional Center in the downtown Oregon City vicinity. The plan emphasizes the creation of pedestrian-friendly places, varied mixed use developments, new open space, and civic amenities. The plan had the following transportation recommendations:

- Widening of McLoughlin Boulevard near I-205
- Widening the I-205 southbound on-ramp
- Connecting 12th Street to McLoughlin Boulevard
- Modifying the Main Street/7th Street intersection
- Widening 14th Street
- Improving and signalizing several intersections

[17] TriMet Transit Improvement Plan: http://trimet.org/tip/index.htm

- Creating new linkages that improve local circulation in the landfill area near OR 213 and Washington Street
- Creating McLoughlin Boulevard and Washington Street as bicycle corridors
- Creating Main Street and Washington Street as primary pedestrian corridors
- Constructing the multi-purpose pathway from the Cove to downtown
- Preserving pedestrian facilities and completing missing links
- Enhancing local transit service to the study area and other parts of Oregon City
- Establishing a Transportation Management Association with assistance from Tri-Met.

Oregon City Downtown Circulation Plan and Parking Study (2010): The Downtown Circulation Plan recommended restoring two-way traffic to Main Street between 6th and 9th Streets, along 7th Street between Main and Railroad, and on Railroad Avenue between 6th and 7th Streets, maximizing curbside and off street parking, and opportunities for pedestrian and bike projects that connect the downtown and adjacent neighborhoods.

Actions or Strategies to be considered in Updating the TSP

Several of the documents reviewed identified transportation actions or strategies that will be considered in updated the Oregon City TSP. The actions or strategies include:

Oregon City Comprehensive Plan (2004): The Oregon City Comprehensive Plan ("Comprehensive Plan") is intended to meet the requirements of the Statewide Planning Goals and the regional Urban Growth Management Functional Plan and to guide the community's vision for the future growth and development of the city. The plan is founded on six principals: promote sustainability and sustainable development; contain urban development; promote redevelopment; protect natural resources; foster economic vitality; provide efficient and cost-effective services, and; ensure a sense of history and place. Comprehensive Plan goals and policies are organized under the same headings as the Statewide Planning Goals. Section 12, Transportation, includes background information and key policy points for the following long-range plans, considered "ancillary plans" to the Comprehensive Plan: Oregon City Transportation Plan (2001, to be updated with this planning project); Oregon City Downtown Community Plan (1999), 7th Street Corridor Design Plan (1996), and Molalla Avenue Boulevard and Bikeway Improvements Plan (2001). This section of the Comprehensive Plan also notes that the city was working on plans for the OR 99E corridor to improve access control, landscaping, pedestrian safety, and the connection to the riverfront (*Oregon City McLoughlin Boulevard Enhancement Plan*) and a Street Connectivity Plan that would comply with the RTP design standards. Information contained in Section 12 pertaining to roadway design standards, multi-modal transportation, rail, marine, and air transportation has been summarized from the 2001 TSP. This information, as well as subsections summarizing information technologies, infrastructure funding, and parking, will need to be updated to be consistent with the information developed for the updated TSP.

In addition to descriptions of the existing transportation system, Section 12 contains the City's adopted transportation goals and policies. Comprehensive Plan policies will need to be made consistent with modified and new transportation policies developed as part of the TSP update.

Oregon City Municipal Code (2010): The City of Oregon City's Zoning Map displays the type and location of land uses in the City. The land use section of the Code implements the Comprehensive Plan by providing descriptions of zone designations, allowable uses within those zones, and development regulations. In addition to these underlying zones, the City adopted a Natural Resources Overlay District (Chapter 17.49), Geologic Hazards Overlay (Chapter 17.44), Floodplain Overlay District (Chapter 17.42), Willamette River Greenway Overlay (Chapter 17.48) and a Historic Overlay District (Chapter 17.40). The following is an overview of code sections that may need to be updated, consistent with the findings and recommendations of the updated TSP.

Site Plan and Design Review is required for all new non-residential developmenr and multi-family uses in all zones.

Standards are found in Chapter 17.62 and include requirements for building location, orientation and design as well as parking, ingress and egress, street connectivity and access to be obtained through an alley when feasible (see Section 17.62.050 – Standards). Sidewalks are required in accordance with the city's transportation master plan and street design standards (17.62.050.8) and code requirements include a number of standards to ensure a "well-marked, continuous and protected on-site pedestrian circulation system (17.62.050.9)" for safe pedestrian access through the parking lot, between building entrances and between the main entrance and the street.

Improvements to the right-of-way, pedestrian ways, bike routes and bikeways, and transit facilities must and be consistent with the TSP and design standards in Title 17. When approving land use actions, the City requires all relevant intersections to be maintained at the minimum acceptable level of service (LOS) upon full build-out (17.62.050.15).

To further promote transit (and pedestrian travel), there are additional development requirements pertaining to building orientation and entrance location for development on a transit street (Section 17.62.080). The Municipal Code provides Tri-Met the authority to require transit-related improvements to be constructed at the time of development (17.62.050.16).

Chapter 16.08 of the Municipal Code controls the process and approval standards applicable to subdivisions. The requirements for a preliminary subdivision plat include a Traffic/Transportation Plan with the following information (16.08.025.B):

- A detailed site circulation plan showing proposed vehicular, bicycle, transit and pedestrian access points and connections to the existing system, circulation patterns and connectivity to existing rights-of-way or adjacent tracts, parking and loading areas and any other transportation facilities in relation to the features illustrated on the site plan

- A traffic impact study prepared by a qualified professional transportation engineer, licensed in the state of Oregon, that assesses the traffic impacts of the proposed development on the existing transportation system and analyzes the adequacy of the proposed internal transportation network to handle the anticipated traffic and the adequacy of the existing system to accommodate the traffic from the proposed development. The City Engineer may waive any of the foregoing requirements if determined that the requirement is unnecessary in the particular case.

Chapter 16.12 details the minimum standards for land division approval. Transportation circulation and connectivity are supported through block length maximums (16.12.020) and pedestrian and bicycle access to activity centers, where this access is not provided via street right-of-way ("discontinuous street right-of-way," Section 16.12.035). Applicants are "responsible for improving the city's planned level of service on all public streets" and "for designing and providing adequate vehicular, bicycle and pedestrian access to their developments (16.12.095)." Chapter 16.08 of the Municipal Code controls the process and approval standards applicable to subdivisions. The requirements for a preliminary subdivision plat include a traffic/transportation plan prepared by a professional transportation engineer (16.08.025.B) showing onsite and nearby vehicular, pedestrian and bike circulation.

Development is also subject to compliance with Title 12 of the Municipal Code. Chapter 12.04 identifies standards for streets based on the classification in the TSP. TSP figures from the TSP are incorporated into the code by reference and include Figure 5-1: Functional Classification System and New Roadway Connections; Figure 5-3: Pedestrian System Plan; Figure 5.6: Bicycle System Plan; and Figure 5.7: Public Transit System Plan (Section 12.04.180). The City has a different design standard for "constrained" local streets and rights-of-way, as shown in Table 12.04.045, and requires that these narrower facilities meet minimum life safety requirements (Section 12.04.200). Minimum street intersection spacing standards are included in Table 12.04.040. Street design standards in Chapter 12.04 also address designing for pedestrian and bicycle safety (12.04.245) and transit (12.04.260). Requirements and standards for pedestrian and bicycle accessways (defined as an off-street path or way) are also found in Chapter 12.24, while street trees are discussed in Chapter 12.08.

Parks & Recreation Master Plan (2008): The Oregon City Parks and Recreation Master Plan Update is intended to help meet the needs of current and future residents by positioning Oregon City to build on the community's unique parks and recreation assets and identify new opportunities. The following are guiding themes expressed through the community planning process:

- Build on Oregon City's natural and recreational outdoor assets
- Support a pedestrian-friendly, "walkable" community, including bicycling
- Enhance the "quality of life" for residents through parks and recreation
- Create new funding mechanisms to sustain the level of standards the community supports

- Balance passive, self-directed, and active recreational opportunities through goals and strategies
- Maintain and upgrade the existing assets and expand park and recreation opportunities as opportunities arise
- Expand citywide events
- Further embrace the historical aspects of Oregon City

Oregon City Futures: A Strategy for Economic Development (2006): The Oregon City Economic Development report is a strategy to guide development and redevelopment of key opportunity areas in Oregon City with an emphasis on economic development. It recommends strategies to help Oregon City in implementing its Metro 2040 designation as one of seven Regional Centers in the Portland Metropolitan Area.

The report identifies the appropriate functions and land uses for the multiple districts within the Oregon City Regional Center, including the Historic Old Town, Blue Heron, Landfill, Clackamette Cove, Waterfront, and the Oregon City Shopping Center Districts. In addition, the key characteristics of several local oriented districts were identified outside of the Regional Center, including the Hospital, Seventh Street Corridor, Hilltop, College, and Industrial Districts.

Oregon City Urban Renewal Plan (2007): The Oregon City Urban Renewal Plan is intended to eliminate blighting influences and to implement goals and objectives of Oregon City's Comprehensive Plan. The boundary of the Renewal Area includes the Downtown, the Park Place Interchange, the Lagoon/Waterfront, the End of Trail, the Washington/7th Corridor, and the Heritage Center areas. Inadequate streets and traffic congestion, the lack of pedestrian and bicycle facilities, parking and other transportation deficiencies have been identified as issues contributing to the depressed conditions in the urban renewal area, and are considered constraints to the future development called for in the Oregon City Comprehensive Plan. Transportation improvements may include the construction, reconstruction, repair or replacement of streets, traffic control devices, bikeways, pedestrian ways and amenities, and multi-use paths.

Main Street Oregon City Program (2008): The Main Street Oregon City program[18] is designated as a Performing Main Street by the National Trust for Historic Preservation. The program works to facilitate, coordinate, and create an environment that generates a positive downtown image, preserves historic and cultural landmarks, and stimulates the economic vitality and investment in Oregon City's downtown area. The Main Street program gathers downtown stakeholders together to act as a catalyst for change in Oregon City's 167 year old downtown. This volunteer led initiative is working to make Oregon City a better place to live, work and visit.

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[18] Main Street Oregon City program: http://downtownoregoncity.org/

TriMet Bike Parking Design Standards: Access to transit via bicycle is a key element of the TriMet's desire for a total transit system. Providing convenient, visible, and secure bicycle parking is a cost-effective way to increase the catchment area of transit. This document supplements the TriMet Design Criteria and describes design considerations for bicycle parking at light rail transit (LRT) stations, commuter rail stations, and transit centers. These guidelines were developed using survey, inventory, and count data as well as research of best practices and recommendations. The following topics are addressed:

- Bike & Rides
- Bike parking access
- Urban & neighborhood stations: design & layout
- Community stations: design and layout
- Bike & Ride secure area layout
- Bike rack and locker layout
- Bike rack and locker spacing
- Bus stop considerations

TriMet Elderly and Disabled Transportation Plan (2009): The 2009 TriMet Elderly and Disabled Transportation Plan (EDTP) builds upon the 2006 EDTP, which recognized the increased and varied transportation needs for a growing population of elders and people with disabilities. The goal is to offer a range of services that match individual abilities and support customer independence and convenience, but also promote fixed route and other lower-cost options as the best use of scarce transportation resources while emphasizing coordination and reducing redundancy. The recommendations of the plan include:

- Make the RideWise consumer education and travel training program a standard and fully coordinate a new and different TriMet LIFT paratransit eligibility process with RideWise. This program gives people freedom, independence and choice.
- Neighborhood shuttles and shopper shuttles to take elders and people with disabilities (E&D) to fixed route transit and to activities, such as grocery shopping, that are difficult to do on the bus. These are hybrid fixed route/paratransit services, so trips can be grouped, but the service is personalized.
- Involving people with disabilities and elders in sensitivity awareness and training for fixed route and paratransit drivers, in fixed route customer service monitoring, in fixed route travel training, and in assisting people with disabilities make transfers from one route to another or use the system beyond an initial training period.
- Give organizations used accessible vans in exchange for providing rides to elders and people with disabilities and recruiting members to be volunteer drivers in the Ride Connection community-based transportation program.
- 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. The total fixed route transit system from the

waiting area, customer service by the operators, priority seating, and security will need to be continually monitored for accessibility and improvement.

- A truly multi-modal transportation system will have pedestrian-safe communities with sidewalks. This plan recommends beginning by developing a Pedestrian Master Plan for one suburban area that can be used as a model by other communities.
- The increase in fatal crashes involving drivers over age 75 can be attributed in part to the driving environment — complicated intersections, hard-to-read signs, badly timed traffic lights. This plan recommends Federal Highway Administration (FHWA) guidelines be adopted for signage, intersection design, pavement markings, lighting, merging lanes for entering freeways and many other roadway features that take into account the limitations of older drivers.
- Older drivers must deal with gradual changes in functioning, changes in their reflexes, their ability to make quick decisions, and their vision at night. This plan recommends older driver safety programs be regularly scheduled throughout the tri-county area and that the programs introduce people to their public transit options as well.

Goal 5 Inventory (2011): Oregon City completed Goal 5 inventory requirements by designating several wetland, open space, riparian corridors, and historically designated structures throughout the City and within the Canemah National Register Historic District and the McLoughlin Conservation District.

Major Developments since 2001: Major developments since the 2001 Oregon City TSP can be found at: http://www.orcity.org/planning/landuse

Transportation Funding Mechanisms: Oregon City has the following current transportation funding mechanisms:

- Transportation System Development Charges (SDCs)
- Metro regional flexible funds
- ODOT flexible funds
- ODOT Pedestrian/Bicycle grant program
- Federal Highway Administration Transportation Enhancement grant program administered by ODOT
- Federal Appropriation and Authorization funds
- Pavement Maintenance Utility Fund

Appendix A: Applicable Plan and Policies

The following plans and policies were reviewed for the Oregon City TSP Update:

State of Oregon

- Transportation System Planning Guidelines
- Transportation Planning Rule (OAR 660-012-0010)
- Oregon Statewide Planning Goals
- Oregon Access Management Rule (OAR 734-051)
- Oregon Transportation Plan
- Oregon Highway Plan
- ODOT Highway Design Manual
- 2010-2013 Statewide Transportation Improvement Program

Metro

- Metro 2035 Regional Transportation Plan
- Metro 2035 Regional Transportation Functional Plan
- Metro 2040 Growth Concept
- Metro Non-Single Occupancy Vehicle (SOV) Target Actions Study
- Metro Regional Trails and Greenways Plan

City of Oregon City

- 2001 Oregon City Transportation System Plan
- Oregon City Capital Improvement Plan
- Oregon City Comprehensive Plan
- Oregon City Municipal Code
- Oregon City McLoughlin Boulevard Enhancement Plan
- Oregon City Downtown Community (Regional Center) Plan
- Oregon City Urban Renewal Plan
- Oregon City Downtown Main Street Program
- Goal 5 Inventory and Map
- Inventory of all major development or transportation projects and annexations constructed since 2001
- List of current funding mechanisms including any City projections from System Development Charges or other existing funding mechanisms
- Oregon City Downtown Circulation Plan and Parking Study
- Parks and Recreation Master Trails Plan
- Parks and Recreation Master Plan

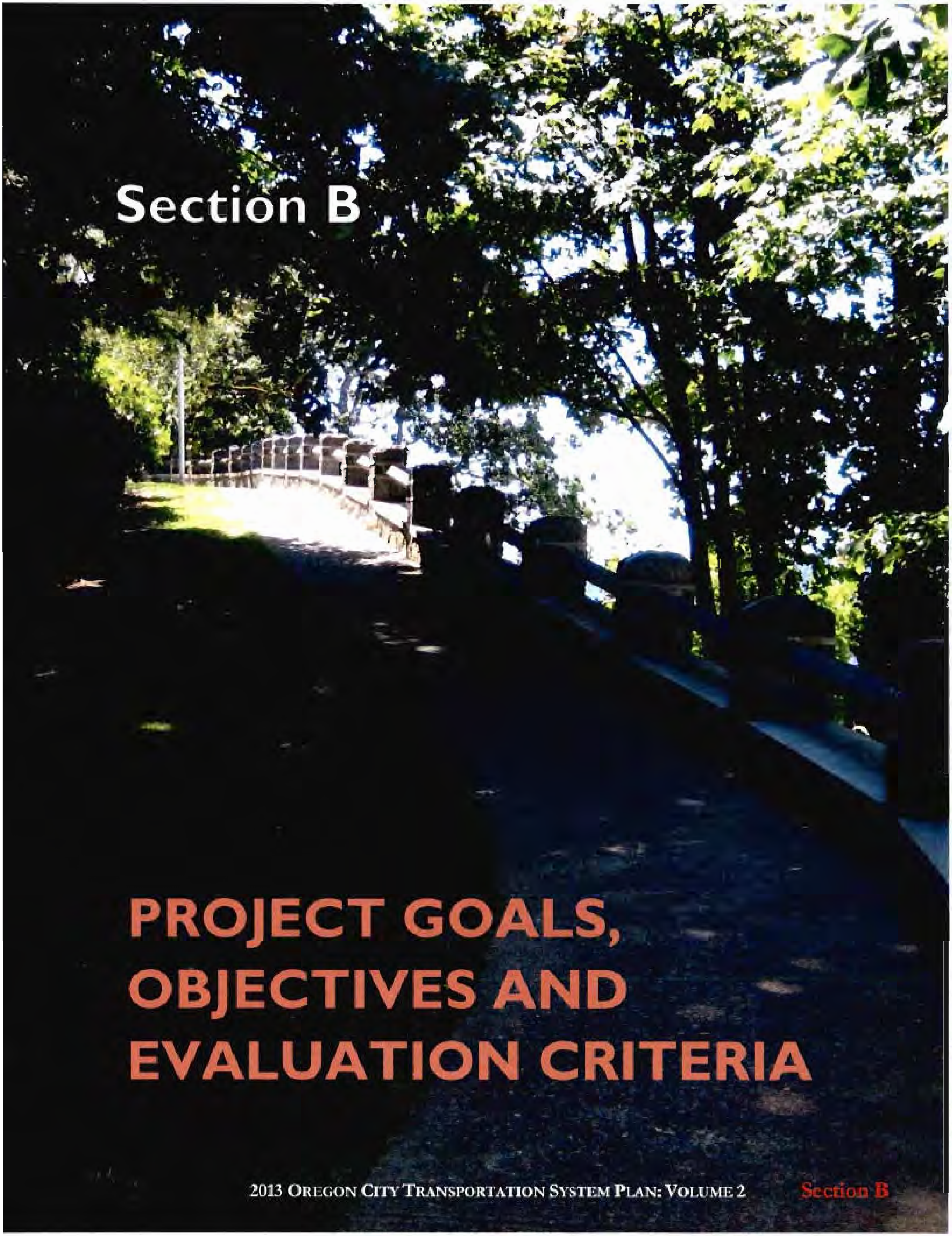
- Oregon City's Economic Opportunities Analysis Report

Clackamas County

- Clackamas County Transportation System Plan

TriMet

- TriMet Transit Investment Plan
- TriMet Bike Parking Design Standards
- TriMet Elderly and Disabled Transportation Plan



Section B

PROJECT GOALS, OBJECTIVES AND EVALUATION CRITERIA

PROJECT GOALS, OBJECTIVES AND EVALUATION CRITERIA

Project Goals and Objectives

The goals and objectives of the Transportation System Plan (TSP) should reflect the vision of the community and provide the policy foundation for the Oregon City TSP. The following recommended goals and objectives considered the past TSP goals and documents adopted after the TSP was completed in 2001. The update to the TSP will include several changes to State and Regional transportation plans and regulations. The TSP will also address and consider evolving transportation engineering, policy, and planning approaches such as active transportation, context sensitive design and Intelligent Transportation Systems.

Goal 1. Provide an equitable, balanced and connected multi-modal transportation system

Provide a "complete" transportation system throughout Oregon City that provides travel options and connects people to jobs, schools, services, recreation, social and cultural institutions within the City.

- **Objective A. Ensure that the transportation system provides equitable access to underserved and vulnerable populations**

  Provide a transportation system that offers people choices, regardless of age, ability, income level and geographic location, and allows them to respond and adapt to changing conditions.

- **Objective B. Reduce total housing and transportation costs for residents**

  Encourage transportation system investments that allow housing diversity and mixed land uses to help reduce the total housing and transportation costs for Oregon City residents.

- **Objective C. Identify new or improved system connections to enhance system efficiency**

  Complete a city-wide connectivity analysis and identify improvements to comply with Metro Regional Transportation Functional Plan, Title 1, section 3.08.110 and provide an efficient, multi-modal transportation system.

- **Objective D. Give priority to connections that help to advance other goal areas**

The priority of investing in new or improved connections is magnified where multiple objectives can be met, e.g., supporting transit, reducing reliance on state highway facilities, deferring major capacity improvements, etc.

- **Objective E. Assure the Oregon City Municipal Code supports a balanced and connected multi-modal transportation system.**

  Review the Municipal Code and make revisions as needed to support a balanced and connected multi-modal transportation system (such as removing barriers which create automobile congestion or impede connectivity among pedestrians or bicyclists.

Goal 2. Increase the convenience and availability of pedestrian, bicycle, and transit modes

Strengthen the pedestrian and bicycle systems in all areas of the city. In addition, identify areas that have existing or future transit-supportive densities and amenities and work with local transit providers such as TriMet, Canby Area Transit (CAT), South Clackamas Transportation District (SCTD), etc. to cost-effectively improve coverage and frequency to achieve greater ridership productivity.

- **Objective A. Identify projects to close gaps and address deficiencies in the pedestrian and bicycle system**

  A system gap analysis should consider proximity to major active transportation centers, such as shopping, schools, and public buildings to determine system gaps and deficiencies.

- **Objective B. Provide safe, comfortable and convenient transportation options**

  Consider active transportation user needs that complement the basic provision of services to encourage higher levels of usage (e.g., street lighting, arterial crossing treatments, bike parking).

- **Objective C. Identify necessary changes to land development code to ensure connectivity between compatible land uses for pedestrian and bicycle trips**

  Land development code provisions should be reviewed to ensure that compatible land uses do not erect barriers which prohibit pedestrian and bicycle connections that limit convenient access and create out-of-direction travel. An example includes borders between high-density residential uses and adjoining retail centers.

- **Objective D. Identify areas that support additional transit services, and coordinate with transit providers to improve the coverage, quality and frequency of services**

  Land uses in Oregon City should be reviewed to identify suitable sites for additional transit services. A mix of land uses and activities should be encouraged to support additional transit service in the City.

- **Objective E. Consider the potential access needs for candidate High Capacity Transit and frequent service bus routes**

  The alignments of the potential future High Capacity Transit (HCT) and existing and/or future frequent service bus routes in Oregon City should be reviewed to consider new or enhanced access needs for prospective station areas.

Goal 3. Enhance the health and safety of residents

Ensure that the transportation system maintains and improves individual health, safety and security by maximizing the comfort and convenience of walking, biking and transit transportation options, public safety and service access.

- **Objective A. Identify improvements to address high collision locations**

  Address high priority safety needs and identify improvements in order to minimize incidents and improve safety for walking, biking and driving trips in the City.

- **Objective B. Identify necessary changes to street design guidelines to support context sensitive design solutions**

  The City's street design guidelines should be responsive to practical needs of individual cases to limit environmental and cost impacts, and the city staff should have authority to approve design exceptions on construction projects that meet the basic needs of the system.

- **Objective C. Reduce impervious street surfaces through "Green Streets"**

  Minimize negative environmental impacts of impervious streets in the City by incorporating "Green Street" techniques to transform streets into landscaped linear park like spaces that capture storm water runoff.

- **Objective D. Provide a network of family-friendly walking and biking routes**

  Encourage less experienced users to access destinations throughout Oregon City via foot or bike by developing a linked network of shared-use streets and paths that provide more comfortable walking and biking routes. The comfort of the routes should be increased by applying green street features and traffic calming techniques and markings.

Goal 4. Emphasize effective and efficient management of the transportation system

Optimize travel capacity and improve travel conditions by better managing our own travel demands, meeting more of our daily needs within our own community, making our existing transportation facilities as smart and efficient as possible, and being strategic about transportation investments. The City should seek to find innovations and fine tuning of existing systems and policies and avoid or forestall costly major roadway capacity improvements.

- **Objective A. Identify opportunities to reduce the use of state facilities and arterials**

for local trips

Areas of the city that have few or no options to traveling on state facilities or arterials should be reviewed to identify possible new or improved local connections.

- **Objective B. Seek to shift vehicle travel to off-peak periods**

  Explore programs to encourage more travel in off-peak hours to better use the existing roadway system. This will include consideration of possible financial incentives for major use sites (e.g., parking pricing, fee discounts), and other travel demand management techniques.

- **Objective C. Maintain the existing transportation system assets.**

  Adequately maintain transportation facilities to preserve their intended function and maintain their useful life.

- **Objective D. Identify opportunities to improve travel reliability and safety with TSMO solutions**

  Seek to advance system management operations strategies that are identified in the Metro Transportation System Management and Operation (TSMO) plan and Metro Regional Travel Options Strategic Plan in helping to preserve the function and quality of operations on state highway facilities and arterials in the City.

- **Objective E. Demand Management**

  Encourage and support the implementation of Transportation Demand Management (TDM) programs.

Goal 5. Foster a sustainable transportation system

A key approach to building a sustainable community requires a transportation system that is environmentally and fiscally sustainable that focuses on decreasing vehicle emissions and transportation related greenhouse gas emissions.

- **Objective A. Support alternative vehicle types by identifying potential electric vehicle plug-in stations and developing implementing code provisions**

  Identify potential supporting locations for electric vehicle plug-in stations and develop changes to building codes to include electric services to support future at home and at work plug in stations.

- **Objective B. Identify existing and future expected VMT levels within the City of Oregon City, and consider opportunities and actions needed to meet RTP targets**

- **Objective C. Encourage alternatives to daily single-occupancy vehicle commuting.**

  Encourage and support technology that encourages carpooling, cooperatives, walking, bicycling, etc.

- **Objective D. Develop and support alternative mobility standards on state facilities and City streets where necessary**

  Identify where alternative mobility standards on state facilities may be necessary for potential future action, consistent with Oregon Highway Plan provisions and explore alternative mobility standards for City streets located in constrained areas.

- **Objective E. Identify areas where alternative land use types would significantly shorten trip lengths or reduce the need for motor vehicle travel within the city**

  The proximity between existing and future land uses may be reviewed to encourage land use patterns and transportation systems that make it more convenient for people to walk, bicycle, use transit and drive less to meet their daily needs.

- **Objective F. Minimize impacts to the natural environment.**

  Avoid adverse impacts to the scenic, natural and cultural resources in Oregon City.

Goal 6. Ensure the transportation system supports a prosperous and competitive economy

Support a prosperous and competitive economy by preserving and enhancing business opportunities, and ensuring the efficient movement of people and goods.

- **Objective A. Freight access and truck travel reliability**

  Improve the freight system efficiency, access, capacity and reliability.

- **Objective B. Increase the distribution of travel information to maximize the reliability and effectiveness of existing major roadway facilities**

  Identify solutions to increase the distribution of travel information through active management (TSMO) techniques and Intelligent Transportation Systems (ITS) solutions.

- **Objective C. Reinforce growth and multi-modal access to 2040 Target Areas**

  Transportation investments should be consistent with and support development within the Oregon City Regional Center, the 7th Street/Molalla Avenue corridor, the OR 99E corridor and the Employment land in the southeast portion of Oregon City.

- **Objective D. Seek to advance travel strategies that are identified in the Metro Regional Mobility Corridors**

Goal 7. Identify solutions and funding to meet system needs

The City will identify transportation investments that can be made with available funding to ensure that system needs can be delivered for growth planned within the community.

- **Objective A. Identify stable revenue sources for transportation investments to meet** the needs of the City, as documented in the updated TSP.

- Objective B. Consider costs and benefits when identifying project solutions and prioritizing public investments.
- Objective C. Identify new funding sources to leverage high priority transportation projects.

Goal 8. Comply with state and regional transportation plans

The City will meet the requirements of the Oregon Transportation Planning Rule, the Oregon Highway Plan, and the Metro 2035 Regional Transportation Plan (RTP) and Regional Functional Transportation Plan (RFTP).

- Objective A. Meet the mobility standards for state highways, or develop and propose alternative standards, consistent with Oregon Highway Plan provisions.
- Objective B. Develop TSP policy and municipal code language to implement the TSP update.
- Objective C. Consider regional needs identified in the Metro RTP, including those identified with the mobility corridors.
- Objective D. Consider and evaluate transportation solutions and strategies consistent with the guidelines and priorities of the Metro RFTP.

Evaluation Criteria

Project alternatives developed through this update will be evaluated by criteria that are an extension from the goals and objectives. These project level criteria provide a point-based technical rating method that will be used to evaluate how well proposed design alternatives meet the measure of effectiveness criteria. By summing ratings (and weighting if desired), alternatives can be compared. In this way, a consistent method will be used to evaluate and rank the alternatives.

Evaluation Criteria and Scoring Methodology

The evaluation criteria were selected based on the City's existing and proposed transportation related goals and objectives. The criteria focuses on compliance with state and local plans and policies, engineering design requirements, and a desire to maximize positive (and minimize negative) economic, social (livability), and environmental impacts. Table 1 lists the evaluation criteria and the corresponding scoring methodology.

Table 1: Oregon City TSP Evaluation Criteria and Scoring

Measure of Effectiveness	Evaluation Score	
Goal 1. Provide an equitable, balanced and connected multi-modal transportation system		
Equitable Access Improves access to underserved or vulnerable populations	+1	Increases access to underserved or vulnerable populations
	0	No change
	-1	Decreases access to underserved or vulnerable populations
Transportation and Housing Cost Reduces total transportation and housing costs	+1	Reduces transportation and housing costs
	0	No change
	-1	Increases transportation and housing costs
Connectivity Connection enhances system efficiency	+1	Improves system efficiency
	0	No change
	-1	Negative impact on system efficiency
Multiple Objectives Connection or improvement satisfies multiple objectives	+1	Satisfies multiple objectives
	0	Satisfies single objective
	-1	Satisfies single objective, but has negative impact on another
Goal 2. Increase the convenience and availability of pedestrian, bicycle, and transit modes		
Pedestrian and Bicycle Facilities Adds bikeway and walkways that fill in system gaps, improve system connectivity, and are accessible to all users.	+1	Improves pedestrian or bicycle connectivity or accessibility
	0	No change
	-1	Reduces connectivity or accessibility
Transit Facilities Improves access to transit facilities. Promotes transit as a viable alternative to the single occupant vehicle.	+1	Improves transit facilities
	0	No change
	-1	Negative impact on provision of services
Provision of services Improves the basic provision of services to encourage higher levels of usage for walking and biking trips	+1	Improves provision of services
	0	No change
	-1	Negative impact on provision of services
Goal 3. Enhance the health and safety of residents		
Safety Improves safety of the transportation system.	+1	Increases safety of the transportation system
	0	No change
	-1	Has potential geometric or user safety concerns
Health	+1	Encourages active living and physical

Measure of Effectiveness		Evaluation Score
Encourages active living and physical activity.		activity
	0	No change
	-1	Discourages active living and physical activity
Pollution Impact Minimizes transportation related pollution.	+1	Reduces transportation related pollution
	0	No change
	-1	Increases transportation related pollution
Goal 4. Emphasize effective and efficient management of the transportation system		
Deferred Investment Reduces need for major highway project construction	+1	Reduces need for major investment
	0	No change
	-1	Accelerates need for major investment
Improved Roadway Efficiency Implements Transportation Demand Management (TDM) or other strategies to create greater mobility, reduce auto trips, make more efficient use of the roadway system, and minimize air pollution.	+1	Improves roadway efficiency
	0	No change
	-1	Negative impact on roadway efficiency
Daily Traffic Capacity Improvement makes daily traffic capacity more reliable.	+1	More reliable daily traffic capacity
	0	No change
	-1	Less reliable daily traffic capacity
Alternative Routes Enhances travel for local trips off the state highway system	+1	Reduces the use of state facilities for local trips
	0	No change
	-1	Increases the use of state facilities for local trips
Goal 5. Foster a sustainable transportation system		
Non-Single Occupancy Vehicle (SOV) Focus Emphasizes the movement of people over vehicles, which reduces the citywide vehicle-miles-travelled (VMT)	+1	Improves non-SOV targets
	0	No change
	-1	Negative impact on non-SOV targets
Environment Minimizes impact to the natural environment	+1	Enhances the natural environment
	0	No change
	-1	Negatively impacts the natural environment
Land Use Supports alternative land use types	+1	Greater potential for mixed land uses
	0	No change

Measure of Effectiveness	Evaluation Score	
	-1	Less potential for mixed land uses
Goal 6. Ensure the transportation system supports a prosperous and competitive economy		
Freight Improves freight access/connectivity	+1	Improves freight facilities
	0	No change
	-1	Negative impact on freight facilities
Corridor Reliability Implements strategies to provide stable and reliable auto and truck traffic flows on major facilities.	+1	Improves roadway reliability
	0	No change
	-1	Negative impact on roadway reliability
2040 Target Areas Improves access in the Metro 2040 Target Areas	+1	Improves access in 2040 Target Area
	0	No change
	-1	Negative impact on access in 2040 Target Area
Goal 7. Identify solutions and funding to meet system needs		
Fundability Available funding sources exist to implement projects in a timely fashion.	+1	Funding sources are available
	0	Feasible costs, but no identified funding
	-1	High costs and no funding expected
Cost Effectiveness Assumed project benefits exceed project costs	+1	Cost effective solution
	0	Average cost solution
	-1	Not a cost effective solution
Goal 8. Comply with state and regional transportation plans		
Compatibility Compatible with other jurisdiction's plans and policies, (including adjacent cities, counties, Metro or ODOT).	+1	Compatible with other plans and contributes to their implementation
	0	Compatible with other plans, but does not necessarily contribute to their implementation
	-1	Not compatible with other plans
Agency Standards Consistent with the standards of the City, Region, and State as a whole.	+1	Consistent with all standards
	0	May require some deviations to standards, but likely to be approved
	-1	Inconsistent with standards and not expected that deviations would be approved

Appendix

Table A1: Comparison of City TSP Goals and Objectives with Metro 2035 RTP Goals

Metro 2035 RTP Goal and Policy	Oregon City TSP Goal / Objective
1.1 Compact Urban Form and Design - use transportation investments to reinforce growth in and multi-modal access to 2040 Target Areas and ensure that envelopment in 2040 Target Areas is consistent with and supports the transportation investments.	Goal 1 / Objective C
1.2 Parking Management - minimize the amount and promote the efficient use of land dedicated to vehicle parking	Goal 3/ Objective B
2.2 Regional Passenger Connectivity - ensure reliable and efficient connections between passenger intermodal facilities and destinations in and beyond the region to improve non-auto access to and from the region and promote the region's function as a gateway for tourism	Goal 2/ Objective D & E
2.3 Metropolitan mobility - maintain sufficient total person-trip and freight capacity to allow reasonable and reliable travel times	Goal 2/ Objective F Goal 3/ Objectives A, B, C & D
3.1 Travel Choices - achieve modal targets for increased walking, bicycling, use of transit and shared ride and reduced reliance on the automobile and drive alone trips	Goal 2/ Objective A, B, C, D & F Goal 4/ Objective B
3.2 Vehicle Miles of Travel - reduce vehicle miles traveled per capita	Goal 5/ Objective A, B, C & D
3.3 Equitable access and barrier free transportation - provide affordable and equitable access to travel choices and serve the needs of all people and businesses, including people with low income, children, elders and people with disabilities	Goal 1/ Objectives A & C Goal 2/ Objectives A, B & D
4.1 Traffic Management - Apply technology solutions to activity manage the transportation system.	Goal 4/ Objective A Goal 5/ Objective A
4.4 Demand management - implement services, incentives and supportive infrastructure to increase telecommuting, walking, biking, taking transit, and carpooling, and shift travel to off-peak periods	Goal 3/ Objective B Goal 4/ Objective C Goal 5/ Objective C
4.5 Value Pricing - consider a wide range of value pricing strategies and techniques as a management tool	Goal 3/ Objective B
5.1 Operational and public safety - reduce fatalities, serious injuries and crashes per capita for all modes of travel	Goal 4/ Objective D Goal 2/ Objective B
6.5 Climate Change - Reduce transportation related greenhouse gas emissions	Goal 5/ Objective A, B, C & D
7.1 Active Living - Provide safe, comfortable and convenient transportation options that support active living and physical activity to meet daily needs and access services	Goal 2/ All
9.2 Maximize return on public investment - make transportation investment decisions that use public resource effectively and efficiently, using performance-based planning	Goal 6/ Objective B
9.3 Stable and innovating funding - stabilize existing transportation revenue while securing new and innovative long-term sources to build, operate and maintain the system for all modes	Goal 6/ Objectives A, C

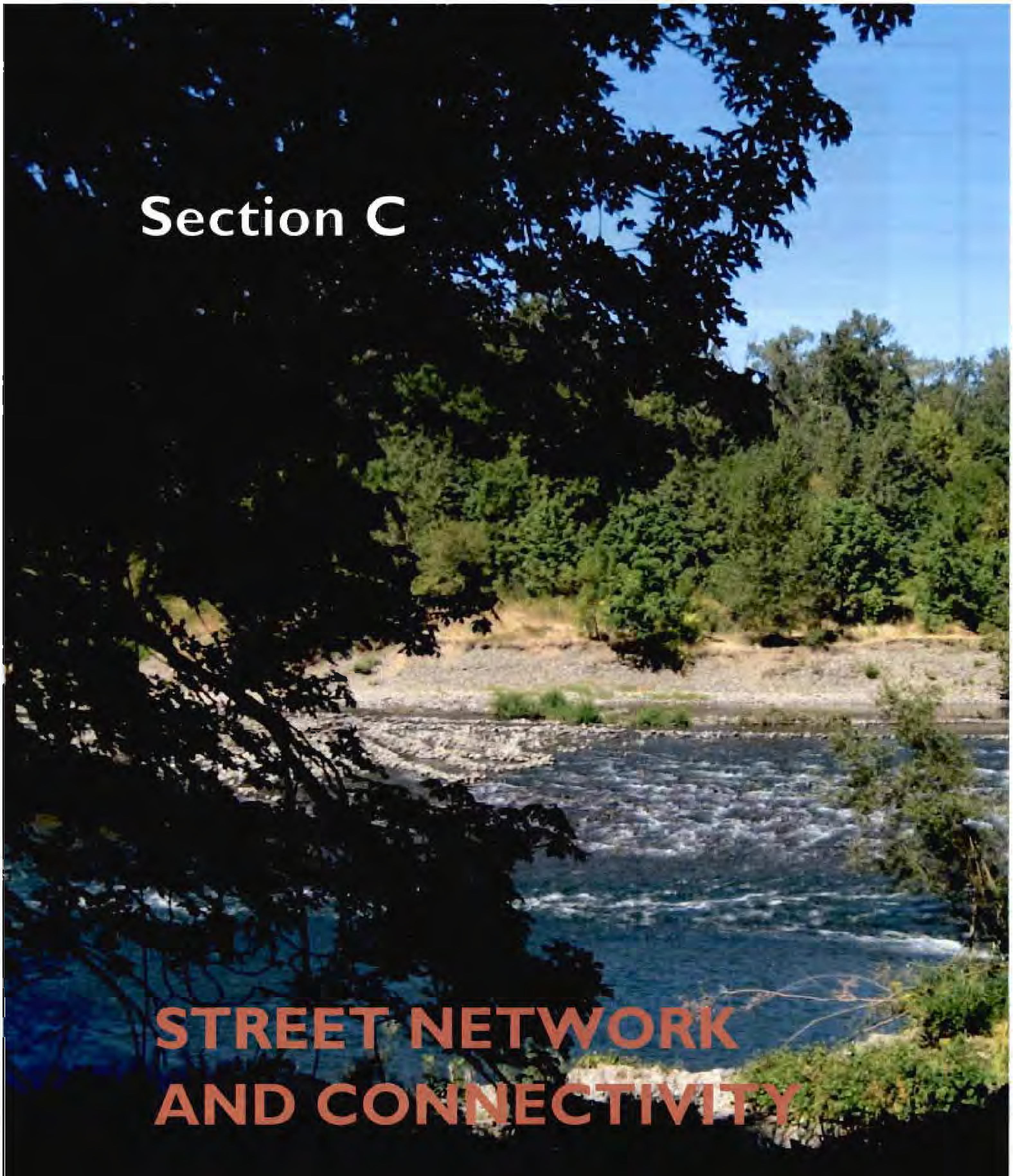
Reference: Metro RTP 2035 Goals and Policies

Ultimately, the goals and objectives of this TSP update will be modified to allow for consistency and updating of the Oregon City Comprehensive Plan, Section 12. Table A2 identifies the existing goals of the Comprehensive Plan and details how the concepts of each goal are addressed in the Goals and Objectives of this TSP Update:

Table A2: Comparison of Existing City TSP Goals and Objectives with Comprehensive Plan

Comprehensive Plan Goal	Oregon City TSP Goal / Objective where Addressed
Goal 12.1 Land Use-Transportation Connection- Ensure that the mutually supportive nature of land use and transportation is recognized in planning for the future of Oregon City.	Goal 1/ Objective A & B Goal 2/ Objective A, B, C & D Goal 4/ Objective B
Goal 12.2 Local and Regional Transit- Promote regional mass transit (South Corridor bus, Bus Rapid Transit, and light rail) that will serve Oregon City.	Goal 2/ Objective D & E Goal 4/ Objective B
Goal 12.3 Multi-Modal Travel Options- Develop and maintain a transportation system that provides and encourages a variety of multi-modal travel options to meet the mobility needs of all Oregon City residents.	Goal 1/ All Goal 2/ All Goal 3/ All Goal 5/ Objective C & D
Goal 12.4 Light Rail- Promote light rail that serves Oregon City and locate park-and-ride facilities at convenient neighborhood nodes to facilitate access to regional transit.	Goal 2/ Objective A, B, C, D & E Goal 4/ Objective B
Goal 12.5 Safety- Develop and maintain a transportation system that is safe.	Goal 2/ Objective A & B Goal 4/ Objective A & D
Goal 12.6 Capacity- Develop and maintain a transportation system that has enough capacity to meet users' needs.	Goal 1/ Objective A Goal 2/ Objective A, B & F Goal 3/ All Goal 4/ Objective A & C
Goal 12.7 Sustainable Approach- Promote a transportation system that supports sustainable practices.	Goal 1/ Objective A & D Goal 2/ All Goal 4/ Objective B Goal 5/ All
Goal 12.8 Implementation/Funding- Identify and implement needed transportation system improvements using available funding.	Goal 4/ All Goal 5/ Objective A Goal 6/ All

Section C



STREET NETWORK AND CONNECTIVITY

This document provides an overview of the street system in Oregon City. Included is a detail of the multi-modal street system, an overview of multi-modal connectivity and an outline of recommended implementation measures required to update the street system as part of the TSP update.

Multi-Modal Street System

Traditional roadway designs focus on the safety and flow of motor vehicle traffic. The one size fits all design approach is less effective at integrating the roadway with the character of the surrounding area and addressing the needs of other users of a roadway. For instance, the design of an arterial roadway through a commercial area has often traditionally been the same as one through a residential neighborhood, both primarily focused on the movement of motor vehicles.

Oregon City recognizes that all roadways within the City should be multi-modal or "complete streets", with each street serving the needs of the various travel modes. The City also realizes that not all streets should be designed the same. To account for this, Oregon City classifies the street system into a hierarchy organized by function and street type (representative of their places). These classifications ensure that the streets reflect the neighborhood through which they pass, consisting of a scale and design appropriate to the character of the abutting properties and land uses. The classifications also provide for and balance the needs of all travel modes including pedestrians, bicyclists, transit riders, motor vehicles and freight. Within these street classifications, context sensitive design may result in alternative cross-sections.

Multi-Modal Street Function

Functional classification of roadways is a common practice in the United States. Traditionally, roadways are classified based on the type of vehicular travel it is intended to serve (local versus through traffic). In Oregon City, the functional classification of a roadway (shown in Figure 1) determines the level of mobility for all travel modes, defining its design characteristics (such as minimum amount of travel lanes), level of access and usage within the City and region. The street functional classification system recognizes that individual streets do not act independently of one another but instead form a network that works together to serve travel needs on a local and regional level. From highest to lowest intended usage, the classifications are freeway, expressway, major arterials, minor arterials, collectors and local streets. Roadways with a higher intended usage generally provide more efficient motor vehicle traffic movement (or mobility) through the City, while roadways with lower intended usage provide greater access for shorter trips to local destinations.

Freeways and Expressways are limited access state roadways. These roadways serve the highest volume of motor vehicle traffic and are primarily utilized for longer distance regional trips. Both OR 213 and I-205 have posted speed limits of 55 miles per hour.

Major Arterial Roadways are intended to move traffic through Oregon City. These roadways generally experience higher traffic volumes and often connect to locations outside of the City (such as Beavercreek Road) or act as a corridor connecting many parts of the City (such as Molalla Avenue). Posted speed limits on these roadways are generally between 30 to 40 miles per hour, with the higher speeds posted in less urbanized areas and lower speeds in areas with more congestion such as downtown.

Minor Arterial Roadways are intended to serve local traffic traveling to and from major arterial roadways. These roadways provide greater accessibility to neighborhoods, often connecting to major activity generators and provide efficient through movement for local traffic. Posted speeds on minor arterial roadways typically range between 25 and 45 miles per hour.

Collector Roadways often connect the neighborhoods to the minor arterial roadways. These roadways serve as major neighborhood routes and generally provide more direct property access or driveways than arterial roadways. Posted speeds on collector roadways generally range between 25 and 35 miles per hour.

Local Roadways provide more direct access to residences in Oregon City. These roadways are often lined with residences and are designed to serve lower volumes of traffic with a statutory speed limit of 25 miles per hour.

Functional Classification Changes

The functional classifications of transportation routes in Oregon City were reviewed to determine the appropriateness of the classification and connectivity. The Metro Regional Transportation Functional Plan requires that, to the extent possible, arterials be spaced at one-mile intervals and collectors to be spaced at half-mile intervals[1]. Overall, most areas in Oregon City comply with the spacing standards to the extent possible. Existing development, topography, environmental areas, the Urban Growth Boundary (UGB) and OR 213 each pose a significant constraint in further improving the arterial and collector connectivity in Oregon City. The functional classifications of several roadways throughout the City were modified to address the connectivity gaps identified below, or due to adequate connections in the immediate area. The updated functional classifications can be seen in Figure 1, while the classification changes are shown in the Appendix.

[1] Metro Regional Transportation Functional Plan, Section 3.08.110 Street System Design Requirements

Arterial Connectivity gaps were identified in the following areas (see Figure 2):

1. An east to west gap between OR 99E and South End Road. *Connectivity hindered by topography and alignment would be outside of the UGB.*
2. An east to west gap between South End Road and OR 213 (near the south City limits). *Connectivity hindered by existing development, topography and alignment would be outside of the UGB.*
3. An east to west gap between Molalla Avenue and Holly Lane, south of Redland Road and north of Maple Lane Road. *Connectivity hindered by existing development, topography, OR 213 and portions of the alignment would be outside of the UGB.*
4. An east to west gap between OR 213 and Beavercreek Road, near Glen Oak Road. *New arterial classification designated in the area (Meyers Road).*
5. A north to south gap between Holcomb Boulevard and Maple Lane Road, east of OR 213. *New arterial classification designated in the area (Holly Lane).*

Collector Connectivity gaps were identified in the following areas (see Figure 2):

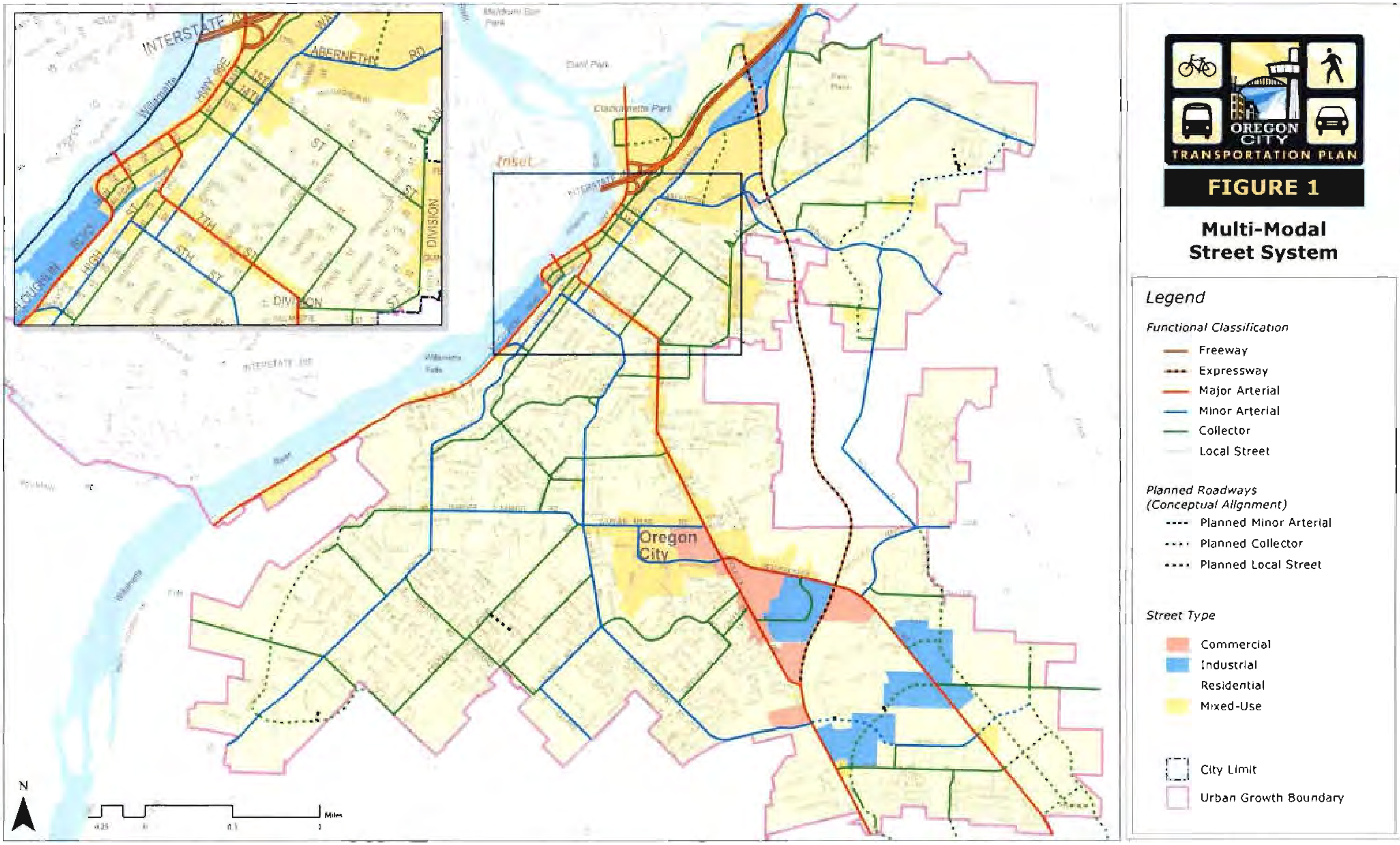
6. An east to west gap between Molalla Avenue and Holly Lane, south of Redland Road and north of Maple Lane Road. *Connectivity hindered by existing development, topography, OR 213 and portions of the alignment would be outside of the UGB.*
7. An east to west gap between OR 99E and South End Road. *Connectivity hindered by existing development, topography and alignment would be outside of the UGB.*
8. A north to south gap between Division Street and Beavercreek Road, west of OR 213. *Connectivity hindered by existing development, topography and alignment would be outside of the UGB.*
9. North to south and east to west gaps between Holcomb Boulevard and Redland Road. *New collector classifications designated in the area.*
10. A north to south gap between Holcomb Boulevard and Maple Lane Road, east of Holly Lane. *Connectivity hindered by topography and alignment would be outside of the UGB.*
11. North to south and east to west gaps to the west of South End Road. *New collector classifications designated in the area.*
12. North to south and east to west gaps, southeast of the Beavercreek Road/ Maple Lane Road intersection. *New collector classifications designated in the area.*

Multi-Modal Street Type

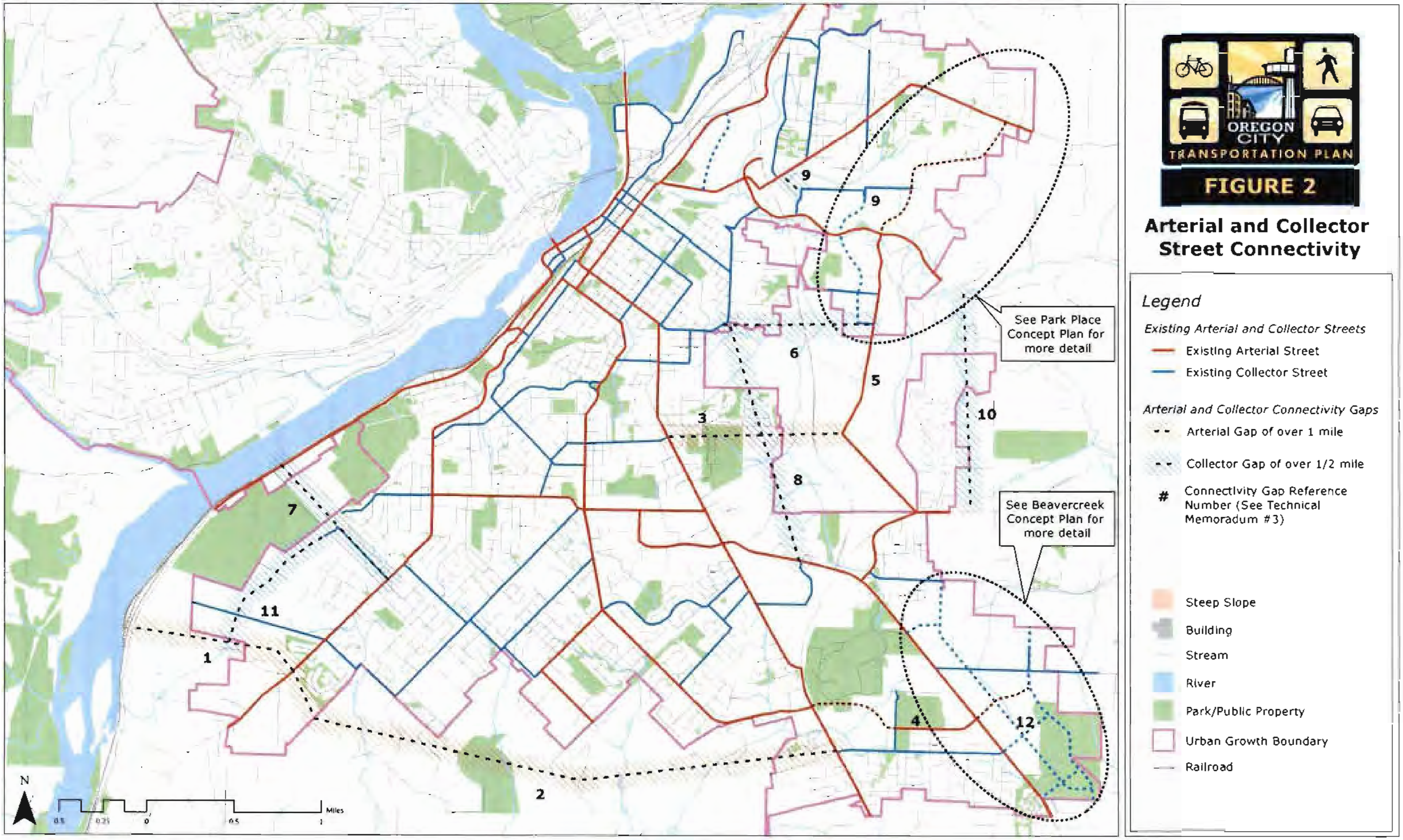
Oregon City further classifies the roadways within the City based on the neighborhood it serves and the intended function for pedestrians, bicyclists and transit riders in that specific area. Within the context of Oregon City's complete street system that will serve all modes, the street type of a roadway defines its cross-section characteristics and determines how users of a roadway interact with the surrounding land use. Since the type and intensity of adjacent land uses and zoning directly influence the level of use by pedestrians, bicyclists and transit riders, the design of a street (including its intersections, sidewalks, and transit stops) should reflect its surroundings.

The street types strike a balance between street functional classification, adjacent land use, zoning designation and the competing travel needs by prioritizing various design elements. Five street types were designated in Oregon City:

- **Mixed-Use Streets** typically have a higher amount of pedestrian activity and are often on a transit route. These streets should emphasize a variety of travel choices such as pedestrian, bicycle and transit use to complement the development along the street. Since mixed-use streets typically serve pedestrian oriented land uses, walking should receive the highest priority of all the travel modes. They should be designed with features such as wider sidewalks, traffic calming (see the traffic calming section later in this document), pedestrian amenities, transit amenities, attractive landscaping, on- street parking, pedestrian crossing enhancements and bicycle lanes.
- **Residential Streets** are generally surrounded by residential uses, although various small shops may be embedded within the neighborhood. These streets often connect neighborhoods to local parks, schools and mixed-use areas. They should be designed to emphasize walking, while still accommodating the needs of bicyclists and motor vehicles. A high priority should be given to design elements such as traffic calming (see the traffic calming section later in this document), landscaped buffers, walkways/ pathways/ trails, on-street parking and pedestrian safety enhancements.
- **Commercial Streets** are primarily lined with retail and large employment complexes. These uses serve customers throughout the City and region and may not have a direct relationship with nearby residential neighborhoods. These streets are somewhat more auto-oriented, but should still accommodate pedestrians and bicyclists safely and comfortably. Design features should include landscaped medians or a two-way left turn lane, sidewalks and bike lanes, pedestrian crossing enhancements and a buffer between the roadway and the sidewalk.
- **Industrial Streets** serve industrial areas. These streets are designed to accommodate a high volume of large vehicles such as trucks, trailers and other delivery vehicles. Pedestrians and bicyclists may be less frequent in these areas, but should still be accommodated safely and comfortably. Roadway widths are typically wider to accommodate larger vehicles. On-street parking should be discouraged.
- **Constrained Streets** are generally located in steep, environmentally sensitive, rural, historic, or development limited areas of the City. These streets may require different design elements that may not be to scale with the adjacent land use. Constrained elements may include narrower or limited travel lanes, and pedestrian and bicycle facilities, or accommodations that generally match those provided by the surrounding developed land uses. To the extent possible, pedestrian and bicycle accommodations should be provided on an adjacent roadway, via a shared-use path or shared within the right-of-way using distinctive design details.



OREGON CITY
TRANSPORTATION PLAN
FIGURE 1
Multi-Modal Street System
Legend
Functional Classification
Freeway
Expressway
Major Arterial
Minor Arterial
Collector
Local Street
Planned Roadways (Conceptual Alignment)
Planned Minor Arterial
Planned Collector
Planned Local Street
Street Type
Commercial
Industrial
Residential
Mixed-Use
City Limit
Urban Growth Boundary
Oregon City
Inset
Clackamette Park
INTERSTATE
ABERNETHY RD
DIVISION
N
Miles



OREGON CITY
TRANSPORTATION PLAN
FIGURE 2
Arterial and Collector Street Connectivity
Legend
Existing Arterial and Collector Streets
Existing Arterial Street
Existing Collector Street
Arterial and Collector Connectivity Gaps
Arterial Gap of over 1 mile
Collector Gap of over 1/2 mile
Connectivity Gap Reference Number (See Technical Memoradum #3)
Steep Slope
Building
Stream
River
Park/Public Property
Urban Growth Boundary
Railroad
See Park Place Concept Plan for more detail
See Beavercreek Concept Plan for more detail
1
2
3
4
5
6
7
8
9
9
10
11
12
N
Miles

Design Types of Streets

Design of the streets in Oregon City requires attention to many elements of the public right-of-way and considers how the street interacts with the adjoining properties. The four zones that comprise the cross-section of streets in Oregon City, including the context zone, walking zone, biking/on-street parking zone and driving zone, are shown in Figure 9. The design of these zones varies based on the functional classification and street type. Overall, there are 16 different design types, ranging from Mixed-Use Major Arterial to Residential Local Street. Note that a design type is not available for limited access roadways classified as Freeway or Expressway. The maximum design criteria for streets can be seen in Section 12.04.180 of the Oregon City Municipal Code. The City may also reduce or eliminate lower- priority design elements of the street along constrained streets located in steep, environmentally sensitive, rural, historic, or development limited areas of the City.

- **Context Zone:** The context zone is the point at which the sidewalk interacts with the adjacent buildings or private property (see Figure 4). The purpose of this zone is to provide a buffer between land use adjacent to the street and to ensure that all street users have safe interactions.
- **Walking Zone**: This is the zone in which pedestrians travel (see Figure 4). The walking zone is determined by the street type and should be a high priority in mixed-use and residential areas. It includes a clear throughway for walking, an area for street furnishings or landscaping (e.g. benches, transit stops and/or plantings) and a clearance distance between curbside on-street parking and the street furnishing area or landscape strip (so parking vehicles or opening doors do not interfere with street furnishings and/or landscaping). Streets located along a transit route should incorporate furnishings to support transit ridership, such as transit shelters and benches, into the furnishings/landscape strip adjacent to the biking/on-street parking zone.
- **Biking/On-Street Parking Zone:** This is the zone for biking and on-street parking, and is the location where users will access transit. It should include bike lanes or buffered bike lanes. The biking/on-street parking zone is determined by the street type and should be a high priority in mixed-use and residential areas.
- **Driving Zone:** This is the throughway zone for drivers, including cars, buses and trucks and should be a high priority in commercial/ employment and industrial areas. The functional classification of the street generally determines the number of through lanes, lane widths, and median and left-turn lane requirements. However, the route designations (such as transit street or freight route) take presentence when determining the appropriate lane width in spite of the functional classification. Wider lanes should only be used for short distances as needed to help buses and trucks negotiate right-turns without encroaching into adjacent or opposing travel lanes. Streets that require a raised median should include a pedestrian refuge at marked crossings. Otherwise, the median can be narrowed at midblock locations, before widening at intersections for left-turn lanes (where required or needed).

Figure 3: Components of Oregon City Streets

Figure 4: Up Close View of the Context and Walking Zones

Determining Optimum Street Designs

The following steps should be used to determine the optimum cross-section for a street:

Step 1: Determine the functional classification and street type based on Figure 8.

Step 2: Determine the maximum street design as shown in Section 12.04.180 of the Oregon City Municipal Code.

Step 3: Determine if the street is located along a regional truck route, local truck route, or a transit route. If so, the through lane width should be a minimum of 12 feet along a truck route or 11 feet along a transit route. If not, the lane width can be reduced a minimum of 12 feet along major arterials, 11 feet on minor arterials, and 10 feet along collectors and local streets, as determined by the City.

Step 4: Determine if more than two through lanes are needed. More than two through lanes should only be considered if the street and parallel routes cannot effectively accommodate the travel demand.

Step 5: Determine if left-turn lanes are needed at intersections. Intersection design should generally try to minimize pedestrian crossing distance. If turn-lanes are warranted, consider the trade-offs between improved driving mobility and increased crossing distance.

Step 6: Compare the optimum street design to the available right-of-way. If the cross-section is wider than the right-of-way, identify whether right-of-way acquisition is necessary or reduce the width of or eliminate lower-priority elements as determined by the City.

Multi-Modal Connectivity

The aggregate effect of local street design impacts the effectiveness of the regional system when local travel is restricted by a lack of connecting routes, and local trips are forced onto the regional network.[2] Therefore, streets should be designed to keep through motor vehicle trips on arterial streets and provide local trips with alternative routes. Street system connectivity is critical because roadway networks provide the backbone for bicycle and pedestrian travel in the region. Metro's local street connectivity principal encourages communities to develop a connected network of local streets to provide a high level of access, comfort, and convenience for bicyclists and walkers that travel to and among centers.

Connectivity of the existing transportation system was reviewed to identify current deficiencies. These locations will be further addressed in the pedestrian, bicycle and motor vehicle plans Topography, environmental constraints, railroads and existing development may be limiting the connectivity in areas of Oregon City. These factors may not stop the possible connections from being made in the noted areas lacking connectivity, but will affect what modes could be accommodated and the financial viability. The major areas lacking connectivity include:

- East and west connectivity across OR 213 between Redland Road and Beavercreek Road, a distance of over two miles
- East to west connectivity between OR 99E (south of the Canemah neighborhood) and the South End neighborhood, with greater than four miles between connections

A multi-modal connectivity plan for Oregon City is shown in Figure 5. It specifies the general location where new streets or shared-use paths could potentially be installed as nearby areas are developed or as the opportunity arises. The purpose of the plan is to ensure that new developments accommodate circulation between adjacent neighborhoods to improve connectivity for all modes of transportation. The criteria used for providing connections are as follows (as required in the Metro Regional Transportation Functional Plan[3]):

- Provide a full local street connection at least every 530 feet (or 1/10 of a mile), if possible
- Provide a pedestrian and bicycle connection every 330 feet if a full-street connection is not possible

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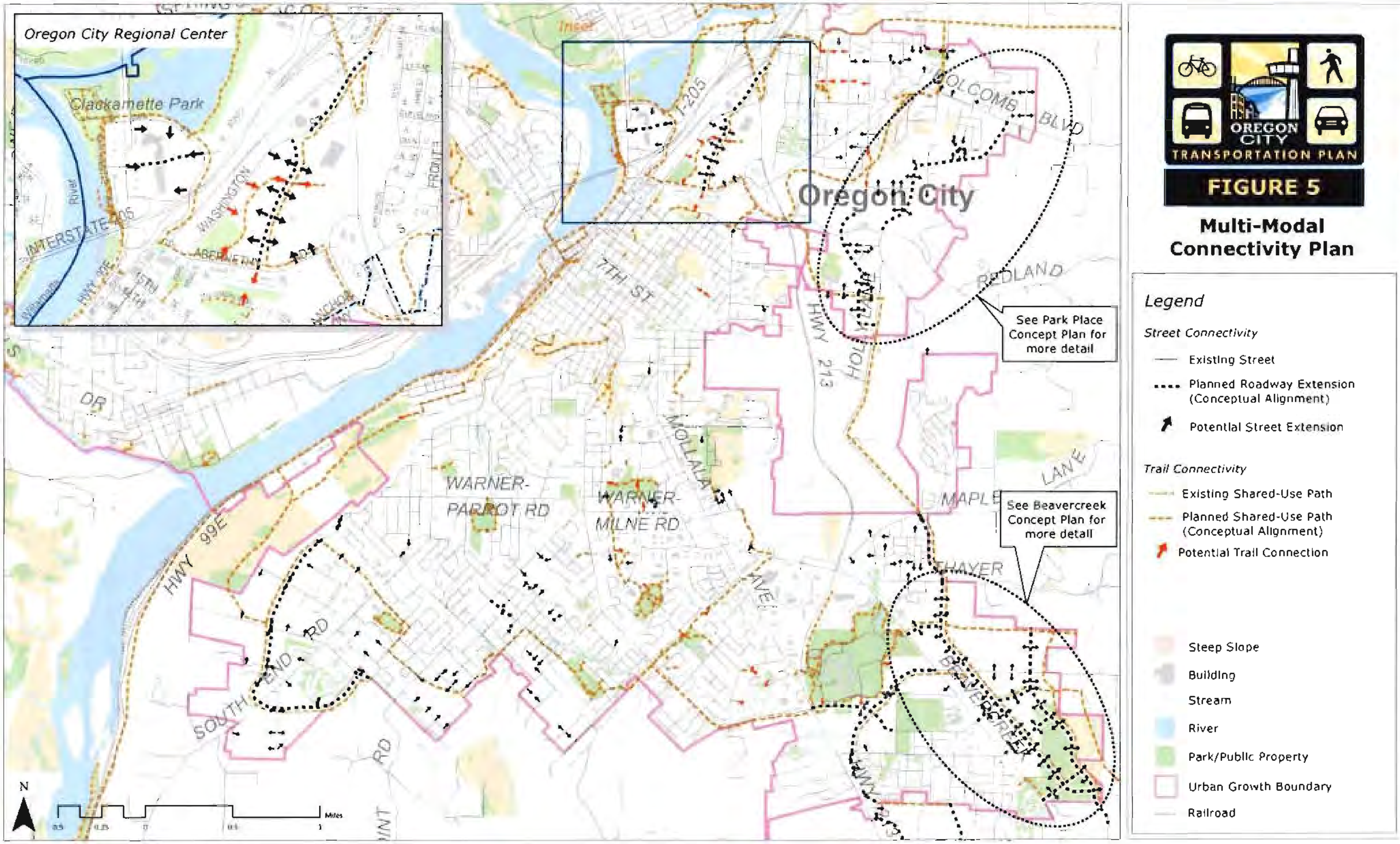
[2] Metro 2035 Regional Transportation Plan, Local Street Network Concept

[3] Metro Regional Transportation Functional Plan, Section 3.08.110, Subsection E, Street System Design Requirements


Oregon City Regional Center
Clackamette Park
INTERSTATE 205
WASHINGTON
ABERNETHY
FRONT
Oregon City
HOLCOMB BLVD
REDLAND
7TH ST
HWY 213
HOLLY LANE
See Park Place Concept Plan for more detail
MOLLALLA
WARNER-PARROT RD
WARNER-MILNE RD
MAPLE LANE
THAYER
See Beavercreek Concept Plan for more detail
BEAVERCREEK
HWY 99E
SOUTH END RD
DR
OREGON CITY TRANSPORTATION PLAN
FIGURE 5
Multi-Modal Connectivity Plan
Legend
Street Connectivity
Existing Street
Planned Roadway Extension (Conceptual Alignment)
Potential Street Extension
Trail Connectivity
Existing Shared-Use Path
Planned Shared-Use Path (Conceptual Alignment)
Potential Trail Connection
Steep Slope
Building
Stream
River
Park/Public Property
Urban Growth Boundary
Railroad
N
Miles

To protect existing neighborhoods from the potential traffic impacts caused by extending stub end streets, connector roadways should incorporate neighborhood traffic management into design and construction. In addition, when a development constructs stub streets, they shall install signs indicating the potential for future connectivity to increase the awareness of residents.

In order to ensure that new development complies with the objectives of the multi-modal street plan, applicants of residential or mixed-use developments of five or more acres will be required to provide a proposed street map as part of the development approval process. The street map must be consistent with the requirements of the Metro Regional Transportation Functional Plan[4] and should be reviewed to ensure the development does the following:

- Provide full street connections with spacing of no more than 530 feet between connections, except where prevented by barriers
- If full street connections are prevented, provides bike and pedestrian accessways with spacing of no more than 330 feet, except where prevented by barriers
- Limit use of cul-de-sacs and other closed-end street systems to situations where barriers prevent full street connections or to locations where pedestrian/bike accesses are to be provided at 330 feet intervals
- Include no cul-de-sacs and other closed-end street longer than 200 feet or having no more than 25 dwelling units
- Include street cross-sections demonstrating dimensions of right-of-way improvements, and posted or expected speed limits

Applicants of residential or mixed-use developments of less than five acres should comply with the following standards[5].

- Provide full street connections with spacing of no more than 530 feet between connections, except where prevented by barriers
- Include no cul-de-sacs and other closed-end street longer than 350 feet[6]
- If full street connections are prevented, provides bike and pedestrian accessways with spacing of no more than 350 feet, except where prevented by barriers

[4] Metro Regional Transportation Functional Plan, Section 3.08.110, Subsection E, Street System Design Requirements

[5] Metro Regional Transportation Functional Plan, Section 3.08.110, Subsection F, Street System Design Requirements

[6] Oregon City Municipal Code, Title 12, Section 12.04.225

Recommended TSP and Code Revisions

The following documents the implementation measures required for the street network and connectivity as part of the TSP update:

- Adopt the Multi-Modal Street System: This will replace the functional classification system for the City.
- Adopt the Design Types for Streets: This will replace the typical cross-sections for streets in the City.
- Adopt the Context Zone Standards for Streets: This includes new/updated standards for frontage, block size, access spacing and pedestrian crossings.
- Adopt the Multi-modal Connectivity Plan: This specifies the general locations where new streets or shared-use paths could potentially be installed as nearby areas are developed or as the opportunity arises.
- Develop local truck routes. Create figures that identify the streets located along a regional truck route, local truck route or a transit route.
- Adopt language that identifies when the City can consider constrained design options for streets.
- The arterial and collector connectivity gaps must be considered when developing solutions for the transportation system.

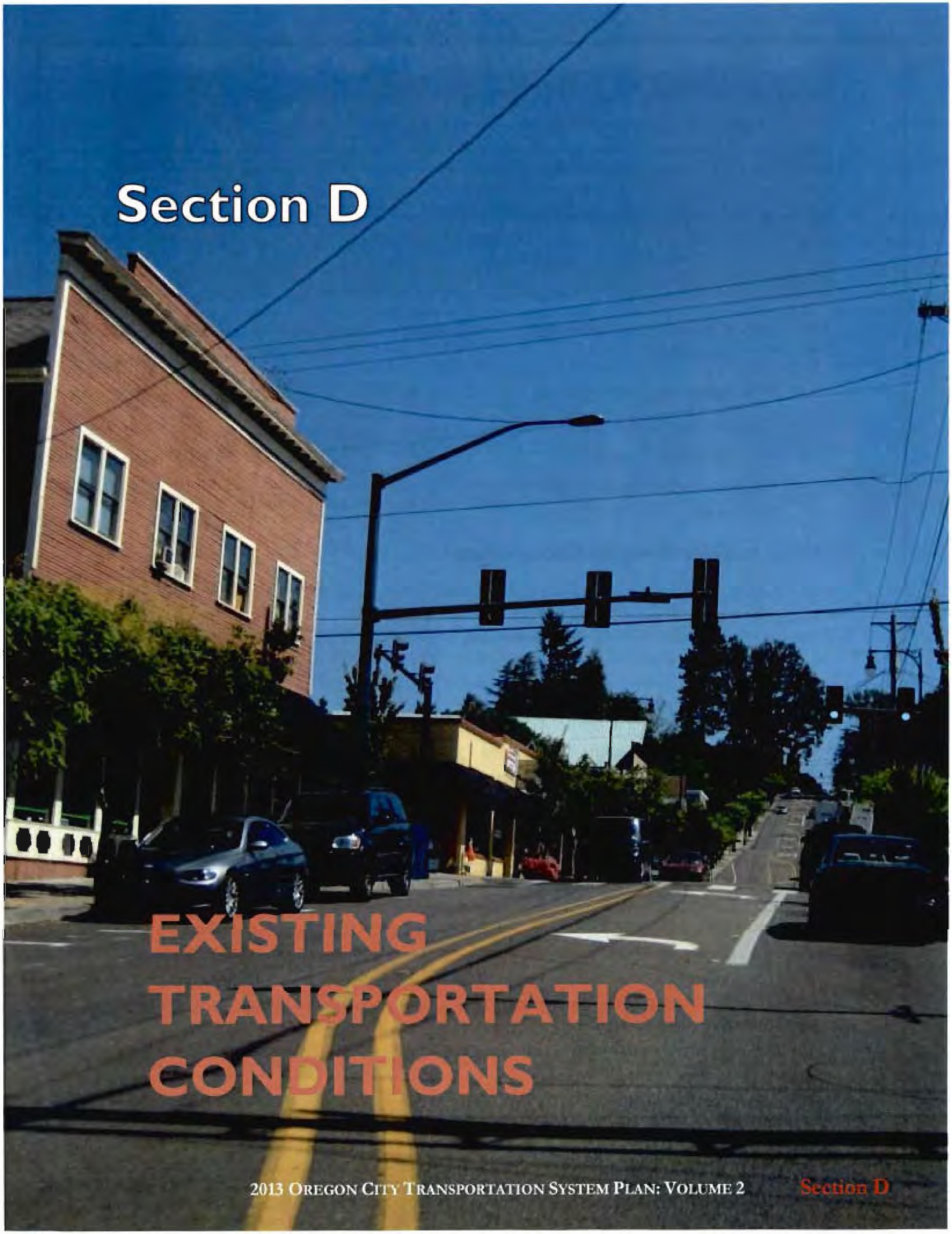
Appendix

Table A1: Oregon City Functional Classification Changes

Roadway	From	To	Change from Prior Classification	Reason for Change
Beutel Road	South End Road	End of Beutel Road	Upgrade from Local to Collector	Collector connectivity gap
Lawton Road / Madrona Drive	South End Road	End of Madrona Drive	Upgrade from Local to Collector	Collector connectivity gap
Rose Road / Deer Lane	South End Road	End of Deer Lane	Upgrade from Local to Collector	Collector connectivity gap
Meyers Road	Beavercreek Road	High School Avenue	Upgrade from Local to Minor Arterial	Arterial connectivity gap
High School Avenue	End of High School Avenue	Glen Oak Road	Upgrade from Local to Collector	Collector connectivity gap
Chanticleer Place / Chanticleer Drive	Russ Wilcox Way	Edgemont Drive	Upgrade from Local to Collector	Collector connectivity gap
Loder Road	UGB	Beavercreek Road	Upgrade from Local to Collector	Collector connectivity gap
Holly Lane	Redland Road	Maple Lane Road	Upgrade from Local to Minor Arterial	Arterial connectivity gap
Donovan Road	Holly Lane	End of Donovan Road	Upgrade from Local to Collector	Collector connectivity gap
Livesay Road	West of Frank Avenue	Redland Road	Upgrade from Local to Collector	Collector connectivity gap
Swan Avenue	Holcomb Boulevard	End of Swan Avenue	Upgrade from Local to Collector	Collector connectivity gap
Pearl Street	Eluria Street	Molalla Avenue	Upgrade from Local to Collector	Collector connectivity gap
Pearl Street	Molalla Avenue	Linn Avenue	Upgrade from Local to Collector	Collector connectivity gap
7th Street	OR 99E	Taylor Street	Upgrade from Minor Arterial to Major Arterial	Consistency with Metro functional classification
Center Street	5th Street	South 2nd Street	Upgrade from Local to Collector	Collector connectivity gap
Railroad Avenue / 7th Street	Main Street	OR 99e	Upgrade from Local to Collector	Collector connectivity gap
12th Street	OR 99e	Main Street	Upgrade from Local to Collector	Collector connectivity gap
14th Street	OR 99e	Washington Street	Upgrade from Local to Collector	Collector connectivity gap
15th Street	OR 99e	Main Street	Upgrade from Local to Collector	Collector connectivity gap

Clackamette Drive/ Dunes Drive	Main Street	OR 99E	Upgrade from Local to Collector	Collector connectivity gap
Agnes Avenue/ Washington Street	Main Street	I-205	Upgrade from Local to Collector	Collector connectivity gap
Skellenger Way/ Salmonberry Drive/ Hazel Grove Drive/ Fibert Drive	Central Point Road	South End Road	Downgrade from Collector to Local Streets	Adequate nearby connection
Spring Valley Drive	Boynton Street	Partlow Road	Downgrade from Collector to Local Street	Adequate nearby connection
Boynton Street	Warner Parrott Road	Central Point Road	Downgrade from Collector to Local Street	Adequate nearby connection
Shenandoah Drive	Warner Parrott Road	Central Point Road	Downgrade from Collector to Local Street	Adequate nearby connection
Woodlawn Avenue	Barker Avenue	Warner Parrott Road	Downgrade from Collector to Local Street	Adequate nearby connection
Central Point Road	Warner Parrott Road	UGB	Downgrade from Minor Arterial to Collector	Collector connectivity gap
Haven Road/ Prospector Terrace	Frontier Parkway	Leland Road	Downgrade from Collector to Local Street	Adequate nearby connection
Frontier Parkway	Meyers Road	Leland Road	Downgrade from Collector to Local Street	Adequate nearby connection
South Fir Street	Fir Street	Molalla Avenue	Downgrade from Minor Arterial to Collector	Collector connectivity gap
Marjorie Lane	Beavercreek Road	End of Marjorie Lane	Downgrade from Minor Arterial to Local Street	Adequate nearby connection
Caufield Road	OR 213	End of Caufield Road	Downgrade from Collector to Local Street	Adequate nearby connection
Ethel Street	Hood Street	Linn Avenue	Downgrade from Collector to Local Street	Adequate nearby connection
Laurel Lane	Holmes Lane	End of Laurel Lane	Downgrade from Collector to Local Street	Adequate nearby connection
May Street	Molalla Avenue	End of May Street	Downgrade from Collector to Local Street	Adequate nearby connection
Warner Street	Molalla Avenue	End of Warner Street	Downgrade from Collector to Local Street	Adequate nearby connection
Holmes Lane	Molalla Avenue	Linn Avenue	Downgrade from Minor Arterial to Collector	Collector connectivity gap
Barclay Hills Drive/ Alden Street/Hilda Street	Newell Ridge Drive	Molalla Avenue	Downgrade from Collector to Local Street	Adequate nearby connection
Roosevelt Street	Eluria Street	Molalla Avenue	Downgrade from Collector	Adequate nearby

			to Local Street	connection
Division Street / Anchor Way	Redland Road	7th Street	Downgrade from Minor Arterial to Collector	Collector connectivity gap
Monroe Street	12th Street	7th Street	Downgrade from Collector to Local Street	Adequate nearby connection
Cleveland Street	Swan Avenue	Apperson Boulevard	Downgrade from Collector to Local Street	Adequate nearby connection



Section D

EXISTING TRANSPORTATION CONDITIONS

This document introduces the transportation conditions in the City of Oregon City. Questions to be answered in this document include:

- What makes Oregon City unique?
- Where do people want to go?
- Where do people come from?
- What parts of the City do people come from?
- What factors determine how people travel?
- What transportation infrastructure is available?
- What travel conditions do people face?

What makes Oregon City unique?

Located along the shores of the Willamette and Clackamas Rivers near the scenic Willamette Falls, Oregon City is the oldest incorporated City west of the Rockies. With a population of around 34,000, the City is characterized by topography that rises sharply from the riverfront and downtown to reach 250 feet, above the Willamette River. The two to three blocks wide downtown is located at the base of a basalt bluff where the McLoughlin Conservation District is found, one of two of the City's historic neighborhoods. At higher elevations and further south from downtown, newer neighborhoods and commercial development has developed over the past 50 years. The City is now comprised of 12 unique neighborhoods as illustrated by the Neighborhood Associations (see Figure in appendix).

View from the Oregon City hillside

In recent years, the City has made great strides at inventing in the Downtown and the 7th Street-Molalla Avenue corridor and becoming a regional destination for employment, shopping and education. These characteristics make Oregon City unique, as well as define the key transportation issues that the City seeks to overcome.

Where do people want to go?

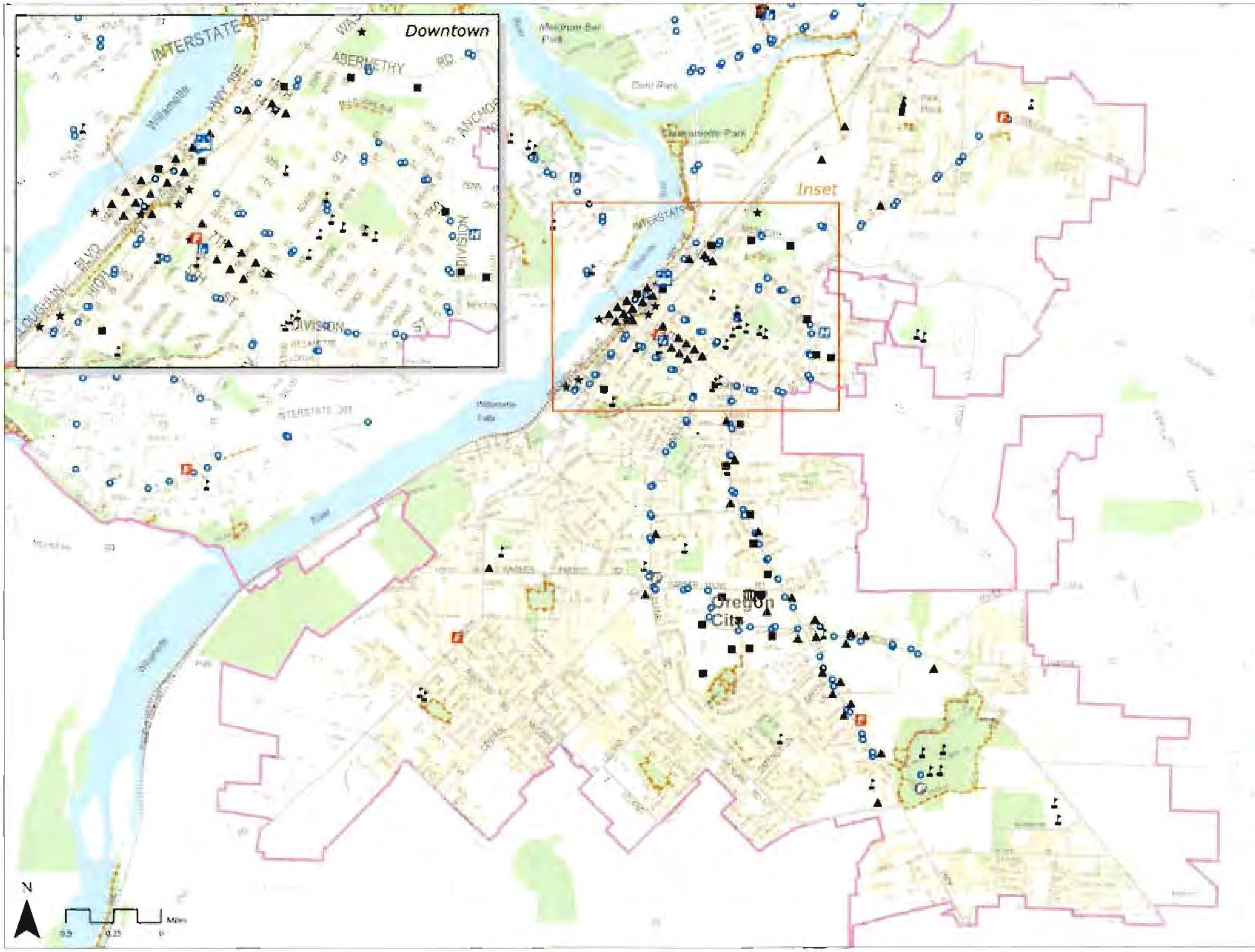
One of the first steps in planning for an effective transportation system is gaining an understanding of the key destinations that people currently travel to throughout the City. These destination points are referred to as activity generators (or trip attractors).

As the oldest incorporated City west of the Rockies, Oregon City is home to several cultural or recreational destinations that attract tourists and residents alike. Major destinations include the End of the Oregon Trail Interpretive Center, Museum of the Oregon Territory, Willamette Falls and the Willamette River waterfront, Carnegie Center, Municipal Elevator, McLoughlin House, Ermatinger House, and Barclay House.

Oregon City is also home to a regional educational institution, Clackamas Community College, in addition to several other major employment and shopping areas, including the historic downtown core. The most common categories of activity generators in the City include (see Figure 1 on the following page for the general locations of some of these activity generators):

- Recreational/Entertainment (e.g. Boat docks, parks, Willamette River Regional Trail, Oregon City Swimming Pool, McLoughlin Promenade)
- Schools (e.g. Clackamas Community College, Holcomb Elementary, Gaffney Lane Elementary, Gardiner Middle, Oregon City High)
- Places of employment (e.g. Oregon City Regional Center, Clackamas County Red Soils Business Park, business areas, industrial areas, offices)
- Shopping (e.g. downtown, grocery stores, shopping centers, restaurants)
- Cultural (e.g. End of the Trail Interpretive Center, McLoughlin House, Museum of the Oregon Territory, Main Street evens, other community events)
- Public Transportation (e.g. Bus stops, Oregon City Transit Center, park and ride, Amtrak)

Each of these categories of activity generators represents important starting and ending points for travel and provides a good basis for planning ideal routes.



Activity Generators

Legend

Activity Generators

- Cultural
- Professional/Office
- Shopping
- Hospital
- School
- Library
- City Hall
- Fire Station
- Police Station

Transit

- Park and Ride
- Bus Stop
- Oregon City Transit Center

- Existing Trails
- Parks and Open Spaces
- Railroad
- City Limit
- Urban Growth Boundary
- Tax Lots

How do people get there?

Most Oregon City residents commuted to work between the years 2005 and 2009 via single occupant motor vehicles (about 76 percent), or carpooling (about 10 percent)[1]. Approximately four percent of residents walked, four percent used public transportation, and two percent biked to work.

Table 1 compares the commute patterns of Oregon City residents to other Cities in the region. Commuting to work via public transportation was fairly similar in Oregon City and West Linn (four percent versus three percent), but accounted for four percent fewer trips in Oregon City than Milwaukie (four percent to eight percent). Fewer residents worked at home in both Oregon City and Milwaukie compared to West Linn (about five percent less), while more walked or biked to work (six percent in Oregon City, five percent in Milwaukie and three percent in West Linn).

Table 1: Transportation Modes Used to Commute to Work

	Percent of Commuters		
Transportation Mode	**Oregon City**	**West Linn**	**Milwaukie**
Workers over 16 years	*14,861*	*12,821*	*10,751*
Motor Vehicle- Single Occupant	76%	76%	74%
Motor Vehicle- Carpool	10%	8%	9%
Walked	4%	2%	4%
Biked	2%	1%	1%
Public Transportation	4%	3%	8%
Worked at Home	4%	9%	4%
Other	0%	1%	0%

Source: US Census Bureau, 2005-2009 American Community Survey

While the U.S. Census Bureau is a valuable source of information for work commute patterns in Oregon City, it does not truly represent the transportation modes utilized to other activity generators like schools, recreation, shopping or access to transit. Non-motor vehicle transportation modes are likely higher in Oregon City for these types of trips.

How transportation modes are used in the City

Pedestrian, bicycle, and motor vehicle activity at key intersections throughout Oregon City was reviewed during the evening peak period (3:15 p.m. to 6:15 p.m.) on a typical weekday in the late spring and early fall of 2011.[2] It was found that during the summer months, activity levels generally increase due to the overall pleasant weather and longer days enticing residents of Oregon City to get out and about in the City. It should be noted that although weekend pedestrian and bicycle activity levels were not measured, they would generally be expected to be higher than the activity levels of a typical weekday.

[1] 2005-2009 American Community Survey, US Census Bureau

[2] Based on counts conducted April 12th, April 13th, April 14th, April 21st and September 7th 2011

- **Pedestrian volumes** are generally highest in Downtown Oregon City and along 7th Street and Molalla Avenue. The highest hourly pedestrian activity during the evening peak occurred at the Molalla Avenue intersection with Clairmont Way, with over 50 pedestrian crossings in the one-hour period between 3:55 p.m. and 4:55 p.m. The highest hourly pedestrian activity levels at the reviewed intersections during the evening peak period are displayed in Figure A1 in the appendix.
- **Bicycle volumes** are generally low during the evening peak period, with no more than nine bicyclists traveling through any of the intersections reviewed during a single one-hour period between 3:15 and 6:15 p.m. The highest volumes occurred on Washington Street between 5th Street and 15th Street, with hourly volumes ranging between eight and nine cyclists. The highest hourly bicycle activity levels at the reviewed intersections during the evening peak period are displayed in Figure A1 in the appendix.
- **Motor vehicle volumes** on the roadways in Oregon City peak during the evening between 3:25 p.m. and 5:10 p.m., but generally vary depending on the time of year. During the summer months, traffic volumes increase due to an influx of recreational and leisure travelers taking advantage of the nice weather. For this reason, the traffic count data was adjusted upward to represent peak seasonal traffic conditions. The peak seasonal traffic volumes developed for the reviewed intersections can be found in Figure A2 in the appendix. Peak seasonal motor vehicle volumes are highest along OR 99E, generally ranging between 1,000 and 2,000 vehicles in each direction during the evening peak hour. Evening peak hour traffic volumes are also high along OR 213, Molalla Avenue, Washington Street and Beavercreek Road, generally ranging between 500 and 1,000 vehicles in each direction.

Where do people come from?

Much of the traffic in Oregon City is often related to employment travel. As shown in Table 2, half of the workers in Oregon City live in another City. The commute mode for employees that travel into the City is often dependent on the regional transportation system. If there is walking, biking, transit or other facility deficits outside the City, then a commuter may be discouraged from utilizing those travel modes.

Table 2: Where Oregon City Workers Live

Oregon City workers who:	Percent of Oregon City Workers	Distance from Oregon City
Live in Oregon City	**50%**	-
Live outside Oregon City	**50%**	-
Live in Portland	*20%*	*12+ miles*
Live in West Linn	*7%*	*1+ miles*
Live in Milwaukie	*4%*	*7+ miles*
Live in Gresham	*4%*	*17+ miles*
Live in Other City in Oregon	*15%*	*2+ miles*

Source: Census Transportation Planning Package (CTPP), 2006-2008 American Community Survey

Oregon City Employee Commute Mode

More than three quarters (75 percent) of the commuters in northeast, south-central, southeast and southwest Oregon City and 70 percent in central Oregon City commute to work via single occupant motor vehicle (see Table 3). The greatest percent of residents walking to their place of employment occurs in the southeast part of Oregon City (6 percent of residents) while the highest bicycle commuting to work occurs in central Oregon City (5 percent). The highest usage of public transportation to work occurs in the central and southeast part of the City (4 percent).

Table 3: Work Commute Mode by area of Oregon City

Transportation Mode	Northeast Oregon City (1)	Central Oregon City (2)	South- Central Oregon City (3)	Southeast Oregon City (4)	Southwest Oregon City (5)
Motor Vehicle-Single Occupant	78%	71%	78%	75%	86%
Motor Vehicle-Carpool	6%	12%	11%	11%	8%
Walked	3%	3%	2%	6%	0%
Biked	0%	5%	2%	0%	0%
Public Transportation	2%	4%	3%	4%	2%
Motorcycle/Other	1%	1%	0%	1%	0%
Worked at Home	10%	3%	4%	4%	4%

Source: US Census Bureau, 2005-2009 American Community Survey

1. Includes the Park Place and part of the Caufield (north of Beavercreek Road) neighborhoods
2. Includes Downtown and the McLoughlin neighborhood
3. Includes the Canemah, Barclay Hills, Rivercrest and part of the South End (northeast of the South End Road/Warner Parrott Road intersection) neighborhoods
4. Includes the Towervista, Hillendale, Gaffney Lane and part of the Caufield (south of Beavercreek Road) neighborhoods
5. Includes the Hazel Grove/ Westling Farm and part of the South End (west of South End Road) neighborhoods

What factors determine how people travel?

Travelers often weigh a variety of factors when deciding how to commute to their destination. Whether the trip will be via motor vehicle, walking, bicycle, or public transportation, the choice is often a balance between ease and convenience of travel, travel cost, and travel time.

Where are you going? Whether you are going to work, school, shopping, or to a park, your trip type (or your destination point) often determines your mode of transportation. If you are destined for a park or school you generally have a higher likelihood to walk or bicycle, as opposed to work or shopping in which travel via motor vehicle is generally more convenient. In addition, the distance of that destination would play a role in mode choice. Trips that are shorter generally present a greater opportunity to walk or bicycle, as opposed to longer distance trips that often require transit or motor vehicle to reach the destination.

Will you have to cross a busy road or walk along a road without sidewalks? The availability of sidewalks, curb ramps to provide wheelchair access, crosswalks, and bicycle lanes increase the comfort and access of walking and biking. A lack of these facilities, particularly on higher volume/speed roadways, discourages people from utilizing non-motor vehicle modes of transportation.

Where you work and how long it takes you to get there. Oregon City residents who work outside of the City are likely to commute via motor vehicle due to travel distance and commute time. As seen in Table 4, about 58 percent of Oregon City residents commute outside the City to work. Over 40 percent of these commuters travel to employment locations at least 10 miles outside of the City.

Table 4: Where Oregon City Residents Work

Oregon City residents who:	Percent of Oregon City Workers	Distance from Oregon City
Work in Oregon City	**42%**	-
Work outside Oregon City	**58%**	-
Work in Portland	*35%*	*12+ miles*
Work in Milwaukie	*4%*	*7+ miles*
Work in Tigard	*4%*	*13+ miles*
Work in Salem	*3%*	*35+ miles*
Work in Other City in Oregon	*12%*	*6+ miles*

Source: Census Transportation Planning Package (CTPP), 2006-2008 American Community Survey

Age and income. Demographic characteristics such as age and income play a key role in determining mode of transportation. Oregon City residents with lower incomes, as well as the youngest and oldest residents often account for more trips via walking, biking, and public transportation. As seen in Table 5, about a quarter (25 percent) of Oregon City residents living in the neighborhoods south of Downtown (e.g. Barclay Hills, Rivercrest, South End, Towervista, Hillendale, Gaffney Lane, Caufield, Hazel Grove and Canemah) are school-aged children, while about 10 percent of Oregon City residents throughout the City are above the retirement age. The central part of Oregon City (Downtown and McLoughlin neighborhood) accounts for the lowest median household income (around $43,000), which is approximately $10,000 to $30,000 less than the other parts of the City.

Table 5: Key Demographics in Oregon City

	Northeast Oregon City	Central Oregon City	South- Central Oregon City	Southeast Oregon City	Southwest Oregon City
Age (by percent of residents)					
School aged (Under 18)	21%	17%	24%	26%	24%
Middle Aged (18 to 66)	68%	71%	68%	64%	63%
Retired Aged (67+)	11%	12%	9%	10%	13%
Median Household Income	$68,110	$42,988	$52,041	$58,362	$70,000

Source: US Census Bureau, 2005-2009 American Community Survey

Is it cold or raining? Weather could potentially play a role in determining how trips are made. Oregon City experiences cool, rainy winters, with mild and generally dry summers. According to the national weather service, average temperatures in the winter months (November to March) are around 45 degrees Fahrenheit, with measurable rainfall occurring about 17 days each winter month. The spring and fall months (April, May, and October) are slightly warmer and dryer, with average temperatures around 55 degrees Fahrenheit, and about 14 days of measurable rainfall. The summer months (June to September) are typically very pleasant, with average temperatures around 65 degrees Fahrenheit, and less than 10 days of measurable rainfall each month.[3] The rainy weather could discourage walking and biking trips, forcing users to potentially make a trip via motor vehicle or other means, when they would otherwise walk or bike.

Are you able to walk or bike on a steep hill? Topography, one of the things that makes Oregon City a unique place with the sloping and hilly terrain, is generally a deterrent to walking and bicycling. The terrain makes these trips more difficult and potentially creates barriers for those with disabilities.

Steep hill without pedestrian or bicycle facilities

[3] Climate Summary for Portland area, National Weather Service

What transportation infrastructure is available?

Oregon City has an abundance of existing transportation infrastructure that residents use on a daily basis. The infrastructure includes sidewalks, bike lanes, multi-use trails, roadways and transit.

Walking

Walking plays a key role in Oregon City's transportation network. Planning for pedestrians not only helps the City provide a complete, multi-modal transportation system, it addresses a social equity issue, ensuring that the young, the elderly, and those not financially able to afford motorized transport have access to goods, services, employment, and education. Approximately four percent of commuters in the City walk to work, with another four percent utilizing public transportation (which generally include a walking trip at the beginning or end) to get to work. In addition to the work commute trips, walking trips are made to and from recreational or shopping areas, schools, or other activity generators. In general, it is desirable to provide continuous sidewalk connections between all activity generators and arterial/collector roadways to allow for safe and attractive non-motorized travel options. Oregon City's walking network, shown in Figure 2, is composed of sidewalks, stairs, and multi-use paths.

Sidewalks are located along roadways, are separated from the roadway with a curb and/or planting strip, and have a hard, smooth surface, such as concrete. The Oregon Department of Transportation (ODOT) standard for sidewalk width is six feet, with a minimum width of five feet acceptable on local streets. Oregon City requires sidewalks to be at least five feet wide. Most of the roadways in downtown Oregon City have sidewalks on both sides, while continuous sidewalks along 7th Street and Molalla Avenue link downtown Oregon City with Clackamas Community College. Beyond these areas, continuous sidewalks are generally limited throughout the City.

Stairway/Elevator: The Oregon City Municipal Elevator, located at the 7th Street/Railroad Avenue intersection and the Grand Staircase provide alternative connections for pedestrians to the top of the bluff above downtown.

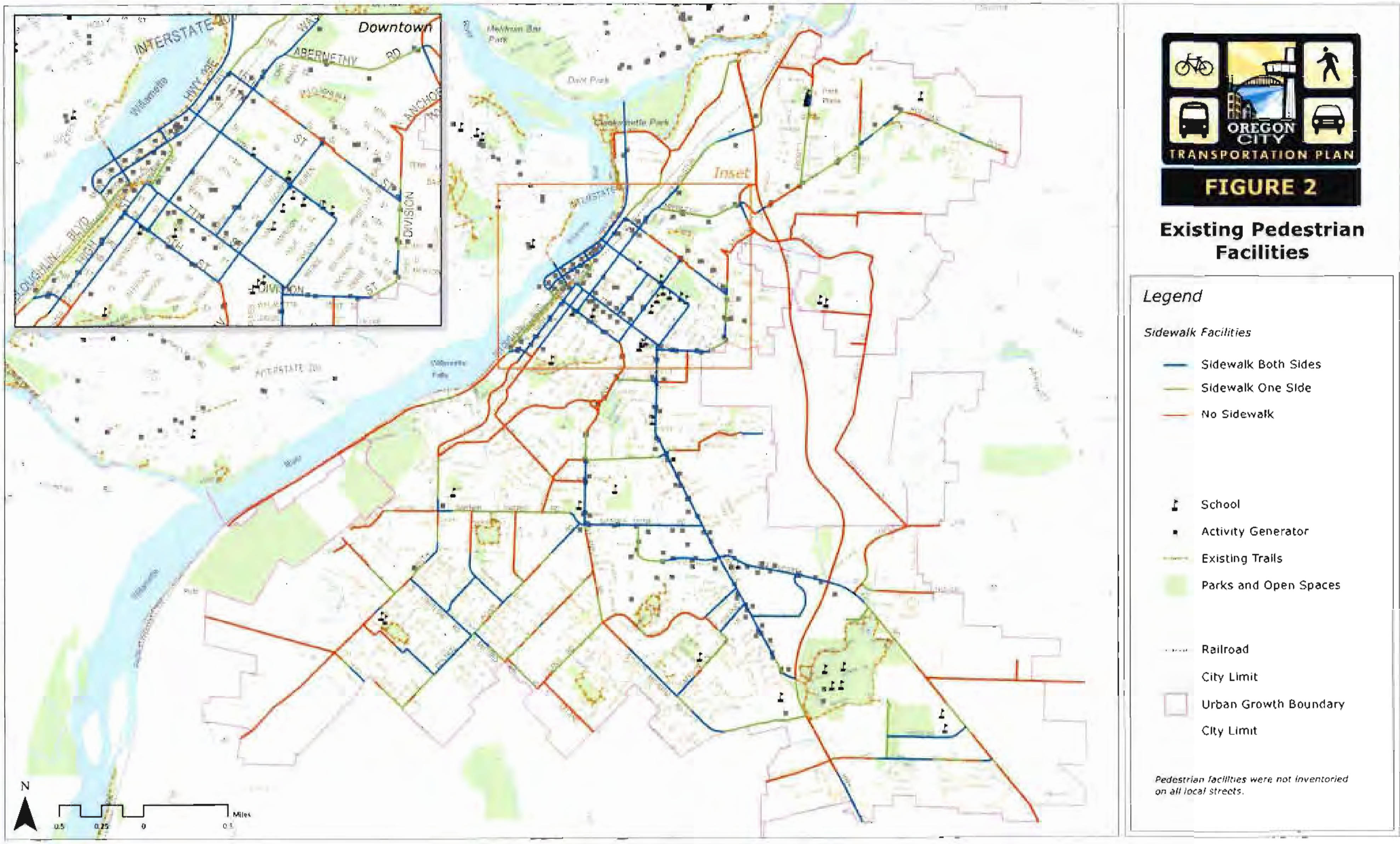
Multi-use paths are used by a variety of non-motorized users, including pedestrians, bicyclists, skateboarders, and runners. Multi-use paths are typically paved (asphalt or concrete) but may also consist of an unpaved smooth surface as long as it meets Americans with Disabilities Act (ADA) standards. Multi-use paths are usually wider than an average sidewalk (i.e. 10 – 14 feet).

