CITY OF TROUTDALE TRANSPORTATION SYSTEM PLAN

Adopted April 8th, 2014 by Ordinance no. 820
Amended December 13th, 2022 by Ordinance no. 881

Prepared for:

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Oregon Department of Transportation

THE CITY OF TROUTDALE OREGON
EST. 1907

KITTELSON & ASSOCIATES

Transportation System Plan

Troutdale Transportation System Plan

Troutdale, Oregon

Prepared For:
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Project No. 26160.0

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CHAPTER 1. EXECUTIVE SUMMARY

INTRODUCTION

In July 1995 the City of Troutdale adopted the first Transportation System Plan (TSP) in the Portland Metropolitan area. Since that time there have been significant changes in regional planning efforts and requirements as well as significant changes in growth and planned growth in the Troutdale area. The TSP was last updated in March 2014, making it relatively current. However, analysis of the entire transportation system and modeling of the roadway network was not conducted as part of the update due to extensive modeling of many streets and intersections in the Troutdale area performed as part of two long-range planning studies, including the 2011 I-84 Troutdale Interchange Area Management Plan (IAMP) and the 2012 East Metro Connections Plan (EMCP). As indicated below, the conclusions and recommendations of these studies were used to help guide the development of the update. Future updates to the TSP will provide a more comprehensive review and update of the multimodal transportation system.

The March 2014 TSP update focused on:

- Compliance with Transportation Planning Rule (TPR – OAR Chapter 660-012), including revisions adopted since the previous TSP was adopted in 2005. Compliance deficiencies identified in the Troutdale Development Code were also addressed.
- Compliance with the 2035 Regional Transportation Plan (RTP) adopted by Metro in June 2010.
- Incorporating the conclusions and recommendations of the I-84 Troutdale Interchange Area Management Plan (IAMP). This IAMP was completed in early 2011 and was adopted in July 2011 by the Oregon Highway Commission as part of the Oregon Highway Plan.
- Incorporating the conclusions and recommendation of the East Metro Connections Plan (EMCP). This regional planning effort was completed in June 2012.

The March 2014 TSP update also included an evaluation of the existing multi-modal transportation system within Troutdale, including the pedestrian, bicycle, transit, and local street systems. The plans associated with each of these systems were updated to reflect any new developments that have occurred since 2005 as well as to ensure compliance with the policy and regulatory requirements of the TPR and the RTP. A brief description of the information updated precedes each section of the TSP.

The March 2014 TSP update was aimed at fulfilling TPR requirements for comprehensive transportation planning in Oregon and presents the investments and priorities for the pedestrian, bicycle, transit, and motor vehicle systems along with new transportation programs to correct existing shortfalls and enhance critical services. For each travel mode, a Master Plan project map and list are identified to support the City's transportation goals and policies. Projects that are reasonably expected to be funded over the next 20 years were also identified and are referred to as Action Plans.

The TSP is intended to guide future transportation investment in the City and determine how land use and transportation decisions can be brought together beneficially for the City and is based on needs required to meet transportation demand in the future. This executive summary provides the goals and policies, modal plans and financing summaries. For a more detailed analysis, Chapters 2, 3, 4 and 5 provide more in-depth information.

Plan Process and Committees

The March 2014 TSP update was developed in close coordination with Troutdale City staff as well as key representatives from the surrounding community. Two formal committees were formed to participate in the plan development:

- Technical Advisory Committee (TAC) – Agency staff from Metro, Oregon Department of Transportation, Multnomah County, the City of Troutdale, the City of Gresham, the City of Wood Village, and the City of Fairview participated in reviewing the technical information used to develop the TSP update. The focus of this group was on consistency with the plans and past decisions in adjoining jurisdictions, and consensus on new recommendations.
- Citizens Advisory Committee (CAC) – The Troutdale Citizens Advisory Committee served as the representatives for citizens and community members. A series of meetings were held with the CAC to report interim study findings and any outstanding policy issues that required their direction. The meetings were open to participation by the general public.

TAC members were provided the opportunity to review and comment on interim work products throughout the TSP update process. The CAC met on several occasions to assist in developing and ranking transportation solutions and to refine master plan elements to ensure consistency with community goals.