View of the Municipal Elevator from Main Street

- The I-205 multi-use path crosses the Clackamas River from Gladstone to the north of Oregon City via the 82nd Drive/Park Place Bridge. Here the path travels into Oregon City to Clackamette Park where it joins the Willamette River Trail. North of the Clackamas River, the I-205 multi-use path generally runs for 16.5 miles paralleling I-205, connecting downtown Oregon City to Marine Drive near the Portland International Airport. The path also interests with other regional trails such as the Springwater Corridor Trail and the Trolley Trail.

- The McLoughlin Promenade runs for approximately a half-mile along the bluff above downtown Oregon City. The path provides a connection from the McLoughlin House on Center Street to Tumwater Drive near OR 99E. A pedestrian bridge over OR 99E (McLoughlin Boulevard) links the west side of OR 99E with the south end of the McLoughlin Promenade.
- The Willamette River Trail, located between OR 99E and the Willamette River, connects Clackamette Park to downtown Oregon City via Jon Storm Park and the newly enhanced pedestrian accessible Willamette Terrace located near 12th Street.
- Several short multi-use paths connect adjacent roadways to City parks, such as the path connecting Hillendale City Park near Clairmont Way to Red Soils Court, just to the south of Beavercreek Road. These are generally used for recreational purposes.
- A number of natural surface trails, such as the Waterboard Park walking path, are also located in Oregon City. These trails are mostly used by pedestrians, primarily for recreational purposes.


Willamette Terrace



Downtown
Inset
OREGON CITY
TRANSPORTATION PLAN
FIGURE 2
Existing Pedestrian Facilities
Legend
Sidewalk Facilities
Sidewalk Both Sides
Sidewalk One Side
No Sidewalk
School
Activity Generator
Existing Trails
Parks and Open Spaces
Railroad
City Limit
Urban Growth Boundary
City Limit
Pedestrian facilities were not inventoried on all local streets.
N
Miles

Bicycling

Oregon City's bicycling network, shown in Figure 3, is composed of bikelanes, shared roadways and multi-use paths.

Shared Roadway: Shared roadways include roadways on which bicyclists and motorists share the same travel lane. The most suitable roadways for shared bicycle use are those with low speeds (25 mph or less) and low traffic volumes (3,000 vehicles per day or fewer). Signed shared roadways are shared roadways that are designated and signed as bicycle routes and serve to provide continuity to other bicycle facilities (e.g. bicycle lanes) or designate a preferred route through the community. Common practice is to sign the route with standard Manual on Uniform Traffic Control Devices (MUTCD) green bicycle route signs with directional arrows. Shared roadways can also have signing that highlights a special route or provides directional information in bicycling minutes or distance (e.g., "Library, 3 minutes, ½ mile").

Signed bike route in Oregon City

- There are a few signed bike routes in the City, such as the OR 99E/Washington Street and Molalla Avenue bike routes.
- Sharrows are used on Main Street in downtown Oregon City
- Many local streets in Oregon City are low speed/low volume roadways that could be classified as shared roadways. Although there are no signs or pavement markings to indicate that a particular local street is a shared roadway or part of a bicycle route, these low traffic roadways often connect residential neighborhoods to commercial areas—allowing bicyclists to bypass heavily trafficked thoroughfares in favor of quieter streets.

Path adjacent to OR 213 near Clackamas Community College

Multi-use paths such as those around Clackamas Community College and I-205 multi-use path provide off-street travel for bicyclists.

Shoulder Bikeway: These are paved roadways that have striped shoulders wide enough for bicycle travel. ODOT recommends a six-foot paved shoulder to adequately provide for bicyclists, and a four-foot minimum width in constrained areas. Roadways with shoulders less than four feet are considered shared roadways. Sometimes shoulder bikeways are signed to alert motorists to expect bicycle travel along the roadway.

Wide shoulders along OR 213

- OR 213 has a wide roadway shoulder available to bicyclists from Washington Street to Beavercreek Road. It does have bicycle markings in a few locations, good pavement quality and sufficient width to accommodate bicycle travel.

Bicycle Lanes: Bike lanes are portions of the roadway designated specifically for bicycle travel via a striped lane and pavement stencils. ODOT standard width for a bicycle lane is six feet. The minimum width of a bicycle lane against a curb or adjacent to a parking lane is five feet. A bicycle lane may be as narrow as four feet, but only in very constrained situations. Bike lanes are most appropriate on arterials and collectors, where high traffic volumes and speeds warrant greater separation of the travel modes. Existing bicycle facilities in Oregon City can be seen in Figure 3.

- Bike lanes are generally available along many arterial and collector roadways in the City including Molalla Avenue, Beavercreek Road, Linn Avenue, South End Road, Warner Milne Road, Warner Parrott Road and Washington Street. In addition, a bike connection to the regional I-205 multi-use trail is provided via OR 213 and Washington Street.

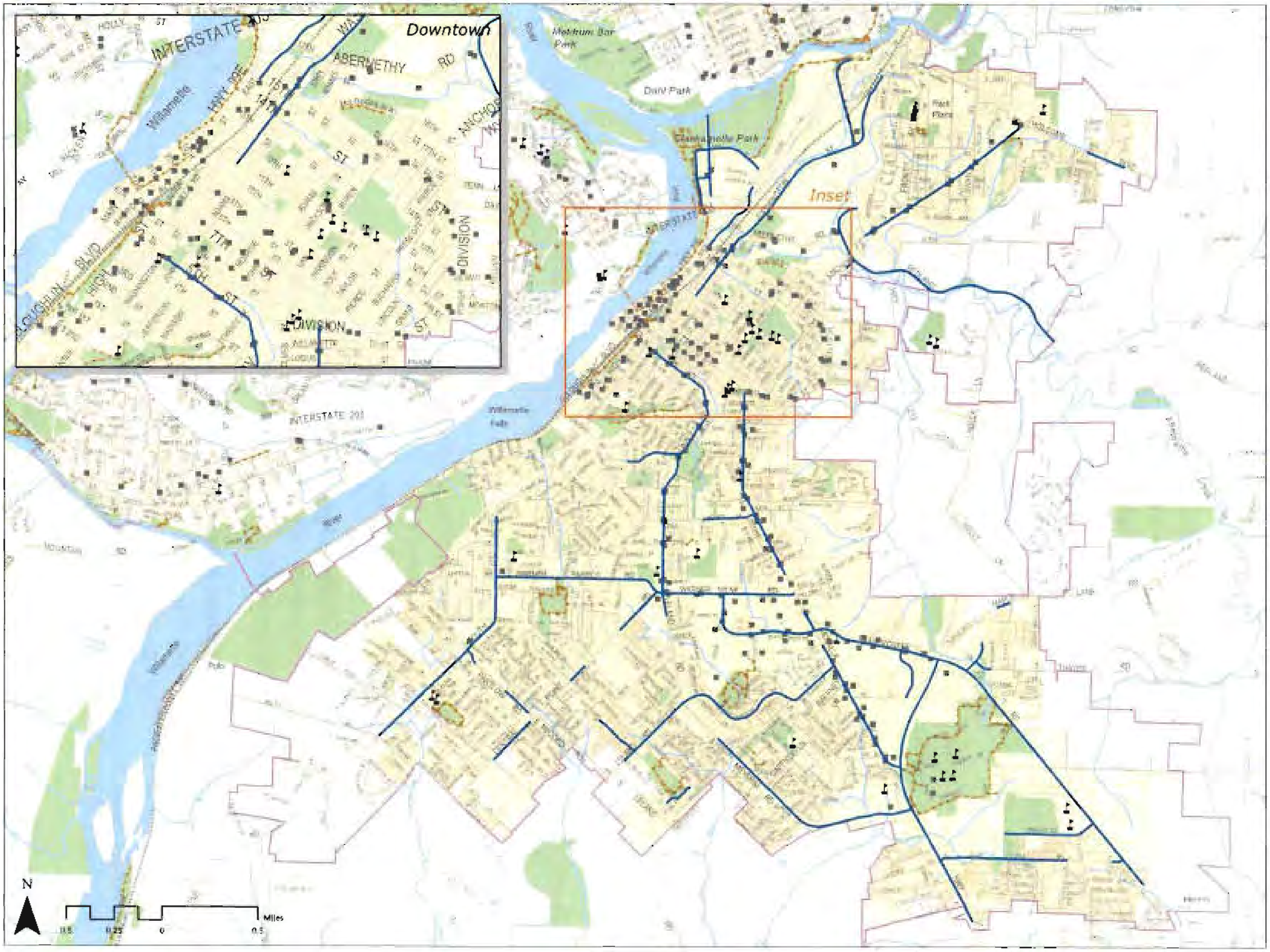
Short-term bike parking near Jon Storm Park

Bicycle Parking: End-of-trip bicycle facilities are a fundamental component of a bicycle network. In addition, a lack of safe and secure parking facilities can be an obstacle to promoting bicycle riding. Bicycle parking can be broadly defined as either short-term or long-term parking.

Short-term parking meant to accommodate visitors, customers, messengers and others expected to depart within two hours; requires approved standard rack, appropriate location and placement, and weather protection.

Long-term parking meant to accommodate employees, students, residents, commuters, and others expected to park more than two hours. This parking is to be provided in a secure, weather-protected manner and location.

- Long-term bike parking is available at Oregon City Hall and the Oregon City Transit Center via bike lockers.



OREGON CITY TRANSPORTATION PLAN

FIGURE 3

Existing Bicycle Facilities

Legend

Bicycle Facilities

- Bicycle Lane
- School
- Activity Generator
- Multi-Use Path
- Parks and Open Spaces
- Railroad
- City Limit
- Urban Growth Boundary
- Tax Lots

Transit

Transit service is provided in Oregon City by TriMet via seven fixed bus routes connecting Oregon City to the rest of the Portland Metropolitan area, and an Americans with Disabilities Act (ADA) paratransit service. The fixed transit routes in Oregon City can be seen in Figure 4. In addition, seasonal transit service is provided to residents and tourists via the Oregon City Trolley, and regional service is provided via the Canby Area Transit system, South Clackamas Transportation District and Amtrak.

Oregon City Transit Center in Downtown

Transit Access and Amenities: The Oregon City Transit Center, located on Main Street between Moss Street and 11th Street, offers a transfer point between the seven TriMet fixed bus routes, the Oregon City Trolley and the regional bus service to Canby. The transit center offers a shelter, bench and rentable bike lockers for riders.

Bus stops in Oregon City are located along Main Street, Railroad Avenue, 2nd Street, High Street, 5th Street, Linn Avenue, 7th Street, Molalla Avenue, Division Street, 9th Street, 16th Street, Jackson Street, Abernethy Road, Holcomb Boulevard, Longview Way, Warner Milne Road and Beavercreek Road. Only some of the bus stops offer benches and shelter and some lack sidewalk connections to the surrounding neighborhoods and businesses. While transit users in the Park Place, McLoughlin, Barclay Hills, Hillendale, Gaffney Lane and Rivercrest neighborhoods are generally in close proximity to a bus stop, those in the Caufield, Canemah, South End, Tower Vista and Hazel Grove/Westling Farm neighborhoods could potentially be over two miles from a bus stop (greater than the typical trip length for the average walking or biking trip).

Park and ride facilities are provided for transit users at two locations in Oregon City, near the Linn Avenue/Williams Avenue intersection (just north of Warner Milne Road) and at Clackamas Community College.

All TriMet buses are equipped with either a boarding ramp or a lift to allow wheelchair access, and include bicycle racks. Riders are only permitted to load their bicycle inside the bus if they can collapse to the size of a standard piece of luggage.

TriMet's LIFT paratransit service provides public transportation to persons with disabilities who are unable to use regular fixed route buses. Curb to curb paratransit service, in wheelchair lift equipped mini-buses, is available generally between 4:30 a.m. and 2:30 a.m. seven days a week.

Frequent bus service to Downtown Portland is provided by Route 33 (McLoughlin) and Route 99 (McLoughlin Express), which run from the transit mall in Downtown Portland to the Oregon City Transit Center or Clackamas Community College. Route 33 runs with 15 minute headways during the a.m., midday, and p.m. peak periods, and offers service between 4:30 a.m. and 1:45 a.m. Monday through Friday. On weekends, Route 33 offers service between 6:00 a.m. and 1:30 a.m. The busiest stops along this route include the Oregon City Transit Center and Clackamas Community College, with nearly 700 and 500 daily boardings and de-boardings respectively.

Route 99 departs Oregon City every 15 minutes between 5:30 a.m. and 8:00 a.m. destined for Downtown Portland and arrives in Oregon City from Downtown Portland every 15 minutes between 3:30 p.m. and 6:30 p.m. Monday through Friday. Some of the busiest stops include the Oregon City Transit Center (131 daily ons/offs), Clackamas Community College (94 daily ons/offs) and Molalla/Clairmont (58 daily ons/offs).

Bus Service to Clackamas Community College is provided by Route 32 (Oatfield), which runs from the transit mall in Downtown Portland or the Milwaukie City Center to Clackamas Community College. Key destinations along this route include the Willamette Falls Hospital, Oregon City Transit Center and the Cities of Portland, Gladstone and Milwaukie. TriMet Route 32 offers bus service between 5:30 a.m. and 7:00 p.m. Monday through Friday, generally with 15 to 30 minute headways. Bus service is also provided on Saturday between the Oregon City Transit Center and Clackamas Community College only, between 10:00 a.m. and 5:30 p.m. with one hour headways. Some of the busiest stops include the Oregon City Transit Center (249 daily ons/offs), Clackamas Community College (174 daily ons/offs) and Molalla/Mountain View (48 daily ons/offs).

Bus Service to Milwaukie is provided by Route 34 (River Road), connecting the Park Place neighborhood (along Holcomb Avenue) to Milwaukie. TriMet Route 34 offers bus service between 5:30 a.m. and 6:45 p.m. Monday through Friday, generally with one to three hour headways. The busiest stop along this route includes the Oregon City Transit Center with 84 daily boardings and de-boardings.

Bus Service to Lake Oswego and the University of Portland is provided by Route 35 (Macadam/Greeley). Route 35 offers bus service between 4:45 a.m. and 1:30 a.m. Monday through Friday, generally with 10 to 30 minute headways. On weekends, Route 35 generally offers service between 6:00 a.m. and 1:15 p.m., approximately every 30 to 60 minutes.

Bus Service to the Clackamas Town Center is provided by Route 79 (Clackamas/Oregon City). Route 79 offers bus service between 6:00 a.m. and 10:30 p.m. Monday through Friday, generally with 30 to 40 minute headways. On weekends, Route 79 offers service between 8:00 a.m. and 10:30 p.m., approximately every 30 to 60 minutes. The Oregon City Transit Center has nearly 700 daily boardings and de-boardings for this route.

Bus Service to West Linn is provided by Route 154 (Willamette). Route 154 provides weekday service between West Linn's Willamette neighborhood and Oregon City approximately every hour between 6:30 a.m. and 7:30 p.m.

The Oregon City Trolley provides free service seven days a week during the summer months for residents and tourists. Key destinations along the route include the McLoughlin House, End of the Oregon Trail Center, Jon Storm Park, Clackamette Park, Ermatinger House, Downtown and the Willamette Falls overlook.

Oregon City Trolley

Bus Service to Canby is provided by Canby Area Transit (CAT). CAT provides weekday service connecting the Oregon City Transit Center to Canby, Aurora, Hubbard and Woodburn.

Bus Service to Molalla is provided via the South Clackamas Transportation District (SCTD). SCDT provides weekday service connecting Clackamas Community College with Carus, Mulino, Liberal and Molalla.

Amtrak provides passenger rail service connecting Oregon City to Seattle and Eugene. The Amtrak station in Oregon City is located on Washington Street, just north of Abernethy Road.

OREGON CITY TRANSPORTATION PLAN

FIGURE 4

Existing Transit Routes

Legend

Transit Facilities

- Bus Stop
- Transit Center
- Park and Ride

Bus Route

- 032
- 033
- 034
- 035
- 079
- 099
- 154

- School
- Activity Generator
- Multi-Use Path
- Parks and Open Spaces
- Railroad
- City Limit
- Urban Growth Boundary
- Tax Lots

Driving

Despite the hilly terrain, the roadways in the Downtown area of Oregon City are generally well connected and follow a gridded pattern. At the top of the hill, many of the roadways are generally windier, not continuous, and have larger blocks despite the relatively flat terrain. In addition, the steep slopes between the Downtown and the other parts of the City allow only limited connections up the hill. For these reasons, it becomes necessary to manage the existing roadways by determining how the traffic from various parts of Oregon City can be channelized within the network in a logical and efficient manner.

How do we manage the roadway network in Oregon City? To manage the roadway network, the City classified the roadways based on a hierarchy according to the intended purpose of each road (as shown in Figure 5). From highest to lowest intended usage, the classifications are freeway, expressway, major arterial, minor arterial, collector, and local streets. Roadways with a higher intended usage generally provide more efficient traffic movement (or mobility) through the City, while roadways with lower intended usage provide greater access for shorter trips to local destinations such as businesses or residences.

Freeways and Expressways are limited access state roadways. These roadways serve the highest volume of motor vehicle traffic and are primarily utilized for longer distance regional trips. Both OR 213 and I-205 have posted speed limits of 55 miles per hour.

Major Arterial Roadways are intended to move traffic through Oregon City. These roadways generally experience higher traffic volumes and often connect to locations outside of the City (such as Beavercreek Road) or act as a corridor connecting many parts of the City (such as Molalla Avenue). Posted speed limits on these roadways are generally between 30 to 45 miles per hour, with the higher speeds posted in less urbanized areas and lower speeds in areas with more congestion such as downtown.

OR 99E is an example of a major arterial roadway.

Minor Arterial Roadways are intended to serve local traffic traveling to and from major arterial roadways. These roadways provide greater accessibility to neighborhoods, often connecting to major activity generators and provide efficient through movement for local traffic. Posted speeds on minor arterial roadways typically range between 25 and 45 miles per hour.

Linn Avenue is an example of a minor arterial roadway.

Collector Roadways often connect the neighborhoods to the minor arterial roadways. These roadways serve as major neighborhood routes and generally provide more direct property access or driveways than arterial roadways. Posted speeds on collector roadways generally range between 25 and 35 miles per hour.

Local Roadways provide more direct access to residences in Oregon City. These roadways are often lined with residences and are designed to serve lower volumes of traffic with a statutory speed limit of 25 miles per hour.

ODOT also classifies roadways in Oregon City under their jurisdiction. Roadways under ODOT jurisdiction (see Figure A3 in the appendix) include the roadways that the City classified as Freeway (I-205), Expressway (OR 213) and several major arterials (i.e. OR 99E, and OR 213). The major characteristics of ODOT roadways in Oregon City are summarized in Table 6. Most of the ODOT roadways in the City are classified by ODOT as District Highways. The exception is I-205, which is classified as an Interstate Highway and OR 99E south of I-205 which is classified as a Regional Highway.

Table 6: ODOT Roadway Characteristics

Roadway (limits)	ODOT Classification*	Special Designations*	Cross section	Posted Speed
I-205 (Willamette River to Clackamas River)	Interstate Highway	Freight Route; Truck Route	4 to 6 lanes	65 mph
OR 213 (I-205 to Molalla Avenue)	District Highway	Expressway; Bypass	4 to 5 lanes	45 to 55 mph
OR 213 (Molalla Avenue to south City limits)	District Highway	N/A	3 to 5 lanes	45 mph
OR 99E (Clackamas River to I-205)	District Highway	Truck Route	4 to 7 lanes	40 mph
OR 99E (I-205 to south City limits)	Regional Highway	Truck Route; Special Transportation Area (STA)**	3 to 5 lanes	30 to 40 mph
OR 43 (Oregon City-West Linn Bridge to OR 99E)	District Highway	STA	2 lanes	25 mph

Source: * Oregon Highway Plan (OHP), Appendix D
**STA designation on OR 99E from 14th Street to Railroad Avenue


OREGON CITY
TRANSPORTATION PLAN
FIGURE 5
Existing Functional Classification and Speed Limits
Legend
Existing Functional Classification
Freeway
Expressway
Major Arterial
Minor Arterial
Collector
Local
Posted Speed Limit
School
Activity Generator
Multi-Use Path
Parks and Open Spaces
Railroad
City Limit
Urban Growth Boundary
Tax Lots
Downtown
Inset
Oregon City
INTERSTATE
ABERNETHY
Miles

Bridges

Five bridges connect Oregon City to areas north and west of the City. The bridges include:

View of the Arch Bridge from Downtown

- **Oregon City-West Linn Arch Bridge** crosses the Willamette River to the northwest of Oregon City, connecting to West Linn. The bridge, constructed in 1922, is just under two tenths of a mile long and is iconic for the region. The bridge is open to motor vehicle, pedestrian and bicycle traffic only. Bicyclists must share the roadway with motor vehicles. In 2010, ODOT estimated 12,700 vehicles crossed the bridge each day.
- **Abernethy Bridge** opened in 1970 and carries I-205 traffic across the Willamette River between Oregon City and West Linn. The bridge is open to motor vehicle and freight traffic only. In 2010, ODOT estimated 98,100 vehicles crossed the bridge each day.
- **Clackamas River Bridge** opened in 1962 and carries I-205 traffic across the Clackamas River between Oregon City and Gladstone. The bridge is open to motor vehicle and freight traffic only. In 2010, ODOT estimated 129,100 vehicles crossed the bridge each day.
- **John McLoughlin Bridge** carries OR 99E traffic across the Clackamas River to the north of Oregon City, connecting to Gladstone. The bridge is open to motor vehicle, freight, pedestrian and bicycle traffic. Bicyclists must share the roadway with motor vehicles. In 2010, ODOT estimated 32,000 vehicles crossed the bridge each day.
- **82nd Drive/Park Place Bridge** crosses the Clackamas River to the north of Oregon City, connecting to Gladstone. The bridge, constructed in 1921, is open to pedestrians and bicyclists only and is part of the I-205 multi-use path.

View across the 82nd Drive/Park Place Bridge

Bridges are also located on OR 213, Anchor Way, Holcomb Boulevard, and Washington Street. In addition, an active railroad bridge crosses the Clackamas River, just to the east of the I-205 Clackamas River Bridge. A second railroad bridge crossing over the Clackamas River is located about midway between the John McLoughlin Bridge and the 82nd Drive/Park Place Bridge. The railroad tracks leading to this bridge have been removed on both sides and it currently sits unused, abandoned since 1968.

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. ODOT has identified I-205 as a freight route through Oregon City. While OR 99E is not classified by ODOT as a freight route, it is designated as a truck route by the federal government.

Much of the freight activity in Oregon City is related to the Metro designated employment land. Designated employment land is located near the southeast corner of the City along OR 213, Beavercreek Road and Molalla Avenue. Freight activity is also generated within the Metro designated Oregon City Regional Center. To allow for efficient movement between these designated areas and regional freight routes, Metro has classified several roadways in the City as freight connectors. The connector roadways link I-5 with the employment areas and include OR 213, Beavercreek Road and OR 99E. Freight accounts for approximately two percent of the traffic on OR 213, a little over one percent on Molalla Avenue and about one percent on Maple Lane Road.

Rail

Railroad tracks are available in Oregon City, just west of Clackamas River Drive and Washington Street at the north end of the City and just west of OR 99E along the Willamette River towards the south end of the City. The tracks are owned by Union Pacific Railroad and are currently utilized by freight and Amtrak passenger trains. ODOT estimates that about six passenger trains and between 20 and 25 freight trains pass through Oregon City each day.[4]

Gated at-grade railroad crossings are located at Forsythe Road and 10th Street, while grade separated crossings are located at OR 213, 15th Street, 14th Street, 13th Street, 12th Street and OR 99E.

Air

Portland International Airport (PDX), owned and operated by the Port of Portland, provides regional and international air service for passengers and freight. The airport is located approximately 18 miles (or about 25 minutes) to the north of Oregon City and is connected via I-205. In addition, the Aurora State Airport and Mulino Airport are located less than 15 miles (or 20 minutes) from Oregon City and provide local commercial service and private aircraft use.

Pipeline

A natural gas pipeline serving Oregon City generally crosses the southeast part of the City near Henrici Road. It is operated by Northwest Natural Gas. Several feeder lines from the main pipeline also serve Oregon City. There are no other major regional water or oil pipelines within the City limits.

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[4] ODOT Intercity Passenger Rail Study, ODOT Rail Division, June 2009 Draft.

Water

Oregon City is bordered by the Willamette River on the west side and Clackamas River on the north side of the City. These warerways generally only serve recreational needs. The Willamette Falls Locks, located just south of Downtown Oregon City on the west side of the Willamette River, provides a canal passage for boaters wishing to travel around Willamette Falls.

Transportation System Management and Operations

Transportation System Management and Operations (TSMO) is a set of integrated transportation solutions intended to improve the performance of existing transportation infrastructure through a combination of transportation system management (TSM) and transportation demand managemenr (TDM) strategies and programs.

Transportation System Management (TSM): Oregon City has several regional roadway facilities that serve the City and neighboring communities (I-205, OR 213 and OR 99E). These roadways, along with parallel arterials including Washington Street, 7th Street-Molalla Avenue and Beavercreek Road benefit from TSM infrastructure. Current TSM infrastructure includes:

- Communications infrastructure is available along I-205 and portions of OR 99E, OR 213, Molalla Avenue, Washington Street and Beavercreek Road.
- Coordinated time of day traffic signal control plans at various intersections along OR 99E, OR 213, Molalla Avenue, Washington Street and Beavercreek Road.
- Ramp meters on the OR 99E and OR 213 eastbound and westbound on ramps to I-205
- Cameras at the I-205 interchanges with OR 99E and OR 213 for monitoring travel conditions.
- Road and weather sensor along OR 99E in the Canemah neighborhood.
- Video detection at the Washington Street/Abernethy Road intersection.

The Portland Regional TSMO Plan calls for Arterial Corridor Management (ACM) along OR 213, Beavercreek Road (south of OR 213), OR 213 (to Henrici Road), Washington Street and 7th Street in Oregon City. The project would improve operations by expanding traveler information and upgrading traffic signal equipment and timings.

The Regional TSMO Plan also calls for ACM with adaptive signal timing along Molalla Avenue between 7th Street and OR 213 and Beavercreek Road between Molalla Avenue and OR 213. This project includes the ACM project with signal systems that automatically adapt to current arterial roadway conditions

Transportation Demand Management: Oregon City implements a variety of TDM measures. They include:

- Parking Management
- Roadway Connectivity

- Investing in pedestrian/bicycle facilities

Metro's regional travel demand model was used to evaluate progress towards meeting transportation demand management (TDM) goals, specifically reducing reliance on the single occupancy vehicle (SOV). Metro sets non-SOV targets for areas throughout the region based on 2040 design type. In Oregon City, the Oregon City Regional Center, the 7th Street-Molalla Avenue Corridor and the OR 99E Corridor are required to meet the non-drive alone modal target of 45 to 55 percent. The employment land and the neighborhood land uses in the City are required to meet the non-drive alone modal target of 40 to 45 percent. As shown in Figure A4 in the appendix, the Oregon City Regional Center, as well as much of the northeast, southeast and southwest portions of the City have experienced an increase in non-SOV trips since 2005. These locations are expected to continue to increase trip share via walking, biking, carpooling or public transportation. A few of the more established neighborhoods outside of Downtown will see a slight decline in non-SOV trips through 2035.

Environmental Justice

As stated by the Environmental Protection Agency, "Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.[5]" Within the context of the TSP, Environmental Justice is an effort to identify underserved and vulnerable populations so the City can improve transportation services while avoiding future impacts. Figure A5 in the appendix identifies the location of low-income populations (indicating populations most likely to be dependent on public transportation), minority groups and elderly persons. Significant populations of low-income residents are located in the Park Place neighborhood. Significant populations of minority groups are located around Molalla Avenue between Beavercreek Road and Division Street, while significant populations of the elderly are located around the 15th Street/Division Street intersection. There were no significant populations of non-English speakers and people with disabilities in the City.

Household Cost of Transportation

The financial burden of transportation costs is growing in the United States. This is generally due to rising costs associated with fuel, vehicle maintenance, insurance and in some cases, people seeking affordable homes greater distances from employment. To be considered affordable, housing costs should be no more than 30 percent of household income, transportation costs no more than 15 percent of household income, or the combination of housing and transportation expenses should be no more than 45 percent of household income. In the Oregon City area[6] the housing costs are currently estimated at 26.1 percent of household income (2006 data), transportation costs (2008 data) are estimated at 22.3 percent of household income, for a total of 48.4 percent of household

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[5] U.S. EPA, Environmental Justice, Compliance and Enforcement, Website, 2007

[6] Housing-Transportation Affordability Index, Center for Neighborhood Technology, http://htaindex.cnt.org/method.php

income spent on housing and transportation expenses. The relatively high percentage of income for transportation costs could be due to Oregon City's location at the south edge of the Metro Area and the need for workers to commute longer distances to employment. In addition, many low density neighborhoods lack retail and other community services within the neighborhood or vicinity.

Providing improved travel options, as well as increasing employment in or near Oregon City could help lower transportation costs. Creating opportunities for higher density mixed use areas, as well as neighborhood retail and services centers in or near low density residential areas could potentially reduce the need for driving.

What travel conditions do people face?

The transportation system in Oregon City is managed with a variety of measures to ensure that the transportation infrastructure in the City maintains acceptable quality for residents.

Safety Evaluation

The safety of the roadways and intersections in Oregon City were monitored through collision data as part of the TSP Update. The data was reviewed to identify potential patterns for motor vehicle, pedestrian, and bicyclist collisions.

Collision data from the most recent five years of available data (2005 to 2009) for all roadways in Oregon City was obtained from ODOT and reviewed. Over the past five years, 2,320 collisions (an average of over 464 collisions a year) occurred in Oregon City. A majority of these collisions (about 70 percent) were either rear-end or turning type collisions (see Figure 6). One percent of the collisions involved pedestrians (about five a year), and one percent involved bicycles (about five a year).

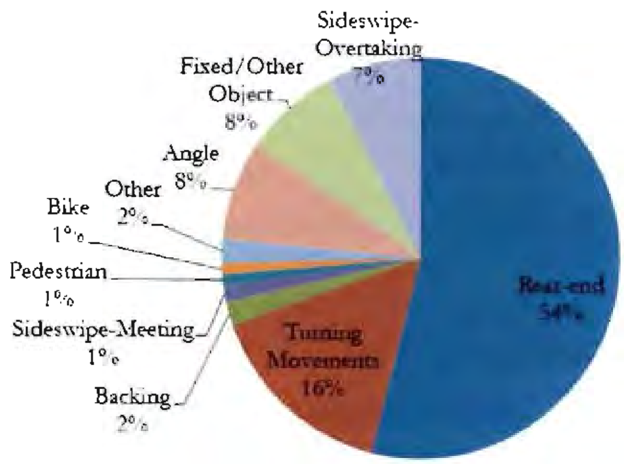


Figure 6: Collision Types (2005 to 2009)

Severities of the collisions in Oregon City over the past five years were generally low, with 58 percent involving property damage only (no injuries). There were four fatalities in the City over the past five years, although fatalities were involved in less than one percent of the collisions.

Pedestrian Safety: There were 22 collisions involving pedestrians over the past five years (eight in 2005, five in 2006, three in 2007, two in 2008 and four in 2009). Of the 22 collisions, six were along Molalla Avenue and 7th Street between Center Street and Warner Milne Road through an area with increased retail activity and a transit corridor. Five additional collisions occurred on OR 99E through Oregon City's downtown: two at 6th Street, one at 10th Street and two at the I-205 ramps. Three additional collisions occurred around downtown Oregon City, one at the Main Street/15th Street, Washington Street/12th Street and Jefferson Street/5th Street intersections. Beavercreek Road had three collisions involving a pedestrian, with one each at Red Soils Court, Fir Street and OR 213. Two occurred in the southwest part of the City, one in the Canemah neighborhood at the OR 99E/Hedges Street intersection and one just north of Canemah at the Tumwater Drive/2nd Street intersection. Two collisions occurred along Holcomb Boulevard through the Park Place neighborhood, one each at Apperson Boulevard and Longview Way, while one occurred towards the south end of the City along Meyers Road at Frontier Parkway. Most of the collisions involving pedestrians were caused by motorists failing to yield the right-of-way. The location of the pedestrian collisions can be seen in Figure 7.

Bicycle Safety: There were 20 collisions involving bicyclists over the past five years (three in 2005, six in 2006, five in 2007, three in 2008 and three in 2009). Of the 20 collisions, seven were on Molalla Avenue between Division Street and Clairmont Way through an area with a high frequency of driveways. Three collisions occurred along both OR 99E and OR 213, with one at Dunes Drive, 14th Street and 2nd Street along OR 99E and one at Washington Street, Redland Road and Meyers Road along OR 213. Linn Avenue had two collisions involving a bicyclist, one each at Eastfield Drive and AV Davis Road. The other collisions involving a bicycle occurred at the Washington Street/14th Street, South End Road/Salmonberry Drive, Beavercreek Road/Kaen Road and Barker Avenue/Clearbrook Drive intersections. Most of the bicycle collisions were caused by a motorist failing to yield the right-of-way when turning. The location of the bicycle collisions can be seen in Figure 7.

Intersection Safety: Collision rates were calculated (based on the past five years of collision data) for each of the 21 intersections reviewed in Oregon City (see Table A1 in the appendix) and summarized in Figure 7. The crash rates at two intersections (Main Street/14th Street and the OR 213/Beavercreek Road intersection) were identified as high collision locations. In addition, the OR 213/Caufield-Glen Oak Road and the Washington Street/12th Street intersections were identified as having above average collision rates. The collisions were further evaluated at these intersections to see if any trends exist.

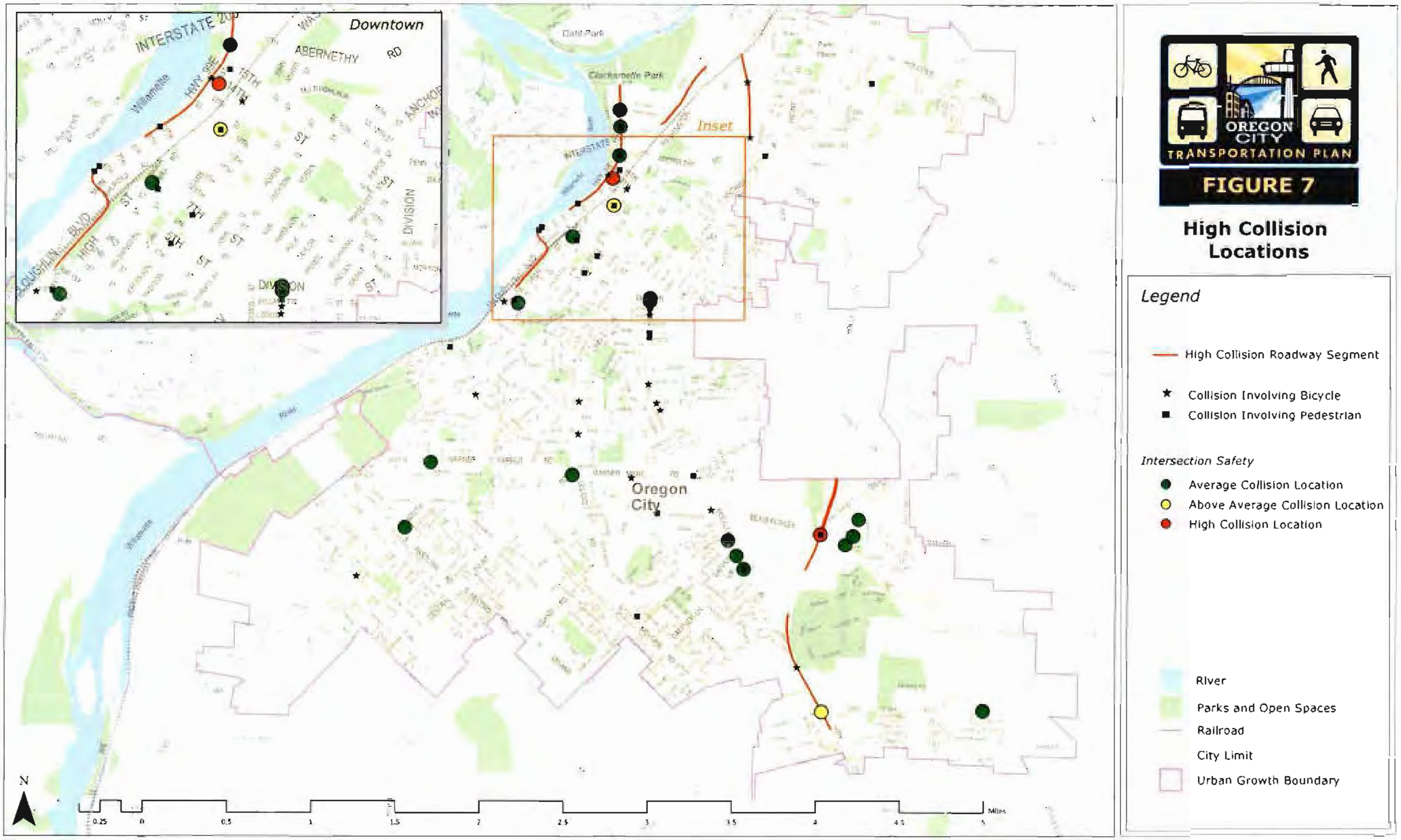
- The Main Street/14th Street intersection is two-way stop controlled, while several of the adjacent intersections along Main Street are all-way stop controlled intersections. Most of the collisions at this intersection were angle type collisions (15 of the 23 collisions) meaning one vehicle pulled out in front of another. This may indicate that drivers on Main Street are unaware that traffic on 14th Street is not required to stop and consequently often fail to yield the right of way.
- The OR 213/Beavercreek Road signalized intersection is located within the 55 mile per hour speed zone and expressway segment of OR 213. This is the first at-grade intersection south of Redland Road for over two miles. Most of the collisions at this intersection were rear-end type (166 of the 212 collisions). This may indicate that drivers are caught off guard by queues from the intersection after traveling at uninterrupted higher speeds for an extended period of time. The severities of the collisions were generally low, with 85 percent involving property damage only (no injuries) or minor injuries. Major injuries were involved in about

seven percent of the collisions and there were no fatalities.

- The OR 213/Caufield-Glen Oak Road signalized intersection is located just south of the 55 mile per hour speed zone and the portion of OR 213 that narrows to one travel lane in each direction. Nearly all of the collisions at this intersection were rear-end type (33 of the 37 collisions). This may indicate that drivers are caught off guard by queues from the intersection or could be focused on maneuvering for position when the road narrows to one lane without noticing stopped vehicles ahead. During evening peak field reviews, queues were observed in the southbound direction extending nearly to Meyers Road.
- The Washington Street/12th Street intersection is two-way stop controlled, with 12th Street yielding the right-of-way. The intersection is characterized by steep topography on both Washington Street and 12th Street. Between 2005 and 2008, 13 collisions occurred at this intersection which is typical for the volume of traffic served. However, in 2009 14 collisions occurred, more than the previous four years combined and amounting to a collision rate more than double the average for the intersection. This may correspond with increased traffic flow on 12th Street after being extended from Main Street to OR 99E. Most of the collisions at this intersection were angle type collisions (17 of the 27 collisions), with eight occurring in 2009. This may indicate that drivers on 12th Street are not noticing the traffic control at the intersection or are unaware that traffic on Washington Street is not required to stop and consequently often fail to yield the right of way. During field reviews, it was noted that the stop sign for the southeast direction of 12th Street is obstructed by tree branches and an electric pole, although a flashing beacon is visible at the intersection. Note that six of the collisions which occurred in 2009 at this intersection were related to a single snow event (five rear-end and one sideswipe type collision).

Are there any areas in Oregon City that are identified as high collision locations by ODOT?
Yes, in Oregon City there are ten locations that rank among the top ten percent of state highways in Oregon for collision frequency.[7] The identified high collision locations are shown in Figure 7 and summarized in the appendix.

[7] 2010 ODOT Safety Priority Index System (SPIS) top 10 percent sites



Downtown
Inset
Oregon City
OREGON CITY
TRANSPORTATION PLAN
FIGURE 7
High Collision Locations
Legend
High Collision Roadway Segment
Collision Involving Bicycle
Collision Involving Pedestrian
Intersection Safety
Average Collision Location
Above Average Collision Location
High Collision Location
River
Parks and Open Spaces
Railroad
City Limit
Urban Growth Boundary
Miles

Pedestrian Conditions

The pedestrian facilities were reviewed as part of this TSP Update to identify facility deficits or potential connectivity or access improvement opportunities. The existing sidewalk system in downtown Oregon City encourages walking trips by providing a high level of connectivity to key destinations, such as shopping, schools, parks and museums. The continuous presence of sidewalks on Molalla Avenue, 7th Street, Warner Milne Road, Beavercreek Road and Meyers Road link much of the major shopping and employment areas of the City with Downtown. Despite the relatively linked walking routes, there are a number of conditions that provide challenges to pedestrians. These include:

Residential neighborhood sidewalk connectivity: While the City has a relatively built-out sidewalk network in much of the major employment and shopping areas, there are limited connections to and within the neighborhoods. Over the past few years, some of the sidewalk gaps throughout the City including portions of Beavercreek Road, Holcomb Boulevard and Central Point Road have been filled. Several major streets connecting to and within the residential neighborhoods of the City including OR 99E (south of Main Street), OR 213 (south of Molalla Avenue), Linn Avenue, Partlow Road, Clairmont Way, Leland Road, Meyers Road, Beavercreek Road, South End Road, Warner Parrot Road, Redland Road, Holcomb Boulevard and Maple Lane Road either lack sidewalks completely, or on one side for extended distances. Sidewalk gaps are most notable in the southern and southwest neighborhoods in the City including Tower Vista, South End, Hillendale, Rivercrest and Canemah. A few of these roadways are under the jurisdiction of ODOT (OR 99E) and Clackamas County (portion of South End Road). In addition, sidewalk gaps are evident around schools such as John McLoughlin Elementary, Holcomb Elementary, King Elementary, Gaffney Lane Elementary and Gardiner Middle. The City should work with developers and these jurisdictions to continue increasing the sidewalk coverage on all roadways in the City.

Pedestrian walking along the shoulder of Main Street

Pedestrian access to Canemah: There are inadequate pedestrian connections between the Canemah neighborhood (along OR 99E at the bottom of the bluff) and the rest of the City. The neighborhood lies between OR 99E and South End Road, however, both lack comfortable well maintained pedestrian facilities and are generally not conductive for walking trips.

Pedestrian roadway crossings: There are pedestrian crosswalks at a large number of intersections in Oregon City, particularly in downtown where pedestrian activity is the highest. However, the need for further crossing enhancements was evident through field observations. Most notable is the need for additional or improved crossings of OR 99E, OR 213, 7th Street, Molalla Avenue and

Washington Street. Pedestrian crossing is difficult across many of these roadways due to high motor vehicle volumes and speeds.

Pedestrian refuge and crosswalk along Molalla Avenue

Signalized crossing opportunities across OR 99E are available at several intersections in downtown between 10th Street and 14th Street. Past 10th Street, a signalized crossing opportunity is not available for nearly a half mile at Main Street. South of downtown, a pedestrian bridge over OR 99E is available just to the north of Tumwater Drive (at the end of the McLoughlin Promenade) and a signalized pedestrian crossing is available at 2nd Street. No additional marked pedestrian crossings (signalized or unsignalized) of OR 99E are available south of 2nd Street through the Canemah neighborhood, a distance of over a half mile.

Crossing opportunities for pedestrians across OR 213 to the Park Place neighborhood (in the northeast portion of the City) are spaced approximately every half mile and available via Washington Street, Holcomb Boulevard and Redland Road. South of Redland Road, a crossing opportunity is not available for over two miles, at Beavercreek Road. Between Beavercreek Road and Caufield-Glen Oak Road, crossing opportunities are available at Molalla Avenue and Meyers Road, spaced about a half mile between each. South of Caufield-Glen Oak Road no additional crossing opportunities of OR 213 are available in the City.

Additional crossing opportunities and enhancements for pedestrians across 7th Street, Molalla Avenue and Washington Street would be beneficial. Visibility issues and steady streams of traffic limit the available gaps for safe pedestrian crossings along these roadways. Marked crossing gaps of greater than a half mile exist on each of these roadways.

Pedestrian connectivity between Downtown and the top of the bluff: The Municipal Elevator and the Grand Staircase provide a pedestrian connection between the lower level and upper portion of 7th Street. Street connections to the top of the bluff from downtown are limited to South End Road, Center Street, 5th Street-Linn Avenue, Singer Hill Road-7th Street, 12th Street, 14th Street and 15th Street. Of these roadways, only Singer Hill Road-7th Street and 12th Street offer continuous pedestrian facilities up the hill, however these facilities are narrow and often impractical for ADA access. Several of these roadways are characterized by steep inclines and narrow winding roadways that are generally not supportive of safe pedestrian travel.

Bicycle Conditions

The bicycle facilities were reviewed as part of this TSP Update to identify facility deficits or potential connectivity or access improvement opportunities. There are two primary north/south routes (5th Street-Linn Avenue and 7th Street-Molalla Avenue) and several primary east/west routes (Warner Milne Road, Warner Parrot Road, Beavercreek Road and Washington Street) in the City with bicycle facilities.

Bicycle facility gaps: While the City has a few primary north/south and east/west routes, there are several facility gaps on major corridors and limited connections within the residential neighborhoods. Bike lane gaps on OR 99E, Washington Street, Leland Road, Meyers Road, Molalla Avenue, Maple Lane Road, Holcomb Boulevard, South End Road, Center Street, Central Point Road and Division Street should be addressed to provide connectivity for bicyclists throughout the City.

Bicyclist riding in the roadway

Bicycle connectivity between Downtown and the top of the bluff: Bicycle connections to the top of the bluff from downtown are limited to South End Road, Center Street, 5th Street-Linn Avenue, Singer Hill Road-7th Street, 12th Street, 14th Street and 15th Street. Of these roadways, only 5th Street-Linn Avenue offers continuous bicycle facilities up the hill. Singer Hill Road-7th Street offers an adjacent bike route between Washington Street and Division Street along 9th Street and Taylor Street. South of Division Street, Singer Hill Road-7th Street becomes Molalla Avenue, which has bike lanes. Several of these roadways are characterized by steep inclines and narrow winding roadways that are generally not supportive of safe bicycle travel.

McLoughlin Promenade: The McLoughlin Promenade could potentially be extended south to provide bicycle and pedestrian connections to the Canemah neighborhood and other areas at the south end of the City. The promenade is only five feet wide and would need to be widened to provide a multi-use trail for bicycle and pedestrian usage. However, the Museum of the Oregon Territory and several businesses lie in the potential path of an off-street multi-use trail in this area. Any potential widening would require historic review to assure it would not detract from the historic significance of the Promenade.

McLoughlin Promenade is only five feet wide

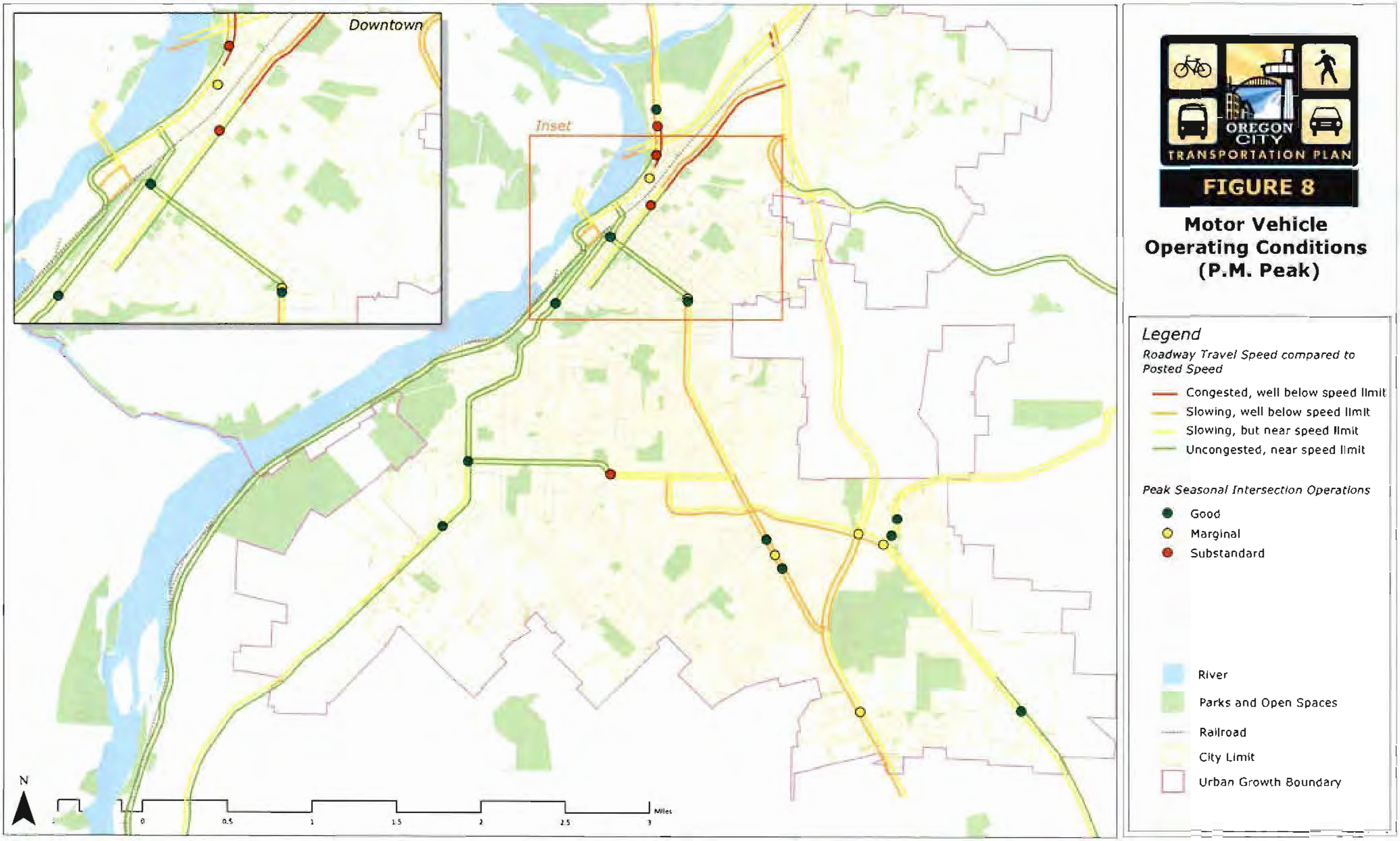
Link the regional trail network with the City network: The connectivity and access to the regional trail network including the I-205 multi-use trail and the potential Oregon City Loop Trail should be enhanced to encourage more biking and walking trips within the City. Bicycle and pedestrian users must currently access the I-205 multi-use trail via OR 99E or Main Street.

Motor Vehicle Conditions

The motor vehicle conditions in Oregon City vary based on the time of year. During the peak seasonal period (typically in August), traffic volumes are higher than those during the average weekday (typically in the spring or fall) and therefore intersection operations are often worse. For this reason, the intersection operations were evaluated at the 21 intersections reviewed during the peak seasonal period. The evaluation utilized 2000 Highway Capacity Manual methodology for all the intersections.

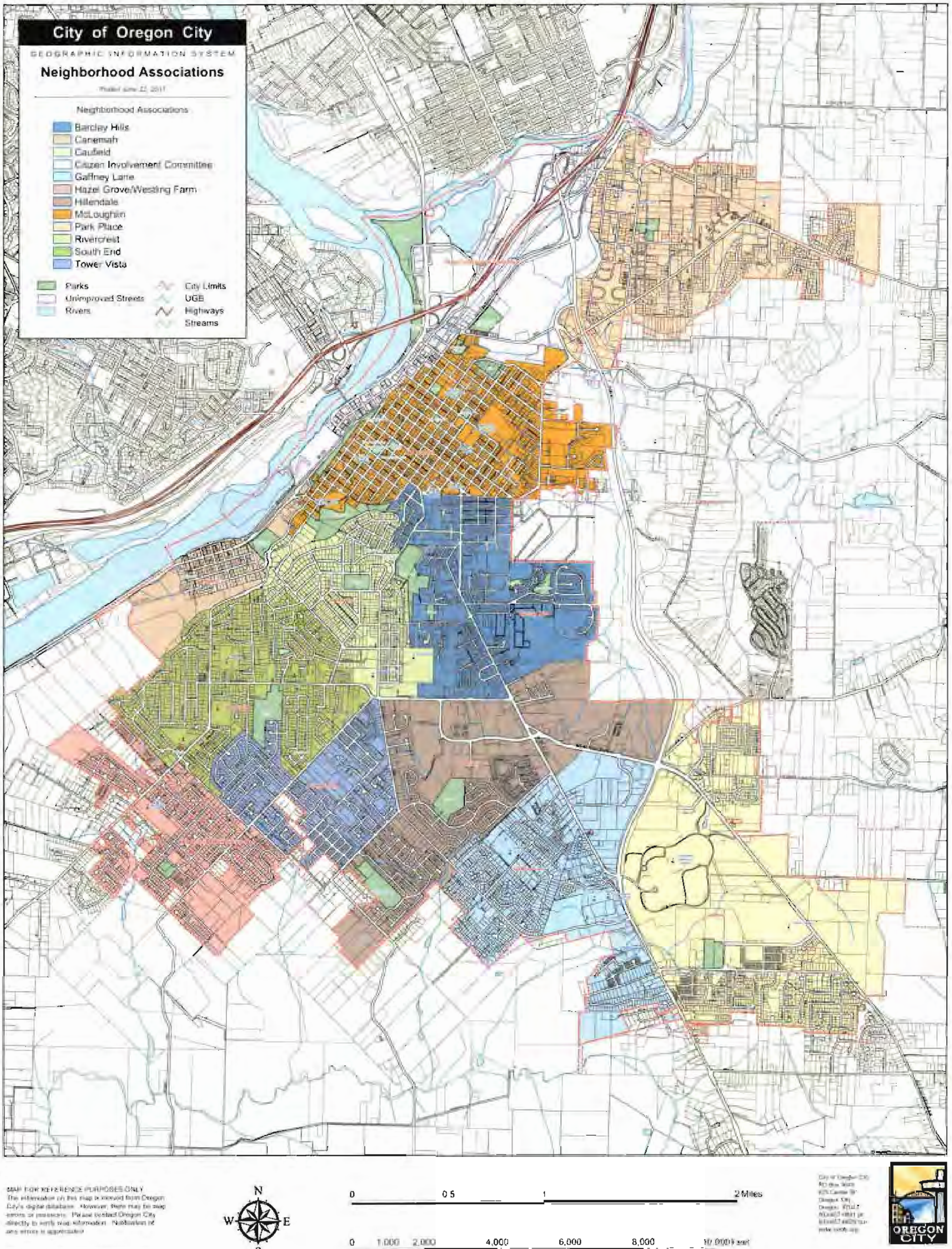
Peak seasonal intersection operations are summarized in Figure 8 and shown in Table A2 in the appendix. During the evening peak period, four of the intersections reviewed are substandard including the OR 99E/I-205 SB Ramps and OR 99E/I-205 NB Ramps intersections. In addition, two unsignalized intersections are substandard (Washington Street/12th Street and Central Point Road/Warner Parrott Road).The side streets at these intersections (12th Street and Central Point Road) generally experience high delay due to steady volumes on the uncontrolled roadway. These approaches typically require more time for an acceptable gap in traffic to make a left turn onto the mainline, therefore, the delay of the side street is high.

Evening peak period motor vehicle speeds were compared to posted speed limits on major roadways in the City. The motor vehicle speeds during the p.m. peak hour were assessed using INRIX historical traffic flows on major roadways. The data, obtained from ODOT, is based on multiple years of collected speed values. As shown in Figure 8, there are several roadways during the evening peak hour that experience travel speeds much lower than the posted speed. Portions of OR 213, OR 99E, Beavercreek Road, Molalla Avenue, and Washington Street experience average travel speeds well below the posted limits during the evening peak hour.



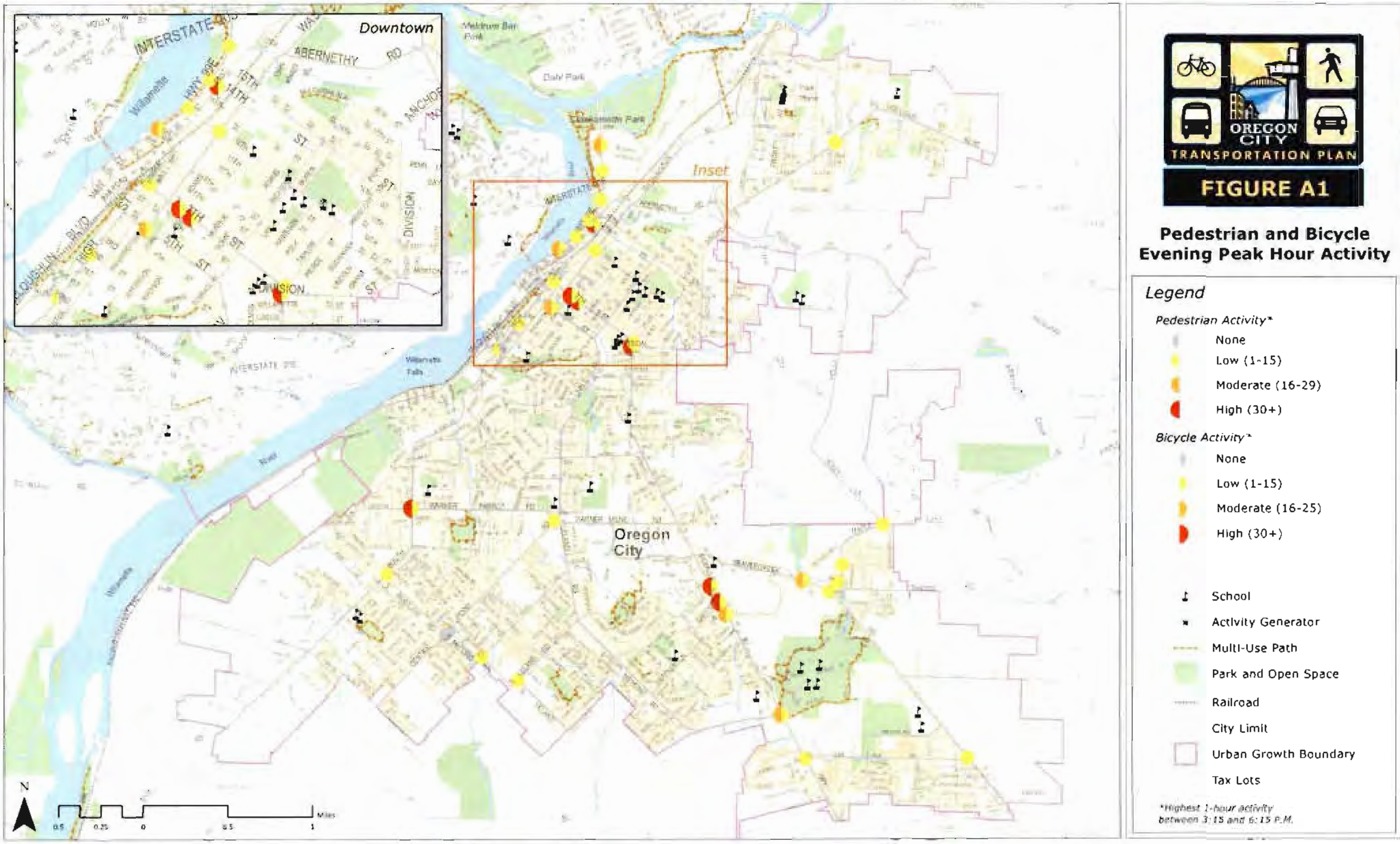
Downtown
Inset
N
0
0.5
1
1.5
2
2.5
3
Miles
OREGON CITY
TRANSPORTATION PLAN
FIGURE 8
Motor Vehicle Operating Conditions (P.M. Peak)
Legend
Roadway Travel Speed compared to Posted Speed
Congested, well below speed limit
Slowing, well below speed limit
Slowing, but near speed limit
Uncongested, near speed limit
Peak Seasonal Intersection Operations
Good
Marginal
Substandard
River
Parks and Open Spaces
Railroad
City Limit
Urban Growth Boundary

Appendix



MAP FOR REFERENCE PURPOSES ONLY
The information on this map is derived from Oregon City's digital database. However, there may be map errors or omissions. Please contact Oregon City directly to verify map information. Notification of any errors is appreciated.

Please recycle with colored office grade paper.



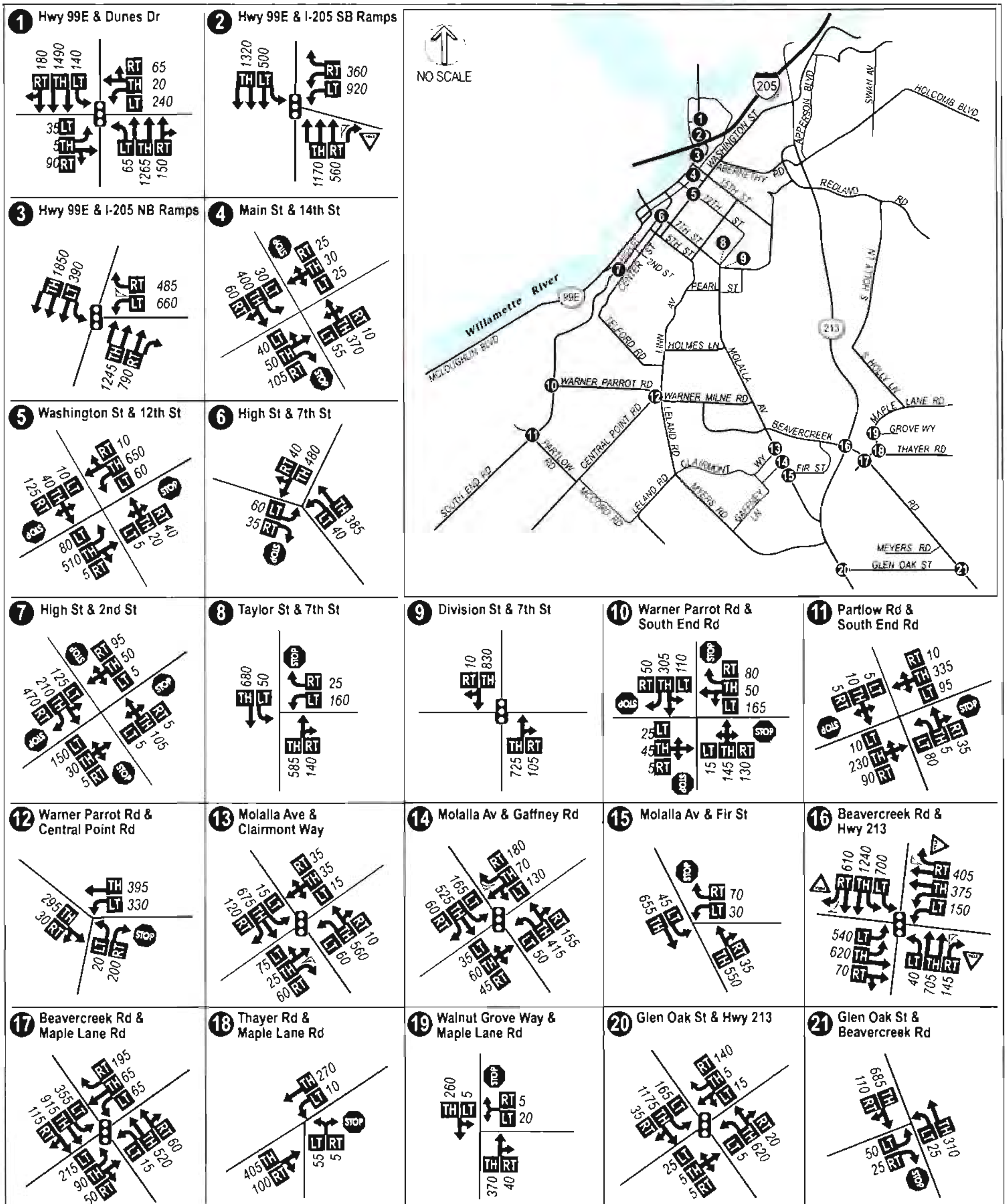
Downtown
Inset
Oregon City
OREGON CITY
TRANSPORTATION PLAN
FIGURE A1
Pedestrian and Bicycle Evening Peak Hour Activity
Legend
Pedestrian Activity*
None
Low (1-15)
Moderate (16-29)
High (30+)
Bicycle Activity*
None
Low (1-15)
Moderate (16-25)
High (30+)
School
Activity Generator
Multi-Use Path
Park and Open Space
Railroad
City Limit
Urban Growth Boundary
Tax Lots
*Highest 1-hour activity between 3:15 and 6:15 P.M.
Miles

Peak Seasonal Traffic Volumes (30HV)

During the summer months, traffic volumes increase due to an influx of recreational and leisure travelers taking advantage of the nice weather. For this reason, the traffic count data was adjusted upward using methodology from the ODOT Analysis Procedures Manual[1] to represent peak seasonal traffic conditions. Using the commuter trend various seasonal factors were developed and applied to the count data to represent peak seasonal (referred to as the 30th highest annual hour (30 HV) volume). The final p.m. peak seasonal traffic volumes developed for the reviewed intersections are displayed in Figure A2.

Peak Seasonal Volumes: The collected count data was factored up to replicate the conditions when traffic volumes are typically highest (August). Using the commuter trend, various seasonal factors were established for the traffic count data collected on April 12th, 13th, 14th, 21st and September 7th.

[1] Analysis Procedures Manual, Oregon Department of Transportation, July 2009.



LEGEND

- 00 - Study Intersection & Number
- STOP - Stop Sign
- Traffic Signal
- Yield
- ← - Lane Configuration
- *00* - 30th Highest Hour Traffic Volume (PM)
- LT TH RT (Left-Thru-Right) - Volume Turn Movement

DKS Associates

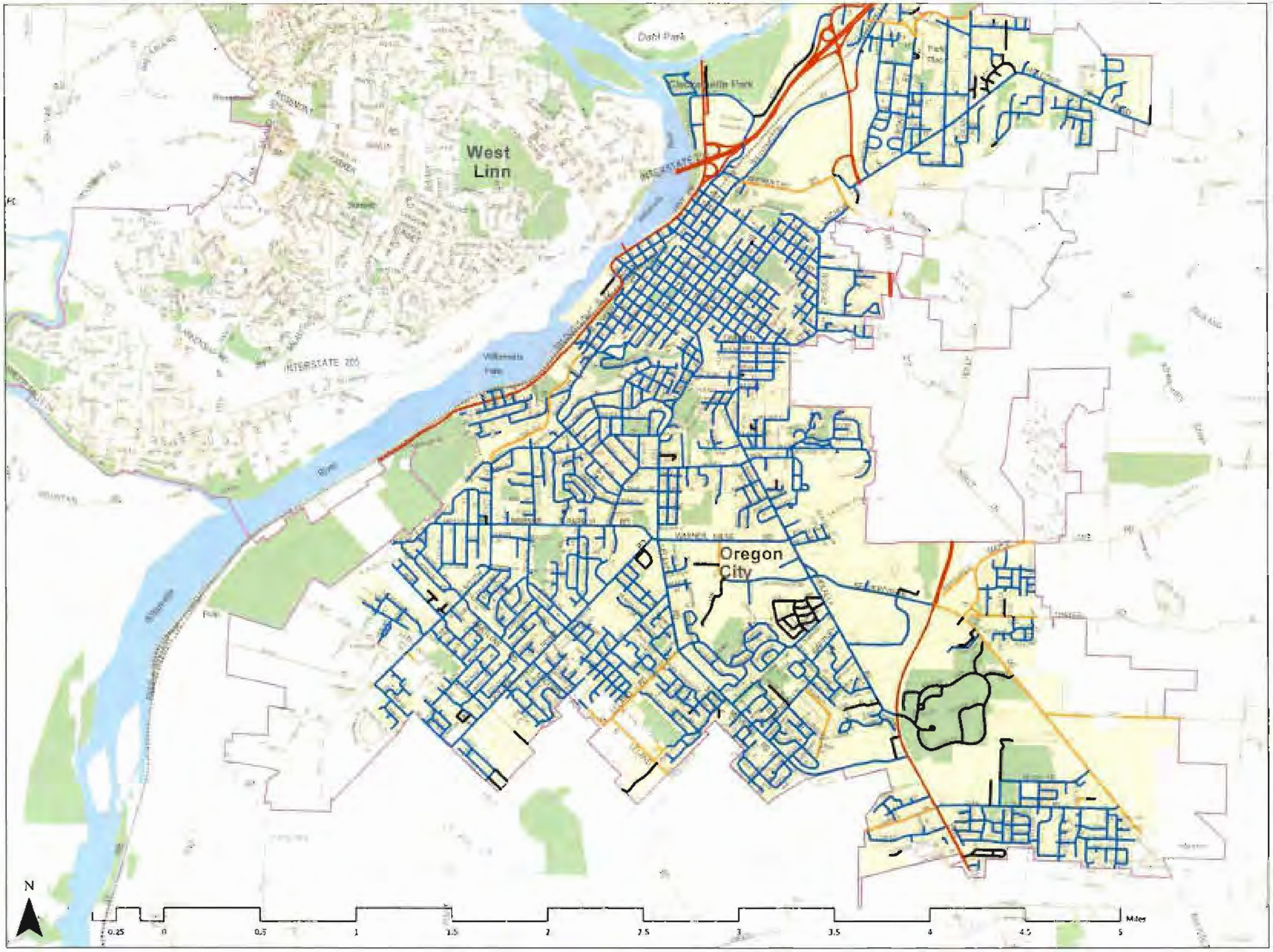
Figure A2

2011 EXISTING 30HV MOTOR VEHICLE VOLUMES (PM Peak Hour)

OREGON CITY
TRANSPORTATION PLAN

FIGURE A3

Roadway Jurisdiction

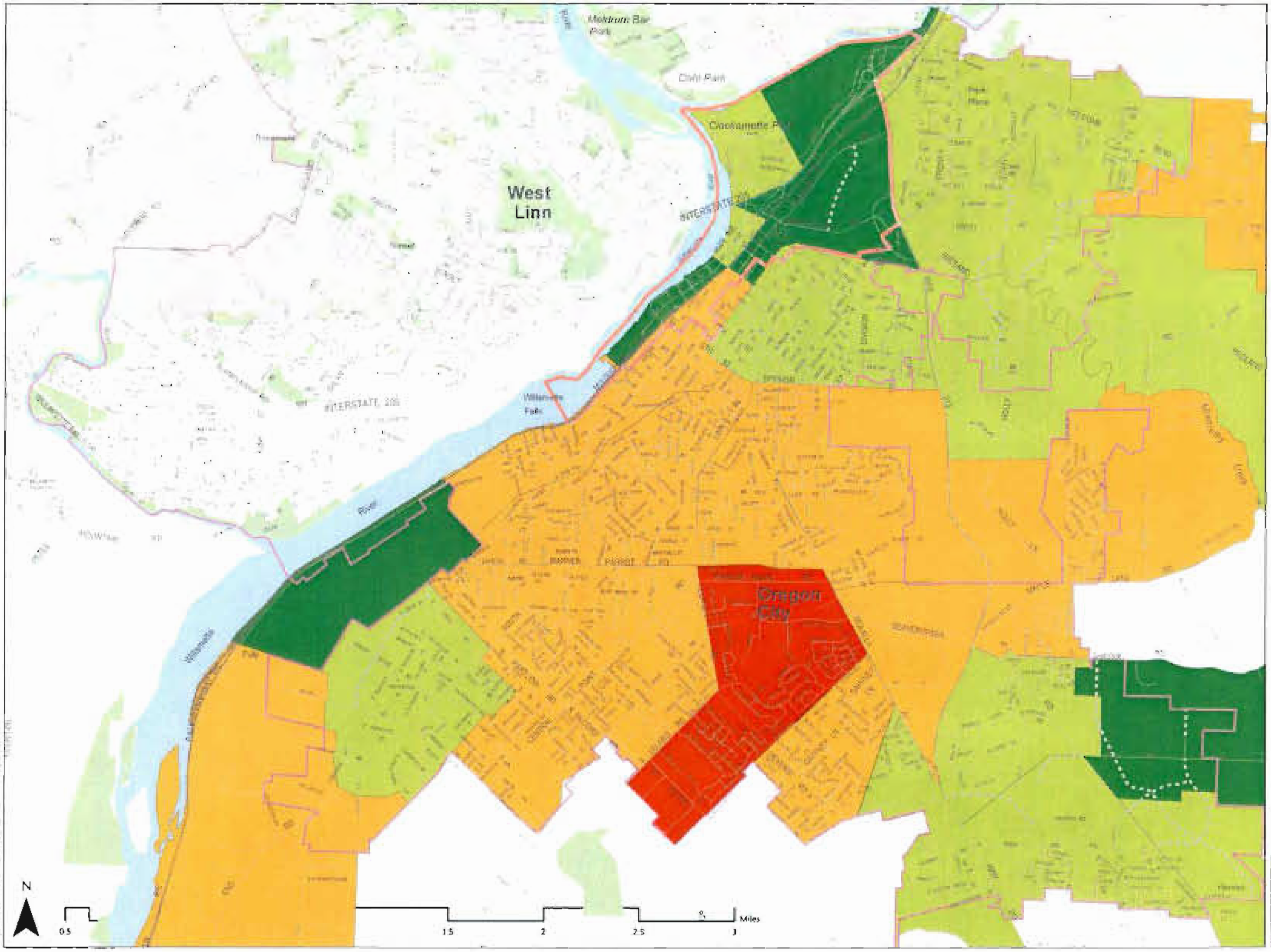


Legend

Roadway Jurisdiction

- Oregon City
- Clackamas County
- ODOT
- Private

- River
- Parks and Open Spaces
- Railroad
- City Limit
- Urban Growth Boundary
- Tax Lots



OREGON CITY TRANSPORTATION PLAN

FIGURE A4

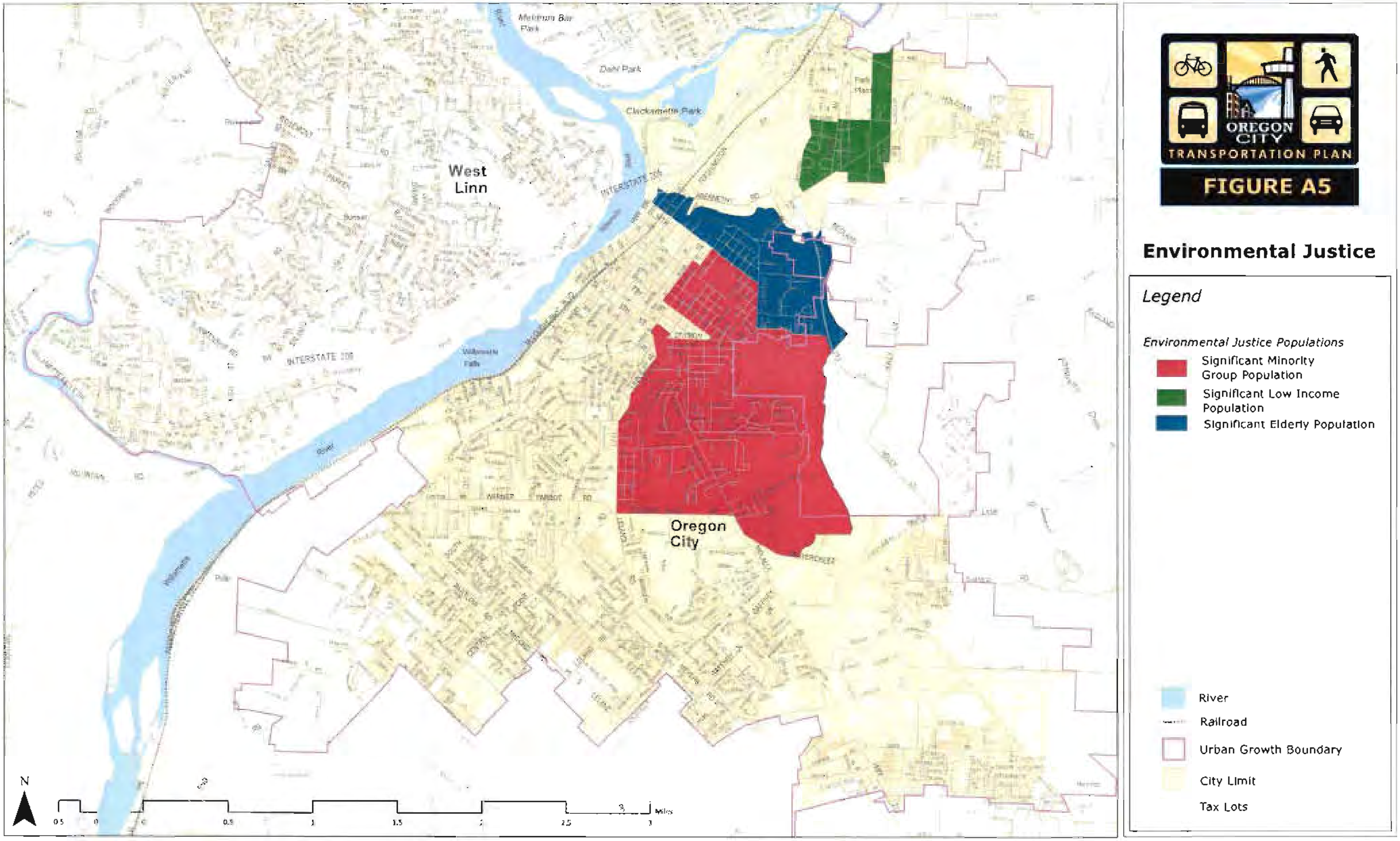
Non-SOV Mode Share Change

Legend

Non-Single Occupant Vehicle Trip Change between 2005 and 2035

- Greater than a 2% decrease
- Decrease up to 2%
- Increase up to 2%
- Greater than a 2% increase

- Oregon City Regional Center
- River
- Planned Roadways
- Railroad
- Urban Growth Boundary



Meldrum Bar Park
Dahl Park
Clackamette Park
West Linn
Interstate 205
Willamette Falls
Oregon City
OREGON CITY
TRANSPORTATION PLAN
FIGURE A5
Environmental Justice
Legend
Environmental Justice Populations
Significant Minority Group Population
Significant Low Income Population
Significant Elderly Population
River
Railroad
Urban Growth Boundary
City Limit
Tax Lots
N
Miles

Intersection Collisions

The total number of crashes experienced at an intersection is typically proportional to the number of vehicles entering it. Therefore, a crash rate describing the frequency of crashes per million entering vehicles (MEV) is used to determine if the number of crashes should be considered high. Using this technique, a collision rate of 1.0 MEV or greater is commonly used to identify when collision occurrences are higher than average and should be further evaluated.

As shown in Table A1, crash rates were calculated (based on the past five years of collision data) for each of the 21 intersections reviewed in Oregon City.

Table A1: Intersection Collision Evaluation

Intersection	Collision Rate
OR 99E/Dunes Drive	0.51
OR 99E/I-205 WB Ramps	0.43
OR 99E/I-205 EB Ramps	0.34
Main Street/14th Street	**1.07**
Washington Street/12th Street	0.95*
7th Street-Singer Hill/High Street	0.11
High Street/2nd Street	0.31
Taylor Street/7th Street	0.03
Molalla Avenue/Division Street	0.16
South End Road/Warner Parrott Road	0.29
South End Road/Lafayette Avenue-Partlow Road	0.18
Central Point Road/Warner Parrott Road	0.13
Molalla Avenue/Clairmont Way	0.59
Molalla Avenue/Gaffney Lane	0.73
Molalla Avenue/Fir Street	0.28
OR 213/Beavercreek Road	**2.05**
Maple Lane Road/Beavercreek Road	0.38
Maple Lane Road/Thayer Road	0.19
Maple Lane Road/Walnut Grove Way	0.00
OR 213/Caufield-Glen Oak Road	0.92
Beavercreek Road/Glen Oak Road	0.36

*Collision rate at this intersection would be 0.74 if the six collisions that occurred during a single snow event in 2009 are not considered.

Bolded Red and Shaded indicates collision rate exceeds 1.0 MEV

High Collision Locations

The following locations were identified as a high collision location (top ten percent of state highways in Oregon) on the ODOT SPIS:

- I-205 Northbound just past the on-ramp from OR 99E

  This high collision segment experiences an increase in traffic from the OR 99E on-ramp and is impacted by traffic exiting I-205 at OR 213. These factors could be contributing to the amount of collisions.

- OR 99E from one-tenth of a mile north of Dunes Drive to I-205

  This high collision segment includes two congested intersections (I-205 Westbound Ramps and Dunes Drive) and is often impacted by queues from the I-205 interchange.

- OR 99E from I-205 to 12th Street

  This high collision segment includes several signalized intersections and is often impacted by queues from the I-205 interchange.

- OR 99E from 11th Street to 9th Street

This high collision segment generally includes several accesses over a short distance, a narrow tunnel and two curves which could be contributing to the amount of collisions.

- OR 99E from 6th Street to one-tenth of a mile south of Railroad Avenue

This high collision segment generally includes several accesses over a short distance which could be contributing to the amount of collisions.

- OR 213 from I-205 to one-tenth of a mile south of Clackamas River Drive

This high collision segment will be mitigated with a planned jug handle at the OR 213/Washington Street-Clackamas River Drive intersection. Washington Street will be extended to undercrosss OR 213 and connect to Clackamas River Drive.

- OR 213 surrounding the Beavercreek Road intersection

  This segment includes the high collision location at the OR 213/Beavercreek Road intersection exceeding the statewide average collision rate. This segment is located within the 55 mile per hour speed zone and expressway segment of OR 213 and is the first at-grade intersection south of Redland Road for over two miles.

- OR 213 surrounding the Molalla Avenue intersection

  This segment is located within the 55 mile per hour speed zone and expressway segment of OR 213. Congestion at surrounding intersections may be impacting this segment.

- OR 213 surrounding the Meyers Road intersection

  This segment is located just south of the 55 mile per hour speed zone on OR 213. Queues in the southbound direction from the Caufield-Glen Oak Road intersection impact this intersection at times.

- OR 213 surrounding the Caufield-Glen Oak Road intersection

  This segment includes the high collision location at the OR 213/ Caufield-Glen Oak Road intersection that was just under the statewide average collision rate. This segment is located just south of the 55 mile per hour speed zone and the portion of OR 213 that narrows to one travel lane in each direction.

Motor Vehicle Operations

Intersection Mobility Standards: The intersections in Oregon City are monitored through mobility standards (or performance measures). Two methods to gauge intersection operations include volume-to-capacity (v/c) ratios and level of service (LOS).

Volume-to-capacity (V/C) ratio: A decimal representation (between 0.00 and 1.00) of the proportion of capacity that is being used (i.e., the saturation) at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00, congestion increases and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays. ODOT mobility standards are based on v/c ratios.

Level of service (LOS): A "report card" rating (A through F) based on the average delay experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity. This condition is typically evident in long queues and delays.

All intersections in Oregon City must operate at or below the adopted performance measures or mitigation would be necessary to approve future growth. The adopted intersection mobility standards vary by jurisdiction of the roadways. All intersections under State jurisdiction in Oregon City must comply with the v/c ratios in the 1999 Oregon Highway Plan (OHP). The OHP specifies v/c thresholds based on place type. The standards in Oregon City range from a v/c ratio of 0.85 to 1.10. Intersections under City or County jurisdiction must comply with a LOS D mobility standard for signalized and unsignalized intersections.

Peak seasonal intersection operations can be seen in Table A2.

Table A2: Intersection Operations (2011 p.m. peak)

Intersection	Mobility Standard	v/c Ratio	Peak Seasonal LOS	Delay
Signalized Intersections under ODOT Jurisdiction				
OR 99E/Dunes Drive	v/c 1.10	0.65	B	19.9
OR 99E/I-205 WB Ramps	v/c 0.85	**0.95**	C	29.9
OR 99E/I-205 EB Ramps	v/c 0.85	**0.99**	D	54.3
OR 213/Beavercreek Road	v/c 0.99	0.83	D	40.7
OR 213/Caufield-Glen Oak Road	v/c 0.99	0.79	C	23.7
Signalized or All-way Stop Intersections under Oregon City or Clackamas County Jurisdiction				
High Street/2nd Street*	LOS D	0.70	C	15.0
Molalla Avenue/Division Street	LOS D	0.62	A	3.5
South End Road/Warner Parrott Road*	LOS D	0.85	C	23.5
Molalla Avenue/Clairmont Way	LOS D	0.55	B	16.3
Molalla Avenue/Gaffney Lane	LOS D	0.67	C	27.2
Maple Lane Road/Beavercreek Road	LOS D	0.65	C	32.8
Unsignalized Intersections under Oregon City or Clackamas County Jurisdiction**				
Main Street/14th Street	LOS D	0.64	A/D	34.8
Washington Street/12th Street	LOS D	0.88	**A/F**	83.0
7th Street-Singer Hill/High Street	LOS D	0.14	A/B	13.4
Taylor Street/7th Street	LOS D	0.53	A/D	26.4
South End Road/Lafayette Avenue-Partlow Road	LOS D	0.40	A/D	25.2
Central Point Road/Warner Parrott Road	LOS D	0.33	**A/F**	61.1
Molalla Avenue/Fir Street	LOS D	0.24	A/C	15.7
Maple Lane Road/Thayer Road	LOS D	0.17	A/C	16.6
Maple Lane Road/Walnut Grove Way	LOS D	0.06	A/B	14.0
Beavercreek Road/Glen Oak Road	LOS D	0.07	A/D	23.5

* All-way stop controlled intersection

** V/C ratio, LOS and delay reported for the worst stop controlled approach

Bolded Red and Shaded indicates intersection exceeds mobility standard

2011 HCM Capacity Analysis Results (30HV)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	5	90	240	20	65	65	1265	150	140	1490	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.86		1.00	0.89		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1645	1495		1767	1612		1719	4913		1770	4800	
Flt Permitted	0.69	1.00		0.67	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1200	1495		1253	1612		1719	4913		1770	4800	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	36	5	93	247	21	67	67	1304	155	144	1536	186
RTOR Reduction (vph)	0	70	0	0	51	0	0	10	0	0	10	0
Lane Group Flow (vph)	36	28	0	247	37	0	67	1449	0	144	1712	0
Confl. Peds. (#/hr)	10		2	2		10	3					3
Heavy Vehicles (%)	9%	0%	8%	2%	12%	0%	5%	4%	3%	2%	6%	6%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	26.5	26.5		26.5	26.5		7.2	56.5		13.5	62.8	
Effective Green, g (s)	27.0	27.0		27.0	27.0		7.2	57.5		13.5	63.8	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.07	0.52		0.12	0.58	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.3	4.8		2.3	4.8	
Lane Grp Cap (vph)	295	367		308	396		113	2568		217	2784	
v/s Ratio Prot		0.02			0.02		0.04	c0.30		0.08	c0.36	
v/s Ratio Perm	0.03			c0.20								
v/c Ratio	0.12	0.08		0.80	0.09		0.59	0.56		0.66	0.62	
Uniform Delay, d1	32.3	31.9		39.0	32.1		50.0	17.8		46.1	15.1	
Progression Factor	1.00	1.00		1.00	1.00		0.71	0.69		1.00	1.00	
Incremental Delay, d2	0.1	0.1		13.6	0.1		3.8	0.5		6.3	1.0	
Delay (s)	32.4	32.0		52.5	32.1		39.3	12.8		52.4	16.1	
Level of Service	C	C		D	C		D	B		D	B	
Approach Delay (s)		32.1			47.2			14.0			18.9	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	920	360	1170	560	500	1320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.91	1.00	1.00	0.91
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)	3367	1553	4988	1568	1736	4988
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3367	1553	4988	1568	1736	4988
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	979	383	1245	596	532	1404
RTOR Reduction (vph)	0	1	0	431	0	0
Lane Group Flow (vph)	979	382	1245	165	532	1404
Heavy Vehicles (%)	4%	4%	4%	3%	4%	4%
Turn Type	NA	pm+ov	NA	Perm	Prot	NA
Protected Phases	4	5	6		5	2
Permitted Phases		4		6		
Actuated Green, G (s)	34.3	67.5	30.0	30.0	33.2	67.2
Effective Green, g (s)	34.3	67.5	30.5	30.5	33.2	67.7
Actuated g/C Ratio	0.31	0.61	0.28	0.28	0.30	0.62
Clearance Time (s)	4.0	4.0	4.5	4.5	4.0	4.5
Vehicle Extension (s)	2.3	2.3	4.7	4.7	2.3	4.7
Lane Grp Cap (vph)	1050	1009	1383	435	524	3070
v/s Ratio Prot	c0.29	0.11	c0.25		c0.31	0.28
v/s Ratio Perm		0.13		0.11		
v/c Ratio	0.93	0.38	0.90	0.38	1.02	0.46
Uniform Delay, d1	36.7	10.7	38.3	32.1	38.4	11.3
Progression Factor	1.00	1.00	0.43	1.42	0.83	0.35
Incremental Delay, d2	14.2	0.1	5.2	1.3	40.0	0.4
Delay (s)	50.9	10.8	21.8	46.8	71.8	4.4
Level of Service	D	B	C	D	E	A
Approach Delay (s)	39.7		29.9			23.0
Approach LOS	D		C			C

Intersection Summary			
HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	660	485	1245	790	390	1850
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.91
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	1583	5036	1583	1736	5085
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	5036	1583	1736	5085
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	688	505	1297	823	406	1927
RTOR Reduction (vph)	0	0	0	450	0	0
Lane Group Flow (vph)	688	505	1297	373	406	1927
Heavy Vehicles (%)	2%	2%	3%	2%	4%	2%
Turn Type	NA	pm+ov	NA	Perm	Prot	NA
Protected Phases	4	5	6		5	2
Permitted Phases		4		6		
Actuated Green, G (s)	43.3	69.3	26.7	26.7	26.0	56.7
Effective Green, g (s)	44.3	69.3	27.7	27.7	26.0	57.7
Actuated g/C Ratio	0.40	0.63	0.25	0.25	0.24	0.52
Clearance Time (s)	5.0	4.0	5.0	5.0	4.0	5.0
Vehicle Extension (s)	2.3	2.3	4.8	4.8	2.3	4.8
Lane Grp Cap (vph)	713	1055	1268	399	410	2667
v/s Ratio Prot	c0.39	0.11	c0.26		c0.23	0.38
v/s Ratio Perm		0.21		0.24		
v/c Ratio	0.96	0.48	1.02	0.94	0.99	0.72
Uniform Delay, d1	32.1	10.8	41.1	40.3	41.9	20.0
Progression Factor	1.00	1.00	1.11	1.80	1.15	1.26
Incremental Delay, d2	25.0	0.2	27.7	25.6	36.2	1.3
Delay (s)	57.1	11.0	73.5	98.0	84.6	26.5
Level of Service	E	B	E	F	F	C
Approach Delay (s)	37.6		83.0			36.6
Approach LOS	D		F			D

Intersection Summary			
HCM Average Control Delay	54.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	30	400	60	55	370	10	40	50	105	5	30	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	34	455	68	62	420	11	45	57	119	6	34	28
Pedestrians		7			4			5			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			0			0	
Right turn flare (veh)									5			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		179										
pX, platoon unblocked												
vC, conflicting volume	434			528			1165	1121	498	1168	1149	435
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	434			528			1165	1121	498	1168	1149	435
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			94			65	69	79	94	81	95
cM capacity (veh/h)	1135			1045			130	185	562	96	179	621

Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1
Volume Total	34	523	494	222	68
Volume Left	34	0	62	45	6
Volume Right	0	68	11	119	28
cSH	1135	1700	1045	348	231
Volume to Capacity	0.03	0.31	0.06	0.64	0.30
Queue Length 95th (ft)	2	0	5	104	30
Control Delay (s)	8.3	0.0	1.7	34.8	27.0
Lane LOS	A		A	D	D
Approach Delay (s)	0.5		1.7	34.8	27.0
Approach LOS				D	D

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	10	40	125	5	20	40	80	510	5	60	650	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	42	132	5	21	42	84	537	5	63	684	11
Pedestrians		1						1			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1578	1527	691	1672	1530	542	696			542		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1578	1527	691	1672	1530	542	696			542		
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 %	83	58	71	84	79	92	91			94		
cM capacity (veh/h)	61	101	447	33	100	543	890			1037		

Direction, Lane #	SE 1	NW 1	NE 1	NE 2	SW 1	SW 2
Volume Total	184	68	84	542	63	695
Volume Left	11	5	84	0	63	0
Volume Right	132	42	0	5	0	11
cSH	208	153	890	1700	1037	1700
Volume to Capacity	0.88	0.45	0.09	0.32	0.06	0.41
Queue Length 95th (ft)	173	51	8	0	5	0
Control Delay (s)	83.0	46.5	9.5	0.0	8.7	0.0
Lane LOS	F	E	A		A	
Approach Delay (s)	83.0	46.5	1.3		0.7	
Approach LOS	F	E				

Intersection Summary			
Average Delay	12.1		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	60	35	40	385	480	40
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	38	43	418	522	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type				TWLTL	None	
Median storage veh)				2		
Upstream signal (ft)				424	1279	
pX, platoon unblocked	0.93					
vC, conflicting volume	1049	543	565			
vC1, stage 1 conf vol	543					
vC2, stage 2 conf vol	505					
vCu, unblocked vol	1013	543	565			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	86	93	96			
cM capacity (veh/h)	459	543	1017			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	103	43	418	565
Volume Left	65	43	0	0
Volume Right	38	0	0	43
cSH	727	1017	1700	1700
Volume to Capacity	0.14	0.04	0.25	0.33
Queue Length 95th (ft)	12	3	0	0
Control Delay (s)	13.4	8.7	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.4	0.8		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	125	210	470	5	105	5	150	30	5	5	50	95
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)	130	219	490	5	109	5	156	31	5	5	52	99

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	349	490	120	193	156
Volume Left (vph)	130	0	5	156	5
Volume Right (vph)	0	490	5	5	99
Hadj (s)	0.22	-0.68	0.01	0.15	-0.32
Departure Headway (s)	6.0	5.1	6.1	6.3	6.0
Degree Utilization, x	0.58	0.70	0.20	0.34	0.26
Capacity (veh/h)	583	685	540	523	552
Control Delay (s)	15.9	17.7	10.7	12.6	11.1
Approach Delay (s)	17.0		10.7	12.6	11.1
Approach LOS	C		B	B	B

Intersection Summary			
Delay	15.0		
HCM Level of Service	C		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	160	25	585	140	50	680
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	168	26	616	147	53	716
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)			97			
pX, platoon unblocked	0.82	0.82			0.82	
vC, conflicting volume	1511	689			763	
vC1, stage 1 conf vol	689					
vC2, stage 2 conf vol	821					
vCu, unblocked vol	1513	508			598	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	47	94			93	
cM capacity (veh/h)	318	465			808	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	168	26	763	53	716
Volume Left	168	0	0	53	0
Volume Right	0	26	147	0	0
cSH	318	465	1700	808	1700
Volume to Capacity	0.53	0.06	0.45	0.07	0.42
Queue Length 95th (ft)	73	4	0	5	0
Control Delay (s)	28.5	13.2	0.0	9.8	0.0
Lane LOS	D	B		A	
Approach Delay (s)	26.4		0.0	0.7	
Approach LOS	D				

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	0	0	0	725	105	0	830	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)								4.0			4.0	
Lane Util. Factor								1.00			1.00	
Frpb, ped/bikes								1.00			1.00	
Flpb, ped/bikes								1.00			1.00	
Frt								0.98			1.00	
Flt Protected								1.00			1.00	
Satd. Flow (prot)								1784			1839	
Flt Permitted								1.00			1.00	
Satd. Flow (perm)								1784			1839	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	0	0	0	0	797	115	0	912	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	909	0	0	923	0
Confl. Peds. (#/hr)			5	5			14		5	5		14
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	7%	0%	3%	12%
Turn Type								NA			NA	
Protected Phases								6			2	
Permitted Phases												
Actuated Green, G (s)								42.1			42.1	
Effective Green, g (s)								42.1			42.1	
Actuated g/C Ratio								0.83			0.83	
Clearance Time (s)								4.0			4.0	
Vehicle Extension (s)								0.2			0.2	
Lane Grp Cap (vph)								1473			1518	
v/s Ratio Prot								c0.51			0.50	
v/s Ratio Perm												
v/c Ratio								0.62			0.61	
Uniform Delay, d1								1.6			1.6	
Progression Factor								1.00			1.00	
Incremental Delay, d2								1.9			1.8	
Delay (s)								3.5			3.4	
Level of Service								A			A	
Approach Delay (s)		0.0			0.0			3.5			3.4	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	3.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	51.0	Sum of lost time (s)	8.9
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	25	45	5	165	50	80	15	145	130	110	305	50
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	27	49	5	181	55	88	16	159	143	121	335	55

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	82	236	88	319	456	55
Volume Left (vph)	27	181	0	16	121	0
Volume Right (vph)	5	0	88	143	0	55
Hadj (s)	0.03	0.42	-0.68	-0.22	0.15	-0.67
Departure Headway (s)	8.1	7.7	6.6	6.7	6.7	5.9
Degree Utilization, x	0.19	0.51	0.16	0.60	0.85	0.09
Capacity (veh/h)	393	438	512	508	520	587
Control Delay (s)	12.9	17.2	9.7	19.2	36.1	8.3
Approach Delay (s)	12.9	15.1		19.2	33.1	
Approach LOS	B	C		C	D	

Intersection Summary			
Delay	23.5		
HCM Level of Service	C		
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	5	10	5	80	5	35	10	230	90	95	335	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	11	6	89	6	39	11	256	100	106	372	11
Pedestrians		3										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	961	970	381	928	925	306	386			356		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	961	970	381	928	925	306	386			356		
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 %	97	95	99	60	98	95	99			91		
cM capacity (veh/h)	204	230	669	221	244	732	1180			1209		

Direction, Lane #	SE 1	NW 1	NW 2	NE 1	SW 1
Volume Total	22	89	44	367	489
Volume Left	6	89	0	11	106
Volume Right	6	0	39	100	11
cSH	265	221	586	1180	1209
Volume to Capacity	0.08	0.40	0.08	0.01	0.09
Queue Length 95th (ft)	7	46	6	1	7
Control Delay (s)	19.8	31.9	11.6	0.3	2.5
Lane LOS	C	D	B	A	A
Approach Delay (s)	19.8	25.2		0.3	2.5
Approach LOS	C	D			

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Volume (veh/h)	295	30	330	395	20	200
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	331	34	371	444	22	225
Pedestrians				1	5	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			370		1539	354
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			370		1539	354
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			69		74	67
cM capacity (veh/h)			1194		86	688

Direction, Lane #	EB 1	WB 1	WB 2	NE 1	NE 2
Volume Total	365	371	444	22	225
Volume Left	0	371	0	22	0
Volume Right	34	0	0	0	225
cSH	1700	1194	1700	86	688
Volume to Capacity	0.21	0.31	0.26	0.26	0.33
Queue Length 95th (ft)	0	33	0	24	35
Control Delay (s)	0.0	9.4	0.0	61.1	12.7
Lane LOS		A		F	B
Approach Delay (s)	0.0	4.3		17.1	
Approach LOS				C	

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	60	560	10	15	675	120	75	25	60	15	35	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	
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	0.96		1.00	0.94		0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.96	1.00		1.00	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		0.99	
Satd. Flow (prot)	1805	1875		1805	1863	1542		1753	1475		1704	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.64	1.00		0.94	
Satd. Flow (perm)	1805	1875		1805	1863	1542		1167	1475		1609	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	589	11	16	711	126	79	26	63	16	37	37
RTOR Reduction (vph)	0	0	0	0	0	20	0	0	55	0	26	0
Lane Group Flow (vph)	63	600	0	16	711	106	0	105	8	0	64	0
Confl. Peds. (#/hr)	7		13	13		7	27		10	10		27
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	0%	3%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases						2	8		8	4		
Actuated Green, G (s)	8.0	80.9		2.8	75.7	75.7		13.3	13.3		13.3	
Effective Green, g (s)	8.0	81.4		2.8	76.2	76.2		13.8	13.8		13.8	
Actuated g/C Ratio	0.07	0.74		0.03	0.69	0.69		0.13	0.13		0.13	
Clearance Time (s)	4.0	4.5		4.0	4.5	4.5		4.5	4.5		4.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0		2.5	2.5		2.5	
Lane Grp Cap (vph)	131	1388		46	1291	1068		146	185		202	
v/s Ratio Prot	0.03	c0.32		0.01	c0.38							
v/s Ratio Perm						0.07		c0.09	0.01		0.04	
v/c Ratio	0.48	0.43		0.35	0.55	0.10		0.72	0.04		0.32	
Uniform Delay, d1	49.0	5.5		52.7	8.4	5.6		46.2	42.3		43.8	
Progression Factor	1.12	0.90		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	1.7	0.8		3.3	1.7	0.2		14.6	0.1		0.7	
Delay (s)	56.6	5.7		56.0	10.1	5.8		60.8	42.4		44.5	
Level of Service	E	A		E	B	A		E	D		D	
Approach Delay (s)		10.6			10.3			53.9			44.5	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	50	415	155	165	525	60	35	60	45	130	70	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	0.95		0.98			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			0.98	1.00
Frt	1.00	0.96		1.00	1.00	0.85		0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.97	1.00
Satd. Flow (prot)	1805	1784		1787	1845	1509		1702			1779	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.80			0.63	1.00
Satd. Flow (perm)	1805	1784		1787	1845	1509		1371			1164	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	437	163	174	553	63	37	63	47	137	74	189
RTOR Reduction (vph)	0	11	0	0	0	14	0	16	0	0	0	148
Lane Group Flow (vph)	53	589	0	174	553	49	0	131	0	0	211	41
Confl. Peds. (#/hr)	9		16	16		9			16	16		
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	0%	6%	2%	1%	2%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases						2	8			4		4
Actuated Green, G (s)	7.0	52.1		21.8	66.9	66.9		23.1			23.1	23.1
Effective Green, g (s)	7.0	52.6		21.8	67.4	67.4		23.6			23.6	23.6
Actuated g/C Ratio	0.06	0.48		0.20	0.61	0.61		0.21			0.21	0.21
Clearance Time (s)	4.0	4.5		4.0	4.5	4.5		4.5			4.5	4.5
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0		2.5			2.5	2.5
Lane Grp Cap (vph)	115	853		354	1130	925		294			250	346
v/s Ratio Prot	0.03	c0.33		0.10	c0.30							
v/s Ratio Perm						0.03		0.10			c0.18	0.03
v/c Ratio	0.46	0.69		0.49	0.49	0.05		0.44			0.84	0.12
Uniform Delay, d1	49.7	22.4		39.2	11.8	8.5		37.5			41.4	34.8
Progression Factor	1.00	1.00		0.80	0.50	0.32		1.00			1.00	1.00
Incremental Delay, d2	2.1	4.6		0.7	1.3	0.1		0.8			21.8	0.1
Delay (s)	51.8	26.9		32.0	7.2	2.8		38.3			63.2	34.9
Level of Service	D	C		C	A	A		D			E	C
Approach Delay (s)		28.9			12.3			38.3			49.8	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	27.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	70	550	35	45	655
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	31	73	573	36	47	682
Pedestrians	6		1			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	1		0			
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						481
pX, platoon unblocked	0.83					
vC, conflicting volume	1374	597			615	
vC1, stage 1 conf vol	597					
vC2, stage 2 conf vol	777					
vCu, unblocked vol	1349	597			615	
tC, single (s)	6.4	6.2			4.3	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.4	
p0 queue free %	91	85			95	
cM capacity (veh/h)	349	498			878	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	104	609	47	682
Volume Left	31	0	47	0
Volume Right	73	36	0	0
cSH	441	1700	878	1700
Volume to Capacity	0.24	0.36	0.05	0.40
Queue Length 95th (ft)	23	0	4	0
Control Delay (s)	15.7	0.0	9.3	0.0
Lane LOS	C		A	
Approach Delay (s)	15.7	0.0	0.6	
Approach LOS	C			

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	540	620	70	150	375	405	40	705	145	700	1240	610
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	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	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3497		3502	3610	1583	1703	3505	1599	3433	3505	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3497		3502	3610	1583	1703	3505	1599	3433	3505	1583
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	581	667	75	161	403	435	43	758	156	753	1333	656
RTOR Reduction (vph)	0	8	0	0	0	290	0	0	113	0	0	345
Lane Group Flow (vph)	581	734	0	161	403	145	43	758	43	753	1333	311
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Prot	Prot	NA	Prot	Prot	NA	Prot
Protected Phases	7	4		3	8	8	1	6	6	5	2	2
Permitted Phases												
Actuated Green, G (s)	19.2	28.3		6.1	15.2	15.2	3.1	27.4	27.4	24.9	49.2	49.2
Effective Green, g (s)	20.7	29.8		7.6	16.7	16.7	4.6	30.4	30.4	26.4	52.2	52.2
Actuated g/C Ratio	0.19	0.27		0.07	0.15	0.15	0.04	0.28	0.28	0.24	0.47	0.47
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	645	946		242	547	240	71	967	441	822	1660	750
v/s Ratio Prot	c0.17	0.21		0.05	c0.11	0.09	0.03	0.22	0.03	c0.22	c0.38	0.20
v/s Ratio Perm												
v/c Ratio	0.90	0.78		0.67	0.74	0.60	0.61	0.78	0.10	0.92	0.80	0.41
Uniform Delay, d1	43.7	37.1		50.1	44.7	43.7	51.9	36.9	29.7	40.8	24.6	19.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.6	3.8		5.8	4.7	3.3	10.9	4.8	0.2	14.6	3.3	0.7
Delay (s)	59.4	40.9		55.8	49.3	47.0	62.8	41.6	29.9	55.4	27.9	19.7
Level of Service	E	D		E	D	D	E	D	C	E	C	B
Approach Delay (s)		49.0			49.4			40.7			33.5	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	40.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	355	915	115	15	520	60	215	90	50	65	65	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		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	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3479		1805	3491		1805	1799		1805	1900	1577
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3479		1805	3491		1805	1799		1805	1900	1577
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)	378	973	122	16	553	64	229	96	53	69	69	207
RTOR Reduction (vph)	0	6	0	0	5	0	0	15	0	0	0	95
Lane Group Flow (vph)	378	1089	0	16	612	0	229	134	0	69	69	112
Confl. Peds. (#/hr)			1	1			2					2
Heavy Vehicles (%)	2%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases												4
Actuated Green, G (s)	29.2	71.7		1.8	44.3		19.4	19.4		9.5	9.5	38.7
Effective Green, g (s)	29.2	72.2		1.8	44.8		19.9	19.9		10.0	10.0	38.7
Actuated g/C Ratio	0.24	0.60		0.02	0.37		0.17	0.17		0.08	0.08	0.32
Clearance Time (s)	4.0	4.5		4.0	4.5		4.5	4.5		4.5	4.5	4.0
Vehicle Extension (s)	2.5	4.0		2.5	4.0		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	431	2095		27	1304		300	299		151	158	509
v/s Ratio Prot	c0.21	c0.31		0.01	0.18		c0.13	0.07		c0.04	0.04	0.05
v/s Ratio Perm												0.02
v/c Ratio	0.88	0.52		0.59	0.47		0.76	0.45		0.46	0.44	0.22
Uniform Delay, d1	43.6	13.8		58.7	28.5		47.8	45.1		52.4	52.3	29.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	17.7	0.9		25.8	1.2		10.5	0.8		1.6	1.4	0.2
Delay (s)	61.4	14.7		84.5	29.7		58.2	45.8		54.0	53.7	29.7
Level of Service	E	B		F	C		E	D		D	D	C
Approach Delay (s)		26.7			31.1			53.4			39.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	32.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	119.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	55	5	405	100	10	270
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	58	5	426	105	11	284
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			391			
pX, platoon unblocked	0.97	0.97			0.97	
vC, conflicting volume	784	479			532	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	759	444			498	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	99			99	
cM capacity (veh/h)	361	598			1040	

Direction, Lane #	WB 1	NE 1	SW 1	SW 2
Volume Total	63	532	11	284
Volume Left	58	0	11	0
Volume Right	5	105	0	0
cSH	373	1700	1040	1700
Volume to Capacity	0.17	0.31	0.01	0.17
Queue Length 95th (ft)	15	0	1	0
Control Delay (s)	16.6	0.0	8.5	0.0
Lane LOS	C		A	
Approach Delay (s)	16.6	0.0	0.3	
Approach LOS	C			

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	5	370	40	5	260
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	5	389	42	5	274
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			982			
pX, platoon unblocked						
vC, conflicting volume	695	411			432	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	695	411			432	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	95	99			100	
cM capacity (veh/h)	392	645			1139	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	26	432	279
Volume Left	21	0	5
Volume Right	5	42	0
cSH	425	1700	1139
Volume to Capacity	0.06	0.25	0.00
Queue Length 95th (ft)	5	0	0
Control Delay (s)	14.0	0.0	0.2
Lane LOS	B		A
Approach Delay (s)	14.0	0.0	0.2
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	5	5	15	5	140	5	620	20	165	1175	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1638			1830	1599	1357	1804		1805	1835	
Flt Permitted		0.77			0.84	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1312			1593	1599	1357	1804		1805	1835	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	5	5	16	5	147	5	653	21	174	1237	37
RTOR Reduction (vph)	0	5	0	0	0	137	0	1	0	0	0	0
Lane Group Flow (vph)	0	31	0	0	21	10	5	673	0	174	1274	0
Heavy Vehicles (%)	4%	0%	50%	0%	0%	1%	33%	5%	0%	0%	3%	6%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4						
Actuated Green, G (s)		8.2			8.2	8.2	1.6	83.1		19.2	100.7	
Effective Green, g (s)		8.7			8.7	8.7	1.6	85.1		19.2	102.7	
Actuated g/C Ratio		0.07			0.07	0.07	0.01	0.68		0.15	0.82	
Clearance Time (s)		4.5			4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)		2.5			2.5	2.5	2.3	4.5		2.3	4.5	
Lane Grp Cap (vph)		91			111	111	17	1228		277	1508	
v/s Ratio Prot							0.00	0.37		c0.10	c0.69	
v/s Ratio Perm		c0.02			0.01	0.01						
v/c Ratio		0.34			0.19	0.09	0.29	0.55		0.63	0.84	
Uniform Delay, d1		55.4			54.8	54.5	61.1	10.2		49.6	6.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.26	2.11	
Incremental Delay, d2		1.7			0.6	0.3	5.6	1.8		3.1	5.2	
Delay (s)		57.1			55.4	54.7	66.7	11.9		65.7	19.0	
Level of Service		E			E	D	E	B		E	B	
Approach Delay (s)		57.1			54.8			12.3			24.6	
Approach LOS		E			D			B			C	

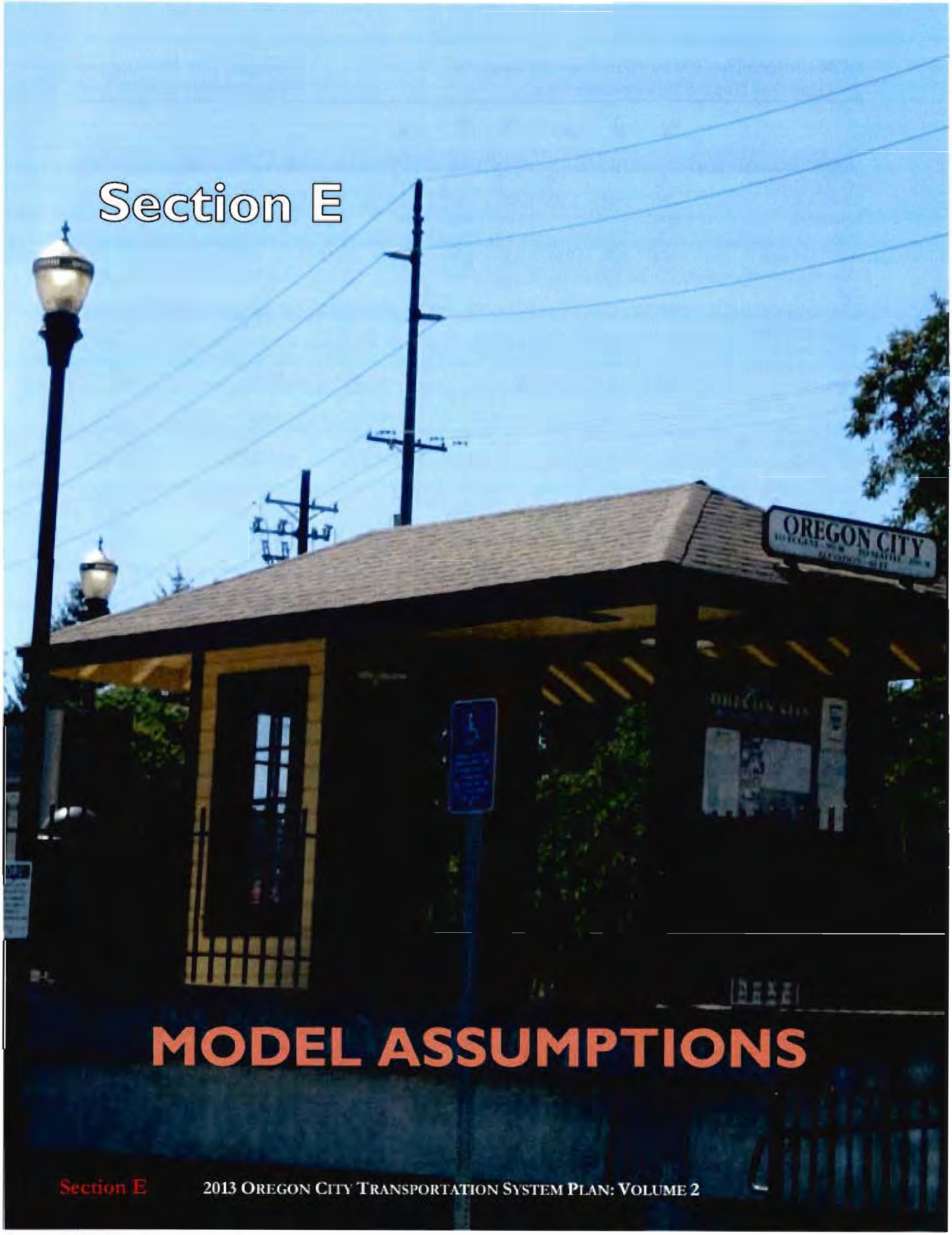
Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	685	110	25	310	50	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	721	116	26	326	53	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			837		1158	779
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			837		1158	779
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		75	93
cM capacity (veh/h)			806		210	393

Direction, Lane #	SE 1	NW 1	NW 2	NE 1	NE 2
Volume Total	837	26	326	53	26
Volume Left	0	26	0	53	0
Volume Right	116	0	0	0	26
cSH	1700	806	1700	210	393
Volume to Capacity	0.49	0.03	0.19	0.25	0.07
Queue Length 95th (ft)	0	3	0	24	5
Control Delay (s)	0.0	9.6	0.0	27.8	14.8
Lane LOS		A		D	B
Approach Delay (s)	0.0	0.7		23.5	
Approach LOS				C	

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		



Section E

MODEL ASSUMPTIONS

Future forecasting is an important step in the transportation planning process and provides estimates of future travel demand. This memorandum describes the forecasting methodology that will be used to project transportation growth and provide traffic volumes for study intersections in the 2035 TSP horizon year. This memorandum describes the assumptions used to project transportation growth through the 2035 horizon year.