2022 TSP Amendment

In 2022 the TSP was amended to incorporate the *2020-2040 Town Center Plan*, including:

- Incorporating the vision and goals for several opportunity sites and corridors in the Town Center District.
- Incorporating guidance from Metro's *2018 Regional Transportation Plan* on implementation of planned improvements in equity focused areas.
- Incorporating policy analysis and guidance on emerging and future trends in transportation and mobility, specifically on electric vehicle charging stations.

The amendment revises the Master Plan and Action Plan projects and project maps to remove projects that are complete or no longer needed and add projects that reflect the vision and goals of the *2020-2040 Town Center Plan* as well as other projects identified within the Town Center District.

The following sections summarize the findings of the overall TSP.

Goals and Policies

The goals and policies of the TSP are presented in Chapter 2. Goals are defined as brief guiding statements that describe a desired result. Policies associated with each of the individual goals describe the actions needed to move the community in the direction of completing each goal. These goals and policies were used to develop strategies and implementing measures for each travel mode.

- Goal 1. Transportation facilities shall be designed and constructed in a manner which enhances the livability of Troutdale.
- Goal 2. Provide a transportation system in Troutdale which is safe, reduces length of travel and limits congestion.
- Goal 3. Provide a balanced, multi-modal transportation system and reduce the number of trips by single occupant vehicles.
- Goal 4. Provide for efficient movement of goods.
- Goal 5. Develop transportation facilities which are accessible to all members of the community.
- Goal 6. Develop a transportation system that is consistent with the City's adopted comprehensive land use plan, and with the adopted plans of state, local and regional jurisdictions.
- Goal 7. Establish a clear and objective set of transportation design and development regulations that addresses all elements of the city transportation system and promote access to and utilization of a multi-modal transportation system.
- Goal 8: Protect the function of the I-84 Troutdale interchange.

Transportation Plans

As indicated previously, the pedestrian, bicycle, and transit system plans have been updated along with sections of the motor vehicle system plan to reflect all of the policy changes, regulatory requirements, and developments that have occurred since 2005. A Master Plan (long term project goals that meet planning requirements) and an Action Plan (projects that are reasonably expected to be funded over the next 20 years) were compiled for each transportation mode. These plans are designed to comply with the 2010 RTP as well as relevant State and adjoining jurisdictions' planning documents. The following sections summarize the Master Plan and Action Plan for each mode.

Pedestrian System

The existing conditions analysis presented in Chapter 3 identifies the pedestrian system needs within Troutdale and reflects all of the pedestrian system improvements that have occurred since 2005. An inventory of the existing pedestrian system was conducted to identify locations where new or in-fill facilities would be required. The inventory identified a variety of locations in need of new sidewalks connections, new pedestrian crossings, and new multi-use paths and trails.

The 2010 RTP includes designations within Troutdale for pedestrian districts, transit/mixed use corridors, and regional trails. The Pedestrian Master Plan identifies a number of potential projects that would improve pedestrian connectivity within the RTP designated areas. The City of Troutdale Development Code identifies the area near downtown as a Town Center, which generally corresponds to the area designated as a pedestrian district in the RTP, and requires new development in these areas to comply with the RTP designations. Figure 1-1 illustrates the Pedestrian Master Plan.

Several strategies were developed to help guide the selection and prioritization of the projects included in the Pedestrian Action Plan. The strategies were used to rank the projects identified in the Pedestrian Master Plan from highest to lowest in terms of priority. The highest-ranking City projects were combined with projects from other agencies identified in previous planning studies to create the project list shown in Table 1-1, which are organized by location and type.

Pedestrian Master Plan

Figure 1-1

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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Table 1-1: Pedestrian Action Plan

Project ID	Location	Type	Project Description	Cost ($1,000)
P1	Troutdale Road	Complete Sidewalks	Install sidewalks on both sides of Troutdale Road from Beaver Creek Lane to Stark Street	-
P2	Troutdale Road	Complete Sidewalks	Install sidewalks on both sides of Troutdale Road from Stark Street to the south city limits	-
P3	Stark Street	Complete Sidewalks	Install sidewalks on both sides of Stark Street from 257th Drive to Troutdale Road	-*
P5	Halsey Street	Complete Sidewalks	Construct pedestrian facilities according to the Main Streets on Halsey Plan with Planning Commission and City Council input and approval	To Be Determined
P8	Hensley Road	Complete Sidewalks	Install sidewalks on the east side of Hensley Road (N/S) from Hensley Road (E/W) to Cherry Park Road consistent with the Troutdale Elementary SRTS Plan. Includes minor pavement widening and drainage.	$350
P17	257th Drive at 26th Street	Pedestrian Crossing	Install enhanced pedestrian crossing treatments on 257th Drive at 26th Street	-
P30	Columbia Park Trail	Trail	Improve existing trail from 18th Way to 22nd Street	$75
P31	Sturges Trail	Trail	Install a trail from the Halsey Street/Sturges Connector Trail to 257th Drive	$50
P37	Historic Columbia River Highway	Curb Extension	Install curb extensions along Historic Columbia River Highway at Kendall Avenue, Buxton Road, Harlow Avenue, and Kibling Street	$190
P39	Hewitt Neighborhood Trail	Multi-Use Path	Complete the multi-use path that connects the Hewitt neighborhood to Stark Street to the south and 257th to the west.	$25
P40	Historic Columbia River Highway	Sidewalk	Install sidewalks on the east side of Historic Columbia River Highway from Depot Park to the Beaver Creek Bridge – Also widen sidewalks on the west side	-
P41	Historic Columbia River Highway	Sidewalks	Install sidewalks on the south side of Historic Columbia River Highway from the Beavercreek bridge to the Sandy River Bridge	-
P42	Downtown/Urban Renewal Area Connections	Pedestrian/Bicycle Bridge	Install a bicycle-pedestrian bridge from Historic Columbia River Highway at Harlow Avenue to the Confluence Site	$375**
P43	2nd Street Bridge	Pedestrian/Bicycle Bridge	Install a bicycle-pedestrian bridge over 257th Drive	$125**
P44	2nd Street Trail	Trail	Install a trail from Kendall Avenue at 2nd Street to Halsey Street via the 2nd Street Bridge	$135
P45	Beaver Creek West Trail	Trail	Install a trail from Depot Park to Glenn Otto Park on or near the west side of Beaver Creek	$175
P48	North Sandy River Trail	Trail	Install a trail from the Sandy River Trail to the 40-mile Loop Trail	$40**
P49	Columbia River Levee Trail	Trail	Install a trail from Sundial Road to the west city limits	$80**
P50	2nd Street Bridge	Feasibility	Study the feasibility of bridge construction and land acquisition	$150
			Total	**$1,770**

Note: Cost estimates indicate the estimated funding to be provided by the City of Troutdale. The projects shown in grey are under the jurisdiction of other agencies. Cost estimates are provided for these outside agency projects only where it is anticipated that the City will contribute funding to the project, and the cost figures shown represent only the City's estimated contribution. Projects shown in white are under the jurisdiction of the City.
* The City of Troutdale's contributions to these project costs are included in the Motor Vehicle Action Plan.
** The City of Troutdale's contribution to these project costs is assumed to be 15% of the overall project costs.

Bicycle System

The existing conditions analysis presented in Chapter 3 identifies the bicycle system needs within Troutdale and reflects all of the bicycle system improvements that have occurred since 2005. The analysis indicates that although a majority of the collector and arterial streets in Troutdale currently provide on-street bike lanes or shoulder bikeways, there are a few locations where new on-street bike lanes or other bicycle treatments, such as shared roadway pavement markings, and off-street multi-use paths could improve the overall bicycle system.