Introduction

The travel demand model is based on the Metro regional travel demand model. The Oregon City TSP model applies trip generation and trip distribution data directly taken from the Metro model, but adds additional detail to more accurately represent local travel conditions and routing alternatives within the city. The Oregon City TSP model will include additional (mostly collector) roadways and refine how the regional model loads trips onto the travel network.

The following sections detail the travel forecast methodology. These components include the roadway network, transportation analysis zones (TAZs), land use, and travel demand.

Roadway Network

The VISUM[1] roadway network obtained from the Metro Regional Travel Demand Forecast Model includes regional level arterial streets, both within and outside of Oregon City.[2] The Oregon City model will be expanded to include all arterial and collector streets within the Oregon City City Limits and Urban Growth Boundary (UGB) at a minimum. The model will include regional roadways outside of the Oregon City UGB that influence study area travel, including the entire Portland metropolitan region, extending as south past Canby and Mulino and east past Estacada.

An existing model roadway network will be refined using Metro's regional model as the initial base. Network elements will be confirmed based on an existing conditions inventory of posted speeds, traffic control, lane geometries, and number of travel lanes. The existing conditions network is the starting point for development of the future model. The Metro 2010 model network is shown in Figure 1.

[1] VISUM is a transportation travel demand modeling software developed by PTV Vision.

[2] Model data provided by Metro, November 2011.

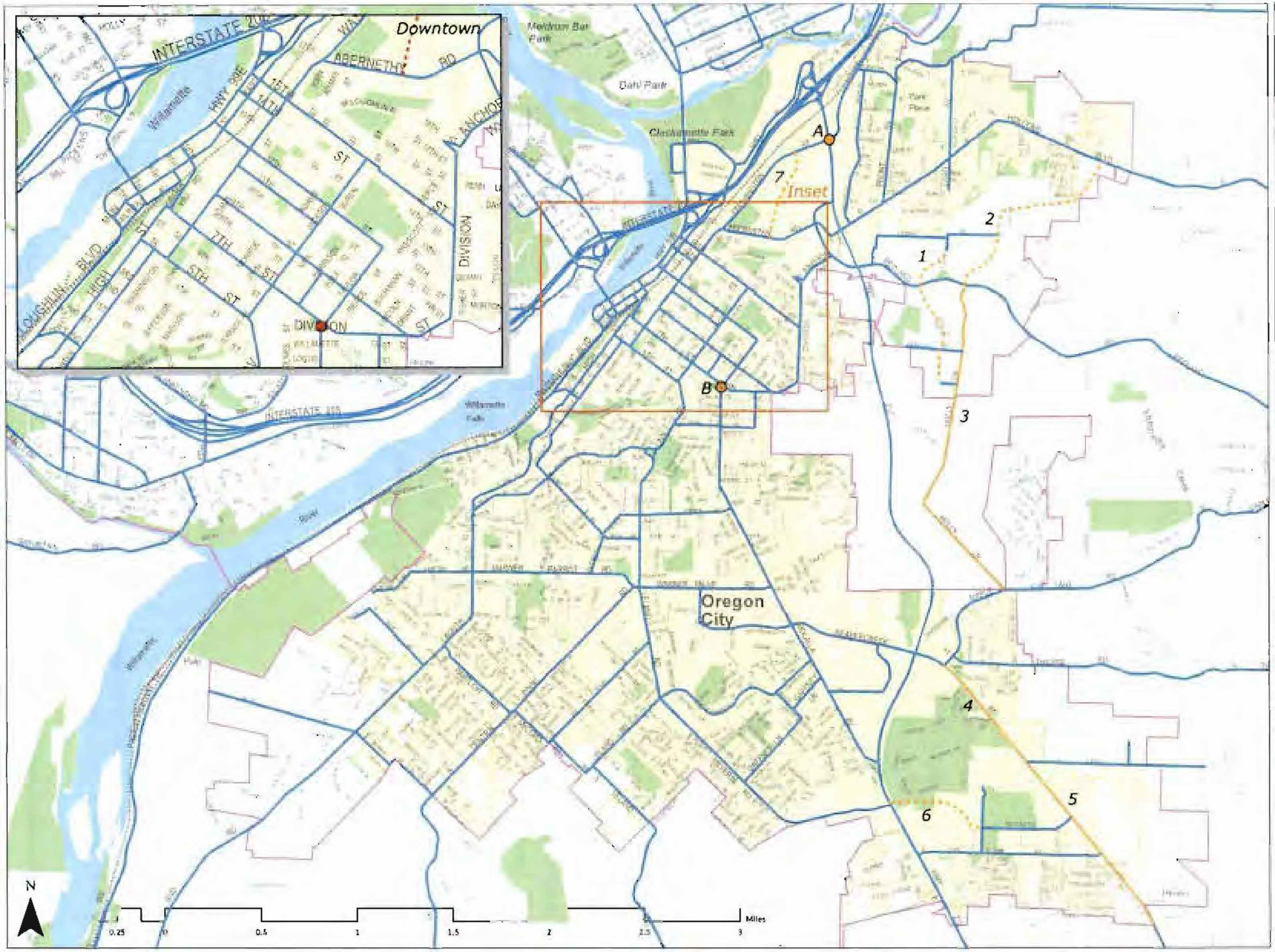
The 2035 future year baseline roadway network will be developed to use for the 2035 No-Build analysis. This network includes new roadways or roadway capacity improvement projects that have identified funding or are included in the following:

- Statewide Transportation Improvement Program (STIP)
- Metro Regional Transportation Plan (RTP – Financially Constrained)
- Oregon City Capital Improvement Plan (specifically identified projects only)

Additional scenarios will be developed to test the various transportation alternatives that will be considered for the Oregon City TSP Update. Table 1 summarizes roadway and intersection improvements that will be assumed in the 2035 network and Figure 1 shows the proposed Oregon City model 2035 base network.

Table 1: Oregon City CIP Financially Constrained Motor Vehicle Projects

Project ID	Source	Project/ Program Name	Start Location	End Location	Description
Roadway Segment Improvements					
1	RTP	Swan Extension	Livesay Rd	Holly Ln	Through lanes, sidewalks, bike lanes, turn lanes to serve UGB expansion area
2	RTP	Holly Lane	Redland Rd	Holcomb Rd	Through lanes, sidewalks, bike lanes, turn lanes to serve UGB expansion area
3	RTP	Holly Lane	Redland Rd	Maple Ln	Turn lanes, bike lanes, sidewalks, intersection improvements, bridge replacement
4	RTP	Beavercreek Rd Improvements Phase 2	Maple Lane	Clackamas Community College	Widen to 5 lanes with sidewalks and bike lanes
5	RTP	Beavercreek Rd Improvements Phase 3	Clackamas Community College	UGB	Widen to 4 lanes with sidewalks and bike lanes
6	City TSP	Meyers Road	High School Avenue	Beavercreek Road	Extension from current terminus at High School Avenue to Beavercreek Road
7	City TSP	Washington – Abernethy Connector	Abernethy Road	Washington Street	Extension from stub south of Washington to Abernethy Road
Intersection Improvements					
A	STIP/ City TSP	Jughandle at OR 213/Washington Street	-	-	Construct Jughandle Intersection at Washington Street
B	RTP	Molalla Avenue Roundabout (Taylor/Division)	-	-	Reconfigure intersection for safety and LOS into roundabout



OREGON CITY TRANSPORTATION PLAN

FIGURE 1

Existing and Future Model Street Network

Legend

2010 Street Network

- Roadway Segment Included In Model Street Network

2035 Model Street Network Improvements

- Intersection Improvement
- Roadway Improvement
- Roadway Extensions
- # Project ID from Technical Memorandum #5

- River
- Parks and Open Spaces
- Railroad
- City Limit
- Urban Growth Boundary

Transportation Analysis Zones

For transportation modeling purposes, the Metro travel demand model has divided the entire Portland metropolitan region into transportation analysis zones (TAZs). These TAZs represent the sources of vehicle trip generation within the region. Metro travel demand model TAZ boundaries do not align directly with the city limits or the Urban Growth Boundary (UGB). For purposes of identifying land use changes from 2010 to 2035, the model study area is defined by the Metro TAZs that most closely match with the UGB. There are approximately 28 Metro TAZs included in the model study area are illustrated in Figure 2. In addition to those 28 Metro TAZs, other Metro TAZs in the regional model were included as well since they directly or indirectly influence traffic on roadways in Oregon City.

Transportation analysis zones are most effective when they represent homogeneous land use (i.e. retail employment or households) and access to the street network. To more effectively distribute traffic onto the Oregon City street network, a number of Metro's TAZs are proposed to be disaggregated, or broken from larger (parent) to smaller (child) TAZs to more accurately reflect the existing and planned land uses in Oregon City. The proposed disaggregation is also shown in Figure 2. Land use data associated with Metro's model is approved at the regional level and in order to be consistent with Metro, land use assumptions for each Metro TAZ must be maintained, as a control total. Updates to this land use data occur very infrequently and changes to this data would not occur once the modeling work has commenced.

Centroids represent the land use and trip generation associated with each TAZ. Centroid connectors are the means (links) by which that trip generation is loaded onto the street network in the model. For regional modeling purposes, where the concern is for regionally significant transportation facilities, relatively few centroid connectors are used. In addition to the TAZ disaggregation proposed, additional centroid connectors will be added to more accurately reflect land use access to the street network in Oregon City.

For the Oregon City TSP model, eight Metro TAZs are proposed to be subdivided into nine additional smaller zones. These disaggregated zones maintain the boundaries of the 'parent' Metro TAZs, but better represent homogeneous land use and traffic loading onto the model's more detailed roadway network. The disaggregated TAZ boundaries for the Oregon City TSP are shown in Figure 2, along with the original Metro TAZ system. The model network also retains TAZs external to Oregon City, but important in the relationship between Oregon City land use and that in the greater Portland metropolitan region, accounting for vehicle trips entering and exiting the TSP study area.

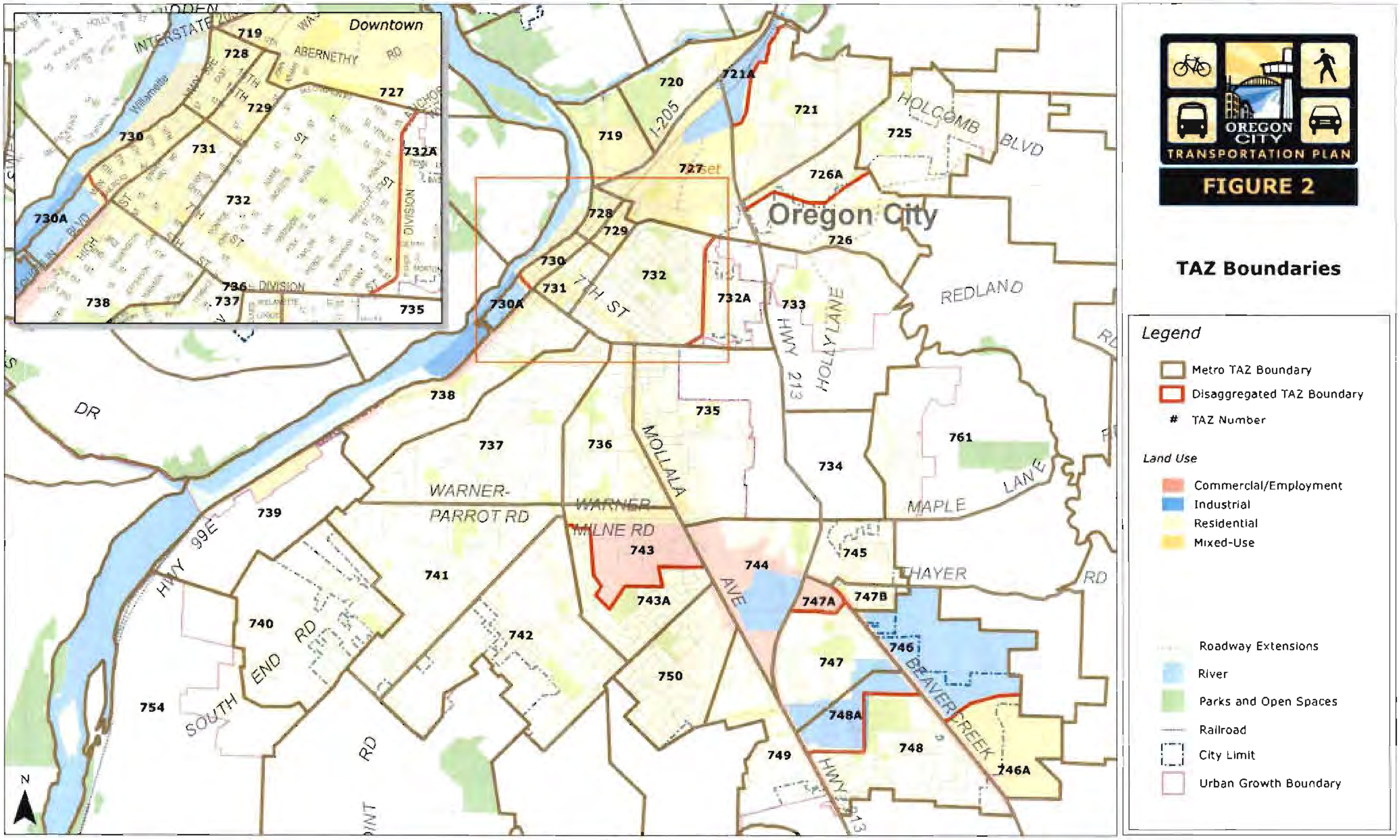


FIGURE 2

TAZ Boundaries

Land Use

Land use is a key factor affecting the traffic demands placed on Oregon City's transportation system. The location, density, type, and mixture of land uses have a direct impact on traffic levels and patterns. Existing 2010 land use inventories and future 2035 land use projections were provided by Metro.

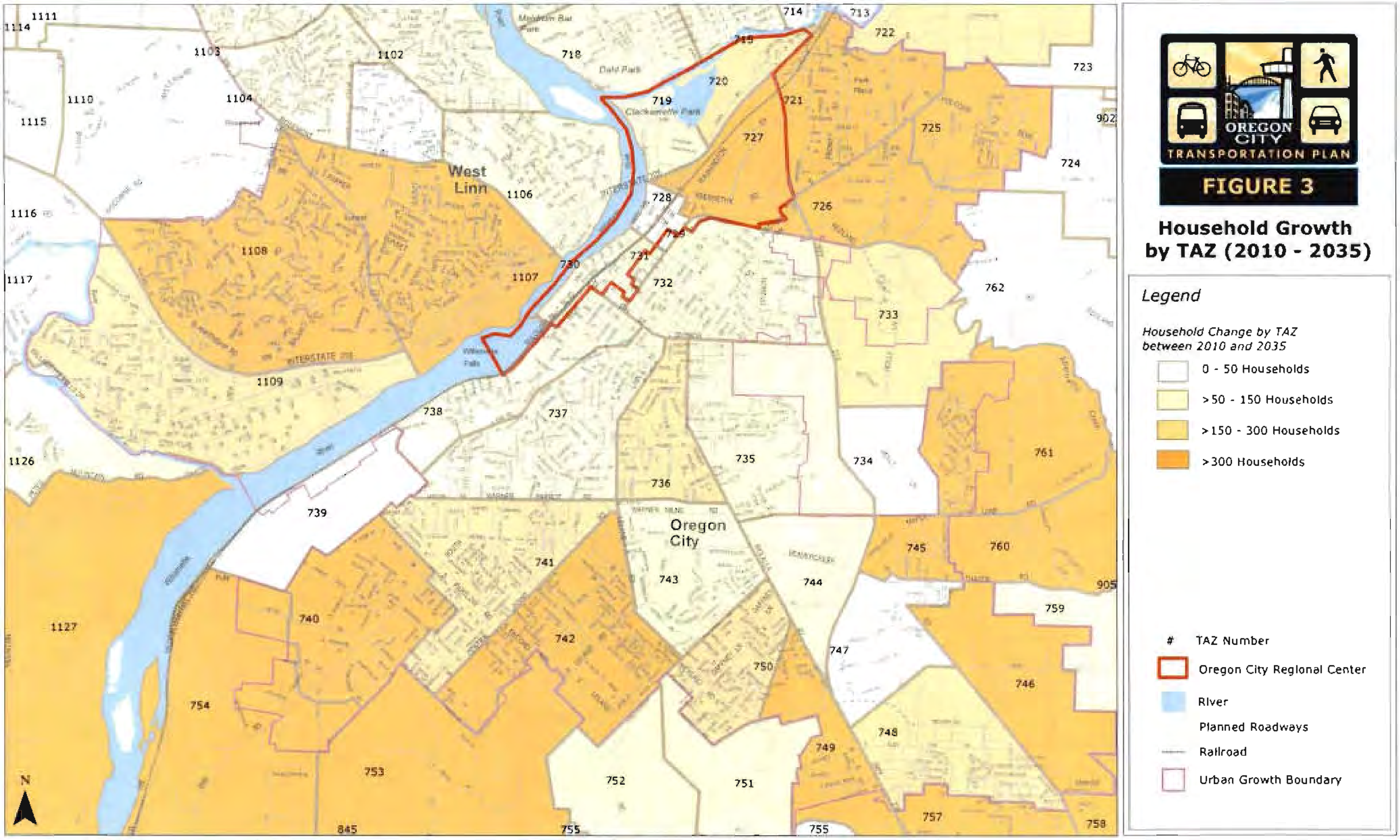
The existing 2010 land use inventory approximated the number of households and the amount of retail employment, service employment, and other employment that currently exist in each Metro TAZ. The Metro land use data will then be split into the smaller TAZ system identified for the Oregon City TSP model. Control totals for the 'parent' Metro TAZ will be maintained for the sum of the 'child' disaggregated TAZs. The allocation of land use totals between disaggregated TAZs will be based on existing aerial photography, tax lot data, and knowledge from previous studies in Oregon City.

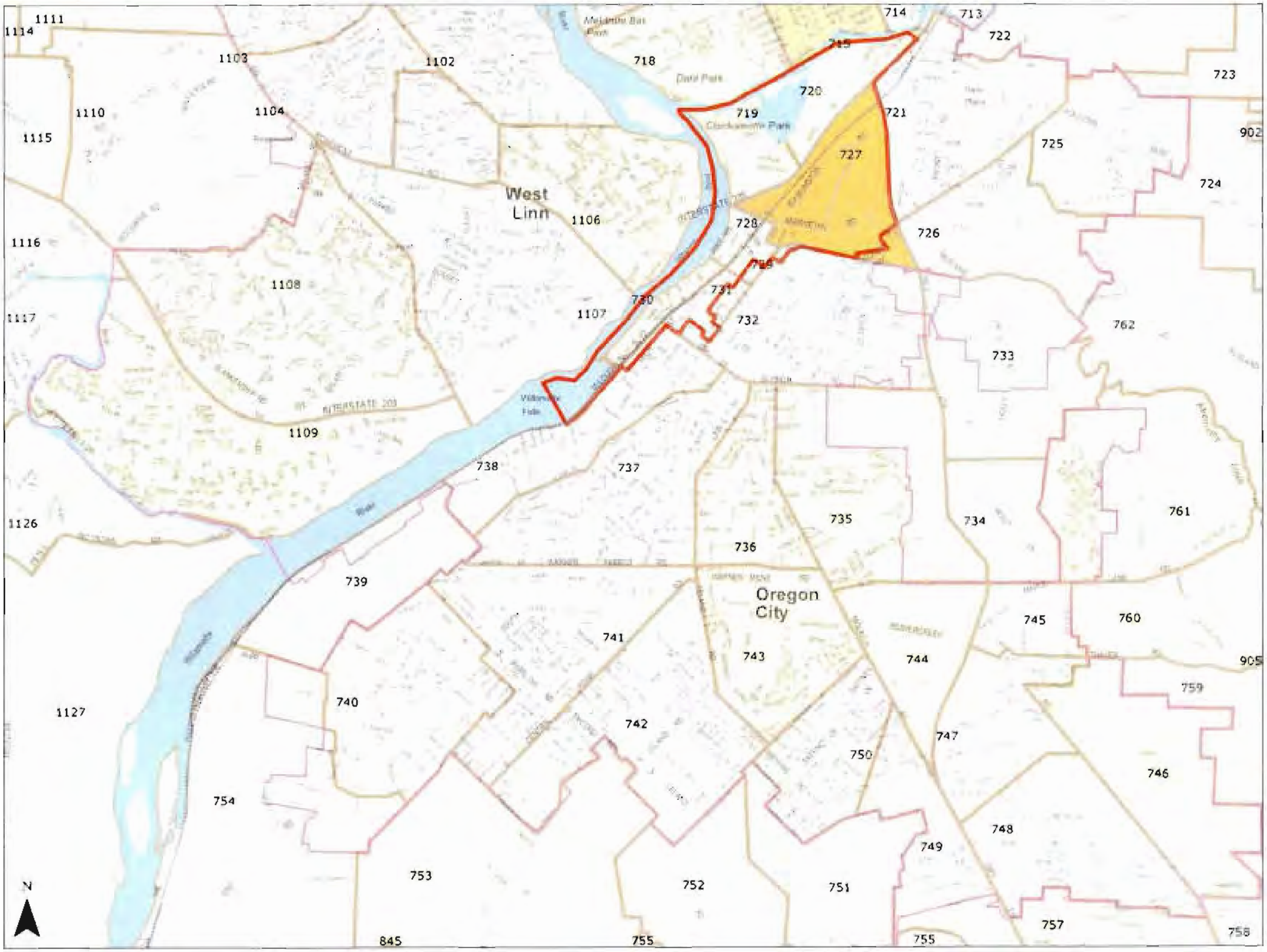
The future 2035 land use projection is an estimate of the amount of each land use that the TAZ could accommodate at expected build-out of vacant or underdeveloped lands assuming Comprehensive Plan designations. The allocation of future growth to Metro TAZs was modified based on input from City of Oregon City Staff. However, the control total was maintained for the sum of TAZs within the UGB area (as identified in Figure 2). Existing land use estimates and future projections for the UGB area are listed in Table 2.

Table 2: Oregon City UGB Area Land Use Summary

Land Use	2010 Land Use	Projected Growth from 2010 to 2035	Projected 2035 Land Use	Percent Growth (2010 – 2035)
Households				
Total Households	**13,022**	**7,963**	**20,985**	**61%**
Employees				
Retail Employees	3,089	2,052	5,141	66%
Service Employees	3,718	3,255	6,973	88%
Other Employees	7,914	3,300	11,214	42%
Total Employees	**14,721**	**8,607**	**23,328**	**58%**

A full set of detailed land use data by TAZ cannot be provided in this memo due to confidentiality of employment information. However, projected growth for households and employment (retail, service and other employment) is provided for each model TAZ in the Appendix. This information is summarized in Figures 3 through 6.


OREGON CITY
TRANSPORTATION PLAN
FIGURE 3
Household Growth by TAZ (2010 - 2035)
Legend
Household Change by TAZ between 2010 and 2035
0 - 50 Households
>50 - 150 Households
>150 - 300 Households
>300 Households
TAZ Number
Oregon City Regional Center
River
Planned Roadways
Railroad
Urban Growth Boundary
West Linn
Oregon City
N



OREGON CITY TRANSPORTATION PLAN

FIGURE 4

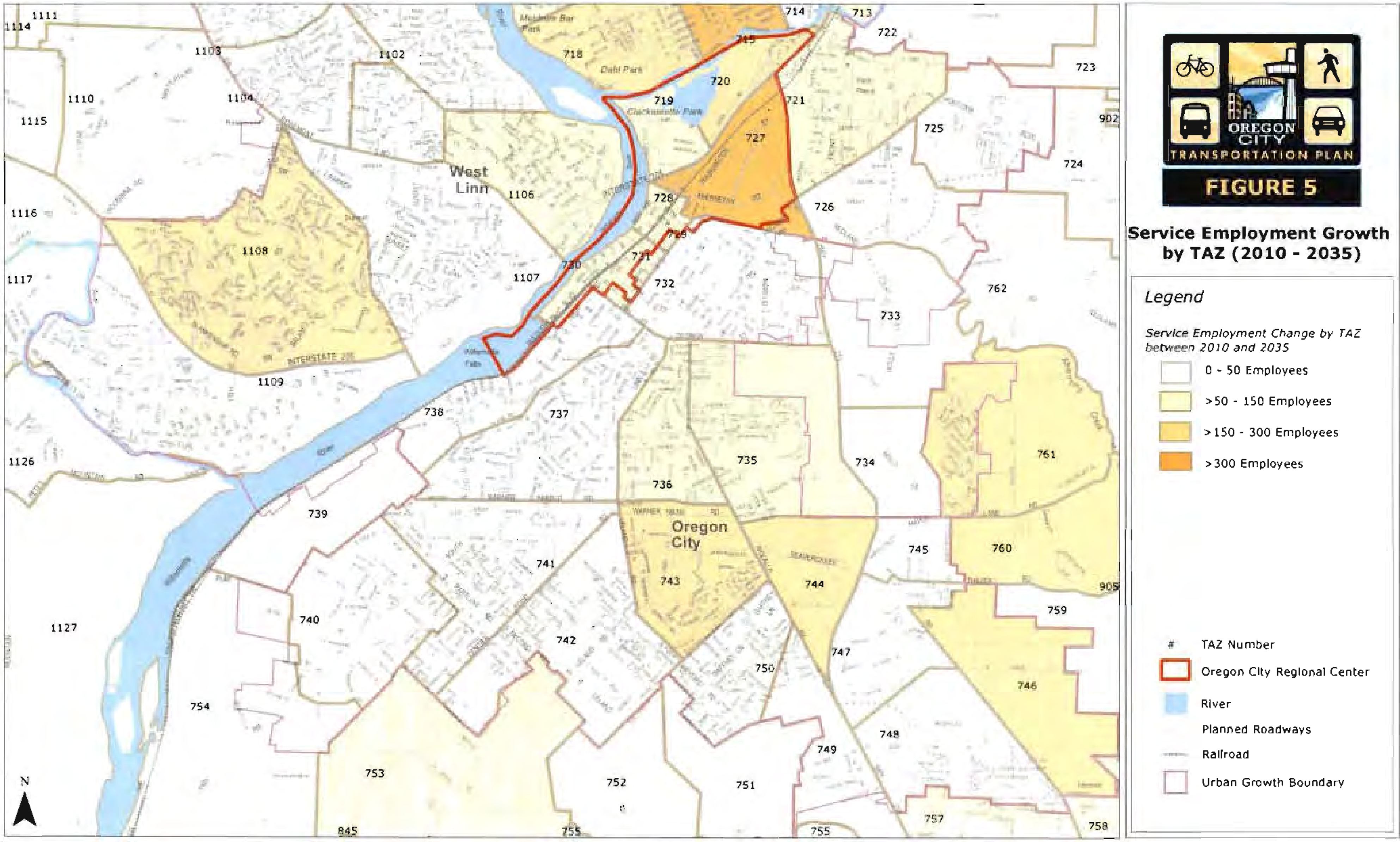
Retail Employment Growth by TAZ (2010 - 2035)

Legend

Service Employment Change by TAZ between 2010 and 2035

- 0 - 50 Employees
- >50 - 150 Employees
- >150 - 300 Employees
- >300 Employees

- # TAZ Number
- Oregon City Regional Center
- River
- Planned Roadways
- Railroad
- Urban Growth Boundary



OREGON CITY
TRANSPORTATION PLAN
FIGURE 5
Service Employment Growth by TAZ (2010 - 2035)
Legend
Service Employment Change by TAZ between 2010 and 2035
0 - 50 Employees
>50 - 150 Employees
>150 - 300 Employees
>300 Employees
TAZ Number
Oregon City Regional Center
River
Planned Roadways
Railroad
Urban Growth Boundary
West Linn
Oregon City
N

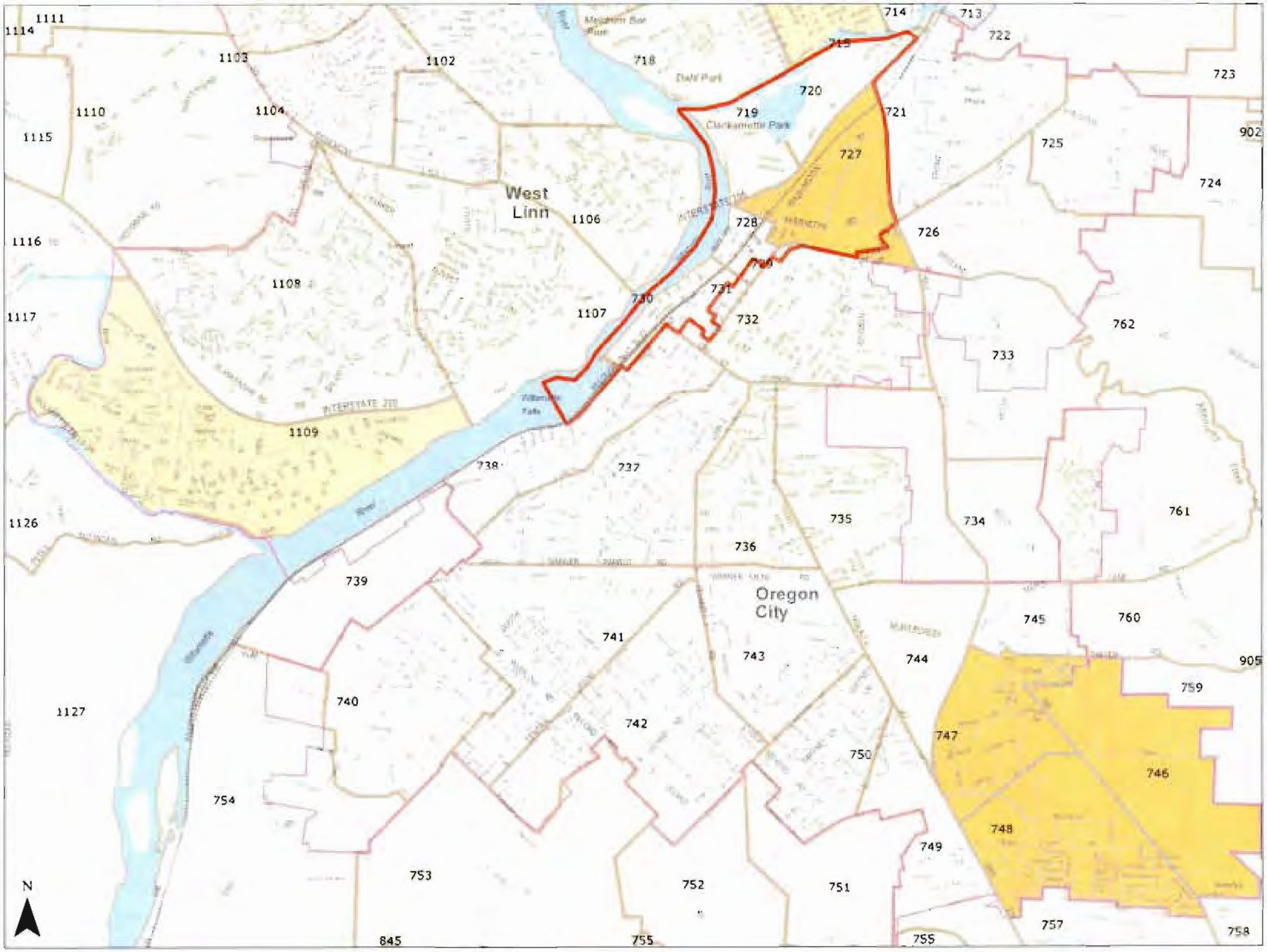


FIGURE 6

Other Employment Growth by TAZ (2010 - 2035)

Legend

Other Employment Change by TAZ between 2010 and 2035

- 0 - 50 Employees
- >50 - 150 Employees
- >150 - 300 Employees
- >300 Employees

- # TAZ Number
- Oregon City Regional Center
- River
- Planned Roadways
- Railroad
- Urban Growth Boundary

Travel Demand

Future year (2035) travel demand on roadways and at intersections in Oregon City will be estimated based on the Oregon City TSP models for 2010 and 2035. Travel demand will be estimated for the weekday PM peak hour for both 2010 and 2035, consistent with the ODOT Analysis Procedures Manual,[7] which documents the typically accepted method of developing future forecasts from model volumes in Oregon. The purpose of the 2010 model is to calibrate the network in preparation for developing the 2035 model. The calibration process may include adjustments to street network elements (connectivity, capacities, speeds, etc.) or centroid connectors (reflecting how the land use accesses the street network). Similar adjustments would be considered for the 2035 model. In addition, the 2010 model will be used as baseline for estimating growth in the 2035 model.

Traffic forecasts will be based on using model post-processing, as identified in the ODOT Analysis Procedures Manual. This approach is derived from methodologies outlined in National Cooperative Highway Research Program Report 255, *Highway Traffic Data for Urbanized Area Project Planning and Design*. This process is based on adding the increment of growth identified between the base and future year PM peak travel demand models to PM peak hour intersection turn movements derived from traffic counts. The method creates future year forecasts that are calibrated to actual data.

The travel demand analysis includes the translation of Metro land use information into motor vehicle trips. This was done for each Oregon City TAZ based on the existing and projected land uses described previously in the Land Use section of this memorandum. This section of the memorandum describes the methodology used to determine how the trips were distributed and assigned to the roadway network.

Motor Vehicle Trip Generation and Distribution

Trip quantities for the Oregon City TSP models were derived directly from Metro's travel demand models for 2010 and 2035. Metro model trip tables will be used as a basis for the Oregon City TSP model. The initial number of trips in the Oregon City TSP model will be consistent with the Metro travel demand model for both external and internal zones. Trip totals identified for Metro TAZs were split proportionally into the disaggregated TAZ system based on land use data and aggregate Metro model trip rates. The sum of the trip totals for disaggregated 'child' zones equaled the trips for each Metro 'parent' zone. Further refinements to trip generation may be made to calibrate the base year Oregon City model to traffic counts. The growth in demand (difference between 2010 and 2035) identified in Metro's travel demand models will be maintained, as identical adjustments to demand will also be applied to the future year model, if need be.

By utilizing trip tables directly from the Metro travel demand models as a basis, the initial distribution of trips will be retained. Relative trip distribution for disaggregated 'child' TAZs reflect the distribution identified for the 'parent' Metro TAZ.

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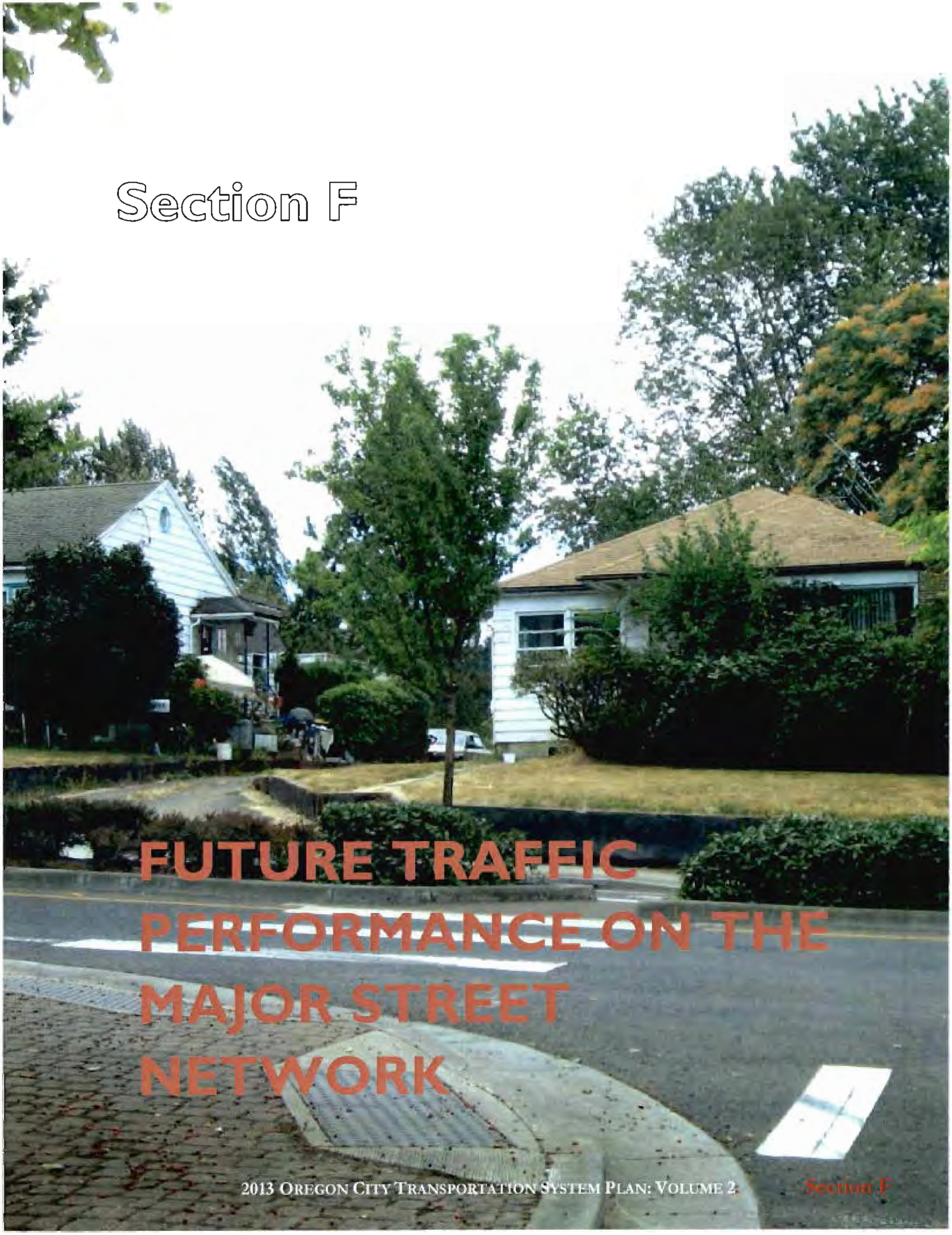
[7] *Analysis Procedures Manual (APM)*, Oregon Department of Transportation (ODOT) Transportation Planning Analysis Unit (TPAU), Last Updated June 2010.

Trip Assignment

Trip assignment involves the determination of the specific travel routes taken for all trips within the transportation network. Both the Oregon City TSP model and the Metro regional model perform trip assignment using VISUM. Model inputs included the transportation network (i.e., road and intersection locations and characteristics, as determined from maps and field inventories) and a trip distribution table (determined using methodology described previously in this memorandum). Iterated equilibrium assignment will be performed using estimated travel times along roadways as well as mid-block and approach capacities at intersections. The path choice for each trip will be based on minimal travel times available between locations in the model. Model outputs will include traffic volumes on roadway segments and at intersections. Model outputs will be reviewed for reasonableness and post-processed (as described previously) to develop forecasts.

Section F



FUTURE TRAFFIC PERFORMANCE ON THE MAJOR STREET NETWORK

FUTURE TRAFFIC PERFORMANCE ON THE MAJOR STREET NETWORK

Oregon City, like many jurisdictions, faces the challenge of accommodating future population and employment growth while keeping acceptable service levels on its transportation network. Oregon City is aware of this challenge and strives to keep the City's Transportation System Plan (TSP) up to date in an effort to prepare for and accommodate the future growth in the most efficient manner possible. Without the big picture that the TSP provides, maintaining acceptable street network performance could not be achieved in an efficient manner. For this reason, the City updated its forecast by reviewing the existing transportation network with growth through 2035 to better understand how the street network would be expected to operate. Using the existing zoning designations, this document explores the expected conditions of the Oregon City street network in 2035, assuming improvements are not pursued to accommodate future growth. Although this document focuses on the future growth and performance of the street system for driving, the forecasting process for future travel demand assumes increased travel via walking, biking and transit, in addition to driving. These modes will be further reviewed in Technical Memorandum #7.

Estimating Future Growth

Before we determine what investments are needed for a transportation network for all modes, we must first look at the existing travel conditions, and then use the latest planning assumptions to forecast what future growth and travel trends might look like in the planning horizon of 2035. This helps to establish future baseline street network conditions that show what the future might look like if no new improvements are made to accommodate growth in the community.

The Traffic Forecasting Process

A determination of future street network needs in Oregon City requires the ability to accurately forecast travel demand resulting from estimates of future population and employment for the City. A primary objective of the transportation planning process is to provide the information necessary for making decisions on when and where improvements should be made to the transportation system to meet travel demand as developed in an urban area travel demand model as part of the Regional Transportation Plan update process. Metro uses VISUM, a computer based program for transportation planning, to process the large amounts of data for the Portland Metropolitan area. The traffic forecasting process can be summarized in six steps (see Figure 1):

1. **Update street network data:** The street network for the Metro Travel Demand Model was expanded to include all arterial and collector streets in Oregon City. The model had previously included most major roadways in the region. The existing model street network was also refined based on the existing conditions inventory of posted speeds, traffic control, lane geometries, and number of travel lanes. The existing model street network was utilized as the starting point for the 2035 Baseline model. Projects with secured funding or that are reasonably likely to be funded by 2035 were added to the street network.

2. **Identify the land use:** Based on 2010[1] and 2035 land use, growth for Oregon City and the surrounding region was estimated.

3. **Group the land use data based on location:** The land use data was split into geographical areas called transportation analysis zones (TAZs), which represent the sources of vehicle trip generation. There are 31 Metro TAZs within or adjacent to the Oregon City. These TAZs were further subdivided into 40 TAZs to better represent land use in Oregon City. The TAZs in Oregon City are shown in Figure A1 in the appendix.

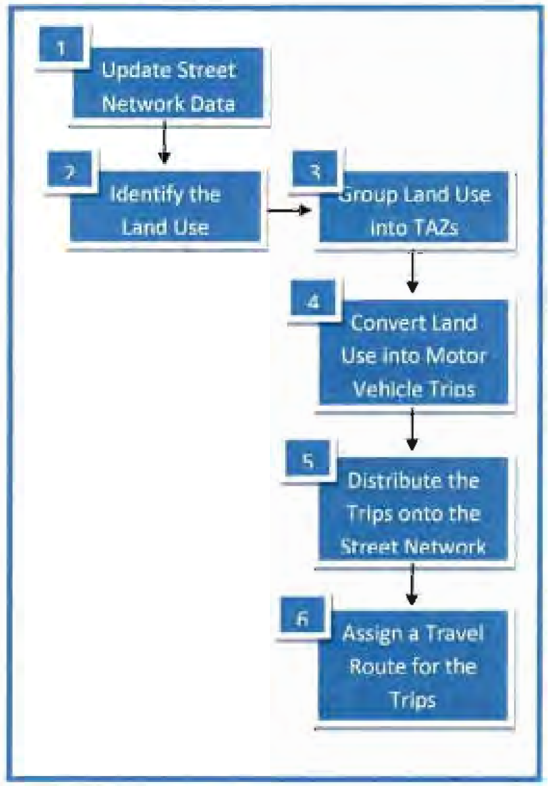


Figure 1: The Traffic Forecasting Process

4. **Convert the land use to motor vehicle trips:** The existing and projected land use is converted into motor vehicle trips. The trip generation process translates existing and projected land use quantities (number of dwelling units, retail, and other employment) into vehicle trip ends (number of vehicles entering or leaving a TAZ) using trip generation rates established during the model verification process.

5. **Distribute the trips onto the street network:** This step estimates how many trips travel from one TAZ in the model to any other TAZ. Distribution is based on the number of vehicles entering or leaving each TAZ pair, and on factors that relate the likelihood of travel between any two zones to the travel time between zones.

6. **Assign a travel route to the trips:** In this process, trips from one TAZ to another are assigned to specific travel routes on the street network, and resulting trip volumes are accumulated on links of the network until all trips are assigned.

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[1] 2010 land use is based on the most current inventory by Metro

Once the traffic forecasting process is complete, we utilize the 2035 traffic volumes to determine the areas of the street network that are expected to be congested and that may need future investments to accommodate growth.

Baseline Street Network Performance

Baseline reflects the street network performance assuming we build the transportation projects that already have secured funding or are reasonably likely to be funded but assumes no additional improvements. Major projects that are included in the Baseline street network are (see Table A1 in the appendix for more detail):

- Swan Avenue extension from Livesay Road to Holly Lane
- Holly Lane extension from Redland Road to Holcomb Boulevard
- Holly Lane improvements from Redland Road to Maple Lane Road
- Beavercreek Road widening from Maple Lane Road to Henrici Road
- Meyers Road extension from OR 213 to High School Avenue
- A roadway connection between Washington Street and Abernethy Road
- Intersection re-configuration at OR 213/Washington Street
- A roundabout at the Molalla Avenue/Division-Taylor Street intersection

Snapshot of Oregon City in 2035

Highlights of the 2035 Baseline performance are discussed below. While these summaries detail land use and growth in Oregon City, the travel demand forecasts that have been evaluated reflect the regional land use growth throughout the Portland metropolitan area.

More People, More Jobs

Today, Oregon City and the adjacent area are home to over 13,000 households and accounts for over 14,500 jobs. Between now and 2035, household growth is expected to increase nearly 2.4 percent a year, slightly outpacing the rate of job growth over the same period.[2] Oregon City and the adjacent area are expected to be home to 23,328 jobs by 2035, a

Oregon City and Adjacent Area Total Households and Employees in 2035 and Percent Change From 2010

[2] Household and Employment growth was estimated by Metro using 2010 and 2035 zoning data

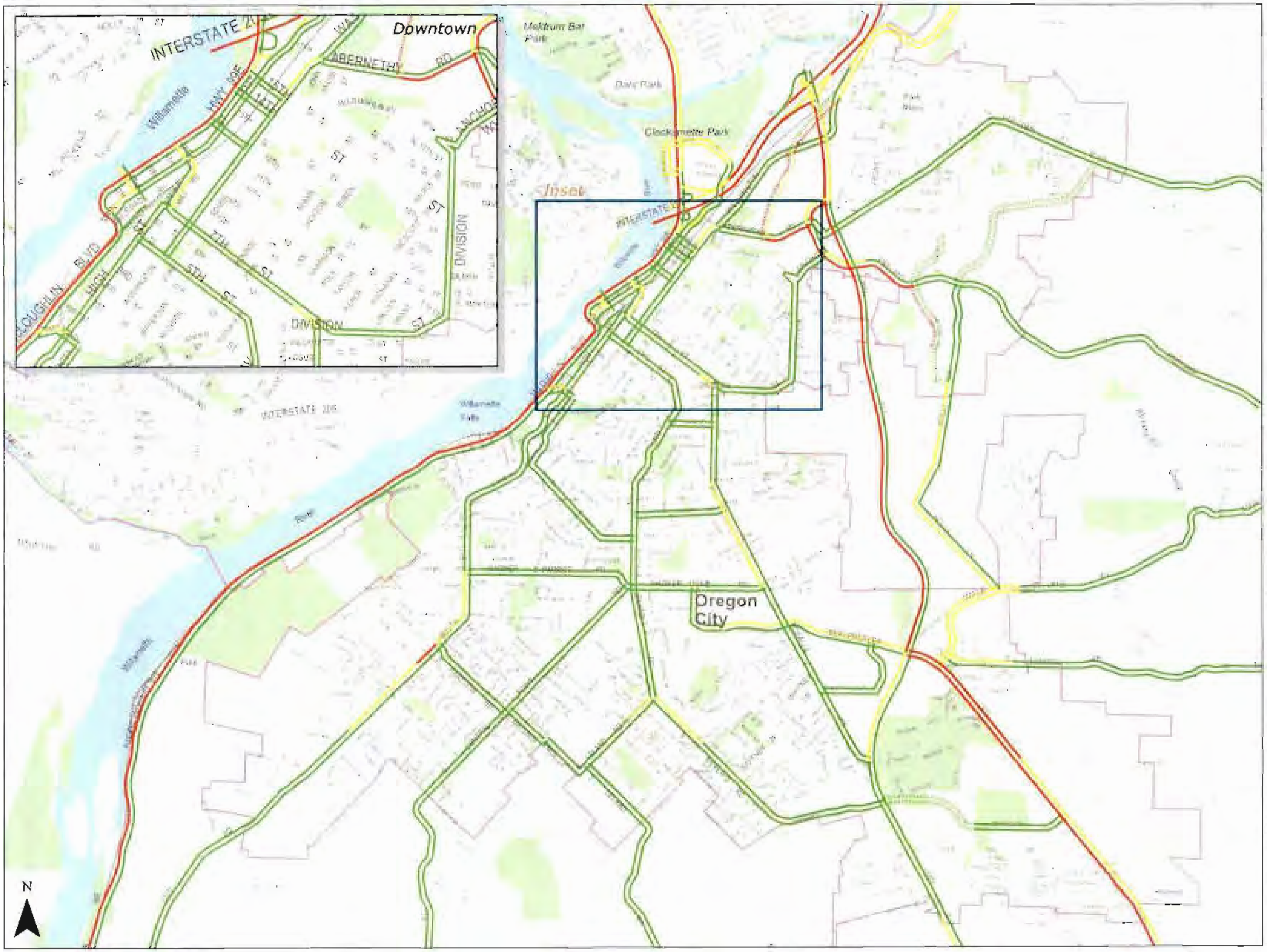
58 percent increase from 2010, or an average of 2.3 percent growth a year. Households are expected to grow to 20,985 by 2035, a 61 percent increase from 2010. With more people and more jobs in and around Oregon City, the street network will face increased demand through 2035. More detail on the land use by TAZ can be found in Table A3 in the appendix.

More Travel

With more jobs and people, the street network in Oregon City will face an additional 21,000 motor vehicle trips during the evening peak hour (see Table A2 in the appendix). Today, the street network in Oregon City is generally able to handle the estimated 33,000 evening peak hour trips. However, the evening peak hour motor vehicle trips are expected to increase 3 percent a year, surpassing 54,000 trips by 2035. Figure 2 shows the estimated increase in motor vehicle trips on the street network during the evening peak hour. As shown, much of the increased demand is expected along the regional roadways, such as I-205, OR 99E and OR 213. These roadways generally connect the Portland Metropolitan area to the employment areas in Oregon City. Other roadways that are expected to see significant traffic increases (according to the Metro travel demand model) include Abernethy Road, Beavercreek Road, Holly Lane, Maple Lane Road, Molalla Avenue, Redland Road and South End Road. Each of these roadways connects a major residential and/or employment growth area in the City to the regional roadway network.

More Congestion

More travel means more congestion. Travel activity as reflected by evening peak hour motor vehicle trips is expected to increase by 75 percent through 2035. Figure 3 shows the expected locations of congestion on the street network in Oregon City. As shown, most of the congestion is expected to be along the regional roadways that would experience the highest growth in evening peak hour motor vehicle volumes, such as I-205, OR 99E and OR 213. Congestion on I-205 and OR 213 would generally have less of an impact on Oregon City compared to that on OR 99E. When OR 99E is congested it has more of an impact on surface street circulation around Downtown Oregon City and could potentially detract from shopping or other retail uses in the area. Other roadways that are expected to experience congestion during the evening include Redland Road and Washington Street. It should be noted that major intersections along the congested roadways could potentially have operational issues based on this analysis. A detailed review of these intersections is forthcoming in Technical Memorandum #7.



OREGON CITY TRANSPORTATION PLAN

FIGURE 2

Motor Vehicle Travel Growth (P.M. Peak)

Legend

Roadway Travel Volume Increase between 2010 and 2035

- Highest Growth in Traffic Volumes (increase of more than 500 vehicles during the p.m. peak hour)
- Higher Growth in Traffic Volumes (increase between 250 and 500 vehicles during the p.m. peak hour)
- Smallest Growth in Traffic Volumes (less than 250 additional vehicles during the p.m. peak hour)

- River
- Parks and Open Spaces
- Planned Roadways
- Railroad
- City Limit
- Urban Growth Boundary

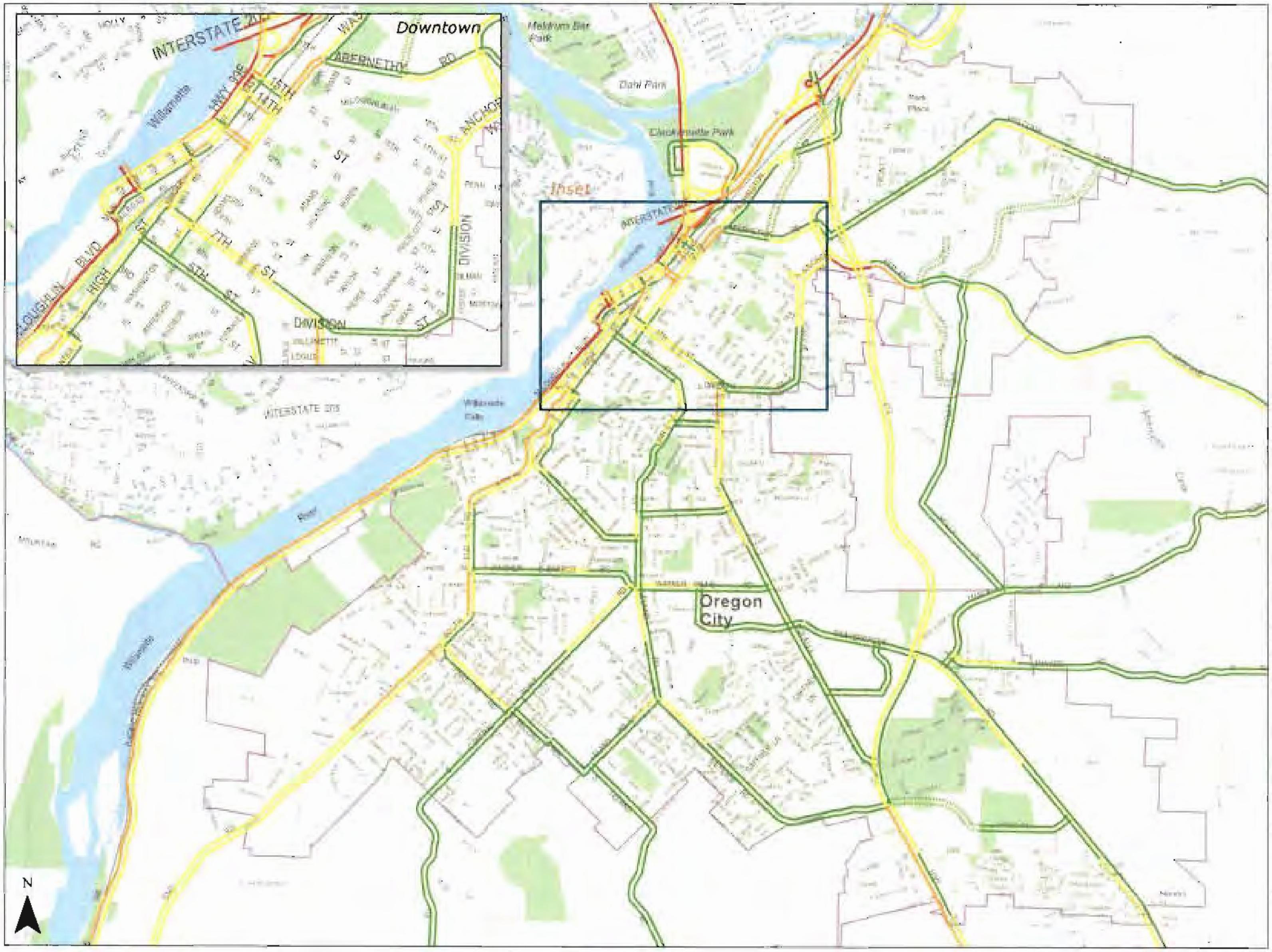


FIGURE 3

2035 Motor Vehicle Congestion (P.M. Peak)

Legend

Roadway Traffic Volume compared to Available Capacity

- Congested, over capacity
- More Congestion, nearing capacity
- Slightly more Congestion, well under capacity
- Uncongested, well under capacity
- River
- Parks and Open Spaces
- Planned Roadways
- Railroad
- City Limit
- Urban Growth Boundary

Appendix

Table A1: Oregon City CIP Financially Constrained Motor Vehicle Projects

Project ID	Source	Project/ Program Name	Start Location	End Location	Description
Roadway Segment Improvements					
1	RTP	Swan Extension	Livesay Rd	Holly Ln	Through lanes, sidewalks, bike lanes, turn lanes to serve UGB expansion area
2	RTP	Holly Lane	Redland Rd	Holcomb Rd	Through lanes, sidewalks, bike lanes, turn lanes to serve UGB expansion area
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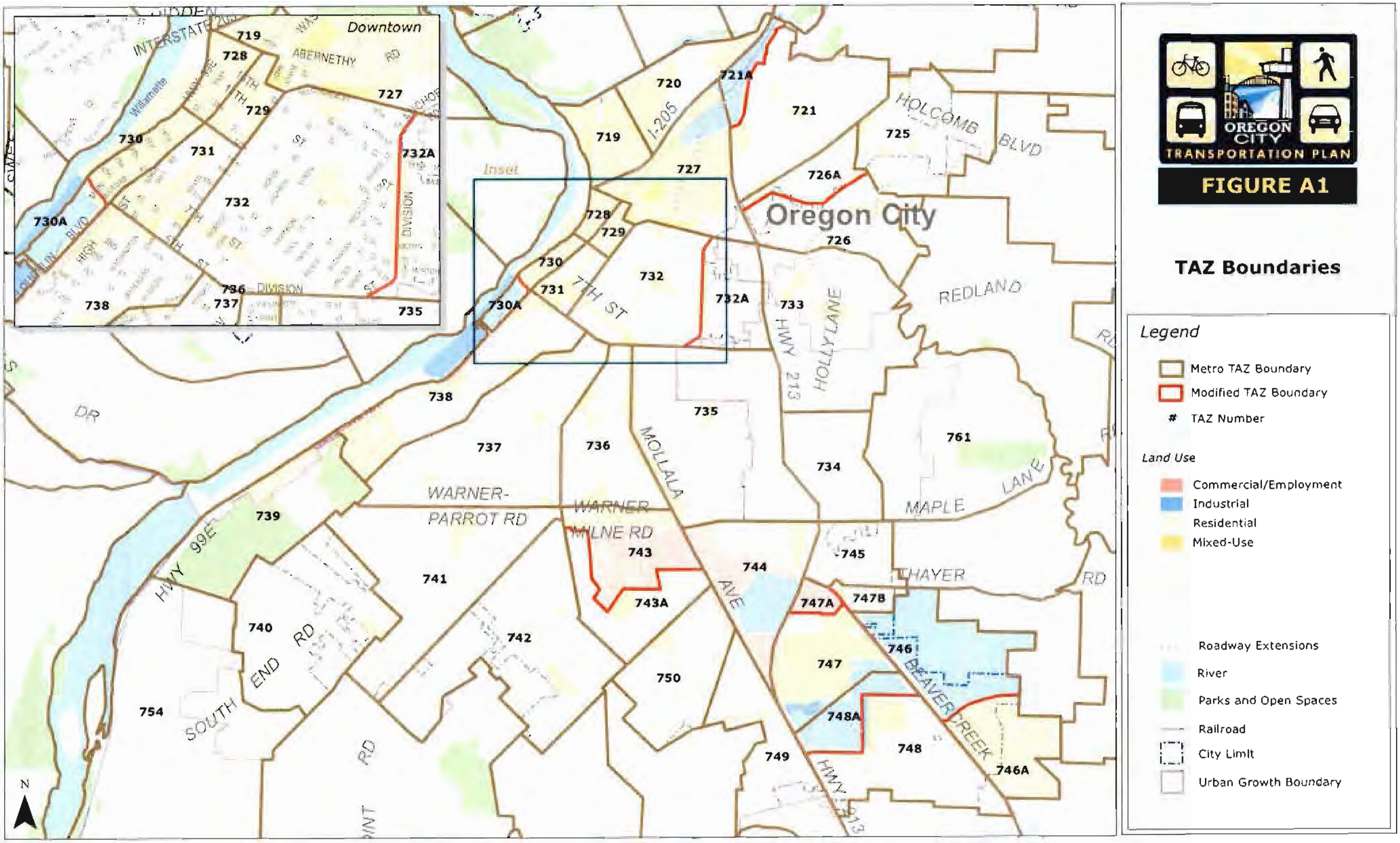
5	RTP	Beavercreek Rd Improvements Phase 3	Clackamas Community College	UGB	Widen to 4 lanes with sidewalks and bike lanes
6	City TSP	Meyers Road	High School Avenue	Beavercreek Road	Extension from current terminus at High School Avenue to Beavercreek Road
7	City TSP	Washington – Abernethy Connector	Abernethy Road	Washington Street	Extension from stub south of Washington to Abernethy Road
Intersection Improvements					
A	STIP/ City TSP	Jughandle at OR 213/Washington Street	-	-	Construct Jughandle Intersection at Washington Street
B	RTP	Molalla Avenue Roundabout (Taylor/Division)	-	-	Reconfigure intersection for safety and LOS into roundabout



OREGON CITY
TRANSPORTATION PLAN
FIGURE A1
TAZ Boundaries
Oregon City
Downtown
Inset
Legend
Metro TAZ Boundary
Modified TAZ Boundary
TAZ Number
Land Use
Commercial/Employment
Industrial
Residential
Mixed-Use
Roadway Extensions
River
Parks and Open Spaces
Railroad
City Limit
Urban Growth Boundary

Table A2: Oregon City Trip Generation by TAZ

TAZ	2010 Trips Leaving	2010 Trips Arriving	2010 Total Trips	2035 Trips Leaving	2035 Trips Arriving	2035 Total Trips	Change in Total Trips (2035-2010)
719	574	387	962	857	605	1,462	500
720	59	23	81	418	280	698	617
721	265	400	665	568	583	1,151	486
721A	137	73	209	103	315	417	208
725	185	307	492	424	824	1,248	755
726	30	62	92	165	330	495	403
726A	74	134	208	90	202	292	84
727	449	289	738	3,286	2,027	5,312	4,574
728	100	73	173	242	170	412	240
729	150	95	245	266	175	441	197
730	290	239	529	556	228	784	255
730A	362	94	456	280	235	515	58
731	275	242	517	390	329	719	202
732	904	1,170	2,074	1,435	786	2,221	147
732A	987	325	1,312	513	804	1,318	6
733	103	117	220	203	326	529	310
734	29	53	82	34	63	98	16
735	752	855	1,607	1,031	1,048	2,079	472
736	700	751	1,451	933	922	1,856	405
737	640	1,038	1,678	716	1,144	1,861	183
738	289	402	691	371	492	862	172
739	27	14	41	43	44	87	46
740	311	513	823	761	1,421	2,183	1,360
741	580	1,154	1,734	701	1,407	2,109	374
742	481	942	1,423	922	1,850	2,772	1,348
743	2,547	961	3,507	1,852	1,711	3,563	56
743A	468	889	1,357	1360	375	1,735	378
744	1,504	880	2,383	2,038	1,207	3,246	862

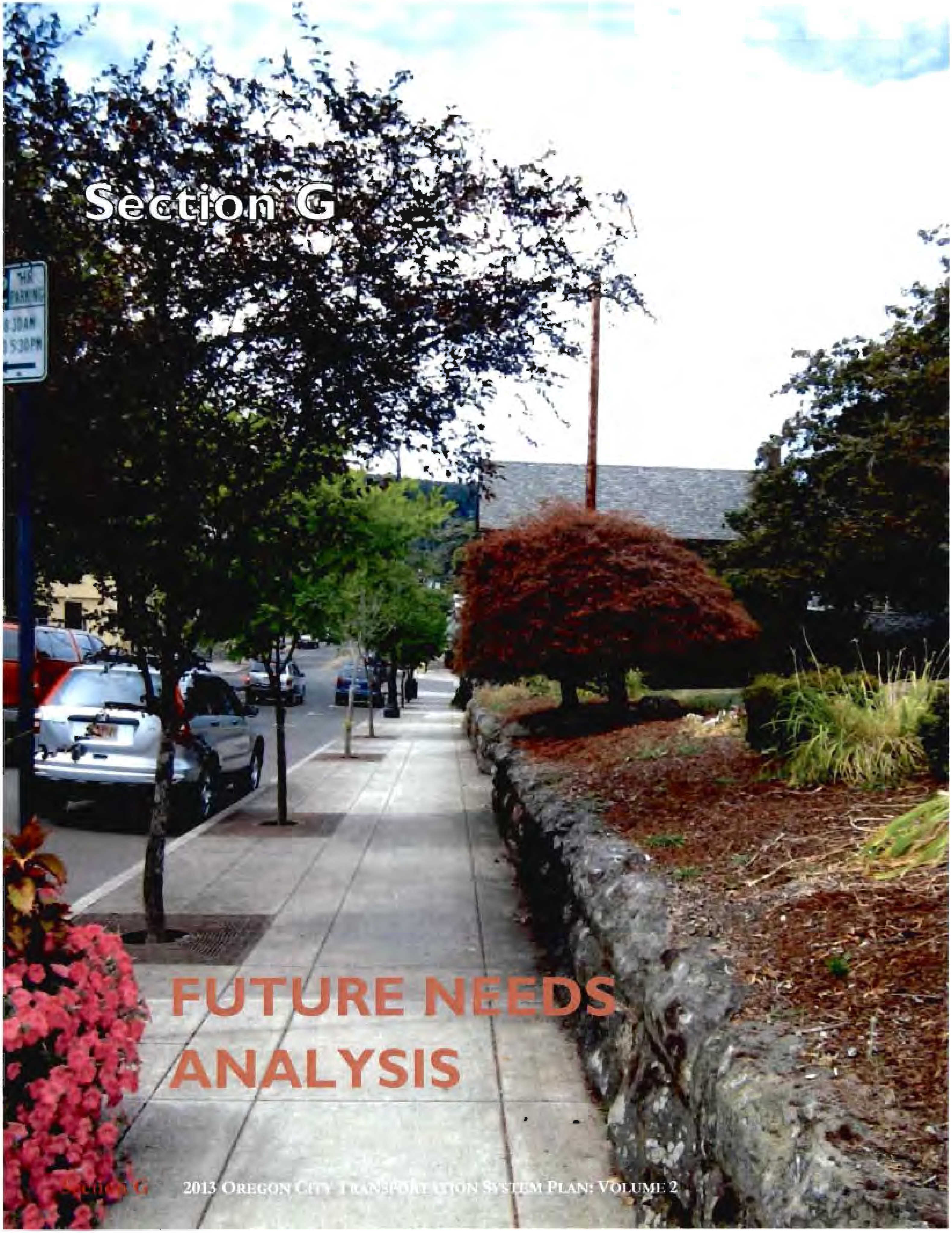
Table A2: Oregon City Trip Generation by TAZ

	2010			2035			
TAZ	Trips Leaving	Trips Arriving	Total Trips	Trips Leaving	Trips Arriving	Total Trips	Change in Total Trips (2035-2010)
745	119	144	263	369	701	1,070	807
746	47	44	91	1,101	672	1,772	1,682
747	897	300	1,197	952	764	1,717	520
747A	683	453	1136	773	399	1172	36
747B	192	294	486	570	128	697	211
748	384	663	1,047	642	571	1,213	166
748A	93	26	119	99	347	446	327
749	522	693	1,215	710	1,044	1,755	540
750	503	735	1,238	655	977	1,632	394
754	84	183	267	406	903	1,309	1,043
761	77	126	202	564	650	1,213	1,011
Total	**16,872**	**16,140**	**33,012**	**27,400**	**27,061**	**54,461**	**21,449**

Table A3: Oregon City TAZ Land Use Growth, 2010 to 2035

TAZ	Household Growth	Employment Growth
719	150	306
720	193	384
721	428	136
725	593	12
726	397	-1
727	370	3112
728	48	148
729	43	128
730	58	208
731	54	121
732	114	17
733	237	16
735	90	275
736	152	197
737	119	31
738	88	69
740	996	13
741	194	1
742	1055	11
743	79	-40
744	78	527
745	660	-15
746	355	1639
747	4	473
748	188	347
749	474	26
750	238	80
761	507	384
Subtotal	**7,962**	**8,605**

Source: Metro



Section G

FUTURE NEEDS ANALYSIS

This document details the 2035 transportation conditions in Oregon City if no new investments are made to the existing transportation system beyond currently funded projects. Included is a summary of how the future transportation needs are determined, a depiction of what travel in 2035 could look like in Oregon City, a detail of where transportation investments are needed and an outline of potential improvements to consider.

How do we Determine Future Transportation System Needs?

Before we determine what investments are needed for the City's transportation system, we must first look at the existing travel conditions, and then use the latest planning assumptions to forecast what future growth and travel trends might look like in 2035. We begin by assuming that no new investments will be made into the transportation system beyond what is already funded for construction and consider how the system will change with planned growth. The following sections explain where growth is expected, how the transportation system will perform and where solutions will be needed. Solutions for addressing the transportation system needs will be explored in Technical Memorandum #9.

Estimating Future Travel

A determination of future transportation system needs in Oregon City requires the ability to accurately forecast travel demand resulting from estimates of future population and employment for the City and the rest of the Metro region. The objective of the transportation planning process is to provide the information necessary for making decisions about how and where improvements should be made to provide a safe and efficient transportation system that provides travel options.

The travel demand forecasting process generally involves estimating travel patterns for new development based on the decisions and preferences demonstrated by existing residents, employers and institutions around the region. Travel demand models are mathematical tools that help us understand future commuter, school and recreational travel patterns including information about the length, mode and time of day a trip will be made. The latest travel models are suitable for motor vehicle and transit planning purposes, and can produce total volumes for autos, trucks and buses on each street and highway in the system. Comparing outputs with observed counts and behaviors on the local system refines model forecasts. This refinement step is completed before any evaluation of system performance is made. Once the traffic forecasting process is complete, the 2035 volumes are used to determine the areas of the street network that are expected to be congested and that may need future investments to accommodate growth. Additional details on the travel forecasting can be found in Figure A1 in the appendix and in Technical Memorandum #5: Modeling Assumptions.

Future Estimates of Walking, Biking and Transit

While there is great interest in developing forecasting models for bicycles and pedestrians, the traditional travel demand methodology used for predicting motor vehicle activity does not easily apply to bicycle and pedestrian travel for a number of reasons. Because the number of daily biking and walking trips in a community tend to be much smaller than the number of vehicular trips, data on walking and biking is typically too small to develop accurate models. Additionally, how people choose routes when they are walking or biking tends to be much more complicated than when they are driving (i.e., motorists tend to take the shortest routes while bicycles may trade directness to avoid a hill or travel on a lower volume street). The nature of bicycle and pedestrian travel and decision-making is not well understood, and is the subject of current national and local research efforts to incorporate bicycle and pedestrian travel into future traditional travel models.

Other sources of information on bicycle and pedestrian activity, such as the U.S. Census tend to undercount the actual number of walking and biking trips made in a community. This is because Census data focuses on the mode of travel used for work trips, which typically make up less than 20 percent of an individual's travel. In addition, the Census requires that respondents choose only one mode—the one used most often during the survey week. As a result, the Census does not capture the bicycle and pedestrian activity of people who bicycle or walk to access transit, to conduct personal business, to socialize, or for recreation.

Therefore, the future needs for walking, biking and transit in Oregon City were determined by reviewing major growth areas of the City and seeing how they were served by existing facilities. In addition, the areas of the City in close proximity to key destinations (such as schools, parks, transit stops, shopping and employment) that have the potential to attract significant walking and biking trips and areas with existing deficiencies were reviewed to determine locations for prioritized walking , biking or transit investments (see Figures 5, 6, and 7).

Snapshot of Oregon City in 2035

Today, Oregon City is home to over 13,000 households and accounts for over 14,500 jobs. Between now and 2035, household growth is expected to increase nearly 2.4 percent a year, slightly outpacing the rate of employment growth over the same period (2.3 percent). Oregon City is expected to be home to over 23,000 jobs almost 21,000 households by 2035, a 58 and 61 percent increase respectively from 2010. With more people and more jobs in Oregon City, the transportation network will face increased demand through 2035.

More People, More Jobs

As shown in Figure 1, much of the population and employment growth is expected to occur around the undeveloped edges of Oregon City. Employment growth is expected to be highest around the

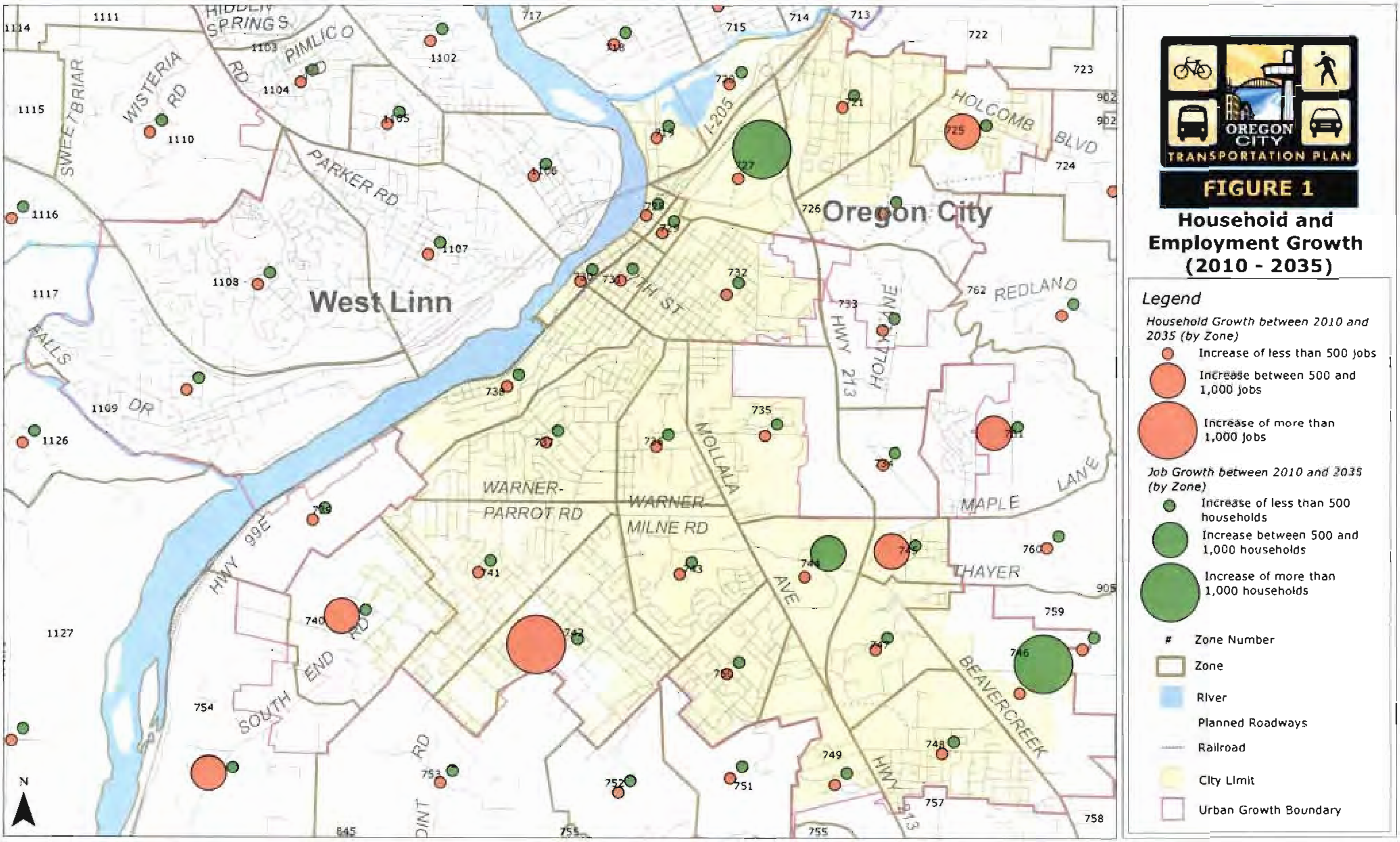
Oregon City Regional Center, including downtown Oregon City and the area bounded by the Clackamas River to the north, Abernethy Road on the south, OR 213 on the east and the Willamette River to the west. High employment growth is also anticipated to occur at the southeast end of the City, around OR 213 and Beavercreek Road.

Household growth is expected to be highest towards the south end of the City, along South End Road, Central Point Road, Leland Road and Meyers Road. High household growth is also expected to occur on the north and east side of the City, along Maple Lane Road, Holcomb Boulevard and Redland Road.

More Travel

With more jobs and people, the street network in Oregon City must cope with an additional 21,000 motor vehicle trips during the evening peak hour (see Table A1 in the appendix). Today, the street network in Oregon City is generally able to handle the estimated 33,000 evening peak hour trips evening peak hour trips. However, the evening peak hour motor vehicle trips are expected to increase 3 percent a year, surpassing 54,000 trips by 2035. Figure 2 illustrates how the population and employment growth through 2035 translates into motor vehicle travel by zone during the evening peak hour. As shown, much of the increased travel is expected to begin or end in zones located in a major residential and/or employment growth area, including around Abernethy Road, Beavercreek Road, Maple Lane Road, Molalla Avenue, Redland Road and South End Road.

2035 motor vehicle volumes on the roadways in Oregon City were utilized to determine the areas of the street network that will be congested and may need future investments to accommodate growth. The street network was assessed under Baseline conditions, which reflects the street network performance assuming we build the transportation projects that already have secured funding or are reasonably likely to be funded but assumes no additional improvements. Major projects that are included in the Baseline street network can be seen in Table A2 in the appendix. The 2035 Baseline traffic volumes developed for the reviewed intersections can be found in Figure A3 in the appendix. Baseline 2035 motor vehicle volumes are expected to be highest along the regional roadways, such as I-205, OR 99E and OR 213. These roadways generally connect the Portland Metropolitan area to the employment areas in Oregon City and serve outlying communities such as Molalla and Canby. Other roadways that are expected to see significant traffic increases include Abernethy Road, Beavercreek Road, Holly Lane, Maple Lane Road, Molalla Avenue, Redland Road and South End Road. Each of these roadways connects a major residential and/or employment growth area in the City to the regional roadway network.


OREGON CITY
TRANSPORTATION PLAN
FIGURE 1
Household and Employment Growth (2010 - 2035)
Legend
Household Growth between 2010 and 2035 (by Zone)
Increase of less than 500 jobs
Increase between 500 and 1,000 jobs
Increase of more than 1,000 jobs
Job Growth between 2010 and 2035 (by Zone)
Increase of less than 500 households
Increase between 500 and 1,000 households
Increase of more than 1,000 households
Zone Number
Zone
River
Planned Roadways
Railroad
City Limit
Urban Growth Boundary
West Linn
Oregon City
N
HIDDEN SPRINGS
PIMLICO
WISTERIA RD
SWEETBRIAR
PARKER RD
FALLS
DR
I-205
HOLCOMB
BLVD
REDLAND
HWY 213
HOLLY LANE
7TH ST
MOLLALA
AVE
WARNER-PARROT RD
WARNER-MILNE RD
MAPLE
LANE
THAYER
BEAVERCREEK
HWY 99E
SOUTH END RD
1111
1114
1115
1116
1117
1126
1127
1102
1103
1104
1107
1108
1109
1110
713
714
715
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722
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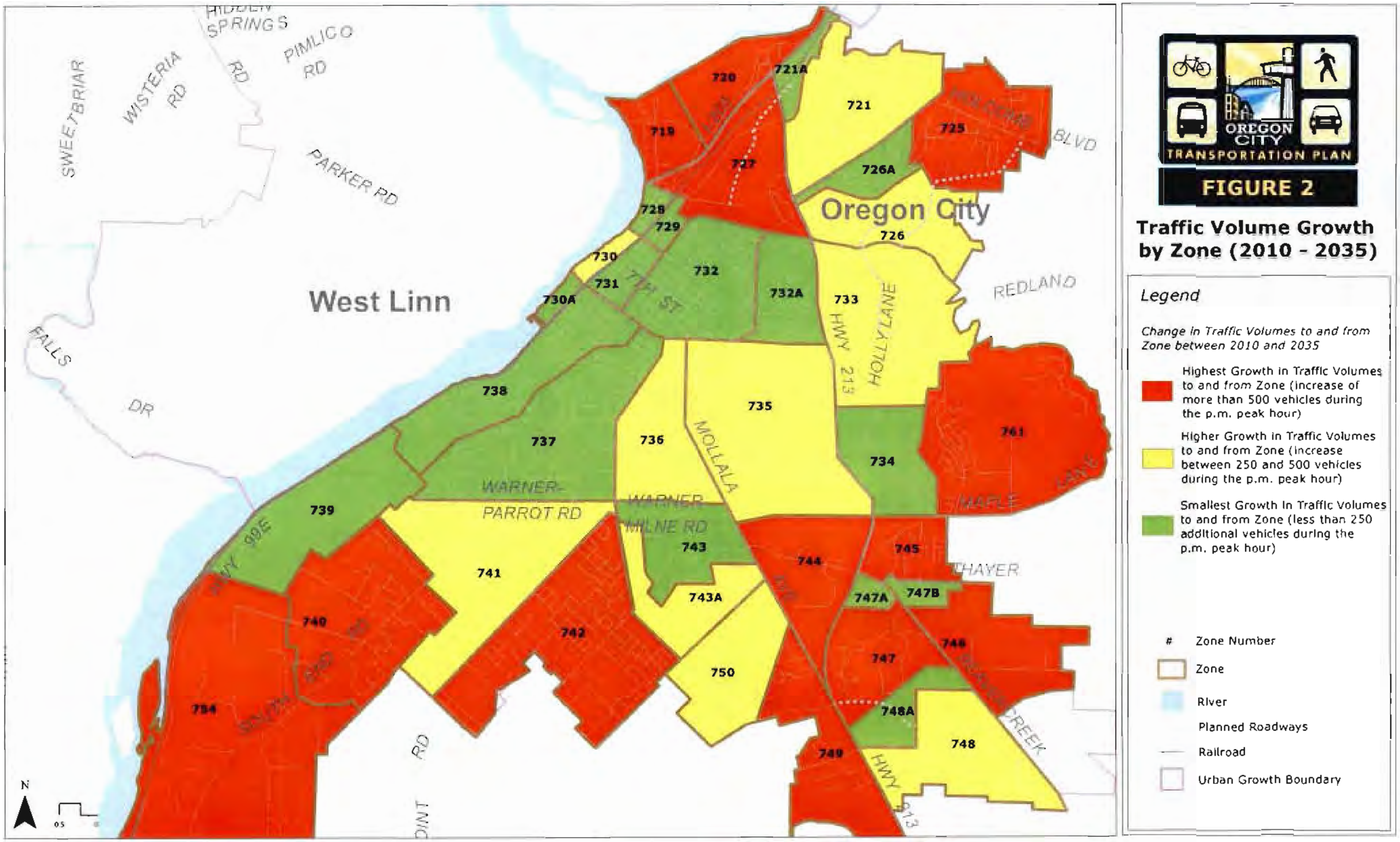
845
902
905


OREGON CITY
TRANSPORTATION PLAN
FIGURE 2
Traffic Volume Growth by Zone (2010 - 2035)
Legend
Change in Traffic Volumes to and from Zone between 2010 and 2035
Highest Growth in Traffic Volumes to and from Zone (increase of more than 500 vehicles during the p.m. peak hour)
Higher Growth in Traffic Volumes to and from Zone (increase between 250 and 500 vehicles during the p.m. peak hour)
Smallest Growth In Traffic Volumes to and from Zone (less than 250 additional vehicles during the p.m. peak hour)
Zone Number
Zone
River
Planned Roadways
Railroad
Urban Growth Boundary
West Linn
Oregon City
SPRINGS RD
PIMLICO RD
SWEETBRIAR
WISTERIA RD
PARKER RD
FALLS DR
BLVD
REDLAND
HWY 213
HOLLY LANE
MOLLALA
WARNER-PARROT RD
WARNER MILNE RD
THAYER
HWY 99E
MAPLE LANE
CREEK
RD
719
720
721A
721
725
726A
726
727
728
729
730
730A
731
732
732A
733
734
735
736
737
738
739
740
741
742
743
743A
744
745
747
747A
747B
748
748A
749
750
754
761

More Congestion

More travel means more congestion. Travel activity as reflected by evening peak hour motor vehicle trips beginning or ending in Oregon City, is expected to increase by 75 percent through 2035. Through travel, or trips that do not begin or end in Oregon City, is also expected to increase through 2035 and is generally representative of growth in Cities such as Molalla and Canby. Figure 3 shows the expected locations that will experience average travel speeds well below the posted limits on the street network in Oregon City. where most of the congestion is expected to be along the regional roadways, such as I-205, OR 99E and OR 213. Congestion on I-205 and OR 213 would generally have less of an impact on Oregon City compared to that on OR 99E. When OR 99E is congested it has more of an impact on surface street circulation around Downtown Oregon City and could potentially detract from shopping or other retail uses in the area. Other roadways that are expected to experience average travel speeds well below the posted limits during the evening include Beavercreek Road, Maple Lane Road, Redland Road and Washington Street.

2035 Baseline intersection operations are summarized in Figure 3 and shown in Table A3 in the appendix. With the increased street network congestion, several of the intersections reviewed are expected to be substandard by 2035 during the evening peak period (see Appendix for more detail), including four signalized intersections (OR 99E/I-205 WB Ramps, OR 99E/I-205 EB Ramps, OR 213/Beavercreek Road and Maple Lane Road/Beavercreek Road) and two all-way stop intersections (High Street/2nd Street and South End Road/Warner Parrott Road). In addition, since many of the intersections along these routes are unsignalized, the side streets generally experience high delay due to steady volumes on the uncontrolled roadway. These approaches typically require more time for an acceptable gap in traffic to make a left turn onto the mainline, therefore, the delay of the side street is high and the intersection becomes substandard. The following seven unsignalized intersections are expected to be substandard by 2035 due to the delay of the side street:

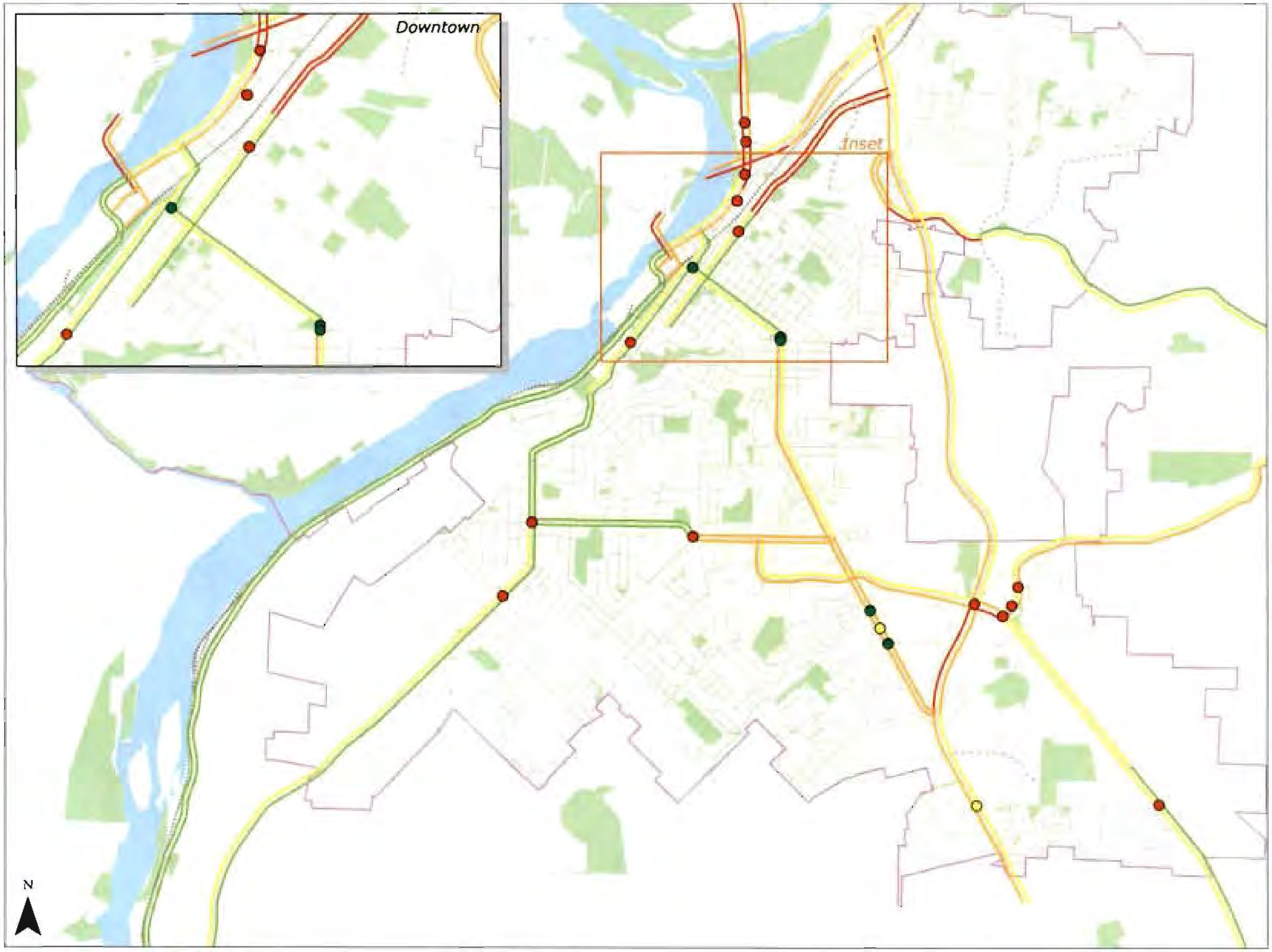
- Main Street/14th Street
- Washington Street/12th Street
- South End Road/Lafayette Avenue-Partlow Road
- Central Point Road/Warner Parrott Road
- Maple Lane Road/Thayer Road
- Maple Lane Road/Walnut Grove Way
- Beavercreek Road/Glen Oak Road

2035 peak period motor vehicle travel times per mile were estimated for major roadways in the City and compared to travel times of the existing street network. The motor vehicle travel times during the p.m. peak hour[1] were assessed using INRIX historical traffic flows[2] and increment

[1] The evening peak hour varies by intersection, but is generally between 4:30 and 5:30 p.m. in Oregon City

[2] INTIX Historical Traffic Flow Data, 2008-2010,data received from ODOT

growth in travel times gathered from the traffic forecasting process. As shown in Figure 4, travel times along several streets in the City are expected to get significantly longer through 2035 (with travel time increases of more than one minute per mile) including portions of I-205, Beavercreek Road, Redland Road and OR 43 (Oregon City-West Linn Bridge). Other roadways that are expected to have higher travel time increases per mile during the evening peak hour include OR 99E, South End Road and Main Street.