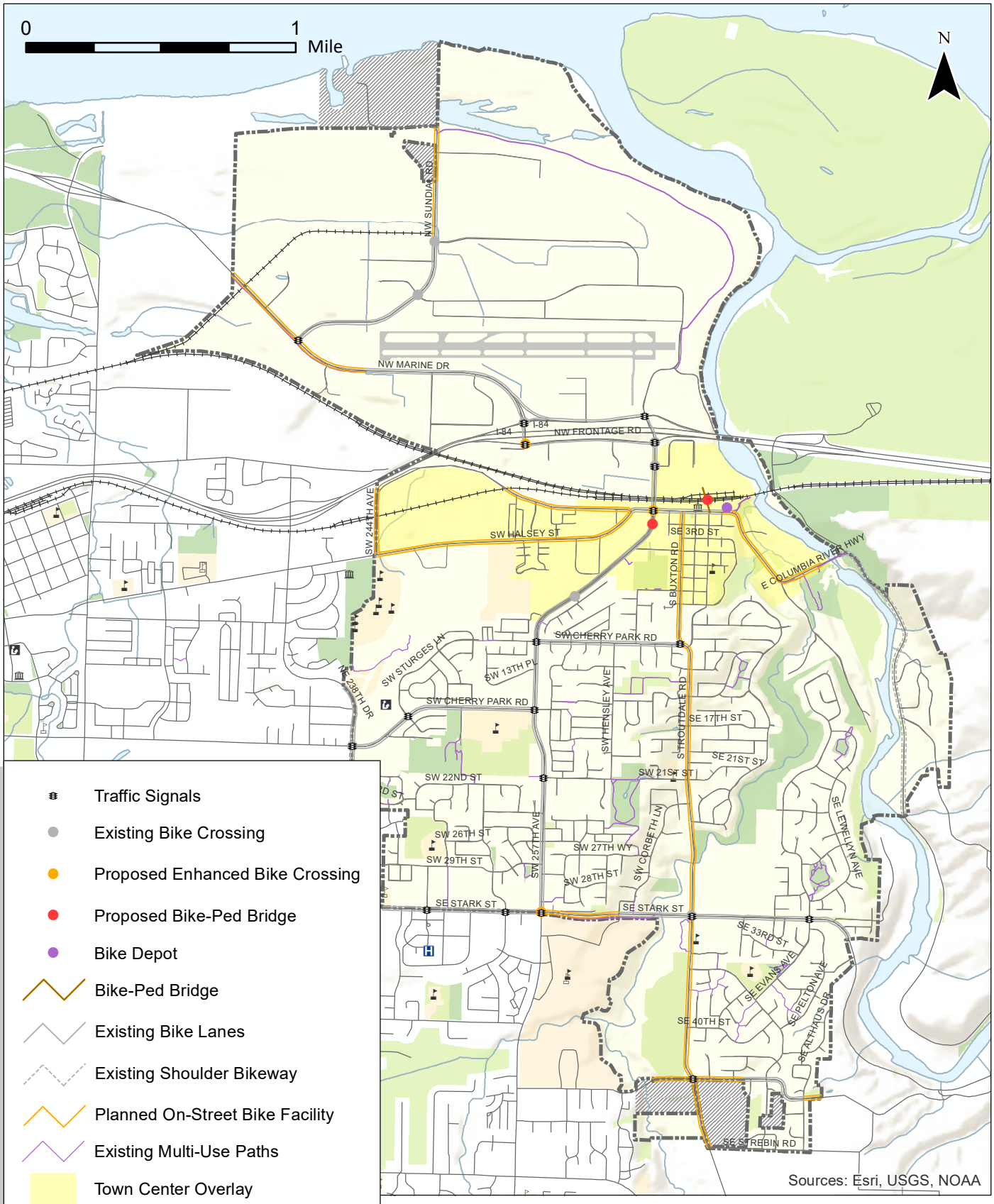
The 2010 RTP includes designations within Troutdale for Regional Bikeways, Community Bikeways, and Regional Trails. The Bicycle Master Plan identifies a number of potential projects that would improve bicycle connectivity along the RTP designated roadways and the 40-mile loop. By complying with the RTP designations and completing the arterial/collector bicycle system, the Bicycle Master Plan is consistent with plans developed by Metro, Multnomah County, and the State. Figure 1-2 illustrates the Bicycle Master Plan.

Several strategies were developed to help guide the selection and prioritization of the projects included in the Bicycle Action Plan. The strategies were used to rank the projects identified in the Bicycle Master Plan from highest to lowest in terms of priority. The highest-ranking City projects were combined with projects from other agencies identified in previous planning studies to create the project list shown in Table 1-2, which are organized by location and type.

Table 1-2: Bicycle Action Plan

Project ID	Location	Type	Project Description	Cost ($1,000)
B1	Stark Street	Bike Lane	Install on-street bike lanes from 257th Avenue to Troutdale Road.	-*
B2	Buxton Road	Enhanced Bike Lane	Install enhanced on-street bike lanes from Historic Columbia River Highway to Cherry Park Road	-
B3	Historic Columbia River Highway	Bike Lane	Install on-street bike lanes from Halsey Street to 244th Avenue	-
B4	Troutdale Road	Bike Lane	Install on-street bike lanes from Cherry Park Road to Stark Street	-
B5	Troutdale Road	Bike Lane	Install on-street bike lanes from Stark Street to the south City limits	-
B19	Halsey Street	Bike Lanes	Construct bike facilities according to the Main Streets on Halsey Plan with Planning Commission and City Council input and approval	To be Determined
B20	Historic Columbia River Highway	Enhanced Bike Lane	Install enhanced on-street bike lanes from Depot Park to east city limits	-
B21	2nd Street/Kibling Avenue	Shared Roadways	Install shared roadway signs on 2nd Street from Kendall Avenue to Kibling Avenue and on Kibling Avenue from 2nd Street to Historic Columbia River Highway	$25
B22	Depot Park	Other	Construct a bike/transit hub at Depot Park	$250
			Total	**$275**

Note: Cost estimates indicate the estimated funding to be provided by the City of Troutdale. The projects shown in grey are under the jurisdiction of other agencies. Cost estimates are provided for these outside agency projects only where it is anticipated that the City will contribute funding to the project, and the cost figures shown represent only the City's estimated contribution. Projects shown in white are under the jurisdiction of the City.
* The City of Troutdale's contributions to these project costs are included in the Motor Vehicle Action Plan.



Bicycle Master Plan

Figure **1-2**

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

Transit System

TriMet is the primary regional transit service provider for the Portland metropolitan area and operates fixed-route and dial-a-ride service in Troutdale, which is located in the northeast corner of TriMet's service area. Due to its location, Troutdale is an end point for the regional service system. Troutdale is not served by high capacity transit or frequent service routes.

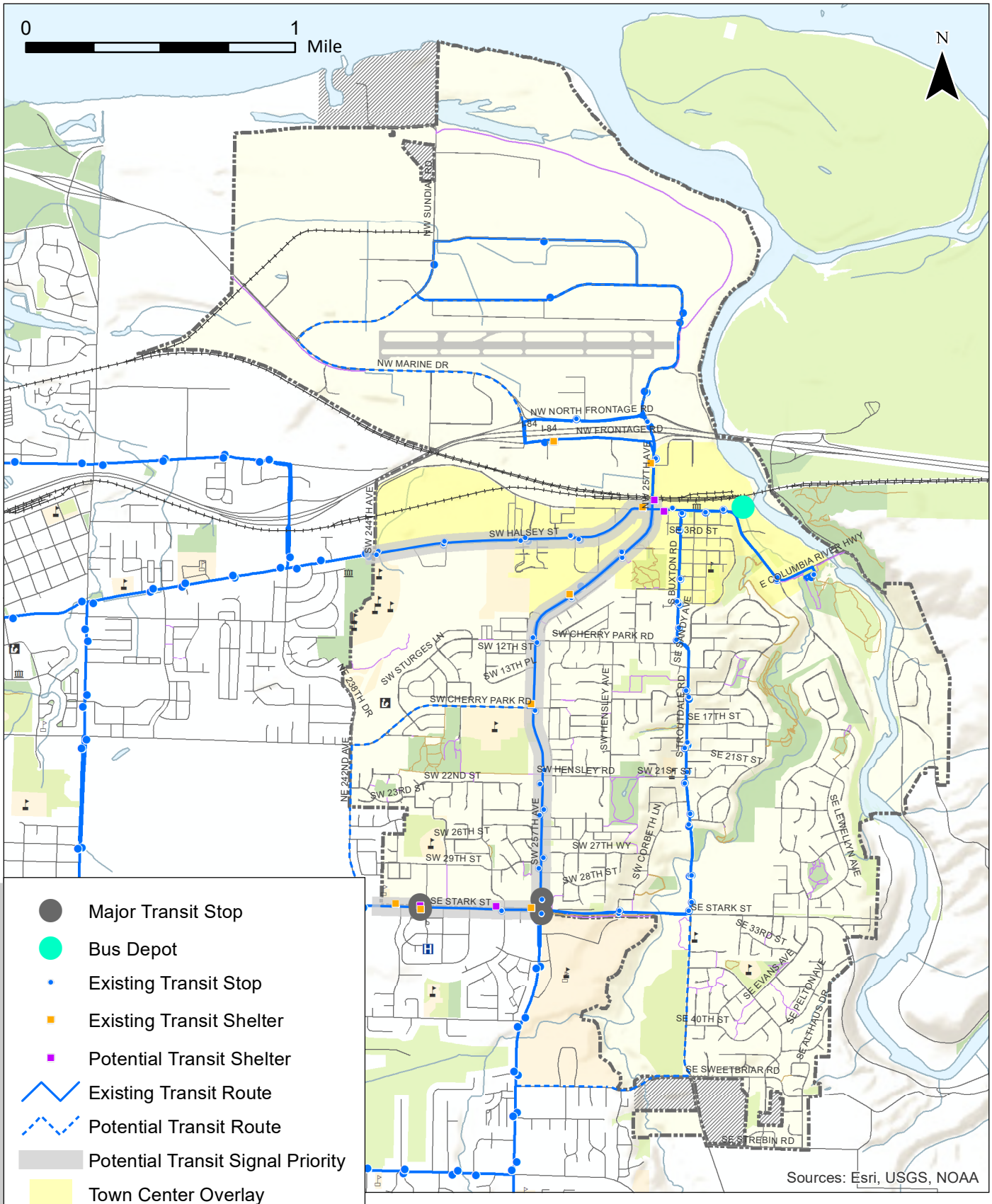
The 2035 High-Capacity Transit System Plan identifies 257th Avenue as a Developing Regional Priority Corridor, which is a corridor where projected 2035 land use and commensurate ridership potential are not supportive of HCT implementation, but which have long-term potential due to political aspirations. Metro's RTP transit route designations in Troutdale include Regional Bus. The existing transit routes in Troutdale are consistent with the Metro designations. Additional needs were identified for the quality of service in Troutdale, including transit route coverage, transit route frequency, reliability, and user amenities. Based on these needs, a Transit Master Plan was created that is shown in Figure 1-3.