OREGON CITY TRANSPORTATION PLAN

FIGURE 3

2035 Baseline Motor Vehicle Operating Conditions (P.M. Peak)

Legend

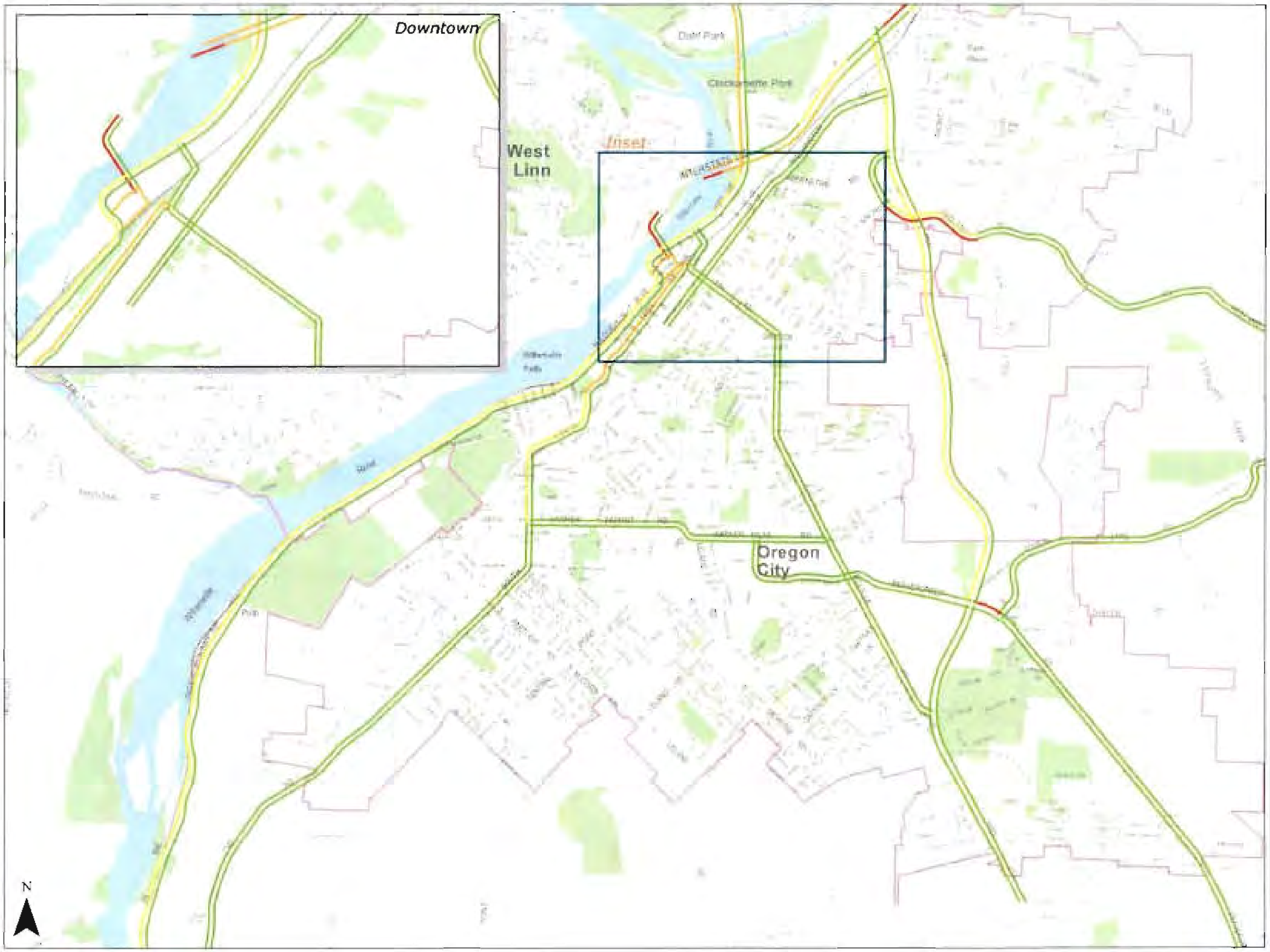
2035 Roadway Travel Speed compared to Posted Speed

- Congested, well below speed limit
- Slowing, well below speed limit
- Slowing, but near speed limit
- Uncongested, near speed limit

2035 Baseline Intersection Operations

- Good
- Marginal
- Substandard

- River
- Parks and Open Spaces
- Planned Roadways
- Railroad
- City Limit
- Urban Growth Boundary



OREGON CITY TRANSPORTATION PLAN

FIGURE 4

2035 Motor Vehicle Travel Time (P.M. Peak)

Legend

Segment Travel Time Change Between 2012 and 2035 (per mile)

- Increase of More than one minutes per mile
- Increase Between 30 seconds and one minute per mile
- Increase Between 15 and 30 seconds per mile
- Increase of Less than 15 seconds per mile

- River
- Parks and Open Spaces
- Planned Roadways
- Railroad
- City Limit
- Urban Growth Boundary

Where are Transportation Improvements Needed?

After reviewing the expected growth throughout the City and considering existing gaps and deficiencies of the transportation system, locations needing improvements were identified to meet the expected travel demand.

Walking Needs

Key transportation system gaps for pedestrians in Oregon City include:

- Lack of sidewalks/crossings along key routes to schools (e.g. near John McLoughlin Elementary, Holcomb Elementary, Oregon City High School, Gardner Middle School, and Mt Pleasant Elementary)
- Lack of sidewalks along routes that provide access to parks and open space (e.g. Charman Avenue near Rivercrest Park, and Chapin and Wesley Linn Parks)
- Lack of transit service within walking distance to neighborhoods west of Linn Avenue and Leland Road.
- Gaps in the sidewalk network along portions of transit routes (e.g. Linn Avenue, Warner Milne Road, and Holcomb Boulevard)
- Lack of sidewalks connecting the Canemah neighborhood to downtown Oregon City
- Lack of sidewalk connections from the residential areas in the south and southwest portions of the City to downtown Oregon City (e.g. along Linn Avenue).
- Lack of pedestrian crossings across major roadways (e.g. near the southern portion of OR 213)

Deficiencies in the pedestrian network include:

- **Lack of pedestrian buffer zone:** There are usually many destinations along arterials and the roads are designed to handle large vehicles, like buses. However, from a pedestrian perspective arterials can be difficult to cross and uncomfortable, or even dangerous to walk along. This is particularly true when there are missing sidewalks, unprotected crossings, or very little buffer provided between fast moving traffic and pedestrians. A buffer can take the form of streetside furnishings, landscaping or on-street parking. Along roads such as OR 99E through the Canemah neighborhood and along Molalla Avenue, the lack of buffer

There is no buffer between the sidewalk and vehicular traffic on much of Molalla Avenue, creating an uncomfortable walking environment

creates an uncomfortable and potentially unsafe walking environment.

- **Pedestrian visibility at crossings:** Opportunities exist to increase pedestrian visibility at pedestrian crossings using treatments such as signage, pavement markings, flashing lights, and median refuge islands. For example, the pedestrian crossing near Garden Meadow Drive on Molalla Avenue (below) can be difficult to see.

Tbe pedestrian refuge island on the left could be made more visible with additional signage and pavement markings.

- **Difficulties for Pedestrians with Mobility Impairments:** While curb ramps are present in much of Downtown, many intersections in other parts of the City lack curb ramps, creating difficulties for pedestrians with mobility impairments as well as people pushing strollers. Some marked crosswalks lead to sidewalks with no curb ramps (e.g., on Warner Parrot Road near Central Point Road).

Lack of curb ramps at a crossing on Warner Parrot Road (left) and in the Canemah neighborhood along OR 99E

- **Lack of pedestrian crossings on major roadways:** The Molalla Avenue-7th Street corridor is designated as a Corridor in the Metro Regional Transportation Plan. There is commercial activity along the length of this corridor, though development patterns along much of Molalla Avenue remain auto oriented, with most buildings separated from the roadway by parking lots. While 7th Street has been upgraded with frequent pedestrian crossing opportunities, the limited number of pedestrian crossings along Molalla Avenue requires pedestrians to travel long distances out of direction to reach a designated crossing.

- **Lack of wayfinding tools:** Oregon City's pedestrian and bicycle system would benefit from additional signage and other wayfinding tools to orient users and direct them to and through major destinations like Downtown, schools, Clackamas Community College, and neighborhoods.
- **Limited street connectivity in some areas:** Although a well-connected street grid exists in Downtown and the McLoughlin neighborhood, discontinuous streets in other areas increase walking distances to reach destinations. A discontinuous street network is difficult for non-motorized users to navigate (i.e., know which streets will reach their destination) deterring bicycle and pedestrian travel.

Key Destinations for Walking Trips: Figure 5 shows the existing walking network and the locations of key destinations that have the potential to attract walking trips. Areas of the City within comfortable walking distance (assumed to be ¼ mile) to the greatest number of activity generators are indicated in red, while locations with lighter shading (green) are within walking distance of a single destination. Even though a location may only be within walking distance of a single destination (such as school or park), it will still be prioritized as a key walking route. Areas with no shading would be outside of the comfortable walking trip distance to any of the destinations. Pedestrian facility gaps located in areas with darker shading (red and yellow) indicate potential locations for prioritizing walking improvements. As shown in Figure 5, most of the areas of the City with the highest walking demand (such as Downtown and along Washington Street and 7th Street-Molalla Avenue) have existing sidewalks. A few streets with high walking demand that lack sidewalks include portions of 15th Street, Linn Avenue, Division Street, and Pearl Street. Residences in the southern and northeastern portion of Oregon City (including the Hazel Grove/Westling Farm, Tower Vista, Caufield, and portions of the South End and Park Place neighborhoods) tend to be located outside of an easy walking distance of destinations or transit stops. Gaps in the pedestrian network limit the ability to walk to key destinations such as Downtown as well as local destinations including schools and parks.

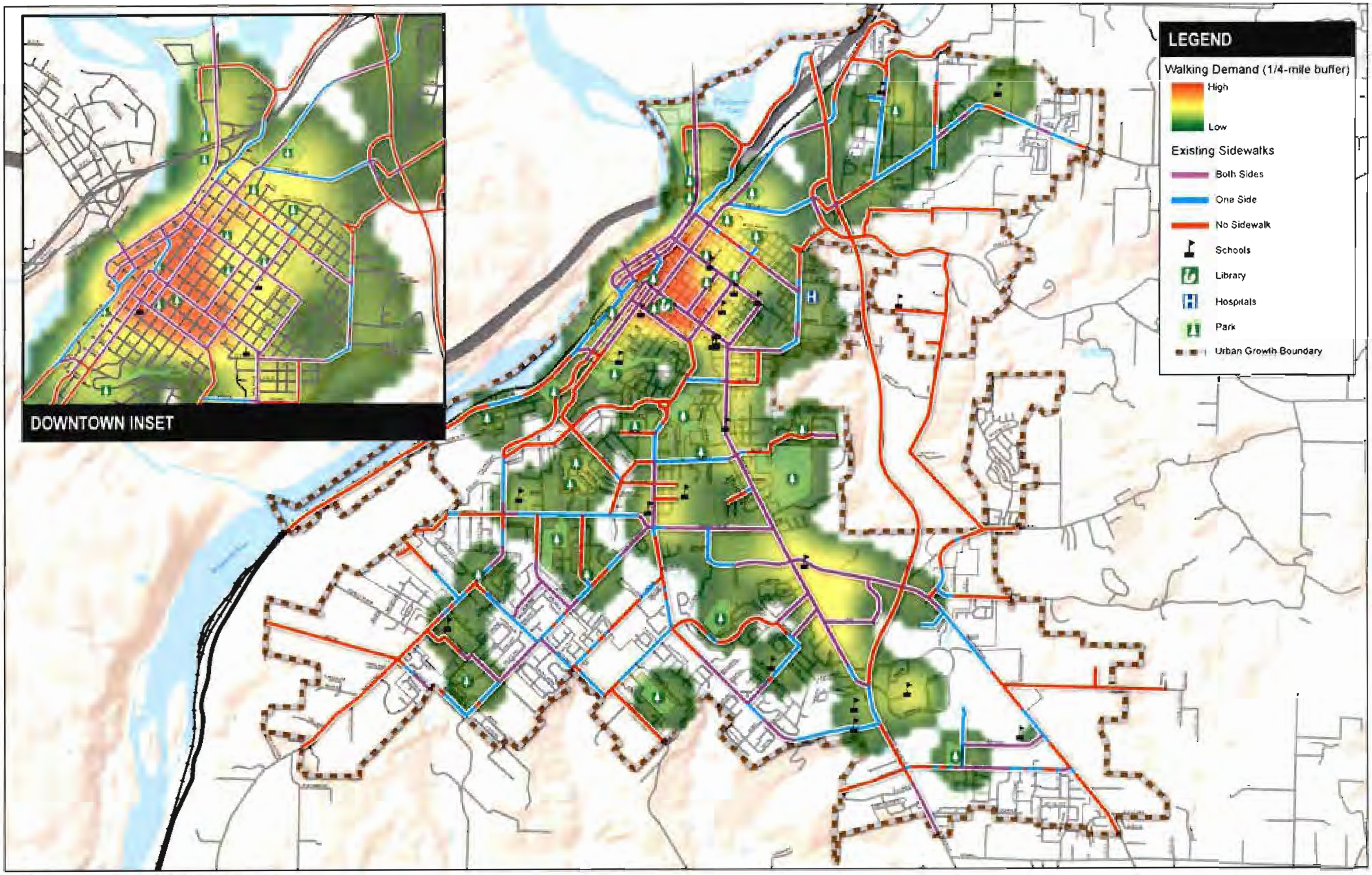


FIGURE 5: Pedestrian Demand Analysis

OREGON CITY TRANSPORTATION SYSTEM PLAN
Date: February 2012
Author: Alta Planning + Design

Biking Needs

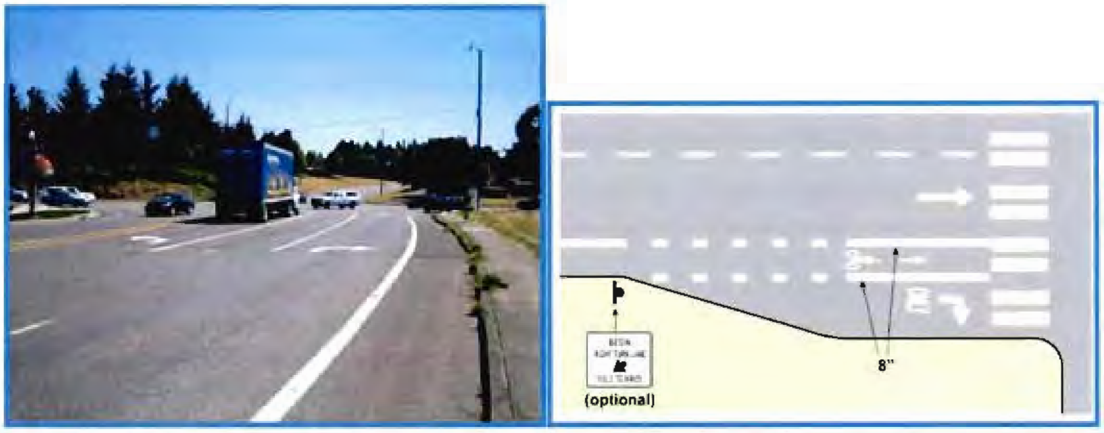
Key transportation system gaps for bicyclists in Oregon City include:

- Disconnected bicycle routes in Downtown and McLoughlin, South End, Tower Vista and Park Place neighborhoods, where biking demand is highest.
- Lack of bike lanes or wide shoulders on state highways (e.g. OR 99E)
- Lack of bike lanes or wide shoulders on arterial and collector streets in Oregon City (e.g. High Street, sections of South End Road and Abernethy Road)
- Lack of climbing bike lanes or other facilities to help bicyclists negotiate steep hills connecting downtown Oregon City with residential areas in the south and southwest portion of the City (e.g. Linn Avenue out of downtown would benefit from an uphill bike lane / downhill shared lane marking facility).
- Roadways periodically "drop" the bike lane, resulting in a discontinuous and uncomfortable experience, as occurs on Molalla Avenue between Warner Milne Road and Beavercreek Road, along Leland Road and along Central Point Road.
- Lack of low-traffic bicycle-friendly streets that are comfortable for children or new/inexperienced cyclists. Bicycle boulevards (also known as Neighborhood Greenways) are lower-volume and lower-speed streets that are optimized for bicycle travel through treatments such as traffic calming, bicycle wayfinding signage, pavement markings, and intersection crossing treatments. This treatment is particularly well suited to residential neighborhoods with good street connectivity, such as the McLoughlin neighborhood.

Deficiencies in the bicycle network include:

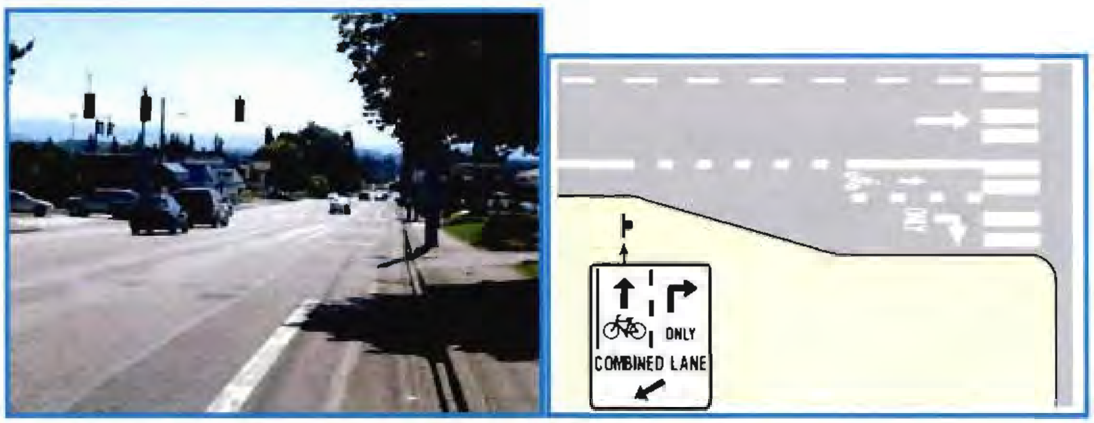
- **Limited bicycle parking near destinations**: Bicycle parking is generally not easy to find in Oregon City, yet it is an essential component to making the bicycle a viable transportation option. Excellent guidance on the provision of short term bicycle parking is found in the Bicycle Parking Guidelines produced by the Association for Pedestrian and Bicycle Professionals.
- **Lack of bicycle detection at traffic signals**: Signalized intersections in Oregon City generally do not detect bicycles. Methods of enabling cyclists to trigger a green signal phase include use of a push-button, loop detector or video detector. Loop detectors need to be regularly maintained to detect cyclists, and pavement stencils should be used to orient cyclists to the appropriate position within the roadway to trigger the signal.
- **Missing or improper bicycle accommodation at some intersections:** The majority of intersections along bike routes in Oregon City properly accommodate the bike lane through the intersection. However, there are a few examples of intersections where the bike lane drops at the intersection or is improperly situated on the outside of a right turn lane. At intersections with a dedicated right turn lane, the bike lane should generally be placed between the through lane and the right turn lane. Guidance on the lane configuration for

an intersection with a right turn lane and through bike lane can be found in the Oregon Bicycle and Pedestrian Plan[3] (see image below).



Bike lane on the outside of the right turn lane at the OR 213/ Molalla Avenue intersection (left). The Oregon Bicycle and Pedestrian Plan recommended placement of a bike lane at an intersection with a right turn lane (right).

If there is limited space to provide a bike lane through an intersection with a right turn lane, the Oregon Bicycle and Pedestrian Plan suggests the use of a combined right turn lane and through bike lane to accommodate both motorists and bicyclists, illustrated in the image below.



The bike lane drops in the southbound direction of Molalla Avenue at Gaffney Lane (left). The Oregon Bicycle and Pedestrian Plan includes the option of providing a combined right turn lane and through bike lane (right).

- **Maintenance issues**: Some bicycle facilities are difficult to see and in need of maintenance to address worn paint.

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[3] Oregon Bicycle and Pedestrian Plan, Chapter 6, Figure 6-2

- **Limited street connectivity in some areas:** Although a well-connected street grid exists in downtown and immediate surrounding neighborhoods, discontinuous streets in other areas require out of direction travel and increase bicycling travel time to key destinations. A discontinuous street network is difficult for non-motorized users to navigate when they are unfamiliar with the area, and thus impedes bicycle and pedestrian travel.
- **Limited amount of bicycle wayfinding signage**: Oregon City has very little signage to guide bicyclists to and along existing bicycle routes. The bicycle system would benefit from signage to orient users and direct them to and through major destinations like downtown, schools, Clackamas Community College, and neighborhoods.

An example of wayfinding signage in Oregon City (left). Example of wayfinding signage outside of the Oregon City limits (right)

Key Destinations for Biking Trips: Figure 6 shows the existing biking network and the locations of key destinations that have the potential to attract biking trips. Areas of the City within comfortable biking distance (assumed to be ½ mile) to the greatest number of activity generators are indicated in red, while locations with lighter shading (green) are within biking distance of a single destination. Even though a location may only be within biking distance of a single destination (such as school or park), it will still be prioritized as a key biking route. Areas with no shading would be outside of the comfortable biking trip distance to any of the destinations. Bicycle facility gaps located in areas with darker shading (red and yellow) indicate potential locations for prioritizing biking improvements. As shown in Figure 6, the existing bike network largely coincides with the roadways which have the highest biking demand, with the exception of several roadways in Downtown and the McLoughlin neighborhood. The busier roadways in these areas without bike lanes include OR 99E, Main Street, 10th Street, 12th Street, 14th Street, 15th Street, 7th Street, Division Street and portions of Washington Street. Other roadways lacking bike lanes in the City with high biking demand include portions of Molalla Avenue, Holcomb Boulevard, South End Road and Leland Road. Trip distances from most neighborhoods in Oregon City are reasonable for bicycling and most neighborhoods are located close to an existing bicycle route. However, the existence of gaps throughout the network effectively limits the ability for people to comfortably connect to destinations by bicycle. Future projects to increase the continuity of the bicycle network will increase the viability of traveling by bicycle.

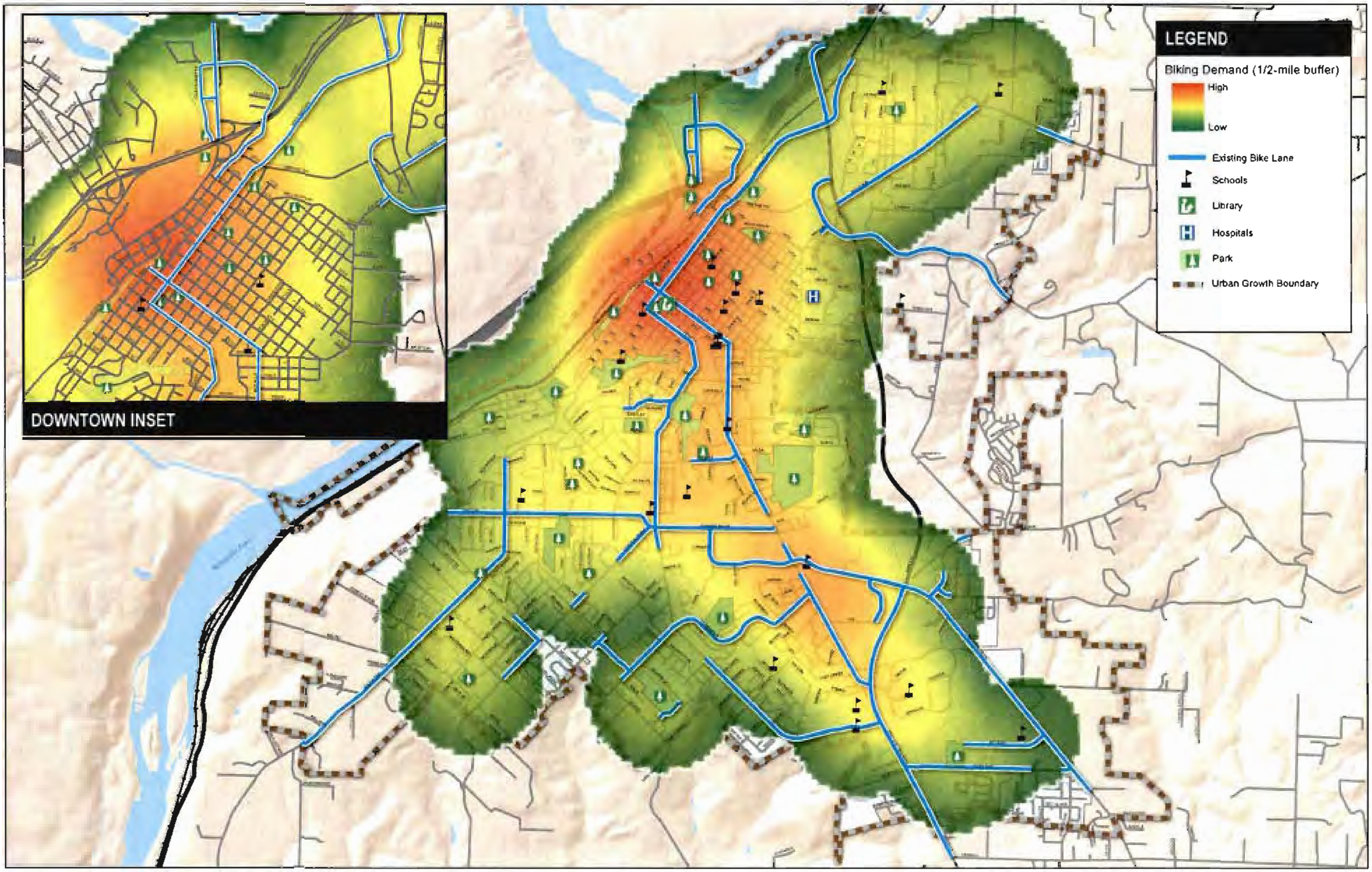

FIGURE 6: Bicycle Demand Analysis

OREGON CITY TRANSPORTATION SYSTEM PLAN
Date: February 2012
Author: Alta Planning + Design

Transit Needs

- **Lack of pedestrian crossings near bus stops:** The lack of pedestrian crossings near bus stops is most evident along Molalla Avenue, but is also true along other streets. Molalla Avenue is generally well-served by a sidewalk network, but generally lacks safe crossing opportunities for pedestrians. Figure 7 highlights those bus stops in Oregon City that do not have a marked crossing within 300 feet. Overall, 42% of Oregon City bus stops are not located within 300 feet of a marked crossing. The presence of a center turn lane along much of the Molalla Avenue corridor presents an opportunity to provide additional pedestrian refuge island crossings. Development of additional pedestrian crossings near bus stops should be done in consultation with TriMet, which has specific guidelines for the placement of bus stops in relation to crossings.

Additional transit stops with shelters would encourage more people to take transit.

- **Limited number of bus stops with shelters and other amenities:** Many bus stops in Oregon City consist of a simple pole indicating the bus route serving the stop. Seating that is sheltered from the weather is available at some stops. Given the rainy climate of the Pacific Northwest, route schedules on signs and additional sheltered bus stops would increase the comfort of existing riders and encourage others to take transit.
- **Transit service gaps and frequency:** The southwest and south portion of the City (including areas along South End Road, Central Point Road and Leland Road) is outside of a comfortable walking or biking trip to transit stops. In addition, the frequency of transit service to Clackamas Community College and to the Park Place neighborhood may need to be increased due to population growth.
- **Transit service in growth areas:** Areas of the City located in a major residential and/or employment growth area, including around Abernethy Road, Beavercreek Road, Maple Lane Road, Meyers Road, Redland Road and South End Road, should incorporate transit amenities and ensure pedestrian and bicycle connectivity in preparation for transit service.
- **Future higb capacity transit service:** Prepare the pedestrian and bicycle network to integrate with potential future high capacity transit. Metro has identified several near phase regional priority corridors[4] for high capacity transit, three of which would connect to

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[4] Near phase priority corridors are corridors where future high capacity transit investments may be viable if recommended planning and policy actions are implemented.

Oregon City. One of the potential routes would extend the MAX green line along I-205, from the Clackamas Town Center to Washington Square Transit Center (with a stop in Oregon City). Another option would extend the MAX green line from the Clackamas Town Center to Oregon City. The last option would extend the Milwaukie MAX line along OR 99E to Oregon City.

Transit priority locations were identified to determine potential investments in the network that would enhance access to bus stops. Figure 7 shows the location of bus stops in Oregon City as well as the relative number of daily boardings to indicate the most frequently used stops. The figure also includes a ¼ mile buffer around each stop to indicate the areas of the City within comfortable walking distance to existing bus stops. As shown, many Oregon City residents live greater than ¼ mile walking distance from a bus stop. While biking can increase access to transit for people living in neighborhoods distant from bus stops, gaps in the existing bicycle network and a lack of bicycle parking near stops limits the attractiveness of biking to transit.

The availability of safe roadway crossing opportunities is another factor that could limit access to transit. The existing bus stops in Oregon City are not always located near a marked pedestrian crossing. While high usage stops, shown in Figure 7, are generally located close to a pedestrian crossing, other less frequently used bus stops throughout the City would benefit from crossings and would increase the general pedestrian friendliness of the streets.

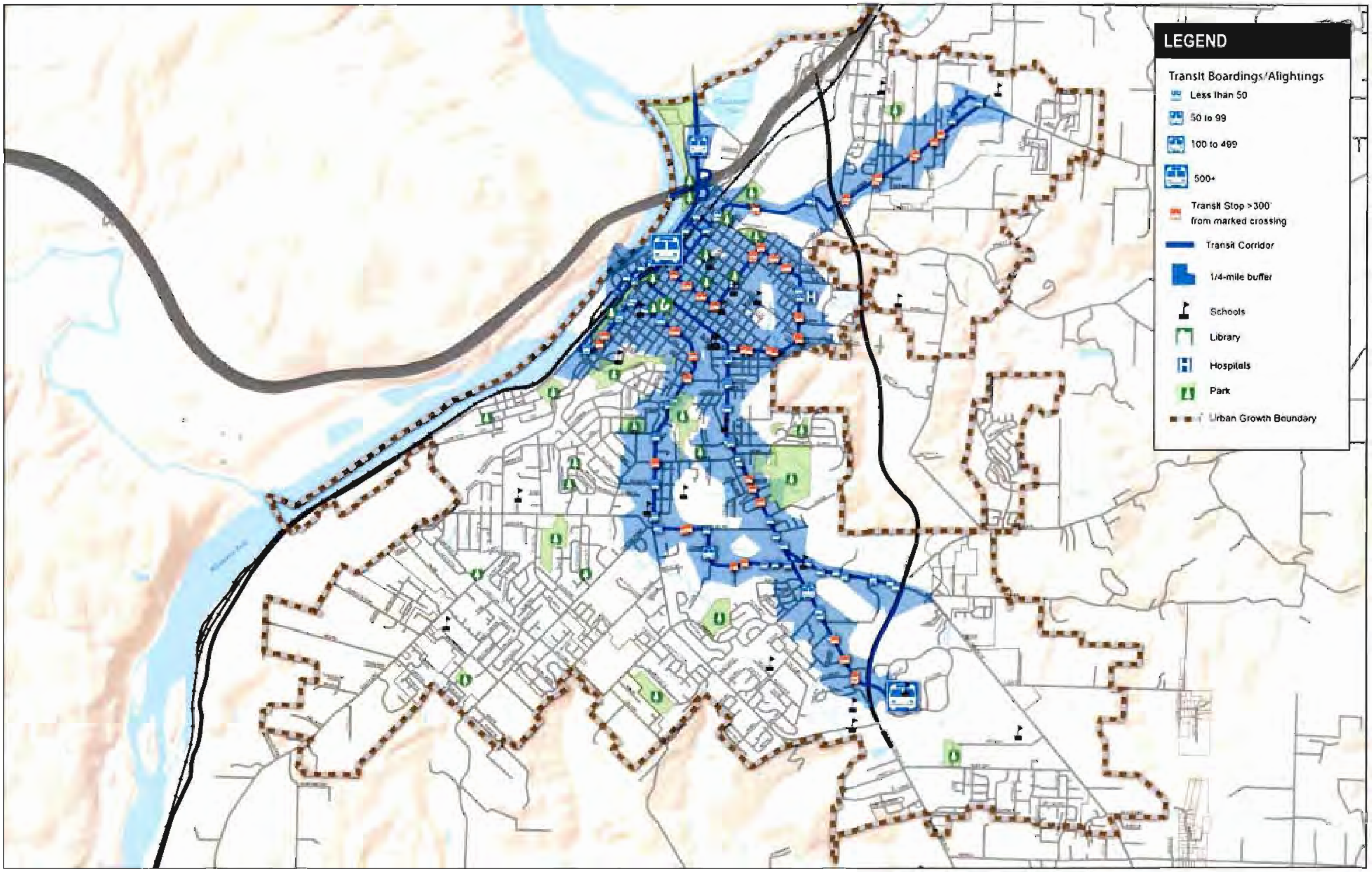

FIGURE 7: Transit Priority Locations

OREGON CITY TRANSPORTATION SYSTEM PLAN
Date: February 2012
Author: Alta Planning + Design

Driving Needs

Intersection capacity deficiencies (see Appendix for more detail) are expected at several intersections by 2035 (see Figure 8), including:

- OR 99E/I-205 WB Ramps
- OR 99E/I-205 EB Ramps
- OR 213/Beavercreek Road
- High Street/2nd Street
- South End Road/Warner Parrott Road
- Maple Lane Road/Beavercreek Road
- Main Street/14th Street
- Washington Street/12th Street
- South End Road/Lafayette Avenue-Partlow Road
- Central Point Road/Warner Parrott Road
- Maple Lane Road/Thayer Road
- Maple Lane Road/Walnut Grove Way

Street capacity deficiencies are expected by 2035 along portions of the following streets (see Figure 8):

- I-205
- OR 99E
- OR 43 (Oregon City-West Linn Bridge)
- OR 213
- Redland Road

Street Connectivity Needs

The Metro Regional Transportation Functional Plan requires that, to the extent possible, arterials be spaced at one-mile intervals, collectors to be spaced at half-mile intervals, and local streets either be spaced at 530 feet (or 1/10 of a mile) intervals, or provide a pedestrian and bicycle connection every 330 feet if a full local street connection is not possible.[5] Overall, most areas in Oregon City comply with the spacing standards to the extent possible, although several gaps were identified (see Figure 8). Existing development, topography, environmental areas, the Urban Growth Boundary (UGB) and OR 213 each pose a significant constraint in further improving connectivity in Oregon City.

Arterial Connectivity gaps were identified in the following areas:

1. An east to west gap between OR 99E and South End Road.
2. An east to west gap between South End Road and OR 213 (near the south City limits).

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[5] Metro Regional Transportation Functional Plan, Section 3.08.110 Street System Design Requirements

3. An east to west gap between Molalla Avenue and Holly Lane, south of Redland Road and north of Maple Lane Road.

Collector Connectivity gaps were identified in the following areas:

4. An east to west gap between Molalla Avenue and Holly Lane, south of Redland Road and north of Maple Lane Road.
5. An east to west gap between OR 99E and South End Road.
6. A north to south gap between Division Street and Beavercreek Road, west of OR 213.
7. North to south and east to west gaps to the west of South End Road.
8. North to south and east to west gaps, southeast of the Beavercreek Road/ Maple Lane Road intersection.
9. North to south gap between Holcomb Boulevard and Redland Road.

Local Street Connectivity gaps were identified in the following areas:

10. North to south and east to west gaps between OR 99E and Main Street, north of I-205.
11. North to south and east to west gaps between Washington Street and Abernethy Road.
12. North to south and east to west gaps between OR 213 and Beavercreek Road, north of Glen Oak Road.
13. North to south and east to west gaps between Holcomb Boulevard and Redland Road.
14. North to south and east to west gaps, southeast of the Beavercreek Road/ Maple Lane Road intersection.
15. East and west connectivity across OR 213 between Redland Road and Beavercreek Road.
16. East to west and north to south connectivity between OR 99E (south of the Canemah neighborhood) and the South End neighborhood.

FIGURE 8
2035 Transportation System Needs

Mobility Corridor Needs

The Metro Regional Transportation Plan identified needs along the Metro Mobility Corridors, including Tualatin/Oregon City (Mobility Corridor #7), Oregon City/Gateway (Mobility Corridor #8), and Oregon City/Willamette Valley (Mobility Corridor #14).

Near-term (1-4 years) Needs

- System and demand management along mobility corridor and parallel facilities for all modes of travel (Mobility Corridor #7, 8, and 14).
- Practical design solutions for bike and pedestrian connections to transit (Mobility Corridor #7).
- Practical design solutions for bikes/pedestrians for safety and to connect to transit (Mobility Corridor #8).
- Address arterial connectivity and crossings (Mobility Corridor #8, and 14).
- I-205/OR 213 Interchange (Mobility Corridor #14).
- Project development for regional trails, Oregon City Loop and Newell Canyon (Mobility Corridor #14).

Medium-term (5-10 years) Needs

- Complete gaps in the arterial network (Mobility Corridor #7, 8, and 14).
- Complete corridor refinement plan (Mobility Corridor #7 and 8).
- Develop congestion pricing methodologies for I-205 (Mobility Corridor #7 and 8).
- Develop plan and implement system expansion policy guidelines to connect Oregon City Regional Center with high capacity transit (Mobility Corridor #7 and 8).
- Identify funding solutions for alternative mode options (Mobility Corridor #7 and 8).
- Project development for regional infrastructure to serve Park Place and Beavercreek Road concept plan UGB expansion areas (Mobility Corridor #14).

Long-term (10-25 years) Needs

- Construct high capacity transit connection to Oregon City Regional Center (Mobility Corridor #7).
- Identify funding solutions for alternative mode options, including high capacity transit to Oregon City (Mobility Corridor #8).
- Construct regional trails and access in Newell Creek and Oregon City Loop (Mobility Corridor #14).

Safety Needs

The crash rates at two intersections (Main Street/14th Street and the OR 213/Beavercreek Road intersection) were identified as high collision locations. In addition, the OR 213/Caufield-Glen Oak Road and the Washington Street/12th Street intersections were identified as having above average collision rates.

The following locations were identified as a high collision roadway segments (top ten percent of state highways in Oregon). All of the following roadways are owned and maintained by ODOT:

- I-205 Northbound just past the on-ramp from OR 99E

  This high collision segment experiences an increase in traffic from the OR 99E on-ramp and is impacted by traffic exiting I-205 at OR 213. These factors could be contributing to the amount of collisions.

- OR 99E from one-tenth of a mile north of Dunes Drive to I-205

  This high collision segment includes two congested intersections (I-205 Westbound Ramps and Dunes Drive) and is often impacted by queues from the I-205 interchange.

- OR 99E from I-205 to 12th Street

  This high collision segment includes several signalized intersections and is often impacted by queues from the I-205 interchange. OR 99E was recently improved along this segment and may no longer be a high collision segment.

- OR 99E from 11th Street to 9th Street

  This high collision segment generally includes several accesses over a short distance which could be contributing to the amount of collisions. The section from 10th Street to 11th Street was recently improved and may no longer be a high collision segment.

- OR 99E from 6th Street to one-tenth of a mile south of Railroad Avenue

  This high collision segment generally includes several accesses over a short distance, a narrow tunnel and two curves which could be contributing to the amount of collisions.

- OR 213 from I-205 to one-tenth of a mile south of Clackamas River Drive

  This high collision segment will be mitigated with the jug handle under construction at the OR 213/Washington Street-Clackamas River Drive intersection. Washington Street will be extended to cross under OR 213 and connect to Clackamas River Drive.

- OR 213 surrounding the Beavercreek Road intersection

  This segment includes the high collision location at the OR 213/Beavercreek Road intersection exceeding the statewide average collision rate. This segment is located within the 55 mile per hour speed zone and expressway segment of OR 213 and is the first at-grade intersection south of Redland Road for over two miles.

- OR 213 surrounding the Molalla Avenue intersection

  This segment is located within the 55 mile per hour speed zone and expressway segment of OR 213. Congestion at surrounding intersections may be impacting this area.

- OR 213 surrounding the Meyers Road intersection

  This segment is located just south of the 55 mile per hour speed zone on OR 213. Queues in the southbound direction from the Caufield-Glen Oak Road intersection impact this intersection at times.

- OR 213 surrounding the Caufield-Glen Oak Road intersection

  This segment includes the high collision location at the OR 213/ Caufield-Glen Oak Road intersection that was just under the statewide average collision rate. This segment is located just south of the 55 mile per hour speed zone and the portion of OR 213 that narrows to one travel lane in each direction.

Freight Needs

A portion of the I-205 state freight route and portions of the OR 99E federal truck route are expected to be near capacity during the evening peak hour by 2035 (as dictated by the forecasted 2035 traffic volumes). In addition, some congestion is expected along the Metro identified freight connectors (or connections to major employment areas), including OR 213 and Beavercreek Road. The freight activity could increase along these streets through 2035, as they connect to the Metro designated employment land along OR 213, Beavercreek Road and Molalla Avenue.

Transportation System Management and Operations Needs

Performance of the existing transportation infrastructure could in improved through a combination of transportation system management (TSM) and transportation demand management (TDM) strategies and programs.

Transportation System Management (TSM): Oregon City has several regional roadway facilities that serve the City and neighboring communities (I-205, OR 213 and OR 99E). These roadways, along with parallel arterials including Washington Street, 7th Street-Molalla Avenue and Beavercreek Road could benefit from improved TSM infrastructure. Opportunities include:

- Expanding the communications infrastructure along streets or at intersections concurrent with capacity or other improvements (such as fiber optic cable).
- Updating coordinated time of day traffic signal control plans at intersections along OR 99E, OR 213, Molalla Avenue, Washington Street and Beavercreek Road.
- The Portland Regional TSMO Plan calls for Arterial Corridor Management (ACM) along OR 213, Beavercreek Road (south of OR 213), OR 213 (to Henrici Road), Washington Street and 7th Street in Oregon City. The project would improve operations by expanding traveler information and upgrading traffic signal equipment and timings.

- The Regional TSMO Plan also calls for ACM with adaptive signal timing along Molalla Avenue between 7th Street and OR 213 and Beavercreek Road between Molalla Avenue and OR 213. This ACM project would include signal systems that automatically adapt to current arterial roadway conditions.
- Improving access spacing along major roadways. An access inventory was conducted along several of the major roadways in Oregon City comparing the number of existing approaches (driveways and public streets) to applicable ODOT and City access spacing standards. Table A4 in the appendix shows the number of existing approaches for each of the street segments reviewed, and compares it to the approximate number of driveway or public street approaches that would be allowed to fully comply with access spacing standards. Several of the segments along OR 99E, OR 213, Beavercreek Road, Molalla Avenue, South End Road and Washington Street have more driveway and public street approaches than allowed to comply with the access spacing standards. While in some cases, no alternative access exists for adjacent properties, there may be areas where the access is modified to a "right-in/right-out" configuration to improve safety.

Transportation Demand Management: Opportunities to expand TDM measures in Oregon City includes:

- Improved parking management
- Improved street connectivity
- Investing in pedestrian/bicycle facilities
- Improved amenities and access for transit stops
- Encouraging and supporting technology for carpooling, cooperatives, etc.
- Modifying land uses to shorten travel distances between residences, employment, shopping, schools and recreation.

Air, Rail, Pipeline and Water Needs

There are no system investments needed for the air and pipeline through 2035. Through 2035, there is the potential for High Speed Passenger Rail, extending from Portland to Eugene, to run through Oregon City. The line would generally follow the existing Union Pacific Railroad tracks. Refer to the ODOT Rail Study for more information.[6] If the High Speed Rail line is selected by the region through Oregon City, a future study will likely determine needed rail investments to support it. However, since the railroad tracks are currently used by Amtrak, new development near the station on Washington Street should be linked with walking and biking facilities.

The Willamette Falls Locks, located just south of Downtown Oregon City on the west side of the Willamette River, should continue to provide a canal passage for boaters wishing to travel around Willamette Falls. In addition, the transient floating tie-up dock at Jon Storm Park along the Willamette River (just north of Downtown) allows boaters to dock and explore the City. The City

[6] ODOT Rail Study: http://www.oregon.gov/ODOT/RAIL/docs/Rail_Study/2010RailStudyBook.pdf

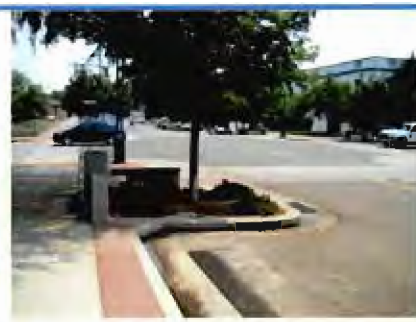
should continue to invest in the maintenance of the dock to ensure it is available to residents and visitors.

Menu of Potential Solutions

A variety of potential improvements to address the needs of the transportation system through 2035 are displayed in Table 1. Green shading indicates potential solutions for improving walking, blue shading indicates potential solutions for improving biking, orange shading indicates potential solutions for improving transit and brown shading indicates potential solutions for improving driving in Oregon City.

Table 1: Menu of Potential Solutions for the Transportation System

Crosswalks High-visibility markings, often consisting of a"zebra" striping pattern, can be effective at locations with high pedestrian crossing volumes, near schools, and/or areas where motorist awareness of pedestrian crossings may be poor.	
Pedestrian Refuge Islands Refuge islands allow pedestrians to cross one segment of the street to a relatively safe location out of the travel lanes, and then continue across the next segment in a separate gap in traffic. A median refuge island allows the pedestrian to tackle each direction of traffic separately.	
Sidewalks and Sidewalk Infill Good sidewalks are continuous, accessible to everyone, provide adequate travel width and feel safe. Sidewalks can provide social spaces for people to interact and contribute to quality of place. Completing sidewalk gaps improves the connectivity of the pedestrian network.	

Curb Extensions Curb extensions reduce the pedestrian crossing distance and improve motorists' visibility of pedestrians waiting to cross the street. Curb extensions can also serve as good locations for bike parking, benches, public art, and other streetscape features.	
Rectangular Rapid Flashing Beacon The RRFB is designed encourage greater motorist compliance at crosswalks. The RRFB is a rectangular shaped lightbar with two high intensity LED lightheads that flash in a wig-wag flickering pattern. The lights are installed below the pedestrian crosswalk sign (located on each side of the road near the crosswalk button) and are activated when a pedestrian pushes the crosswalk button.	
Streetscape Improvements Streetscape improvements are features that enhance the pedestrian experience. These include public art, pocket parks, ornamental lighting, gateway features and street furniture. Many of these improvements can easily integrate environmentally- friendly "green" elements.	

Pedestrian Countdown Signals

Countdown signals display the number of seconds remaining for a pedestrian to complete a crossing, enabling users to make their own judgment whether to cross or wait. The allotted time can be adjusted to accommodate slower pedestrians, such as seniors or children.

Curb Ramp Retrofits

Retrofitting ADA-compliant curb ramps to existing sidewalks greatly improves mobility and accessibility for mobility-impaired users. Curb ramps also improve the walking environment for pedestrians with strollers, delivery carts, and other "wheel" devices.

Bike Lanes

Designated exclusively for bicycle travel, bike lanes are separated from vehicle travel lanes with striping and also include pavement stencils.

Bike Box

A bike box is a designated area at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase.

Bike Box for Left-turns at Signalized Intersections A bike box for left turns (otherwise known as a Copenhagen Left) allows bicyclists to make left-turns at intersections without having to veer across traffic. A bicyclist turns left by traveling through the intersection in the direction they are heading, and then waiting in the designated left-turn box before proceeding across the street on a green light.	
Share the Road Signage 'Share the Road' signage can be used to raise awareness and legitimize the presence of bicycles on the roadways.	
Shared Lane Marking Shared-lane markings or "sharrows" are designed to inform motorists to expect cyclists to be in the middle of the travel lane, and to inform cyclists that they should be in the travel lane and away from parked cars. An uphill bike lane and downhill shared lane markings can be used on hilly routes that do not have room to accommodate bike lanes in both directions.	
Bicycle Boulevard/Neighborhood Greenway Traffic calming can be used to optimize neighborhood streets for bicycle and pedestrian travel. Intersection improvements can be made to assist bicyclists at difficult roadway crossings	

Shared-use paths

Shared-use paths can provide a desirable facility particularly for novice riders, recreational trips, and cyclists of all skill levels preferring separation from traffic. Facilities may be constructed adjacent to roads, through parks, or along linear corridors such as active or abandoned railroad lines or waterways.

Wayfinding Signage and Pavement Markings

Directional signage indicating locations of destinations and travel time/distance to those destinations increases users' comfort and accessibility to the pedestrian and bicycle systems. Pavement markings can be used on bicycle boulevards, which are low-traffic bike routes without bike lanes.

Colored Bike Lanes

Colored bike lanes are used in areas where automobiles and bicycles cross paths and it is not clear who has the right-of-way. Colored bike lanes and accompanying signs assign priority to the bicyclist.

Bicycle Detection at Signalized Intersections

Bicycle-activated loop detectors are installed within the roadway to allow the presence of a bicycle to trigger a change in the traffic signal. Detectors that are sensitive enough to detect bicycles should have pavement markings to instruct cyclists how to trip them.

Bicycle Parking

Short-term parking: parking meant to accommodate visitors, customers and others expected to depart within two hours; requires approved standard rack, appropriate location and placement, and weather protection.

Long-term parking: parking meant to accommodate employees, students, residents, commuters, and others expected to park more than two hours. This parking should be provided in a secure, weather-protected manner and location.

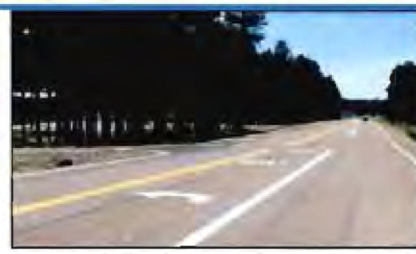
Transit Stop Enhancements

Provision of passenger amenities at bus stops creates a more pleasant and attractive environment for bus riders and may encourage people to use the transit system. Common amenities include: shelters, benches, trash cans, and bus route information.

Shelters should be placed at least 2 feet from the curb when facing away from the street and at least 4 feet away when facing toward it. The adjacent sidewalk must still have a 5-foot clear passage. Orientation of the shelter should consider prevailing winter winds.

Construct Bus Pullouts

Bus pullouts allow transit vehicles to pick up and drop off passengers in an area outside the traveled way and are generally provided on high-volume and/ or high-speed roadways. They are frequently constructed at bus stops with

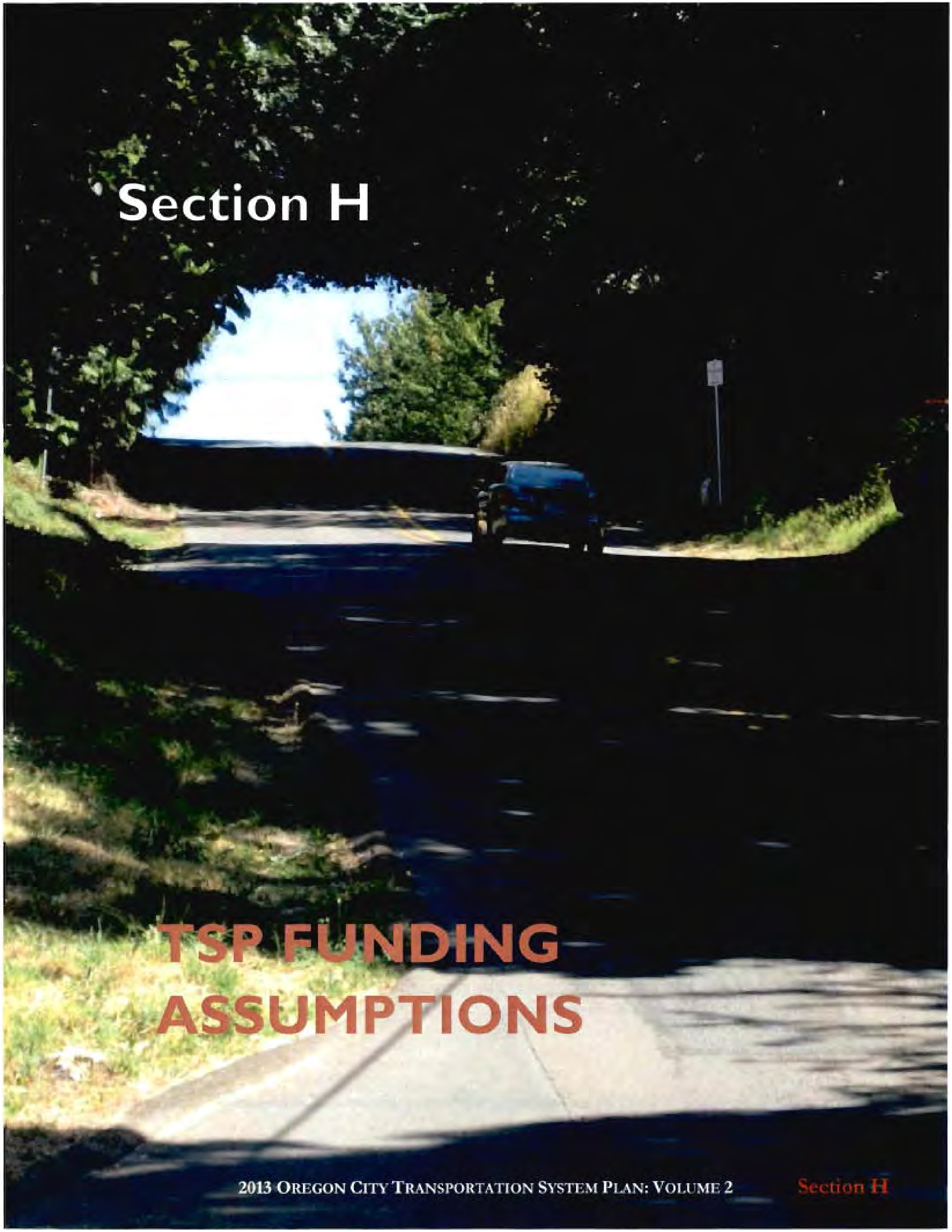
a high number of passenger boardings such as large shopping centers and office buildings. By removing stopped buses from travel lanes, delay to traffic is considerably reduced and safety is enhanced by removing an obstruction from the traveled way. They also help better define bus stop locations, can be used for bus layovers, and create a more relaxed environment for loading and unloading.	
Move Bus Stops to Far Side of Signalized Intersections On multi-lane streets or streets with wide shoulders where motor vehicles may pass uncontrolled around a stopped bus, bus stops located on the far side of intersections are preferred to provide needed sight distance. At signalized intersections, bus stops may be located on either the near side or far side of the intersection. However, in locations where bus pullouts are desired, far-side stops should be used. In general, far-side bus stops are desired because they reduce conflicts with right turning vehicles, encourage pedestrians to cross behind the bus, minimize the area needed for curbside bus zones, make it easier for buses to reenter traffic at signalized intersections, and have fewer impacts on roadway capacity. However, far-side stops also require passengers to access the bus further from the crosswalks, may interfere with right turns from the side street, and where pullouts are not used, can result in blockages of an intersection.	
Construct Turn Lanes to separate Turning Vehicles from Through Traffic The provision of turn lanes (left or right) removes slowing or stopped vehicles attempting to turn off of a roadway from faster moving through traffic. This not only provides significant safety benefits, but also enhances system capacity.	

Modernization to meet Design Standards The modernization of a roadway generally refers to upgrading elements to meet current design standards and capacity needs. Outdated roadway designs may not be serving present day demands due to insufficient number and width of lanes, poor geometry, or failure to accommodate a particular mode of travel (e.g., no bike lanes).	
Intersection or Roadway Capacity Enhancements Capacity improvements may include roadway widening, intersection control modification (such as installation of a roundabout), or other capacity enhancements.	
Modify Intersection Approach Geometry When the configuration of through and turn lanes at intersection approaches does not properly reflect the demand for these movements, the right of way at signalized intersections cannot be efficiently utilized. Also, poor alignment of opposing lanes or mismatched left turn treatments often require signal phasing that may not be the most effective option for maximizing through capacity. By reconfiguring the number and type of lanes approaching a signalized intersection, significant improvements in capacity can be achieved.	

Signal Timing Enhancements The assignment of right of way to competing movements at an intersection plays a critical role in the overall capacity of that intersection and the roadway itself. Old signal timing plans may not be appropriately serving current demands or may not be designed to accommodate fluctuating demands throughout the day or week. Also, timing plans can be created based on specific priorities, such as giving preference to the mainline during peak travel periods. In some situations, signal timing may be adequate, but adjacent signals are not equipped to communicate with each other or are too close together to coordinate properly.	
Intelligent Transportation Systems (ITS) Intelligent Transportation Systems (ITS) come in many forms and have numerous applications. In general, they include any number of ways of collecting and conveying information regarding roadway operations to agency staff managing the facility or even to motorists. This can allow both operators and motorists to make informed decisions based on real-time information, leading to quicker responses to incidents, diversion away from congestion, and increased efficiencies in roadway operation.	
Restriction of Left Turns at Traffic Signals Because left turn and through movements are often competing for limited right of way, the removal of left turns from an intersection, either completely or during a specific time of day, can significantly improve through traffic capacity.	
Restrict Turning Movements at Approaches The number of conflict points on a roadway introduced by a particular approach can be significantly reduced by restricting turn movements, such as allowing only right-in and right-out movements, allowing only right-in movements, or prohibiting	

only left-out movements (as shown in graphic).	
Construct Non-traversable Medians The construction of non-traversable medians is a means of reducing the number of conflict points introduced on a roadway by approaches. Non-traversable medians can be simple concrete islands or barriers or can be constructed to include landscaping or other decorated treatments. Stamping colored concrete with a brick or rock pattern is a simple median treatment that may be more aesthetically pleasing that plain concrete. They can also be used to accommodate pedestrian refuges or can have breaks allowing for limited or full turning movements.	
Provide Alternate Access through Improved Local Street Connectivity Reasonable alternate access can be provided where it does not currently exist by constructing new roadways adjacent to properties that abut a high volume roadway. Such roadways can take the form of frontage roads, backage roads, or can simply be new collector or local streets.	
Move Approaches to Lower Volume Facilities This treatment is often a good option for properties fronting high volume streets (such as OR 99E and Molalla Avenue) and that have frontage along an alternate roadway of a lower volume. However, where existing site circulation or building locations create a dependency for the pre-existing access, the ability to change site access may require total or partial site redevelopment. Also, before access is reestablished to a side street, it should be confirmed that there would be adequate separation between the new driveway and the intersection with the high volume roadway to avoid turning conflicts or frequent obstruction by vehicle queues.	

Consolidate Multiple Approaches to Single Properties A common method of reducing approach density is to eliminate multiple approaches to a single property where feasible. This can be done where it has been determined that the property can adequately be served with fewer approaches than it currently maintains. However, where existing site circulation or building locations create a dependency for the pre-existing roadway access, the ability to change site access may require total or partial site redevelopment.	
Create Shared Approaches to Properties using Easements or under Common Ownership Sharing an approach to a roadway is a means of consolidating approaches while providing direct access to properties that might not otherwise have it. This tool is most advantageous when applied between two "landlocked" properties that have no other means of reasonable access than to a high volume roadway. Such properties would typically be provided their own approach. However, when a shared approach can be arranged, the end result is only one approach to the roadway rather than two.	



Section H

TSP FUNDING ASSUMPTIONS

This document details the transportation funding that is expected to be available through 2035. The funding assumptions will help prioritize the investments the City can make in the transportation system, and will be utilized to develop a set of transportation improvements that will likely be funded to meet identified needs through 2035.

Current Funding Sources

Three general funding sources are utilized by the City for transportation, including the Street, System Development Change (SDC) and Transportation Utility Fee Funds. The following sections detail the revenue and expenditure forecasts for each.

Street Fund

The Oregon City Street Fund primarily includes revenues from the State Highway Trust. It also includes transfers from the General Fund to assist in the costs of operating the Municipal Elevator, in addition to other miscellaneous small revenues (sometimes one-time deposits). State funds through the State Highway Trust Fund come from state motor vehicle fuel tax, vehicle registration fees, and truck weight-mile fees, and are distributed on a per capita basis to cities and counties. By statute, the money may be used for any road-related purpose, including walking, biking, bridge, street, signal, and safety improvements. A funding breakdown for the Street Fund can be seen in Table 1.

The state gas tax funds have previously failed to keep up with cost increases and inflation. With increased fuel efficiency of vehicles and the State's emphasis on reducing vehicle miles traveled, the real revenue collected has gradually eroded over time. In an effort to offset the relative decline in contribution of state funds, the Oregon Jobs and Transportation Act (Oregon House Bill 2001) recently passed. House Bill 2001 (adopted by the 2009 legislature) increases transportation-related fees including the state gas tax and vehicle registration fees. 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 recently increased from $27 to $43 per vehicle per year for passenger cars, with similar increases for other vehicle types. The gas tax in Oregon increased on January 1, 2011 by six cents, to 30 cents per gallon. This was the first increase in the state gas tax since 1993.

Revenues: Current revenue sources for the Street Fund are expected to provide over $47 million through 2035. According to the 2012 State Shared Revenue estimates[1], Oregon City is expected to receive $1,185,000 in State gas tax and vehicle registration fee revenue this year. The increased transportation related fees from House Bill 2001 are expected to bring an additional $585,000 annually to Oregon City.[2]

Because there is no index for cost inflation, the revenue level will increase proportionally with the City's population growth. As a conservative estimate[3] for TSP planning purposes, the same levels ($1,185,000 and $585,000 per year) are assumed in the future. Through 2035, Oregon City is expected to receive over $42 million in State gas tax and license fee revenue.

State law requires that a minimum of one percent of the State gas tax and vehicle registration funds received must be set aside for construction and maintenance of walking and bicycling facilities. In Oregon City, this represents approximately $20,000 per year and nearly $480,000 through 2035.

In addition, the City received approximately $190,000 in other revenues within the Street Fund over the past six years. Keeping this revenue level consistent, this represents about $4.5 million through 2035.

Expenditures: Current expenditures for the Street Fund are expected to top $32 million through 2035 (based expenditures over the past six years). The majority of Street Operations Funds are spent on local street operations and maintenance needs (over $30 million through 2035). In addition, over $2 million will be needed to fund non- SDC eligible project costs (see Table A1 in the Appendix).

Funds for Capital Expenditures: Over $14.7 million (including the existing balance of the fund) is expected to be available for capital needs after street operation and maintenance needs are met through 2035. These funds can potentially be spent on non-SDC eligible project costs or other street improvements that are related to maintenance such as upgraded retaining walls and stairways, new guardrail, signal equipment replacement and upgrades, or curb and gutter. The net revenue of over $14 million for the Street Fund is directly related to the House Bill 2001, which is expected to provide an additional $585,000 annually or about $14 million through 2035. The City had not seen most of these additional funds yet in the revenue and expenditure data over the past six years, since the gas tax increase went into effect on January 1, 2011 and with the recent increase to vehicle registration fees. Without HB 2001, the City would have little to no surplus in the Street Fund.

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[1] 2012 State Shared Revenue Estimates, League of Oregon Cities

[2] IBID

[3] The population growth rate in Oregon City was assumed to be roughly the same as the cost inflation rate, therefore, existing revenues were maintained through 2035.

Table 1: Oregon City Street Operations Funding Breakdown

Street Operations Fund	Annual Amount	Estimated Amount Through 2035
Estimated Revenue Sources	**$1,980,000**	**$47,520,000**
State Highway Trust Fund	*$1,185,000**	*$28,440,000*
*Oregon Jobs and Transportation Act (House Bill 2001)***	*$585,000**	*$14,040,000*
Bikeway/Walkway (1% of State Highway Trust Fund and House Bill 2001)	*$20,000**	*$480,000*
Other	*$190,000****	*$4,560,000*
Estimated Expenditures	-	**$32,995,000**
Street Operation Needs and Maintenance	*$1,275,000****	*$30,600,000*
*Non-SDC Eligible Project Expenses*****	-	*$2,395,000*
Net Revenues (Street Operations Revenues-Expenditures)		**$14,525,000**
Existing Fund Balance (2010-11 Fiscal Year)		**$255,000**
Total Funds for Street Improvement Needs (Net Revenue + Existing Balance)		**$14,780,000**

Source: Oregon City Finance Department.

* Based on the 2012 State Shared Revenue Estimates by the League of Oregon Cities.

** New revenue from the increased gas tax and vehicle registration fees related to House Bill 2001.

*** Based on average revenues and expenditures over the six-year period between 2005 and 2010.

**** See Table A1 in the Appendix.

Street System Development Charge (SDC) Fund

System development charges (SDC) are fees collected from new development and used as a funding source for all capacity adding projects for the transportation system. The funds collected can be used to construct or improve portions of roadways impacted by applicable development. A funding breakdown for the SDC Fund can be seen in Table 2.

The SDC is collected from new development and is a one-time fee. The fee is based on the proposed land use and size, and is proportional to each land use's potential PM peak hour vehicle trip generation. The vehicle SDC rate was recently increased to $7,257 per peak hour trip, and a new pedestrian and bicycle SDC was introduced at $201.88 per peak hour trip. These rates are adjusted annually based on the Seattle Engineering News Record (ENR) Construction Cost Index (CCI). However, as a conservative estimate[4] for TSP planning purposes, the rates were assumed at the same levels through 2035.

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[4] The population growth rate in Oregon City was assumed to be roughly the same as the cost inflation rate, therefore, existing revenues were maintained through 2035.

Revenues: Revenue sources for the SDC Fund are expected to provide over $141 million through 2035 (based on forecasted yearly population and employment growth through 2035, as shown in Figure 1). The total SDC fees collected is expected to be over $129 million for vehicles and nearly $1.7 million for pedestrian and bicycle. It should be noted that the Oregon Revised Statutes sections 223.205 through 223.295 (Bancroft Bonding Act) and Oregon City Municipal Code Chapter 13.20.080 (Deferred SDC Payment Allowed) provides property owners with a deferred financing option for SDC's. Since residents can defer SDC payments up to a period of 10 years in accordance with the state law, the City may not realize the full SDC revenue estimated until several years beyond 2035. However, the City will continue to receive deferred payments from residents who chose this payment method from previous years, so the SDC revenue estimate was maintained through 2035.

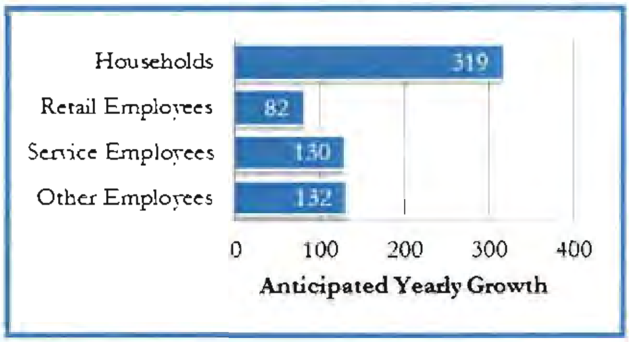


Figure 1: Expected Yearly Household and Employee Growth through 2035

Expenditures: Expenditures for the SDC Fund are expected to be over $34 million through 2035 for planned projects. This includes over $24 million that is expected to be spent on planned SDC eligible project expenses (see Table A1 in the appendix). In addition, over $10 million is expected to be spent on planned SDC project expenses with revenue from grants and other sources.

Funds for SDC Projects: Over $109 million (including the existing balance of the fund) is expected to be available for additional projects after reducing the planned SDC project expenditures through 2035. These funds can be spent on the SDC eligible projects shown in Table A2 in the appendix.

Table 2: Oregon City System Development Charge Funding Breakdown

System Development Charge (SDC) Fund	Estimated Amount Through 2035
Estimated Revenue Sources*	**$141,245,000**
Street SDC	*$129,360,000*
Pedestrian/Bicycle SDC	*$1,680,000*
*Other***	*$10,205,000*
Estimated Expenditures**	**$34,700,000**
Street SDC Eligible Project Expenses	*$24,495,000*
Pedestrian/Bicycle SDC Eligible Project Expenses	*$0*
Miscellaneous Expenses	*$10,205,000*
Net Revenues (SDC Fund Revenues-Expenditures)	**$106,545,000**
Funds for Eligible Street SDC Project Expenses	*$104,865,000*
Funds for Eligible Pedestrian/Bicycle SDC Project Expenses	*$1,680,000*
Existing Fund Balance (2010-11 Fiscal Year)	**$2,835,000**
Total Funds for SDC Projects (Net Revenue + Existing Balance)	**$109,380,000**

Source: Oregon City Finance Department.
*Based on forecasted population and employment growth through 2035.
**See Table A1 in the appendix.

Transportation Utility Fee Fund

The transportation utility fee is a recurring monthly charge that is paid by all residences and businesses within the City. The fee is based on the number of trips a particular land use generates and is collected through the City's regular utility bill. The transportation utility fee is designated for use in the maintenance and repair of streets under the jurisdiction of Oregon City. Revenues cannot be used to construct new infrastructure or on enhancements not directly related to improving or maintaining the condition of existing City streets. A funding breakdown for the Transportation Utility Fee Fund can be seen in Table 3.

Current Transportation Utility Fees are $9.00 per month per single family residential unit, and about $6.30 per month for multi-family units. Non-residential fees vary by type and size of the land use, ranging between $0.33 and $16.33 per square foot of gross floor area. The fees are expected to increase in the 2012-2013 fiscal year to $11.00 per single family residential unit, $7.70 per multi-family unit, and between $0.38 and $19.20 per square foot of gross floor area for non-residential uses.

Revenues: The transportation utility fees are expected to raise over $51 million through 2035 (based on forecasted population and employment growth through 2035). As a conservative estimate[5] for TSP planning purposes, the transportation utility fees for the 2012-2013 fiscal year were assumed to remain consistent through 2035.

Expenditures: It is assumed that the City would spend 100% of the fund revenue (over $51 million), in addition to the existing balance of the fund ($710,000) on street maintenance through 2035.

Funds for Street Maintenance: The Transportation Utility Fee revenues and the existing fund balance (a total of over $52 million) are expected to be spent on maintenance and repair of streets under the jurisdiction of Oregon City through 2035.

Table 3: Oregon City Transportation Utility Funding Breakdown

Transportation Utility Fee Fund	Annual Amount	Estimated Amount Through 2035
Estimated Revenue Sources*	$2,150,000	$51,600,000
Estimated Expenditures**	-	$52,310,000
Net Revenue (Transportation Utility Fee Revenues-Expenditures)		**$-710,000**
Existing Fund Balance (2010-11 Fiscal Year)		$710,000
Total Funds for Street Maintenance (Net Revenue + Existing Balance)		**$0**

Source: Oregon City Finance Department.
*Based on forecasted population and employment growth through 2035.
** Assumed to be 100% of the Transportation Utility Fee revenue ($51.6 million), plus the existing fund balance for the 2010-2011 fiscal year ($710,000).

Funding Summary

To put the expected available funding in context, the existing capital improvement plan (CIP) for the City (as of 2009) had over $312 million worth of motor vehicle and over $13 million worth of pedestrian and bicycle improvements. Of those project costs, approximately $158 million of the motor vehicle and $6 million of the pedestrian and bicycle project costs are needed to accommodate new development, and therefore are eligible for SDC funding. This leaves about $154 million in motor vehicle and $7 million in pedestrian and bicycle project costs to serve existing transportation deficiencies. These project costs are not eligible to utilize SDC funds and must be funded through other means, such as the Street Fund or other State or Federal grants. Unless additional funds are explored, Oregon City will be expected to have a little over $14.7 million (from the Street Fund) to cover the $154 million in motor vehicle and $7 million in pedestrian and bicycle project costs that are not eligible for SDC funds (based on the current revenue and expenditure forecasts).

[5] An increase to the transportation utility fee in Oregon City was assumed to be roughly the same as the cost inflation rate, therefore, existing revenues were maintained through 2035.

Overall, Oregon City is expected to have the following funds available after accounting for the expenditures detailed in the previous sections:

- Street Fund: $14,780,000

  These funds can potentially be spent on non-SDC eligible project costs or other street improvement needs

- SDC Fund: $109,380,000

  The improvement projects eligible for SDC funding can be updated on-going. The needed transportation system investments identified through the TSP update could potentially be used to amend the existing SDC project list.

- Transportation Utility Fee Fund: $0

  Over $52 million was assumed to be spent on street maintenance through 2035.

Potential Additional Funding Sources

Oregon City is expected to have funding shortfall of approximately $150 million for the non-SDC eligible project costs in the CIP. The City may wish to consider expanding its funding options in order to ensure that funding is available for more of the proposed improvements.

Transportation funding options include local taxes, assessments and charges, and state and federal appropriations, grants, and loans. All of these resources can be constrained based on a variety of factors, including the willingness of local leadership and the electorate to burden citizens and businesses; the availability of local funds to be dedicated or diverted to transportation issues from other competing City programs; and the availability of state and federal funds. Nonetheless, it is important for the City to consider all opportunities for providing, or enhancing, funds needed for the transportation improvements included in the CIP.

The following sources have been used by cities to fund the capital and maintenance aspects of their transportation programs. There may be means to begin to or further utilize these sources, as described below, to address existing or new needs identified in the Transportation System Plan.

General Fund Revenues

At the discretion of the City Commission, the City can allocate General Fund revenues to pay for its transportation program. General Fund revenues are primarily comprised of property taxes and also includes franchise fees, state shared revenues, and other fees imposed by the City. This allocation is completed as a part of the City's annual budget process, but the funding potential of this approach is constrained by competing community priorities set by the City Council. General Fund resources can fund any aspect of the program, from capital improvements to operations, maintenance, and administration. Additional revenues available from this source are only available to the extent that either General Fund revenues are increased or City Council directs and diverts funding from other City programs.

Local Fuel Tax

Twenty-two cities and two counties in Oregon have adopted local gas taxes by public vote ranging from one to five cents per gallon. The taxes are paid to the city monthly by distributors of fuel. The process for presenting such a tax to voters will need to be consistent with Oregon State law as well as the laws of the City. Nearby locations with a gas tax includes Milwaukie (two cents per gallon), Canby (three cents per gallon), Tigard (three cents per gallon), Multnomah County (three cents per gallon) and Washington County (one cent per gallon).

Urban Renewal District

An Urban Renewal District (URD) would be a tax-funded district within the City. The URD would be funded with the incremental increases in property taxes that result from construction of applicable improvements. This type of tax increment financing has been used in Oregon since 1960 and has been used in Oregon City to partially fund transportation projects such as 7th Street, Fir Street extension, Washington Street Bridge, Red Soils Court, and OR 213/Beavercreek Road intersection. Projects to be funded within an Urban Renewal District must be included in the applicable Urban Renewal Plan.

Local Improvement Districts

Local Improvement Districts (LIDs) can be formed to fund capital transportation projects. LIDs provide a means for funding specific improvements that benefit a specific group of property owners. LIDs require City Commission approval, must not have opposition from more than 2/3 of affected property owners, and must have a specific project definition and qualified property assessment. Benefiting properties are assessed their share to pay for improvements. LIDs can be matched against other funds where a project has system wide benefit beyond the adjacent properties. LIDs are often used for sidewalks and pedestrian amenities that provide clear benefit to residents along the subject street.

Debt Financing

While not a direct funding source, debt financing can be used to mitigate the immediate impacts of significant capital improvement projects and spread costs over the useful life of a project. Though interest costs are incurred, the use of debt financing can serve not only as a practical means of funding major improvements, but is also viewed as an equitable funding strategy, spreading the burden of repayment over existing and future customers who will benefit from the projects. The obvious caution in relying on debt service is that a funding source must still be identified to fulfill annual repayment obligations. In Oregon City, any debt financing over $25,000 must be approved by the voters in accordance with the current City Charter.

Appendix

Table A1: Funding Breakdown of Planned Oregon City SDC Projects

Project Name	Total Project Cost	City Funding Responsibility[1]	SDC Eligible %[2]	Oregon City: SDC Eligible Project Cost	Oregon City: Non-SDC Eligible Project Cost*	ODOT Funding**
Swan Ave Extension: Livesay Road to Redland Road	$2,485,000	100%	100.0%	$2,485,000	$0	
Swan Ave Extension: Redland Road to Holly Lane	$5,180,000	100%	100.0%	$5,180,000	$0	
Holly Lane Extension: Redland Road to Holcomb Boulevard	$11,800,000	100%	100.0%	$11,800,000	$0	
Beavercreek Road Improvements: Claymont Drive (CCC Entrance) to UGB	$3,095,000	100%	54.0%	$1,670,000	$1,425,000	
Meyers Road Extension: OR 213 to High School Lane	$3,595,000	100%	54.2%	$1,950,000	$1,645,000	
New street connection between Abernethy Road and Washington Street	$10,395,000	30%	39.2%	$1,225,000	$1,895,000	$7,275,000
Molalla Avenue/Taylor/Division Intersection Roundabout	$545,000	100%	34.2%	$185,000	$360,000	
Total	**$37,095,000**	-	-	**$24,495,000**	**$5,325,000**	**$7,275,000**

*Funding for the non-SDC eligible projects costs include $2,930,000 from the "Other" revenue source under the SDC Fund and $2,395,000 from the Street Operations Fund.

** ODOT funding of $7,275,000 was assumed under the "Other" revenue source in the SDC Fund.

[1] 2009 Transportation SDC Study, FCS Group

[2] IBID

Table A2: Oregon City SDC Project List

Oregon City
Transportation SDC Study
TSDC Project List -- Road Improvements

FINAL

Table 4

#	Project Source (1)	Yr of Cost Estimate	Project Title (1)	Eligible Capacity Increasing % (2)	Serving Existing Deficiency	City Funding Responsibility (3)	Project Cost (1)	SDC Eligible Cost
			State Facility Projects (All Sources)					
PP-1	2008 List	2008	HWY 213 Corridor Improvements (I-205 to Oregon City UGB)	0.0%	100.0%	30.0%	R-37, R-51, R-52, R-53, R-77, R-88, R-105	See Related Project Costs
R-37	2008 List	2008	HWY 213: I-205 to Redland Rd	17.3%	82.7%	30.0%	PP-1, R-51, R-52, R-53, R-77, R-88	See Related Project Costs
R-38	2008 List	2008	HWY 213: Molalla Ave to Henrici Rd	23.8%	76.2%	30.0%	R-54, R-55, R-56, P-51	See Related Project Costs
R-48	2008 List	2008	HWY 99E/I-205 SB Ramps	93.0%	7.0%	30.0%	762,000	212,598
R-49	2008 List	2008	HWY 99E/I-205 NB Ramps	0.0%	100.0%	30.0%	783,000	-
R-50	2008 List	2008	HWY 99E/Main Street	38.8%	61.2%	30.0%	422,000	49,159
R-52	2008 List	2008	HWY 213/Washington Street	83.0%	17.0%	30.0%	20,000,000	4,980,000
R-53	2008 List	2008	Hwy 213/Redland Road	99.0%	1.0%	40.0%	10,600,000	4,197,600
R-54	2008 List	2008	HWY 213/Molalla Avenue	54.0%	46.0%	30.0%	1,450,000	235,026
R-55	2008 List	2008	HWY 213/Glen Oak Road/Caufield Road	79.0%	21.0%	30.0%	340,000	80,580
R-56	2008 List	2008	HWY 213/Henrici Road	62.8%	37.2%	30.0%	720,000	135,574
R-77	2008 List	2008	Redland Rd/Abernethy Rd	84.0%	16.0%	30.0%	450,000	113,400
R-88	2008 List	2008	Redland Rd extension between Abernethy Rd & Washington St	39.2%	60.8%	30.0%	13,100,000	1,540,959
R-105	2008 List	2008	Hwy 213/Beavercreek Road (improvement for existing deficiency)	0.0%	100.0%	30.0%	50,000,000	-
			Beavercreek Concept Plan-BR					
BR-1	2008 List	2008	Beavercreek Rd: Marjorie Ln to Clairmont Dr (CCC Entrance)	51.6%	48.4%	100.0%	6,300,000	3,251,502
BR-2	2008 List	2008	Beavercreek Rd: Clairmont Dr (CCC Entrance) to UGB (not Henrici)	54.0%	46.0%	100.0%	10,995,000	5,940,487
BR-3	2008 List	2008	Clairmont Drive: Beavercreek Road to Center Parkway	100.0%	0.0%	100.0%	2,400,000	2,400,000
BR-4	2008 List	2008	Loder Road: Beavercreek Road to Center Parkway	54.8%	45.2%	100.0%	1,400,000	766,610
BR-5	2008 List	2008	Loder Road: Center Parkway to East Site Boundary	100.0%	0.0%	100.0%	4,200,000	4,200,000
BR-6	2008 List	2008	Meyers Road: Beavercreek Road to Ridge Parkway	100.0%	0.0%	100.0%	3,500,000	3,500,000
BR-7	2008 List	2008	Glen Oak Road: Beavercreek Road to Ridge Parkway	100.0%	0.0%	100.0%	3,400,000	3,400,000
BR-8	2008 List	2008	Center Parkway: Old Acres Ln to Thayer Road	100.0%	0.0%	100.0%	17,700,000	17,700,000
BR-9	2008 List	2008	Ridgeway Parkway: Old Acres Ln to North Site Boundary	100.0%	0.0%	100.0%	9,800,000	9,800,000
BR-10	2008 List	2008	Beavercreek Road/Maplelane Road	53.4%	46.6%	100.0%	250,000	133,444
BR-11	2008 List	2008	Beavercreek Road/Meyers Road	53.1%	46.9%	100.0%	5,000,000	2,654,172
			Park Place Concept Plan-PP					
PP-2	2008 List	2008	Redland Road: Abernethy/Holcomb to Swan Ave (Holly Ln)	39.6%	60.4%	100.0%	11,500,000	4,558,791
PP-3	2008 List	2008	Holly Lane: Redland to Maplelane Road	54.4%	45.6%	100.0%	1,000,000	544,218
PP-4	2008 List	2008	Livesay Road: Swan Ext to Holly Ext	76.3%	23.7%	100.0%	1,800,000	1,373,333
PP-5	2008 List	2008	Donovan Road: Holly Lane to Ogden Middle School	62.8%	37.2%	100.0%	1,200,000	753,191
PP-6	2008 List	2008	Swan Ave Extension: Existing Swan Ave S to Holcomb Blvd	100.0%	0.0%	100.0%	1,100,000	1,100,000
PP-8	2008 List	2008	Swan Ave Extension: Redland Rd to Holly Ln	100.0%	0.0%	100.0%	9,300,000	9,300,000

#	Project Source (1)	Yr of Cost Estimate	Project Title (1)	Eligible Capacity Increasing % (2)	Serving Existing Deficiency	City Funding Responsibility (3)	Project Cost (1)	SDC Eligible Cost
PP-9	2008 List	2008	Holly Lane Extension: Redland Rd to Holcomb Blvd	100.0%	0.0%	100.0%	17,400,000	17,400,000
PP-10	2008 List	2008	Anchor Way/Redland	70.0%	30.0%	100.0%	2,900,000	2,030,000
PP-11	2008 List	2008	Holly Ln/Redland Rd	65.0%	35.0%	100.0%	2,000,000	1,300,000
PP-12	2008 List	2008	Holly Ln/Maplelane Rd	65.0%	35.0%	100.0%	1,600,000	1,040,000
PP-13	2008 List	2008	Swan Ave/Holcomb Blvd	69.2%	30.8%	100.0%	300,000	207,468
			Roadway System Plan-R (City Streets)					
R-10	2008 List	2008	Washington Street/12th Street	29.9%	70.1%	100.0%	510,000	152,696
R-11	2008 List	2008	Anchor Way: 18th St to Redland Rd	40.0%	60.0%	100.0%	445,000	178,000
R-12	2008 List	2008	Beavercreek Road: CCC to Glen Oak Rd	0.0%	100.0%	100.0%	See cost for BR-2.	-
R-13	2008 List	2008	Boynton Street: Warner Parrot Rd to Buol St	40.0%	60.0%	100.0%	445,000	178,000
R-14	2008 List	2008	Central Point Road: Roundtree Dr to UGB	40.0%	60.0%	100.0%	940,000	376,000
R-15	2008 List	2008	Forsythe Rd: Clackamas River Dr to Swan Ave	40.0%	60.0%	100.0%	1,200,000	480,000
R-16	2008 List	2008	Gaffney Lane: Molalla Ave to Meyers Rd	40.0%	60.0%	100.0%	1,635,000	654,000
R-17	2008 List	2008	Glen Oak Road: HWY 213 to Beavercreek Rd	100.0%	0.0%	100.0%	825,000	825,000
R-18	2008 List	2008	Holcomb Road: Redland Rd to UGB	40.0%	60.0%	100.0%	2,710,000	1,084,000
R-19	2008 List	2008	Holmes Lane-Hilda St: Linn Ave to Alden St	40.0%	60.0%	100.0%	1,090,000	436,000
R-20	2008 List	2008	Leland Rd: McCord Rd to UGB	100.0%	0.0%	100.0%	1,616,000	1,616,000
R-21	2008 List	2008	Maplelane Road: Beavercreek Rd to UGB	40.0%	60.0%	100.0%	1,360,000	544,000
R-22	2008 List	2008	McCord Road: Central Point Rd to Leland Rd	40.0%	60.0%	100.0%	740,000	296,000
R-23	2008 List	2008	Partlow Road: South End Rd to Central Point Rd	40.0%	60.0%	100.0%	1,700,000	680,000
R-24	2008 List	2008	Pease Road: Leland Rd to McCord Rd	40.0%	60.0%	100.0%	1,070,000	428,000
R-25	2008 List	2008	Redland Rd: Holly Ln to UGB	100.0%	0.0%	100.0%	2,212,000	2,212,000
R-26	2008 List	2008	South End Road: Partlow Rd to UGB	100.0%	0.0%	100.0%	1,445,000	1,445,000
R-27	2008 List	2008	Swan Avenue: Holcomb Rd to Forsythe Rd	40.0%	60.0%	100.0%	851,000	340,400
R-28	2008 List	2008	Thayer Road: Maplelane Rd to UGB	40.0%	60.0%	100.0%	902,000	360,800
R-29	2008 List	2008	Washington St-Clackamas River Drive: Abernethy Rd to UGB	100.0%	0.0%	100.0%	1,750,000	1,750,000
R-30	2008 List	2008	Holcomb Road/Front St/Beemer Jacobs Way	52.5%	47.5%	100.0%	1,130,000	593,690
R-31	2008 List	2008	Leland Rd/Pease Rd	72.6%	27.4%	100.0%	250,000	181,513
R-34	2008 List	2008	Warner Milne Rd/Molalla Ave	30.7%	69.3%	100.0%	1,614,000	496,228
R-35	2008 List	2008	Warner Milne/Warner Parrott Rd/Leland/Linn Ave/Central Point Rd	42.8%	57.2%	100.0%	2,000,000	856,924
R-40	2008 List	2008	Washington Street: 12th St to 7th St	35.4%	64.6%	100.0%	1,340,000	474,768
R-42	2008 List	2008	Molalla Avenue: Holmes Lane to HWY 213	31.9%	68.1%	100.0%	See related project costs.	-
R-44	2008 List	2008	Warner Milne Road: Beavercreek Rd to Leland/Linn Ave	28.6%	71.4%	100.0%	7,500,000	2,148,058
R-61	2008 List	2008	Main Street/14th Street	65.0%	35.0%	100.0%	515,000	334,750
R-62	2008 List	2008	Main Street/10th Street	65.0%	35.0%	100.0%	515,000	334,750
R-63	2008 List	2008	Molalla Avenue/Barclay Hills Dr	32.3%	67.7%	100.0%	60,000	19,394
R-64	2008 List	2008	Molalla Avenue/Clairmont Way	23.5%	76.5%	100.0%	400,000	94,068
R-65	2008 List	2008	Molalla Avenue/Gaffney Lane	23.6%	76.4%	100.0%	450,000	106,354
R-66	2008 List	2008	Beavercreek Rd/Warner Milne Rd	27.4%	72.6%	100.0%	440,000	120,402
R-69	2008 List	2008	Beavercreek Rd/Glen Oak Rd	54.0%	46.0%	100.0%	See cost for BR-7.	-
R-70	2008 List	2008	Warner Parrott Rd/South End Rd	65.0%	35.0%	100.0%	1,553,580	1,009,827
R-71	2008 List	2008	Warner Parrott Rd/Central Point Rd	42.5%	57.5%	100.0%	See R-35	-
R-72	2008 List	2008	Warner Milne Rd/Linn-Leland Ave	42.9%	57.1%	100.0%	See R-35	-

#	Project Source (1)	Yr of Cost Estimate	Project Title (1)	Eligible Capacity Increasing % (2)	Serving Existing Deficiency	City Funding Responsibility (3)	Project Cost (1)	SDC Eligible Cost
R-73	2008 List	2008	South End Rd/High Street/S 2nd St	65.0%	35.0%	100.0%	1,367,604	888,943
R-75	2008 List	2008	Linn Ave/Davis Rd/Ethel St	86.0%	14.0%	100.0%	510,300	438,858
R-76	2008 List	2008	Leland Rd/Clairmont Way/Meyers Rd	67.9%	32.1%	100.0%	510,300	346,493
R-79	2008 List	2008	Spring Valley Dr: Partlow Rd to Salmonberry Dr	0.0%	100.0%	100.0%	N/A	-
R-80	2008 List	2008	Shenandoah Dr: Central Point to Pease Rd & Pease to Leland Rd	28.6%	71.4%	100.0%	N/A	-
R-83	2008 List	2008	South Douglas Loop (CCC) to Glen Oak Road	23.7%	76.3%	100.0%	3,120,000	739,516
R-84	2008 List	2008	Coquille Drive Extension	49.7%	50.3%	100.0%	5,200,000	2,586,347
R-86	2008 List	2008	Meyers Road to Caufield Road	65.8%	34.2%	100.0%	N/A	-
R-91	2008 List	2008	SE 82nd Drive crossing of Clackamas River	24.9%	75.1%	100.0%	N/A	-
R-92	2008 List	2008	Fir Street Extension: Highway 213 to Beavercreek Road	51.5%	48.5%	100.0%	18,750,000	9,660,883
R-93	2008 List	2008	Ethel St to May St (south of Holmes Lane)	44.5%	55.5%	100.0%	N/A	-
R-94	2008 List	2008	Laurel Lane Extension: May St to Warner Milne Rd	42.7%	57.3%	100.0%	N/A	-
R-95	2008 List	2008	Roosevelt St Extension: Molalla Ave to Linn Ave	45.6%	54.4%	100.0%	N/A	-
R-96	2008 List	2008	12th Street Extension: Taylor St to Grant St	40.3%	59.7%	100.0%	N/A	-
R-97	2008 List	2008	Skellenger Way to Meyers Road/Clairmont Way	40.4%	59.6%	100.0%	N/A	-
R-98	2008 List	2008	Meyers Road Extension: Highway 213 to High School Lane	54.2%	45.8%	100.0%	10,000,000	5,415,282
R-102	2008 List	2008	Parrish Road Extension	100.0%	0.0%	100.0%	4,000,000	4,000,000
R-104	2008 List	2008	Molalla Avenue/Taylor/Division	34.2%	65.8%	100.0%	1,000,000	341,998
R-106	2008 List	2008	Agnes Street: Main Street to Highway 213	61.4%	38.6%	100.0%	13,575,000	8,332,559
Total				**58.1%**	**41.9%**	**78.3%**	**$ 312,918,784**	**$ 158,455,615**
less: Beginning FY2007 Transportation SDC Fund Balance (4)								$ 1,614,627
Total Future Capital Projects for SDC Calculation								$ 156,840,988

NOTES

(1) 2008 List = Primary sources were the 2001 Transportation System Plan and the Beavercreek Road and Park Place Concept Plans. Original cost estimates in 2001 TSP were updated to 2008 dollars.

(2) Projects were allocated based on growth's share of total future peak-hour trips. When such data was unavailable, baseline projections of vehicle/capacity (V/C) ratios were utilized to determine existing system deficiencies.

(3) Minimum 10% City match for State project costs. The City anticipates potential City contribution of at least 30% and up to 40%.

(4) Source: FY2007 City budget.

Oregon City
Transportation SDC Study
TSDC Project List -- Bike/Ped Improvements

FINAL

Table 5

#	Project Source (1)	Yr of Cost Estimate	Project Title (1)	Eligible Capacity Increasing % (2)	Serving Existing Deficiency	Project Cost (1)	SDC Eligible Cost
			Bicycle System Improvements-B				
B-2	2008 Bike/Ped	2008	Beavercreek Road (Maplelane to UGB)	48.5%	51.5%	$ 55,080	$ 26,717
B-3	2008 Bike/Ped	2008	Molalla Avenue (Beavercreek to Hwy 213)	48.5%	51.5%	29,160	14,144
B-4	2008 Bike/Ped	2008	Singer Hill (Hwy 99E to 7th St)	48.5%	51.5%	N/A	-
B-5	2008 Bike/Ped	2008	South End Road (Barker Avenue to UGB)	48.5%	51.5%	2,360,897	1,145,187
B-6	2008 Bike/Ped	2008	Warner Milne Road (Linn Ave to Molalla Ave)	48.5%	51.5%	23,328	11,316
B-7	2008 Bike/Ped	2008	Washington Street (11th Street to 5th Street)	48.5%	51.5%	12,960	6,286
B-8	2008 Bike/Ped	2008	Highway 99E (S 2nd Street to South UGB)	48.5%	51.5%	133,650	64,829
B-9	2008 Bike/Ped	2008	Highway 213 (I-205 to Molalla Ave)	48.5%	51.5%	12,960	6,286
B-10	2008 Bike/Ped	2008	5th Street (High street to Jackson street)	48.5%	51.5%	7,128	3,458
B-11	2008 Bike/Ped	2008	Anchor Way (Redland Road to Division Street)	48.5%	51.5%	See cost for R-11.	-
B-12	2008 Bike/Ped	2008	Central Point Road (Warner Parrott to UGB)	48.5%	51.5%	125,388	60,821
B-13	2008 Bike/Ped	2008	Division Street (Anchor Way to Molalla Ave)	48.5%	51.5%	33,048	16,030
B-14	2008 Bike/Ped	2008	Gaffney Lane (Molalla Avenue to Meyers Road)	48.5%	51.5%	See cost for R-16.	-
B-15	2008 Bike/Ped	2008	Holmes Lane (Telford Road to Molalla Avenue)	48.5%	51.5%	9,720	4,715
B-16	2008 Bike/Ped	2008	Leland Road (Warner Milne Road to UGB)	48.5%	51.5%	2,195,988	1,065,195
B-17	2008 Bike/Ped	2008	Main Street Extension	48.5%	51.5%	346,874	168,256
B-18	2008 Bike/Ped	2008	Monroe Street (12th Street to 5th Street)	48.5%	51.5%	7,290	3,536
B-19	2008 Bike/Ped	2008	Partlow Road (South End Road to Central Point Road)	48.5%	51.5%	See cost for R-23.	-
B-20	2008 Bike/Ped	2008	12th Street (99E to Taylor St)	48.5%	51.5%	45,360	22,003
B-21	2008 Bike/Ped	2008	15th Street (Washington St to Division St)	48.5%	51.5%	11,340	5,501
B-22	2008 Bike/Ped	2008	Barker Ave (South End Rd to Telford Ave)	48.5%	51.5%	8,100	3,929
B-24	2008 Bike/Ped	2008	Center Street (7th St to Telford Ave)	48.5%	51.5%	31,104	15,087
B-25	2008 Bike/Ped	2008	Clackamette Drive (Main St Extension to Highway 99E)	48.5%	51.5%	19,440	9,430
B-26	2008 Bike/Ped	2008	Front Avenue (Forsythe Rd to Holcomb Rd)	48.5%	51.5%	21,384	10,373
B-28	2008 Bike/Ped	2008	High Street (7th St to S 2nd St)	48.5%	51.5%	8,586	4,165
B-29	2008 Bike/Ped	2008	Hilda St/Alden St/Barclay Hills Dr-Molalla Ave to Newell Ridge Dr	48.5%	51.5%	6,480	3,143
B-30	2008 Bike/Ped	2008	Holcomb Boulevard (Abernethy Rd to UGB)	48.5%	51.5%	65,448	31,746
B-31	2008 Bike/Ped	2008	Jackson Street (15th St to 12th St)	48.5%	51.5%	6,480	3,143
B-32	2008 Bike/Ped	2008	Main Street (Main Extension to Singer Hill)	48.5%	51.5%	11,340	5,501
B-33	2008 Bike/Ped	2008	Meyers Road (Highway 213 to Beavercreek Rd)	48.5%	51.5%	See cost for R-98.	-
B-34	2008 Bike/Ped	2008	Railroad Avenue (Main St to Hwy 99E)	48.5%	51.5%	4,860	2,357
B-35	2008 Bike/Ped	2008	Swan Avenue (Forsythe Rd to Holcomb Blvd)	48.5%	51.5%	8,910	4,322
B-36	2008 Bike/Ped	2008	Telford Road (Center St to Holmes Lane)	48.5%	51.5%	8,100	3,929

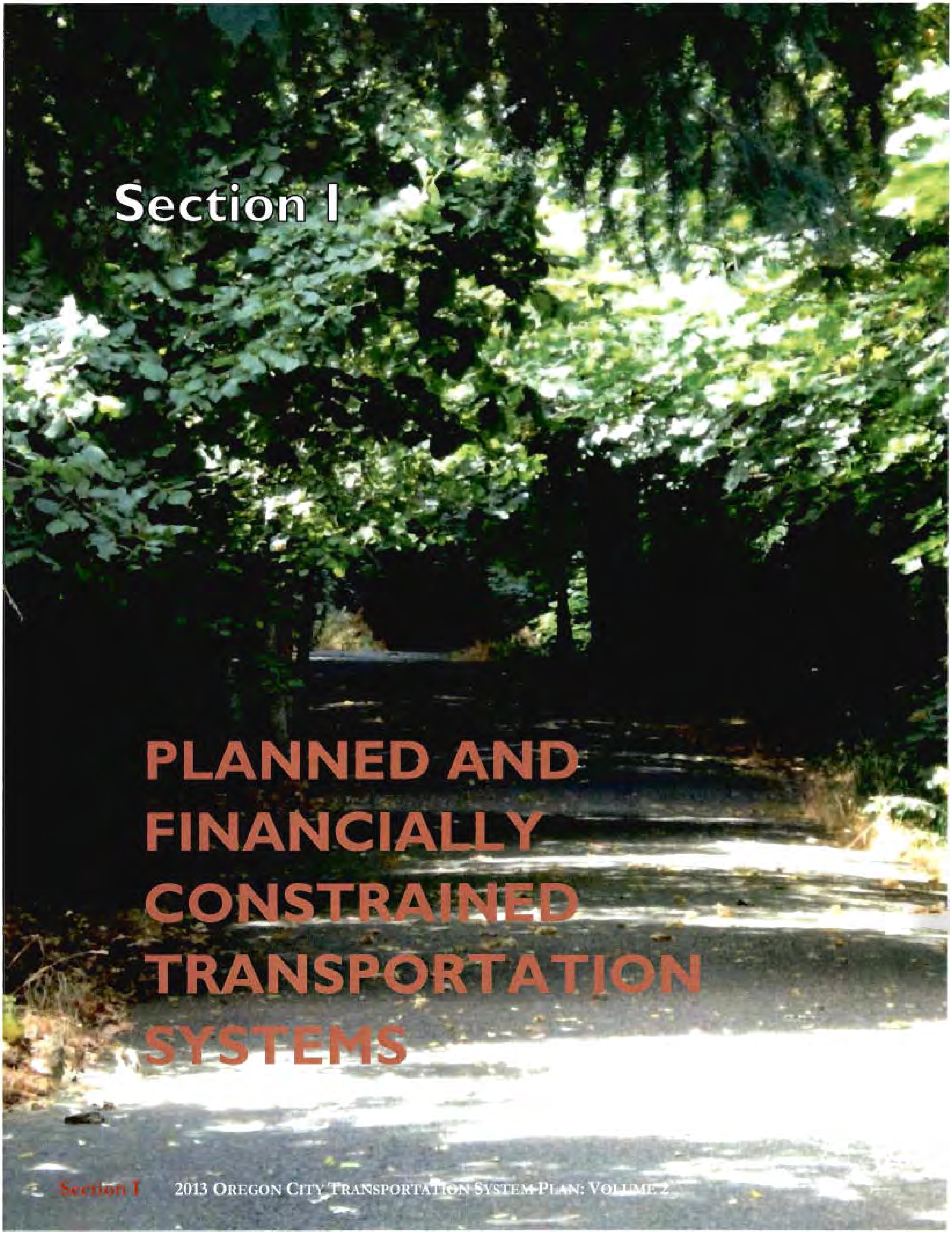
#	Project Source (1)	Yr of Cost Estimate	Project Title (1)	Eligible Capacity Increasing % (2)	Serving Existing Deficiency	Project Cost (1)	SDC Eligible Cost
B-37	2008 Bike/Ped	2008	Taylor Street (12th St to 7th St)	48.5%	51.5%	10,368	5,029
B-38	2008 Bike/Ped	2008	Canemah Road (Telford Road to Warner Parrott Road)	48.5%	51.5%	3,564	1,729
B-39	2008 Bike/Ped	2008	Davis Road (Telford Road to Linn Avenue)	48.5%	51.5%	5,994	2,907
B-40	2008 Bike/Ped	2008	Cleveland Street (Front Street to Swan Avenue)	48.5%	51.5%	10,692	5,186
B-41	2008 Bike/Ped	2008	Clackamas River Drive (Hwy 213 to UGB)	48.5%	51.5%	27,540	13,359
B-42	2008 Bike/Ped	2008	Abernethy Road (Washington Street to Redland Road)	48.5%	51.5%	17,172	8,330
B-43	2008 Bike/Ped	2008	Fir Street (Molalla Avenue to Beavercreek Road)	48.5%	51.5%	29,160	14,144
B-44	2008 Bike/Ped	2008	Melinda Street (Clackamas River Drive to Front Street)	48.5%	51.5%	4,212	2,043
			Recommended Pedestrian Improvements				
P-1	2008 Ped List		Highway 213 (Molalla Avenue to UGB)	48.5%	51.5%	-	-
P-2	2008 Ped List		Highway 99E (Clackamas River Br to Dunes Drive)	48.5%	51.5%	-	-
P-4	2008 Ped List		Highway 99E (Tumwater Drive to Hedges Street)	48.5%	51.5%	-	-
P-5	2008 Ped List		Abernethy-Holcomb Blvd (Washington Street to Winston Drive)	48.5%	51.5%	See cost for R-18.	-
P-6	2008 Ped List		Abernethy-Holcomb Blvd (Redland Road to Winston Drive)	48.5%	51.5%	See cost for R-18.	-
P-10	2008 Ped List		Beavercreek Road (Maplelane Road to UGB)	48.5%	51.5%	See costs for BR-1 & BR-2	-
P-11	2008 Ped List		Berta Drive (Clairmont Way to Gaffney Lane)	48.5%	51.5%	116,640	56,578
P-12	2008 Ped List		Berta Drive (Gaffney Lane to End)	48.5%	51.5%	77,760	37,719
P-13	2008 Ped List		Boynton Street (warner Parrott Road to Buol street)	48.5%	51.5%	See cost for R-13.	-
P-14	2008 Ped List		Center Street (S 2nd Street to Telford Road)	48.5%	51.5%	388,800	188,593
P-15	2008 Ped List		Central Point Road (Roundtree Drive to Partlow Road)	48.5%	51.5%	See cost for R-14.	-
P-16	2008 Ped List		Central Point Road (Skellenger Way to UGB)	48.5%	51.5%	See cost for R-14.	-
P-17	2008 Ped List		Central Point Road (Roundtree Drive to UGB)	48.5%	51.5%	See cost for R-14.	-
P-18	2008 Ped List		Clackamas River Drive (Hwy 213 to UGB)	48.5%	51.5%	See cost for R-29.	-
P-19	2008 Ped List		Clairmont Way (Southwood Drive to Leland Road)	48.5%	51.5%	291,600	141,445
P-20	2008 Ped List		Clairmont Way (Molalla Avenue to Leland Road)	48.5%	51.5%	388,800	188,593
P-21	2008 Ped List		Division Street (Selma Street to 12th Street)	48.5%	51.5%	58,320	28,289
P-22	2008 Ped List		Division Street (Gilman Park Drive to Anchor Way)	48.5%	51.5%	194,400	94,296
P-23	2008 Ped List		Division Street (15th Street to Anchor Way)	48.5%	51.5%	71,604	34,733
P-24	2008 Ped List		Forsythe Road (Clackamas River Dr to UGB)	48.5%	51.5%	See cost for R-15.	-
P-25	2008 Ped List		Front Avenue (Forsythe Road to Holcomb Blvd)	48.5%	51.5%	264,141	128,125
P-26	2008 Ped List		Gaffney Lane (Meyers Road to Lazy Creek Lane)	48.5%	51.5%	See cost for R-16.	-
P-27	2008 Ped List		Glen Oak Road (Hwy 213 to Beavercreek Road)	48.5%	51.5%	486,648	236,056
P-28	2008 Ped List		Holmes Lane (Molalla Avenue to Linn Avenue)	48.5%	51.5%	213,840	103,726
P-29	2008 Ped List		Holmes Lane (Laurel Lane to Reliance Lane)	48.5%	51.5%	See cost for R-19.	-
P-30	2008 Ped List		Leland Road (Warner Milne Road to Whitcomb Drive)	48.5%	51.5%	See cost for R-20.	-
P-31	2008 Ped List		Leland Road (Haven Road to UGB)	48.5%	51.5%	See cost for R-20.	-
P-32	2008 Ped List		Leland Road (Hiefield Court to UGB)	48.5%	51.5%	See cost for R-20.	-
P-33	2008 Ped List		Linn Ave (Jackson Street to Oak Street)	48.5%	51.5%	97,200	47,148
P-34	2008 Ped List		Linn Ave (Charman Street to Holmes Lane)	48.5%	51.5%	155,520	75,437

#	Project Source (1)	Yr of Cost Estimate	Project Title (1)	Eligible Capacity Increasing % (2)	Serving Existing Deficiency	Project Cost (1)	SDC Eligible Cost
P-35	2008 Ped List		Linn Ave (Jackson street to Holmes Lane)	48.5%	51.5%	349,920	169,734
P-36	2008 Ped List		Maplelane Road (Beavercreek Road to Country Village Drive)	48.5%	51.5%	See cost for R-21.	-
P-37	2008 Ped List		McCord Road (Daybreak Court to Leland Road)	48.5%	51.5%	See cost for R-22.	-
P-38	2008 Ped List		McCord Road (Central Point Road to Leland Road)	48.5%	51.5%	See cost for R-22.	-
P-39	2008 Ped List		Meyers Road (Leland Road to Highway 213)	48.5%	51.5%	514,026	249,336
P-40	2008 Ped List		Meyers Road (Leland Road to Gaffney Lane)	48.5%	51.5%	291,600	141,445
P-41	2008 Ped List		Partlow Road (South End Road to Central Point Road)	48.5%	51.5%	See cost for R-23	-
P-42	2008 Ped List		Redland Road (Highway 213 to Abernethy Road)	48.5%	51.5%	See cost for R-25.	-
P-43	2008 Ped List		Redland Road (Abernethy Road to UGB)	48.5%	51.5%	See cost for R-25.	-
P-44	2008 Ped List		South End Road (Warner Parrott Road to UGB)	48.5%	51.5%	See cost for R-26.	-
P-45	2008 Ped List		South End Road (Barker Road to Warner Parrott Rd)	48.5%	51.5%	116,640	56,578
P-46	2008 Ped List		South End Road (Barker Road to 2nd Street)	48.5%	51.5%	855,360	414,905
P-47	2008 Ped List		Swan Avenue (Forsythe Road to Holcomb Blvd)	48.5%	51.5%	See cost for R-27.	-
P-48	2008 Ped List		Telford Road (Center Street to Davis Road)	48.5%	51.5%	445,176	215,939
P-49	2008 Ped List		Thayer Road (Maplelane Road to UGB)	48.5%	51.5%	See cost for R-28.	-
P-50	2008 Ped List		Warner Parrott Road (Linn Ave to South End Road)	48.5%	51.5%	316,467	153,507
P-51	2008 Ped List		Washington Street (Abernethy Road to Hwy 213)	48.5%	51.5%	See cost for R-29.	-
P-52	2008 Ped List		S 2nd Street (Tumwater Drive to Center Street)	48.5%	51.5%	77,760	37,719
P-53	2008 Ped List		15th Street (Highway 99E to Taylor Street)	48.5%	51.5%	816,480	396,045
P-55	2008 Ped List		Hood Street (Linn Ave to Gardiner Middle School)	48.5%	51.5%	116,640	56,578
P-56	2008 Ped List		Ethel Street (Linn Ave to Gardiner Middle School)	48.5%	51.5%	174,960	84,867
P-57	2008 Ped List		Jackson Street (16th Street to Atkinson Park)	48.5%	51.5%	77,760	37,719
P-58	2008 Ped List		Park Drive (Linn Avenue to Rivercrest Park)	48.5%	51.5%	194,400	94,296
P-59	2008 Ped List		Hilda Street (Molalla Avenue to Mountain View Cem.)	48.5%	51.5%	194,400	94,296
P-60	2008 Ped List		Warner Street (Molalla Avenue to St. John's Cem.)	48.5%	51.5%	194,400	94,296
Total				**48.5%**	**51.5%**	**$ 13,260,367**	**$ 6,432,131**

NOTES

(1) 2008 Bike/Ped = Project list provided as an appendix to 2008 Oregon City Transportation SDC Rate memo. DKS Associates.
2008 Ped List = Pedestrian System Plan Sidewalk Projects.