Several strategies were developed to help guide the selection and prioritization of the projects included in the Transit Action Plan. The strategies were used to rank the projects identified in the Transit Master Plan from highest to lowest in terms of priority. The highest-ranking City projects were combined with projects identified in previous planning studies to create the project list shown in Table 1-3, which are organized by location and type.

Table 1-3: Transit Action Plan

Project ID	Location	Description	Cost ($1,000)
T2	Cherry Park Road	Coordinate with TriMet to provide a new route between 242nd and 257th Drive.	-
T3	Bus Stop Enhancements	Coordinate with TriMet to provide bus shelters at the following transit stops that meet TriMet's minimum thresholds and support community goals for local transit service	-
T5	Transit Signal Priority	Coordinate with TriMet and Multnomah County to implement transit signal priority on Halsey Street, 257th Drive, and Stark Street.	-
T6	Marine/Sundial/Graham	Coordinate with TriMet to further enhance service to the north industrial area.	-
T7	Troutdale Road/17th Street/Cochran Road	Coordinate with TriMet to provide a new route serving the southeast Troutdale area.	-
T9	Existing Transit Routes	Coordinate with TriMet to reduce transit route headways (the amount of time between transit vehicle arrivals at a stop).	-
T10	Transit Corridors	Direct growth to increase the density of development along transit routes in the City of Troutdale in an effort to support regional transit service goals	-
		Total	**$0**

Note: Cost estimates indicate the estimated funding to be provided by the City of Troutdale. The projects shown in grey are under the jurisdiction of other agencies. Cost estimates are provided for these outside agency projects only where it is anticipated that the City will contribute funding to the project, and the cost figures shown represent only the City's estimated contribution. Projects shown in white are under the jurisdiction of the City.