(2) Based on growth's share of total future peak-hour trips (2005-2030).



Section I

PLANNED AND FINANCIALLY CONSTRAINED TRANSPORTATION SYSTEMS

PLANNED AND FINANCIALLY CONSTRAINED TRANSPORTATION SYSTEMS

This document reduces the 362 solutions for the Oregon City transportation system into a Financially Constrained Plan. Included is a summary of the process utilized to develop and analyze the solutions for the transportation system and a detail of the Financially Constrained and Planned Transportation Systems identified for Oregon City.

Project Categories

The Oregon City approach to developing transportation solutions for this update placed more value on investments in smaller cost-effective solutions for the transportation system rather than larger, more costly ones (see Technical Memorandum #9 for more information). The approach enabled more cost-effective solutions to increase transportation system capacity and helped to encourage multiple travel options, increase street connectivity and promote a more sustainable transportation system. Taking the network approach to transportation system improvements, the projects in this plan fall within one of several categories:

- **Driving** projects to improve connectivity, safety and capacity throughout the City. Oregon City identified 95 driving projects that will cost an estimated $162.3 million to complete.
- **Walking** projects for sidewalk infill, providing seamless connections for pedestrians throughout the City. Oregon City identified 75 walking projects that will cost an estimated $14.7 million to complete.
- **Biking** projects including an integrated network of bicycle lanes and marked on-street routes that facilitates convenient travel citywide. Oregon City identified 66 biking projects that will cost an estimated $5.3 million to complete.
- **Shared-Use Path** projects providing local and regional off-street travel for walkers and bikers. The citywide shared-use path vision includes 53 projects totaling an estimated $30.2 million.
- **Transit** projects to enhance the quality and convenience for passengers. Oregon City identified four transit projects that will cost an estimated $1.3 million to complete.
- **Family Friendly** projects to fill gaps between shared-use paths, parks, and schools, offering a network of low-volume streets for more comfortable biking and walking throughout the City. The 33 family-friendly routes identified by the City will cost an estimated $5.2 million to complete.

- **Crossing** project solutions, proving safe travel across streets along key biking and walking routes. A total of 36 crossing projects were identified, totaling an estimated $2.8 million.

Assessing the Performance of Transportation Solutions

The projects and/or policies in the categories listed above aim to satisfy the goals and policies for the Oregon City TSP Update. Each solution was evaluated to see how the community priorities match the perceived project benefits and shortfalls. A variety of transportation evaluation criteria and measures were derived from the community priorities (based on the project goals and objectives) and used to evaluate and compare the solutions to one another. The goals, objectives and evaluation criteria established for Oregon City can be found in Technical Memorandum #2.

Project stakeholders were given the opportunity to rank the eight project goals, from most valuable to least valuable. Using the weighted goals, the transportation solutions were evaluated and compared to one another, placing more value on those project stakeholders felt were most important to the community. The following goals (listed in order of importance to the community), were utilized to assess the performance of the transportation solutions:

- Enhance the health and safety of residents
- Emphasize effective and efficient management of the transportation system
- Foster a sustainable transportation system
- Provide an equitable, balanced and connected multi-modal transportation system
- Identify solutions and funding to meet system needs
- Increase the convenience and availability of pedestrian, bicycle, and transit modes
- Ensure the transportation system supports a prosperous and competitive economy
- Comply with state and regional transportation plans

Each transportation solution was assigned a time frame for the expected investment need, based on a project's contribution to achieving the community priorities of Oregon City. The investment recommendations attempted to balance implementation considerations with available funding. Complex and costly capital projects were disfavored compared with implementation of low cost projects that can have more immediate impacts and can spread investment benefits citywide.

Funding the Transportation Solutions

With an estimated $222 million worth of transportation solutions identified, Oregon City must make investment decisions to develop a set of transportation improvements that will likely be funded to meet identified needs through 2035. Overall, Oregon City is expected to have the following funds available through 2035 after accounting for the expenditures:

- Approximately $14.7 million is expected to be available for capital needs after street operation and maintenance needs are met through 2035. These funds can be spent on non SDC eligible project costs or other street improvements that are related to maintenance such as upgraded retaining walls and stairways, new guardrail, signal equipment replacement and upgrades, or curb and gutter.
- Over $109 million is expected to be available for System Development Charge (SDC) projects after reducing the planned SDC project expenditures through 2035. This includes about $2 million for pedestrian and bicycle SDC projects and over $107 million for street SDC projects. The improvement projects eligible for SDC funding can be updated on-going. It was assumed that the needed transportation system investments identified through the TSP update would be used to amend the existing SDC project list.

To put the expected available funding in context, over $162 million worth of motor vehicle, over $50 million worth of pedestrian, bicycle and shared-use path improvements and $9 million worth of transit, street crossing and family-friendly route projects were identified by the City. Of those project costs, approximately $100 million of the motor vehicle and $23 million of the pedestrian, bicycle and shared-use path project costs are needed to accommodate new development, and therefore are eligible for SDC funding. This leaves about $63 million in motor vehicle and $27 million in pedestrian, bicycle and shared-use path project costs to serve existing transportation deficiencies. These project costs, in addition to the transit, street crossing and family-friendly route project costs, are not eligible to utilize SDC funds and must be funded through other means, such as the Street Fund or other State or Federal grants.

Unless additional funds are developed, Oregon City will be expected to have a little over $14.7 million (from the Street Fund) to cover the $63 million in motor vehicle, $27 million in pedestrian, bicycle and shared-use path, and $9 million in transit, street crossing and family-friendly route project costs that are not eligible for SDC funds (based on the current revenue and expenditure forecasts). In other words, about $84.3 million worth of projects would be unfunded. Clearly, most of the transportation solutions identified for the City are not reasonably likely to be funded through 2035. For this reason, the transportation solutions were divided into two categories. Those reasonably expected to be funded by 2035 were included in the Likely to be Funded Transportation System, while the projects that are not expected to be funded by 2035 were included in the Not Likely to be Funded Transportation System.

Likely to be Funded Transportation System

The Likely to be Funded Plan identifies the transportation solutions reasonably expected to be funded by 2035 and have the highest priority for implementation. Transportation solutions within the Likely to be Funded Transportation System were recommended within several different priority/time horizons:

- Short-term: projects recommended for implementation in within 1 to 5 years.
- Medium-term: projects recommended for implementation in within 5 to 10 years.
- Long-term: projects likely to be implemented beyond 10 years from the adoption of this plan. These projects are important for the development of the City transportation network, but are unlikely to be funded in the next 10 years.

The Likely to be Funded Transportation solutions are summarized in Table 1 and illustrated in Figures 1 to 6. The projects numbered on Figures 1 to 6 correspond with the project numbers in Table 1. Over $73 million worth of investments are included in the Likely to be Funded Transportation System. The project numbers are denoted as a driving ("D"), walking ("W"), biking ("B"), shared-use path ("S"), transit ("T"), street crossing ("C") or a family-friendly route ("FF"). Planning level cost estimates for the projects can be found in the appendix.

Table 1: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
Further Study				
D0	OR 213/Beavercreek Road Refinement Plan	OR 213 from Redland Road to Molalla Avenue	Identify and evaluate circulation options to reduce motor vehicle congestion along the corridor. Explore alternative mobility targets.	Short-term
D00	I-205 Refinement Plan	I-205 at the OR 99E and OR 213 Ramp Terminals	Identify and evaluate circulation options to reduce motor vehicle congestion at the interchanges. Explore alternative mobility targets, and consider impacts related to a potential MMA Designation for the Oregon City Regional Center.	Short-term
Driving Solutions (Intersection and Street Management- see Figure 1)				
D1	Molalla Avenue/ Beavercreek Road Adaptive Signal Timing	Molalla Avenue from Washington Street to Gaffney Lane; Beavercreek Road from Molalla Avenue to Maple Lane Road	Deploy adaptive signal timing that adjusts signal timings to match real-time traffic conditions.	Short-term
D7	Option 1: 14th Street Restriping	Option 1: OR 99E to John Adams Street	**Option 1:** Convert 14th Street to one-way eastbound between McLoughlin Boulevard and John Adams Street: • Convert the Main Street/14th Street intersection to all-way stop control (per project D13). • From McLoughlin Boulevard to Main Street, 14th Street would be restriped to include two 12-foot eastbound travel lanes, a six-foot eastbound bike lane, a six-foot westbound contra-flow bike lane, and an eight-foot landscaping buffer on the north side • From Main Street to Washington Street, 14th Street would be restriped to include two 11-foot eastbound travel lanes, a five-foot eastbound bike lane, a five-foot westbound contra-flow bike lane, and an eight-foot on-street parking lane on the north side • From Washington Street to John Adams Street, 14th Street would be restriped to include one 12-foot eastbound travel lane, a six-foot eastbound bike lane, a six-foot westbound contra-flow bike lane, and an eight-foot on-street parking lane on the north and south side • Add a bicycle signal, with detection at the McLoughlin Boulevard/14th Street intersection. Add bicycle detection to the traffic signal at the Washington	Short-term

Table 1: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
			Street/14th Street intersection.	
	Option 2: Main Street/14th Street Intersection Widening	Option 2: Main Street/14th Street	**Option 2:** Convert the Main Street/14th Street intersection to all-way stop control (per project D13). Widen 14th Street to include shared through/left-turn and through/right-turn lanes in both directions	
D8	15th Street Restriping	OR 99E to John Adams Street	Convert 15th Street to one-way westbound between Washington Street and McLoughlin Boulevard: • From John Adams Street to Washington Street, 15th Street would be striped as a shared-roadway (per project B6). • From Washington Street to Main Street, 15th Street would be restriped to include two 11-foot westbound travel lanes, a five-foot westbound bike lane, a five-foot eastbound contra-flow bike lane, and an eight-foot on-street parking lane on the south side. Complete the sidewalk gaps on the north side of 15th Street between Main Street and Center Street, and on the south side between Center Street and Washington Street (per project W75). • From Main Street to McLoughlin Boulevard, 15th Street would be restriped to include two 12-foot travel lanes, a six-foot westbound bike lane, and an eight-foot on-street parking lane on the south side. Add a 12-foot shared-use path with a two-foot buffer adjacent to the on-street parking lane. Add bicycle detection to the traffic signal at the Washington Street/15th Street intersection.	Included with project D7
D11	Optimize existing traffic signals	Citywide	Optimize the existing traffic signals by updating the existing coordinated signal timing plans, upgrading traffic signal controllers or communication infrastructure or cabinets.	Short-term
D12	Protected/permitted signal phasing	Citywide	Incorporate protected/permitted phasing for left turn movements at traffic signals.	Short-term
D13	Main Street/14th Street Safety Enhancement	Main Street/14th Street	Convert to all-way stop control to be consistent with the traffic control at surrounding intersections on Main Street.	Included with project D7
D14	Southbound OR 213 Advanced Warning System	Southbound OR 213, north of the Beavercreek Road intersection	Install a queue warning system for southbound drivers on OR 213 to automatically detect queues and	Short-term

Table 1: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
			warn motorists in advance via a Variable Message Sign	
D27	OR 213/Beavercreek Road Operational Enhancement	OR 213/Beavercreek Road	Lengthen the dual left-turn lanes along Beavercreek Road to provide an additional 200 feet of storage for the eastbound approach	Short-term
D28	Washington Street/12th Street Safety Enhancement	Washington Street/12th Street	Install a traffic signal with dedicated left turn lanes for the 12th Street approaches to Washington Street.	Medium-term
D30	Molalla Avenue/Division Street-Taylor Street Safety Enhancement	Molalla Avenue/Division Street-Taylor Street	Install a single-lane roundabout	Medium-term
D32	South End Road/Warner Parrott Road Operational Enhancement	South End Road/Warner Parrott Road	Install a traffic signal with dedicated left turn lanes for the South End Road approaches to Warner Parrott Road	Medium-term
D33	South End Road/Lafayette Avenue-Partlow Road Operational Enhancement	South End Road/Lafayette Avenue-Partlow Road	Install a single-lane roundabout	Medium-term
D40	Main Street/Dunes Drive Extension Operational Enhancement	Main Street/Dunes Drive Extension	Install a single-lane roundabout	Long-term
D41	South End Road/Buetel Road Operational Enhancement	South End Road/Buetel Road	Install a single-lane roundabout	Medium-term
D42	South End Road/Deer Lane Extension Operational Enhancement	South End Road/Deer Lane Extension	Install a single-lane roundabout	Long-term
D43	Holcomb Boulevard/Holly Lane North Extension Operational Enhancement	Holcomb Boulevard/Holly Lane North Extension	Install a single-lane roundabout	Long-term
D44	Beavercreek Road/Loder Road Extension Operational Enhancement	Beavercreek Road/Loder Road Extension	Install a roundabout	Medium-term
D45	Meyers Road Extension/ Loder Road Extension Operational Enhancement	Meyers Road Extension/ Loder Road Extension	Install a single-lane roundabout	Medium-term
Driving Solutions (Street Extensions- see Figure 2)				
D46	Meyers Road West extension	OR 213 to High School Avenue	Extend Meyers Road from OR 213 to High School Avenue as an Industrial Minor Arterial. Create a local street connection to Douglas Loop.	Short-term
D47	Meyers Road East extension	Beavercreek Road to the Meadow Lane Extension	Extend Meyers Road from Beavercreek Road to the Meadow Lane Extension as an Industrial Minor Arterial. Between the Holly Lane and Meadow Lane extensions, add a sidewalk and bike lane to the south side of the street, with a shared-	Medium-term

Table 1: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
			use path to be added on north side per project S19. Modify the existing traffic signal at Beavercreek Road	
D48	Holly Lane North extension	Redland Road to Holcomb Boulevard	Extend Holly Lane from Redland Road to Holcomb Boulevard as a Residential Minor Arterial. Create local street connections to Cattle Drive and Journey Drive.	Long-term
D49	Swan Avenue extension	Livesay Road to Redland Road	Extend Swan Avenue from Livesay Road to Redland Road as an Residential Collector	Long-term
D50		Redland Road to Morton Road	Extend Swan Avenue from Redland Road to Morton Road as an Residential Collector	Long-term
D51	Deer Lane extension	Rose Road to Buetel Road	Extend Deer Lane from Rose Road to Buetel Road as a Residential Collector. Add a sidewalk and bike lane to the east side of the street, with a shared-use path to be added on west side per project S32.	Long-term
D52		Buetel Road to Parrish Road	Extend Deer Lane from Buetel Road to Parrish Lane as a Residential Collector. Add a sidewalk and bike lane to the east/north side of the street, with a shared-use path to be added on west/south side per project S33. Create a local street connection to Finnegans Way Install a roundabout at South End Road (per project D42).	Long-term
D53	Madrona Drive extension	Madrona Drive to Deer Lane	Extend Madrona Drive to Deer Lane as a Constrained Residential Collector	Long-term
D54	Clairmont Drive extension	Beavercreek Road to Holly Lane South Extension	Extend Clairmont Drive from Beavercreek Road to the Holly Lane South extension as an Industrial Collector. Add a sidewalk and bike lane to the south side of the street, with a shared-use path to be added on north side per project S17.	Long-term
D55	Glen Oak Road extension	Beavercreek Road to the Meadow Lane Extension	Extend Glen Oak Road from Beavercreek Road to the Meadow Lane Extension as a Residential Collector. Install a roundabout at Beavercreek Road (per project D39)	Long-term
D56	Timbersky Way extension	Beavercreek Road to the Meadow Lane Extension	Extend Timbersky Way from Beavercreek Road to the Meadow Lane Extension as a Residential Collector. Add a sidewalk and bike lane to the south side of the street, with a shared-use path to be added on north side per project S20.	Long-term

Table 1: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
D57	Holly Lane South extension	Maple Lane Road to Thayer Road	Extend Holly Lane from Maple Lane Road to Thayer Road as a Residential Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S14. Install a roundabout at Maple Lane Road (per project D37).	Medium-term
D58		Thayer Road to Meyers Road	Extend Holly Lane from Thayer Road to the Meyers Road extension as an Industrial Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S15.	Medium-term
D59		Meyers Road to the Meadow Lane Extension	Extend Holly Lane from the Meyers Road extension to the Meadow Lane Extension as a Mixed-Use Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S16.	Long-term
D60	Meadow Lane extension	Meadow Lane to Meyers Road	Extend Meadow Lane to the Meyers Road Extension as a Mixed-Use Collector. Between Old Acres Lane and the Glen Oak Road extension, add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S21.	Long-term
D61		Meyers Road to UGB (north of Loder Road)	Extend Meadow Lane from the Meyers Road Extension to the UGB (north of Loder Road) as an Industrial Collector	Medium-term
D62	Dunes Drive Extension	OR 99E to Agnes Avenue	Extend Dunes Drive from OR 99E to Agnes Avenue as a Mixed-Use Collector. Install a roundabout at the Dunes Drive/Agnes Avenue intersection (per project D40). Will require redevelopment of the Oregon City Shopping Center.	Medium-term
D63	Washington Street to Abernethy Road Connection	Washington Street to Abernethy Road	Connect Washington Street to Abernethy Road with a Mixed-Use Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S5. This street should be a public access road built to City standards but maintained by a private entity.	Long-term
D64	Loder Road Extension	Beavercreek Road to Glen Oak Road	Extend Loder Road from Beavercreek Road to Glen Oak Road as an Industrial Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be	Short-term

Table 1: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
			added on east side per project S18. Create a local street connection to Douglas Loop. Install a roundabout at Meyers Road (per project D45).	
D65	Parrish Road Extension	From Parrish Road east to Kolar Drive	Complete the gap between Parrish Road as a Constrained Residential Collector.	Long-term
D66	Washington Street Realignment	Home Depot Driveway to Clackamas River Drive	Washington Street Realignment associated with the OR 213/Washington Street Jug-handle Project.	Under Construction
D72	Hampton Drive Extension	Hampton Drive to Atlanta Drive	Extend Hampton Drive to Atlanta Drive as a Residential Local Street.	Long-term
Driving Solutions (Street and Intersection Expansions- see Figure 3)				
D73	McLoughlin Boulevard Improvements - Phase 2	Dunes Drive to Clackamas River Bridge	Boulevard and gateway improvements, including pedestrian and bicycle facilities. Access management improvements just north of the I-205 southbound ramps.	Under Construction
D80	Division Street Upgrade	7th Street to 18th Street	Improve to Collector cross-section, as a constrained street	Long-term
D81	Beavercreek Road Upgrade	Clairmont Drive (CCC Entrance) to Meyers Road	Improve to Industrial Major Arterial cross-section	Medium-term
D82		Meyers Road to UGB	Improve to Residential Major Arterial cross-section	Long-term
D89	South End Road Upgrade	Partlow Road-Lafayette Road to UGB	Improve to Residential Minor Arterial cross-section	Medium-term
D92	Washington Street Upgrade	11th Street to 7th Street	Improve to Minor Arterial cross-section, as a constrained street. Add curb-ramps at intersections	Medium-term
Walking Solutions (see Figure 4)				
W5	Washington Street Sidewalk Infill	Washington Street-Abernethy Road Extension to Abernethy Road	Complete sidewalk gaps on both sides of the street	Short-term
W11	Holcomb Boulevard (East of OR 213) Sidewalk Infill	OR 213 overcrossing to Swan Avenue	Complete sidewalk gaps on both sides of the street	Medium-term
W12		Longview Way to Winston Drive	Complete sidewalk gaps on both sides of the street	Medium-term
W13		Barlow Drive to UGB	Complete sidewalk gaps on both sides of the street	Medium-term
W34	Molalla Avenue Sidewalk Infill	Gaffney Lane to Sebastian Way	Complete sidewalk gaps on both sides of the street	Included with project W74
W35	Leland Road Sidewalk Infill	Warner Milne Road to Meyers Road	Complete sidewalk gaps on both sides of the street	Short-term
W41	Warner Milne Road Sidewalk Infill	Leland Road to west of Molalla Avenue	Complete sidewalk gaps on both sides of the street	Short-term
W42	Beavercreek Road Sidewalk Infill	Warner Milne Road to east of Kaen Road	Complete sidewalk gaps on the east side of the street	Short-term

Table 1: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
W47	South End Road (south of Partlow) Sidewalk Infill	Partlow Road to Buetel Road	Complete sidewalk gaps on both sides of the street	Included with project D89
W48		Buetel Road to UGB	Complete sidewalk gaps on both sides of the street	Included with project D89
W54	South End Road (north of Partlow) Sidewalk Infill	Partlow Road to Barker Avenue	Complete sidewalk gaps on both sides of the street	Short-term
W56	Warner Parrott Road Sidewalk Infill	King Road to Marshall Street	Complete sidewalk gaps on the north side of the street	Short-term
W62	Linn Avenue Sidewalk Infill	Ella Street to Charman Avenue	Complete sidewalk gaps on both sides of the street	Short-term
W64	Brighton Avenue-Creed Street Sidewalk Infill	Charman Avenue to Waterboard Park Road	Complete sidewalk gaps on both sides of the street	Short-term
W65	Brighton Avenue-Park Drive Sidewalk Infill	Charman Avenue to Linn Avenue	Complete sidewalk gaps on both sides of the street	Short-term
W70	Division Street Sidewalk Infill	7th Street to 18th Street	Complete sidewalk gaps on both sides of the street	Included with project D80
W73	Molalla Avenue Streetscape Improvements Phase 3	Holmes Lane to Warner Milne Road	Streetscape improvements including widening sidewalks, sidewalk infill, ADA accessibility, bike lanes, reconfigure travel lanes, add bus stop amenities.	Medium-term
W74	Molalla Avenue Streetscape Improvements Phase 4	Beavercreek Road to OR 213	Streetscape improvements including widening sidewalks, sidewalk infill, ADA accessibility, bike lanes, reconfigure travel lanes, add bus stop amenities.	Medium-term
W75	15th Street Sidewalk Infill	OR 99E to Washington Street	Complete sidewalk gaps on both sides of the street, with a shared-use path to be added on south side between OR 99E and Main Street per project S53.	Included with project D8
Biking Solutions (see Figure 5)				
B1	7th Street Shared Roadway	OR 43 Bridge to Railroad Avenue	Add wayfinding and shared lane markings	Short-term
B2	Railroad Avenue-9th Street Shared Roadway	OR 99E to Main Street	Add wayfinding and shared lane markings	Short-term
B3	Main Street Shared Roadway	OR 99E to 15th Street	Add wayfinding and shared lane markings	Short-term
B5	12th Street (west of Washington Street) Shared Roadway	OR 99E to Washington Street	Add wayfinding and shared lane markings	Short-term
B6	15th Street (west of John Adams) Shared	Washington Street to John Adams Street	Add wayfinding and shared lane markings	Included with

Table 1: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
	Roadway			project D8
B12	Holcomb Boulevard (East of OR 213) Bike Lanes	Longview Way to UGB	Add bike lanes to both sides of the street	Medium-term
B29	Beavercreek Road Bike Lanes	Pebble Beach Drive to UGB	Add bike lanes to both sides of the street	Included with project D82
B32	Fir Street Bike Lanes	Molalla Avenue to 1,500 feet east	Add bike lanes to both sides of the street	Medium-term
B33	Leland Road Bike Lanes	Marysville Lane to Meyers Road	Add bike lanes to both sides of the street	Medium-term
B35	Meyers Road Bike Lanes	Leland Road to Autumn Lane	Add bike lanes to both sides of the street	Medium-term
B37	Molalla Avenue Bike Lanes	Gales Lane to Adrian Way	Complete bike lane gaps on both sides of the street	Included with project W73
B42	South End Road (south of Partlow) Bike Lanes	Buetel Road to UGB	Add bike lanes to both sides of the street	Included with project D89
B53	Holmes Lane Bike Lanes	Linn Avenue to Rilance Lane	Add bike lanes to both sides of the street	Medium-term
B55	Pearl Street Bike Lanes	Linn Avenue to Molalla Avenue	Add bike lanes to both sides of the street	Medium-term
B60	Division Street Bike Lanes	7th Street to 18th Street	Add bike lanes to both sides of the street	Included with project D80
B65	14th Street Bike Lanes	OR 99E to John Adams Street	Add an eastbound bike lane and a westbound contra-flow bike lane	Included with project D7
B66	15th Street Bike Lanes	OR 99E to Washington Street	Add a westbound bike lane and an eastbound contra-flow bike lane, with a shared-use path to be added on south side of 15th Street between OR 99E and Main Street per project S53.	Included with project D8
Shared-Use Path Solutions (see Figure 6)				
S14	Maple Lane-Thayer Shared-Use Path	Maple Lane Road to Thayer Road	Add a shared-use path on the east side of the Holly Lane extension between Maple Lane and Thayer.	Long-term
S15	Thayer-Loder Shared-Use Path	Thayer Road to Loder Road	Add a shared-use path on the east side of the Holly Lane extension between Thayer and Loder.	Long-term
S18	Loder Road Shared-Use Path	Glen Oak Road to Holly Lane Extension	Add a shared-use path on the south/east side of the Loder Road extension between Glen Oak Road and the Holly Lane extension.	Long-term
S24	Gaffney Lane Elementary Shared-Use	Eastborne Drive to Falcon Drive	Add a shared-use path along the northern boundary of	Long-term

Table 1: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
	Path		Gaffney Lane Elementary School between the Eastborne Drive path and Falcon Drive	
S36	Tumwater-4th Shared-Use Path	Tumwater Drive to 4th Avenue	Add a shared-use path through Old Canemah Park connecting 4th Avenue to the Tumwater/South 2nd intersection	Long-term
S53	15th Street Shared-Use Path	OR 99E to Main Street	Add a shared-use path on the south side of 15th Street between OR 99E and Main Street.	Included with project D8
Transit Solutions				
T1	Molalla Avenue Transit Signal Priority	Washington Street to Gaffney Lane	Provide priority at traffic signals for buses behind schedule. This includes the use and deployment of Opticom detectors at traffic signals and emitters on buses.	Short-term
T2	OR 99E Transit Signal Priority	Dunes Drive to 10th Street		Short-term
T3	Bus Stop Amenity Enhancement	Citywide	Add amenities at bus stops as needed, including bus shelters, landing pads, benches, trash/recycling receptacles and lighting	Short-term
Street Crossing Solutions (see Figure 6)				
C11	Beavercreek Road/Loder Road Shared-Use Path Crossing	Beavercreek Road/Loder Road intersection	Install crosswalk and pedestrian activated flasher on Beavercreek Road	Long-term
C35	John Adams/7th Family Friendly Route Crossing	7th Street/John Adams Street intersection	Install crosswalk and pedestrian activated flasher on 7th Street	Long-term
Family-Friendly Routes (see Figure 4 or 5)				
FF13	Leland-Warner Parrot Family Friendly Route	Leland Road to Warner Parrot Road	Add sidewalks on both sides of the street. Add wayfinding, traffic calming and shared lane markings. Route via Hampton Drive, Atlanta Drive, Auburn Drive and Boynton Street. Includes Hampton Drive extension to Central Point Road	Long-term
FF19	Warner Parrot-Barker Family Friendly Route	Warner Parrot Road to Barker Avenue	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings. Route via Woodlawn Avenue and Woodfield Court.	Long-term
FF20	Barker Avenue Family Friendly Route	South End Road to Telford Road	Add sidewalks on both sides of the street. Add wayfinding, traffic calming and shared lane markings. Route via Barker Avenue	Long-term

Table 1: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
FF23	Charman Avenue Family Friendly Route	Telford Road to Linn Avenue	Add sidewalks and bike lanes on both sides of the street. Add wayfinding and traffic calming	Long-term
Citywide and Programmatic Improvements				
N/A	Family Friendly Routes	Citywide	Program to systematically implement the Neighborhood Greenway network on a yearly basis	N/A
N/A	Sidewalk Infill Program	Citywide	Capital program to systematically design and construct missing sidewalks along prioritized pedestrian routes. Provide sidewalks on local, residential streets that lead to roadways with transit service.	N/A
N/A	Develop Bicycle and Pedestrian Design Guidelines	Citywide	Develop bicycle and pedestrian design guidelines that establish preferred designs that represent best practices. Key treatments include pedestrian crossing design and bicycle accommodation at intersections (i.e. bike boxes, bicycle detection, etc.).	N/A
N/A	ADA/Curb Ramp Upgrade Program	Citywide	Upgrade curb ramps and eliminate gaps in ADA access along prioritized pedestrian routes near key destinations.	N/A
N/A	Pedestrian Wayfinding Signage	Citywide	Pedestrian wayfinding tools can include signs and walking maps indicating walking routes to destinations and transit stops, as well as digital applications for smart phones.	N/A
N/A	Bicycle Parking Program	Citywide	Implement bicycle rack design and placement standards; review development applications for compliance; coordinate with sidewalk installation by developments or in city projects.	N/A
N/A	Bike Lane Re-striping Schedule	Citywide	Develop a bike lane re-striping schedule.	N/A
N/A	Bicycle Wayfinding Signage	Citywide	Implement a bicycle wayfinding signage program to assist bicyclists in choosing comfortable routes and to help visiting bicyclists navigate through the city.	N/A
N/A	Stop Here For Pedestrians signage	Citywide	Add Stop Here For Pedestrians signage at existing and new crosswalks. State standards require installation of a stop line in advance of the crosswalk to use this sign.	N/A
N/A	Bicycle/Pedestrian Connections to Transit	Citywide	Coordinate infrastructure upgrades near transit stops and park and rides to improve access and amenities targeted at	N/A

Table 1: Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
			increasing ridership.	
N/A	Repaving policy	Citywide	Ensure repaving projects extend the full width of the road, including the full shoulder or bike lane.	N/A
N/A	Streetscape Enhancements	Citywide	Develop projects to create a pedestrian buffer zone on key pedestrian routes, including those that provide access to transit. Streets that would benefit from a buffer zone include Molalla Ave and Warner Milne Rd.	N/A
N/A	Safe Routes to Schools Curriculum	Citywide	Leverage ODOT Safe Routes Program with local investment to bring Safe Routes curriculum to all area K-8 schools.	N/A

Not Likely to be Funded Transportation System

The projects and actions outlined within the Likely to be Funded System will significantly improve Oregon City's transportation system. If the City is able to implement a majority of the Likely to be Funded System, nearly two decades from now Oregon City residents will have access to a safer, more balanced multimodal transportation network.

The Not Likely to be Funded Transportation System identifies those transportation solutions that are not reasonably expected to be funded by 2035, but many of which are critically important to the transportation system. Some of the projects will require funding and resources beyond what is available in the time frame of this plan. Others are contingent upon redevelopment that makes it possible to create currently missing infrastructure, such as street connections.

The Not Likely to be Funded Transportation System solutions are summarized in Table 2 and illustrated in Figures 1 to 6. The projects numbered on Figures 1 to 6 correspond with the project numbers in Table 2. The project numbers are denoted as a driving ("D"), walking ("W"), biking ("B"), shared-use path ("S"), transit ("T"), street crossing ("C") or a family-friendly route ("FF"). Planning level cost estimates for the projects can be found in the appendix.

The Not Likely to be Funded Transportation System includes about $149 million worth of investments. Transportation solutions within the Not Likely to be Funded Transportation System were recommended within several different priority/time horizons:

- Long-term Phase 2: Projects with the highest priority for implementation beyond the projects included in the Likely to be Funded Transportation System, should additional funding become available.
- Long-term Phase 3: Projects with the next highest priority for implementation beyond the projects included in the Likely to be Funded Transportation System, should additional funding become available.
- Long-term Phase 4: The last phase of projects to be implemented, should additional funding become available.

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
Driving Solutions (Intersection and Street Management- see Figure 1)				
D2	Beavercreek Road Traffic Surveillance	Molalla Avenue to Maple Lane Road	Install video monitoring cameras and vehicle detection equipment to provide turn movement counts, hourly volumes, travel times, and speed	Long-term Phase 2
D3	Washington Street Traffic Surveillance	7th Street to OR 213		Long-term Phase 3
D4	7th Street/Molalla Avenue Traffic Surveillance	Washington Street to OR 213		Long-term Phase 3
D5	OR 213/ 7th Street-Molalla Avenue/ Washington Street Integrated Corridor Management	I-205 to Henrici Road	Integrate traffic surveillance and traffic control equipment with ODOT	Long-term Phase 3
D6	OR 99E Integrated Corridor Management	OR 224 (in Milwaukie) to 10th Street		Long-term Phase 3
D9	OR 213/Beavercreek Road Weather Information Station	OR 213/Beavercreek Road	Install road weather information stations that provide temperature, road conditions, and a video image.	Long-term Phase 4
D10	Warner Milne Road/Linn Avenue Road Weather Information Station	Warner Milne Road/Linn Avenue		Long-term Phase 4
D15	Holcomb Boulevard Curve Warning System	Holcomb Boulevard just to the west of the OR 213 overcrossing	Install a curve warning system on Holcomb Boulevard that activates when a motorist approaches the curve at a high speed.	Long-term Phase 3
D16	Holcomb Boulevard Speed Warning System	Holcomb Boulevard east of Jada Way	Install a speed warning system that activates when a motorist approaches at a high speed.	Long-term Phase 4
D17	Washington Street Speed Warning System	Washington Street near 9th Street		Long-term Phase 4
D18	7th Street Speed Warning System	7th Street near Harrison Street		Long-term Phase 4
D19	Linn Avenue Speed Warning System	Linn Avenue near Glenwood Court		Long-term Phase 4
D20	OR 99E Northbound Speed Warning System	OR 99E near Paquet Street		Long-term Phase 4
D21	OR 99E Southbound Speed Warning System	OR 99E near Hedges Street		Long-term Phase 4
D22	Central Point Road Speed Warning System	Central Point Road near White Lane		Long-term Phase 4
D23	South End Road School Zone Flashers	South End Road near Salmonberry	Install school zone flashers	Long-term

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
		Drive and Filbert Drive		Phase 4
D24	Gaffney Lane School Zone Flashers	Gaffney Lane near Glenview Court and Falcon Drive		Long-term Phase 4
D25	Meyers Road School Zone Flashers	Meyers Road near High School Lane		Long-term Phase 4
D26	Beavercreek Road School Zone Flashers	Beavercreek Road south of Loder Road and north of Glen Oak Road		Long-term Phase 4
D29	John Adams Street/7th Street Safety Enhancement	John Adams Street/7th Street	Restripe 7th Street to include a northbound left-turn pocket from 7th Street to John Adams Street.	Long-term Phase 2
D31	High Street/2nd Street Operational Enhancement	High Street/2nd Street	Install a traffic signal	Long-term Phase 4
D34	Central Point Road/Warner Parrott Road Operational Enhancement	Central Point Road/Warner Parrott Road	Restrict left turns from Central Point Road to Warner Parrott Road. Install a roundabout at the Linn Avenue-Leland Road/ Warner Parrott Road-Warner Milne Road intersection	Long-term Phase 4
D35	Redland Road/Anchor Way Operational Enhancement	Redland Road/Anchor Way	Install a traffic signal	Long term Phase 4
D36	Redland Road/Holly Lane Operational Enhancement	Redland Road/Holly Lane	Install a single-lane roundabout	Long-term Phase 4
D37	Maple Lane Road/Holly Lane Operational Enhancement	Maple Lane Road/Holly Lane	Install a single-lane roundabout	Long-term Phase 4
D38	Maple Lane Road/Walnut Grove Way Operational Enhancement	Maple Lane Road/Walnut Grove Way	Install a single-lane roundabout or realign Maple Lane Road in correlation with development	Long-term Phase 3
D39	Beavercreek Road/Glen Oak Road Operational Enhancement	Beavercreek Road/Glen Oak Road	Install a roundabout	Long-term Phase 2
Driving Solutions (Street Extensions- see Figure 2)				
D67	OR 99E to Beutel Road Extension Feasibility Study	OR 99E to Beutel Road	Further study a potential connection between OR 99E and Beutel Road as a Constrained Minor Arterial. Add shared-use path on the east side of the street per project S34. Install a roundabout at South End Road (per project D41). The connection will likely be hindered by topography.	Long-term Phase 4
D68	Chanticleer Place Extension	Glen Oak Road to north of Russ	Extend Chanticleer Place from Glen Oak Road to	Long-term

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
		Wilcox Way	Russ Wilcox Way as a Residential Collector.	Phase 3
D69		South of Talawa Drive to Chanticleer Drive	Extend Chanticleer Place from Talawa Drive to Chanticleer Drive as a Residential Collector.	Long-term Phase 3
D70	Chanticleer Drive Extension	South of Edgemont Drive to Henrici Road	Extend Chanticleer Drive from Edgemont Drive to Henrici Road as a Residential Collector.	Long-term Phase 3
D71	Coquille Drive Extension	Quinalt Drive to Henrici Drive	Extend Coquille Drive from Quinalt Drive to Henrici Drive as a Residential Collector.	Long-term Phase 3
Driving Solutions (Street and Intersection Expansion- see Figure 3)				
D74	McLoughlin Boulevard Improvements - Phase 3	10th Street to Main Street	Widen OR 99E to a five-lane cross-section that includes two travel lanes in each direction and a center two-way left-turn lane and/or a median to improve access management. The project will also improve pedestrian and bicycle facilities.	Long-term Phase 2
D75	I-205 Southbound Interchange Improvements	OR 99E/I-205 Southbound Ramps	Add dual left-turn lanes on the southbound OR 99E approach to the southbound I-205 ramp. Widen the on-ramp to the ramp meters to accommodate the dual left-turn approach.	Long-term Phase 3
D76	I-205 Northbound Interchange Improvements	OR 99E/I-205 Northbound Ramps	Add dual left-turn lanes on the westbound I-205 Off-ramp approach to OR 99E. Widen the off-ramp approaching OR 99E to maintain the separated westbound right-turn lane.	Long-term Phase 3
D77	OR 213 Safety Improvement	Molalla Avenue to Conway Drive	Widen to five lanes (two travel lanes in each direction, with a center turn lane/median) with bike lanes and sidewalks	Long-term Phase 4
D78	Anchor Way Safety Improvement	18th Street to Division Street	Realign Anchor Way to connect with Division Street	Long-term Phase 4
D79	OR 213/Redland Road Capacity Improvements	Redland Road to Redland Road undercrossing	Add a third northbound travel lane on OR 213 north of the Redland Road undercrossing. Extend the third southbound travel on OR 213 south of the Redland Road intersection and merge the third lane before the Redland Road undercrossing. Add a right-turn lane (southbound OR 213 to westbound Redland).	Long-term Phase 4

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
			Convert the Redland Road approach to OR 213 to 1 receiving lane, 2 left-turn approach lanes, and 1 right-turn lane.	
D83	Holly Lane Upgrade	Redland Road to Maple Lane Road	Improve to Residential Minor Arterial cross-section	Long-term Phase 2
D84	Maple Lane Road Upgrade	Beavercreek Road to UGB	Improve to Residential Minor Arterial cross-section	Long-term Phase 2
D85	Loder Road Upgrade	Beavercreek Road to UGB	Improve to Industrial Collector cross-section. Install a roundabout at the Beavercreek Road/Loder Road intersection.	Long-term Phase 2
D86	Livesay Road Upgrade	Redland Road to Swan Avenue	Improve to Residential Collector cross-section.	Long-term Phase 3
D87		Swan Avenue to Holly Lane extension	Improve to Mixed-Use Collector cross-section.	Long-term Phase 3
D88	Donovan Road Upgrade	Holly Lane to UGB	Improve to Mixed-Use Collector cross-section.	Long-term Phase 3
D90	Main Street Upgrade	15th Street to Agnes Avenue	Improve to Mixed-Use Collector cross-section between 17th Street and Agnes Avenue. Between 15th Street and 17th Street, restripe Main Street to include two 12-foot travel lanes, a six-foot northbound bike lane, a six-foot southbound bike lane, and an eight-foot on-street parking lane on the east side.	Long-term Phase 2
D91	Redland Road Upgrade	Holcomb Boulevard to Holly Lane	Improve to Minor Arterial cross-section, as a constrained street	Long-term Phase 2
D93	Beurel Road Upgrade	South End Road to northern terminus	Improve to Collector cross-section, as a constrained street	Long-term Phase 2
Walking Solutions (see Figure 4)				
W1	Dunes Drive Sidewalk Infill	OR 99E to Clackamette Drive	Complete sidewalk gaps the south side of the street	Long-term Phase 4
W2	Main Street Sidewalk Infill	OR 99E to 17th Street	Complete sidewalk gaps on west/south side of the street. A shared-use path will be added on east/north side per project S1	Included with project D90

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
W3		17th Street to 15th Street	Complete sidewalk gaps the west side of the street	Included with project D90
W4	Agnes Avenue Sidewalk Infill	Main Street to Washington Drive	Complete sidewalk gaps on both sides of the street	Long-term Phase 4
W6	Holcomb Boulevard (West of OR 213) Sidewalk Infill	Abernethy Road to OR 213 overcrossing	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W7	Redland Road (West of OR 213) Sidewalk Infill	Abernethy Road to Anchor Way	Complete sidewalk gaps on west/south side of the street. A shared-use path will be added on west side per project S6	Long-term Phase 2
W8	Forsythe Road Sidewalk Infill	Clackamas River Drive to Harley Avenue	Complete sidewalk gaps on south side of the street. A shared-use path will be added on north side per project S7	Long-term Phase 3
W9	Clackamas River Drive Sidewalk Infill	OR 213 to Forsythe Road	Complete sidewalk gaps on east side of the street. A shared-use path will be added on west side per project S8	Long-term Phase 2
W10		Forsythe Road to UGB	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W14	Apperson Boulevard Sidewalk Infill	La Rae Street to Gain Street	Complete sidewalk gaps on the west side of the street	Long-term Phase 3
W15	Swan Avenue Sidewalk Infill	Forsythe Road to Ann Drive	Complete sidewalk gaps on both sides of the street	Long-term Phase 2
W16	Livesay Road Sidewalk Infill	Redland Road to Frank Avenue	Complete sidewalk gaps on both sides of the street	Included with project D86/D87
W17	Redland Road (East of OR 213) Sidewalk Infill	Anchor Way to Livesay Road	Complete sidewalk gaps on north side of the street. A shared-use path will be added on south side per project S6	Included with project D91
W18		Livesay Road to UGB	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W19	Donovan Road Sidewalk Infill	Holly Lane to western terminus	Complete sidewalk gaps on north side of the street. A shared-use path will be added on south side per project S12	Long-term Phase 4

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
W20	Morton Road Sidewalk Infill	Holly Lane to Swan Extension	Complete sidewalk gaps on both sides of the street	Long-term Phase 4
W21	Holly Lane Sidewalk Infill	Redland Road to Donovan Road	Complete sidewalk gaps on both sides of the street	Included with project D83
W22		Donovan Road to Maple Lane Road	Complete sidewalk gaps on west side of the street. A shared-use path will be added on east side per project S13	Included with project D83
W23	Maple Lane Road Sidewalk Infill	Beavercreek Road to UGB	Complete sidewalk gaps on both sides of the street	Included with project D84
W24	Thayer Road Sidewalk Infill	Maple Lane Road to UGB	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W25	Loder Road Sidewalk Infill	Beavercreek Road to the Holly Lane Extension	Complete sidewalk gaps on north side of the street. A shared-use path will be added on south side per project S18.	Included with project D85
W26		Holly Lane Extension to the UGB	Complete sidewalk gaps on both sides of the street	Included with project D85
W27	High School Avenue Sidewalk Infill	Meyers Road to Glen Oak Road	Complete sidewalk gaps on the west side of the street	Long-term Phase 3
W28	Glen Oak Road Sidewalk Infill	OR 213 to High School Avenue	Complete sidewalk gaps on both sides of the street	Long-term Phase 2
W29		Coquille Drive to Augusta Drive	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W30	Chanticleer Drive Sidewalk Infill	North terminus to south terminus	Complete sidewalk gaps on both sides of the street	Long-term Phase 4
W31	OR 213 Sidewalk Infill	Molalla Avenue to Conway Drive	Complete sidewalk gaps on both sides of the street	Included with project D77
W32	Bertha Drive Sidewalk Infill	Clairmont Way to Gaffney Lane	Complete sidewalk gaps on the east side of the street	Long-term Phase 3
W33	Gaffney Lane Sidewalk Infill	Cokeron Drive to Glenview Court	Complete sidewalk gaps on both sides of the street	Long-term

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
				Phase 2
W36	Leland Road Sidewalk Infill	Meyers Road to McCord Road	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W37		McCord Road to UGB	Complete sidewalk gaps on both sides of the street	Long-term Phase 4
W38	Meyers Road Sidewalk Infill	Leland Road to Frontier Parkway	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W39	Jessie Avenue Sidewalk Infill	Leland Road to Frontier Parkway	Complete sidewalk gaps on both sides of the street	Long-term Phase 4
W40	Clairmont Way Sidewalk Infill	Leland Road to Bertha Drive	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W43	McCord Road Sidewalk Infill	Sunset Springs Drive to Leland Road	Complete sidewalk gaps on both sides of the street	Long-term Phase 4
W44	Pease Road Sidewalk Infill	Leland Road to Tidewater Street	Complete sidewalk gaps on both sides of the street	Long-term Phase 4
W45	Central Point Road Sidewalk Infill	McCord Road to Trade Wind Street	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W46		Parrish Road to Hazeldell Avenue	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W49	Parrish Road Sidewalk Infill	South End Road to eastern terminus	Complete sidewalk gaps on both sides of the street	Long-term Phase 4
W50		Kolar Drive to Central Point Road	Complete sidewalk gaps on the south side of the street	Long-term Phase 4
W51	Buetel Road Sidewalk Infill	South End Road to western terminus	Complete sidewalk gaps on both sides of the street	Included with project D93
W52	Partlow Road Sidewalk Infill	South End Road to Central Point Road	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W53	Rose Road Sidewalk Infill	South End Road to Deer Lane	Complete sidewalk gaps on both sides of the street	Long-term Phase 4
W55	Lawton Road Sidewalk Infill	South End Road to Netzel Street	Complete sidewalk gaps on both sides of the street	Long-term Phase 4
W57	Canemah Road Sidewalk Infill	Warner Parrott Road to Telford	Complete sidewalk gaps on both sides of the street	Long-term

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
		Road		Phase 3
W58	Hood Street Sidewalk Infill	Linn Avenue to eastern terminus	Complete sidewalk gaps on both sides of the street	Long-term Phase 4
W59	Telford Road Sidewalk Infill	Ogden Drive to Holmes Lane	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W60	AV Davis-Ethel Street Sidewalk Infill	Holmes Lane to Leonard Street	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W61	Holmes Lane (west of Bell Court) Sidewalk Infill	Telford Road to Bell Court	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W63	Charman Avenue Sidewalk Infill	Linn Avenue to Electric Avenue	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W66	Warner Street Sidewalk Infill	Prospect Street to Molalla Avenue	Complete sidewalk gaps on the south side of the street	Long-term Phase 4
W67	Holmes Lane (east of Bell Court) Sidewalk Infill	Bell Court to Prospect Street	Complete sidewalk gaps on the north side of the street	Long-term Phase 3
W68	Pearl Street Sidewalk Infill	Linn Avenue to Eluria Street	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W69	Center Street Sidewalk Infill	Clinton Street to 1st Street	Complete sidewalk gaps on both sides of the street	Long-term Phase 3
W71	15th Street Sidewalk Infill	Harrison Street to Jefferson Street	Complete sidewalk gaps on both sides of the street	Long-term Phase 4
W72	Anchor Way Sidewalk Infill	18th Street to Redland Road	Complete sidewalk gaps on east side of the street. A shared-use path will be added on west side per project S49.	Long-term Phase 4
Biking Solutions (see Figure 5)				
B4	Main Street Bike Lanes	Agnes Avenue to I-205 undercrossing	Add a bike lane to the west side of the street. A shared-use path will be added on east/north side per project S1	Long-term Phase 3
B7	Agnes Avenue Bike Lanes	Main Street to Washington Drive	Add bike lanes to both sides of the street	Long-term Phase 4
B8	Abernethy Road Bike Lanes	Washington Street to Redland Road	Add a bike lane to the south side of the street. A shared-use path will be added on the north side per project S2.	Long-term Phase 2

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
B9	Holcomb Boulevard (West of OR 213) Bike Lanes	Abernethy Road to OR 213 overcrossing	Add bike lanes to both sides of the street	Long-term Phase 2
B10	Forsythe Road Bike Lanes	Clackamas River Drive to Harley Avenue	Add a bike lane to the south side of the street. A shared-use path will be added on north side per project S7	Long-term Phase 4
B11	Clackamas River Drive Bike Lanes	Forsythe Road to UGB	Add bike lanes to both sides of the street	Long-term Phase 3
B13	Apperson Boulevard Shared Roadway	Forsythe Road to Holcomb Boulevard	Add wayfinding and shared lane markings	Long-term Phase 3
B14	Swan Avenue Bike Lanes	Forsythe Road to Holcomb Boulevard	Add bike lanes to both sides of the street	Long-term Phase 2
B15	Swan Avenue Shared Roadway	Holcomb Boulevard to southern terminus	Add wayfinding and shared lane markings	Long-term Phase 4
B16	Livesay Road Bike Lanes	Redland Road to Frank Avenue	Add bike lanes to both sides of the street	Long-term Phase 4
B17	Donovan Road Bike Lanes	Holly Lane to western terminus	Add a bike lane to the north side of the street. A shared-use path will be added on south side per project S12	Long-term Phase 4
B18	Morton Road Bike Lanes	Holly Lane to Swan Extension	Add bike lanes to both sides of the street	Long-term Phase 4
B19	Holly Lane Bike Lanes	Redland Road to Donovan Road	Add bike lanes to both sides of the street	Included with project D83
B20		Donovan Road to Maple Lane Road	Add a bike lane to the west side of the street. A shared-use path will be added on east side per project S13	Included with project D83
B21	Maple Lane Bike Lanes	Walnut Grove Way to UGB	Add bike lanes to both sides of the street	Included with project D84
B22	Thayer Road Bike Lanes	Elder Road to UGB	Add bike lanes to both sides of the street	Long-term Phase 3
B23	Loder Road Bike Lanes	Beavercreek Road and the Holly Lane Extension	Add a bike lane to the north side of the street. A shared-use path will be added on south side per	Included with project

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
			project S18.	D85
B24		Holly Lane Extension to the UGB	Add bike lanes to both sides of the street	Included with project D85
B25	High School Avenue Shared Roadway	Meyers Road to Glen Oak Road	Add wayfinding and shared lane markings	Long-term Phase 4
B26	Glen Oak Road Bike Lanes	Coquille Drive to Augusta Drive	Add bike lanes to both sides of the street	Long-term Phase 3
B27	Coquille Drive Shared Roadway	Glen Oak Road to Turtle Bay Drive	Add wayfinding and shared lane markings	Long-term Phase 4
B28	Chanticleer Drive Shared Roadway	North terminus to south terminus	Add wayfinding and shared lane markings	Long-term Phase 4
B30	Bertha Drive Bike Lanes	Clairmont Way to Gaffney Lane	Add bike lanes to both sides of the street	Long-term Phase 4
B31	Gaffney Lane Bike Lanes	Cokeron Drive to Glenview Court	Add bike lanes to both sides of the street	Long-term Phase 3
B34	Leland Road Bike Lanes	Kalal Court to UGB	Add bike lanes to both sides of the street	Long-term Phase 3
B36	Jessie Avenue Bike Lanes	Leland Road to Jessie Court	Add bike lanes to both sides of the street	Long-term Phase 4
B38	McCord Road Bike Lanes	Central Point Road to Leland Road	Add bike lanes to both sides of the street	Long-term Phase 2
B39	Pease Road Shared Roadway	Leland Road to Tidewater Street	Add wayfinding and shared lane markings	Long-term Phase 4
B40	Central Point Road Bike Lanes	Partlow Road to Swallowtail Place	Complete bike lane gaps on both sides of the street	Long-term Phase 2
B41		Parrish Road to Skellenger Way	Add bike lanes to both sides of the street	Long-term Phase 2
B43	Parrish Road Shared Roadway	South End Road to eastern terminus	Add wayfinding and shared lane markings	Long-term Phase 4
B44	Parrish Road Bike Lanes	Kolar Drive to Central Point Road	Add bike lanes to both sides of the street	Long-term Phase 4
B45	Buetel Road Bike Lanes	South End Road to western terminus	Add bike lanes to both sides of the street	Included

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
				with project D93
B46	Partlow Road Bike Lanes	South End Road to Central Point Road	Complete bike lane gaps on both sides of the street	Long-term Phase 2
B47	Rose Road Bike Lanes	South End Road to Deer Lane	Add bike lanes to both sides of the street	Long-term Phase 4
B48	Lawton Road Shared Roadway	South End Road to Netzel Street	Add wayfinding and shared lane markings	Long-term Phase 4
B49	Canemah Road Shared Roadway	Warner Parrott Road to Telford Road	Add wayfinding and shared lane markings	Long-term Phase 4
B50	Telford Road Shared Roadway	Charman Avenue to Holmes Lane	Add wayfinding and shared lane markings	Long-term Phase 3
B51	AV Davis-Ethel Street Shared Roadway	Holmes Lane to Leonard Street	Add wayfinding and shared lane markings	Long-term Phase 3
B52	Holmes Lane Shared Roadway	Telford Road to Linn Avenue	Add wayfinding and shared lane markings	Long-term Phase 4
B54	Brighton Avenue-Creed Street Shared Roadway	Charman Avenue to Waterboard Park Road	Add wayfinding and shared lane markings	Long-term Phase 3
B56	Pearl Street Shared Roadway	Molalla Avenue to Eluria Street	Add wayfinding and shared lane markings	Long-term Phase 3
B57	Center Street Shared Roadway	Clinton Street to 5th Street	Add wayfinding and shared lane markings	Long-term Phase 3
B58	South 2nd Street Shared Roadway	High Street to Tumwater Drive	Add wayfinding and shared lane markings	Long-term Phase 3
B59	5th Street Shared Roadway	Washington Street to Center Street	Add wayfinding and shared lane markings	Long-term Phase 3
B61	Taylor Street Shared Roadway	7th Street to 12th Street	Add wayfinding and shared lane markings	Long-term Phase 3
B62	12th Street Shared Roadway	Taylor Street to Washington Street	Add wayfinding and shared lane markings	Long-term Phase 3
B63	15th Street Shared Roadway	Division Street to John Adams Street	Add wayfinding and shared lane markings	Long-term Phase 4
B64	Anchor Way Bike Lanes	18th Street to Redland Road	Add a bike lane to the east side of the street. A	Long-term

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
			shared-use path will be added on west side per project S49.	Phase 2
Shared-Use Path Solutions (see Figure 6)				
S1	Main Street Shared-Use Path	Clackamette Park to 17th Street	Add a shared-use path on the north/east side of the street	Long-term Phase 2
S2	Abernethy Road Shared-Use Path	Main Street to Redland Road	Add a shared-use path on the north side of the street from Main Street to Redland Road. Add a railroad gate at the 17th Street rail crossing. Will require permission for an at-grade pedestrian and bicycle rail crossing.	Long-term Phase 3
S3	OR 99E Shared-Use Path	10th Street to Railroad Avenue	Add a shared-use path on the west side of the street	Included with project D74
S4	Abernethy Creek Park Shared-Use Path	John Adams Street to 15th Street	Add a shared-use path between John Adams and 15th, with a bridge over the gully	Long-term Phase 4
S5	Abernethy Road-Clackamas River Drive Shared-Use Path	Abernethy Road to Clackamas River Drive	Add a shared-use path on the east side of the Abernethy-Washington extension and on the east side of the Washington Street realignment to Clackamas River Drive	Long-term Phase 2
S6	Redland Road Shared-Use Path	Abernethy Road to Livesay Road	Add a shared-use path on the west/south side of the street	Long-term Phase 2
S7	Forsythe Road Shared-Use Path	Clackamas River Drive to UGB	Add a shared-use path on the north side of the street	Long-term Phase 4
S8	Clackamas River Drive Shared-Use Path	OR 213 to Forsythe Road	Add a shared-use path on the west side of the street	Long-term Phase 2
S9	Swan-Livesay Shared-Use Path	Bonn Street to Livesay Road	Add a shared-use path between Swan and Livesay, with a bridge over the gully	Long-term Phase 4
S10	Redland-Holcomb Shared-Use Path	Redland Road to Holcomb Boulevard	Add a shared-use path along the north side of the gully from the Redland/Livesay to Holcomb/Oak Tree intersection	Long-term Phase 3
S11	Holcomb- Forsythe Road Shared-Use Path	Holcomb Boulevard to Forsythe Road	Add a shared-use path connecting the Redland-Holcomb Shared-Use Path to the Forsythe Road Shared-Use Path	Long-term Phase 4

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
S12	Redland-Holly Shared-Use Path	Redland Road to Holly Lane	Add a shared-use path along the east side of the gully between the Redland/Livesay and Holly/Donovan intersection. Will require a bridge over the gully south of Redland Road	Long-term Phase 2
S13	Holly Lane Shared-Use Path	Donovan Road to Maple Lane Road	Add a shared-use path on the east side of the street	Long-term Phase 2
S16	Loder-Timbersky Shared-Use Path	Loder Road to Timbersky Way	Add a shared-use path on the east side of the Holly Lane extension between Loder and Timbersky.	Long-term Phase 3
S17	Clairmont Drive Shared-Use Path	Beavercreek Road to UGB	Add a shared-use path on the north side of the Clairmont Drive extension between Beavercreek Road and the UGB.	Long-term Phase 3
S19	Meyers Road Extension Shared-Use Path	Holly Lane Extension to UGB	Add a shared-use path on the north side of the Meyers Road extension between the Holly Lane extension and the UGB.	Long-term Phase 3
S20	Timbersky Extension Shared-Use Path	Pebble Beach Drive to Meadow Lane Extension	Add a shared-use path on the east side of Beavercreek Road and the north side of the Timbersky Way extension between Pebble Beach Drive and the Meadow Lane Extension Shared-use Path	Long-term Phase 3
S21	Meadow Lane Extension Shared-use Path	Old Acres Lane to UGB (north of Loder Road)	Add a shared-use path on the east side of the Meadow Lane extension from Meadow Lane to the Glen Oak Road extension. Between the Glen Oak Road extension and the UGB (north of Loder Road) the shared-use path will run along the west side of the ridge	Long-term Phase 4
S22	Meyers-Beavercreek Shared-Use Path	Morrie Drive to Beavercreek Road	Add a shared-use path under the power lines between Morrie Drive and Beavercreek Road. Will require a portion of the parking lot between Molalla and Beavercreek	Long-term Phase 2
S23	Meyers Road Shared-Use Path	Meyers-Beavercreek Shared-Use Path to OR 213	Add a shared-use path on the south side of Meyers Road between the Meyers-Beavercreek Shared-Use Path and the Clackamas Community College Shared-use Path	Long-term Phase 3
S25	Falcon-Pompei Shared-Use Path	Falcon Drive to Naples Street	Add a shared-use path between Falcon Drive and	Long-term

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
			Naples Street	Phase 3
S26	Leland Road-Wesley Lynn Park Shared-Use Path	Leland Road to Wesley Lynn Park	Add a shared-use path between Leland Road and the Wesley Lynn Park Shared-Use Path	Long-term Phase 3
S27	Hillendale Park-Leonard Street Shared-Use Path	Hillendale Park Shared-Use Path to Leonard Street	Add a shared-use path along the western boundary of the Clackamas County Red Soils Campus	Long-term Phase 2
S28	Beavercreek-Hilltop Shared-Use Path	Beavercreek Road to Fox Lane	Add a shared-use path along the ridge connecting the Meyers-Beavercreek Shared-Use Path to Hilltop Avenue	Long-term Phase 3
S29	Fremont-Hiefield Shared-Use Path	Fremont Street to Hiefield Court	Add a shared-use path between Fremont Street and the Hillendale Park-Leonard Street Shared-Use Path	Long-term Phase 4
S30	Orchard Grove-Hazelnut Shared-Use Path	Orchard Grove Drive to Hazelnut Court	Add a shared-use path between Orchard Grove Drive and Hazelnut Court	Long-term Phase 3
S31	South End-Deer Lane Shared-Use Path	Deer Lane to Filbert Drive	Add a shared-use path between the Deer Lane extension and Filbert Drive	Long-term Phase 3
S32	Deer Lane Extension Shared-Use Path	Buetel Road to Deer Lane	Add a shared use path on the west side of the Deer Lane extension	Long-term Phase 3
S33	Buetel-Kolar Shared-Use Path	Buetel Road to Kolar Drive	Add a shared-use path on the west/south side of the Deer Lane extension between Buetel Road and Kolar Drive	Long-term Phase 4
S34	OR 99E-Buetel Shared-Use Path	OR 99E to Buetel Road	Add a shared-use path between OR 99E and Buetel Road	Long-term Phase 3
S35	Canemah-Buetel Road Shared-Use Path	5th Avenue to OR 99E-Buetel Road Shared-Use Path	Add a shared-use path connecting Canemah to the OR 99E-Buetel Road shared-use path	Long-term Phase 3
S37	OR 99E (south of Railroad Avenue) Shared-Use Path	Railroad Avenue to UGB	Add a shared-use path along the north side of the street. Rehabilitate existing boardwalk between South 2nd Street and Hedges Street	Long-term Phase 2
S38	Singer Creek Park Shared-Use Path	Singer Creek Park to Electric Avenue	Add a shared-use path from Singer Creek Park to Electric Avenue	Long-term Phase 3
S39	Electric-East Shared-Use Path	Electric Avenue to East Street	Add a shared-use path from Electric Avenue to East Street	Long-term Phase 3
S40	Hood-Warner Shared-Use Path	Hood Street to Warner Street	Add a shared-use path from Hood Street to Warner Street	Long-term Phase 2

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
S41	Beavercreek-Laurel Shared-Use Path	Beavercreek Road to Laurel Lane	Add a shared-use path on the western edge of the cemetery, from Beavercreek Road to Laurel Lane	Long-term Phase 2
S42	Fox-Hillcrest Shared-Use Path	Fox Lane to Hillcrest Street	Add a shared-use path from Fox Lane to the Mountainview Cemetery	Long-term Phase 3
S43	Magnolia-Eluria Shared-Use Path	Magnolia Street to Eluria Street	Add a shared-use path between Magnolia Street and Eluria Street	Long-term Phase 3
S44	End of the Oregon Trail Shared-Use Path	Abernethy Road to east of the Abernethy-Washington Street extension	Add a shared-use path	Long-term Phase 3
S45	4th Street Shared-Use Path	West of Jackson Street to east of Monroe Street	Add a shared-use path	Long-term Phase 3
S46	John Adams Shared-Use Path	10th Street to west of 11th Street	Add a shared-use path	Long-term Phase 3
S47	Barclay Park Shared-Use Path	Jefferson Street to John Adams Street	Add a shared-use path through Barclay Park	Long-term Phase 3
S48	Atkinson Park Shared-Use Path	17th Street to 18th Street	Add a shared-use path	Long-term Phase 4
S49	Anchor Way Shared-Use Path	18th Street to Redland Road	Add a shared-use path on the west side of the street	Long-term Phase 4
S50	King Elementary School Shared-Use Path	South End Road to Woodfield Court	Add a shared-use path along the northern boundary of King Elementary School between Amanda Court and Woodfield Court	Long-term Phase 3
S51	Chanticleer-Coquille Shared-Use Path	Chanticleer Drive to Coquille Drive	Add a shared-use path between Chanticleer Drive and Coquille Drive	Long-term Phase 3
S52	Linn Avenue Shared-Use Path	Electric Avenue to Pearl Street	Add a shared-use path between Electric Avenue and Pearl Street	Long-term Phase 2
Transit Solutions				
T4	Oregon City TMA Startup Program	Oregon City Regional Center	Implements a transportation management association program with employers.	Long-term Phase 2
Street Crossing Solutions (see Figure 6)				
C1	Clackamette Drive Crossing	Clackamette Park overflow lot to the Clackamette Park entrance	Install crosswalk and pedestrian activated flasher on Clackamette Drive	Long-term Phase 3
C2	Main Street Crossing	I-205 Shared Use Path to south of	Relocate the existing crosswalk on Main Street	Long-term

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
		Main Street	approximately 175 feet southeast to align with the I-205 Shared Use Path. Install a pedestrian activated flasher.	Phase 4
C3	Holcomb/Front Family Friendly Route Crossing	Holcomb Boulevard/Front Avenue intersection	Install crosswalk and pedestrian activated flasher on Holcomb Boulevard	Long-term Phase 4
C4	Holcomb/Swan Crossing	Holcomb Boulevard/Swan Avenue intersection	Install crosswalk and pedestrian activated flasher on Holcomb Boulevard	Long-term Phase 4
C5	Holcomb Boulevard Shared-Use Path Crossing	Holcomb Boulevard/Oak Tree Terrace intersection	Install crosswalk and pedestrian activated flasher on Holcomb Boulevard	Long-term Phase 4
C6	Holcomb/Winston Crossing	Holcomb Boulevard/ Winston Drive intersection	Install crosswalk and pedestrian activated flasher on Holcomb Boulevard	Long-term Phase 4
C7	Redland Road Shared-Use Path Crossing	Redland Road/Livesay Road intersection	Install crosswalk and pedestrian activated flasher on Redland Road	Long-term Phase 2
C8	Holly Lane Shared-Use Path Crossing	Holly Lane/Donovan Road intersection	Install crosswalk and pedestrian activated flasher on Holly Lane	Long-term Phase 4
C9	Maple Lane Road Shared-Use Path Crossing	Maple Lane Road/Holly Lane intersection	Install crosswalk and pedestrian activated flasher on Maple Lane Road	Long-term Phase 2
C10	Thayer Road Shared-Use Path Crossing	Thayer Road/Holly-Thayer Shared-Use Path intersection	Install crosswalk and curb extensions on Thayer Road	Long-term Phase 4
C12	Beavercreek Road/Pebble Beach Drive Shared-Use Path Crossing	Beavercreek Road/ Pebble Beach Drive intersection	Install crosswalk and pedestrian activated flasher on Beavercreek Road	Long-term Phase 4
C13	Meyers Road Extension/Loder Road Extension Shared-Use Path Crossing	Meyers Road Extension/Loder Road Extension intersection	Install crosswalk and pedestrian activated flasher on Meyers Road	Long-term Phase 3
C14	Glen Oak Road Shared-Use Path Crossing	Glen Oak Road/Loder Road Extension intersection	Install crosswalk and curb extensions on Glen Oak Road	Long-term Phase 4
C15	Meyers Road Shared-Use Path Crossing	Meyers Road/Moccasin Way intersection	Install crosswalk and pedestrian activated flasher on Meyers Road	Long-term Phase 3
C16	Clairmont Way Family Friendly Route Crossing	Clairmont Way/Eastborne Drive intersection	Install pedestrian activated flasher at the existing crosswalk on Clairmont Way near Eastborne Drive	Long-term Phase 3
C17	Leland Road Family Friendly Route Crossing	Leland Road/Reddaway Avenue intersection	Install pedestrian activated flasher at the existing crosswalk on Leland Road at Reddaway Avenue	Long-term Phase 2
C18	Meyers Road Family Friendly Route Crossing	Leland Road/Hiefield Court intersection	Install crosswalk and pedestrian activated flasher on Leland Road	Long-term Phase 4

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
C19	Warner Milne Road Shared-Use Path Crossing	Warner Milne Road/ Hillendale Park-Leonard Street Shared-Use Path intersection	Install crosswalk and pedestrian activated flasher on Warner Milne Road	Long-term Phase 2
C20	Hampton Drive Family Friendly Route Crossing	Central Point Road/Hampton Drive intersection	Install crosswalk and pedestrian activated flasher on Central Point Road	Long-term Phase 3
C21	Hazelnut Court Family Friendly Route Crossing	Central Point Road/ Hazelnut Court intersection	Install crosswalk and curb extensions on Central Point Road	Long-term Phase 3
C22	Deer Lane Extension Shared-Use Path Crossing	South End Road/Deer Lane Extension intersection	Install crosswalk and pedestrian activated flasher on South End Road	Long-term Phase 4
C23	Buetel Road/Deer Lane Extension Shared-Use Path Crossing	Buetel Road/Deer Lane Extension intersection	Install crosswalk and curb extensions on Buetel Road	Long-term Phase 3
C24	Filbert Drive Family Friendly Route Crossing	South End Road/Filbert Drive intersection	Install crosswalk and pedestrian activated flasher on South End Road	Long-term Phase 3
C25	Warner Parrot/Boynton Family Friendly Route Crossing	Warner Parrot Road/Boynton Street intersection	Install crosswalk and pedestrian activated flasher on Warner Parrot Road	Long-term Phase 2
C26	South End/Amanda Family Friendly Route Crossing	South End Road/Amanda Court intersection	Install pedestrian activated flasher at the existing crosswalk on South End Road at Amanda Court	Long-term Phase 2
C27	OR 99E-Buetel Shared-Use Path Crossing	OR 99E-Buetel Road Shared-Use Path intersection	Install crosswalk and pedestrian activated flasher on OR 99E	Long-term Phase 4
C28	AV Davis Road Crossing	Linn Avenue/AV Davis Road intersection	Install a pedestrian activated flasher at the existing crosswalk on Linn Avenue at AV Davis Road	Long-term Phase 2
C29	Holmes/Leonard Family Friendly Route Crossing	Holmes Lane/Leonard Street intersection	Install crosswalk and pedestrian activated flasher on Holmes Lane	Long-term Phase 2
C30	Barclay Hills Drive Crossing	Molalla Avenue/Barclay Hills Drive intersection	Install a pedestrian activated flasher at the existing crosswalk on Molalla Avenue at Barclay Hills Drive	Long-term Phase 4
C31	Park Drive Crossing	Linn Avenue/Park Drive intersection	Install a pedestrian activated flasher at the existing crosswalk on Linn Avenue at Park Drive	Long-term Phase 2
C32	Electric Avenue Family Friendly Route Crossing	Linn Avenue/Electric Avenue	Install crosswalk and pedestrian activated flasher on Linn Avenue	Long-term Phase 2
C33	JQ Adams/5th Family Friendly Route Crossing	5th Street/JQ Adams Street intersection	Install crosswalk and pedestrian activated flasher on 5th Street	Long-term Phase 4
C34	Jackson/7th Family Friendly Route Crossing	7th Street/Jackson Street intersection	Install crosswalk and pedestrian activated flasher on 7th Street	Long-term Phase 2

Table 2: Not Likely to be Funded Transportation System

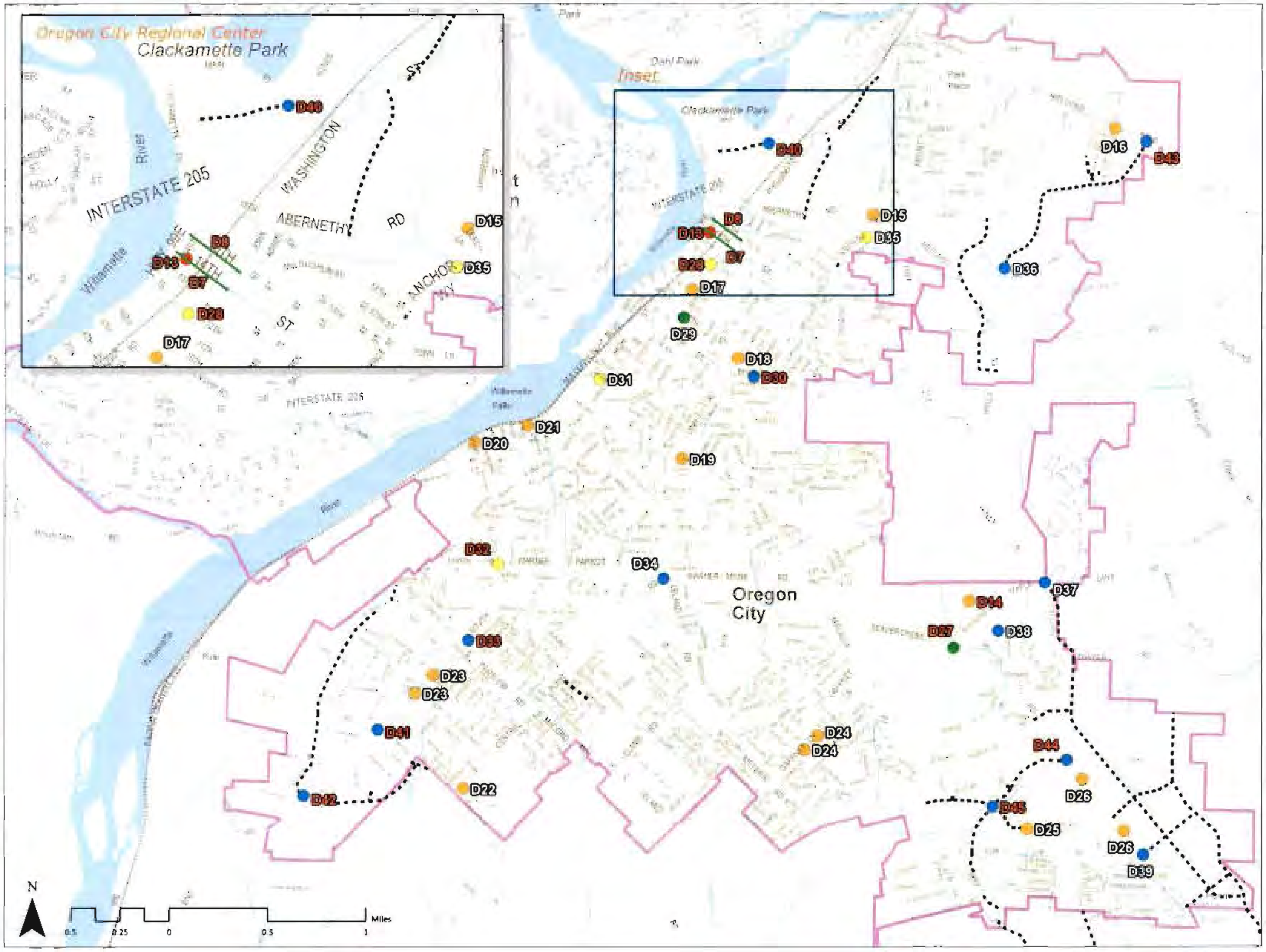
Project #	Project Description	Project Extent	Project Elements	Priority
C36	Jerome Street Crossing	OR 99E/Jerome Street	Install crosswalk and pedestrian activated flasher on OR 99E in Canemah	Long-term Phase 2
Family-Friendly Routes (see Figure 4 or 5)				
FF1	John Adams Family Friendly Route	Abernethy Road to Abernethy Creek Park	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings	Long-term Phase 4
FF2	Front Avenue Family Friendly Route	Forsythe Road to Holcomb Boulevard	Add sidewalks on the east side of the street. Add wayfinding, traffic calming and shared lane markings	Long-term Phase 3
FF3	Cleveland Street Family Friendly Route	Apperson Boulevard to Swan Avenue	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings	Long-term Phase 3
FF4	Jacobs-Beemer Family Friendly Route	Holcomb Boulevard to Redland-Holcomb Shared-Use Path	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings	Long-term Phase 4
FF5	Glen Oak-Chanticleer Drive Family Friendly Route	Glen Oak Road to Chantieleer Drive	Add wayfinding and shared lane markings. Includes street extensions between Glen Oak Road and Chanticleer Place, and Chanticleer Place and Chanticleer Drive.	Long-term Phase 4
FF6	Coquille-Beavercreek Road Family Friendly Route	Coquille Drive to Beavercreek Road	Add wayfinding and shared lane markings. Route via Turtle Bay Drive, Torrey Pines Drive and Pebble Beach Drive.	Long-term Phase 4
FF7	Falcon Drive Family Friendly Route	Gaffney Lane to Falcon-Pompei Shared-Use Path	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings	Long-term Phase 3
FF8	Pompei Drive-Naples Street Family Friendly Route	OR 213 to Falcon-Pompei Shared-Use Path	Add wayfinding and shared lane markings. Route via Sebastian Way, Pompei Drive, Sandra Loop and Naples Street	Long-term Phase 3
FF9	Hillendale Park to Gaffney Lane Elementary Family Friendly Route	Hillendale Park to Gaffney Lane Elementary Shared-Use Path	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings. Route via Eastborne Way, Clairmont Way, Wassail Lane, and Roseberry Avenue	Long-term Phase 3
FF10	Frontier Parkway Family Friendly Route	Wesley Lynn Park to Meyers-Beavercreek Shared-Use Path	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings. Route via Frontier Parkway and Morrie Drive	Long-term Phase 3
FF11	Hiefield Court Family Friendly Route	Leland Road to Hillendale Park-Leonard Street Shared-Use Path	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings	Long-term Phase 2

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
FF12	Hilltop Avenue Family Friendly Route	Fox Lane to Beavercreek-Hilltop Shared-Use Path	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings. Route via Hilltop Avenue and Fox Lane	Long-term Phase 4
FF14	McCord-Leland Family Friendly Route	Orchard Grove Drive to Fremont Street	Add sidewalks on both sides of the street. Add wayfinding, traffic calming and shared lane markings. Route via Pease Road, Tidewater Street and Fremont Street	Long-term Phase 2
FF15	Orchard Grove Family Friendly Route	Orchard Grove-Hazelnut Shared-Use Path to McCord Road	Add wayfinding and shared lane markings. Route includes Orchard Grove Drive	Long-term Phase 2
FF16	Central Point-South End Family Friendly Route	Central Point Road to South End Road	Add wayfinding and shared lane markings. Route includes Filbert Drive, Hazel Grove Drive, Hazelnut Avenue, Geranium Place and Kolar Drive	Long-term Phase 3
FF17	Deer Lane Family Friendly Route	Rose Road to South End-Deer Lane Shared-Use Path	Add sidewalks on both sides of the street. Add wayfinding, traffic calming and shared lane markings. Route via Deer Lane.	Long-term Phase 2
FF18	Rose-Amanda Family Friendly Route	Rose Road to Amanda Court	Add sidewalks on both sides of the street. Add wayfinding, traffic calming and shared lane markings. Route via Madrona Drive, Lafayette Avenue, Lawton Road, Netzel Street and Amanda Court. Route includes Madrona Drive extension to Rose Road	Long-term Phase 2
FF21	Canemah Family Friendly Route	Old Canemah Park to Cemetery Road	This site is located within the Canemah National Register District. Add wayfinding and shared lane markings. Add a walking path on one side of the street, if approved by the Historic Review Board. Route via 5th Avenue, Blanchard Street, 4th Avenue, Ganong Street and 3rd Avenue	Long-term Phase 4
FF22	Tumwater-South 2nd Family Friendly Route	Waterboard Park to Tumwater-4th Shared-Use Path to McLoughlin Promenade	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings. Route via Tumwater Drive, South 2nd Street and Waterboard Park Road	Long-term Phase 4
FF24	Leonard-Bell Family Friendly Route	Williams Street to northern terminus of Bell Court	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings. Route via Leonard Street and Bell Court	Long-term Phase 3

Table 2: Not Likely to be Funded Transportation System

Project #	Project Description	Project Extent	Project Elements	Priority
FF25	Hillcrest-Magnolia Family Friendly Route	Fox-Hillcrest Shared-Use Path to Magnolia-Eluria Shared-Use Path	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings. Route via Mountainview Cemetery, Hilda Street, Duane Street, Barclay Hills Drive and Magnolia Street.	Long-term Phase 4
FF26	Warner-Holmes Family Friendly Route	Kamm Street to Holmes Lane	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings. Route via Warner Street and Prospect Street	Long-term Phase 4
FF27	Electric-5th Family Friendly Route	Electric-East Shared-Use Path to 4th/5th Street	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings. Route via East Street, 4th Street and Jackson Street	Long-term Phase 2
FF28	Eluria Street Family Friendly Route	Division Street to Pearl Street	Add sidewalks on both sides of the street. Add wayfinding and shared lane markings	Long-term Phase 4
FF29	Jackson Street Family Friendly Route	5th Street to 17th Street	Complete sidewalk gaps. Add wayfinding, traffic calming and shared lane markings. Route via JQ Adams Street, 6th Street and Jackson Street	Long-term Phase 4
FF30	9th-Lincoln Street Family Friendly Route	Division Street to John Adams Street	Complete sidewalk gaps. Add wayfinding, traffic calming and shared lane markings	Long-term Phase 4
FF31	4th Street Family Friendly Route	Jackson Street to McLoughlin Promenade	Add wayfinding and shared lane markings	Long-term Phase 2
FF32	John Adams-Jefferson Street Family Friendly Route	Waterboard Park Road to 15th Street	Complete sidewalk gaps. Add wayfinding and shared lane markings	Long-term Phase 2
FF33	18th Street Family Friendly Route	Anchor Way Shared-Use Path to McLoughlin Avenue	Complete sidewalk gaps. Add wayfinding and shared lane markings	Long-term Phase 4



OREGON CITY TRANSPORTATION PLAN

FIGURE 1

Planned Intersection and Street Management Solutions

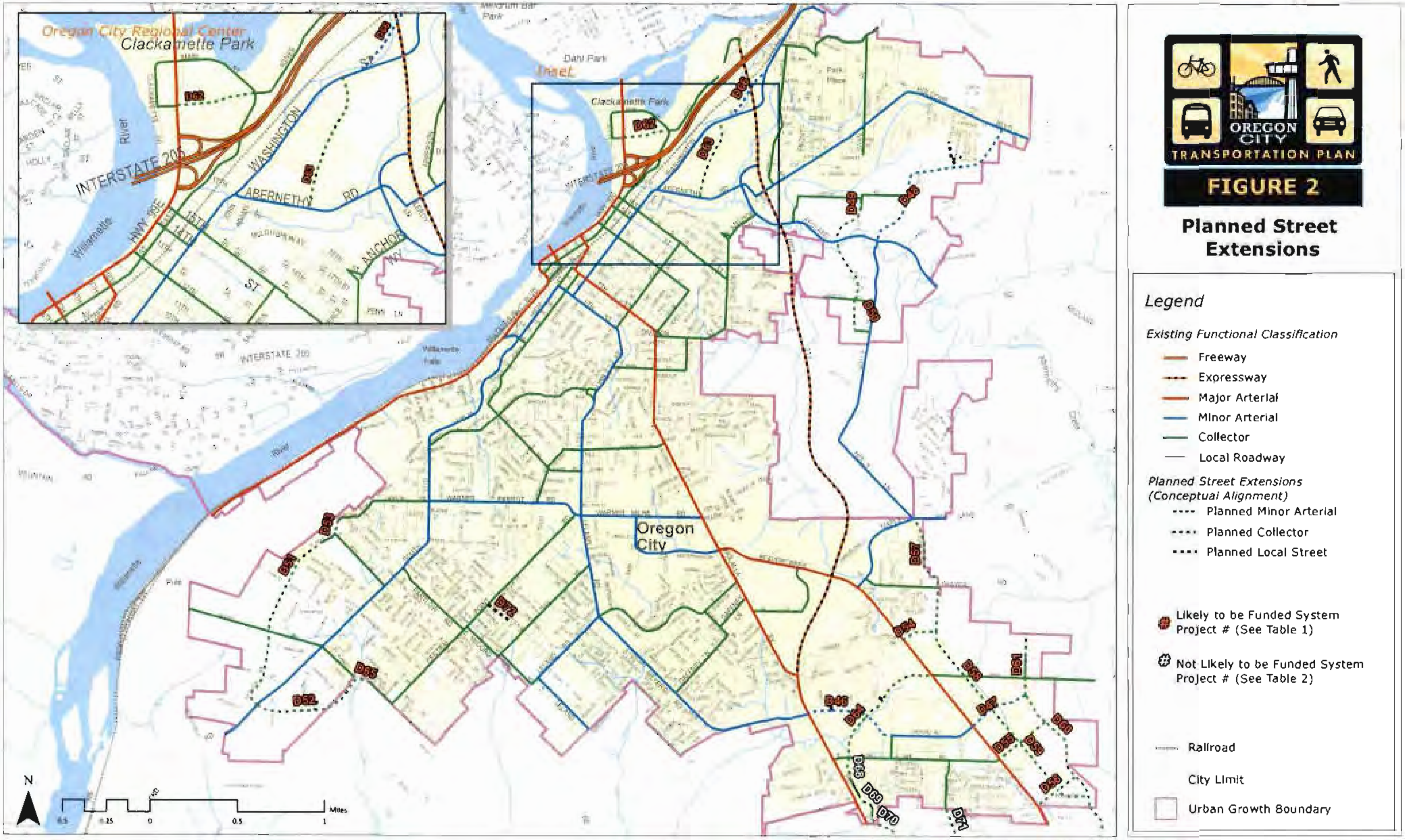
Legend

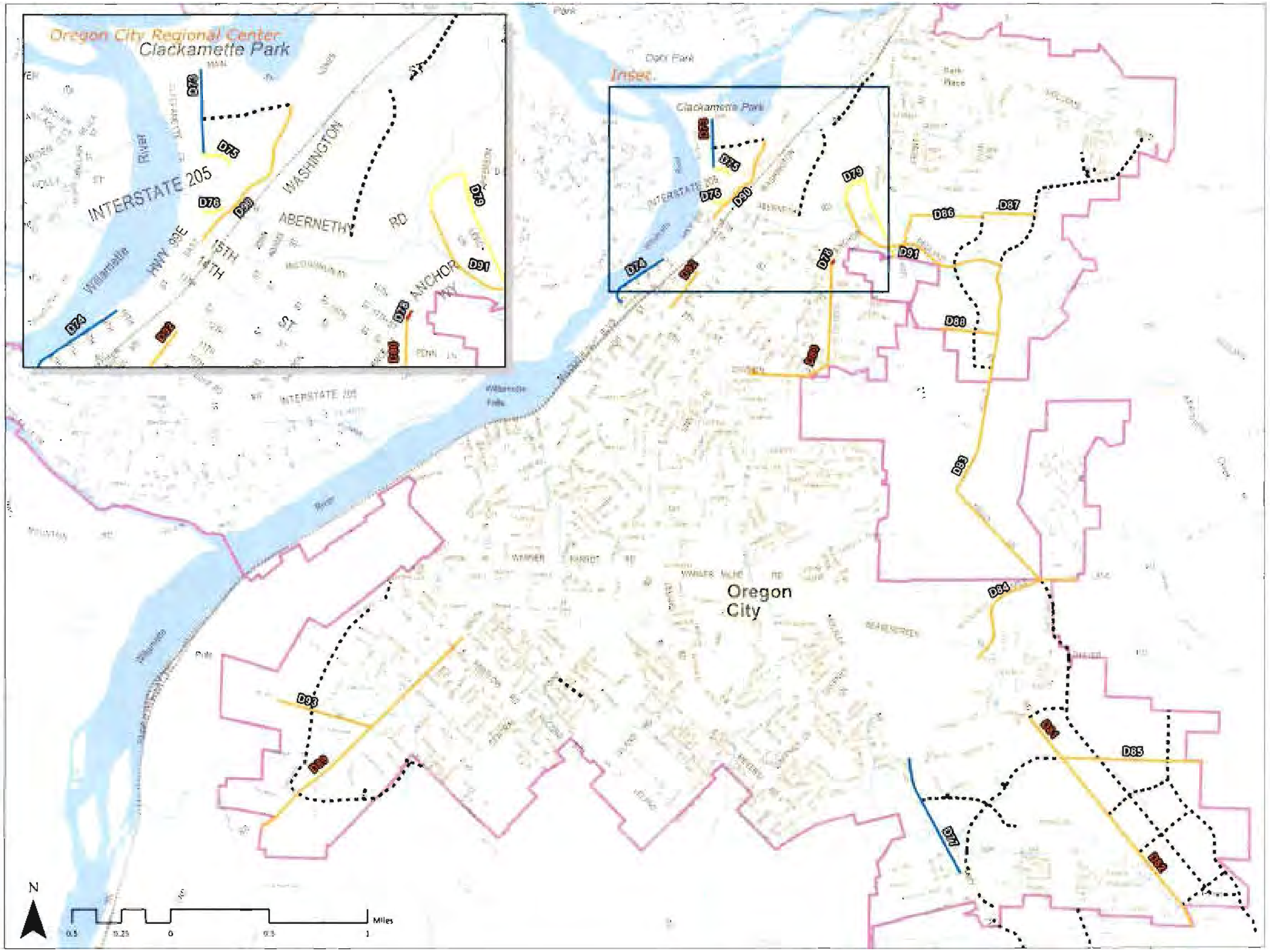
Planned Intersection Management Solutions

- Planned Traffic Signal
- Planned All-way Stop Control
- Planned Roundabout
- Planned Turn Lane
- Planned Transportation System Management and Operations (TSMO)

Planned Street Management Solutions

- Planned Street Restriping
- Likely to be Funded System Project # (See Table 1)
- Not Likely to be Funded System Project # (See Table 2)
- Planned Street Extension (Conceptual Alignment)
- Railroad
- City Limit
- Urban Growth Boundary


OREGON CITY
TRANSPORTATION PLAN
FIGURE 2
Planned Street Extensions
Legend
Existing Functional Classification
Freeway
Expressway
Major Arterial
Minor Arterial
Collector
Local Roadway
Planned Street Extensions (Conceptual Alignment)
Planned Minor Arterial
Planned Collector
Planned Local Street
Likely to be Funded System Project # (See Table 1)
Not Likely to be Funded System Project # (See Table 2)
Railroad
City Limit
Urban Growth Boundary
Oregon City Regional Center
Clackamette Park
INTERSTATE 205
WASHINGTON
ABERNETHY RD
Inset
Oregon City
Miles



OREGON CITY TRANSPORTATION PLAN

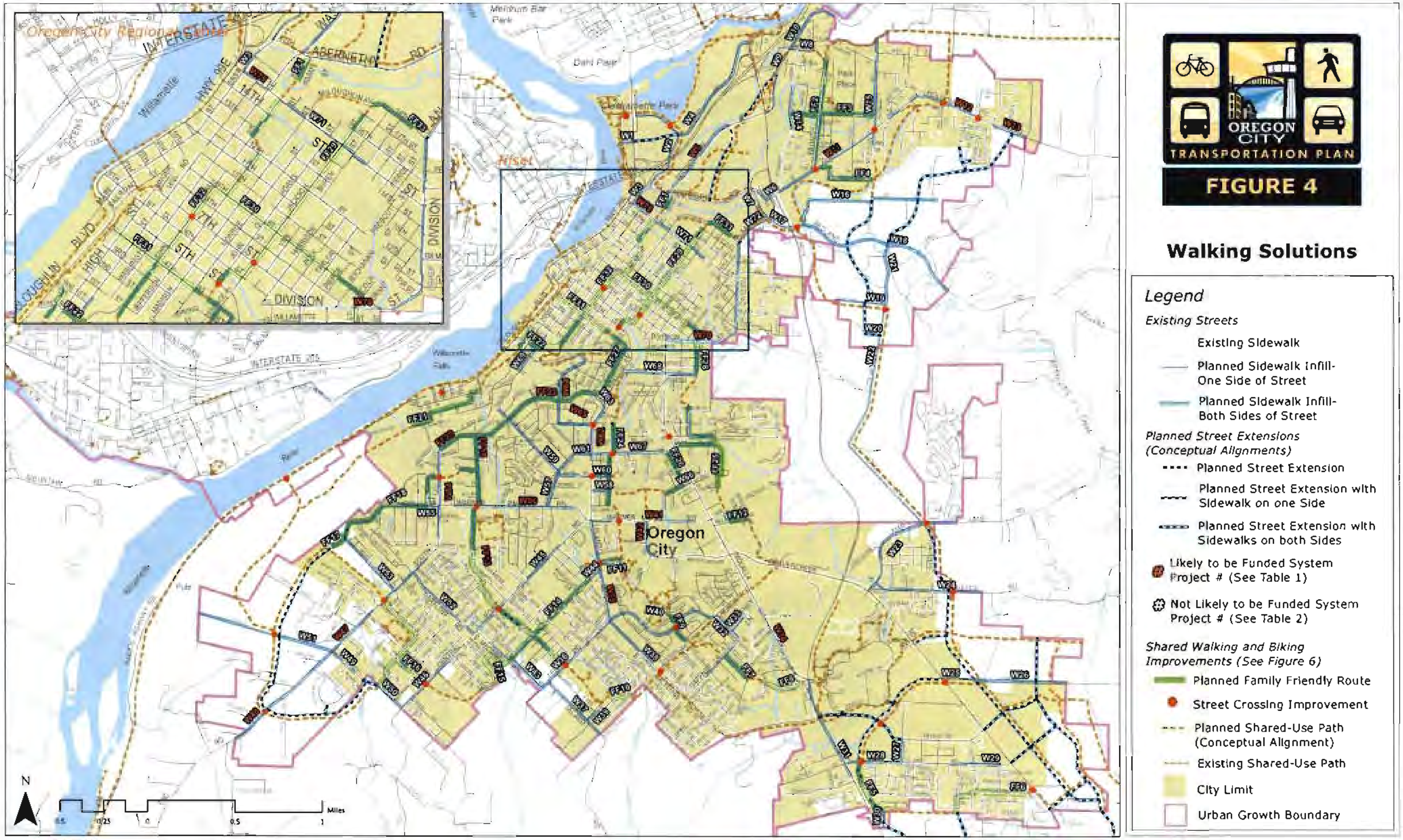
FIGURE 3

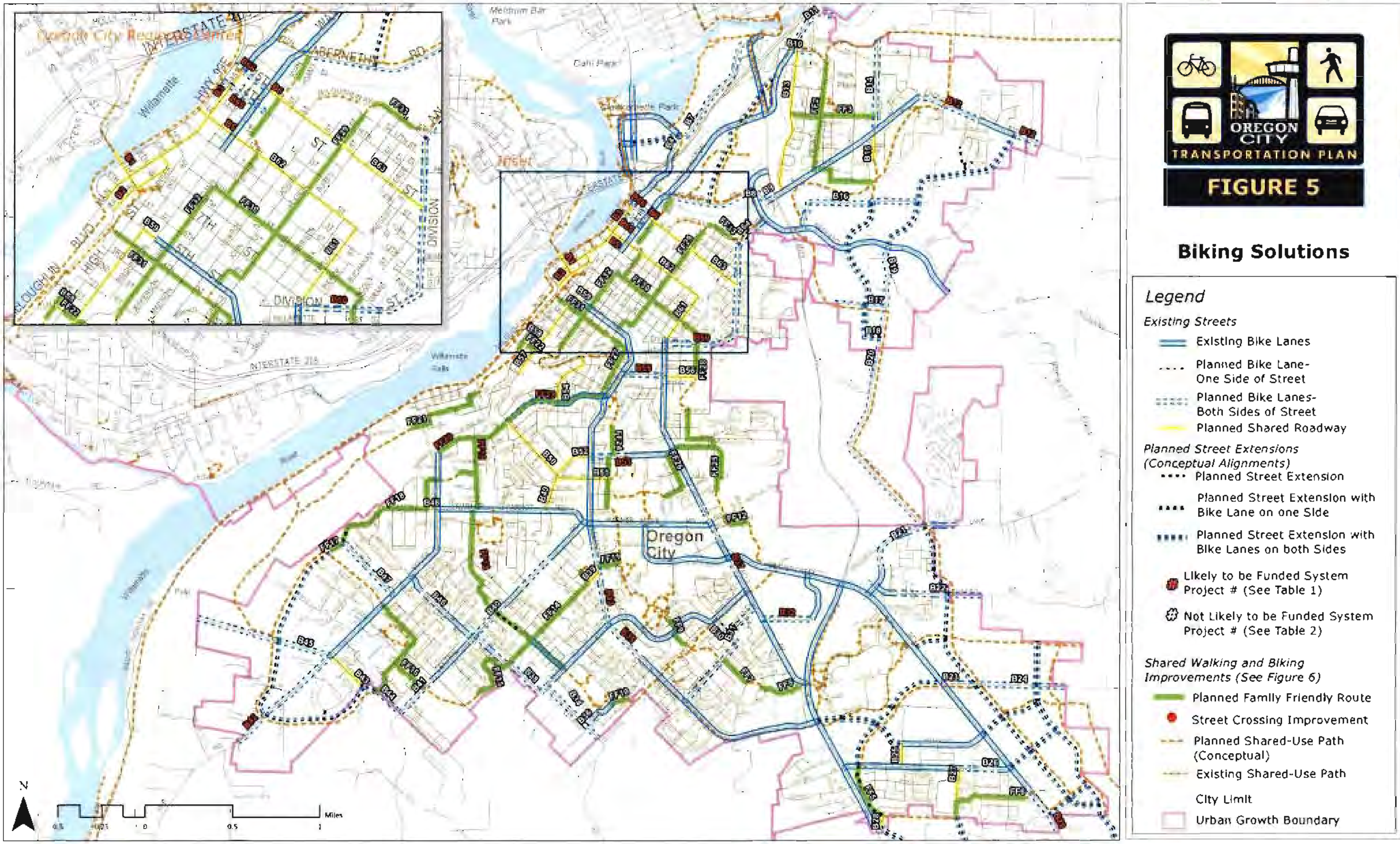
Planned Street and Intersection Expansions