Transit Master Plan

Figure **1-3**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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Motor Vehicle System

Future traffic conditions were analyzed as part of the 2005 TSP as well as the 2011 IAMP and the 2012 EMCP in an effort to identify motor vehicle system needs in Troutdale. Based on the analyses, it was determined that without a significant investment in Transportation System Management (TSM), Travel Demand Management (TDM), and other roadway improvements, several key facilities in the City would fail (or continue to fail) in the future. The following sections summarize the elements of the motor vehicle system plan, which meet the demands of future growth and comply with local and regional planning requirements.

Transportation System Management (TSM)

Transportation System Management (TSM) focuses on low-cost strategies to enhance operational performance of the transportation system by seeking solutions to immediate transportation problems, finding ways to better manage transportation, maximizing urban mobility, and treating all modes of travel as a coordinated system. TSM measures focus primarily on region wide improvements, however there are a number of TSM measures that are recommended for use in Troutdale, which include:

- Intelligent Transportation Systems (ITS): ITS focuses on increasing the efficiency of existing transportation infrastructure, which enhances the overall system performance and reduces the need to add capacity (e.g., travel lanes). Efficiency is achieved by providing services and information to travelers so they can (and will) make better travel decisions and to transportation system operators so they can better manage the system and improve system reliability. Figure 4-7 in Chapter 4 illustrates the Traffic Control Master Plan, which includes ITS devices and communications in the Troutdale area.

Neighborhood Traffic Management (NTM): The City of Troutdale has a Speed Hump Program that establishes a process to guide speed hump installation through neighborhood involvement. This program includes considerations of street classification and emergency response needs, but it does not provide the opportunity for application of other NTM devices. The Speed Hump Program could be updated to consider other traffic calming measures, such as those identified in Table 4-14, and work with the community to find the traffic calming solution that best meets their needs and maintains roadway function. Additional NTM measure descriptions that include diagrams, benefits, and costs are included in the technical appendix. Any NTM project should include oordinateon with emergency agency staff to assure public safety.

Access Management: 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 the individual destination. Proper implementation of Access Management techniques should reduce congestion, reduce accident rates, lessen the need for highway widening, conserve energy, and reduce air pollution.

New development and roadway projects should meet the requirements summarized in Table 1-4. The minimum spacing of roadways and driveways listed in this table is consistent with Multnomah County's access spacing standards.

Table 1-4: Access Management Standards

Street Facility	Maximum spacing of roadways	Minimum spacing of roadways and driveways
Arterials	1,000 Feet	530 Feet
Collector	530 Feet	150 Feet
Neighborhood/Local	530 Feet	-
All Roads	Require an access report for new access points stating that the driveway/roadway is safe as designed meeting adequate stacking, sight distance and deceleration requirements as set by ODOT, Multnomah County and AASHTO.	

Local Street Connectivity: Much of the local street network in Troutdale is built out and, in many cases, fairly well connected. In other words, multiple access opportunities exist for entering or exiting neighborhoods. However, there are still a number of locations where the majority of neighborhood traffic is funneled onto one single street. This results in out-of-direction travel for motorists and an imbalance of traffic volumes that impacts residential frontage.

A Local Street Connectivity Plan was developed for Troutdale, which is shown in Figure 1-4. In most cases, the connector alignments are not specific and are aimed at reducing potential neighborhood traffic impacts by better balancing traffic flows on neighborhood routes. To protect existing neighborhoods from potential traffic impacts of extending stub end streets, connector roadways should incorporate NTM into their design and construction. All stub streets should have signs indicating the potential for future connectivity. Additionally, any new development that involves the construction of a new street or street extension is required by the current development code to meet the following connectivity standards:

- Provides full street connections with spacing of no more than 530 feet between connections except where prevented by barriers
- Provides bike and pedestrian access ways in lieu of streets with spacing of no more than 330 feet except where prevented by barriers
- Limits use of cul-de-sacs and other closed-end street systems to situations where barriers prevent full street connections
- Includes no close-end street longer than 200 feet or serving more than 25 dwelling units
- Includes street cross-sections demonstrating dimensions of ROW improvements, with streets designed for posted or expected speed limits

Functional Classification: A street's functional classification defines its role in the transportation system and reflects desired operational and design characteristics such as right-of-way requirements, pavement widths, pedestrian and bicycle features, and driveway (access) spacing standards. Figure 1-5 illustrates the functional classification plan for Troutdale, which has been updated to ensure consistency with surrounding jurisdictions.