Legend

Planned Street and Intersection Expansion Solutions

- Planned Intersection Widening
- Planned Street Widening
- Planned Street Realignment
- Planned Street Upgrade
- Likely to be Funded System Project # (See Table 1)
- Not Likely to be Funded System Project # (See Table 2)
- Planned Street Extension (Conceptual Alignment)
- Railroad
- City Limit
- Urban Growth Boundary


OREGON CITY
TRANSPORTATION PLAN
FIGURE 4
Walking Solutions
Legend
Existing Streets
Existing Sidewalk
Planned Sidewalk Infill-One Side of Street
Planned Sidewalk Infill-Both Sides of Street
Planned Street Extensions (Conceptual Alignments)
Planned Street Extension
Planned Street Extension with Sidewalk on one Side
Planned Street Extension with Sidewalks on both Sides
Likely to be Funded System Project # (See Table 1)
Not Likely to be Funded System Project # (See Table 2)
Shared Walking and Biking Improvements (See Figure 6)
Planned Family Friendly Route
Street Crossing Improvement
Planned Shared-Use Path (Conceptual Alignment)
Existing Shared-Use Path
City Limit
Urban Growth Boundary
Oregon City
Oregon City Regional Center
Miles


OREGON CITY
TRANSPORTATION PLAN
FIGURE 5
Biking Solutions
Legend
Existing Streets
Existing Bike Lanes
Planned Bike Lane-
One Side of Street
Planned Bike Lanes-
Both Sides of Street
Planned Shared Roadway
Planned Street Extensions
(Conceptual Alignments)
Planned Street Extension
Planned Street Extension with
Bike Lane on one Side
Planned Street Extension with
Bike Lanes on both Sides
Likely to be Funded System
Project # (See Table 1)
Not Likely to be Funded System
Project # (See Table 2)
Shared Walking and Biking
Improvements (See Figure 6)
Planned Family Friendly Route
Street Crossing Improvement
Planned Shared-Use Path
(Conceptual)
Existing Shared-Use Path
City Limit
Urban Growth Boundary
Oregon City Regional Center
Oregon
City
DIVISION
Miles

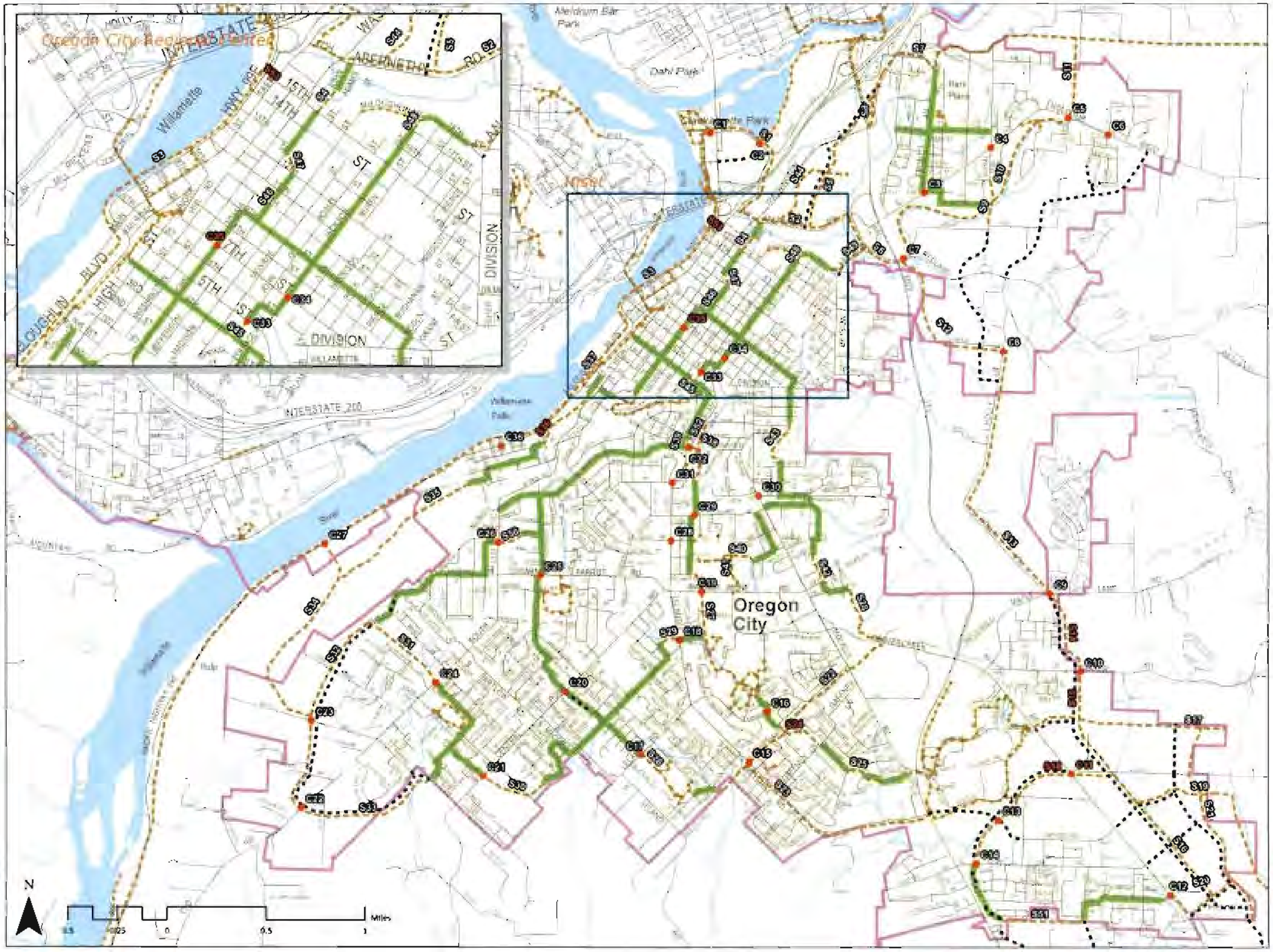


FIGURE 6

Shared Walking and Biking Solutions

Legend

Shared Walking and Biking Improvements

- Planned Family Friendly Route
- Street Crossing Improvement

Shared-Use Paths

- Existing Shared-Use Path
- Planned Shared-Use Path (Conceptual)

- Likely to be Funded System Project # (See Table 1)
- Not Likely to be Funded System Project # (See Table 2)

- Planned Street Extension (Conceptual Alignment)
- City Limit
- Urban Growth Boundary

Appendix

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
Further Study					
D0	OR 213/Beavercreek Road Refinement Plan	OR 213 from Redland Road to Molalla Avenue	N/A	Likely to be Funded	$100,000
D00	I-205 Refinement Plan	I-205 at the OR 99E and OR 213 Ramp Terminals	N/A	Likely to be Funded	$100,000
Driving Solutions					
D1	Molalla Avenue/ Beavercreek Road Adaptive Signal Timing	Molalla Avenue from Washington Street to Gaffney Lane; Beavercreek Road from Molalla Avenue to Maple Lane Road	63	Likely to be Funded (Evaluation Score)	$1,430,000
D2	Beavercreek Road Traffic Surveillance	Molalla Avenue to Maple Lane Road	52	Long-term Phase 2	$560,000
D3	Washington Street Traffic Surveillance	7th Street to OR 213	50	Long-term Phase 3	$430,000
D4	7th Street/Molalla Avenue Traffic Surveillance	Washington Street to OR 213	50	Long-term Phase 3	$775,000
D5	OR 213/ 7th Street-Molalla Avenue/ Washington Street Integrated Corridor Management	I-205 to Henrici Road	48	Long-term Phase 3	$1,690,000
D6	OR 99E Integrated Corridor Management	OR 224 (in Milwaukie) to 10th Street	49	Long-term Phase 3	$690,000
D7	Option 1: 14th Street Restriping	OR 99E to John Adams Street	65	Likely to be Funded (Evaluation Score)	$670,000
	Option 2: Main Street/14th Street Intersection Widening	Main Street/14th Street	56	Likely to be Funded (Evaluation Score)	$75,000
D8	15th Street Restriping	OR 99E to John Adams Street	65	Included with another project	$0
D9	OR 213/Beavercreek Road Weather Information Station	OR 213/Beavercreek Road	35	Long-term Phase 4	$100,000
D10	Warner Milne Road/Linn Avenue Road Weather Information Station	Warner Milne Road/Linn Avenue	35	Long-term Phase 4	$100,000
D11	Optimize existing traffic signals	Citywide	71	Likely to be Funded (Evaluation Score)	$30,000

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
D12	Protected/permitted signal phasing	Citywide	66	Likely to be Funded (Evaluation Score)	$40,000
D13	Main Street/14th Street Safety Enhancement	Main Street/14th Street	58	Included with another project	$0
D14	Southbound OR 213 Advanced Warning System	Southbound OR 213, north of the Beavercreek Road intersection	59	Likely to be Funded (Evaluation Score)	$100,000
D15	Holcomb Boulevard Curve Warning System	Holcomb Boulevard just to the west of the OR 213 overcrossing	49	Long-term Phase 3	$25,000
D16	Holcomb Boulevard Speed Warning System	Holcomb Boulevard east of Jada Way	34	Long-term Phase 4	$25,000
D17	Washington Street Speed Warning System	Washington Street near 9th Street	36	Long-term Phase 4	$25,000
D18	7th Street Speed Warning System	7th Street near Harrison Street	36	Long-term Phase 4	$25,000
D19	Linn Avenue Speed Warning System	Linn Avenue near Glenwood Court	32	Long-term Phase 4	$25,000
D20	OR 99E Northbound Speed Warning System	OR 99E near Paquet Street	36	Long-term Phase 4	$25,000
D21	OR 99E Southbound Speed Warning System	OR 99E near Hedges Street	36	Long-term Phase 4	$25,000
D22	Central Point Road Speed Warning System	Central Point Road near White Lane	32	Long-term Phase 4	$25,000
D23	South End Road School Zone Flashers	South End Road near Salmonberry Drive and Filbert Drive	20	Long-term Phase 4	$9,000
D24	Gaffney Lane School Zone Flashers	Gaffney Lane near Glenview Court and Falcon Drive	20	Long-term Phase 4	$9,000
D25	Meyers Road School Zone Flashers	Meyers Road near High School Lane	20	Long-term Phase 4	$4,500
D26	Beavercreek Road School Zone Flashers	Beavercreek Road south of Loder Road and north of Glen Oak Road	22	Long-term Phase 4	$9,000
D27	OR 213/Beavercreek Road Operational Enhancement	OR 213/Beavercreek Road	59	Likely to be Funded (Evaluation Score)	$45,000
D28	Washington Street/12th Street Safety Enhancement	Washington Street/12th Street	60	Likely to be Funded (Evaluation Score)	$315,000

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
D29	John Adams Street/7th Street Safety Enhancement	John Adams Street/7th Street	55	Long-term Phase 2	$20,000
D30	Molalla Avenue/Division Street-Taylor Street Safety Enhancement	Molalla Avenue/Division Street-Taylor Street	N/A	Likely to be Funded (Baseline)	$545,000
D31	High Street/2nd Street Operational Enhancement	High Street/2nd Street	42	Long-term Phase 4	$315,000
D32	South End Road/Warner Parrott Road Operational Enhancement	South End Road/Warner Parrott Road	58	Likely to be Funded (Evaluation Score)	$345,000
D33	South End Road/Lafayette Avenue-Partlow Road Operational Enhancement	South End Road/Lafayette Avenue-Partlow Road	58	Likely to be Funded (Evaluation Score)	$475,000
D34	Central Point Road/Warner Parrott Road Operational Enhancement	Central Point Road/Warner Parrott Road	43	Long-term Phase 4	$510,000
D35	Redland Road/Anchor Way Operational Enhancement	Redland Road/Anchor Way	43	Long-term Phase 4	$310,000
D36	Redland Road/Holly Lane Operational Enhancement	Redland Road/Holly Lane	43	Long-term Phase 4	$515,000
D37	Maple Lane Road/Holly Lane Operational Enhancement	Maple Lane Road/Holly Lane	43	Long-term Phase 4	$515,000
D38	Maple Lane Road/Walnut Grove Way Operational Enhancement	Maple Lane Road/Walnut Grove Way	46	Long-term Phase 3	$460,000
D39	Beavercreek Road/Glen Oak Road Operational Enhancement	Beavercreek Road/Glen Oak Road	54	Long-term Phase 2	$505,000
D40	Main Street/Dunes Drive Extension Operational Enhancement	Main Street/Dunes Drive Extension	45	Likely to be Funded (Evaluation Score)	$460,000
D41	South End Road/Buetel Road Extension Operational Enhancement	South End Road/Buetel Road Extension	56	Likely to be Funded (Evaluation Score)	$500,000
D42	South End Road/Deer Lane Extension Operational Enhancement	South End Road/Deer Lane Extension	48	Likely to be Funded (Evaluation Score)	$505,000
D43	Holcomb Boulevard/Holly Lane North Extension Operational Enhancement	Holcomb Boulevard/Holly Lane North Extension	40	Likely to be Funded (Evaluation Score)	$505,000
D44	Beavercreek Road/Loder Road Extension Operational Enhancement	Beavercreek Road/Loder Road Extension	46	Likely to be Funded (Evaluation Score)	$500,000

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
D45	Meyers Road Extension/ Loder Road Extension Operational Enhancement	Meyers Road Extension/ Loder Road Extension	46	Likely to be Funded (Evaluation Score)	$540,000
D46	Meyers Road West extension	OR 213 to High School Avenue	N/A	Likely to be Funded (Baseline)	$3,595,000
D47	Meyers Road East extension	Beavercreek Road to the Meadow Lane Extension	64	Likely to be Funded (100% SDC Eligible)	$2,210,000
D48	Holly Lane North extension	Redland Road to Holcomb Boulevard	N/A	Likely to be Funded (Baseline)	$11,800,000
D49	Swan Avenue extension	Livesay Road to Redland Road	N/A	Likely to be Funded (Baseline)	$2,485,000
D50		Redland Road to Morton Road	N/A	Likely to be Funded (Baseline)	$5,180,000
D51	Deer Lane extension	Rose Road to Buetel Road	52	Likely to be Funded (100% SDC Eligible)	$3,500,000
D52		Buetel Road to Parrish Road	43	Likely to be Funded (100% SDC Eligible)	$7,335,000
D53	Madrona Drive extension	Madrona Drive to Deer Lane	45	Likely to be Funded (100% SDC Eligible)	$385,000
D54	Clairmont Drive extension	Beavercreek Road to Holly Lane South Extension	54	Likely to be Funded (100% SDC Eligible)	$1,235,000
D55	Glen Oak Road extension	Beavercreek Road to the Meadow Lane Extension	52	Likely to be Funded (100% SDC Eligible)	$2,705,000
D56	Timbersky Way extension	Beavercreek Road to the Meadow Lane Extension	52	Likely to be Funded (100% SDC Eligible)	$1,620,000
D57	Holly Lane South extension	Maple Lane Road to Thayer Road	60	Likely to be Funded (100% SDC Eligible)	$3,025,000
D58		Thayer Road to Meyers Road	67	Likely to be Funded (100% SDC Eligible)	$4,390,000
D59		Meyers Road to the Meadow Lane Extension	54	Likely to be Funded (100% SDC Eligible)	$4,785,000
D60	Meadow Lane extension	Meadow Lane to Meyers Road	50	Likely to be Funded (100% SDC Eligible)	$4,930,000

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
D61		Meyers Road to UGB (north of Loder Road)	54	Likely to be Funded (100% SDC Eligible)	$2,220,000
D62	Dunes Drive Extension	OR 99E to Agnes Avenue	73	Likely to be Funded (100% SDC Eligible)	$2,445,000
D63	Washington Street to Abernethy Road Connection	Washington Street to Abernethy Road	N/A	Likely to be Funded (Baseline)	$10,395,000
D64	Loder Road Extension	Beavercreek Road to Glen Oak Road	67	Likely to be Funded (100% SDC Eligible)	$4,980,000
D65	Parrish Road Extension	From Parrish Road east to Kolar Drive	45	Likely to be Funded (100% SDC Eligible)	$1,870,000
D66	Washington Street Realignment	Home Depot Driveway to Clackamas River Drive	N/A	Under Construction	N/A
D67	OR 99E to Beutel Road Extension Study	OR 99E to Beutel Road	21	Long-term Phase 4	$50,000
D68	Chanticleer Place Extension	Glen Oak Road to north of Russ Wilcox Way	45	Long-term Phase 3	$855,000
D69	Chanticleer Place Extension	South of Talawa Drive to Chanticleer Drive	45	Long-term Phase 3	$730,000
D70	Chanticleer Drive Extension	South of Edgemont Drive to Henrici Road	45	Long-term Phase 3	$1,715,000
D71	Coquille Drive Extension	Quinalt Drive to Henrici Drive	45	Long-term Phase 3	$1,715,000
D72	Hampton Drive Extension	Hampton Drive to Atlanta Drive	45	Long-term Phase 3	$845,000
D73	McLoughlin Boulevard Improvements - Phase 2	Dunes Drive to Clackamas River Bridge	68	Under Construction	N/A
D74	McLoughlin Boulevard Improvements - Phase 3	10th Street to Main Street	60	Long-term Phase 3	$14,300,000
D75	I-205 Southbound Interchange Improvements	OR 99E/I-205 Southbound Ramps	52	Long-term Phase 3	$3,000,000
D76	I-205 Northbound Interchange Improvements	OR 99E/I-205 Northbound Ramps	50	Long-term Phase 3	$3,000,000
D77	OR 213 Safety Improvement	Molalla Avenue to Conway Drive	40	Long-term Phase 4	$2,895,000

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
D78	Anchor Way Safety Improvement	18th Street to Division Street	34	Long-term Phase 4	$340,000
D79	OR 213/Redland Road Capacity Improvements	Redland Road to Redland Road undercrossing	32	Long-term Phase 4	$10,060,000
D80	Division Street Upgrade	7th Street to 18th Street	59	Likely to be Funded (Evaluation Score)	$1,530,000
D81	Beavercreek Road Upgrade	Clairmont Drive (CCC Entrance) to Meyers Road	N/A	Likely to be Funded (Baseline)	$1,350,000
D82		Meyers Road to UGB	N/A	Likely to be Funded (Baseline)	$1,745,000
D83	Holly Lane Upgrade	Redland Road to Maple Lane Road	52	Long-term Phase 2	$5,800,000
D84	Maple Lane Road Upgrade	Beavercreek Road to UGB	52	Long-term Phase 2	$2,200,000
D85	Loder Road Upgrade	Beavercreek Road to UGB	56	Long-term Phase 2	$2,000,000
D86	Livesay Road Upgrade	Redland Road to Swan Avenue	48	Long-term Phase 3	$1,295,000
D87		Swan Avenue to Holly Lane extension	48	Long-term Phase 3	$1,545,000
D88	Donovan Road Upgrade	Holly Lane to UGB	48	Long-term Phase 3	$1,335,000
D89	South End Road Upgrade	Partlow Road-Lafayette Road to UGB	56	Likely to be Funded (100% SDC Eligible)	$3,630,000
D90	Main Street Upgrade	15th Street to Agnes Avenue	56	Long-term Phase 2	$1,855,000
D91	Redland Road Upgrade	Holcomb Boulevard to Holly Lane	56	Long-term Phase 2	$1,540,000
D92	Washington Street Upgrade	11th Street to 7th Street	65	Likely to be Funded (Evaluation Score)	$75,000
D93	Beutel Road Upgrade	South End Road to Northern Terminus	52	Long-term Phase 2	$955,000
Walking Solutions					
W1	Dunes Drive Sidewalk Infill	OR 99E to Clackamette Drive	56	Long-term Phase 4	$17,000
W2	Main Street Sidewalk Infill	OR 99E to 17th Street	69	With Another Project	N/A
W3		17th Street to 15th Street	69	With Another Project	N/A
W4	Agnes Avenue Sidewalk Infill	Main Street to Washington Drive	56	Long-term Phase 4	$381,000
W5	Washington Street Sidewalk Infill	Washington Street-Abernethy Road Extension to Abernethy Road	77	Likely to be Funded (Evaluation Score)	$280,000

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
W6	Holcomb Boulevard (West of OR 213) Sidewalk Infill	Abernethy Road to OR 213 overcrossing	66	Long-term Phase 3	$73,500
W7	Redland Road (West of OR 213) Sidewalk Infill	Abernethy Road to Anchor Way	69	Long-term Phase 2	$50,500
W8	Forsythe Road Sidewalk Infill	Clackamas River Drive to Harley Avenue	60	Long-term Phase 3	$32,000
W9	Clackamas River Drive Sidewalk Infill	OR 213 to Forsythe Road	70	Likely to be Funded (Evaluation Score)	$110,500
W10		Forsythe Road to UGB	60	Long-term Phase 3	$199,500
W11	Holcomb Boulevard (East of OR 213) Sidewalk Infill	OR 213 overcrossing to Swan Avenue	81	Likely to be Funded (Evaluation Score)	$350,000
W12		Longview Way to Winston Drive	70	Likely to be Funded (Evaluation Score)	$271,500
W13		Barlow Drive to UGB	70	Likely to be Funded (Evaluation Score)	$110,000
W14	Apperson Boulevard Sidewalk Infill	La Rae Street to Gain Street	60	Long-term Phase 3	$68,500
W15	Swan Avenue Sidewalk Infill	Forsythe Road to Ann Drive	68	Long-term Phase 2	$326,500
W16	Livesay Road Sidewalk Infill	Redland Road to Frank Avenue	56	With Another Project	N/A
W17	Redland Road (East of OR 213) Sidewalk Infill	Anchor Way to Livesay Road	69	With Another Project	N/A
W18		Livesay Road to UGB	58	Long-term Phase 3	$530,000
W19	Donovan Road Sidewalk Infill	Holly Lane to western terminus	56	Long-term Phase 4	$77,500
W20	Morton Road Sidewalk Infill	Holly Lane to Swan Extension	56	Long-term Phase 4	$45,500
W21	Holly Lane Sidewalk Infill	Redland Road to Donovan Road	58	With Another Project	N/A
W22		Donovan Road to Maple Lane Road	71	With Another Project	N/A
W23	Maple Lane Road Sidewalk Infill	Beavercreek Road to UGB	77	With Another Project	N/A
W24	Thayer Road Sidewalk Infill	Maple Lane Road to UGB	66	Long-term Phase 3	$334,000
W25	Loder Road Sidewalk Infill	Beavercreek Road and the Holly Lane Extension	77	With Another Project	N/A
W26		Holly Lane Extension to the UGB	66	With Another Project	N/A
W27	High School Avenue Sidewalk Infill	Meyers Road to Glen Oak Road	66	Long-term Phase 3	$35,000
W28	Glen Oak Road Sidewalk Infill	OR 213 to High School Avenue	69	Long-term Phase 2	$177,000

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
W29		Coquille Drive to Augusta Drive	61	Long-term Phase 3	$155,500
W30	Chanticleer Drive Sidewalk Infill	North terminus to south terminus	56	Long-term Phase 4	$26,000
W31	OR 213 Sidewalk Infill	Molalla Avenue to Conway Drive	81	With Another Project	N/A
W32	Bertha Drive Sidewalk Infill	Clairmont Way to Gaffney Lane	59	Long-term Phase 3	$33,500
W33	Gaffney Lane Sidewalk Infill	Cokeron Drive to Glenview Court	69	Long-term Phase 2	$258,000
W34	Molalla Avenue Sidewalk Infill	Gaffney Lane to Sebastian Way	79	With Another Project	N/A
W35	Leland Road Sidewalk Infill	Warner Milne Road to Meyers Road	77	Likely to be Funded (Evaluation Score)	$312,500
W36		Meyers Road to McCord Road	66	Long-term Phase 3	$258,000
W37		McCord Road to UGB	56	Long-term Phase 4	$220,500
W38	Meyers Road Sidewalk Infill	Leland Road to Frontier Parkway	66	Long-term Phase 3	$186,000
W39	Jessie Avenue Sidewalk Infill	Leland Road to Frontier Parkway	56	Long-term Phase 4	$52,500
W40	Clairmont Way Sidewalk Infill	Leland Road to Bertha Drive	66	Long-term Phase 3	$366,500
W41	Warner Milne Road Sidewalk Infill	Leland Road to west of Molalla Avenue	77	Likely to be Funded (Evaluation Score)	$191,000
W42	Beavercreek Road Sidewalk Infill	Warner Milne Road to east of Kaen Road	79	Likely to be Funded (Evaluation Score)	$68,500
W43	McCord Road Sidewalk Infill	Sunset Springs Drive to Leland Road	56	Long-term Phase 4	$223,000
W44	Pease Road Sidewalk Infill	Leland Road to Tidewater Street	56	Long-term Phase 4	$41,000
W45	Central Point Road Sidewalk Infill	McCord Road to Trade Wind Street	66	Long-term Phase 3	$317,500
W46		Parrish Road to Hazeldell Avenue	66	Long-term Phase 3	$300,000
W47	South End Road (south of Partlow) Sidewalk Infill	Partlow Road to Buetel Road	79	With Another Project	N/A
W48		Buetel Road to UGB	69	With Another Project	N/A
W49	Parrish Road Sidewalk Infill	South End Road to eastern terminus	56	Long-term Phase 4	$94,500
W50		Kolar Drive to Central Point Road	56	Long-term Phase 4	$47,500
W51	Buetel Road Sidewalk Infill	South End Road to western terminus	66	With Another Project	N/A
W52	Partlow Road Sidewalk Infill	South End Road to Central Point Road	66	Long-term Phase 3	$262,000
W53	Rose Road Sidewalk Infill	South End Road to Deer Lane	56	Long-term Phase 4	$239,500
W54	South End Road (north of Partlow) Sidewalk Infill	Partlow Road to Barker Avenue	77	Likely to be Funded (Evaluation Score)	$330,500

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
W55	Lawton Road Sidewalk Infill	South End Road to Netzel Street	56	Long-term Phase 4	$35,000
W56	Warner Parrott Road Sidewalk Infill	King Road to Marshall Street	77	Likely to be Funded (Evaluation Score)	$184,000
W57	Canemah Road Sidewalk Infill	Warner Parrott Road to Telford Road	66	Long-term Phase 3	$113,000
W58	Hood Street Sidewalk Infill	Linn Avenue to eastern terminus	56	Long-term Phase 4	$63,000
W59	Telford Road Sidewalk Infill	Ogden Drive to Holmes Lane	66	Long-term Phase 3	$269,500
W60	AV Davis-Ethel Street Sidewalk Infill	Holmes Lane to Leonard Street	66	Long-term Phase 3	$167,000
W61	Holmes Lane (west of Bell Court) Sidewalk Infill	Telford Road to Bell Court	66	Long-term Phase 3	$207,500
W62	Linn Avenue Sidewalk Infill	Ella Street to Charman Avenue	77	Likely to be Funded (Evaluation Score)	$180,500
W63	Charman Avenue Sidewalk Infill	Linn Avenue to Electric Avenue	66	Long-term Phase 3	$47,000
W64	Brighton Avenue-Creed Street Sidewalk Infill	Charman Avenue to Waterboard Park Road	77	Likely to be Funded (Evaluation Score)	$186,000
W65	Brighton Avenue-Park Drive Sidewalk Infill	Charman Avenue to Linn Avenue	77	Likely to be Funded (Evaluation Score)	$179,000
W66	Warner Street Sidewalk Infill	Prospect Street to Molalla Avenue	56	Long-term Phase 4	$13,000
W67	Holmes Lane (east of Bell Court) Sidewalk Infill	Bell Court to Prospect Street	66	Long-term Phase 3	$75,000
W68	Pearl Street Sidewalk Infill	Linn Avenue to Eluria Street	66	Long-term Phase 3	$230,500
W69	Center Street Sidewalk Infill	Clinton Street to 1st Street	66	Long-term Phase 3	$142,500
W70	Division Street Sidewalk Infill	7th Street to 18th Street	77	With Another Project	N/A
W71	15th Street Sidewalk Infill	Harrison Street to Jefferson Street	56	Long-term Phase 4	$192,500
W72	Anchor Way Sidewalk Infill	18th Street to Redland Road	56	Long-term Phase 4	$49,000
W73	Molalla Avenue Streetscape Improvements Phase 3	Holmes Lane to Beavercreek Road	77	Likely to be Funded (Evaluation Score)	$2,225,000
W74	Molalla Avenue Streetscape Improvements Phase 4	Beavercreek Road to OR 213	77	Likely to be Funded (Evaluation Score)	$2,735,000
W75	15th Street Sidewalk Infill	Washington Street to OR 99E	77	With Another Project	N/A
Biking Solutions					

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
B1	7th Street Shared Roadway	OR 43 Bridge to Railroad Avenue	69	Likely to be Funded (Evaluation Score)	$4,500
B2	Railroad Avenue-9th Street Shared Roadway	OR 99E to Main Street	59	Likely to be Funded (Evaluation Score)	$10,000
B3	Main Street Shared Roadway	OR 99E to 15th Street	66	Likely to be Funded (Evaluation Score)	$21,500
B4	Main Street Bike Lanes	Agnes Avenue to I-205 undercrossing	66	Long-term Phase 3	$46,500
B5	12th Street (west of Washington Street) Shared Roadway	OR 99E to Washington Street	74	Likely to be Funded (Evaluation Score)	$4,500
B6	15th Street (west of John Adams) Shared Roadway	Washington Street to John Adams Street	74	With Another Project	
B7	Agnes Avenue Bike Lanes	Main Street to Washington Drive	59	Long-term Phase 4	$352,000
B8	Abernethy Road Bike Lanes	Washington Street to Redland Road	69	Long-term Phase 2	$248,500
B9	Holcomb Boulevard (West of OR 213) Bike Lanes	Abernethy Road to OR 213 overcrossing	71	Long-term Phase 2	$169,000
B10	Forsythe Road Bike Lanes	Clackamas River Drive to Harley Avenue	59	Long-term Phase 4	$59,000
B11	Clackamas River Drive Bike Lanes	Forsythe Road to UGB	63	Long-term Phase 3	$184,000
B12	Holcomb Boulevard (East of OR 213) Bike Lanes	Longview Way to UGB	79	Likely to be Funded (Evaluation Score)	$272,500
B13	Apperson Boulevard Shared Roadway	Forsythe Road to Holcomb Boulevard	64	Long-term Phase 3	$28,000
B14	Swan Avenue Bike Lanes	Forsythe Road to Holcomb Boulevard	69	Long-term Phase 2	$255,500
B15	Swan Avenue Shared Roadway	Holcomb Boulevard to southern terminus	59	Long-term Phase 4	$5,500
B16	Livesay Road Bike Lanes	Redland Road to Frank Avenue	59	Long-term Phase 4	$397,500
B17	Donovan Road Bike Lanes	Holly Lane to western terminus	59	Long-term Phase 4	$143,500
B18	Morton Road Bike Lanes	Holly Lane to Swan Extension	59	Long-term Phase 4	$42,000
B19	Holly Lane Bike Lanes	Redland Road to Donovan Road	71	With Another Project	N/A

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
B20	Holly Lane Bike Lanes	Donovan Road to Maple Lane Road	79	With Another Project	N/A
B21	Maple Lane Bike Lanes	Walnut Grove Way to UGB	79	With Another Project	N/A
B22	Thayer Road Bike Lanes	Elder Road to UGB	61	Long-term Phase 3	$261,500
B23	Loder Road Bike Lanes	Beavercreek Road and the Holly Lane Extension	77	With Another Project	N/A
B24	Loder Road Bike Lanes	Holly Lane Extension to the UGB	61	With Another Project	N/A
B25	High School Avenue Shared Roadway	Meyers Road to Glen Oak Road	59	Long-term Phase 4	$4,500
B26	Glen Oak Road Bike Lanes	Coquille Drive to Augusta Drive	61	Long-term Phase 3	$113,500
B27	Coquille Drive Shared Roadway	Glen Oak Road to Turtle Bay Drive	56	Long-term Phase 4	$6,500
B28	Chanticleer Drive Shared Roadway	North terminus to south terminus	56	Long-term Phase 4	$1,500
B29	Beavercreek Road Bike Lanes	Pebble Beach Drive to UGB	71	With Another Project	N/A
B30	Bertha Drive Bike Lanes	Clairmont Way to Gaffney Lane	59	Long-term Phase 4	$61,500
B31	Gaffney Lane Bike Lanes	Cokeron Drive to Glenview Court	61	Long-term Phase 3	$359,500
B32	Fir Street Bike Lanes	Molalla Avenue to 1,500 feet east	77	Likely to be Funded (Evaluation Score)	$139,000
B33	Leland Road Bike Lanes	Marysville Lane to Meyers Road	77	Likely to be Funded (Evaluation Score)	$224,500
B34	Leland Road Bike Lanes	Kalal Court to UGB	61	Long-term Phase 3	$237,000
B35	Meyers Road Bike Lanes	Leland Road to Autumn Lane	77	Likely to be Funded (Evaluation Score)	$122,000
B36	Jessie Avenue Bike Lanes	Leland Road to Jessie Court	59	Long-term Phase 4	$32,500
B37	Molalla Avenue Bike Lanes	Gales Lane to Adrian Way	79	With Another Project	N/A
B38	McCord Road Bike Lanes	Central Point Road to Leland Road	69	Long-term Phase 2	$265,000
B39	Pease Road Shared Roadway	Leland Road to Tidewater Street	59	Long-term Phase 4	$2,500
B40	Central Point Road Bike Lanes	Partlow Road to Swallowtail Place	69	Long-term Phase 2	$288,000
B41	Central Point Road Bike Lanes	Parrish Road to Skellenger Way	69	Long-term Phase 2	$138,000
B42	South End Road (south of Partlow) Bike Lanes	Buetel Road to UGB	71	With Another Project	N/A
B43	Parrish Road Shared Roadway	South End Road to eastern terminus	56	Long-term Phase 4	$8,000
B44	Parrish Road Bike Lanes	Kolar Drive to Central Point Road	59	Long-term Phase 4	$88,000
B45	Buetel Road Bike Lanes	South End Road to western terminus	69	With Another Project	N/A

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
B46	Partlow Road Bike Lanes	South End Road to Central Point Road	69	Long-term Phase 2	$118,000
B47	Rose Road Bike Lanes	South End Road to Deer Lane	59	Long-term Phase 4	$202,000
B48	Lawton Road Shared Roadway	South End Road to Netzel Street	56	Long-term Phase 4	$2,000
B49	Canemah Road Shared Roadway	Warner Parrott Road to Telford Road	59	Long-term Phase 4	$7,000
B50	Telford Road Shared Roadway	Charman Avenue to Holmes Lane	66	Long-term Phase 3	$14,500
B51	AV Davis-Ethel Street Shared Roadway	Holmes Lane to Leonard Street	66	Long-term Phase 3	$10,500
B52	Holmes Lane Shared Roadway	Telford Road to Linn Avenue	59	Long-term Phase 4	$8,000
B53	Holmes Lane Bike Lanes	Linn Avenue to Rilance Lane	77	Likely to be Funded (Evaluation Score)	$100,000
B54	Brighton Avenue-Creed Street Shared Roadway	Charman Avenue to Waterboard Park Road	66	Long-term Phase 3	$12,000
B55	Pearl Street Bike Lanes	Linn Avenue to Molalla Avenue	77	Likely to be Funded (Evaluation Score)	$119,000
B56	Pearl Street Shared Roadway	Molalla Avenue to Eluria Street	66	Long-term Phase 3	$6,500
B57	Center Street Shared Roadway	Clinton Street to 5th Street	66	Long-term Phase 3	$18,500
B58	South 2nd Street Shared Roadway	High Street to Tumwater Drive	66	Long-term Phase 3	$1,000
B59	5th Street Shared Roadway	Washington Street to Center Street	66	Long-term Phase 3	$1,500
B60	Division Street Bike Lanes	7th Street to 18th Street	69	With Another Project	N/A
B61	Taylor Street Shared Roadway	7th Street to 12th Street	66	Long-term Phase 3	$10,000
B62	12th Street Shared Roadway	Taylor Street to Washington Street	66	Long-term Phase 3	$17,500
B63	15th Street Shared Roadway	Division Street to Washington Street	59	Long-term Phase 4	$22,000
B64	Anchor Way Bike Lanes	18th Street to Redland Road	69	Long-term Phase 2	$57,500
B65	14th Street Bike Lanes	OR 99E to John Adams Street	74	With Another Project	N/A
B66	15th Street Bike Lanes	OR 99E to Washington Street	74	With Another Project	N/A
Shared-Use Path Solutions					
S1	Main Street Shared-Use Path	Clackamette Park to 17th Street	69	Long-term Phase 2	$780,000
S2	Abernethy Road Shared-Use Path	Washington Street to Redland Road	66	Long-term Phase 3	$619,500
S3	OR 99E Shared-Use Path	10th Street to Railroad Avenue	81	With Another Project	N/A
S4	Abernethy Creek Park Shared-Use Path	John Adams Street to 15th Street	56	Long-term Phase 4	$517,500

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
S5	Abernethy Road-Clackamas River Drive Shared-Use Path	Abernethy Road to Clackamas River Drive	69	Long-term Phase 2	$1,361,000
S6	Redland Road Shared-Use Path	Abernethy Road to Livesay Road	71	Long-term Phase 2	$462,000
S7	Forsythe Road Shared-Use Path	Clackamas River Drive to UGB	58	Long-term Phase 4	$775,000
S8	Clackamas River Drive Shared-Use Path	OR 213 to Forsythe Road	69	Long-term Phase 2	$452,500
S9	Swan-Livesay Shared-Use Path	Swan Avenue to Livesay Road	56	Long-term Phase 4	$671,000
S10	Redland-Holcomb Shared-Use Path	Redland Road to Holcomb Boulevard	66	Long-term Phase 3	$1,514,000
S11	Holcomb- Forsythe Road Shared-Use Path	Holcomb Boulevard to Forsythe Road	58	Long-term Phase 4	$433,000
S12	Redland-Holly Shared-Use Path	Redland Road to Holly Lane	69	Long-term Phase 2	$1,160,000
S13	Holly Lane Shared-Use Path	Donovan Road to Maple Lane Road	71	Long-term Phase 2	$1,515,500
S14	Maple Lane-Thayer Shared-Use Path	Maple Lane Road to Thayer Road	81	Likely to be Funded (Evaluation Score)	$478,500
S15	Thayer-Loder Shared-Use Path	Thayer Road to Loder Road	81	Likely to be Funded (Evaluation Score)	$633,000
S16	Loder-Timbersky Shared-Use Path	Loder Road to Timbersky Way	66	Long-term Phase 3	$846,000
S17	Clairmont Drive Shared-Use Path	Beavercreek Road to UGB	66	Long-term Phase 3	$1,113,500
S18	Loder Road Shared-Use Path	Glen Oak Road to Holly Lane Extension	81	Likely to be Funded (Evaluation Score)	$1,005,000
S19	Meyers Road Extension Shared-Use Path	Holly Lane Extension to UGB	66	Long-term Phase 3	$430,500
S20	Timbersky Extension Shared-Use Path	Pebble Beach Drive to Meadow Lane Extension	66	Long-term Phase 3	$442,500
S21	Meadow Lane Extension Shared-use Path	Old Acres Lane to UGB (north of Loder Road)	56	Long-term Phase 4	$1,180,500
S22	Meyers-Beavercreek Shared-Use Path	Morrie Drive to Beavercreek Road	69	Long-term Phase 2	$1,211,500
S23	Meyers Road Shared-Use Path	Meyers-Beavercreek Shared-Use Path to OR 213	64	Long-term Phase 3	$1,158,500
S24	Gaffney Lane Elementary Shared-Use Path	Eastborne Drive to Falcon Drive	77	Likely to be Funded (Evaluation Score)	$216,000

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
S25	Falcon-Pompei Shared-Use Path	Falcon Drive to Naples Street	64	Long-term Phase 3	$92,000
S26	Leland Road-Wesley Lynn Park Shared-Use Path	Leland Road to Wesley Lynn Park	66	Long-term Phase 3	$129,000
S27	Hillendale Park-Leonard Street Shared-Use Path	Hillendale Park Shared-Use Path to Leonard Street	69	Long-term Phase 2	$477,000
S28	Beavercreek-Hilltop Shared-Use Path	Beavercreek Road to Fox Lane	66	Long-term Phase 3	$408,500
S29	Fremont-Hiefield Shared-Use Path	Fremont Street to Hiefield Court	56	Long-term Phase 4	$101,000
S30	Orchard Grove-Hazelnut Shared-Use Path	Orchard Grove Drive to Hazelnut Court	66	Long-term Phase 3	$375,500
S31	South End-Deer Lane Shared-Use Path	Deer Lane to Filbert Drive	66	Long-term Phase 3	$494,000
S32	Deer Lane Extension Shared-Use Path	Buetel Road to Deer Lane	66	Long-term Phase 3	$609,000
S33	Buetel-Kolar Shared-Use Path	Buetel Road to Kolar Drive	56	Long-term Phase 4	$1,324,000
S34	OR 99E-Buetel Shared-Use Path	OR 99E to Buetel Road	65	Long-term Phase 3	$1,226,000
S35	Canemah-Buetel Road Extension Shared-Use Path	5th Avenue to OR 99E-Buetel Road Extension	65	Long-term Phase 3	$876,500
S36	Tumwater-4th Shared-Use Path	Tumwater Drive to 4th Avenue	81	Likely to be Funded (Evaluation Score)	$396,000
S37	OR 99E (south of Railroad Avenue) Shared-Use Path	Railroad Avenue to UGB	71	Long-term Phase 2	$2,540,000
S38	Singer Creek Park Shared-Use Path	Singer Creek Park to Electric Avenue	66	Long-term Phase 3	$55,500
S39	Electric-East Shared-Use Path	Electric Avenue to East Street	65	Long-term Phase 3	$36,000
S40	Hood-Warner Shared-Use Path	Hood Street to Warner Street	67	Long-term Phase 2	$338,000
S41	Beavercreek-Laurel Shared-Use Path	Beavercreek Road to Laurel Lane	67	Long-term Phase 2	$215,000
S42	Fox-Hillcrest Shared-Use Path	Fox Lane to Hillcrest Street	66	Long-term Phase 3	$160,000
S43	Magnolia-Eluria Shared-Use Path	Magnolia Street to Eluria Street	66	Long-term Phase 3	$267,500
S44	Jackson Street Shared-Use Path	North of 4th Street to 5th Street	66	Long-term Phase 3	$24,000
S45	4th Street Shared-Use Path	West of Jackson Street to east of Monroe Street	66	Long-term Phase 3	$23,500
S46	John Adams Shared-Use Path	10th Street to west of 11th Street	66	Long-term Phase 3	$24,000
S47	Barclay Park Shared-Use Path	Jefferson Street to John Adams Street	66	Long-term Phase 3	$71,500
S48	Atkinson Park Shared-Use Path	17th Street to 18th Street	56	Long-term Phase 4	$38,500

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
S49	Anchor Way Shared-Use Path	18th Street to Redland Road	56	Long-term Phase 4	$253,500
S50	King Elementary School Shared-Use Path	South End Road to Woodfield Court	66	Long-term Phase 3	$142,000
S51	Chanticleer-Coquille Shared-Use Path	Chanticleer Drive to Coquille Drive	66	Long-term Phase 3	$448,000
S52	Linn Avenue Shared-Use Path	Electric Avenue to Pearl Street	69	Long-term Phase 2	$101,500
S53	15th Street Shared-Use Path	OR 99E to Main Street	77	With Another Project	N/A
Transit Solutions					
T1	Molalla Avenue Transit Signal Priority	Washington Street to Gaffney Lane	61	Likely to be Funded (Evaluation Score)	$200,000
T2	OR 99E Transit Signal Priority	Dunes Drive to 10th Street	59	Likely to be Funded (Evaluation Score)	$200,000
T3	Bus Stop Amenity Enhancement	Citywide	80	Likely to be Funded (Evaluation Score)	$200,000
T4	Oregon City TMA Startup Program	Oregon City Regional Center	54	Long-term Phase 2	$700,000
Street Crossing Solutions					
C1	Clackamette Drive Crossing	Clackamette Park overflow lot to the Clackamette Park entrance	66	Long-term Phase 3	$80,000
C2	Main Street Crossing	I-205 Shared Use Path to south of Main Street	59	Long-term Phase 4	$80,000
C3	Holcomb/Front Family Friendly Route Crossing	Holcomb Boulevard/Front Avenue intersection	61	Long-term Phase 4	$80,000
C4	Holcomb/Swan Crossing	Holcomb Boulevard/Swan Avenue intersection	61	Long-term Phase 4	$80,000
C5	Holcomb Boulevard Shared-Use Path Crossing	Holcomb Boulevard/Oak Tree Terrace intersection	61	Long-term Phase 4	$80,000
C6	Holcomb/Winston Crossing	Holcomb Boulevard/ Winston Drive intersection	59	Long-term Phase 4	$80,000
C7	Redland Road Shared-Use Path Crossing	Redland Road/Livesay Road intersection	69	Long-term Phase 2	$80,000
C8	Holly Lane Shared-Use Path Crossing	Holly Lane/Donovan Road intersection	61	Long-term Phase 4	$80,000

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
C9	Maple Lane Road Shared-Use Path Crossing	Maple Lane Road/Holly Lane intersection	69	Long-term Phase 2	$80,000
C10	Thayer Road Shared-Use Path Crossing	Thayer Road/Holly-Thayer Shared-Use Path intersection	59	Long-term Phase 4	$80,000
C11	Beavercreek Road/Loder Road Shared-Use Path Crossing	Beavercreek Road/Loder Road intersection	77	Likely to be Funded (Evaluation Score)	$80,000
C12	Beavercreek Road/Pebble Beach Drive Shared-Use Path Crossing	Beavercreek Road/ Pebble Beach Drive intersection	61	Long-term Phase 4	$80,000
C13	Meyers Road Extension/Loder Road Extension Shared-Use Path Crossing	Meyers Road Extension/Loder Road Extension intersection	66	Long-term Phase 3	$80,000
C14	Glen Oak Road Shared-Use Path Crossing	Glen Oak Road/Loder Road Extension intersection	59	Long-term Phase 4	$80,000
C15	Meyers Road Shared-Use Path Crossing	Meyers Road/Moccasin Way intersection	66	Long-term Phase 3	$80,000
C16	Clairmont Way Family Friendly Route Crossing	Clairmont Way/Eastborne Drive intersection	66	Long-term Phase 3	$80,000
C17	Leland Road Family Friendly Route Crossing	Leland Road/Reddaway Avenue intersection	69	Long-term Phase 2	$80,000
C18	Meyers Road Family Friendly Route Crossing	Leland Road/Hiefield Court intersection	59	Long-term Phase 4	$80,000
C19	Warner Milne Road Shared-Use Path Crossing	Warner Milne Road/ Hillendale Park-Leonard Street Shared-Use Path intersection	69	Long-term Phase 2	$80,000
C20	Hampton Drive Family Friendly Route Crossing	Central Point Road/Hampton Drive intersection	66	Long-term Phase 3	$80,000
C21	Hazelnut Court Family Friendly Route Crossing	Central Point Road/ Hazelnut Court intersection	66	Long-term Phase 3	$80,000
C22	Deer Lane Extension Shared-Use Path Crossing	South End Road/Deer Lane Extension intersection	61	Long-term Phase 4	$80,000
C23	Buetel Road/Deer Lane Extension Shared-Use Path Crossing	Buetel Road/Deer Lane Extension intersection	66	Long-term Phase 3	$80,000
C24	Filbert Drive Family Friendly Route	South End Road/Filbert Drive	66	Long-term Phase 3	$80,000

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
	Crossing	intersection			
C25	Warner Parrot/Boynton Family Friendly Route Crossing	Warner Parrot Road/Boynton Street intersection	69	Long-term Phase 2	$80,000
C26	South End/Amanda Family Friendly Route Crossing	South End Road/Amanda Court intersection	69	Long-term Phase 2	$80,000
C27	OR 99E/Buetel Extension Shared-Use Path Crossing	OR 99E/Buetel Road Extension intersection	61	Long-term Phase 4	$80,000
C28	AV Davis Road Crossing	Linn Avenue/AV Davis Road intersection	69	Long-term Phase 2	$80,000
C29	Holmes/Leonard Family Friendly Route Crossing	Holmes Lane/Leonard Street intersection	69	Long-term Phase 2	$80,000
C30	Barclay Hills Drive Crossing	Molalla Avenue/Barclay Hills Drive intersection	61	Long-term Phase 4	$80,000
C31	Park Drive Crossing	Linn Avenue/Park Drive intersection	69	Long-term Phase 2	$80,000
C32	Electric Avenue Family Friendly Route Crossing	Linn Avenue/Electric Avenue	69	Long-term Phase 2	$80,000
C33	Jackson/5th Family Friendly Route Crossing	5th Street/Jackson Street intersection	59	Long-term Phase 4	$80,000
C34	Jackson/7th Family Friendly Route Crossing	7th Street/Jackson Street intersection	69	Long-term Phase 2	$80,000
C35	John Adams/7th Family Friendly Route Crossing	7th Street/John Adams Street intersection	77	Likely to be Funded (Evaluation Score)	$80,000
C36	Jerome Street Crossing	OR 99E/Jerome Street	77	Long term ph2	$80,000
Family-Friendly Routes					
FF1	John Adams Family Friendly Route	Abernethy Road to Abernethy Creek Park	56	Long-term Phase 4	$52,000
FF2	Front Avenue Family Friendly Route	Forsythe Road to Holcomb Boulevard	66	Long-term Phase 3	$242,000
FF3	Cleveland Street Family Friendly Route	Apperson Boulevard to Swan Avenue	66	Long-term Phase 3	$275,000
FF4	Jacobs-Beemer Family Friendly Route	Holcomb Boulevard to Redland-Holcomb Shared-Use Path	56	Long-term Phase 4	$213,000

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
FF5	Glen Oak-Chanticleer Drive Family Friendly Route	Glen Oak Road to Chanticleer Drive	56	Long-term Phase 4	$3,500
FF6	Coquille-Beavercreek Road Family Friendly Route	Coquille Drive to Beavercreek Road	56	Long-term Phase 4	$17,500
FF7	Falcon Drive Family Friendly Route	Gaffney Lane to Falcon-Pompei Shared-Use Path	63	Long-term Phase 3	$7,000
FF8	Pompei Drive-Naples Street Family Friendly Route	OR 213 to Falcon-Pompei Shared-Use Path	63	Long-term Phase 3	$8,500
FF9	Hillendale Park to Gaffney Lane Elementary Family Friendly Route	Hillendale Park to Gaffney Lane Elementary Shared-Use Path	63	Long-term Phase 3	$120,000
FF10	Frontier Parkway Family Friendly Route	Wesley Lynn Park to Meyers-Beavercreek Shared-Use Path	66	Long-term Phase 3	$70,500
FF11	Hiefield Court Family Friendly Route	Leland Road to Hillendale Park-Leonard Street Shared-Use Path	69	Long-term Phase 2	$74,500
FF12	Hilltop Avenue Family Friendly Route	Fox Lane to Beavercreek-Hilltop Shared-Use Path	56	Long-term Phase 4	$97,000
FF13	Leland-Warner Parrot Family Friendly Route	Leland Road to Warner Parrot Road	77	Likely to be Funded (Evaluation Score)	$323,000
FF14	McCord-Leland Family Friendly Route	Orchard Grove Drive to Fremont Street	69	Long-term Phase 2	$386,000
FF15	Orchard Grove Family Friendly Route	Orchard Grove-Hazelnut Shared-Use Path to McCord Road	69	Long-term Phase 2	$14,000
FF16	Central Point-South End Family Friendly Route	Central Point Road to South End Road	66	Long-term Phase 3	$30,500
FF17	Deer Lane Family Friendly Route	Rose Road to South End-Deer Lane Shared-Use Path	69	Long-term Phase 2	$55,500
FF18	Rose-Amanda Family Friendly Route	Rose Road to Amanda Court	69	Long-term Phase 2	$436,500
FF19	Warner Parrot-Barker Family Friendly Route	Warner Parrot Road to Barker Avenue	77	Likely to be Funded (Evaluation Score)	$289,000
FF20	Barker Avenue Family Friendly Route	South End Road to Telford Road	77	Likely to be Funded (Evaluation Score)	$268,500

Table A1: 2013 Likely to be Funded and Not Likely to be Funded Transportation Systems

Project #	Project Description	Project Extent	Total Evaluation Score	Priority*	Estimated Cost
FF21	Canemah Family Friendly Route	Old Canemah Park to Cemetery Road	56	Long-term Phase 4	$289,000
FF22	Tumwater-South 2nd Family Friendly Route	Waterboard Park to Tumwater-4th Shared-Use Path to McLoughlin Promenade	56	Long-term Phase 4	$117,000
FF23	Charman Avenue Family Friendly Route	Telford Road to Linn Avenue	77	Likely to be Funded (Evaluation Score)	$357,500
FF24	Leonard-Bell Family Friendly Route	Williams Street to northern terminus of Bell Court	63	Long-term Phase 3	$270,500
FF25	Hillcrest-Magnolia Family Friendly Route	Fox-Hillcrest Shared-Use Path to Magnolia-Eluria Shared-Use Path	56	Long-term Phase 4	$271,000
FF26	Warner-Holmes Family Friendly Route	Kamm Street to Holmes Lane	56	Long-term Phase 4	$189,500
FF27	Electric-5th Family Friendly Route	Electric-East Shared-Use Path to 4th/5th Street	69	Long-term Phase 2	$264,500
FF28	Eluria Street Family Friendly Route	Division Street to Pearl Street	56	Long-term Phase 4	$98,500
FF29	Jackson Street Family Friendly Route	5th Street to 17th Street	56	Long-term Phase 4	$103,500
FF30	9th-Lincoln Street Family Friendly Route	Division Street to John Adams Street	56	Long-term Phase 4	$92,500
FF31	4th Street Family Friendly Route	Jackson Street to McLoughlin Promenade	69	Long-term Phase 2	$12,000
FF32	John Adams-Jefferson Street Family Friendly Route	Waterboard Park Road to 15th Street	69	Long-term Phase 2	$141,500
FF33	18th Street Family Friendly Route	Anchor Way Shared-Use Path to McLoughlin Avenue	56	Long-term Phase 4	$50,000

*Notes:

Likely to be Funded (Baseline): Projects assumed on the baseline street network, and included in Likely to be Funded Transportation System

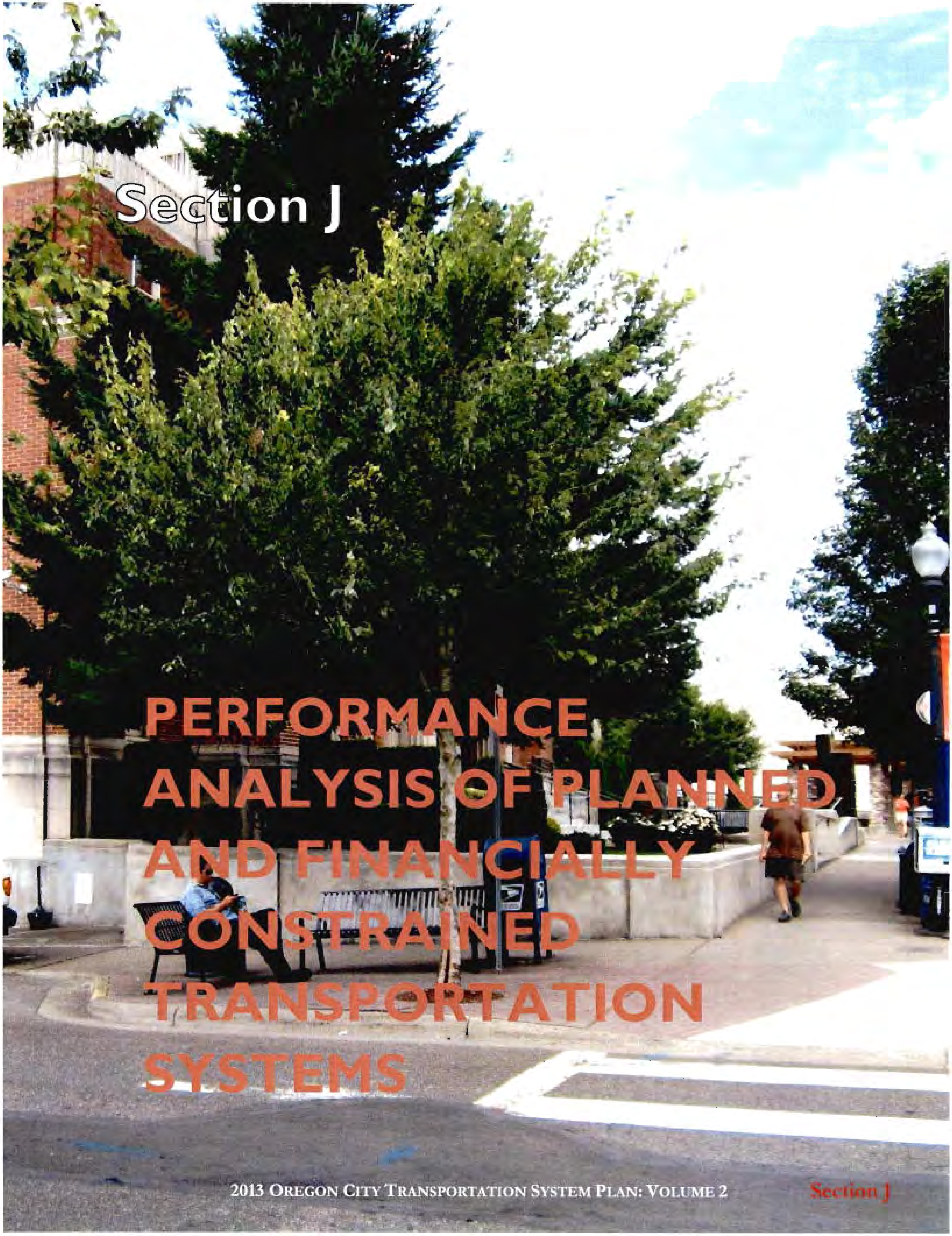
Likely to be Funded (Evaluation Score): Projects with evaluation scores high enough for the Likely to be Funded Transportation System

Likely to be Funded (100% SDC Eligible): Projects with costs that are 100 percent SDC fundable, and by default made the Likely to be Funded Transportation System regardless of the evaluation score

Long-term Phase 2, 3, and 4: Projects included in Planned Transportation System

Section J

PERFORMANCE ANALYSIS OF PLANNED AND FINANCIALLY CONSTRAINED TRANSPORTATION SYSTEMS



PERFORMANCE ANALYSIS OF FINANCIALLY CONSTRAINED AND PLANNED TRANSPORTATION SYSTEMS

This document details the 2035 transportation conditions in Oregon City after investments are made to the existing transportation system. Included is a summary of the evolving travel patterns after the transportation system is improved, a detail of how the performance of the transportation system investments will be tracked, and a depiction of how the plan's investment decisions would be expected to impact the long-term objectives of the City and region.

Investing in the Oregon City Transportation System

Now that the City has identified an estimated $222 million worth of transportation system solutions, we must look at the forecasted baseline travel conditions in 2035 (as documented in Technical Memorandum #7), and determine if the identified solutions can adequately accommodate the forecasted travel demand.

Evolving Travel Patterns

The Metro Regional Travel Demand Model was utilized to forecast traffic volumes for the 2035 Financially Constrained and Planned Transportation Systems. After incorporating the transportation system investments into the 2035 baseline street network, shifting driver patterns and travel demands along various routes emerge. For example, a driver may have previously traveled out of direction to avoid a congested route. The route may no longer be congested after the City invests in the transportation system and therefore the driver could potentially shift back to the more direct route, saving on travel time and distance. The travel demand model produces total volumes for autos, trucks and buses on each street and highway in the system. Comparing outputs with observed counts and behaviors on the local system refines model forecasts. This refinement step is completed before any evaluation of system performance is made. Once the traffic forecasting process is complete, the 2035 volumes were used to evaluate the performance of the transportation system assuming an estimated $222 million worth of investments. Additional details on the travel forecasting can be found in Technical Memorandum #5: Modeling Assumptions.

2035 motor vehicle volumes on the roadways in Oregon City were developed and used to evaluate the performance of the transportation system investments. The street network was assessed with the Financially Constrained Transportation System, which includes the transportation solutions reasonably expected to be funded by 2035 and have the highest priority for implementation and Planned Transportation System, which includes all projects regardless of expected funding through

2035 (see Technical Memorandum #11 for more details). The 2035 Financially Constrained and Planned Transportation System traffic volumes developed for the reviewed intersections can be found in Figure A1 and A2 in the appendix.

Various trends that emerged from the Financially Constrained Transportation System included:

- Drivers that may have previously utilized OR 213 between the Park Place neighborhood and the Metro employment area southeast of the OR 213/Beavercreek Road intersection are expected to divert to Holly Lane (and the Holly Lane extension) between Holcomb Boulevard and the Meyers Road east extension (east of Beavercreek Road). This would be expected to result in reduced travel along various routes, including portions of OR 213, Holcomb Boulevard, Maple Lane Road and Beavercreek Road.
- Reduced travel would be expected along OR 99E between Dunes Drive and 14^{th} Street as drivers re-route to the Dunes Drive extension to Agnes Avenue.
- Drivers traveling between the South End neighborhood and the Warner Parrott Road/Central Point Road intersection are expected to divert from Warner Parrott Road and South End Road to Central Point Road and the street extension between Parrish Road and South End Road.

Various trends that emerged from the Planned Transportation System included:

- Drivers that may have previously utilized Beavercreek Road or Leland Road traveling between areas south of the City reroute to OR 213 after being widened between Molalla Avenue and Conway Drive.
- After improvements to the OR 213/Redland Road intersection and modernization of Redland Road between Abernethy Road and Holly Lane, more drivers are attracted to the route.

Tracking Performance of Transportation System Investments

The Oregon City TSP update employs a performance based approach, focusing on measurable outcomes of the investments the City chooses to make to the transportation system[1]. The approach allows the City to measure the degree to which its investments support regional and City-wide priorities. In this manner, the City is able to track how its investment decisions impact a set of performance objectives through 2035. While the performance objectives do not represent the complete picture, they do offer a baseline against which to assess how the policies, investments and planning decisions made in this plan may affect the future. Oregon City developed measures for safety, congestion, freight reliability, walking, biking, transit and non-single occupant vehicle (SOV), and climate change to help translate investment decisions to the community priorities of the TSP

[1] Metro Regional Transportation Functional Plan, Section 3.08.230 requires local jurisdictions to develop performance measures for TSP updates

update. The performance measures included the following:

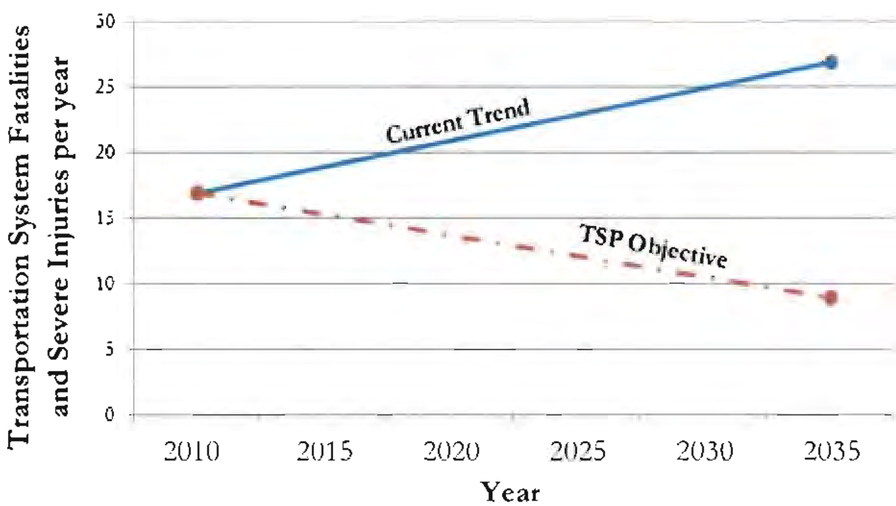
- **Safety**: Reduce fatalities and serious injuries by 50% from 2010 for drivers, walkers and bikers
- **Congestion:**
  - Reduce vehicle hours of delay per person by 10% from 2010.
  - Work towards meeting mobility targets for streets and intersections[2]
- **Freight Reliability:** Reduce vehicle hours of delay for truck trips by 10% from 2010.
- **Walking, Biking, Transit and Non-SOV:**
  - Work toward achieving the non-SOV mode share targets of 45 to 55 percent for the Oregon City Regional Center and the 7th Street-Molalla Avenue Corridor and 40 to 45 percent for other areas of the City.
  - Triple walking, biking and transit mode share from 2010.
- **Climate Change:** Reduce vehicle miles traveled (VMT) per capita by 10 percent compared to 2010

Putting the Plan to the Test

How will investment decisions of the TSP, an estimated $222 million worth, improve the performance of the transportation network in Oregon City? To answer this question, the plan's investment decisions were evaluated against the performance measures to identify long-term trends through 2035. The results are presented in the following sections.

Safety is expected to improve despite the Current Trend

The future trend for total fatalities and severe injuries resulting from collisions along the transportation system in Oregon City is expected to decrease despite what recent collision data suggests.[3]



[2] The Metro Regional Transportation Functional Plan includes Mid-day and PM peak mobility standards in the Regional Mobility Policy, Table 3.08-2

[3] The current trend was developed based on collision data between 2005 and 2010

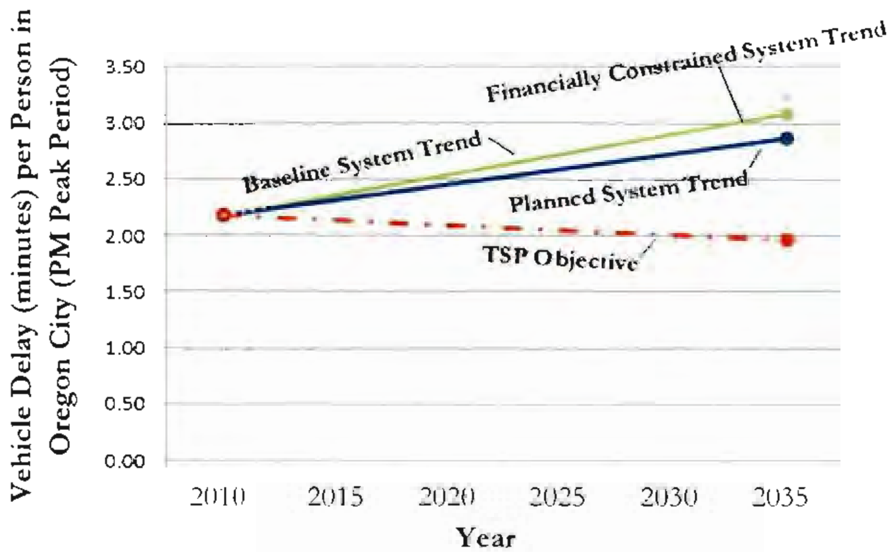
Although we are unable to forecast future collisions along the transportation system, with investments in improved street crossings, walking and biking facilities, and to high collision locations and congested intersections, the trend is expected to be more in line with the safety objective of the TSP (reducing fatalities and serious injuries by 50% from 2010).

Overall, there were two fatalities and 15 severe injuries in 2010. Pedestrians were involved in eight collisions, with two pedestrians sustaining severe injuries. While there were nine collisions involving a bicyclist in 2010, none of the cyclists sustained severe injuries. By 2035, Oregon City hopes to limit total fatalities and severe injuries to less than 10 in a year.

Progress is expected to be made towards meeting the Congestion Targets

To reduce congestion, Oregon City identified over $162 million worth of projects to improve driving, and approximately $60 million to enhance walking, biking and transit usage.

Vehicle hours of Delay[4]: The same dynamics that make Oregon City an attractive place to live and open a business- its access to major regional transportation routes including I-205, OR 213, OR 99E, and OR 43- pose a challenge for meeting this performance measure. The TSP objective envisions decreasing delay by approximately ten percent through 2035, to fewer than two minutes per person during the evening peak period. However, the future trend for delay along Oregon City streets during the evening peak period (after assuming the planned system investments) is expected to increase slightly through 2035, from about two minutes to just under three minutes per person. This is generally associated with increased delay along the regional routes (such as OR 99E and OR 213), a side effect of local and regional population and employment growth. Since these routes serve outlying communities such as Molalla and Canby, trips that have origins and destinations outside of Oregon City are expected to significantly contribute to the increased delay in Oregon City.



[4] Delay is defined as the amount of time spent in congestion greater than 0.90 v/c, page 5-7, 2035 Metro RTP

With delay increasing, even after nearly $222 million worth of transportation system investments, the limitations of relying on infrastructure improvements as a means of meeting this objective are evident as the benefits are difficult to assess.

However, the City is working towards meeting this objective by decreasing delay nearly 15 percent from what would be expected without the transportation system investments (see the Baseline System Trend).

Mobility Targets for Streets: Metro's regional travel demand model was used to estimate if streets in Oregon City could handle tbe increased travel demand through 2035 assuming the TSP investments.[5] While transportation system investments were recommended throughout the City, financially feasible solutions could not be identified for the routes connecting Oregon City across the Willamette and Clackamas Rivers. These routes, including the Oregon City-West Linn Arch Bridge, OR 99E and I-205, are expected to be congested by 2035 (operating above a v/c of 1.00), and will likely meter traffic coming into the City during peak hours. Once demand exceeds the available capacity along these routes, drivers will be forced to adjust their travel to directly before or after the evening peak hour. Therefore, the evening peak hour congestion that Metro's regional travel demand model is forecasting throughout the Oregon City Regional Center and along routes connecting to it, including OR 99E, OR 213, South End Road, Singer Hill Road and Redland Road, is not expected to occur since the travel demand across the rivers will be spread over more than one hour. Even with the excess travel demand across the rivers, the remaining streets in the City (beyond those mentioned above) are forecasted to comply with the Metro Regional Transportation Functional Plan mobility targets during the evening peak period. Overall, the street system investments in the TSP are expected to help the City work towards meeting mobility targets during the evening peak period.

During the midday peak hour[6], all streets in Oregon City are expected to comply with the mobility targets of the Metro Regional Transportation Functional Plan, with the exception of the routes connecting Oregon City across the Willamette River, including the southbound direction of the Oregon City-West Linn Arch Bridge and portions of I-205.

Mobility Targets at Intersections: 2035 intersection operations assuming the transportation system investments (Likely to be Funded and Not Likely to be Funded Systems) are shown in Table A1 in TSP Volume 2, Section J. With over $162 million worth of improvements to the street system, nearly all intersections reviewed are expected to meet mobility targets through 2035 during the evening peak period. Despite the investments in the transportation system, three of the intersections

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[5] The raw model v/c plots for the mid-day and evening peak periods were reviewed as a qualitative assessment for this objective but detailed link capacity analysis was not performed.

[6] Metro's regional travel demand model was reviewed with RTP investments only during the midday peak period. Not all improvements from the Oregon City TSP were included, however, they will likely not impact travel patterns during the midday period due to limited congestion.

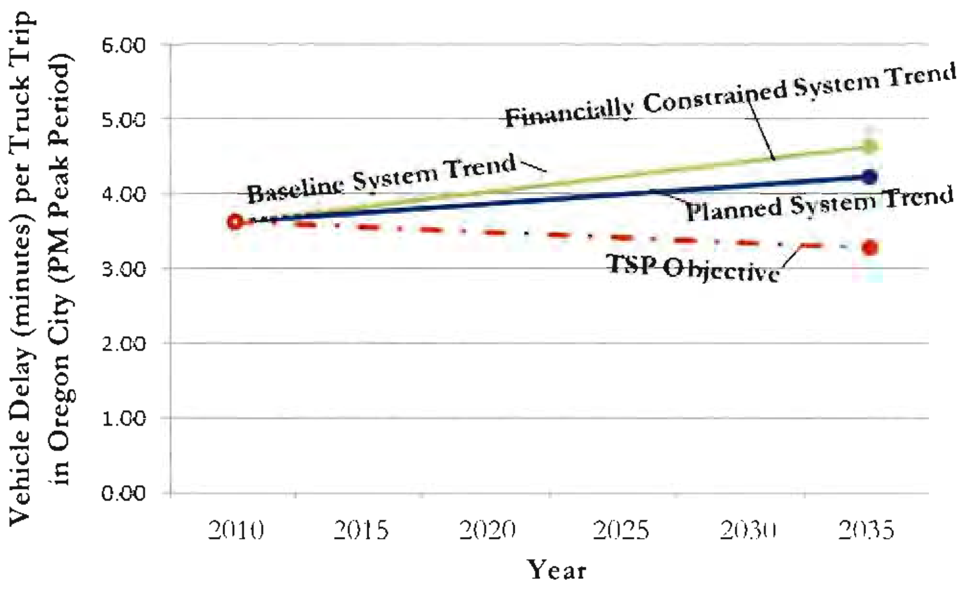
reviewed are still expected to be substandard by 2035 during the evening peak period (see Section J of the TSP Volume 2 for more detail), including the OR 99E/I-205 SB Ramps, OR 99E/I-205 NB Ramps and OR 213/Beavercreek Road intersections.

With the recommended improvements to the OR 99E/I-205 SB Ramp and OR 99E/I-205 NB Ramp intersections, compliance with the mainline mobility target (v/c of 1.10) is expected; however, the intersections would still be expected to operate above the freeway ramp terminal mobility target (v/c of 0.85). The investment decisions of the TSP allow these intersections to work towards meeting mobility targets and reduce the vehicle spillback onto the off-ramps from I-205 during the evening peak period, meeting the congestion objective of the TSP.

In addition, several projects have been previously planned that would reduce congestion at the OR 213/Beavercreek Road intersection. A planned project to replace the OR 213/Beavercreek Road intersection with an interchange was eliminated due to livability, multi-modal access and funding constraints within the 2035 planning horizon. The project should be reconsidered beyond the planning horizon since the intersection is expected to operate above the mobility target by 2035. The investment decisions of the TSP allow this intersection to work towards meeting mobility targets, satisfying the congestion objective of the TSP.

Progress is expected to be made towards reducing Freight Delay

Oregon City's access to major regional transportation routes including I-205, OR 213, OR 99E, and OR 43- pose a challenge for meeting this performance measure (similar to the vehicle hours of delay measure). The TSP objective envisions decreasing delay by approximately ten percent through 2035, to just over three minutes per truck trip during the evening peak period. However, the future trend for truck delay in Oregon City during the evening peak period (after assuming the planned system investments) is expected to increase slightly through 2035, from about three and a half minutes to four minutes per person. This is generally associated with increased delay along the regional routes, where most trucks trips occur. Since these

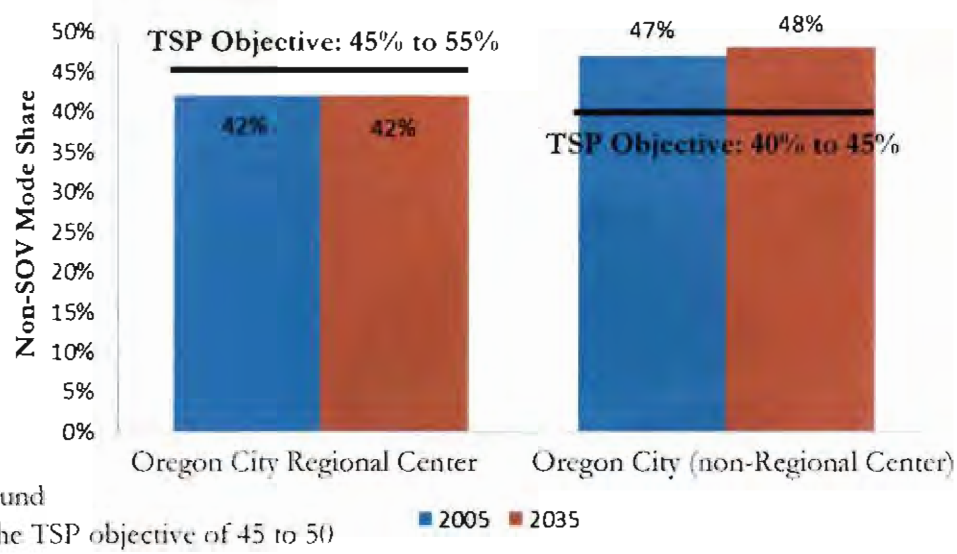


routes serve outlying communities such as Molalla and Canby, drivers that have origins and destinations outside of Oregon City are expected to significantly contribute to the increased truck delay in Oregon City. However, the City is working towards meeting this objective by decreasing truck delay 15 percent from what would be expected without the transportation system investments (see the Baseline System Trend).

A Reduction in Single Occupant Vehicle Travel is expected

Non-single occupant vehicle (SOV) travel in Oregon City is expected to continue to increase through 2035.

Non-Single Occupancy Vehicle (SOV) Travel: Metro's regional travel demand model was used to evaluate progress towards meeting transportation demand management (TDM) goals, specifically reducing reliance on the single occupancy vehicle.[7] Oregon City's non-SOV mode shares (outside of the Oregon City Regional Center) are expected to be above the TSP objective of 40 to 45 percent, with an estimated non-SOV mode share of 47 percent in 2005 and 48 percent in 2035. The non-SOV mode share in the Oregon City Regional Center is expected to remain steady through 2035, at around 42 percent, slightly below the TSP objective of 45 to 50 percent.



The TSP makes investment decisions that further help the City work towards achieving the non-SOV mode share targets. The City is expected to continue to increase trip share via walking, biking, carpooling or public transportation with investment decisions including a project that would help implement a Transportation Management Association (TMA) program with employers and residents within the Oregon City Regional Center.

The Oregon City TSP includes solutions to decrease single occupancy vehicle travel by focusing on investments that encourage multi-modal travel, including increased walking and bicycling facilities

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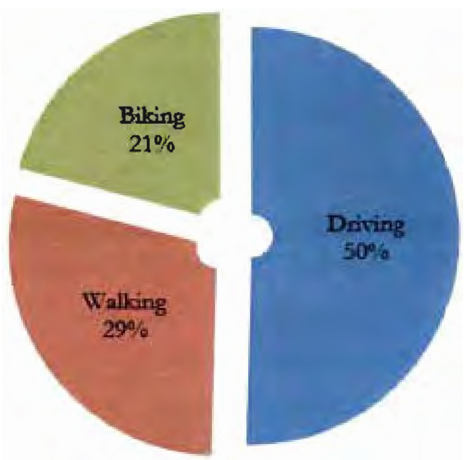
[7] The Metro RTP Financially Constrained Plan was utilized for the non-SOV mode share analysis; therefore, not all of the projects included in the TSP were captured in the analysis.

and transit stop access/amenity improvements.

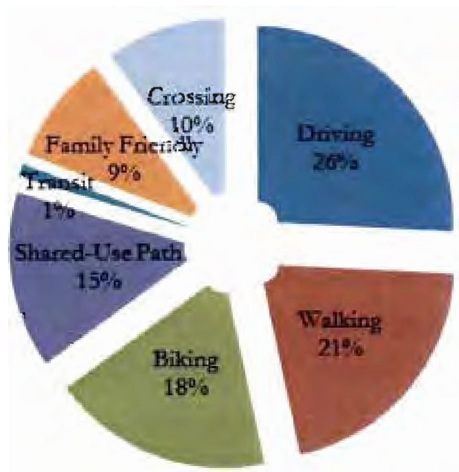
The TSP also includes maximum public street spacing standards to allow for sufficiently spaced pedestrian crossings. Street connections to increase the convenience of walking and bicycling were also recommended throughout the City, including the Oregon City Regional Center.

Walking, Biking and Transit Mode Share: Oregon City has identified nearly $60 million worth of investments with over 260 walking, biking, transit or other shared-use path projects in its TSP. This accounts for over 75 percent of the projects in the 2013 TSP and represents an increase of more than 25 percent when compared to the projects in the 2001 TSP. While no data is available to quantify the impact of these walking, biking and transit investments in the City, they are expected to help the City work towards tripling the walking, biking and transit mode share between 2010 and 2035.

The City identified investments to complete walking and biking gaps along the major street system, and identified a network of low-volume more comfortable walking and biking routes off the major street system to further encourage walking and biking to key destinations throughout the City.



Percent of TSP Projects by Travel Mode (2001 TSP)

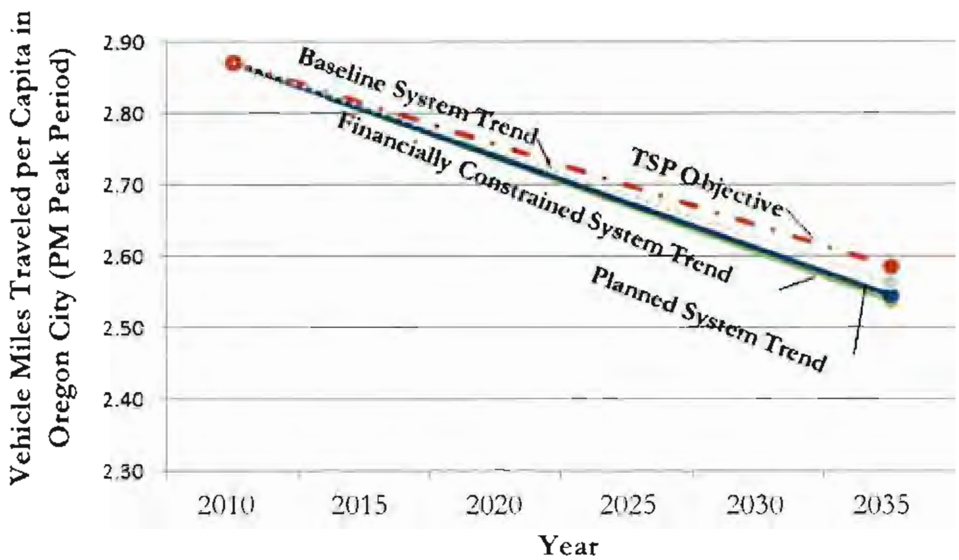


Percent of TSP Projects by Travel Mode (2013 TSP)

The Plan is expected to outperform the Climate Change Target

Despite healthy local and regional population and employment growth, vehicle miles traveled in Oregon City is expected to be reduced more than the TSP objective through 2035. The TSP objective envisions decreasing vehicle miles traveled by approximately ten percent through 2035, to about 2.6 miles per person during the evening peak period.

However, the future trend for vehicle miles traveled in Oregon City during the evening peak period (after assuming $222 million worth of investments) is expected to decrease nearly 13 percent through 2035, from about 3 miles to 2.5 miles per person. This is likely representative of job growth in Oregon City, as more residents have the option to work closer to home. In addition, the $60 million worth of investments in over 260 walking, biking, transit or other shared-use path projects in the 2013 TSP help reduce the need to drive for local trips in the City.



Revisiting the Plan at Congested Locations

After assuming $222 million worth of transportation system solutions, one location failed to meet the performance objectives of the TSP (Main Street/14th Street intersection). The system investments are expected to cause this intersection to move further away from meeting the intersection mobility target. This section details further improvements that are needed at this intersection to comply with the performance objectives of the TSP.

Main Street/14th Street intersection: After the investments were assumed to the transportation system, travel patterns evolved leading to increased congestion at the Main Street/14th Street intersection. Converting the intersection to all-way stop control, operations are still expected to be substandard. Further improvements are recommended at the intersection and the surrounding street network (shown in Figure 1), to include one of the following options:

Option 1:

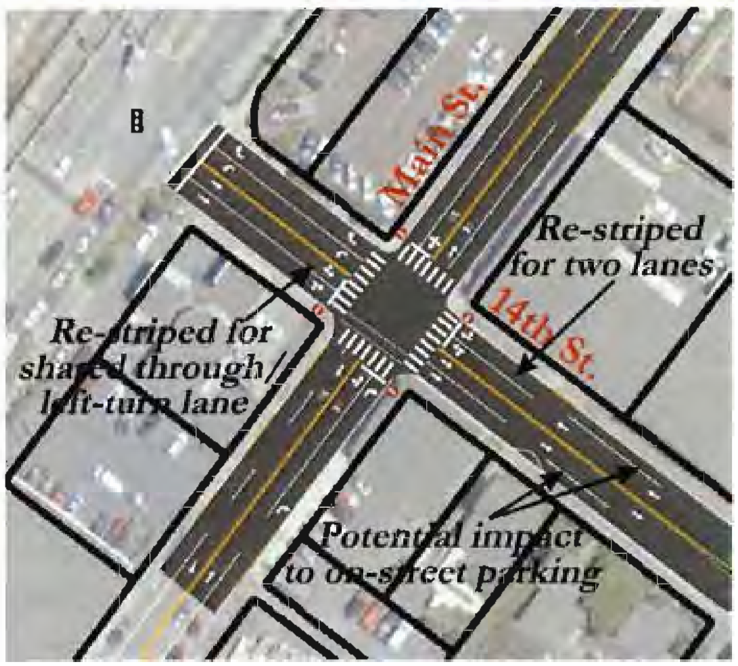
- **Convert 14th Street to one-way eastbound between McLoughlin Boulevard and John Adams Street (project D7):**
    - From McLoughlin Boulevard to Main Street, 14th Street would be restriped to include two 12-foot eastbound travel lanes, a six-foot eastbound bike lane, a six-foot westbound contra-flow bike lane, and an eight-foot landscaping buffer on the north side
    - From Main Street to Washington Street, 14th Street would be restriped to include two 11-foot eastbound travel lanes, a five-foot eastbound bike lane, a five-foot westbound contra-flow bike lane, and an eight-foot on-street parking lane on the north side
    - From Washington Street to John Adams Street, 14th Street would be restriped to include one 12-foot eastbound travel lane, a six-foot eastbound bike lane, a six-foot westbound contra-flow bike lane, and an eight-foot on-street parking lane on the north and south side
    - Add a bicycle signal, with detection at the McLoughlin Boulevard/14th Street intersection.
    - Add bicycle detection to the traffic signal at the Washington Street/14th Street intersection.
- **Convert 15th Street to one-way westbound between Washington Street and McLoughlin Boulevard (project D8):**
    - From John Adams Street to Washington Street, 15th Street would be striped as a shared-roadway (per project B6).
    - From Washington Street to Main Street, 15th Street would be restriped to include two 11-foot westbound travel lanes, a five-foot westbound bike lane, a five-foot eastbound contra-flow bike lane, and an eight-foot on-street parking lane on the south side. Complete the sidewalk gaps on the north side of 15th Street between Main Street and Center Street, and on the south side between Center Street and Washington Street (per project W75).
    - From Main Street to McLoughlin Boulevard, 15th Street would be restriped to include two 12-foot travel lanes, a six-foot westbound bike lane, and an eight-foot on-street parking lane on the south side. Add a 12-foot shared-use path with a two-foot buffer adjacent to the on-street parking lane.
    - Add bicycle detection to the traffic signal at the Washington Street/15th Street intersection.

Benefits: With these improvements, the intersection would be expected to operate within the mobility target through 2035. These improvements would also be expected to enhance circulation and improve safety for walking, biking and driving at the intersection and the surrounding street network. With the addition of bike lanes, sidewalk infill, additional parking stalls, and enhanced motor vehicle circulation, multiple TSP objectives would be satisfied.

Shortfalls: The clearance under the railroad crossing on 15th Street is not enough to accommodate large trucks. This would require reconstruction of the road bed along 15th Street to increase the clearance.

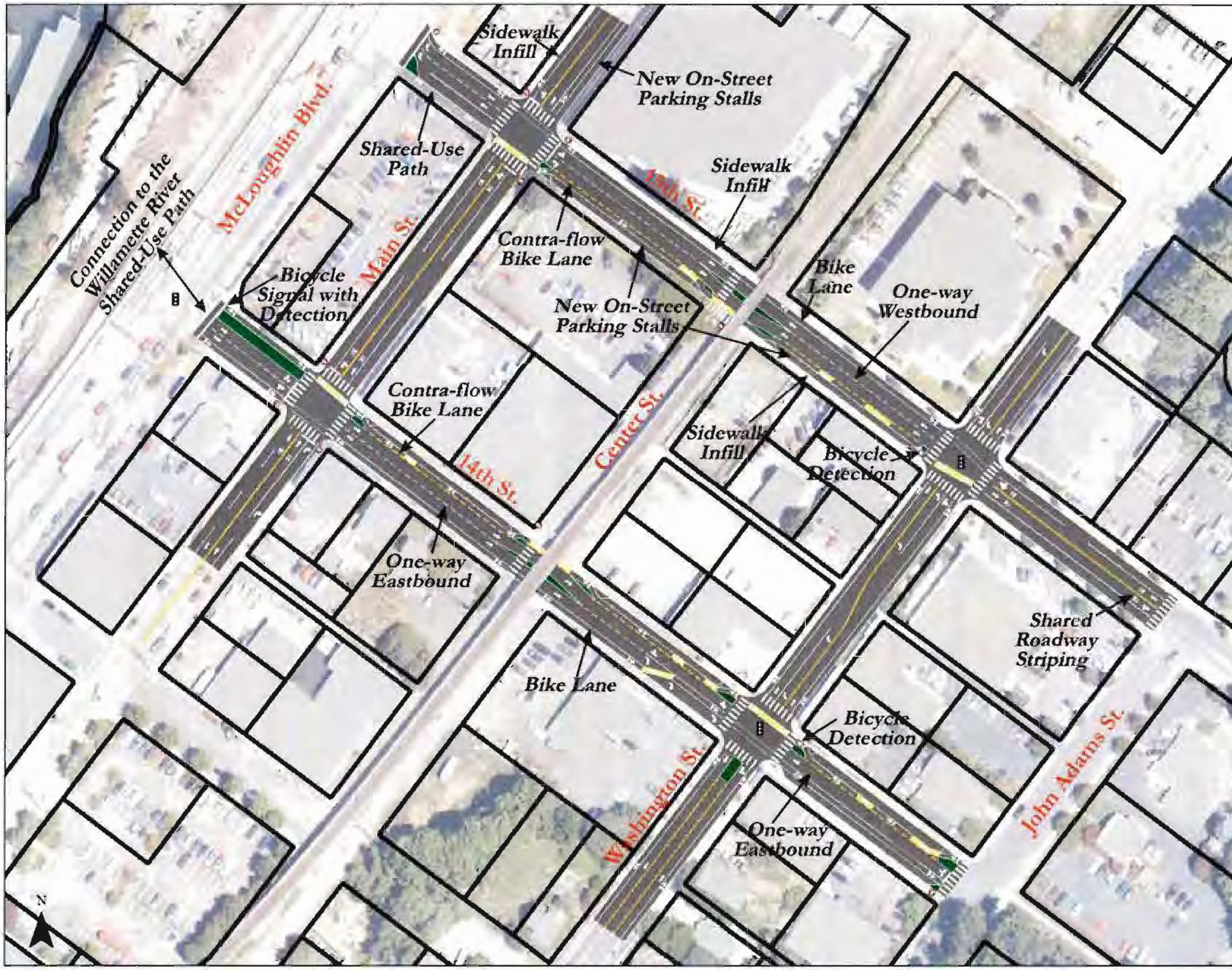
Option 2:

- **Widen 14th Street to include shared through/left-turn and through/right-turn lanes in both directions at the Main Street intersection (see image on the right).**



Benefits: With these improvements, the intersection would be expected to operate within the mobility target through 2035.

Shortfalls: Only approximately 50 feet of storage will be available for the north-westbound through/right-turn lane on 14th Street (without impacting the on-street parking along the north side of 14th Street). In addition, south-eastbound drivers along 14th Street (away from the Main Street intersection) would only have approximately 70 feet to merge into a single travel lane (without impacting the on-street parking along the south side of 14th Street). The intersection widening would also work against the TSP objective to enhance multi-modal travel.



OREGON CITY TRANSPORTATION PLAN

FIGURE 1

Option 1: Planned Improvements along 14th and 15th Streets

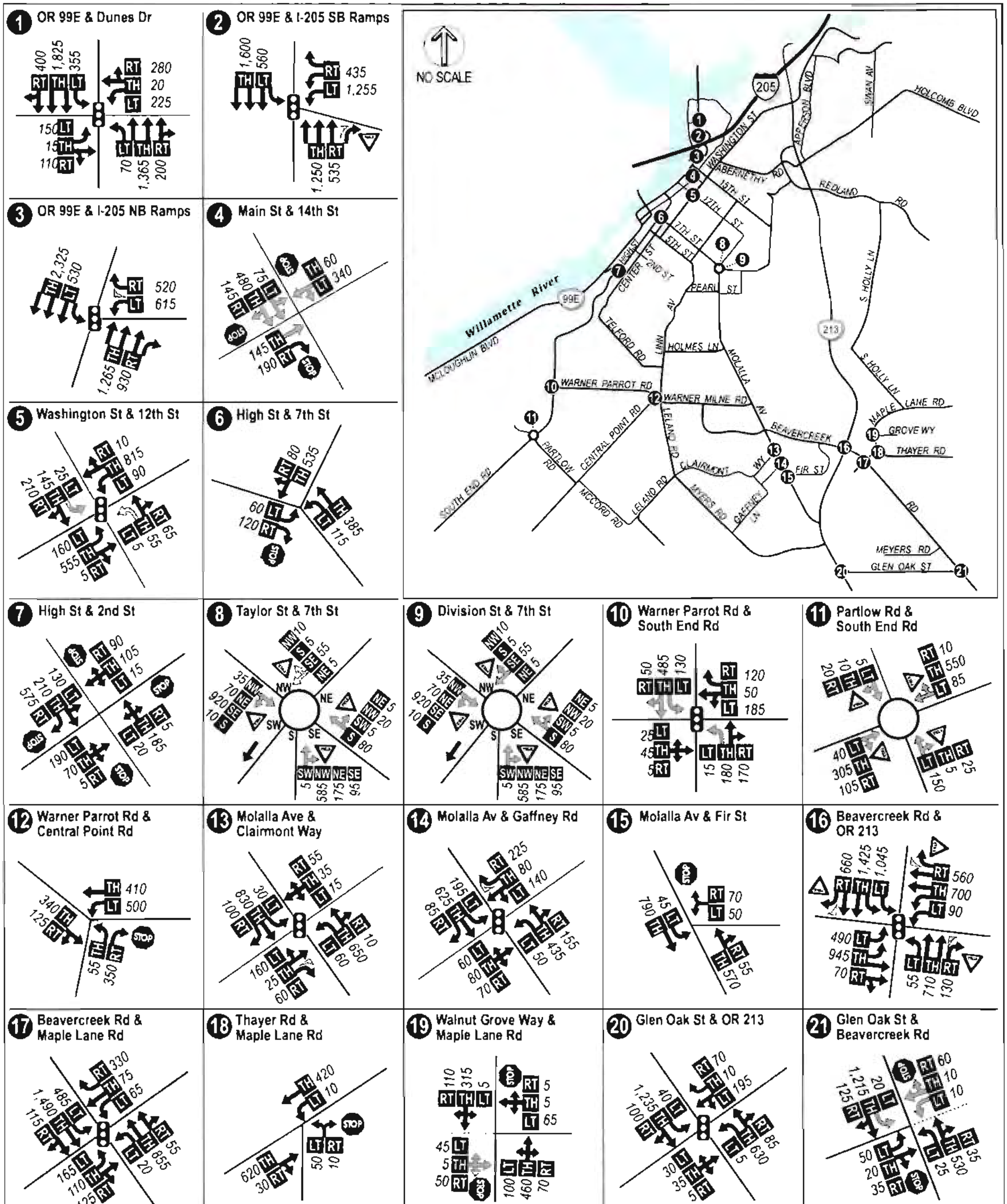
Legend

Traffic Signal

Stop Sign

DKS

Appendix



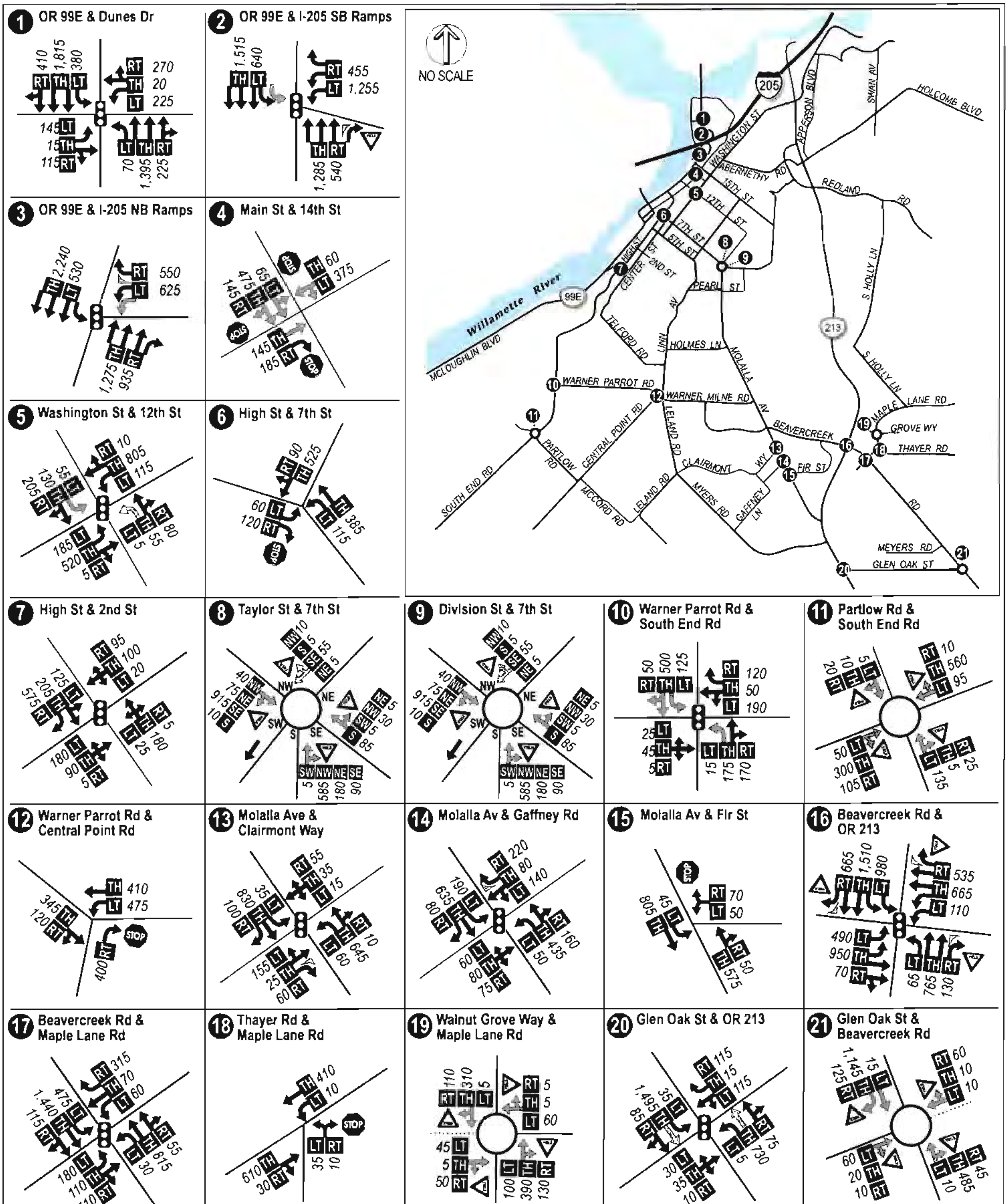
LEGEND

- 00 - Study Intersection & Number
- STOP - Stop Sign
- Traffic Signal
- Yield
- Existing Lane Configuration
- Planned Lane Configuration
- *00* - Design Hour Traffic Volume (PM)
- LT TH RT - Volume Turn Movement (Left-Thru-Right)

DKS Associates

Figure A1

2035 FINANCIALLY CONSTRAINED MOTOR VEHICLE VOLUMES (PM Peak Hour)



LEGEND

- 00 - Study Intersection & Number
- STOP - Stop Sign
- Traffic Signal
- Yield
- Existing Lane Configuration
- Planned Lane Configuration
- 00 - Design Hour Traffic Volume (PM)
- LT TH RT - Volume Turn Movement (Left • Thru • Right)

DKS Associates

Figure A2

2035 PLANNED SYSTEM MOTOR VEHICLE VOLUMES (PM Peak Hour)

Table A1: Intersection Operations (p.m. peak)

Intersection	Mobility Standard	2035 Baseline Conditions v/c Ratio	2035 Baseline Conditions LOS	2035 Baseline Conditions Delay (secs)	2035 Financially Constrained System Conditions v/c Ratio	2035 Financially Constrained System Conditions LOS	2035 Financially Constrained System Conditions Delay (secs)	2035 Planned System Conditions v/c Ratio	2035 Planned System Conditions LOS	2035 Planned System Conditions Delay (secs)	Planned Intersection Solution (Financially Constrained or Planned Transportation System)
Signalized Intersections under ODOT Jurisdiction (prior to implementing planned intersection solutions)											
OR 99E/Dunes Drive	v/c 1.10	0.94	C	32.1	0.97	C	34.7	0.99	D	44.7	N/A
OR 99E/I-205 SB Ramps	v/c 0.85	1.14	E	54.7	1.12	D	49.3	0.97	C	27.3	Add dual left-turn lanes on the southbound OR 99E approach to the southbound I-205 ramp (Planned System)
OR 99E/I-205 NB Ramps	v/c 0.85	1.11	D	51.1	1.06	D	48.5	0.97	D	35.8	Add dual left-turn lanes on the westbound I-205 Off-ramp approach to OR 99E (Planned System)
OR 213/ Beavercreek Road	v/c 0.99	1.07	F	84.3	1.05	E	73.4	1.05	E	73.9	Adaptive Signal Timing. Lengthen the dual left-turn lanes along Beavercreek Road to provide an additional 200 feet of storage for the eastbound approach (Financially Constrained System)
OR 213/Caufield-Glen Oak Road	v/c 0.99	0.95	D	47.7	1.01	E	63.5	0.64	B	16.3	Widen to five lanes, with two travel lanes in each direction, and a center turn lane/median (Planned System)
Signalized or All-way Stop Intersections under Oregon City or Clackamas County Jurisdiction (prior to implementing planned intersection solutions)											
High Street/2nd Street	v/c 0.99	1.02*	F	38.6	1.03*	E	36.4	0.55	A	9.1	Install a traffic signal (Planned System)
Molalla Avenue/ Division Street	v/c 0.99	1.00	B	18.2	0.97	B	13.8	0.99	B	15.6	Install a single-lane roundabout (Financially Constrained System)
Taylor Street/7th Street	v/c 0.99										
South End Road/ Warner Parrott Road	v/c 0.99	>1.20*	F	>100	0.60	A	9.3	0.61	A	9.5	Install a traffic signal with dedicated left turn lanes for the South End Road approaches to Warner Parrott Road (Financially Constrained System)
Molalla Avenue/	v/c 0.99	0.73	C	24.2	0.74	C	24.2	0.74	C	24.0	Adaptive Signal Timing (Financially Constrained

Clairmont Way											System)
Molalla Avenue/ Gaffney Lane	v/c 0.99	0.76	C	29.9	0.76	C	29.3	0.73	C	29.5	Adaptive Signal Timing (Financially Constrained System)
Maple Lane Road/ Beavercreek Road	v/c 0.99	1.10	E	78.6	0.81	D	36.3	0.79	D	35.3	Adaptive Signal Timing (Financially Constrained System)
Unsignalized Intersections under Oregon City or Clackamas County Jurisdiction (prior to implementing planned intersection solutions)**											
Main Street/14th Street	v/c 1.10	1.28	A/F	>100	1.26*	F	82.7	1.28*	F	88.4	Convert to an all-way stop (Financially Constrained System)
					0.84*	C	36.9	0.91*	D	47.4	Option 1: Convert to an all-way stop. Convert 14th Street to one-way eastbound between McLoughlin Boulevard and John Adams Street and restripe the 14th Street approaches to Main Street to include shared through/left-turn and through/right-turn lanes (Financially Constrained System)
					0.74*	C	18.6	0.76*	C	19.3	Option 2: Convert to an all-way stop. Widen 14th Street to include shared through/left-turn and through/right-turn lanes in both directions (Financially Constrained System)
Washington Street/ 12th Street	v/c 1.10	>1.20	A/F	>100	0.90	C	22.2	0.89	C	21.5	Install a traffic signal with dedicated left turn lanes for the 12th Street approaches to Washington Street (Financially Constrained System)
7th Street-Singer Hill/High Street	v/c 1.10	0.46	A/C	17.1	0.38	A/C	15.2	0.38	A/C	15.2	N/A
South End Road/ Lafayette Avenue-Partlow Road	v/c 0.99	>1.20	A/F	>100	0.65	A	8.9	0.66	A	9.0	Install a single-lane roundabout (Financially Constrained System)
Central Point Road/ Warner Parrott Road	v/c 0.99	>1.20	B/F	>100	>1.20	B/F	86.1	0.68	B/C	22.0	Restrict left turns from Central Point Road to Warner Parrott Road. Install a roundabout at the Linn Avenue-Leland Road/ Warner Parrott Road-Warner Milne Road intersection (Planned System)
Molalla Avenue/	v/c 0.99	0.47	A/C	19.3	0.48	A/C	19.1	0.49	A/C	19.4	N/A

Fir Street											
Maple Lane Road/ Thayer Road	v/c 0.99	**>1.20**	B/F	>100	0.40	A/C	24.7	0.40	A/C	21.9	N/A
Maple Lane Road/ Walnut Grove Way	v/c 0.99	0.81	A/F	>100	0.56	A/F	59.4	0.49	A	7.8	Install a single-lane roundabout (Planned System)
Beavercreek Road/ Glen Oak Road	v/c 0.99	0.73	A/F	58.2	0.83	A/E	46.6	0.76	A	4.3	Install a roundabout (Planned System)

* Intersection with all-way stop control; V/C reported for the worst movement, LOS and delay reported for the entire intersection

**V/C ratio, LOS and delay reported for the worst movement at unsignalized intersections

Bolded Red and Shaded indicates intersection exceeds mobility standard

2035 Financially Constrained Transportation System SIDRA and HCM Capacity Analysis Results

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	15	110	225	20	280	70	1365	200	355	1825	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		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	0.87		1.00	0.86		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1649	1521		1767	1592		1719	4898		1770	4739	
Flt Permitted	0.31	1.00		0.62	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	530	1521		1154	1592		1719	4898		1770	4739	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	155	15	113	232	21	289	72	1407	206	366	1881	412
RTOR Reduction (vph)	0	54	0	0	215	0	0	16	0	0	22	0
Lane Group Flow (vph)	155	74	0	232	95	0	72	1597	0	366	2271	0
Confl. Peds. (#/hr)	10		2	2		10	3					3
Heavy Vehicles (%)	9%	0%	8%	2%	12%	0%	5%	4%	3%	2%	6%	6%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	27.5	27.5		27.5	27.5		4.0	37.0		32.0	65.0	
Effective Green, g (s)	28.0	28.0		28.0	28.0		4.0	38.0		32.0	66.0	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.04	0.35		0.29	0.60	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.3	4.8		2.3	4.8	
Lane Grp Cap (vph)	135	387		294	405		63	1692		515	2843	
v/s Ratio Prot		0.05			0.06		0.04	c0.33		0.21	c0.48	
v/s Ratio Perm	c0.29			0.20								
v/c Ratio	1.15	0.19		0.79	0.23		1.14	0.94		0.71	0.80	
Uniform Delay, d1	41.0	32.1		38.2	32.5		53.0	35.0		34.9	16.9	
Progression Factor	1.00	1.00		1.00	1.00		0.87	0.82		1.00	1.00	
Incremental Delay, d2	122.8	0.2		12.7	0.2		122.6	6.8		4.1	2.4	
Delay (s)	163.8	32.3		50.9	32.7		168.5	35.5		39.0	19.3	
Level of Service	F	C		D	C		F	D		D	B	
Approach Delay (s)		104.3			40.5			41.2			22.0	
Approach LOS		F			D			D			C	

Intersection Summary			
HCM Average Control Delay	34.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	96.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	1255	435	1250	535	560	1600
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	3.5	4.0	4.0
Lane Util. Factor	0.97	1.00	0.91	1.00	1.00	0.91
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)	3367	1553	4988	1568	1736	4988
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3367	1553	4988	1568	1736	4988
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1321	458	1316	563	589	1684
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1321	458	1316	563	589	1684
Heavy Vehicles (%)	4%	4%	4%	3%	4%	4%
Turn Type	NA	pm+ov	NA	Free	Prot	NA
Protected Phases	4	5	6		5	2
Permitted Phases		4		Free		
Actuated Green, G (s)	37.0	69.0	28.5	110.0	32.0	64.5
Effective Green, g (s)	37.0	69.0	29.0	110.0	32.0	65.0
Actuated g/C Ratio	0.34	0.63	0.26	1.00	0.29	0.59
Clearance Time (s)	4.0	4.0	4.5		4.0	4.5
Vehicle Extension (s)	2.3	2.3	4.7		2.3	4.7
Lane Grp Cap (vph)	1133	1031	1315	1568	505	2947
v/s Ratio Prot	c0.39	0.13	c0.26		c0.34	0.34
v/s Ratio Perm		0.17		0.36		
v/c Ratio	1.17	0.44	1.00	0.36	1.17	0.57
Uniform Delay, d1	36.5	10.6	40.5	0.0	39.0	13.9
Progression Factor	1.00	1.00	0.37	1.00	0.91	0.39
Incremental Delay, d2	84.5	0.2	18.5	0.3	89.1	0.5
Delay (s)	121.0	10.8	33.3	0.3	124.7	6.0
Level of Service	F	B	C	A	F	A
Approach Delay (s)	92.6		23.4			36.7
Approach LOS	F		C			D

Intersection Summary			
HCM Average Control Delay	49.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	615	520	1265	930	530	2325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.91
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	1583	5036	1583	1736	5085
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	5036	1583	1736	5085
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	641	542	1318	969	552	2422
RTOR Reduction (vph)	0	0	0	39	0	0
Lane Group Flow (vph)	641	542	1318	930	552	2422
Heavy Vehicles (%)	2%	2%	3%	2%	4%	2%
Turn Type	NA	Free	NA	pm+ov	Prot	NA
Protected Phases	4		6	4	5	2
Permitted Phases		Free		6		
Actuated Green, G (s)	36.0	110.0	27.0	63.0	33.0	64.0
Effective Green, g (s)	37.0	110.0	28.0	65.0	33.0	65.0
Actuated g/C Ratio	0.34	1.00	0.25	0.59	0.30	0.59
Clearance Time (s)	5.0		5.0	5.0	4.0	5.0
Vehicle Extension (s)	2.3		4.8	2.3	2.3	4.8
Lane Grp Cap (vph)	595	1583	1282	993	521	3005
v/s Ratio Prot	c0.36		c0.26	0.32	c0.32	0.48
v/s Ratio Perm		0.34		0.27		
v/c Ratio	1.08	0.34	1.03	0.94	1.06	0.81
Uniform Delay, d1	36.5	0.0	41.0	20.6	38.5	17.6
Progression Factor	1.00	1.00	0.90	1.13	1.20	1.40
Incremental Delay, d2	59.5	0.6	31.5	14.4	45.7	1.3
Delay (s)	96.0	0.6	68.6	37.7	92.1	25.8
Level of Service	F	A	E	D	F	C
Approach Delay (s)	52.3		55.5			38.1
Approach LOS	D		E			D

Intersection Summary			
HCM Average Control Delay	46.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	75	480	145	65	395	10	60	85	190	5	25	35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	79	505	153	68	416	11	63	89	200	5	26	37

Direction, Lane #	SE 1	SE 2	NW 1	NE 1	NE 2	SW 1
Volume Total (vph)	79	658	495	153	200	68
Volume Left (vph)	79	0	68	63	0	5
Volume Right (vph)	0	153	11	0	200	37
Hadj (s)	0.50	-0.14	0.04	0.25	-0.61	-0.29
Departure Headway (s)	7.5	6.9	7.1	8.1	7.3	8.7
Degree Utilization, x	0.17	1.26	0.97	0.34	0.40	0.17
Capacity (veh/h)	465	529	495	434	485	395
Control Delay (s)	10.8	152.3	60.2	14.2	13.9	13.4
Approach Delay (s)	137.1		60.2	14.0		13.4
Approach LOS	F		F	B		B

Intersection Summary			
Delay	82.7		
HCM Level of Service	F		
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	25	145	210	5	55	65	160	555	5	90	815	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.92		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1795	1709		1803	1721		1736	1860		1805	1877	
Flt Permitted	0.67	1.00		0.25	1.00		0.10	1.00		0.33	1.00	
Satd. Flow (perm)	1270	1709		475	1721		189	1860		629	1877	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	153	221	5	58	68	168	584	5	95	858	11
RTOR Reduction (vph)	0	72	0	0	53	0	0	0	0	0	0	0
Lane Group Flow (vph)	26	302	0	5	73	0	168	589	0	95	869	0
Confl. Peds. (#/hr)	3		1	1		3	1					1
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	2%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	16.0	16.0		16.0	16.0		44.8	38.7		40.2	36.4	
Effective Green, g (s)	16.0	16.0		16.0	16.0		44.8	38.7		40.2	36.4	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.64	0.55		0.57	0.52	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	288	388		108	391		254	1021		422	969	
v/s Ratio Prot		c0.18			0.04		c0.06	0.32		0.01	c0.46	
v/s Ratio Perm	0.02			0.01			0.36			0.12		
v/c Ratio	0.09	0.78		0.05	0.19		0.66	0.58		0.23	0.90	
Uniform Delay, d1	21.5	25.6		21.3	22.0		13.2	10.5		7.5	15.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	9.5		0.2	0.2		6.3	0.8		0.3	10.8	
Delay (s)	21.6	35.1		21.5	22.2		19.5	11.3		7.8	26.1	
Level of Service	C	D		C	C		B	B		A	C	
Approach Delay (s)		34.2			22.2			13.1			24.3	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	70.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	60	120	115	385	535	80
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	63	126	121	405	563	84
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type				TWLTL	None	
Median storage veh)				2		
Upstream signal (ft)				424	1279	
pX, platoon unblocked	0.95					
vC, conflicting volume	1253	605	647			
vC1, stage 1 conf vol	605					
vC2, stage 2 conf vol	647					
vCu, unblocked vol	1239	605	647			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	75	87			
cM capacity (veh/h)	374	501	948			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	189	121	405	647
Volume Left	63	121	0	0
Volume Right	126	0	0	84
cSH	752	948	1700	1700
Volume to Capacity	0.25	0.13	0.24	0.38
Queue Length 95th (ft)	25	11	0	0
Control Delay (s)	15.2	9.4	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	15.2	2.2		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	130	210	575	20	185	5	190	70	5	15	105	90
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)	135	219	599	21	193	5	198	73	5	16	109	94

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	354	599	219	276	219
Volume Left (vph)	135	0	21	198	16
Volume Right (vph)	0	599	5	5	94
Hadj (s)	0.23	-0.68	0.03	0.13	-0.20
Departure Headway (s)	7.1	6.2	7.2	7.2	7.1
Degree Utilization, x	0.70	1.03	0.44	0.55	0.43
Capacity (veh/h)	501	599	468	477	480
Control Delay (s)	23.7	67.3	15.7	18.8	15.4
Approach Delay (s)	51.1		15.7	18.8	15.4
Approach LOS	F		C	C	C

Intersection Summary			
Delay	36.4		
HCM Level of Service	E		
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

MOVEMENT SUMMARY

Site: 7th/Molalla/Taylor/Division - Financially Constrained System

7th/Molalla/Taylor/Division
2035 Financially Constrained System - PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: RoadName											
3L	L	617	4.0	0.786	9.3	LOS A	13.5	347.7	0.80	0.61	24.3
8R	R	284	3.1	0.785	4.8	LOS A	13.5	347.7	0.80	0.54	24.8
Approach		901	3.7	0.785	7.9	LOS A	13.5	347.7	0.80	0.59	24.5
South East: RoadName											
11L	L	85	4.0	0.266	17.6	LOS B	2.1	53.5	0.88	0.96	21.9
16T	T	21	1.0	0.266	10.3	LOS B	2.1	53.5	0.88	0.89	23.2
16R	R	1	1.0	0.263	11.6	LOS B	2.1	53.5	0.88	0.90	23.1
Approach		107	3.4	0.266	16.1	LOS B	2.1	53.5	0.88	0.95	22.1
North East: RoadName											
17L	L	59	3.9	0.145	13.7	LOS B	1.1	27.4	0.79	0.85	23.0
14T	T	1	1.0	0.150	8.4	LOS A	1.1	27.4	0.79	0.75	24.1
14R	R	11	1.0	0.144	9.7	LOS A	1.1	27.4	0.79	0.78	23.9
Approach		71	3.5	0.145	13.1	LOS B	1.1	27.4	0.79	0.84	23.1
North West: RoadName											
15L	L	37	1.0	0.970	24.5	LOS C	38.6	987.3	1.00	1.00	20.2
12T	T	74	1.0	0.982	18.2	LOS B	38.6	987.3	1.00	1.00	20.9
12R	R	979	3.1	0.977	18.2	LOS B	38.6	987.3	1.00	1.01	20.9
Approach		1089	2.9	0.977	18.5	LOS C	38.6	987.3	1.00	1.01	20.8
All Vehicles		2168	3.3	0.977	13.8	LOS B	38.6	987.3	0.91	0.82	22.4

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

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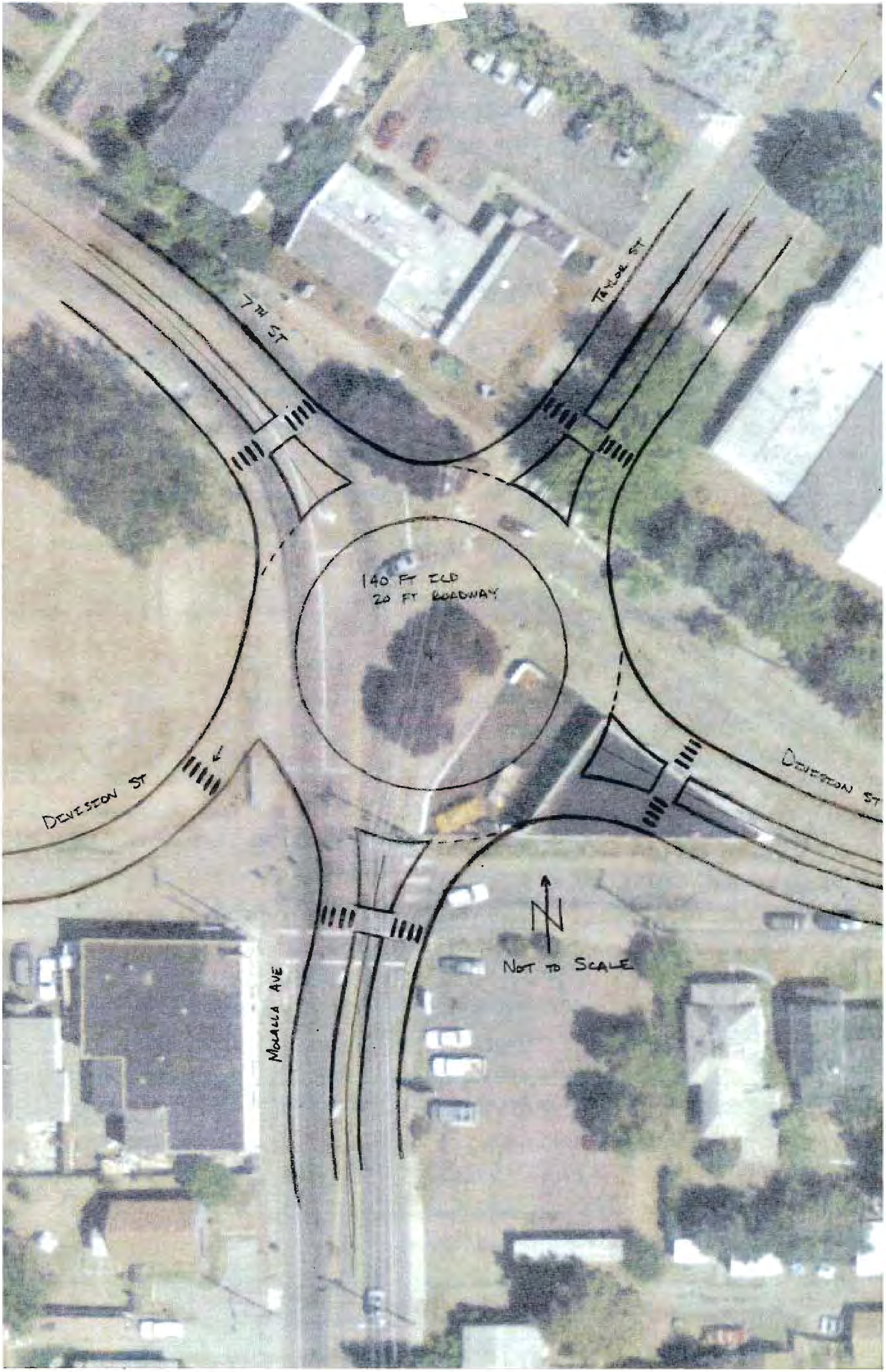
7th ST
TAYLOR ST
140 FT ICD
20 FT ROADWAY
DIVISION ST
DIVISION ST
MOLALLA AVE
N
NOT TO SCALE

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	45	5	185	50	120	15	180	170	130	485	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00			0.99	1.00	0.99	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.93		1.00	0.99	
Flt Protected		0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844			1778	1548	1793	1694		1797	1846	
Flt Permitted		0.87			0.72	1.00	0.33	1.00		0.50	1.00	
Satd. Flow (perm)		1628			1331	1548	627	1694		953	1846	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	47	5	195	53	126	16	189	179	137	511	53
RTOR Reduction (vph)	0	3	0	0	0	87	0	58	0	0	6	0
Lane Group Flow (vph)	0	75	0	0	248	39	16	310	0	137	558	0
Confl. Peds. (#/hr)	9		8	8		9	13		6	6		13
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	2%	2%	1%	0%	3%	2%	0%	1%	2%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		13.6			13.6	13.6	22.0	22.0		22.0	22.0	
Effective Green, g (s)		13.6			13.6	13.6	22.0	22.0		22.0	22.0	
Actuated g/C Ratio		0.31			0.31	0.31	0.50	0.50		0.50	0.50	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		508			415	483	316	855		481	931	
v/s Ratio Prot								0.18			c0.30	
v/s Ratio Perm		0.05			c0.19	0.03	0.03			0.14		
v/c Ratio		0.15			0.60	0.08	0.05	0.36		0.28	0.60	
Uniform Delay, d1		10.8			12.7	10.6	5.5	6.5		6.2	7.7	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			2.3	0.1	0.1	0.3		0.3	1.0	
Delay (s)		11.0			15.0	10.7	5.6	6.8		6.6	8.7	
Level of Service		B			B	B	A	A		A	A	
Approach Delay (s)		11.0			13.5			6.8			8.3	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	43.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

MOVEMENT SUMMARY

Site: Southend Road/Partlow Road - Financially Constrained Syst

Southend Rd/Partlow Rd
2035 Financially Constrained System - PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South East: Partlow Road											
11L	L	158	1.0	0.231	14.9	LOS B	1.6	41.1	0.58	0.78	28.5
16T	T	5	0.0	0.229	7.7	LOS A	1.6	41.1	0.58	0.61	30.8
16R	R	26	3.0	0.231	9.1	LOS A	1.6	41.1	0.58	0.66	30.7
Approach		189	1.3	0.231	13.9	LOS B	1.6	41.1	0.58	0.75	28.9
North East: South End Road											
17L	L	89	1.0	0.658	14.9	LOS B	7.8	196.8	0.71	0.81	29.3
14T	T	579	1.0	0.656	7.8	LOS A	7.8	196.8	0.71	0.65	31.0
14R	R	11	0.0	0.658	9.0	LOS A	7.8	196.8	0.71	0.69	31.0
Approach		679	1.0	0.656	8.7	LOS B	7.8	196.8	0.71	0.67	30.7
North West: Lafayette Avenue											
15L	L	5	0.0	0.075	18.7	LOS B	0.6	13.8	0.79	0.86	27.1
12T	T	11	0.0	0.075	11.5	LOS B	0.6	13.8	0.79	0.76	29.4
12R	R	21	0.0	0.075	12.8	LOS B	0.6	13.8	0.79	0.78	29.2
Approach		37	0.0	0.075	13.3	LOS B	0.6	13.8	0.79	0.79	28.9
South West: South End Road											
13L	L	42	0.0	0.405	13.0	LOS B	3.7	92.4	0.40	0.80	29.9
18T	T	321	0.0	0.403	5.8	LOS A	3.7	92.4	0.40	0.46	32.5
18R	R	111	1.0	0.403	7.1	LOS A	3.7	92.4	0.40	0.55	32.1
Approach		474	0.2	0.403	6.8	LOS B	3.7	92.4	0.40	0.51	32.2
All Vehicles		1379	0.7	0.656	8.9	LOS A	7.8	196.8	0.58	0.63	30.9

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

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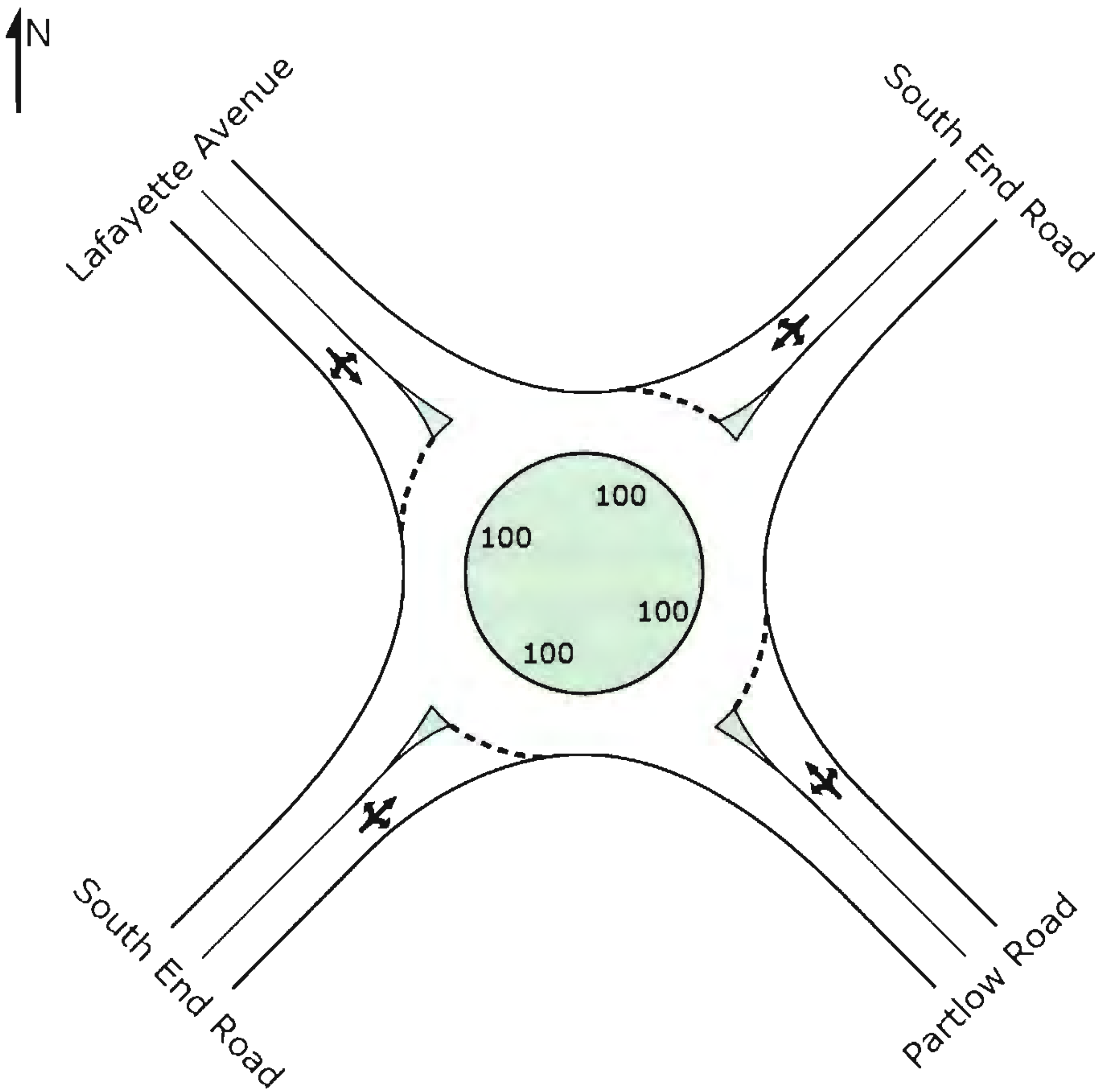

N
Lafayette Avenue
South End Road
100
100
100
100
South End Road
Partlow Road

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Volume (veh/h)	340	125	500	410	55	350
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	358	132	526	432	58	368
Pedestrians				1	5	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			494		1913	430
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			494		1913	430
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			51		0	41
cM capacity (veh/h)			1075		37	624

Direction, Lane #	EB 1	WB 1	WB 2	NE 1	NE 2
Volume Total	489	526	432	58	368
Volume Left	0	526	0	58	0
Volume Right	132	0	0	0	368
cSH	1700	1075	1700	37	624
Volume to Capacity	0.29	0.49	0.25	1.55	0.59
Queue Length 95th (ft)	0	69	0	153	96
Control Delay (s)	0.0	11.5	0.0	514.9	18.7
Lane LOS		B		F	C
Approach Delay (s)	0.0	6.3		86.1	
Approach LOS				F	

Intersection Summary			
Average Delay	22.8		
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	60	650	10	30	830	100	160	25	60	15	35	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	
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	0.96		1.00	0.96		0.95	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.95	1.00		1.00	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		0.99	
Satd. Flow (prot)	1805	1876		1805	1863	1542		1736	1499		1664	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.61	1.00		0.94	
Satd. Flow (perm)	1805	1876		1805	1863	1542		1108	1499		1583	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	684	11	32	874	105	168	26	63	16	37	58
RTOR Reduction (vph)	0	0	0	0	0	17	0	0	50	0	37	0
Lane Group Flow (vph)	63	695	0	32	874	88	0	194	13	0	74	0
Confl. Peds. (#/hr)	7		13	13		7	27		10	10		27
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	0%	3%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases						2	8		8	4		
Actuated Green, G (s)	6.4	71.6		3.7	68.9	68.9		21.7	21.7		21.7	
Effective Green, g (s)	6.4	72.1		3.7	69.4	69.4		22.2	22.2		22.2	
Actuated g/C Ratio	0.06	0.66		0.03	0.63	0.63		0.20	0.20		0.20	
Clearance Time (s)	4.0	4.5		4.0	4.5	4.5		4.5	4.5		4.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0		2.5	2.5		2.5	
Lane Grp Cap (vph)	105	1230		61	1175	973		224	303		319	
v/s Ratio Prot	0.03	c0.37		0.02	c0.47							
v/s Ratio Perm						0.06		c0.18	0.01		0.05	
v/c Ratio	0.60	0.56		0.52	0.74	0.09		0.87	0.04		0.23	
Uniform Delay, d1	50.6	10.4		52.3	14.1	7.9		42.5	35.3		36.8	
Progression Factor	1.09	1.11		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	6.1	1.5		6.1	4.3	0.2		27.4	0.0		0.3	
Delay (s)	61.1	13.1		58.4	18.4	8.1		69.9	35.4		37.0	
Level of Service	E	B		E	B	A		E	D		D	
Approach Delay (s)		17.0			18.6			61.4			37.0	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM Average Control Delay	24.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	50	435	155	195	625	85	60	80	70	140	80	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	0.95		0.98			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			0.98	1.00
Frt	1.00	0.96		1.00	1.00	0.85		0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.97	1.00
Satd. Flow (prot)	1805	1788		1787	1845	1509		1698			1789	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.69			0.57	1.00
Satd. Flow (perm)	1805	1788		1787	1845	1509		1182			1059	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	458	163	205	658	89	63	84	74	147	84	237
RTOR Reduction (vph)	0	11	0	0	0	18	0	17	0	0	0	177
Lane Group Flow (vph)	53	610	0	205	658	71	0	204	0	0	231	60
Confl. Peds. (#/hr)	9		16	16		9			16	16		
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	0%	6%	2%	1%	2%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases						2	8			4		4
Actuated Green, G (s)	6.2	53.0		17.8	64.6	64.6		26.2			26.2	26.2
Effective Green, g (s)	6.2	53.5		17.8	65.1	65.1		26.7			26.7	26.7
Actuated g/C Ratio	0.06	0.49		0.16	0.59	0.59		0.24			0.24	0.24
Clearance Time (s)	4.0	4.5		4.0	4.5	4.5		4.5			4.5	4.5
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0		2.5			2.5	2.5
Lane Grp Cap (vph)	102	870		289	1092	893		287			257	392
v/s Ratio Prot	0.03	c0.34		c0.11	0.36							
v/s Ratio Perm						0.05		0.17			c0.22	0.04
v/c Ratio	0.52	0.70		0.71	0.60	0.08		0.71			0.90	0.15
Uniform Delay, d1	50.5	22.0		43.7	14.2	9.6		38.1			40.3	32.8
Progression Factor	1.00	1.00		0.73	0.52	0.56		1.00			1.00	1.00
Incremental Delay, d2	3.3	4.7		5.3	1.8	0.1		7.3			30.6	0.1
Delay (s)	53.8	26.7		37.2	9.2	5.5		45.4			70.9	32.9
Level of Service	D	C		D	A	A		D			E	C
Approach Delay (s)		28.8			14.9			45.4			51.7	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	29.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	50	70	570	55	45	790
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	52	73	594	57	47	823
Pedestrians	6		1			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	1		0			
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						481
pX, platoon unblocked	0.77					
vC, conflicting volume	1546	628			657	
vC1, stage 1 conf vol	628					
vC2, stage 2 conf vol	918					
vCu, unblocked vol	1560	628			657	
tC, single (s)	6.4	6.2			4.3	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.4	
p0 queue free %	82	85			94	
cM capacity (veh/h)	293	478			847	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	125	651	47	823
Volume Left	52	0	47	0
Volume Right	73	57	0	0
cSH	379	1700	847	1700
Volume to Capacity	0.33	0.38	0.06	0.48
Queue Length 95th (ft)	35	0	4	0
Control Delay (s)	19.1	0.0	9.5	0.0
Lane LOS	C		A	
Approach Delay (s)	19.1	0.0	0.5	
Approach LOS	C			

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	490	945	70	90	700	560	55	710	130	1045	1425	660
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	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	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	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3521		3502	3610	1583	1703	3505	1599	3433	3505	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3521		3502	3610	1583	1703	3505	1599	3433	3505	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	516	995	74	95	737	589	58	747	137	1100	1500	695
RTOR Reduction (vph)	0	5	0	0	0	386	0	0	68	0	0	269
Lane Group Flow (vph)	516	1064	0	95	737	203	58	747	69	1100	1500	426
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Prot	Prot	NA	Prot	Prot	NA	Prot
Protected Phases	7	4		3	8	8	1	6	6	5	2	2
Permitted Phases												
Actuated Green, G (s)	14.7	31.1		4.1	20.5	20.5	4.0	20.8	20.8	32.5	49.3	49.3
Effective Green, g (s)	15.2	31.6		4.6	21.0	21.0	4.5	22.8	22.8	33.0	51.3	51.3
Actuated g/C Ratio	0.14	0.28		0.04	0.19	0.19	0.04	0.20	0.20	0.29	0.46	0.46
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	466	993		144	677	297	68	714	326	1012	1605	725
v/s Ratio Prot	0.15	c0.30		0.03	c0.20	0.13	0.03	c0.21	0.04	c0.32	0.43	0.27
v/s Ratio Perm												
v/c Ratio	1.11	1.07		0.66	1.09	0.68	0.85	1.05	0.21	1.09	0.93	0.59
Uniform Delay, d1	48.4	40.2		52.9	45.5	42.4	53.4	44.6	37.1	39.5	28.8	22.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	74.2	49.7		8.8	61.2	5.5	59.8	46.4	0.6	55.0	10.8	1.8
Delay (s)	122.6	89.9		61.8	106.7	48.0	113.2	91.0	37.7	94.5	39.6	24.3
Level of Service	F	F		E	F	D	F	F	D	F	D	C
Approach Delay (s)		100.6			79.3			84.6			54.7	
Approach LOS		F			E			F			D	

Intersection Summary			
HCM Average Control Delay	73.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	485	1490	115	20	855	55	165	110	125	65	75	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		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	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3500		1805	3511		1803	1748		1805	1900	1578
Flt Permitted	0.95	1.00		0.95	1.00		0.44	1.00		0.38	1.00	1.00
Satd. Flow (perm)	1770	3500		1805	3511		843	1748		717	1900	1578
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	511	1568	121	21	900	58	174	116	132	68	79	347
RTOR Reduction (vph)	0	3	0	0	3	0	0	29	0	0	0	77
Lane Group Flow (vph)	511	1686	0	21	955	0	174	219	0	68	79	270
Confl. Peds. (#/hr)			1	1			2					2
Heavy Vehicles (%)	2%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Prot	NA		Prot	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases							8			4		4
Actuated Green, G (s)	40.1	82.0		2.9	44.8		30.6	18.8		17.4	10.1	50.2
Effective Green, g (s)	40.1	82.5		2.9	45.3		31.1	19.3		18.4	10.6	50.2
Actuated g/C Ratio	0.31	0.64		0.02	0.35		0.24	0.15		0.14	0.08	0.39
Clearance Time (s)	4.0	4.5		4.0	4.5		4.5	4.5		4.5	4.5	4.0
Vehicle Extension (s)	2.5	4.0		2.5	4.0		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	552	2247		41	1238		327	263		169	157	616
v/s Ratio Prot	c0.29	c0.48		0.01	0.27		c0.07	c0.13		0.02	0.04	0.14
v/s Ratio Perm							0.06			0.03		0.03
v/c Ratio	0.93	0.75		0.51	0.77		0.53	0.83		0.40	0.50	0.44
Uniform Delay, d1	42.8	15.9		62.1	37.0		41.0	53.0		49.1	56.4	28.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	21.5	2.4		7.8	4.7		1.3	19.4		1.1	1.8	0.4
Delay (s)	64.3	18.2		69.9	41.7		42.3	72.4		50.2	58.3	29.2
Level of Service	E	B		E	D		D	E		D	E	C
Approach Delay (s)		28.9			42.3			60.0			36.7	
Approach LOS		C			D			E			D	

Intersection Summary			
HCM Average Control Delay	36.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	128.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	50	10	620	30	10	420
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	53	11	653	32	11	442
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			391			
pX, platoon unblocked						
vC, conflicting volume	1132	668			684	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1132	668			684	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	98			99	
cM capacity (veh/h)	224	461			919	

Direction, Lane #	WB 1	NE 1	SW 1	SW 2
Volume Total	63	684	11	442
Volume Left	53	0	11	0
Volume Right	11	32	0	0
cSH	245	1700	919	1700
Volume to Capacity	0.26	0.40	0.01	0.26
Queue Length 95th (ft)	25	0	1	0
Control Delay (s)	24.7	0.0	9.0	0.0
Lane LOS	C		A	
Approach Delay (s)	24.7	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	5	50	65	5	5	100	460	70	5	315	110
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	47	5	53	68	5	5	105	484	74	5	332	116
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								982				
pX, platoon unblocked												
vC, conflicting volume	1139	1168	389	1187	1189	521	447			558		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1139	1168	389	1187	1189	521	447			558		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	70	97	92	48	97	99	91			99		
cM capacity (veh/h)	159	174	659	131	169	559	1113			1023		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	105	79	663	453
Volume Left	47	68	105	5
Volume Right	53	5	74	116
cSH	258	140	1113	1023
Volume to Capacity	0.41	0.56	0.09	0.01
Queue Length 95th (ft)	47	70	8	0
Control Delay (s)	28.2	59.4	2.4	0.2
Lane LOS	D	F	A	A
Approach Delay (s)	28.2	59.4	2.4	0.2
Approach LOS	D	F		

Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	35	5	195	10	70	5	630	85	40	1235	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1753			1814	1599	1357	1787		1805	1820	
Flt Permitted		0.63			0.67	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1134			1280	1599	1357	1787		1805	1820	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	37	5	205	11	74	5	663	89	42	1300	105
RTOR Reduction (vph)	0	2	0	0	0	61	0	4	0	0	2	0
Lane Group Flow (vph)	0	72	0	0	216	13	5	748	0	42	1403	0
Heavy Vehicles (%)	4%	0%	50%	0%	0%	1%	33%	5%	0%	0%	3%	6%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4						
Actuated Green, G (s)		21.9			21.9	21.9	0.8	80.8		7.8	87.8	
Effective Green, g (s)		22.4			22.4	22.4	0.8	82.8		7.8	89.8	
Actuated g/C Ratio		0.18			0.18	0.18	0.01	0.66		0.06	0.72	
Clearance Time (s)		4.5			4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)		2.5			2.5	2.5	2.3	4.5		2.3	4.5	
Lane Grp Cap (vph)		203			229	287	9	1184		113	1307	
v/s Ratio Prot							0.00	0.42		c0.02	c0.77	
v/s Ratio Perm		0.06			c0.17	0.01						
v/c Ratio		0.35			0.94	0.05	0.56	0.63		0.37	1.07	
Uniform Delay, d1		44.9			50.7	42.5	61.9	12.2		56.2	17.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.31	2.31	
Incremental Delay, d2		0.8			43.6	0.0	43.5	2.6		1.0	45.6	
Delay (s)		45.7			94.3	42.5	105.4	14.8		74.6	86.3	
Level of Service		D			F	D	F	B		E	F	
Approach Delay (s)		45.7			81.1			15.4			86.0	
Approach LOS		D			F			B			F	

Intersection Summary			
HCM Average Control Delay	63.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	20	1215	125	25	530	35	50	20	35	10	10	60
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	1279	132	26	558	37	53	21	37	11	11	63
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	595			1411			2066	2034	1345	1997	2082	576
vC1, stage 1 conf vol							1387	1387		629	629	
vC2, stage 2 conf vol							679	647		1368	1453	
vCu, unblocked vol	595			1411			2066	2034	1345	1997	2082	576
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			95			65	89	80	89	93	88
cM capacity (veh/h)	981			490			151	185	184	97	155	517

Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	NE 2	SW 1	SW 2
Volume Total	21	1411	26	595	53	58	11	74
Volume Left	21	0	26	0	53	0	11	0
Volume Right	0	132	0	37	0	37	0	63
cSH	981	1700	490	1700	151	184	97	387
Volume to Capacity	0.02	0.83	0.05	0.35	0.35	0.31	0.11	0.19
Queue Length 95th (ft)	2	0	4	0	36	32	9	17
Control Delay (s)	8.7	0.0	12.8	0.0	41.0	33.3	46.6	16.5
Lane LOS	A		B		E	D	E	C
Approach Delay (s)	0.1		0.5		36.9		20.2	
Approach LOS					E		C	

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		

2035 Planned Transportation System SIDRA and HCM Capacity Analysis Results

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	15	115	225	20	270	70	1395	225	380	1815	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		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	0.87		1.00	0.86		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1649	1519		1768	1592		1719	4890		1770	4735	
Flt Permitted	0.32	1.00		0.61	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	549	1519		1129	1592		1719	4890		1770	4735	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	149	15	119	232	21	278	72	1438	232	392	1871	423
RTOR Reduction (vph)	0	55	0	0	209	0	0	20	0	0	23	0
Lane Group Flow (vph)	149	79	0	232	91	0	72	1650	0	392	2271	0
Confl. Peds. (#/hr)	10		2	2		10	3					3
Heavy Vehicles (%)	9%	0%	8%	2%	12%	0%	5%	4%	3%	2%	6%	6%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	27.0	27.0		27.0	27.0		4.0	33.6		35.9	65.5	
Effective Green, g (s)	27.5	27.5		27.5	27.5		4.0	34.6		35.9	66.5	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.04	0.31		0.33	0.60	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.3	4.8		2.3	4.8	
Lane Grp Cap (vph)	137	380		282	398		63	1538		578	2863	
v/s Ratio Prot		0.05			0.06		0.04	c0.34		0.22	c0.48	
v/s Ratio Perm	c0.27			0.21								
v/c Ratio	1.09	0.21		0.82	0.23		1.14	1.07		0.68	0.79	
Uniform Delay, d1	41.2	32.6		38.9	32.8		53.0	37.7		32.1	16.5	
Progression Factor	1.00	1.00		1.00	1.00		0.87	0.78		1.00	1.00	
Incremental Delay, d2	102.3	0.2		17.0	0.2		125.3	40.1		2.7	2.4	
Delay (s)	143.5	32.8		55.9	33.0		171.2	69.6		34.8	18.9	
Level of Service	F	C		E	C		F	E		C	B	
Approach Delay (s)		91.1			43.0			73.8			21.2	
Approach LOS		F			D			E			C	

Intersection Summary			
HCM Average Control Delay	44.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	1255	455	1285	540	640	1515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	3.5	4.0	4.0
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.91
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)	3367	1553	4988	1568	3367	4988
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3367	1553	4988	1568	3367	4988
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1321	479	1353	568	674	1595
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1321	479	1353	568	674	1595
Heavy Vehicles (%)	4%	4%	4%	3%	4%	4%
Turn Type	NA	pm+ov	NA	Free	Prot	NA
Protected Phases	4	5	6		5	2
Permitted Phases		4		Free		
Actuated Green, G (s)	44.0	67.0	30.5	110.0	23.0	57.5
Effective Green, g (s)	44.0	67.0	31.0	110.0	23.0	58.0
Actuated g/C Ratio	0.40	0.61	0.28	1.00	0.21	0.53
Clearance Time (s)	4.0	4.0	4.5		4.0	4.5
Vehicle Extension (s)	2.3	2.3	4.7		2.3	4.7
Lane Grp Cap (vph)	1347	1002	1406	1568	704	2630
v/s Ratio Prot	c0.39	0.10	c0.27		c0.20	0.32
v/s Ratio Perm		0.21		0.36		
v/c Ratio	0.98	0.48	0.96	0.36	0.96	0.61
Uniform Delay, d1	32.6	11.9	38.9	0.0	43.0	18.1
Progression Factor	1.00	1.00	0.35	1.00	0.93	0.47
Incremental Delay, d2	19.9	0.2	11.7	0.4	18.3	0.7
Delay (s)	52.5	12.1	25.5	0.4	58.3	9.2
Level of Service	D	B	C	A	E	A
Approach Delay (s)	41.7		18.1			23.8
Approach LOS	D		B			C

Intersection Summary			
HCM Average Control Delay	27.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	625	550	1275	935	530	2240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.91	1.00	1.00	0.91
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)	3433	1583	5036	1583	1736	5085
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1583	5036	1583	1736	5085
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	651	573	1328	974	552	2333
RTOR Reduction (vph)	0	0	0	47	0	0
Lane Group Flow (vph)	651	573	1328	927	552	2333
Heavy Vehicles (%)	2%	2%	3%	2%	4%	2%
Turn Type	NA	Free	NA	pm+ov	Prot	NA
Protected Phases	4		6	4	5	2
Permitted Phases		Free		6		
Actuated Green, G (s)	32.0	110.0	29.0	61.0	35.0	68.0
Effective Green, g (s)	33.0	110.0	30.0	63.0	35.0	69.0
Actuated g/C Ratio	0.30	1.00	0.27	0.57	0.32	0.63
Clearance Time (s)	5.0		5.0	5.0	4.0	5.0
Vehicle Extension (s)	2.3		4.8	2.3	2.3	4.8
Lane Grp Cap (vph)	1030	1583	1373	964	552	3190
v/s Ratio Prot	0.19		0.26	c0.29	c0.32	0.46
v/s Ratio Perm		0.36		0.30		
v/c Ratio	0.63	0.36	0.97	0.96	1.00	0.73
Uniform Delay, d1	33.3	0.0	39.5	22.4	37.5	14.1
Progression Factor	1.00	1.00	0.87	1.03	1.16	1.33
Incremental Delay, d2	1.0	0.6	16.7	19.1	29.8	0.9
Delay (s)	34.3	0.6	51.2	42.1	73.4	19.7
Level of Service	C	A	D	D	E	B
Approach Delay (s)	18.5		47.4			29.9
Approach LOS	B		D			C

Intersection Summary			
HCM Average Control Delay	34.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	65	475	145	65	395	10	50	95	185	40	35	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	68	500	153	68	416	11	53	100	195	42	37	26

Direction, Lane #	SE 1	SE 2	NW 1	NE 1	NE 2	SW 1
Volume Total (vph)	68	653	495	153	195	105
Volume Left (vph)	68	0	68	53	0	42
Volume Right (vph)	0	153	11	0	195	26
Hadj (s)	0.50	-0.14	0.04	0.22	-0.61	-0.05
Departure Headway (s)	7.7	7.1	7.4	8.3	7.5	9.0
Degree Utilization, x	0.15	1.28	1.01	0.35	0.41	0.26
Capacity (veh/h)	457	519	495	425	471	386
Control Delay (s)	10.8	161.2	70.6	14.6	14.4	15.2
Approach Delay (s)	147.0		70.6	14.5		15.2
Approach LOS	F		F	B		C

Intersection Summary			
Delay	88.4		
HCM Level of Service	F		
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↰	↑↱		↰	↑↱		↰	↑↱		↰	↑↱	
Volume (vph)	55	130	205	5	55	80	185	520	5	115	805	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1795	1702		1803	1704		1736	1860		1805	1877	
Flt Permitted	0.63	1.00		0.27	1.00		0.10	1.00		0.38	1.00	
Satd. Flow (perm)	1199	1702		510	1704		186	1860		718	1877	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	137	216	5	58	84	195	547	5	121	847	11
RTOR Reduction (vph)	0	79	0	0	66	0	0	0	0	0	0	0
Lane Group Flow (vph)	58	274	0	5	76	0	195	552	0	121	858	0
Confl. Peds. (#/hr)	3		1	1		3	1					1
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	2%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	14.9	14.9		14.9	14.9		46.4	39.3		39.8	36.0	
Effective Green, g (s)	14.9	14.9		14.9	14.9		46.4	39.3		39.8	36.0	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.66	0.56		0.57	0.51	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	255	362		109	363		281	1044		467	965	
v/s Ratio Prot		c0.16			0.04		c0.07	0.30		0.01	c0.46	
v/s Ratio Perm	0.05			0.01			0.39			0.13		
v/c Ratio	0.23	0.76		0.05	0.21		0.69	0.53		0.26	0.89	
Uniform Delay, d1	22.8	25.9		21.9	22.7		13.8	9.6		7.3	15.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	8.8		0.2	0.3		7.2	0.5		0.3	10.0	
Delay (s)	23.2	34.6		22.1	23.0		21.0	10.1		7.6	25.2	
Level of Service	C	C		C	C		C	B		A	C	
Approach Delay (s)		33.0			23.0			12.9			23.0	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	21.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	60	120	115	385	525	90
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	63	126	121	405	553	95
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type				TWLTL	None	
Median storage veh)				2		
Upstream signal (ft)				424	1279	
pX, platoon unblocked	0.95					
vC, conflicting volume	1247	600	647			
vC1, stage 1 conf vol	600					
vC2, stage 2 conf vol	647					
vCu, unblocked vol	1234	600	647			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	75	87			
cM capacity (veh/h)	375	505	948			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	189	121	405	647
Volume Left	63	121	0	0
Volume Right	126	0	0	95
cSH	757	948	1700	1700
Volume to Capacity	0.25	0.13	0.24	0.38
Queue Length 95th (ft)	25	11	0	0
Control Delay (s)	15.2	9.4	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	15.2	2.2		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	205	575	25	180	5	180	90	5	20	100	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0			4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00			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		1.00			1.00			0.94	
Flt Protected		0.98	1.00		0.99			0.97			1.00	
Satd. Flow (prot)		1828	1599		1851			1835			1731	
Flt Permitted		0.81	1.00		0.94			0.71			0.96	
Satd. Flow (perm)		1504	1599		1756			1350			1666	
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)	130	214	599	26	188	5	188	94	5	21	104	99
RTOR Reduction (vph)	0	0	336	0	2	0	0	1	0	0	51	0
Lane Group Flow (vph)	0	344	263	0	217	0	0	286	0	0	173	0
Confl. Peds. (#/hr)									5	5		
Heavy Vehicles (%)	2%	2%	1%	0%	2%	0%	0%	0%	0%	0%	2%	4%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		17.9	17.9		17.9			14.9			14.9	
Effective Green, g (s)		17.9	17.9		17.9			14.9			14.9	
Actuated g/C Ratio		0.44	0.44		0.44			0.37			0.37	
Clearance Time (s)		4.0	4.0		4.0			4.0			4.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		660	702		770			493			608	
v/s Ratio Prot												
v/s Ratio Perm		c0.23	0.16		0.12			c0.21			0.10	
v/c Ratio		0.52	0.37		0.28			0.58			0.28	
Uniform Delay, d1		8.3	7.7		7.3			10.4			9.2	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		0.7	0.3		0.2			1.7			0.3	
Delay (s)		9.1	8.0		7.5			12.1			9.4	
Level of Service		A	A		A			B			A	
Approach Delay (s)		8.4			7.5			12.1			9.4	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM Average Control Delay	9.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	40.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

MOVEMENT SUMMARY

Site: 7th/Molalla/Taylor/Division - Planned System

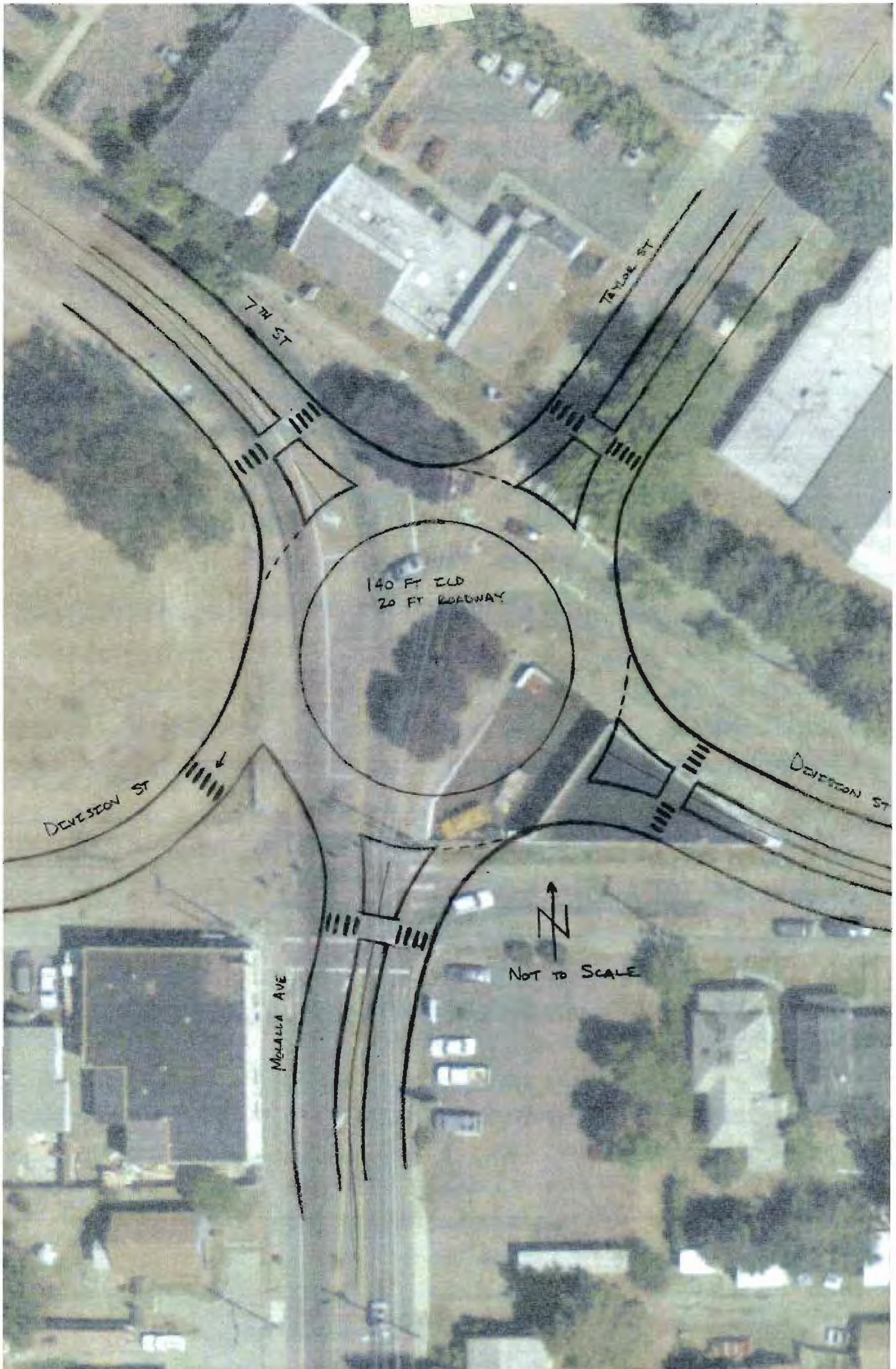
7th/Molalla/Taylor/Division
2035 Planned System - PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: RoadName											
3L	L	617	4.0	0.800	9.6	LOS A	13.9	356.6	0.85	0.63	24.3
8R	R	284	3.0	0.801	4.9	LOS A	13.9	356.6	0.85	0.57	24.6
Approach		901	3.7	0.801	8.1	LOS A	13.9	356.6	0.85	0.61	24.4
South East: RoadName											
11L	L	91	4.0	0.314	17.9	LOS B	2.5	64.5	0.90	0.98	21.8
16T	T	32	1.0	0.316	10.6	LOS B	2.5	64.5	0.90	0.92	23.1
16R	R	1	1.0	0.351	11.9	LOS B	2.5	64.5	0.90	0.93	23.0
Approach		123	3.2	0.315	16.0	LOS B	2.5	64.5	0.90	0.96	22.1
North East: RoadName											
17L	L	59	3.9	0.149	14.0	LOS B	1.1	28.4	0.80	0.86	22.9
14T	T	1	1.0	0.150	8.6	LOS A	1.1	28.4	0.80	0.76	24.0
14R	R	11	1.0	0.150	9.9	LOS A	1.1	28.4	0.80	0.79	23.8
Approach		71	3.5	0.149	13.3	LOS B	1.1	28.4	0.80	0.85	23.0
North West: RoadName											
15L	L	42	1.0	0.979	27.9	LOS C	42.2	1080.0	1.00	1.09	19.2
12T	T	79	1.0	0.987	21.7	LOS C	42.2	1080.0	1.00	1.09	19.7
12R	R	974	3.1	0.991	21.7	LOS C	42.2	1080.0	1.00	1.10	19.7
Approach		1095	2.8	0.990	21.9	LOS C	42.2	1080.0	1.00	1.09	19.7
All Vehicles		2189	3.2	0.990	15.6	LOS B	42.2	1080.0	0.93	0.88	21.7

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

SIDRA INTERSECTION



7TH ST
TAYLOR ST
140 FT ICD
20 FT ROADWAY
DIVISION ST
DIVISION ST
N
NOT TO SCALE
MOLALLA AVE

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	45	5	190	50	120	15	175	170	125	500	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00			0.99	1.00	0.99	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.93		1.00	0.99	
Flt Protected		0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844			1778	1548	1793	1692		1796	1847	
Flt Permitted		0.87			0.72	1.00	0.32	1.00		0.51	1.00	
Satd. Flow (perm)		1627			1329	1548	602	1692		960	1847	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	47	5	200	53	126	16	184	179	132	526	53
RTOR Reduction (vph)	0	3	0	0	0	86	0	60	0	0	6	0
Lane Group Flow (vph)	0	75	0	0	253	40	16	303	0	132	573	0
Confl. Peds. (#/hr)	9		8	8		9	13		6	6		13
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	2%	2%	1%	0%	3%	2%	0%	1%	2%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		13.8			13.8	13.8	22.2	22.2		22.2	22.2	
Effective Green, g (s)		13.8			13.8	13.8	22.2	22.2		22.2	22.2	
Actuated g/C Ratio		0.31			0.31	0.31	0.50	0.50		0.50	0.50	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		510			417	486	304	854		484	932	
v/s Ratio Prot								0.18			c0.31	
v/s Ratio Perm		0.05			c0.19	0.03	0.03			0.14		
v/c Ratio		0.15			0.61	0.08	0.05	0.35		0.27	0.61	
Uniform Delay, d1		10.9			12.8	10.6	5.5	6.6		6.3	7.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			2.5	0.1	0.1	0.3		0.3	1.2	
Delay (s)		11.0			15.3	10.7	5.6	6.8		6.6	9.0	
Level of Service		B			B	B	A	A		A	A	
Approach Delay (s)		11.0			13.8			6.8			8.6	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	44.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

MOVEMENT SUMMARY

Site: Southend Road/Partlow Road - Planned System

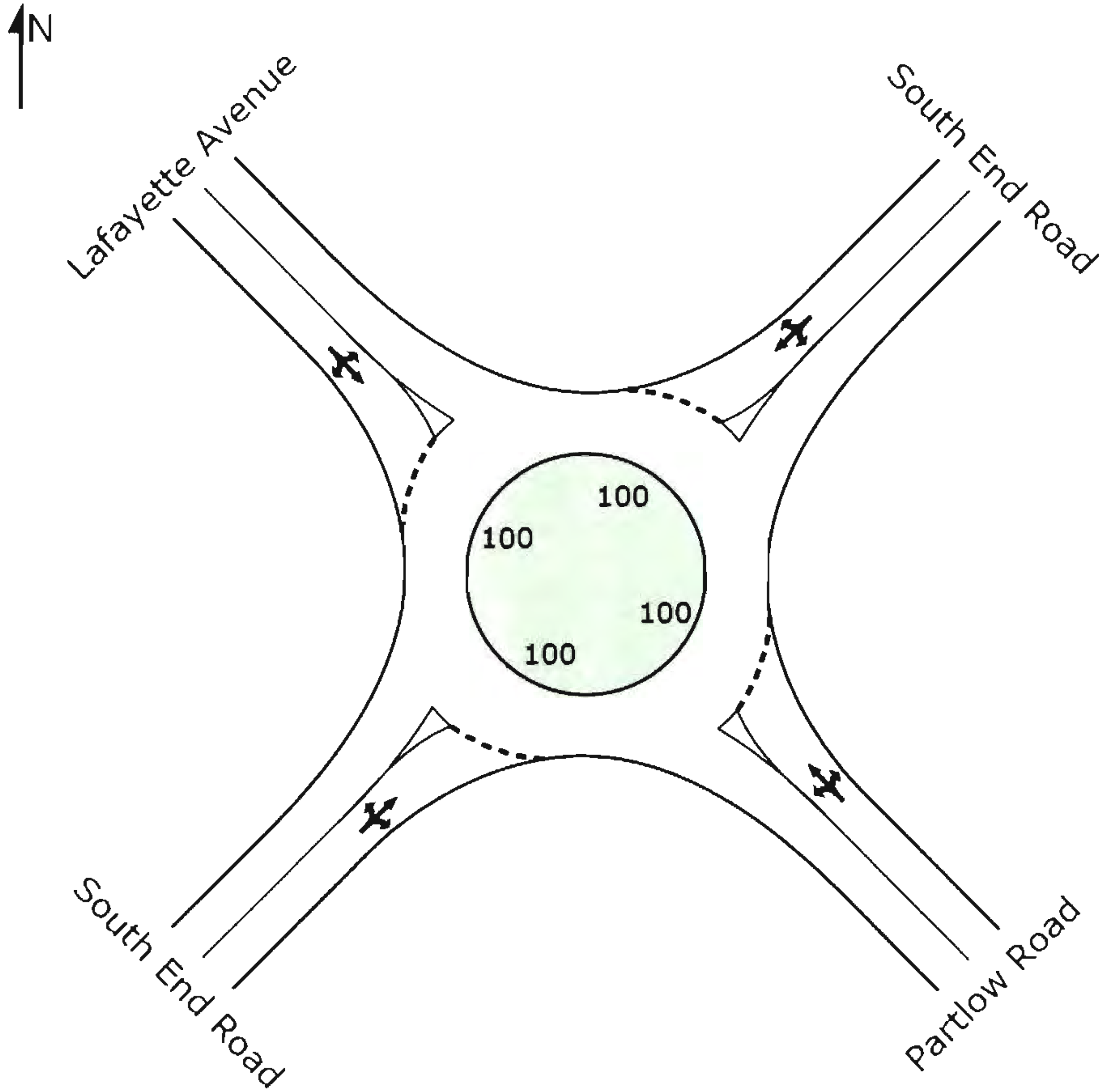
Southend Rd/Partlow Rd
2035 Planned System - PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South East: Partlow Road											
11L	L	142	1.0	0.213	14.9	LOS B	1.5	37.7	0.58	0.77	28.6
16T	T	5	0.0	0.211	7.7	LOS A	1.5	37.7	0.58	0.61	30.9
16R	R	26	3.0	0.214	9.1	LOS A	1.5	37.7	0.58	0.66	30.7
Approach		174	1.3	0.213	13.8	LOS B	1.5	37.7	0.58	0.75	28.9
North East: South End Road											
17L	L	100	1.0	0.667	15.0	LOS B	8.2	205.6	0.71	0.81	29.3
14T	T	589	1.0	0.669	7.8	LOS A	8.2	205.6	0.71	0.65	30.9
14R	R	11	0.0	0.658	9.0	LOS A	8.2	205.6	0.71	0.68	31.0
Approach		700	1.0	0.669	8.8	LOS B	8.2	205.6	0.71	0.67	30.7
North West: Lafayette Avenue											
15L	L	5	0.0	0.076	18.8	LOS B	0.6	14.1	0.80	0.86	27.0
12T	T	11	0.0	0.076	11.6	LOS B	0.6	14.1	0.80	0.76	29.4
12R	R	21	0.0	0.076	12.8	LOS B	0.6	14.1	0.80	0.79	29.1
Approach		37	0.0	0.076	13.3	LOS B	0.6	14.1	0.80	0.79	28.8
South West: South End Road											
13L	L	53	0.0	0.414	13.1	LOS B	3.8	95.8	0.42	0.79	29.9
18T	T	316	0.0	0.415	5.9	LOS A	3.8	95.8	0.42	0.48	32.4
18R	R	111	1.0	0.416	7.2	LOS A	3.8	95.8	0.42	0.55	32.0
Approach		479	0.2	0.415	7.0	LOS B	3.8	95.8	0.42	0.53	32.0
All Vehicles		1389	0.7	0.669	9.0	LOS A	8.2	205.6	0.60	0.63	30.8

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

SIDRA INTERSECTION



N
Lafayette Avenue
South End Road
South End Road
Partlow Road
100
100
100
100

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Volume (veh/h)	345	120	475	410	0	400
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	363	126	500	432	0	421
Pedestrians				1	5	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			494		1863	432
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			494		1863	432
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			53		100	32
cM capacity (veh/h)			1075		42	622

Direction, Lane #	EB 1	WB 1	WB 2	NE 1
Volume Total	489	500	432	421
Volume Left	0	500	0	0
Volume Right	126	0	0	421
cSH	1700	1075	1700	622
Volume to Capacity	0.29	0.47	0.25	0.68
Queue Length 95th (ft)	0	63	0	130
Control Delay (s)	0.0	11.2	0.0	22.0
Lane LOS		B		C
Approach Delay (s)	0.0	6.0		22.0
Approach LOS				C

Intersection Summary			
Average Delay	8.1		
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	60	645	10	35	830	100	155	25	60	15	35	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	
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	0.96		1.00	0.96		0.95	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.95	1.00		1.00	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		0.99	
Satd. Flow (prot)	1805	1876		1805	1863	1542		1736	1498		1664	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.61	1.00		0.94	
Satd. Flow (perm)	1805	1876		1805	1863	1542		1106	1498		1584	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	679	11	37	874	105	163	26	63	16	37	58
RTOR Reduction (vph)	0	0	0	0	0	16	0	0	51	0	37	0
Lane Group Flow (vph)	63	690	0	37	874	89	0	189	12	0	74	0
Confl. Peds. (#/hr)	7		13	13		7	27		10	10		27
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	0%	3%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases						2	8		8	4		
Actuated Green, G (s)	6.4	71.7		4.0	69.3	69.3		21.3	21.3		21.3	
Effective Green, g (s)	6.4	72.2		4.0	69.8	69.8		21.8	21.8		21.8	
Actuated g/C Ratio	0.06	0.66		0.04	0.63	0.63		0.20	0.20		0.20	
Clearance Time (s)	4.0	4.5		4.0	4.5	4.5		4.5	4.5		4.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0		2.5	2.5		2.5	
Lane Grp Cap (vph)	105	1231		66	1182	978		219	297		314	
v/s Ratio Prot	0.03	c0.37		0.02	c0.47							
v/s Ratio Perm						0.06		c0.17	0.01		0.05	
v/c Ratio	0.60	0.56		0.56	0.74	0.09		0.86	0.04		0.24	
Uniform Delay, d1	50.6	10.3		52.1	13.8	7.8		42.7	35.7		37.1	
Progression Factor	1.09	1.09		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	6.1	1.5		8.5	4.2	0.2		27.5	0.0		0.3	
Delay (s)	61.0	12.7		60.7	18.0	8.0		70.2	35.7		37.4	
Level of Service	E	B		E	B	A		E	D		D	
Approach Delay (s)		16.8			18.5			61.5			37.4	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	50	435	160	190	635	80	60	80	75	140	80	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	0.95		0.98			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			0.98	1.00
Frt	1.00	0.96		1.00	1.00	0.85		0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.97	1.00
Satd. Flow (prot)	1805	1785		1787	1845	1509		1693			1789	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.69			0.57	1.00
Satd. Flow (perm)	1805	1785		1787	1845	1509		1189			1048	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	458	168	200	668	84	63	84	79	147	84	232
RTOR Reduction (vph)	0	11	0	0	0	17	0	18	0	0	0	173
Lane Group Flow (vph)	53	615	0	200	668	67	0	208	0	0	231	59
Confl. Peds. (#/hr)	9		16	16		9			16	16		
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	0%	6%	2%	1%	2%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases						2	8			4		4
Actuated Green, G (s)	6.2	52.7		17.9	64.4	64.4		26.4			26.4	26.4
Effective Green, g (s)	6.2	53.2		17.9	64.9	64.9		26.9			26.9	26.9
Actuated g/C Ratio	0.06	0.48		0.16	0.59	0.59		0.24			0.24	0.24
Clearance Time (s)	4.0	4.5		4.0	4.5	4.5		4.5			4.5	4.5
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0		2.5			2.5	2.5
Lane Grp Cap (vph)	102	863		291	1089	890		291			256	395
v/s Ratio Prot	0.03	c0.34		0.11	c0.36							
v/s Ratio Perm						0.04		0.17			c0.22	0.04
v/c Ratio	0.52	0.71		0.69	0.61	0.08		0.71			0.90	0.15
Uniform Delay, d1	50.5	22.4		43.4	14.5	9.7		38.0			40.3	32.6
Progression Factor	1.00	1.00		0.73	0.52	0.57		1.00			1.00	1.00
Incremental Delay, d2	3.3	5.0		4.4	1.9	0.1		7.5			31.7	0.1
Delay (s)	53.8	27.3		36.3	9.4	5.6		45.6			72.0	32.7
Level of Service	D	C		D	A	A		D			E	C
Approach Delay (s)		29.4			14.7			45.6			52.3	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	29.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	50	70	575	50	45	805
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	52	73	599	52	47	839
Pedestrians	6		1			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	1		0			
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						481
pX, platoon unblocked	0.76					
vC, conflicting volume	1564	631			657	
vC1, stage 1 conf vol	631					
vC2, stage 2 conf vol	933					
vCu, unblocked vol	1584	631			657	
tC, single (s)	6.4	6.2			4.3	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.4	
p0 queue free %	82	85			94	
cM capacity (veh/h)	287	477			847	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	125	651	47	839
Volume Left	52	0	47	0
Volume Right	73	52	0	0
cSH	374	1700	847	1700
Volume to Capacity	0.33	0.38	0.06	0.49
Queue Length 95th (ft)	36	0	4	0
Control Delay (s)	19.4	0.0	9.5	0.0
Lane LOS	C		A	
Approach Delay (s)	19.4	0.0	0.5	
Approach LOS	C			

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	490	950	70	110	665	535	65	765	130	980	1510	665
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	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	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	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3522		3502	3610	1583	1703	3505	1599	3433	3505	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3522		3502	3610	1583	1703	3505	1599	3433	3505	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	516	1000	74	116	700	563	68	805	137	1032	1589	700
RTOR Reduction (vph)	0	5	0	0	0	364	0	0	69	0	0	275
Lane Group Flow (vph)	516	1069	0	116	700	199	68	805	68	1032	1589	425
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Prot	Prot	NA	Prot	Prot	NA	Prot
Protected Phases	7	4		3	8	8	1	6	6	5	2	2
Permitted Phases												
Actuated Green, G (s)	15.2	31.1		4.1	20.0	20.0	4.0	22.3	22.3	31.0	49.3	49.3
Effective Green, g (s)	15.7	31.6		4.6	20.5	20.5	4.5	24.3	24.3	31.5	51.3	51.3
Actuated g/C Ratio	0.14	0.28		0.04	0.18	0.18	0.04	0.22	0.22	0.28	0.46	0.46
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	481	994		144	661	290	68	760	347	966	1605	725
v/s Ratio Prot	0.15	c0.30		0.03	c0.19	0.13	0.04	0.23	0.04	c0.30	c0.45	0.27
v/s Ratio Perm												
v/c Ratio	1.07	1.08		0.81	1.06	0.69	1.00	1.06	0.20	1.07	0.99	0.59
Uniform Delay, d1	48.1	40.2		53.3	45.8	42.8	53.8	43.9	35.9	40.2	30.1	22.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	61.9	51.1		26.0	51.7	5.8	109.1	49.5	0.5	49.0	20.1	1.7
Delay (s)	110.1	91.3		79.3	97.4	48.5	162.9	93.3	36.4	89.3	50.2	24.2
Level of Service	F	F		E	F	D	F	F	D	F	D	C
Approach Delay (s)		97.4			75.9			90.3			56.9	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM Average Control Delay	73.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	475	1440	115	30	815	55	180	110	110	60	70	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		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	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3499		1805	3510		1803	1758		1805	1900	1578
Flt Permitted	0.95	1.00		0.95	1.00		0.45	1.00		0.42	1.00	1.00
Satd. Flow (perm)	1770	3499		1805	3510		860	1758		790	1900	1578
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	500	1516	121	32	858	58	189	116	116	63	74	332
RTOR Reduction (vph)	0	4	0	0	3	0	0	26	0	0	0	75
Lane Group Flow (vph)	500	1633	0	32	913	0	189	206	0	63	74	257
Confl. Peds. (#/hr)			1	1			2					2
Heavy Vehicles (%)	2%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Prot	NA		Prot	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases							8			4		4
Actuated Green, G (s)	38.7	80.9		3.1	45.3		29.8	18.2		16.5	9.4	48.1
Effective Green, g (s)	38.7	81.4		3.1	45.8		30.3	18.7		17.5	9.9	48.1
Actuated g/C Ratio	0.31	0.64		0.02	0.36		0.24	0.15		0.14	0.08	0.38
Clearance Time (s)	4.0	4.5		4.0	4.5		4.5	4.5		4.5	4.5	4.0
Vehicle Extension (s)	2.5	4.0		2.5	4.0		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	540	2246		44	1268		327	259		170	148	599
v/s Ratio Prot	c0.28	c0.47		0.02	0.26		c0.07	c0.12		0.02	0.04	0.13
v/s Ratio Perm							0.06			0.03		0.03
v/c Ratio	0.93	0.73		0.73	0.72		0.58	0.80		0.37	0.50	0.43
Uniform Delay, d1	42.7	15.2		61.4	35.0		41.1	52.2		48.9	56.1	29.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	21.9	2.1		43.0	3.5		2.0	15.1		1.0	1.9	0.4
Delay (s)	64.6	17.3		104.4	38.5		43.2	67.3		49.8	58.0	29.5
Level of Service	E	B		F	D		D	E		D	E	C
Approach Delay (s)		28.4			40.7			56.5			36.8	
Approach LOS		C			D			E			D	

Intersection Summary			
HCM Average Control Delay	35.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	126.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	35	10	610	30	10	410
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	37	11	642	32	11	432
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			391			
pX, platoon unblocked						
vC, conflicting volume	1111	658			674	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1111	658			674	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	98			99	
cM capacity (veh/h)	231	468			927	

Direction, Lane #	WB 1	NE 1	SW 1	SW 2
Volume Total	47	674	11	432
Volume Left	37	0	11	0
Volume Right	11	32	0	0
cSH	260	1700	927	1700
Volume to Capacity	0.18	0.40	0.01	0.25
Queue Length 95th (ft)	16	0	1	0
Control Delay (s)	21.9	0.0	8.9	0.0
Lane LOS	C		A	
Approach Delay (s)	21.9	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	45	5	50	60	5	5	100	390	130	5	310	110
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	47	5	53	63	5	5	105	411	137	5	326	116
Approach Volume (veh/h)		105			74			653			447	
Crossing Volume (veh/h)		395			563			58			174	
High Capacity (veh/h)		1015			887			1324			1209	
High v/c (veh/h)		0.10			0.08			0.49			0.37	
Low Capacity (veh/h)		827			714			1106			1001	
Low v/c (veh/h)		0.13			0.10			0.59			0.45	

Intersection Summary			
Maximum v/c High	0.49		
Maximum v/c Low	0.59		
Intersection Capacity Utilization	74.1%	ICU Level of Service	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	35	10	115	15	115	5	730	75	35	1495	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.98			1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1685			1820	1599	1357	3405		1805	3471	
Flt Permitted		0.77			0.66	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1323			1260	1599	1357	3405		1805	3471	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	37	11	121	16	121	5	768	79	37	1574	89
RTOR Reduction (vph)	0	5	0	0	0	103	0	5	0	0	2	0
Lane Group Flow (vph)	0	75	0	0	137	18	5	842	0	37	1661	0
Heavy Vehicles (%)	4%	0%	50%	0%	0%	1%	33%	5%	0%	0%	3%	6%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4						
Actuated Green, G (s)		17.9			17.9	17.9	0.8	87.4		5.2	91.8	
Effective Green, g (s)		18.4			18.4	18.4	0.8	89.4		5.2	93.8	
Actuated g/C Ratio		0.15			0.15	0.15	0.01	0.72		0.04	0.75	
Clearance Time (s)		4.5			4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)		2.5			2.5	2.5	2.3	4.5		2.3	4.5	
Lane Grp Cap (vph)		195			185	235	9	2435		75	2605	
v/s Ratio Prot							0.00	0.25		c0.02	c0.48	
v/s Ratio Perm		0.06			c0.11	0.01						
v/c Ratio		0.38			0.74	0.08	0.56	0.35		0.49	0.64	
Uniform Delay, d1		48.2			51.0	46.0	61.9	6.7		58.6	7.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.19	1.43	
Incremental Delay, d2		0.9			14.0	0.1	43.5	0.4		2.7	1.1	
Delay (s)		49.1			65.0	46.1	105.4	7.1		72.3	11.8	
Level of Service		D			E	D	F	A		E	B	
Approach Delay (s)		49.1			56.1			7.7			13.1	
Approach LOS		D			E			A			B	

Intersection Summary			
HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Right Turn Channelized												
Volume (veh/h)	15	1145	125	10	485	45	60	20	10	10	10	60
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	1205	132	11	511	47	63	21	11	11	11	63
Approach Volume (veh/h)		1353			568			95			84	
Crossing Volume (veh/h)		32			100			1232#			584	
High Capacity (veh/h)		1351			1281			514			873	
High v/c (veh/h)		1.00			0.44			0.18			0.10	
Low Capacity (veh/h)		1131			1067			391			701	
Low v/c (veh/h)		1.20			0.53			0.24			0.12	

Intersection Summary			
Maximum v/c High	1.00		
Maximum v/c Low	1.20		
Intersection Capacity Utilization	86.3%	ICU Level of Service	E

Crossing flow exceeds 1200, method is not applicable

Main Street/14th Street Supplemental Improvement HCM Capacity Analysis Results

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	75	480	145	0	0	0	0	145	190	340	60	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	79	505	153	0	0	0	0	153	200	358	63	0

Direction, Lane #	SE 1	SE 2	NE 1	NE 2	SW 1
Volume Total (vph)	332	405	153	200	421
Volume Left (vph)	79	0	0	0	358
Volume Right (vph)	0	153	0	200	0
Hadj (s)	0.14	-0.24	0.07	-0.61	0.18
Departure Headway (s)	7.1	6.7	7.5	6.8	7.1
Degree Utilization, x	0.65	0.75	0.32	0.38	0.84
Capacity (veh/h)	493	528	464	509	490
Control Delay (s)	21.0	25.7	12.7	12.7	36.9
Approach Delay (s)	23.6		12.7		36.9
Approach LOS	C		B		E

Intersection Summary			
Delay	24.8		
HCM Level of Service	C		
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	65	475	145	0	0	0	0	145	185	375	60	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	68	500	153	0	0	0	0	153	195	395	63	0

Direction, Lane #	SE 1	SE 2	NE 1	NE 2	SW 1
Volume Total (vph)	318	403	153	195	458
Volume Left (vph)	68	0	0	0	395
Volume Right (vph)	0	153	0	195	0
Hadj (s)	0.13	-0.24	0.07	-0.61	0.18
Departure Headway (s)	7.1	6.8	7.6	6.9	7.1
Degree Utilization, x	0.63	0.76	0.32	0.37	0.91
Capacity (veh/h)	494	520	459	504	458
Control Delay (s)	20.4	26.5	12.9	12.6	47.4
Approach Delay (s)	23.8		12.7		47.4
Approach LOS	C		B		E

Intersection Summary			
Delay	28.4		
HCM Level of Service	D		
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	65	475	145	65	395	10	50	95	185	40	35	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	68	500	153	68	416	11	53	100	195	42	37	26

Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	NE 2	SW 1
Volume Total (vph)	318	403	276	218	153	195	105
Volume Left (vph)	68	0	68	0	53	0	42
Volume Right (vph)	0	153	0	11	0	195	26
Hadj (s)	0.13	-0.24	0.15	0.00	0.22	-0.61	-0.05
Departure Headway (s)	7.2	6.8	7.5	7.3	8.1	7.3	8.2
Degree Utilization, x	0.64	0.76	0.58	0.45	0.34	0.39	0.24
Capacity (veh/h)	488	517	459	475	414	471	409
Control Delay (s)	20.7	27.0	18.9	14.9	14.1	13.7	13.7
Approach Delay (s)	24.2		17.2		13.8		13.7
Approach LOS	C		C		B		B

Intersection Summary			
Delay	19.3		
HCM Level of Service	C		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	75	480	145	65	395	10	60	85	190	5	25	35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	79	505	153	68	416	11	63	89	200	5	26	37

Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	NE 2	SW 1
Volume Total (vph)	332	405	276	218	153	200	68
Volume Left (vph)	79	0	68	0	63	0	5
Volume Right (vph)	0	153	0	11	0	200	37
Hadj (s)	0.14	-0.24	0.15	0.00	0.25	-0.61	-0.29
Departure Headway (s)	7.0	6.6	7.3	7.2	8.0	7.1	7.9
Degree Utilization, x	0.64	0.74	0.56	0.43	0.34	0.39	0.15
Capacity (veh/h)	501	532	470	487	422	482	418
Control Delay (s)	20.6	25.1	18.0	14.3	13.8	13.4	12.3
Approach Delay (s)	23.1		16.4		13.6		12.3
Approach LOS	C		C		B		B

Intersection Summary			
Delay	18.6		
HCM Level of Service	C		
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

2035 Planned Transportation System Supplemental Intersection SIDRA Analysis Results

MOVEMENT SUMMARY

Site: Warner Milne/Linn - Planned System

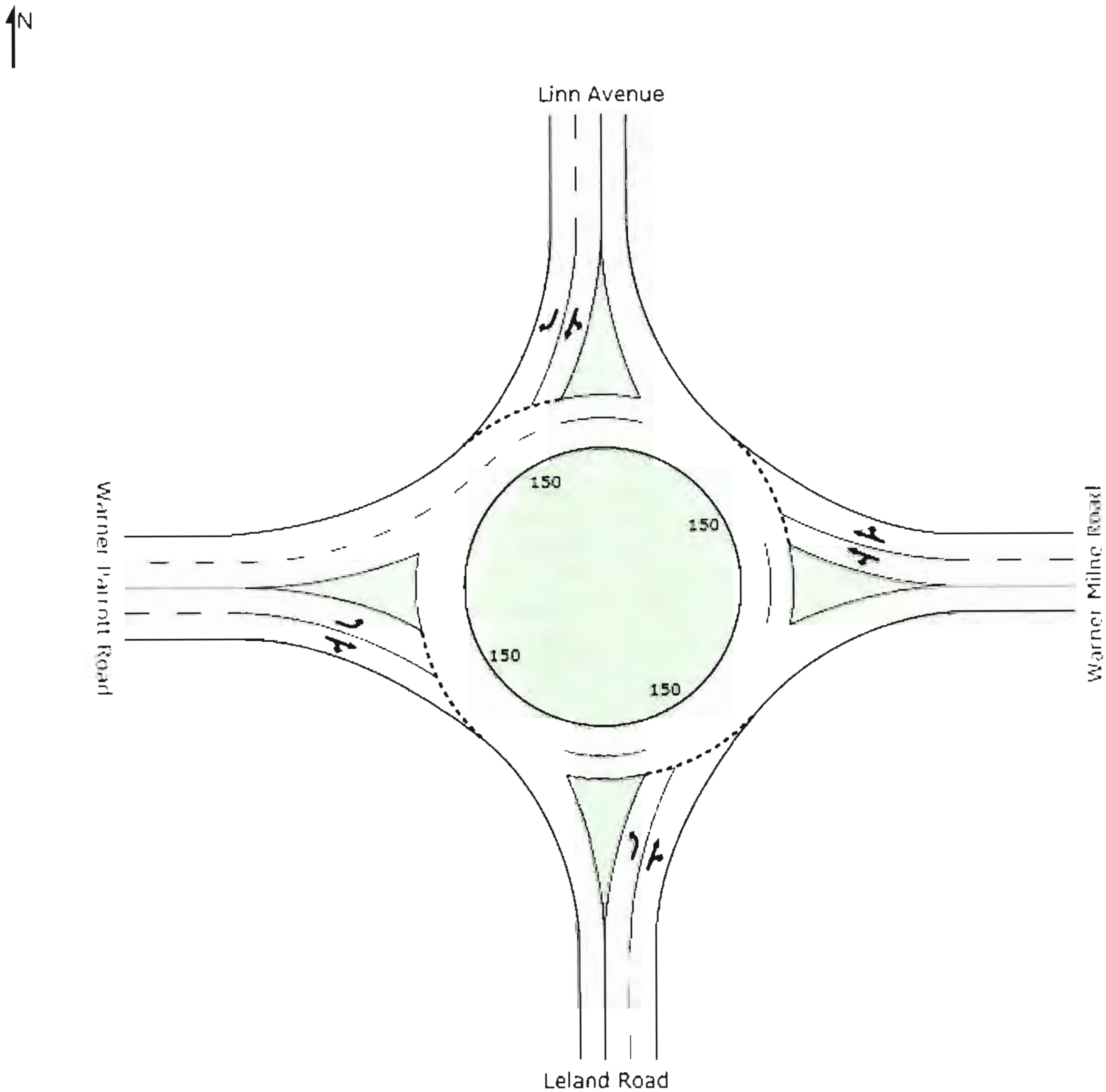
Warner Milne Road/Linn Avenue
2035 Planned System - PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Leland Road											
3L	L	158	2.0	0.863	38.8	LOS D	15.6	393.8	1.00	1.38	20.3
8T	T	189	1.0	0.865	29.9	LOS C	15.6	393.8	1.00	1.38	20.9
8R	R	121	0.0	0.865	31.6	LOS C	15.6	393.8	1.00	1.38	20.8
Approach		468	1.1	0.863	33.3	LOS D	15.6	393.8	1.00	1.38	20.7
East: Warner Milne Road											
1L	L	168	0.0	0.525	16.2	LOS B	5.4	136.0	0.80	0.90	28.9
6T	T	647	2.0	0.524	7.2	LOS A	5.5	139.1	0.79	0.67	30.9
6R	R	189	0.0	0.523	8.5	LOS A	5.5	139.1	0.79	0.73	31.2
Approach		1005	1.3	0.524	8.9	LOS B	5.5	139.1	0.79	0.72	30.6
North: Linn Avenue											
7L	L	179	0.0	0.673	19.5	LOS B	6.4	159.8	0.87	1.10	27.3
4T	T	284	1.0	0.672	10.9	LOS B	6.4	159.8	0.87	1.02	29.7
4R	R	126	2.0	0.325	12.3	LOS B	1.8	46.0	0.74	0.87	29.5
Approach		589	0.9	0.673	13.8	LOS B	6.4	159.8	0.84	1.01	28.8
West: Warner Parrott Road											
5L	L	95	2.0	0.658	19.7	LOS B	9.2	233.4	0.95	1.03	27.6
2T	T	511	2.0	0.659	11.0	LOS B	9.2	233.4	0.95	0.99	30.0
2R	R	121	2.0	0.208	10.4	LOS B	1.5	38.9	0.75	0.79	30.7
Approach		726	2.0	0.659	12.1	LOS B	9.2	233.4	0.91	0.96	29.7
All Vehicles		2789	1.4	0.863	14.9	LOS B	15.6	393.8	0.87	0.96	27.7

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS D. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

SIDRA INTERSECTION


N
Linn Avenue
Warner Parrott Road
Warner Milne Road
150
150
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Leland Road

MOVEMENT SUMMARY

Site: Maple Lane/Holly Lane - Planned System

Maple Lane Rd/Holly Lane
2035 Planned System - PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South East: Holly Lane Extension											
11L	L	11	1.0	0.702	25.1	LOS C	9.2	234.2	0.97	1.17	24.6
16T	T	347	2.0	0.709	18.0	LOS B	9.2	234.2	0.97	1.15	26.1
16R	R	63	3.0	0.710	19.2	LOS B	9.2	234.2	0.97	1.15	26.0
Approach		421	2.1	0.709	18.3	LOS C	9.2	234.2	0.97	1.15	26.1
North East: Maple Lane Road											
17L	L	63	1.0	0.619	19.8	LOS B	7.0	178.2	0.87	1.03	26.7
14T	T	232	2.0	0.618	12.7	LOS B	7.0	178.2	0.87	0.97	28.8
14R	R	132	1.0	0.618	13.9	LOS B	7.0	178.2	0.87	0.98	28.6
Approach		426	1.5	0.617	14.1	LOS B	7.0	178.2	0.87	0.98	28.4
North West: Holly Lane											
15L	L	195	1.0	0.732	18.7	LOS B	11.0	278.4	0.90	0.94	27.1
12T	T	300	2.0	0.732	11.6	LOS B	11.0	278.4	0.90	0.89	29.3
12R	R	142	2.0	0.733	12.9	LOS B	11.0	278.4	0.90	0.90	29.1
Approach		637	1.7	0.732	14.1	LOS B	11.0	278.4	0.90	0.91	28.5
South West: Maple Lane Road											
13L	L	132	2.0	0.700	23.1	LOS C	9.1	229.3	0.96	1.13	25.2
18T	T	300	1.0	0.699	15.9	LOS B	9.1	229.3	0.96	1.11	26.9
18R	R	11	1.0	0.702	17.2	LOS B	9.1	229.3	0.96	1.11	26.8
Approach		442	1.3	0.699	18.1	LOS C	9.1	229.3	0.96	1.11	26.4
All Vehicles		1926	1.7	0.732	15.9	LOS B	11.0	278.4	0.92	1.02	27.4

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

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SIDRA INTERSECTION 5.0.5.1510

Project: X:\Projects\2010\P10068-008 (Oregon City TSP Update)\Analysis\2035 Financially Constrained System \OC TSP Update.sip
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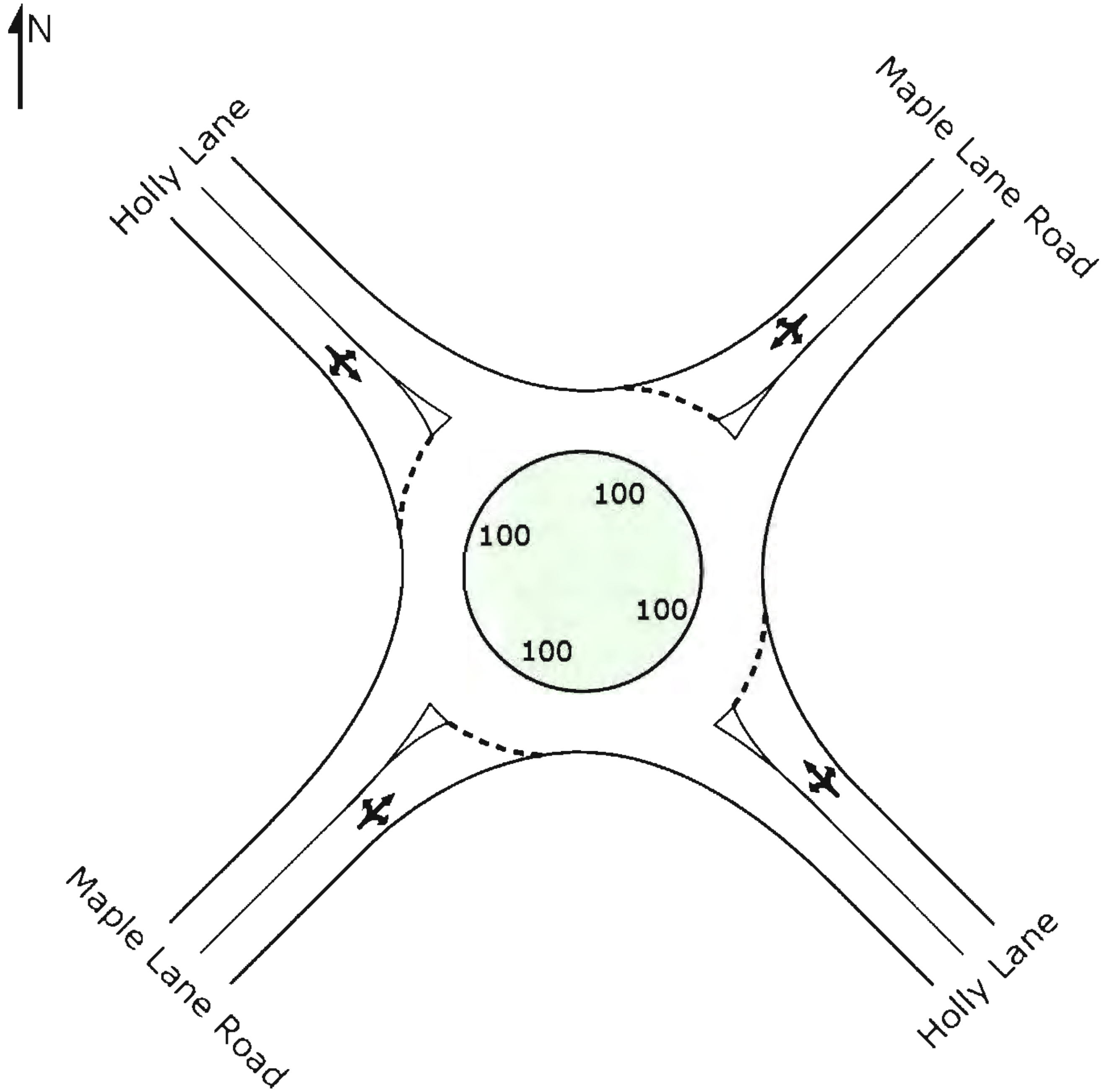
SIDRA INTERSECTION


N
Holly Lane
Maple Lane Road
100
100
100
100
Maple Lane Road
Holly Lane

MOVEMENT SUMMARY

Site: Meyers Ext/Loder Ext - Planned System

Meyer Road/Loder Road Ext
2035 Planned System - PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South East: Meyers Road Extension											
11L	L	16	5.0	0.116	13.9	LOS B	0.7	19.0	0.42	0.82	29.6
16T	T	74	5.0	0.116	6.7	LOS A	0.7	19.0	0.42	0.51	32.4
16R	R	16	5.0	0.116	8.0	LOS A	0.7	19.0	0.42	0.59	32.0
Approach		105	5.0	0.116	8.0	LOS B	0.7	19.0	0.42	0.57	31.9
North East: Loder Road Extension											
17L	L	16	5.0	0.190	13.1	LOS B	1.3	34.6	0.32	0.81	29.9
14T	T	111	5.0	0.191	5.9	LOS A	1.3	34.6	0.32	0.45	32.9
14R	R	74	5.0	0.191	7.2	LOS A	1.3	34.6	0.32	0.54	32.4
Approach		200	5.0	0.191	7.0	LOS B	1.3	34.6	0.32	0.51	32.4
North West: Meyers Road Extension											
15L	L	121	5.0	0.252	13.5	LOS B	1.8	47.1	0.39	0.75	29.5
12T	T	79	5.0	0.252	6.3	LOS A	1.8	47.1	0.39	0.47	32.3
12R	R	53	5.0	0.252	7.6	LOS A	1.8	47.1	0.39	0.54	31.9
Approach		253	5.0	0.252	10.0	LOS B	1.8	47.1	0.39	0.62	30.8
South West: Loder Road Extension											
13L	L	16	5.0	0.117	13.9	LOS B	0.8	19.7	0.44	0.82	29.6
18T	T	74	5.0	0.117	6.7	LOS A	0.8	19.7	0.44	0.52	32.3
18R	R	16	5.0	0.117	8.0	LOS A	0.8	19.7	0.44	0.59	32.0
Approach		105	5.0	0.117	8.0	LOS B	0.8	19.7	0.44	0.57	31.8
All Vehicles		663	5.0	0.252	8.5	LOS A	1.8	47.1	0.38	0.57	31.6

Level of Service (Aver. Int. Delay): LOS A. Based on average celay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

Processed: Tuesday, September 04, 2012 3:24:21 PM

SIDRA INTERSECTION 5.0.5.1510
Project: X:\Projects\2010\P10068-008 (Oregon City TSP Update)\Analysis\2035 Financially Constrained System \OC TSP Update.sip
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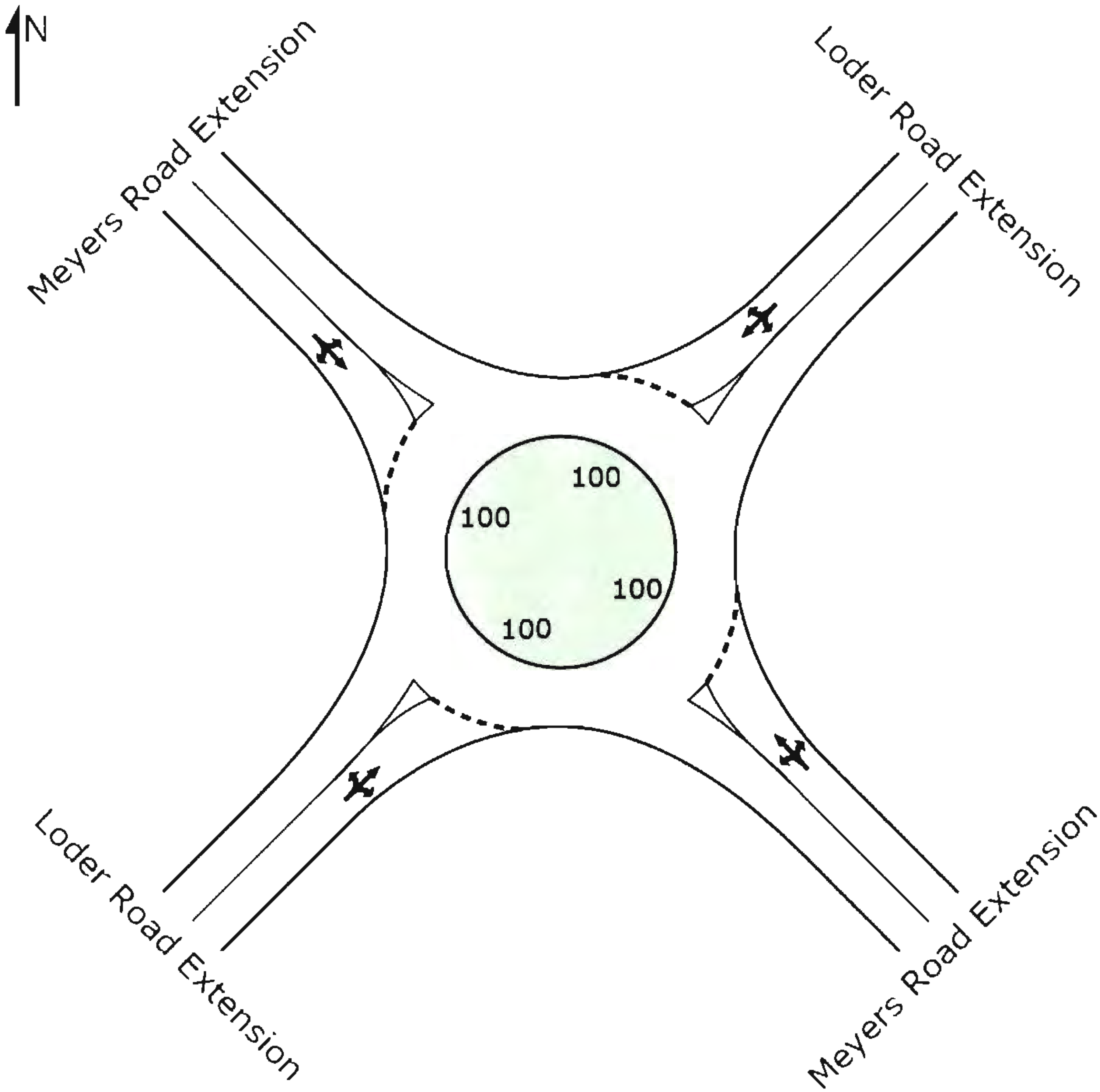
SIDRA INTERSECTION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Meyers Road Extension
Loder Road Extension
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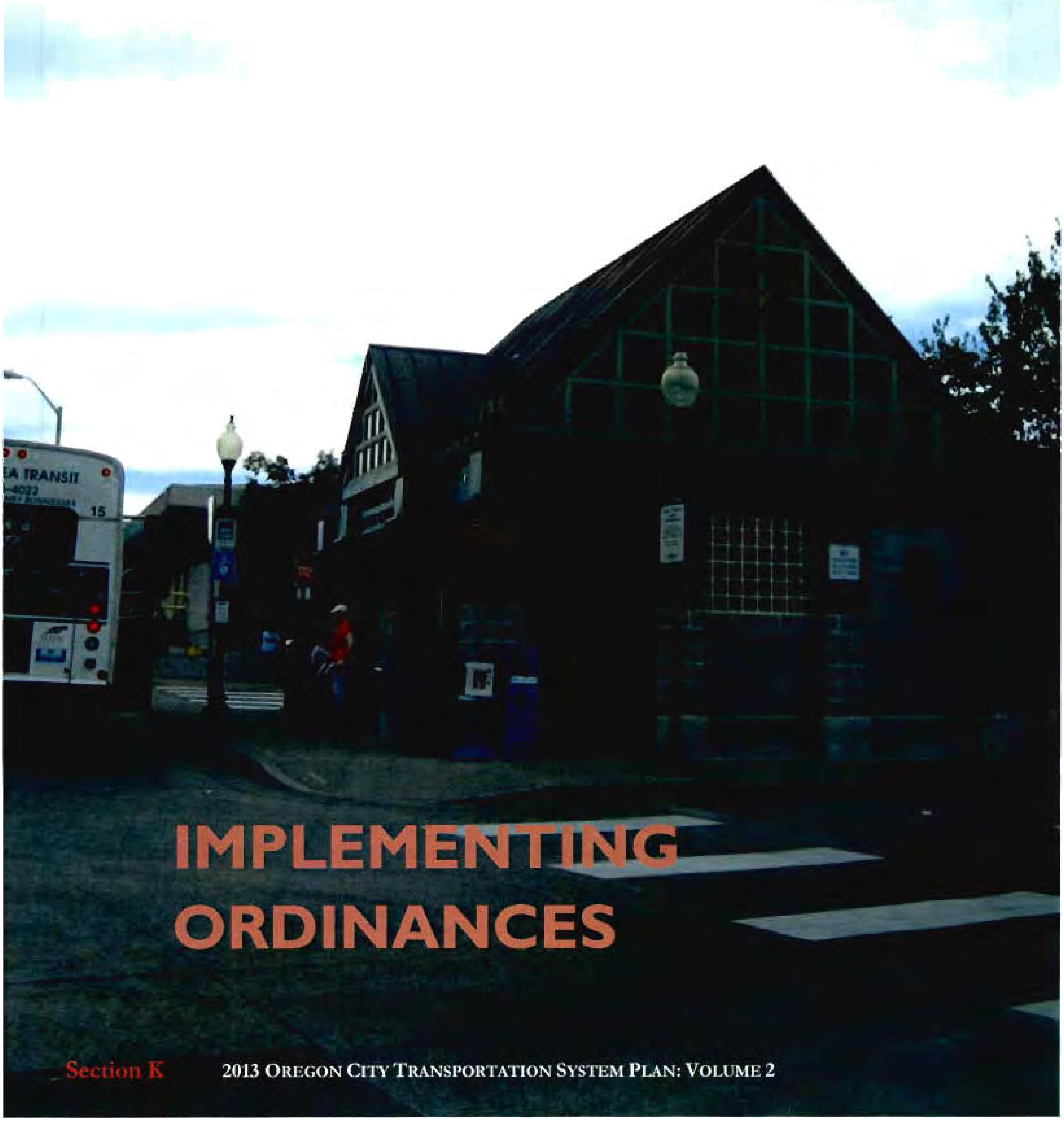
Meyers Road Extension

Section K



IMPLEMENTING ORDINANCES

This memorandum provides an evaluation of the adopted City of Oregon City Transportation System Plan (TSP), Municipal Code (OCMC), and Comprehensive Plan given regional requirements set out in the Metro Regional Transportation Functional Plan (RTFP) for compliance with the Regional Transportation Plan (RTP). Metro has provided public agencies and consultants with a checklist for reviewing local TSPs, codes, and comprehensive plans for compliance with the RTFP. This memorandum uses the checklist for presenting findings of City TSP, Municipal Code, and Comprehensive Plan compliance with RTFP requirements.

The evaluation table is divided according to the document being evaluated (the TSP is included in Table 1, Municipal Code in Table 2, and Comprehensive Plan in Table 3). In some cases, as is indicated in the beginning of the requirement language, there are requirements that address more than one document. In such cases, the requirement is addressed in separate sections of the evaluation table accordingly.

This memorandum identifies potential local regulatory amendments that are recommended in order to comply with regional regulations. This lays the groundwork for Task 8.2, in which draft and revised amendments will be prepared in adoption-ready language and format.

Table 1: Findings of Compliance of the TSP with the RTFP

Regional Transportation Functional Plan Requirement	Findings of Compliance - TSP
Include, to the extent practicable, a network of major arterial streets at one mile spacing and minor arterials or collectors at half-mile spacing, considering: • Existing topography; • Rail lines; freeways; pre-existing development, leases, easements or covenants; • Requirements of Metro's Urban Growth Management Functional Plan Title 3 (Water Quality and Flood plains) and Title 13 (Nature in Neighborhoods), such as streams, rivers, flood plains, wetlands, riparian and upland fish and wildlife habitat areas. • Arterial design concepts in chapter 2 of RTP • Best practices and designs as set forth in regional state or local plans and best practices for protecting natural resources and natural areas **(Title 1, Street System Design Sec 3.08.110C)**	The TSP update, specifically Technical Memorandum #3: Street Network and Connectivity, identified arterial and collector gaps throughout the City. The existing street functional classification system was updated to meet the spacing standards to the extent practical. **Recommendation:** The Multi-modal Street System recommended in the TSP update will need to be adopted by the City.
Include a conceptual map of new streets for all contiguous areas of vacant and re developable lots and parcels of five or more acres that are zoned to allow residential or mixed-use development. The map shall identify street connections to adjacent areas and should demonstrate opportunities to extend and connect new streets to existing streets, provide direct public right-of-way routes and limit closed-end street designs consistent with Title 1, Sec 3.08.110E **(Title 1, Street System Design Sec 3.08.110D)**	The TSP update, specifically Technical Memorandum #3: Street Network and Connectivity, includes a multi-modal street connectivity plan. **Recommendation:** The TSP update will include recommended street spacing standards to guide street connectivity in the City.
<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 adopted TSP has existing street spacing standards but does not identify spacing standards for driveways and multi-modal street design features. **Recommendation:** The TSP update will include recommended street and driveway spacing standards and a multi-modal street system (see Technical Memorandum #9: Solutions).
Include investments, policies, standards and criteria to provide pedestrian and bicycle connections to	The adopted TSP identifies pedestrian and bicycle

Regional Transportation Functional Plan Requirement	Findings of Compliance - TSP
all existing transit stops and major transit stops designated in Figure 2.15 of the RTP. **(Title 1, Transit System Design Sec 3.08.120A)**	connections to transit stops. **Recommendation:** The walking and biking plans in the TSP update will ensure connections to transit stops.
Include a transit plan consistent with transit functional classifications shown in Figure 2.15 of the RTP that shows the locations of major transit stops, transit centers, high capacity transit stations, regional bike-transit facilities, inter-city bus and rail passenger terminals designated in the RTP, transit-priority treatments such as signals, park-and-ride facilities, and bicycle and pedestrian routes, consistent with sections 3.08.130 and 3.08.140, between essential destinations and transit stops. **(Title 1, Transit System Design Sec 3.08.120B(1))**	The adopted TSP includes a transit plan for the City. **Recommendation:** The TSP update will update the figures and discussion of the transit system in Oregon City.
Include a pedestrian plan, for an interconnected network of pedestrian routes within and through the city or county. The plan shall include: • An inventory of existing facilities that identifies gaps and deficiencies in the pedestrian system; • An evaluation of needs for pedestrian access to transit and essential destinations for all mobility levels, including direct, comfortable and safe pedestrian routes; • A list of improvements to the pedestrian system that will help the city or county achieve the regional Non-SOV modal targets in Table 3.08-1 of the RTFP, and other targets established pursuant to section 3.08.230; • Provisions for sidewalks along arterials, collectors and most local streets, except that sidewalks are not required along controlled roadways, such as freeways; • Provision for safe crossings of streets and controlled pedestrian crossings on major arterials **(Title 1, Pedestrian System Design Sec 3.08.130A)**	The adopted TSP includes a pedestrian plan for the City. **Recommendation**: The TSP update will update the figures and discussion of the pedestrian system in Oregon City.
Include a bicycle plan for an interconnected network of bicycle routes within and through the city or county. The plan shall include: • An inventory of existing facilities that identifies gaps and deficiencies in the bicycle system; • An evaluation of needs for bicycle access to transit and essential destinations, including direct, comfortable and safe bicycle routes and secure bicycle parking, considering TriMet Bicycle	The adopted TSP includes a bicycle plan for the City. **Recommendation:** The TSP update will update the figures and discussion of the biking system in Oregon City.

Regional Transportation Functional Plan Requirement	Findings of Compliance - TSP
Parking Guidelines; • A list of improvements to the bicycle system that will help the city or county achieve the regional Non-SOV modal targets in Table 3.08-1 of the RTFP and other targets established pursuant to section 3.08.230; • Provision for bikeways along arterials, collectors and local streets, and bicycling parking in centers, at major transit stops shown in Figure 2.15 in the RTP, park-and-ride lots and associated with institutional uses; • Provision for safe crossing of streets and controlled bicycle crossings on major arterials **(Title 1, Bicycle System Design Sec 3.08.140)**	
Include a freight plan for an interconnected sysrem of freight networks within and through the city or county. The plan shall include: • An inventory of existing facilities that identifies gaps and deficiencies in the freight system; • An evaluation of freight access to freight intermodal facilities, employment and industrial areas and commercial districts; • A list of improvements to the freight system that will help the city or county increase reliability of freight movement, reduce freight delay and achieve targets established pursuant to section 3.08.230. **(Title 1, Freight System Design Sec 3.08.150)**	The adopted TSP does not include a freight plan for the City. **Recommendation:** The TSP update will create a freight plan and update discussion of the freight system in Oregon City.

Include a transportation system management and operations (TSMO) plan to improve the performance of existing transportation infrastructure within or through the city or county. A TSMO plan shall include:
• An inventory and evaluation of existing local and regional TSMO infrastructure, strategies and programs that identifies gaps and opportunities to expand infrastructure, strategies and programs
• A list of projects and strategies, consistent with the Regional TSMO Plan, based upon consideration of the following functional areas:
    • Multimodal traffic management investments
    • Traveler Information investments
	The adopted TSP does not include a TSMO plan for the City.
	
	Recommendation: The TSP update will create a TSMO plan for Oregon City that addresses how these areas have been addressed.

Regional Transportation Functional Plan Requirement	Findings of Compliance - TSP
• Traffic incident management investments • Transportation demand management investments **(Title 1, Transportation System Management and Operations Sec 3.08.160)**	
Incorporate regional and state transportation needs identified in the 2035 RTP as well as local transportation needs. The determination of local transportation needs based upon: • System gaps and deficiencies identified in the inventories and analysis of transportation system pursuant to Title 1; • Identification of facilities that exceed the Deficiency Thresholds and Operating Standards in Table 3.08-2 or the alternative thresholds and standards established pursuant to section 3.08.230; • Consideration and documentation of the needs of youth, seniors, people with disabilities and environmental justice populations within the city of county, including minorities and low-income families. A local determination of transportation needs must be consistent with the following elements of the RTP: • The population and employment forecast and planning period of the RTP, except that a city or county may use an alternative forecast for the city or county, coordinated with Metro, to account for changes to comprehensive plan or land use regulations adopted after adoption of the RTP; • System maps and functional classifications for street design, motor vehicles, transit, bicycles, pedestrians and freight in Chapter 2 of the RTP; • Regional non-SOV modal targets in Table 3.08-1 and the Deficiency Thresholds and Operating Standards in Table 3.08-2. When determining its transportation needs, a city or county shall consider the regional needs identified in the mobility corridor strategies in Chapter 4 of the RTP. **(Title 2, Transportation Needs Sec 3.08.210)**	**Recommendation:** The TSP update will consider regional and state transportation needs when determining and developing solutions for the transportation system in Oregon City. The strategies identified for the mobility corridors in Oregon City will also be considered.
Consider the following strategies in the order listed, to meet the transportation needs determined pursuant to section 3.08.210 and performance targets and standards pursuant to section 3.08.230. The city or county shall explain its choice of one or more of the strategies and why other strategies were	**Recommendation:** The TSP update will consider these strategies when evaluating solutions for Oregon City.

Regional Transportation Functional Plan Requirement	Findings of Compliance - TSP
not chosen: • TSMO, including localized TDM, safety, operational and access management improvements; • Transit, bicycle and pedestrian system improvements; • Traffic-calming designs and devices; • Land use strategies in OAR 660-012-0035(2) • Connectivity improvements to provide parallel arterials, collectors or local streets that include pedestrian and bicycle facilities, consistent with the connectivity standards in section 3.01.110 and design classifications in Table 2.6 of the RTP, • Motor vehicle capacity improvements, consistent with the RTP Arterial and Throughway Design and Network Concepts in Table 2.6 and Section 2.5.2 of the RTP, only upon a demonstration that other strategies in this subsection are not appropriate or cannot adequately address identified transportation needs A city or county shall coordinate its consideration of the above strategies with the owner of the transportation facility affected by the strategy. Facility design is subject to the approval of the facility owner. If analysis under subsection 3.08.210A (Local Needs determination) indicates a new regional or state need that has not been identified in the RTP, the city or county may propose one of the following actions: • Propose a project at the time of Metro review of the TSP to be incorporated into the RTP during the next RTP update; or • Propose an amendment to the RTP for needs and projects if the amendment is necessary prior to the next RTP update. **(Title 2, Transportation Solutions Sec 3.08.220)**	
Demonstrate that solutions adopted pursuant to section 3.08.220 (Transportation Solutions) will achieve progress toward the targets and standards in Tables 3.08-1, and 3.08-2 and measures in subsection D (local performance measures), or toward alternative targets and standards adopted by the city or county. The city or county shall include the regional targets and standards or its alternatives in its TSP.	Minimum and maximum parking standards and street designs are included in the Municipal Code. **Recommendation:** The TSP update will include a discussion

Regional Transportation Functional Plan Requirement	Findings of Compliance - TSP
A city or county may adopt alternative targets or standards in place of the regional targets and standards upon a demonstration that the alternative targets or standards: • Are no lower than the modal targets in Table 3.08-1 and no lower than the ratios in Table 3.08-2; • Will not result in a need for motor vehicle capacity improvements that go beyond the planned arterial and throughway network defined in Figure 2.12 of the RTP and that are not recommended in, or are inconsistent with, the RTP; and • Will not increase SOV travel to a degree inconsistent with the non-SOV modal targets in Table 3.08-1. If the city or county adopts mobility standards for state highways different from those in Table 3.08-2, it shall demonstrate that the standards have been approved by the Oregon Transportation Commission. Each city and county shall also include performance measures for safety, vehicle miles traveled per capita, freight reliability, congestion, and walking, bicycling and transit mode shares to evaluate and monitor performance of the TSP. To demonstrate progress toward achievement of performance targets in Tables 3.08-1 and 3.08-2 and to improve performance of state highways within its jurisdiction as much as feasible and avoid their further degradation, the city or county shall adopt the following: • Parking minimum and maximum ratios in Centers and Station Communities consistent with subsection 3.08.410A; • Designs for street, transit, bicycle, freight and pedestrian systems consistent with Title 1; and • TSMO projects and strategies consistent with section 3.08.160; and • Land use actions pursuant to OAR 660-012-0035(2). **(Title 2, Performance Targets and Standards Sec 3.08.230)**	on how the transportation solutions achieve the performance measures for the categories indicated to monitor the performance of the TSP. The TSP update will also develop local performance measures pursuant to subsection D and will recommend updated standards as appropriate.
Specify the general locations and facility parameters, such as minimum and maximum ROW dimensions and the number and width of traffic lanes, of planned regional transportation facilities and improvements identified on general location depicted in the appropriate RTP map. Except as otherwise provided in the TSP, the general location is as follows:	General facility parameters are included in the adopted TSP and the Municipal Code. **Recommendation:** The TSP update will specify the location

Regional Transportation Functional Plan Requirement	Findings of Compliance - TSP
• For new facilities, a corridor within 200 feet of the location depicted on the appropriate RTP map; • For interchanges, the general location of the crossing roadways, without specifying the general location of connecting ramps; • For existing facilities planned for improvements, a corridor within 50 feet of the existing right-of-way and • For realignments of existing facilities, a corridor within 200 feet of the segment to be realigned as measured from the existing right-of-way depicted on the appropriate RTP map. A City or county may refine or revise the general location of a planned regional facility as it prepares or revises impacts of the facility or to comply with comprehensive plan or statewide planning goals. If, in developing or amending its TSP, a city or county determines the general location of a planned regional facility or improvement is inconsistent with its comprehensive plan or a statewide goal requirement, it shall: • Propose a revision to the general location of the planned facility or improvement to achieve consistency and, if the revised location lies outside the general location depicted in the appropriate RTP map, seek an amendment to the RTP; or • Propose a revision to its comprehensive plan to authorize the planned facility or improvement at the revised location. **(Title 3, Defining Projects in Transportation System Plan Sec 3.08.310)**	of and include facility parameters for any new or revised regional facilities.
<u>(Could be adopted in TSP or other adopted policy document)</u> Adopt parking policies, management plans and regulations for Centers and Station Communities. Plans may be adopted in TSPs or other adopted policy documents and may focus on sub-areas of Centers. Plans shall include an inventory of parking supply and usage, an evaluation of bicycle parking needs with consideration of TriMet Bicycle Parking Guidelines. Policies shall be adopted in the TSP. Policies, plans and regulations must consider and may include the following range of strategies: • By-right exemptions from minimum parking requirements; • Parking districts; • Shared parking;	The Oregon City Regional Center has an existing Parking Plan. **Recommendation:** The TSP update will recommend additional policies or strategies for the Oregon City Regional Center Parking Plan as appropriate

Regional Transportation Functional Plan Requirement	Findings of Compliance - TSP
• Structured parking; • Bicycle parking; • Timed parking; • Differentiation between employee parking and parking for customers, visitors and patients; • Real-time parking information; • Priced parking; • Parking enforcement **(Title 4, Parking Management Sec 3.08.410I)**	
If a city or county proposes a transportation project that is not included in the RTP and will result in a significant increase in SOV capacity or exceeds the planned function or capacity of a facility designated in the RTP, it shall demonstrate consistency with the following in its project analysis: • The strategies set forth in subsection 3.08.220A(1-5) (TSMO, Transit/bike/ped system improvements, traffic calming, land use strategies, connectivity improvements) • Complete street designs consistent with regional street design policies • Green street designs consistent with federal regulations for stream protection. If the city or county decides not to build a project identified in the RTP, it shall identify alternative projects or strategies to address the identified transportation need and inform Metro so that Metro can amend the RTP. This section does not apply to city or county transportation projects that are financed locally and would be undertaken on local facilities. **(Title 5, Amendments of City and County Comprehensive and Transportation System Plans Sec 3.08.510C)**	**Recommendation:** The TSP update will include the discussion if any new transportation improvements are identified that will require amendment to the RTP.

Table 2: Findings of Compliance of the Municipal Code with the RTFP

Regional Transportation Functional Plan Requirement	Findings of Compliance – Municipal Code
Allow complete street designs consistent with regional street design policies **(Title 1, Street System Design Sec 3.08.110A(1))** Allow green street designs consistent with federal regulations for stream protection **(Title 1, Street System Design Sec 3.08.110A(2))** 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))**	OCMC Section 12.04.180 (Street design) addresses street design in terms of minimum right-of-way and pavement widths. The section refers to the TSP for the functional classifications of roadways that correspond to the minimum widths. It allows for exceptions to the minimum standards if the City Engineer finds that an alternative design provides for "adequate and safe traffic, pedestrian and bicycle flows and transportation alternatives and protects and provides adequate multi-modal transportation services for the development as well as the surrounding community." Complete street designs, green street designs, and transit-supportive street designs should be permitted – and even supported – by this code language. In particular, Section 12.04.260 (Street design—Transit) facilitates transit-supportive design in requiring the applicant to coordinate with TriMet when the applicant's site potentially impacts transit streets as identified in the City TSP. Street cross-sections themselves are provided in the existing TSP (Figures 5-2A and 5-2B). The figures present "typical" cross-sections, with flexibility in design allowed according to the functional classification of the roadway. **Recommendation:** Existing code language complies with these requirements and no substantive amendments are recommended. The street system designs will be updated in the TSP, and code sections on design will be revised to refer to or reflect these updated designs.
Allow implementation of: • Narrow streets (<28 ft curb to curb);	• Narrow streets: The existing cross-section standard for local streets in the 2001 TSP show from 20 to 32 feet of pavement depending on whether parking is provided on

Regional Transportation Functional Plan Requirement	Findings of Compliance – Municipal Code
• 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)**	one or both sides of the street. However, existing code (OCMC Section 12.04.180.A/Table 12.04.020) specifies minimum pavement width as 32 feet for local streets. • Wide sidewalks: OCMC Section 12.04.010 (Construction specifications—Improved streets) requires all sidewalks to be constructed to City standards and widths specified in the TSP. The TSP requires sidewalks for all roads functionally classified as arterials, collectors, and local streets, with widths no less than five feet (Table 5-2 and Figures 5-2A and 5-2B). However, neither the TSP nor code address the clear or through zone. • Landscaped pedestrian buffer strips or paved furnishing zones: OCMC Section 12.04.180 (Street design) only specifies right-of-way and pavement widths and does not call out dimensions for design features inside the right-of-way and outside of the pavement. However, minimum right-of-way widths for each functional classification are at least 20 feet wider than pavement width, allowing for at least five feet of sidewalk and either buffer strip or furnishing zone on each side of the roadway. The code and TSP both refer to planting strips – and OCMC 12.04.265 (Street design—Planter strips) specifically addresses these, but neither the code nor the TSP address furnishing zones. OCMC Section 12.08.015 (Street tree planting and maintenance requirements) requires street trees for every 35 feet of frontage, to be evenly distributed along the frontage, for all new development and major redevelopment. (However, major redevelopment is not defined in this code section or in code definitions.) • Traffic calming: Traffic calming is acknowledged in the 2001 TSP, but examples or a "tool box" of techniques

Regional Transportation Functional Plan Requirement	Findings of Compliance – Municipal Code
	and treatments are not provided in the TSP. Traffic calming is not addressed in the code. • Short and direct right-of-way routes and shared-use paths: OCMC Chapter 16.12 (Minimum Improvements and Design Standards for Land Divisions) and in particular Section 16.12.035 (Blocks—Pedestrian and bicycle access) establishes standards "to provide direct access to nearby neighborhood activity centers, transit streets and other transit facilities." Multimodal circulation within a site or land division is supported by the provisions in OCMC Section 16.08.025.B (Traffic/Transportation Plan), 17.52 (Off-Street Parking and Loading), and 17.62 (Site Plan and Design Review). A detailed site circulation plan is required that shows proposed vehicular, bicycle, transit and pedestrian circulation within a site and connections to the existing transportation system, to existing rights-of-way or adjacent tracts, and to parking and loading areas. The code also establishes pedestrian and bicycle accessways, which are defined in OCMC Section 17.04.030 as "any off-street path or way as described in Chapter 12.24 (Pedestrian and Bicycle Accessways), intended primarily for pedestrians or bicycles and which provides direct routes within and from new developments to residential areas, retail and office areas, transit streets and neighborhood activity centers." Accessways, pursuant to Section 12.24.030, are required between discontinuous street rights-of-way, at least every 500 feet through long blocks, where there are inconvenient or out of direction pedestrian and bicycle travel patterns, in new subdivisions and planned developments (Chapters 16.08, 16.12, and 17.64), and in multifamily residential districts and nonresidential

Regional Transportation Functional Plan Requirement	Findings of Compliance – Municipal Code
	districts. In these ways, existing code provisions ensure that bicycle and pedestrian paths and connections can be required through the development and land division permitting process. However, the 2001 TSP does not identify multi-use paths and trails on the Pedestrian Plan and Bicycle Plan. • Opportunities to extend streets: The code generally discourages dead-end and stub streets but Subsection B of OCMC Section 12.04.175 (Street design—Generally) allows for stubbing streets when necessary to create connections to future adjacent development. Likewise, Section 17.62.050.A.2.f. in Site Design Review states that "Development shall be required to provide existing or future connections to adjacent sites through the use of a vehicular and pedestrian access easements where applicable." For land divisions, Section 16.08.025.B (Traffic/Transportation Plan) requires that a detailed site circulation plan show "proposed vehicular, bicycle, transit and pedestrian access points and connections to the existing system, circulation patterns and connectivity to existing rights-of-way or adjacent tracts." The code does not specify that notification be posted on streets to be extended, as called out in the RTFP requirements. **Recommendations:** • Table 12.04.020 should be amended to allow for a narrower cross-section, as allowed by the TSP and consistent with RTFP Title 1. • Code language in OCMC Section 12.04.010 (12.04.010 - Construction specifications—Improved streets) should be modified to clarify a clear or through zone as an

Regional Transportation Functional Plan Requirement	Findings of Compliance – Municipal Code
	unobstructed space at least five feet wide for all sidewalks. (Language also can be drafted to allow for exceptions to the clear zone.) This language should also be incorporated into Section 17.04 (Definitions) and the TSP. Similarly these sections should address and define furnishing zones. • Provide examples or a "tool box" of traffic calming techniques and treatments in the TSP. Corresponding code language may be recommended for Chapter 12, specifying what traffic calming treatments are acceptable and under what conditions. • The TSP should identify multi-use paths and/or trails on the Pedestrian Plan and Bicycle Plan. Accessways are defined in the code, but definitions for shared-use paths and/or trails should be added. • The code should specify that notification be posted on streets to be extended; modifications to Section 12.04.175, Section 17.62.050.A.2.f, and, Section 16.08.025.B are recommended.
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	Multimodal circulation within a site or land division is supported by OCMC Section 16.08.025.B (Traffic/Transportation Plan). • Full street connections with spacing of no more than 530 feet: OCMC Sections 16.12.020 (Blocks – Generally) and 16.12.025 (Blocks – Length) specify block lengths of 500 feet, with exceptions for environmental conditions and other barriers. • Bike and pedestrian accessways in lieu of streets, with spacing of no more than 330 feet: OCMC Section 16.12.035 (Blocks—Pedestrian and bicycle access) requires that subdivisions provide pedestrian/bicycle

Regional Transportation Functional Plan Requirement	Findings of Compliance – Municipal Code
full street connections • Includes no closed-end street longer than 220 feet or having no more than 25 dwelling units **(Title 1, Street System Design Sec 3.08.110E)**	accessways between discontinuous street right-of-way and long blocks at distances less than 500 feet. • Cul-de-sacs and closed-end streets: OCMC Section 12.04.225 (Street design—Cul-de-sacs and dead-end streets) limits the use of cul-de-sacs and dead-end streets in Oregon City. When they are proposed, they are required to be less than 350 feet long. OCMC Section 16.12.035 (Blocks—Pedestrian and bicycle access) requires pedestrian and bicycle accessways from cul-de-sacs to the nearest street or neighborhood activity center. **Recommendations**: • OCMC Section 12.24.030 and Section 16.12.035 should be amended to require bicycle and pedestrian access at distances less 330 feet (instead of 500 feet), except in the case of significant constraints. • In order to fully comply with the RTFP, OCMC Section 12.04.225 (Street design—Cul-de-sacs and dead-end streets) needs to be amended so that street length is reduced to 220 feet and housing on the street segment is limited to 25 dwelling units.
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)**	Preliminary plat standards for subdivisions in OCMC Section 16.08.025.B require a transportation plan shows a circulation system that is connected to the surrounding transportation system and demonstrates compliance with other code transportation standards. This includes compliance with block length standards in Section 16.12.025 so that blocks on local streets and collectors do not exceed five hundred feet and requirements for Pedestrian/bicycle accessways in Section 16.12.035, as well as required connections with

Regional Transportation Functional Plan Requirement	Findings of Compliance – Municipal Code
	future adjacent development (OCMC Section 12.04.175.B, Section 16.08.025.B, and Section 17.62.050.A.2.f) **Recommendation:** Existing code language complies with this requirement and no amendments are recommended.
<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)**	OCMC Subsection 12.04.005.A (Jurisdiction and management of the public rights-of-way) acknowledges that ODOT and Clackamas County also have rights-of-way in the city and, for facilities not under City jurisdiction, defers to the applicable jurisdiction and their permitting standards. Existing public street spacing standards (Table 12.04.040) depend on the functional classification of the streets in Oregon City. The existing standards actually allow for more connectivity than the requirements in RTFP Section 3.08.110G and C (major arterial spacing of one mile and minor arterial and collector spacing of a half mile) Pedestrian crossings are addressed in the City's existing street design standards, which include crosswalk design and allowances for alternatives to this typical design (OCMC Section12.04.245). Goal 2 and the "Other Pedestrian Amenities" section in the TSP addresses safe crossing, and Figure 5-5 illustrates median crossings. However, there are no location criteria in the existing code or TSP for that indicate under what circumstances crosswalks will be required. Cross-sections in Figures 5-4a and 5-4b show on-street parking for all functional classifications of roadway except for major arterials. **Recommendation:** The City's adopted development standards are consistent with the requirements of this

Regional Transportation Functional Plan Requirement	Findings of Compliance – Municipal Code
	Section. Multimodal street design and appropriate location of pedestrian crossings and on-street parking is being explored as part of the TSP update. To the extent that the TSP includes criteria for locating protected crossings, amendments OCMC Section 12.04.245 for consistency with the TSP may be appropriate.
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 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))**	Subsection A.9 of OCMC Section 17.62.050, Site Plan and Design Review, establishes extensive criteria for pedestrian circulation on-site. OCMC 17.62.080 specifically addresses development along transit streets, including requirements for maximum setbacks and for all buildings to face the street and to have a direct pedestrian connection with the transit street. OCMC Section 12.04.260 (Street design—Transit) requires the applicant to coordinate with TriMet when the applicant's site potentially impacts transit streets as identified in the City TSP. Coordination of crossings is not called out in this section. Standards in both OCMC Chapter 12.04 (Streets, Sidewalks and Public Places) and Chapter 17.62 (Site Plan and Design Review) address street and site plan design to accommodate transit amenities and facilities. Section 12.04.260 (Street design—Transit), Section 17.62.080 (Special development standards along transit streets), and Subsection 17.62.050.A.15 of Site Plan and Design Review allow decision makers to require transit-supportive elements such as direct pedestrian and bicycle connections to transit streets and stops, as well as easements, stops, shelters, pullouts, and pads, when the site is adjacent to a designated transit street. **Recommendation:** Address mid-block crossings in OCMC 17.62.080 (Special development standards along

Regional Transportation Functional Plan Requirement	Findings of Compliance – Municipal Code
	transit streets).
(Could be in Comprehensive plan or TSP as well) 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 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)**	Site design standards related to transit are established in OCMC Chapter 12.04 (Streets, Sidewalks and Public Places) and Chapter 17.62 (Site Plan and Design Review). Street trees are addressed in OCMC 12.08. The 2001 TSP, 1999 Downtown Community Plan, and 2007 Urban Renewal Plan all include improvements for the pedestrian environment in the city, but stop short of creating pedestrian districts. There are no additional standards related to pedestrian environment included in the mixed use or historic commercial zoning code sections. **Recommendation:** The "alternative approach" of establishing pedestrian districts is not necessary, as the City's existing development requirements are transit supportive, consistent with RTFP requirements. However, many of the elements identified with pedestrian districts are being considered as part of the TSP update. At a system level, recommendations resulting from this planning process will include proposed policy and implementing code language that will strengthen and improve the City's transportation system for pedestrians.
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)**	OCMC Subsection 17.62.050.A.9 for Site Plan and Design Review establishes extensive criteria for on-site pedestrian circulation, and pedestrian circulation is also addressed by Chapter 12.24 (Pedestrian and Bicycle Accessways) and Section 16.08.025.B (Traffic/Transportation Plan). **Recommendation:** Existing code language complies with this requirement and no amendments are recommended.

Regional Transportation Functional Plan Requirement	Findings of Compliance – Municipal Code
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 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.	• Parking ratios and maximums: City parking ratios and maximums are presented in Table 17.52.020 of OCMC Chapter 17.52 (Off-Street Parking and Loading) and are consistent with those in RTFP Table 3.08-3. • Variances and exemptions: Chapter 17.52 (Off-Street Parking and Loading) allows for reductions in required parking spaces in the case of transit-oriented development, transportation demand management (TDM), shared parking, and on-street parking (Section 17.52.020.B). Subsection A.5 of OCMC 17.52.020 exempts changes in use within an existing building located in the MUD Design District from additional parking requirements. OCMC 17.60 (Variances) provides a general process for varying from requirements, including parking requirements. • Residential parking districts: The City code and Comprehensive Plan do not address residential parking districts, but the 2009 Downtown Oregon City Parking Study does. • Parking lot landscaping and pedestrian circulation: OCMC Section 17.52.060 (Parking lot landscaping) includes requirements for pedestrian accessways, trees, and landscaping along the perimeter and in the interior of parking lots. • On-street loading: Chapter 17.52 (Off-Street Parking and Loading) does not address the location of on-street freight loading and unloading. • Long-term bicycle parking: OCMC Section 17.52.040 (Bicycle parking standards) addresses the amount of bicycle parking, and parking location and design. The section addresses parking for the uses specified in the

Regional Transportation Functional Plan Requirement	Findings of Compliance – Municipal Code
• 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 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)**	RTFP requirement, but it does not specifically address long-term bicycle parking. **Recommendations:** • The TSP update will coordinate with the recommendations of the 2009 Downtown Oregon City Parking Study in order to use parking resources more efficiently, particularly in the Historic Downtown and on the Bluff. Code language for implementing new parking strategies may be prepared as needed to coordinate with City staff efforts to implement the recommendations from the parking study. • Amend OCMC 12.04 (Streets, sidewalks and public places) to address the location of on-street freight loading and unloading. • Amend Section 17.52.040 (Bicycle parking standards) to include requirements for long-term bicycle parking.

Table 3: Findings of Compliance of the Comprehensive Plan with the RTFP

Regional Transportation Functional Plan Requirement	Findings of Compliance – Comprehensive Plan
When proposing an amendment to the comprehensive plan or to a zoning designation, consider the strategies in subsection 3.08.220A as part of the analysis required by OAR 660-012-0060. If a city or county adopts the actions set forth in 3.08.230E (parking ratios, designs for street, transit, bicycle, pedestrian, freight systems, TSMO projects and strategies, and land use actions) and section 3.07.630.B of Title 6 of the UGMFP, it shall be eligible for an automatic reduction of 30 percent below the vehicular trip generation rates recommended by the Institute of Transportation Engineers when analyzing the traffic impacts, pursuant to OAR 660-012-0060, of a plan amendment in a Center, Main Street, Corridor or Station Community. **(Title 5, Amendments of City and County Comprehensive and Transportation System Plans Sec 3.08.510A,B)**	Other than a general reference to compliance with Statewide Planning Goals, there is not specific language related to the Transportation Planning Rule and Section -0060 in the criteria for zoning changes and amendments in OCMC Section 17.68.020, nor is there in Section 17.50.170 (Legislative hearing process) or the Comprehensive Plan. **Recommendation:** Given the findings about mobility performance presented in the existing and future transportation conditions reports, the City should consider the requirements in the cited RTFP and Urban Growth Management Functional Plan sections and determine if additional actions are necessary related to reduced trip generation rates for proposed amendments in the Regional Center or the City's designated Corridors.
(Could be located in TSP or other adopted policy document) Adopt parking policies, management plans and regulations for Centers and Station Communities. Plans may be adopted in TSPs or other adopted policy documents and may focus on sub-areas of Centers. Plans shall include an inventory of parking supply and usage, an evaluation of bicycle parking needs with consideration of *TriMet Bicycle Parking Guidelines*. Policies shall be adopted in the TSP. Policies, plans and regulations must consider and may include the following range of strategies: • By-right exemptions from minimum parking requirements; • Parking districts; • Shared parking; • Structured parking; • Bicycle parking; • Timed parking; • Differentiation between employee parking and parking for customers, visitors and patients; • Real-time parking information;	Parking principles are included in language about functional classifications of roadways (Table 5-2) and the Street Design Standards section and figures (Figures 5-2A and B) of Section 5 of the 2001 TSP. The existing TSP policies do not address the parking strategies in this RTFP requirement. Chapter 17.52 (Off-Street Parking and Loading) of the City code does address shared parking, bicycle parking, and carpool/vanpool employee parking. However, the 2009 Downtown Oregon City Parking Study recommends several parking strategies that can be worked into both TSP policy and implementation projects. **Recommendation:** Consider amending TSP policies to address the parking strategies in this RTFP requirement that are not currently covered by existing policies or code language. Refer to the 2009 Downtown Park Study recommendations in preparing proposed policy language and management strategies.

• Priced parking; • Parking enforcement. **(Title 4, Parking Management Sec 3.08.410I)**	

Draft Amendments to the Oregon City Municipal Code

June 12, 2013

The following are proposed amendments with code sections numbered as they would be in the OCMC and are presented in adoption-ready format. Where new language is proposed to be added, it is underlined; where it is proposed to be removed, it is ~~struck through~~.

OCMC CHAPTER 12.04 - STREETS, SIDEWALKS AND PUBLIC PLACES

12.04.003 Applicability

A. Compliance with this chapter is required for all Land Divisions, Site Plan and Design Review, Master Plan, Detailed Development Plan and Conditional Use applications and all public improvements.

B. Compliance with this chapter is also required for new construction or additions which exceed 50 percent of the existing square footage, of all single and two-family dwellings. All applicable single and two-family dwellings shall provide any necessary dedications, easements or agreements as identified in the Transportation System Plan and this Chapter. In addition, the frontage of the site shall comply with the following prioritized standards identified in this chapter:

1. Improve street pavement, construct curbs, gutters, sidewalks and planter strips; and
2. Plant street trees

The cost of compliance with the standards identified in 12.04.003.B.1 and 12.04.003.B.2 is limited to ten (10%) percent of the total construction costs. The value of the alterations and improvements as determined by the Community Development Director is based on the entire project and not individual building permits. It is the responsibility of the applicant to submit to the Community Development Director the value of the required improvements. Additional costs may be required to comply with other applicable requirements associated with the proposal such as access or landscaping requirements.

12.04.007 Modifications.

The review body may consider modification of this standard resulting from constitutional limitations restricting the City's ability to require the dedication of property or for any other reason, based upon the criteria listed below and other criteria identified in the standard to be modified. All modifications shall be processed through a Type II Land Use application and may require additional evidence from a transportation engineer or others to verify compliance. Compliance with the following criteria is required:

A. The modification meets the intent of the standard;
B. The modification provides safe and efficient movement of pedestrians, motor vehicles, bicyclists and freight;
C. The modification is consistent with an adopted plan; and
D. The modification is complementary with a surrounding street design; OR, in the alternative,
E. If a modification is requested for constitutional reasons, the applicant shall demonstrate the constitutional provision or provisions to be avoided by the modification and propose a modification that complies with the state or federal constitution. The City shall be under no obligation to grant a modification in excess of that which is necessary to meet its constitutional obligations.

12.04.025 - Street design—Driveway Curb cuts.

A. With the exception of the limitations identified in 12.04.025.B, all driveway curb cuts shall be limited to the following dimensions.

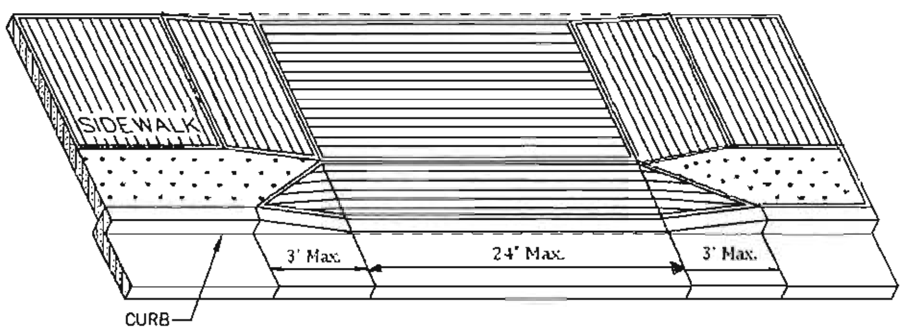
Property Use	Minimum Driveway Width	Maximum Driveway Width at sidewalk or

	at sidewalk or property line	property line
Residential Dwelling* with one Car Garage/Parking Space	10 feet	12 feet
Residential Dwelling* with two Car Garage/Parking Space	18 feet	24 feet
Residential Dwelling* with three or more Car Garages/Parking Space	18 feet	30 feet
Non Residential or Multi-Family Residential Driveway Access	15 feet	40 feet

*Residential dwelling limited to single-family and two-family dwellings.

The driveway width abutting the street pavement may be extended 3 feet on either side of the driveway to accommodate turn movements. Driveways may be widened onsite in locations other than where the driveway meets sidewalk or property line (for example between the property line and the entrance to a garage).

Single-Family Dwelling with a Two Car Garage



BA. ~~To assure public safety, reduce traffic hazards and promote the welfare of pedestrians, bicyclists and residents of the subject area, such as a cul-de-sac or dead-end street, t~~The decision maker shall be authorized through a Type II process, unless another procedure applicable to the proposal applies, to minimize the number and size of curb cuts (including driveways) as far as practicable for any of the following purposes ~~where any of the following conditions are necessary~~:

1. To provide adequate space for on-street parking;
2. To facilitate street tree planting requirements;
3. To assure pedestrian and vehicular safety by limiting vehicular access points; and
4. To assure that adequate sight distance requirements are met.

~~Where the decision maker determines any of these situations exist or may occur due to approval of a proposed development, driveway curb cuts shall be limited to those widths as approved by the public works street standard drawings.~~

a. Where the decision maker determines any of these situations exist or may occur due to the approval of a proposed development for non-residential uses or attached or multi-family housing, a shared driveway shall be required and limited to twenty-four feet in width adjacent to the sidewalk or property line and may extend to a maximum of thirty feet abutting the street pavement to facilitate turning movements.

~~Shared residential driveways shall be limited to twenty-four feet in width adjacent to the sidewalk and property line and may extend to a maximum of thirty feet abutting the street pavement to facilitate turning movements. Non-residential development driveway curb cuts in these situations shall be limited to those widths as approved by the public works street standard drawings or as approved by the city engineer upon review of the vehicle turning radii based on a professional engineer's design submittal.~~

b. Where the decision maker determines any of these situations exist or may occur due to approval of a proposed development for detached housing within the "R-5" Single –Family Dwelling District or "R-3.5" Dwelling District, driveway curb cuts shall be limited to twelve feet in width adjacent to the sidewalk or property line and may extend to a maximum of eighteen feet abutting the street pavement to facilitate turning movements.

C~~B~~. For all driveways, the following standards apply.
1. Each new or redeveloped curb cut shall have an approved concrete approach or asphalted street connection where there is no concrete curb and a minimum hard surface for at least ten feet and preferably twenty feet back into the lot as measured from the current edge of street pavement to provide for controlling gravel tracking onto the public street. The hard surface may be concrete, asphalt, or other surface approved by the city engineer.
2~~C. It shall be a code violation to drive~~ Driving vehicles, trailers, boats, or other wheeled objects across a sidewalk or roadside planter strip at a location other than an approved permanent or city-approved temporary driveway approach is prohibited. Damages caused by such action shall be corrected by the adjoining property owner.
3~~D. It shall be a code violation to place~~ Placing soil, gravel, wood, or other material in the gutter or space next to the curb of a public street with the intention of using it as a permanent or temporary driveway is prohibited. Damages caused by such action shall be corrected by the adjoining property owner.
4~~E~~. Any driveway built within public street or alley right-of-way shall be built and permitted per city requirements as approved by the city engineer.
D~~F~~. Exceptions. The public works director reserves the right to waive this ~~policy in certain instances~~ standard, if it is determined through a Type II decision, including written findings, that it is in the best interest of the public to do so. Examples of allowable exceptions include:
1. Corner properties or properties adjacent to more than one street frontage provided at least one on-street parking space on each frontage remains available after the installation of a second driveway.
2. Special needs for disabled access.
3. When the size of the lot or the length of the street frontage is adequate to support more than one driveway, the installation of a driveway will result in the loss of no more than one on-street parking space and there is no shortage of on-street parking available for neighboring property.
In no case shall more than two driveways be allowed on any single family residential property.
~~G. Appeals. Decisions made by the public works director are final unless appealed in writing to the transportation advisory committee for review and recommendation to the city commission.~~
~~H. Failure to Comply. Failure to meet the intent of this section shall be a violation of this Code and enforceable as a civil infraction.~~

~~12.04.045 - Street Design—Constrained local streets and/or rights-of-way.~~
~~Any accessway with a pavement width of less than thirty-two feet shall require the approval of the city engineer, community development director and fire chief and shall meet minimum life safety requirements, which may include fire suppression devices as determined by the fire marshal to assure an adequate level of fire and life safety. The standard width for constrained streets is twenty feet of paving with no on-street parking and twenty-eight feet with on-street parking on one side only. Constrained local streets shall maintain a twenty-foot wide unobstructed accessway. Constrained local streets and/or right-of-way shall comply with necessary slope easements, sidewalk easements and altered curve radius, as approved by the city engineer and community development director.~~
~~Table 12.04.045~~

~~STREET DESIGN STANDARDS FOR LOCAL CONSTRAINED STREETS~~

	~~Minimum~~	~~Required~~
~~Type of Street~~	~~Right-of-way~~	~~Pavement Width~~
~~Constrained local street~~	~~20 to 40~~	~~20 to less than 32 feet~~

~~**12.04.095 - Street Design—Curb Cuts.**~~

~~To assure public safety, reduce traffic hazards and promote the welfare of pedestrians, bicyclists and residents of the subject area, such as a cul-de-sac or dead-end street, the decision maker shall be authorized to minimize the number and size of curb cuts (including driveways) as far as practicable where any of the following conditions are necessary:~~

~~A. To provide adequate space for on-street parking;~~

~~B. To facilitate street tree planting requirements;~~

~~C. To assure pedestrian and vehicular safety by limiting vehicular access points; and~~

~~D. To assure that adequate sight distance requirements are met.~~

~~Where the decision maker determines any of these situations exist or may occur due to approval of a proposed development, single residential driveway curb cuts shall be limited to twelve feet in width adjacent to the sidewalk and property line and may extend to a maximum of eighteen feet abutting the street pavement to facilitate turning movements. Shared residential driveways shall be limited to twenty-four feet in width adjacent to the sidewalk and property line and may extend to a maximum of thirty feet abutting the street pavement to facilitate turning movements. Non-residential development driveway curb cuts in these situations shall be limited to the minimum required widths based on vehicle turning radii based on a professional engineer's design submittal and as approved by the decision maker.~~

12.04.175 - Street design—Generally.

The location, width and grade of street shall be considered in relation to: existing and planned streets, topographical conditions, public convenience and safety for all modes of travel, existing and identified future transit routes and pedestrian/bicycle accessways, overlay districts, and the proposed use of land to be served by the streets. The street system shall assure an adequate traffic circulation system with intersection angles, grades, tangents and curves appropriate for the traffic to be carried considering the terrain. To the extent possible, proposed streets shall connect to all existing or approved stub streets that abut the development site. ~~Where location not shown in the development plan, t~~The arrangement of streets shall either:

A. Provide for the continuation or appropriate projection of existing principal streets in the surrounding area and on adjacent parcels or conform to a plan for the area approved or adopted by the city to meet a particular situation where topographical or other conditions make continuance or conformance to existing streets impractical;

B. Where necessary to give access to or permit a satisfactory future development of adjoining land, streets shall be extended to the boundary of the development and the resulting dead-end street (stub) may be approved with a temporary turnaround as approved by the city engineer. Notification that the street is planned for future extension shall be posted on the stub street until the street is extended and shall inform the public that the dead-end street may be extended in the future. Access control in accordance with section 12.04~~.200~~ shall be required to preserve the objectives of street extensions.

12.04.180 - Street design ~~Minimum right-of-way~~

~~All development shall provide adequate right-of-way and pavement width. Adequate right-of-way and pavement width shall be provided by:~~

~~A. Complying with the street design standards contained in the table provided in Chapter 12.04. The street design standards are based on the classification of streets that occurred in the Oregon City Transportation System Plan (TSP), in particular, the following TSP figures provide the appropriate classification for each street in Oregon City: Figure 5-1: Functional Classification System and New Roadway Connections; Figure 5-3: Pedestrian System Plan; Figure 5.6: Bicycle System Plan; and Figure 5.7: Public Transit System Plan. These TSP figures from the Oregon City Transportation System Plan are incorporated herein by reference in order to determine the classification of particular streets.~~

~~**Type of Street**~~	~~**Maximum Right-of-Way Width**~~	~~**Pavement Width**~~
~~Major arterial~~	~~124 feet~~	~~98 feet~~

~~Type of Street~~	~~Maximum Right-of-Way Width~~	~~Pavement Width~~
~~Minor arterial~~	~~114 feet~~	~~88 feet~~
~~Collector street~~	~~86 feet~~	~~62 feet~~
~~Neighborhood Collector street~~	~~81 feet~~	~~59 feet~~
~~Local street*~~	~~54 feet~~	~~32 feet~~
~~Alley~~	~~20 feet~~	~~16 feet~~

~~B. The applicant may submit an alternative street design plan that varies from the street design standards identified above. An alternative street design plan may be approved by the city engineer if it is found the alternative allows for adequate and safe traffic, pedestrian and bicycle flows and transportation alternatives and protects and provides adequate multi-modal transportation services for the development as well as the~~

All development regulated by this Chapter shall provide street improvements in compliance with the standards in ~~the~~ Figure ~~in~~ 12.04.180 depending on the street classification set forth in the Transportation System Plan and the Comprehensive Plan designation of the adjacent property, unless an alternative plan has been adopted. The standards provided below are maximum design standards and may be reduced with an alternative street design which may be approved based on the modification criteria in 12.04.007.

Figure 12.04.180 Example Residential Local Street

Table 12.04.180 Street Design

To read the table below, select the road classification as identified in the Transportation System Plan and the Comprehensive Plan designation of the adjacent properties to find the maximum design standards for the road cross section. If the Comprehensive Plan designation on either side of the street differs, the wider right-of-way standard shall apply. The steps for determining the appropriate cross-section of a street are found in the Transportation System Plan.

Road Classification	**Comprehensive Plan Designation**	**Right-of-Way Width**	**Pavement Width**	**Public Access**	**Sidewalk**	**Landscape Strip**	**Bike Lane**	**Street Parking**	**Travel Lanes**	**Median**
Major Arterial	Mixed Use, Commercial or Public/Quasi Public	116 ft.	94 ft.	0.5 ft.	10.5 ft. sidewalk including 5 ft.x5 ft. tree wells		6 ft.	8 ft.	(5) 12 ft. Lanes	6 ft.
	Industrial	120 ft.	88 ft.	0.5 ft.	5 ft.	10.5~~'~~ ft.	6 ft.	N/A	(5) 14 ft. Lanes	6 ft.
	Residential	126 ft.	94 ft.	0.5 ft.	5 ft.	10.5~~'~~ ft.	6 ft.	8 ft.	(5) 12 ft. Lanes	6 ft.

Road Classification	**Comprehensive Plan Designation**	**Right-of-Way Width**	**Pavement Width**	**Public Access**	**Sidewalk**	**Landscape Strip**	**Bike Lane**	**Street Parking**	**Travel Lanes**	**Median**
Minor Arterial	Mixed Use, Commercial or Public/Quasi Public	116 ft.	94 ft.	0.5 ft.	10.5 ft. sidewalk including 5 ft.x5 ft. tree wells		6 ft.	8 ft.	(5) 12 ft. Lanes	6 ft.
	Industrial	118 ft.	86 ft.	0.5 ft.	5 ft.	10.5~~'~~ ft.	6 ft.	7 ft.	(5) 12 ft. Lanes	N/A

	Residential	100 ft.	68 ft.	0.5 ft.	5 ft.	10.5~~'~~ ft.	6 ft.	7 ft.	(3) 12 ft. Lanes	6 ft.

Road Classification	Comprehensive Plan Designation	Right-of-Way Width	Pavement Width	Public Access	Sidewalk	Landscape Strip	Bike Lane	Street Parking	Travel Lanes	Median
Collector	Mixed Use, Commercial or Public/Quasi Public	86 ft.	64 ft.	0.5 ft.	10.5 ft. sidewalk including 5 ft.x5 ft. tree wells		6 ft.	8 ft.	(3) 12 ft. Lanes	N/A
	Industrial	88 ft.	62 ft.	0.5 ft.	5 ft.	7.5 ft.	6 ft.	7 ft.	(3) 12 ft. Lanes	N/A
	Residential	85 ft.	59 ft.	0.5 ft.	5 ft.	7.5 ft.	6 ft.	7 ft.	(3) 11 ft. Lanes	N/A

Road Classification	Comprehensive Plan Designation	Right-of-Way Width	Pavement Width	Public Access	Sidewalk	Landscape Strip	Bike Lane	Street Parking	Travel Lanes	Median
Local	Mixed Use, Commercial or Public/Quasi Public	62 ft.	40 ft.	0.5 ft.	10.5 ft. sidewalk including 5 ft.x5 ft. tree wells		N/A	8 ft.	(2) 12 ft. Lanes	N/A
	Industrial	60 ft.	38 ft.	0.5 ft.	5 ft.	5.5 ft.	(2) 19 ft. Shared Space			N/A
	Residential	54 ft.	32 ft.	0.5 ft.	5 ft.	5.5 ft.	(2) 16 ft. Shared Space			N/A

1. Pavement width includes, bike lane, street parking, travel lanes and median.
2. Public access, sidewalks, landscape strips, bike lanes and on-street parking are required on both sides of the street in all designations. The right-of-way width and pavement widths identified above include the total street section.
3. A 0.5~~'~~ foot curb is included in landscape strip or sidewalk width.
4. Travel lanes may be through lanes or turn lanes.
5. The 0.5~~'~~ foot public access provides access to adjacent public improvements.
6. Alleys shall have a minimum right-of-way width of 20 feet and a minimum pavement width of 16 feet. If alleys are provided, garage access shall be provided from the alley.

12.04.190 Street Design--Alignment.

The centerline of streets shall be:

A. Aligned with existing streets by continuation of the centerlines; or

B. Offset from the centerline by no more than five ~~10~~(5) feet, provided appropriate mitigation, in the judgment of the City Engineer, is provided to ensure that the offset intersection will not pose a safety hazard.

12.04.194 Traffic Sight Obstructions

All new streets and driveways shall comply with the Traffic Sight Obstructions in ~~c~~Chapter 10.32.

~~**12.04.195 – Minimum Street Intersection Spacing Standards**~~

~~A. All new development and redevelopment shall meet the following Public intersection spacing standards~~

~~ADD DIAGRAM EXAMPLE~~

~~Table 12.04.040 - Public Street Intersection Spacing Standards~~

	~~Distance in Feet between Streets of Various Classifications~~								
	~~Between Arterial and Arterial~~	~~Between Arterial and Collector~~	~~Between Arterial and Neighborhood Collector~~	~~Between Arterial and Local Street~~	~~Between Collector Street and Collector Street~~	~~Collector Street and Neighborhood~~	~~Between Collector and Local Street~~	~~Between Neighborhood Collector and Local Street~~	~~Between two adjacent Local Streets~~
~~Measured along an Arterial Street~~	~~1320~~	~~800~~	~~600~~	~~300~~	~~600~~	~~300~~	~~150~~	~~150~~	~~150~~
~~Measured along a Collector Street~~	~~800~~	~~800~~	~~600~~	~~300~~	~~600~~	~~300~~	~~150~~	~~150~~	~~150~~
~~Measured along a Neighborhood Collector Street~~	~~800~~	~~600~~	~~300~~	~~300~~	~~300~~	~~150~~	~~150~~	~~150~~	~~150~~
~~Measured along a Local Street~~	~~600~~	~~600~~	~~300~~	~~300~~	~~300~~	~~150~~	~~150~~	~~150~~	~~150~~

~~Note: With regard to public intersection spacing standards, same distances apply to both major arterial and minor arterial streets. In this table, the term "arterial" applies to both major arterial and minor arterial streets.~~

~~or~~

~~B. A lesser distance between intersections may be allowed, provided appropriate mitigation, in the judgment of the City Engineer, is provided to ensure that the reduction in intersection spacing will not pose a safety hazard.~~

12.04.195 – Spacing Standards

All new development and redevelopment shall meet the spacing standards identified in Table 12.04.195, as measured between the right-of-way centerlines. The spacing standards within this section do not apply to alleys.

ADD DIAGRAM

Table 12.04.195 Spacing Standards

Street Functional Classification	**Spacing Standards**	**Mixed-Use, Residential** or Public/Quasi Public **Comprehensive Plan Designation**	**Commercial or Industrial Comprehensive Plan Designation**
Major Arterial Streets	Location identified in Figure 6 of the Transportation System Plan.		
	Minimum Driveway Spacing (Street to Driveway)	175 ft.	225 ft.
Minor Arterial Streets	Location identified in Figure 6 of the Transportation System Plan.		
	Minimum Driveway Spacing (Street to Driveway)	175 ft.	225 ft.
Collector Streets	Location identified in Figure 6 of the Transportation System Plan.		
	Minimum Driveway Spacing (Street to Driveway)	100 ft.	150 ft.
	Minimum Block Size (Street to Street)	150 ft.	150 ft.

Table 12.04.195 Spacing Standards

Street Functional Classification	Spacing Standards	Mixed-Use, Residential or Public/Quasi Public Comprehensive Plan Designation	Commercial or Industrial Comprehensive Plan Designation
	Minimum Driveway Spacing (Street to Driveway)	25 ft.	25 ft.

The maximum block spacing between streets is 530 feet. If the maximum block size is exceeded, pedestrian accessways must be provided every 330 feet.

~~**12.04.197 –Street Designation**~~

All new streets shall be designed as local streets unless otherwise designated in the Transportation System Plan.

12.04.199 Pedestrian and Bicycle Accessways

Pedestrian/bicycle accessways are intended to provide direct, safe and convenient connections between residential areas, retail and office areas, institutional facilities, industrial parks, transit streets, neighborhood activity centers, rights-of-way, and pedestrian/bicycle accessways which minimize out-of-direction travel, and transit-orientated developments where public street connections for automobiles, bicycles and pedestrians are unavailable. Pedestrian/bicycle accessways are appropriate in areas where public street options are unavailable, impractical or inappropriate. Pedestrian and bicycle accessways are required through private property or as right-of-way connecting development to the right-of-way at intervals not exceeding three-hundred-and-thirty feet of frontage; or where the lack of street continuity creates inconvenient or out of direction travel patterns for local pedestrian or bicycle trips.

A. Entry points shall align with pedestrian crossing points along adjacent streets and with adjacent street intersections.
B. Accessways shall be free of horizontal obstructions and have a nine-foot, six-inch high vertical clearance to accommodate bicyclists. To safely accommodate both pedestrians and bicycles, accessway right-of-way widths shall be as follows:

1. Accessways shall have a fifteen-foot-wide right-of-way with a seven-foot wide paved surface between a five foot planter strip and a three foot planter strip.
2. If an accessway also provides secondary fire access, the right-of-way width shall be at least twenty-three feet wide with a fifteen-foot paved surface a five foot planter strip and a three foot planter strip.

C. Accessways shall be direct with at least one end point of the accessway always visible from any point along the accessway. On-street parking shall be prohibited within fifteen feet of the intersection of the accessway with public streets to preserve safe sight distance and promote safety.
D. To enhance pedestrian and bicycle safety, accessways shall be lighted with pedestrian-scale lighting. Accessway lighting shall be to a minimum level of one-half foot-candles, a one and one-half foot-candle average, and a maximum to minimum ratio of seven-to-one and shall be oriented not to shine upon adjacent properties. Street lighting shall be provided at both entrances.
E. ~~Wherever practicable, a~~Accessways shall comply with Americans with Disabilities Act (ADA)~~as possible~~.
F. The planter strips on either side of the accessway shall be landscaped along adjacent property by installation of the following:

1. Within the three foot planter strip, an evergreen hedge screen of thirty to forty-two inches high or shrubs spaced no more than four feet apart on average;
2. Ground cover covering one hundred percent of the exposed ground. No bark mulch shall be allowed except under the canopy of shrubs and within two feet of the base of trees;

3. Within the five foot planter strip, two-inch minimum caliper trees with a maximum of thirty-five feet of separation between the trees to increase the tree canopy over the accessway;
4. In satisfying the requirements of this section, evergreen plant materials that grow over forty-two inches in height shall be avoided. All plant materials shall be selected from the Oregon City Native Plant List.

G. Accessways shall be designed to prohibit unauthorized motorized traffic. Curbs and removable, lockable bollards are suggested mechanisms to achieve this.

H. Accessway surfaces shall be paved with all-weather materials as approved by the city. Pervious materials are encouraged. Accessway surfaces shall be designed to drain stormwater runoff to the side or sides of the accessway. Minimum cross slope shall be two percent.

I. In parks, greenways or other natural resource areas, accessways may be approved with a five-foot wide gravel path with wooden, brick or concrete edgings .

J. The Community Development Director may approve an alternative accessway design due to existing site constraints through the modification process set forth in Section 12.04.007.

K. Ownership, liability and maintenance of accessways.

To ensure that all pedestrian/bicycle accessways will be adequately maintained over time, the hearings body shall require one of the following:

1 Dedicate the accessways to the public as public right-of-way prior to the final approval of the development; or
2 The developer incorporates the accessway into a recorded easement or tract that specifically requires the property owner and future property owners to provide for the ownership, liability and maintenance of the accessway.

~~12.04.200 Street Design--Constrained Local Streets and/or Rights-of-Way.~~

~~Any accessway with a pavement width of less than thirty-two feet shall require the approval of the City Engineer, Community Development Director and Fire Chief and shall meet minimum life safety requirements, which may include fire suppression devices as determined by the fire marshal to assure an adequate level of fire and life safety. The standard width for constrained streets is twenty feet of paving with no on-street parking and twenty-eight feet with on-street parking on one side only. Constrained local streets shall maintain a twenty-foot wide unobstructed accessway. Constrained local streets and/or right-of-way shall comply with necessary slope easements, sidewalk easements and altered curve radius, as approved by the City Engineer and Community Development Director.~~

~~Table 12.04.045~~ ~~STREET DESIGN STANDARDS FOR LOCAL CONSTRAINED STREETS~~		
	~~Minimum~~	~~Required~~
~~Type of Street~~	~~Right-of-Way~~	~~Pavement Width~~
~~Constrained local street~~	~~30 to 40 feet~~	~~20 to less than 32 feet~~

12.04.205 - ~~Intersection level of Service~~ Mobility Standards.

Delete existing section and replace with the following:

Development shall demonstrate compliance with intersection mobility standards. When evaluating the performance of the transportation system, the City of Oregon City requires all intersections, except for the facilities identified in subsection D below, to be maintained at or below the following mobility standards during the two-hour peak operating conditions. The first hour has the highest weekday traffic volumes and the second hour is the next highest hour before or after the first hour. Except as provided otherwise below, this may require the installation of mobility improvements as set forth in the Transportation System Plan or as otherwise identified by the City Transportation Engineer.

A. For intersections within the Regional Center, the following mobility standards apply:

1. During the first hour, a maximum v/c ratio of 1.10 shall be maintained. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.
2. During the second hour, a maximum v/c ratio of 0.99 shall be maintained at signalized intersections. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.
3. Intersections located on the Regional Center boundary shall be considered within the Regional Center.

B. For intersections outside of the Regional Center but designated on the Arterial and Throughway Network, as defined in the Regional Transportation Plan, the following mobility standards apply:

1. During the first hour, a maximum v/c ratio of 0.99 shall be maintained. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.
2. During the second hour, a maximum v/c ratio of 0.99 shall be maintained at signalized intersections. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.

C. For intersections outside the boundaries of the Regional Center and not designated on the Arterial and Throughway Network, as defined in the Regional Transportation Plan, the following mobility standards apply:

1. For signalized intersections:
   a. During the first hour, LOS "D" or better will be required for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of the critical movements.
   b. During the second hour, LOS "D" or better will be required for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of the critical movements.
2. For unsignalized intersections outside of the boundaries of the Regional Center:
   a. For unsignalized intersections, during the peak hour, all movements serving more than 20 vehicles shall be maintained at LOS "E" or better. LOS "F" will be tolerated at movements serving no more than 20 vehicles during the peak hour.

D. Until the City adopts new performance measures that identify alternative mobility targets, the City shall exempt proposed development that is permitted, either conditionally, outright, or through detailed development master plan approval, from compliance with the above-referenced mobility standards for the following state-owned facilities:

I-205 / OR 99E Interchange

I-205 / OR 213 Interchange

OR 213 / Beavercreek Road

Interchanges located within or on the Regional Center Boundaries.

1. In the case of conceptual development approval for a master plan that impacts the above references intersections:
   a. the form of mitigation will be determined at the time of the detailed development plan review for subsequent phases utilizing the Code in place at the time the detailed development plan is submitted; and
   b. only those trips approved by a detailed development plan review are vested.
2. Development which does not comply with the mobility standards for the intersections identified in 12.04.205.D shall provide for the improvements identified in the Transportation System Plan (TSP) in an effort to improve intersection mobility as necessary to offset the impact caused by development. Where required by other provisions of the Code, the applicant shall provide a traffic impact study that includes an assessment of the development's impact on the intersections identified in this exemption and shall construct the intersection improvements listed in the TSP or required by the Code.

12.04.220 Street Design--Half Street.
Half streets, while generally not acceptable, may be approved where essential to the development, when in conformance with all other applicable requirements, and where it will not create a safety hazard. When approving half streets, the decision maker must first determine that it will be practical to require the dedication of the other half of the street when the adjoining property is divided or developed. Where the decision maker approves a half street, the applicant must construct an additional ten feet of pavement width so as to make the half street safe and usable until such time as the other half is constructed. Whenever a half street is adjacent to property capable of being divided or developed, the other half of the street shall be provided and improved when that adjacent property divides or develops. Access Control ~~as described in 12.04.200~~ may be required to preserve the objectives of half streets.

When the remainder of an existing half-street improvement is made it shall include the following items: dedication of required right-of-way, construction of the remaining portion of the street including pavement, curb and gutter, landscape strip, sidewalk, street trees, lighting and other improvements as required for that particular street. It shall also include at a minimum the pavement replacement to the centerline of the street. Any damage to the existing street shall be repaired in accordance with the City's "Moratorium Pavement Cut Standard" or as approved by the City Engineer.

12.04.225 - Street design—Cul-de-sacs and dead-end streets.
The city discourages the use of cul-de-sacs and permanent dead-end streets except where construction of a through street is found by the decision maker to be impracticable due to topography or some significant physical constraint such as ~~unstable soils~~ geologic hazards, wetland, natural or historic resource areas, dedicated open space, existing development patterns, ~~or~~ arterial access restrictions or similar situation as determined by the Community Development Director. When permitted, access from new cul-de-sacs and permanent dead-end streets shall be limited to ~~have~~ a maximum of 25 dwelling units and a maximum street length of ~~three hundred fifty~~ two hundred feet, as measured from the right-of-way line of the nearest intersecting street to the back of the cul-de-sac curb face. In addition, cul-de-sacs and dead end roads shall ~~and~~ include pedestrian/bicycle accessways as ~~provided in Section 17.90.220 of~~ required in this ~~code and~~ Chapter~~12.24~~. This section is not intended to preclude the use of curvilinear eyebrow widening of a street where needed ~~to provide adequate lot coverage~~.

Where approved, cul-de-sacs shall have sufficient radius to provide adequate turn-around for emergency vehicles in accordance with Fire District and City adopted street standards. Permanent dead-end streets other than cul-de-sacs shall provide public street right-of-way / easements sufficient to provide turn-around space with appropriate no-parking signs or markings for waste disposal, sweepers, and other long vehicles in the form of a hammerhead or other design to be approved by the decision maker. Driveways shall be encouraged off the turnaround to provide for additional on-street parking space.

12.04.260 - Street design—Transit.
Streets shall be designed and laid out in a manner that promotes pedestrian and bicycle circulation. The applicant shall coordinate with Tri-Met where the application impacts transit streets as identified on Figure 5.7: Public Transit System Plan of the Oregon City Transportation System Plan. Pedestrian/bicycle access ways shall be provided as necessary in conformance with the requirements in Section 17.90.220 of this code and Chapter ~~12.24~~ 12.04 to minimize the travel distance to transit streets and stops and neighborhood activity centers. The decision maker may require provisions, including easements, for transit facilities along transit streets where a need for bus stops, bus pullouts or other transit facilities within or adjacent to the development has been identified.

~~OCMC CHAPTER 12.24 PEDESTRIAN/BICYCLE ACCESSWAYS~~
Delete entire chapter. Standards integrated into Chapter 12.04.

OCMC CHAPTER 16.12 - MINIMUM IMPROVEMENTS AND DESIGN STANDARDS FOR LAND DIVISIONS

16.12.015 - Street design—Generally.
~~Street design standards for all new development and land divisions shall comply with Chapter 12.04—Street Design Standards.~~ Development shall demonstrate compliance with Chapter 12.04 - Streets, Sidewalks and Public Places.

~~**16.12.025 - Blocks—Length.**~~
~~Block lengths for local streets and collectors shall not exceed five hundred feet between through streets, as measured between nearside right-of-way lines.~~

~~**16.12.035 - Blocks—Pedestrian and bicycle access.**~~
~~A. To facilitate the most practicable and direct pedestrian and bicycle connections to adjoining or nearby neighborhood activity centers, public rights-of-way, and pedestrian/bicycle accessways which minimize out-of-direction travel, subdivisions shall include pedestrian/bicycle access-ways between discontinuous street right-of-way where the following applies:~~
~~1. Where a new street is not practicable;~~
~~2. Through excessively long blocks at intervals not exceeding five hundred feet of frontage as measured between nearside right-of-way lines;~~
~~3. Where the lack of street continuity creates inconvenient or out of direction travel patterns for local pedestrian or bicycle trips.~~
~~B. Pedestrian/bicycle accessways shall be provided:~~
~~1. To provide direct access to nearby neighborhood activity centers, transit streets and other transit facilities;~~
~~2. Where practicable, to provide direct access to other adjacent developments and to adjacent undeveloped property likely to be subdivided or otherwise developed in the future;~~
~~3. To provide direct connections from cul-de-sacs and internal private drives to the nearest available street or neighborhood activity center;~~
~~4. To provide connections from cul-de-sacs or local streets to arterial or collector streets.~~
~~C. An exception may be made where the community development director determines that construction of a separate accessway is not feasible due to physical or jurisdictional constraints. Such evidence may include but is not limited to:~~
~~1. That other federal, state or local requirements prevent construction of an accessway;~~
~~2. That the nature of abutting existing development makes construction of an accessway impracticable;~~
~~3. That the accessway would cross an area affected by an overlay district in a manner incompatible with the purposes of the overlay district;~~
~~4. That the accessway would cross topography consisting predominantly of slopes over twenty-five percent;~~
~~5. That the accessway would terminate at the urban growth boundary and extension to another public right-of-way is not part of an adopted plan.~~
~~D. Pedestrian/bicycle accessways shall comply with the development standards set out in Section 12.24 of this code, with the ownership, liability and maintenance standards in Section 12.24 of this code, and with such other design standards as the city may adopt.~~

16.12.095 Minimum Improvements--Public Facilities and Services.
The following minimum improvements shall be required of all applicants for a land division under Title 16, unless the decision-maker determines that any such improvement is not proportional to the impact imposed on the City's public systems and facilities:
A. Transportation System. Applicants and all subsequent lot owners shall be responsible for improving the city's

planned level of service on all public streets, including alleys within the land division and those portions of public streets adjacent to but only partially within the land division. All applicants shall execute a binding agreement to not remonstrate against the formation of a local improvement district for street improvements that benefit the applicant's property. Applicants are responsible for designing and providing adequate vehicular, bicycle and pedestrian access to their developments and for accommodating future access to neighboring undeveloped properties that are suitably zoned for future development. Storm drainage facilities shall be installed and connected to off-site natural or man-made drainageways. Upon completion of the street improvement survey, the applicant shall reestablish and protect monuments of the type required by ORS 92.060 in monument boxes with covers at every public street intersection and all points or curvature and points of tangency of their center line, and at such other points as directed by the city engineer.

B. Stormwater Drainage System. Applicants shall design and install drainage facilities within land divisions and shall connect the development's drainage system to the appropriate downstream storm drainage system as a minimum requirement for providing services to the applicant's development. The applicant shall obtain county or state approval when appropriate. All applicants shall execute a binding agreement to not remonstrate against the formation of a local improvement district for stormwater drainage improvements that benefit the applicant's property. Applicants are responsible for extending the appropriate storm drainage system to the development site and for providing for the connection of upgradient properties to that system. The applicant shall design the drainage facilities in accordance with city drainage master plan requirements, Chapter 13.12 and the Public Works Stormwater and Grading Design Standards.

C. Sanitary Sewer System. The applicant shall design and install a sanitary sewer system to serve all lots or parcels within a land division in accordance with the city's sanitary sewer design standards, and shall connect those lots or parcels to the city's sanitary sewer system, except where connection is required to the county sanitary sewer system as approved by the county. All applicants shall execute a binding agreement to not remonstrate against the formation of a local improvement district for sanitary sewer improvements that benefit the applicant's property. Applicants are responsible for extending the city's sanitary sewer system to the development site and through the applicant's property to allow for the future connection of neighboring undeveloped properties that are suitably zoned for future development. The applicant shall obtain all required permits and approvals from all affected jurisdictions prior to final approval and prior to commencement of construction. Design shall be approved by the city engineer before construction begins.

D. Water System. The applicant shall design and install a water system to serve all lots or parcels within a land division in accordance with the city public works water system design standards, and shall connect those lots or parcels to the city's water system. All applicants shall execute a binding agreement to not remonstrate against the formation of a local improvement district for water improvements that benefit the applicant's property. Applicants are responsible for extending the city's water system to the development site and through the applicant's property to allow for the future connection of neighboring undeveloped properties that are suitably zoned for future development.

E. Sidewalks. The applicant shall provide for sidewalks on both sides of all public streets, on any private street if so required by the decision-maker, and in any special pedestrian way within the land division. Exceptions to this requirement may be allowed in order to accommodate topography, trees or some similar site constraint. In the case of major or minor arterials, the decision-maker may approve a land division without sidewalks where sidewalks are found to be dangerous or otherwise impractical to construct or are not reasonably related to the applicant's development. The decision-maker may require the applicant to provide sidewalks concurrent with the issuance of the initial building permit within the area that is the subject of the land division application. Applicants for partitions may be allowed to meet this requirement by executing a binding agreement to not remonstrate against the formation of a local improvement district for sidewalk improvements that benefit the applicant's property.

F. Bicycle Routes. If appropriate to the extension of a system of bicycle routes, existing or planned, the decision-maker may require the installation of separate bicycle lanes within streets and separate bicycle paths.

G. Street Name Signs and Traffic Control Devices. ~~The applicant shall pay the city and the city installs street name~~

~~signs at all street intersections.~~ The applicant shall install street signs and traffic control devices as directed by the city engineer. Street name signs and traffic control devices shall be in conformance with all applicable city regulations and standards.
H. Street Lights. The applicant shall install street lights which shall be served from an underground source of supply. Street lights shall be in conformance with all city regulations.
I. Street Trees. Refer to Chapter 12.08, Street Trees.
J. Bench Marks. At least one bench mark shall be located within the subdivision boundaries using datum plane specified by the city engineer.
K. Other. The applicant shall make all necessary arrangements with utility companies or other affected parties for the installation of underground lines and facilities. Electrical lines and other wires, including but not limited to communication, street lighting and cable television, shall be placed underground.
L. Oversizing of Facilities. All facilities and improvements shall be designed to city standards as set out in the city's facility master plan, public works design standards, or other city ordinances or regulations. Compliance with facility design standards shall be addressed during final engineering. The city may require oversizing of facilities to meet standards in the city's facility master plan or to allow for orderly and efficient development. Where oversizing is required, the applicant may request reimbursement from the city for oversizing based on the city's reimbursement policy and funds available, or provide for recovery of costs from intervening properties as they develop.
M. Erosion Control Plan--Mitigation. The applicant shall be responsible for complying with all applicable provisions of Chapter 17.47 with regard to erosion control.

OCMC CHAPTER 17.04 – DEFINITIONS

17.04.030 "Accessway, pedestrian/bicycle" means any off-street path or way as described in Chapter ~~12.24~~ 12.04, intended primarily for pedestrians or bicycles and which provides direct routes within and from new developments to residential areas, retail and office areas, transit streets and neighborhood activity centers.

17.04.712 "Major transit stop" means transit centers, high capacity transit stations, major bus stops, inter-city bus passenger terminals, inter-city rail passenger terminals, and bike-transit facilities as shown in the Regional Transportation Plan.

17.04.800 "Neighborhood activity center" refers to land uses which attract or are capable of attracting a ~~greater than average level of pedestrian activity. Neighborhood activity centers include, but are not limited to, parks, schools, retail store and service areas, shopping centers, recreational centers, meeting rooms, theaters, museums, transit stops and other pedestrian oriented uses.~~ substantial amount of pedestrian use. Neighborhood activity centers include, but are not limited to, parks, schools, retail store and service areas, shopping centers, recreational centers, meeting rooms, theaters, museums and other pedestrian oriented uses.

17.04.1310 "Transit street" means any street identified as an existing or planned bus or ~~light rail~~ mass transit route as shown in the city's transportation ~~master~~ plan (~~1989~~ 2001 or as subsequently amended) or a street on which transit operates.

17.04.1312 "Transportation facilities" shall include construction, operation, and maintenance of travel lanes, bike lanes and facilities, curbs, gutters, drainage facilities, sidewalks, transit stops, landscaping, and related improvements located within rights-of-ways controlled by a public agency, consistent with the City Transportation System Plan.

TRANSPORTATION FACILITIES ARE TO BE IDENTIFIED AS A PERMITTED USE IN ALL ZONING DESIGNATIONS WITH THE ADDITION OF THE FOLLOWING CODE SECTIONS:
17.08.020.J. Transportation facilities

17.10.020.J. Transportation facilities
17.12.020.J. Transportation facilities
17.14.020.J. Transportation facilities
17.16.020.K. Transportation facilities
17.18.020.I. Transportation facilities
17.29.020.AA. Transportation facilities
17.31.020.Q. Transportation facilities
17.36.020.O. Transportation facilities
17.37.020.O. Transportation facilities
17.39.020.G. Transportation facilities

OCMC CHAPTER 17.34 "MUD"—MIXED-USE DOWNTOWN DISTRICT

~~**17.34.070 - Mixed-use downtown dimensional standards—For properties located within the downtown design district.**~~

~~H. Parking Standards. The minimum number of off-street vehicular parking stalls required in Chapter 17.52 may be reduced by fifty percent.~~

OCMC CHAPTER 17.52 OFF-STREET PARKING AND LOADING

17.52.15 Planning Commission Adjustment of Parking Standards.

A. Purpose: The purpose of permitting a Planning Commission Adjustment to Parking Standards is to provide for flexibility in modifying parking standards in all zoning districts, without permitting an adjustment that would adversely impact the surrounding or planned neighborhood. The purpose of an adjustment is to provide flexibility to those uses which may be extraordinary, unique or to provide greater flexibility for areas that can accommodate a denser development pattern based on existing infrastructure and ability to access the site by means of walking, biking or transit. An adjustment to a minimum or maximum parking standard may be approved based on a determination by the Planning Commission that the adjustment is consistent with the purpose of this Code, and the approval criteria can be met.

B. Procedure: A request for a Planning Commission Parking Adjustment shall be initiated by a property owner or authorized agent by filing a land use application. The application shall be accompanied by a site plan, drawn to scale, showing the dimensions and arrangement of the proposed development and parking plan, the extent of the adjustment requested along with findings for each applicable approval criteria. A request for a parking adjustment shall be processed as a Type III application as set forth in Chapter 17.50.

C. Approval criteria for the adjustment are as follows:

1. Documentation: The applicant shall document that the individual project will require an amount of parking that is different from that required after all applicable reductions have been taken.

2. Parking analysis for surrounding uses and on- street parking availability- The applicant must show that there is a continued 15% parking vacancy in the area adjacent to the use during peak parking periods and that the applicant has permission to occupy this area to serve the use pursuant to the procedures set forth by the Community Development Director.

    a. For the purposes of demonstrating the availability of on street parking as defined in 17.52.020.B.3 , the applicant shall undertake a parking study during time periods specified by the Community Development Director. The time periods shall include those during which the highest parking demand is anticipated by the proposed use. Multiple observations during multiple days shall be required.

    b. Base on the parking availability identified in the parking study, parking requirements for the development may be adjusted The calculation of the available on-street parking shall be adjusted based on the proximity of that parking to the site and be adjusted according to distance as follows:

        i Vacant spaces within 300 feet of the site are to be counted at 50 percent;

ii. Vacant spaces between 300 and 600 feet of the site are to be counted at 20 percent. Distances are to be calculated as traversed by a pedestrian that utilizes sidewalks and legal crosswalks or an alternative manner as accepted by the Community Development Director.

3. Function and Use of Site: The applicant shall demonstrate that modifying the amount of required parking spaces will not significantly impact the use or function of the site and/or adjacent sites;

4. Compatibility: The proposal is compatible with the character, scale and existing or planned uses of the surrounding neighborhood;

5. Safety: The proposal does not significantly impact the safety of adjacent properties and Rights-of-Way.

6. Services: The proposal will not create a significant impact to public services, including fire and emergency services.

17.52.020 Number of automobile spaces required. *(replace section with the following)*

A. The number of parking spaces shall comply with the minimum and maximum standards listed in Table 17.52.020. The parking requirements are based on spaces per one thousand square feet ~~gross~~ net leasable area unless otherwise stated.

Table 17.52.020 Number of automobile spaces required. LAND USE	*PARKING REQUIREMENTS*	
	MINIMUM	*MAXIMUM*
~~Single-Family Dwelling~~	~~1.00 per unit~~	
Multi-Family: Studio	1.00 per unit	1.5 per unit
Multi-Family: 1 bedroom	1.25 per unit	2.00 per unit
Multi-Family: 2 bedroom	1.5 per unit	2.00 per unit
Multi-Family: 3 bedroom	1.75 per unit	2.50 per unit
Hotel,~~/~~Motel	1.0 per guest room	1.25 per guest room
~~Welfare/~~Correctional Institution	1 per 7 beds	1 per 5 beds
Senior housing, including congregate care, residential care and assisted living facilities; nursing homes and other types of group homes;	1 per 7 beds	1 per 5 beds
Hospital	2.00	4.00
~~Religious Assembly Building~~	~~0.25 per seat~~	~~0.5 per seat~~
Preschool Nursery/Kindergarten	2.00	3.00
Elementary/Middle School	1 per classroom	1 per classroom + 1 per administrative employee + 0.25 per seat in auditorium/assembly room/stadium
High School,~~/~~College,~~/~~Commercial School for Adults	0.20 per # staff and students	0.30 per # staff and students
Auditorium,~~/~~Meeting Room,~~/~~Stadium,~~/~~	.25 per seat	0.5 per seat

Religious Assembly Building, ~~/~~movie theater,		
Retail Store,~~/~~Shopping Center,~~/~~Restaurants	4.10	5.00
Office	2.70	3.33
Medical or Dental Clinic	2.70	3.33
Sports Club,~~/~~Recreation Facilities	Case Specific	5.40
Storage Warehouse,~~/~~Freight Terminal	0.30 ~~per gross thousand square feet ft.~~	0.40 ~~per gross thousand square feet~~
Manufacturing,~~/~~Wholesale Establishment	1.60 ~~per gross thousand square feet~~	1.67 ~~per gross thousand square feet~~
Light Industrial,~~/~~Industrial Park	1.3	1.60

1.Multiple Uses. In the event several uses occupy a single structure or parcel of land, the total requirements for off-street parking shall be the sum of the requirements of the several uses computed separately.

2.Requirements for types of buildings and uses not specifically listed herein shall be determined by the community development director, based upon the requirements of comparable uses listed.

3.Where calculation in accordance with the above list results in a fractional space, any fraction less than one-half shall be disregarded and any fraction of one-half or more shall require one space.

4.The minimum required parking spaces shall be available for the parking of operable passenger automobiles of residents, customers, patrons and employees only, and shall not be used for storage of vehicles or materials or for the parking of vehicles used in conducting the business or use.

5.A Change in use within an existing building located in the MUD Design District is exempt from additional parking requirements. Additions to an existing building and new construction are required to meet the minimum parking requirements for the areas as specified in Table 17.52.020 for the increased square footage.

B. Parking requirements can be met either onsite, or offsite by meeting the following conditions:

1.Mixed uses. If more than one type of land use occupies a single structure or parcel of land, the total requirements for off-street automobile parking shall be the sum of the requirements for all uses, unless it can be shown that the peak parking demands are actually less (e.g., the uses operate on different days or at different times of the day). In that case, the total requirements shall be reduced accordingly, up to a maximum reduction of 50%, as determined by the community development director.

2.Shared parking. Required parking facilities for two or more uses, structures, or parcels of land may be satisfied by the same parking facilities used jointly, to the extent that the owners or operators show that the need for parking facilities does not materially overlay (e.g., uses primarily of a daytime versus nighttime nature), that the shared parking facility is within 1,000 feet of the potential uses, and provided that the right of joint use is evidenced by a recorded deed, lease, contract, or similar written instrument authorizing the joint use.

3. On-Street Parking. On-street parking may be counted toward the minimum standards when it is on the street face abutting the subject land use. An on-street parking space must not obstruct a required clear vision area and it shall not violate any law or street standard. On-street parking for commercial uses shall conform to the following standards:

a. Dimensions. The following constitutes one on-street parking space:

1. Parallel parking, each [22] feet of uninterrupted and available curb;
2. [45/60] degree diagonal, each with [15] feet of curb;
3. 90 degree (perpendicular) parking, each with [12] feet of curb.

4. Public Use Required for Credit. On-street parking spaces counted toward meeting the parking requirements of a specific use may not be used exclusively by that use, but shall be available for general public use at all times. Signs or other actions that limit general public use of on-street spaces are prohibited.

C. Reduction of the Number of Automobile Spaces Required. The required number of parking stalls may be reduced in the

Downtown Parking Overlay District: 50% reduction in the minimum number of spaces required is allowed prior to seeking further reductions in sections 2 and 3 below

1. Transit Oriented Development. For projects not located within the Downtown Parking Overlay District, the Community Development Director may reduce the required number of parking stalls up to 25% when it is determined that a project in a commercial center (60,000 square feet or greater of retail or office use measured cumulatively within a 500 foot radius) or multi-family development with over 80 units, is adjacent to or within 1,320 feet of an existing or planned public transit street and is within 1,320 feet of the opposite use (commercial center or multi-family development with over 80 units)
2. Reduction in Parking for Tree Preservation. The Community Development Director may grant an adjustment to any standard of this requirement provided that the adjustment preserves a regulated tree or grove so that the reduction in the amount of required pavement can help preserve existing healthy trees in an undisturbed, natural condition. The amount of reduction must take into consideration any unique site conditions and the impact of the reduction on parking needs for the use, and must be approved by the Community Development Director. This reduction is discretionary.
3. Transportation Demand Management. The Community Development Director may reduce the required number of parking stalls up to 25% when a parking-traffic study prepared by a traffic engineer demonstrates:
    a. Alternative modes of transportation, including transit, bicycles, and walking, and/or special characteristics of the customer, client, employee or resident population will reduce expected vehicle use and parking space demand for this development, as compared to standard Institute of Transportation Engineers vehicle trip generation rates and further that the Transportation Demand Management Program promotes or achieves parking utilization lower than minimum city parking requirements.
    b. Transportation Demand Management (TDM) Program has been developed for approval by, and is approved by the City Engineer. The plan will contain strategies for reducing vehicle use and parking demand generated by the development and will be measured annually. If, at the annual assessment, the City determines the plan is not successful, the plan may be revised. If the City determines that no good-faith effort has been made to implement the plan, the City may take enforcement actions.

17.52.030.E - Standards for automobile parking.

Carpool and Vanpool Parking. New ~~office and industrial~~ developments with seventy-five or more parking spaces, and new hospitals, government offices, group homes, nursing and retirement homes, schools and transit park-and-ride facilities with fifty or more parking spaces, shall identify the spaces available for employee, student and commuter parking and designate at least five percent, but not fewer than two, of those spaces for exclusive carpool and vanpool parking. Carpool and vanpool parking spaces shall be located closer to the main employee, student or commuter entrance than all other employee, student or commuter parking spaces with the exception of ~~handicapped~~ ADA accessible parking spaces. The carpool/vanpool spaces shall be clearly marked "Reserved - Carpool/Vanpool Only."

17.52.040 - Bicycle parking standards.

A. Purpose-Applicability. To encourage bicycle transportation to help reduce principal reliance on the automobile, and to ensure bicycle safety and security, bicycle parking shall be provided in conjunction with all uses other than single-family dwellings or duplexes.

B. Number of Bicycle Spaces Required. For any use not specifically mentioned in Table A, the bicycle parking requirements shall be the same as the use which, as determined by the Community Development Director, is most similar to the use not specifically mentioned. Calculation of the number of bicycle parking spaces required shall be determined in the manner established in Section 17.52.020 for determining automobile parking space requirements. Modifications to bicycle parking requirements may be made through the Site Plan and Design, Conditional Use, or Master Plan review process.

TABLE A Required Bicycle Parking Spaces*

Where two options for a requirement are provided, the option resulting in more bicycle parking applies. Where a calculation results in a fraction, the result is rounded up to the nearest whole number.

USE	MINIMUM BICYCLE PARKING	MINIMUM BICYCLE PARKING – COVERED – The following percentage of bicycle parking is required to be covered
~~Multiple~~ Multi-family (three or more units)	1 per 10 units (minimum of 2)	50% (minimum of 1)
Institutional		
~~Welfare institution~~	~~1 per 2010 auto spaces~~	
Correctional institution	1 per ~~30~~15 auto spaces (minimum of 2)	30% (minimum of 1)
Nursing home or care facility, ~~sanitarium~~	1 per 30 auto spaces (minimum of 2)	30% (minimum of 1)
Hospital	1 per 20 auto spaces (minimum of 2)	30% (minimum of 1)
Park-and-ride lot	~~5~~ 1 per 5 auto spaces ~~acre, at least one of which is a locker~~ (minimum of 2)	50% (minimum of 1)
Transit center	~~5~~1 per 5 auto spaces ~~center at least one of which is a locker~~ (minimum of 2)	50% (minimum of 1)
Parks and open space	~~2, or~~ 1 per 10 auto spaces (minimum of 2)	0%
Public parking lots	1 per ~~20~~10 auto spaces (minimum of 2)	50% (minimum of 1)
Automobile parking structures	1 per ~~20~~10 auto spaces (minimum of 4)	80% (minimum of 2)
Religious institutions, movie theater, auditorium or meeting room	1 per ~~20~~10 auto spaces (minimum of 2)	30% (minimum of 1)
Libraries, museums	1 per ~~10~~5 auto spaces (minimum of 2)	30% (minimum of 1)
Preschool, nursery, kindergarten	2 per classroom (minimum of 2)	50% (minimum of 1)
Elementary~~, junior high~~	4 per classroom (minimum of 2)	50% (minimum of 1)

USE	MINIMUM BICYCLE PARKING	MINIMUM BICYCLE PARKING – COVERED – The following percentage of bicycle parking is required to be covered
Junior high and High school	2 per classroom (minimum of 2)	50% (minimum of 2)
College, business/commercial schools	2 per classroom (minimum of 2)	50% (minimum of 1)
~~Other auditorium/meeting room~~	~~1 per 20 auto spaces (minimum of 2)~~	
Swimming pools, gymnasiums, ball courts	1 per 10 auto spaces (minimum of 2)	30% (minimum of 1)
Retail stores and shopping centers	1 per 20 auto spaces (minimum of 2)	50% (minimum of 2)
Retail stores handling exclusively bulky merchandise such as automobile, boat or trailer sales or rental	1 per 40 auto spaces (minimum of 2)	0%
Bank, office	1 per 20 auto spaces (minimum of 2)	50% (minimum of 1)
Medical and dental clinic	1 per 20 auto spaces (minimum of 2)	50% (minimum of 1)
~~Convenience food store~~	~~1 per 10 auto spaces~~	
~~Furniture and appliance stores~~	~~1 per 40 auto spaces~~	
Eating and drinking establishment,	1 per 20 auto spaces (minimum of 2)	0%
Gasoline service station	1~~2~~ per 10 auto spaces (minimum of 2)	0%

*Covered bicycle parking is not required for developments with 2 or fewer stalls.

C. Security of Bicycle Parking ~~Location of Bicycle Parking~~

Bicycle parking facilities shall be secured. Acceptable secured bicycle parking area shall be in the form of a lockable enclosure onsite, secure room in a building onsite, a covered or uncovered rack onsite, bicycle parking within the adjacent right-of-way or another form of secure parking where the bicycle can be stored, as approved by the decision maker. All bicycle racks and lockers shall be securely anchored to the ground or to a structure. Bicycle racks shall be designed so that bicycles may be securely locked to them without undue inconvenience and, when in the right-of-way shall comply with clearance and ADA requirements.

~~1. Bicycle parking shall be located on-site, in one or more convenient, secure and accessible location. The City Engineer and the community development director may permit the bicycle parking to be provided within the public right-of-way. If sites have more than one building, bicycle parking shall be distributed as appropriate to serve all buildings. If a building has two or more main building entrances, the review authority may require bicycle parking to be distributed to serve all main building entrances, as it deems appropriate.~~

~~2. Bicycle parking areas shall be clearly marked or visible from on-site buildings or the street. If a bicycle parking area is not plainly visible from the street or main building entrance, a sign must be posted indicating the location of the bicycle parking area. Indoor bicycle parking areas shall not require stairs to access the space unless approved by the community development director.~~

~~3. All bicycle parking areas shall be located to avoid conflicts with pedestrian and motor vehicle movement.~~

~~a. Bicycle parking areas shall be separated from motor vehicle parking and maneuvering areas and from arterial streets by a barrier or a minimum of five feet.~~

~~b. Bicycle parking areas shall not obstruct pedestrian walkways; provided, however, that the review authority may allow bicycle parking in the public sidewalk where this does not conflict with pedestrian accessibility.~~

~~4. Accessibility.~~

~~a. Outdoor bicycle areas shall be connected to main building entrances by pedestrian accessible walks.~~

~~b. Outdoor bicycle parking areas shall have direct access to a public right-of-way.~~

D. Location of Bicycle Parking

1. Bicycle parking shall be located on-site, in one or more convenient, secure and accessible location. The City Engineer and the Community Development Director may permit the bicycle parking to be provided within the right-of-way provided adequate clear zone and ADA requirements are met. If sites have more than one building, bicycle parking shall be distributed as appropriate to serve all buildings. If a building has two or more main building entrances, the review authority may require bicycle parking to be distributed to serve all main building entrances, as it deems appropriate.
2. Bicycle parking areas shall be clearly marked or visible from on-site buildings or the street. If a bicycle parking area is not plainly visible from the street or main building entrance, a sign must be posted indicating the location of the bicycle parking area. Indoor bicycle parking areas shall not require stairs to access the space unless approved by the community development director.
3. All bicycle parking areas shall be located to avoid conflicts with pedestrian and motor vehicle movement.

a. Bicycle parking areas shall be separated from motor vehicle parking and maneuvering areas and from arterial streets by a barrier or a minimum of five feet.

b. Bicycle parking areas shall not obstruct pedestrian walkways; provided, however, that the review authority may allow bicycle parking in the right-of-way where this does not conflict with pedestrian accessibility.

4. Accessibility.

a. Outdoor bicycle areas shall be connected to main building entrances by pedestrian accessible walkways.

b. Outdoor bicycle parking areas shall have direct access to a right-of-way.

c. Outdoor bicycle parking should be no farther from the main building entrance than the distance to the closest vehicle space, or 50 feet, whichever is less, unless otherwise determined by the community development director, city engineer, or planning commission.

~~Bicycle parking facilities shall offer security in the form of either a lockable enclosure or a stationary rack to which the bicycle can be locked. All bicycle racks and lockers shall be securely anchored to the ground or to a structure. Bicycle racks shall be designed so that bicycles may be securely locked to them without undue inconvenience.~~

D. Bicycle parking facilities shall offer security in the form of either a lockable enclosure in which the bicycle can be stored or a stationary rack to which the bicycle can be locked. All bicycle racks and lockers shall be securely anchored to the ground or to a structure. Bicycle racks shall be designed so that bicycles may be securely locked to them without undue inconvenience.

17.52.090 - Loading Areas

A. Purpose.

1. The purpose of this section is to provide adequate loading areas for commercial, office, retail and industrial uses that do not interfere with the operation of adjacent streets.

B. Applicability.

1. Section 17.52.090 applies to uses that are expected to have service or delivery truck visits with a 40-foot or longer wheelbase, at a frequency of one or more vehicles per week. The City Engineer and decision maker shall determine through Site Plan and Design Review the number, size, and location of required loading areas, if any.

C. Standards.

1. The off-street loading space shall be large enough to accommodate the largest vehicle that is expected to serve the use without obstructing vehicles or pedestrian traffic on adjacent streets and driveways. Applicants are advised to provide complete and accurate information about the potential need for loading spaces because the City Engineer or decision maker may restrict the use of other public right-of-way to ensure efficient loading areas and reduce interference with other uses.
2. Where parking areas are prohibited between a building and the street, loading areas are also prohibited.
3. The City Engineer and decision maker, through Site Plan and Design Review, may approve a loading area adjacent to or within a street right-of-way when all of the following loading and unloading operations conditions are met:
   a. Short in duration (*i.e.,* less than one hour);
   b. Infrequent (less than three operations daily between 5:00 a.m. and 12:00 a.m. or all operations between 12:00 a.m. and 5:00 a.m. at a location that is not adjacent to a residential zone);
   c. Does not obstruct traffic during peak traffic hours;
   d. Does not interfere with emergency response services; and
   e. Is acceptable to the applicable roadway authority.

OCMC CHAPTER 17.62 - SITE PLAN AND DESIGN REVIEW

17.62.050.A.2. Vehicular Access and Connectivity.

a. Parking areas shall be located behind buildings, below buildings, or on one or both sides of buildings.

b. Ingress and egress locations on ~~public~~ thoroughfares shall be located in the interest of public safety. Access for emergency services (fire and police) shall be provided.

c. Alleys or vehicular access easements shall be provided in the following Districts: R-2, MUC-1, MUC-2, MUD and NC zones unless other permanent provisions for access to off-street parking and loading facilities are approved by the decision-maker. The corners of alley intersections shall have a radius of not less than ten feet.

d. Sites abutting an alley shall be required to gain vehicular access from the alley unless deemed impracticable by the community development director.

e. Where no alley access is available, the development shall be configured to allow only one driveway per frontage. On corner lots, the driveway(s) shall be located off of the side street (unless the side street is an arterial) and away from the street intersection. Shared driveways shall be required as needed to accomplish the requirements of this section. The location and design of pedestrian access from the ~~public~~ sidewalk shall be emphasized so as to be clearly visible and distinguishable from the vehicular access to the site. Special landscaping, paving, lighting, and architectural treatments may be required to accomplish this requirement.

f. Driveways that are at least 24 feet wide shall align with existing or planned streets on adjacent sites.

g~~f~~. Development shall be required to provide existing or future connections to adjacent sites through the use of vehicular and pedestrian access easements where applicable. Such easements shall be required in addition to applicable street dedications as required in Chapter 12.04.

h. Vehicle and pedestrian access easements may serve in lieu of streets when approved by the decision maker only where dedication of a street is deemed impracticable by the city.

i. Vehicular and pedestrian easements shall allow for public access and shall comply with all applicable pedestrian access requirements.

j. In the case of dead-end stub streets that will connect to streets on adjacent sites in the future, notification that the street is planned for future extension shall be posted on the stub street until the street is extended and shall inform the public that the dead-end street may be extended in the future. k. Parcels larger than three acres shall provide streets as required in Chapter 12.04. The streets shall connect with existing or planned streets adjacent to the site.

l~~g~~. Parking garage entries ~~(both individual, private and shared parking garages)~~ shall not dominate the streetscape. They shall be designed and situated to be ancillary to the use and architecture of the ground floor. This standard applies to both public garages and any individual private garages, whether they front on a street or private interior access road.

m~~h~~. Buildings containing above-grade structured parking shall screen such parking areas with landscaping or landscaped berms, or incorporate contextual architectural elements that complement adjacent buildings or buildings in the area. Upper level parking garages shall use articulation or fenestration treatments that break up the massing of the garage and/or add visual interest.

17.62.050.A.15.

Adequate right-of-way and improvements to streets, pedestrian ways, bike routes and bikeways, and transit facilities shall be provided and be consistent with the city's transportation master plan and design standards and this title. Consideration shall be given to the need for street widening and other improvements in the area of the proposed development impacted by traffic generated by the proposed development. This shall include, but not be limited to, improvements to the right-of-way, such as installation of lighting, signalization, turn lanes, median and parking strips, traffic islands, paving, curbs and gutters, sidewalks, bikeways, street drainage facilities and other facilities needed because of anticipated vehicular and pedestrian traffic generation. Compliance with 12.04 - Streets, Sidewalks and Public Places shall be sufficient to achieve right-of-way and improvement adequacy.

~~When approving land use actions, Oregon City requires all relevant intersections to be maintained at the minimum acceptable level of service (LOS) upon full build-out of the proposed land use action. The minimum acceptable LOS standards are as follows:~~

~~a. For signalized intersection areas of the city that are located outside the Regional Center boundaries a LOS of "D" or better for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of critical movements.~~

~~b. For signalized intersections within the Regional Center boundaries a LOS "D" can be exceeded during the peak hour; however, during the second peak hour, LOS "D" or better will be required as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0.~~

~~c. For unsignalized intersection throughout the city a LOS "E" or better for the poorest approach and with no movement serving more than twenty peak hour vehicles operating at worse than LOS "F" will be tolerated for minor movements during a peak hour.~~

17.62.050.A.16. If a transit agency~~Tri-Met~~, upon review of an application for an industrial, institutional, retail or office development, recommends that a bus stop, bus turnout lane, bus shelter, accessible bus landing pad, lighting, or transit stop connection be constructed, or that an easement or dedication be provided for one of these uses, consistent with an agency adopted or approved plan at the time of development, the review authority shall require such improvement, using designs supportive of transit use. Improvements at a major transit stop may include intersection or mid-block traffic management improvements to allow for crossings at major transit stops, as identified in the Transportation System Plan.

OCMC CHAPTER 17.65 – MASTER PLANS

17.65.050.C.2 ~~The transportation system has sufficient capacity based on the city's level of service standards and is capable of supporting the development proposed in addition to the existing and planned uses in the area, or will be made adequate~~ Development shall demonstrate compliance with Chapter 12.04 - Streets, Sidewalks and Public Places.

OCMC CHAPTER 17.56 – CONDITIONAL USE

17.56.010.A.3 ~~The site and proposed development are timely, considering the adequacy of transportation systems, public facilities and services existing or planned for the area affected by the use.~~ Development shall demonstrate compliance with Chapter 12.04 - Streets, Sidewalks and Public Places.