Local Street Connectivity Plan

Figure **1-4**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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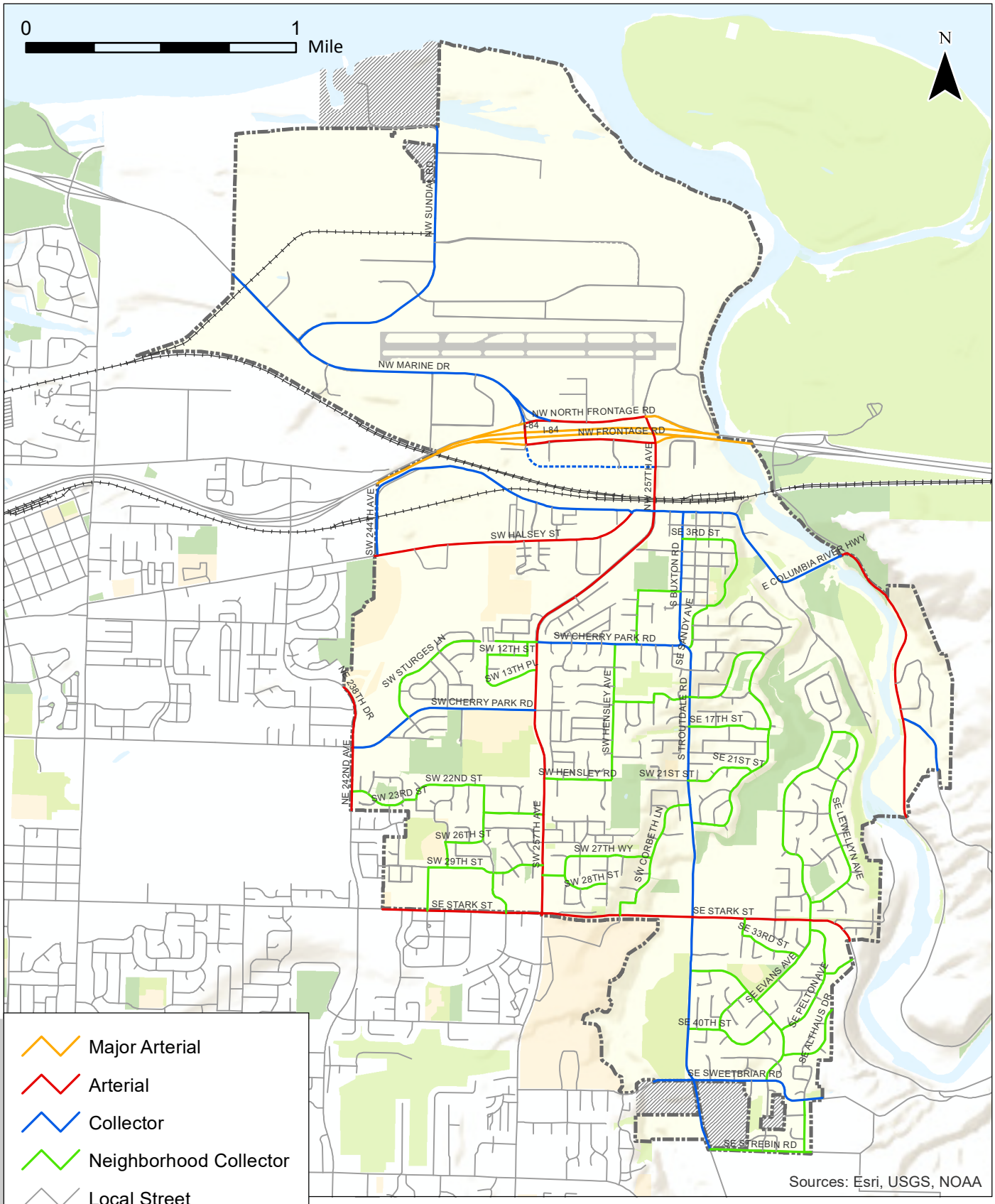

Functional Classification Plan

Figure **1-5**

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

Street Standards: The City of Troutdale has adopted standards for street cross sections that apply citywide to local streets (32' curb-to-curb), neighborhood streets (36' curb-to-curb), and commercial/industrial streets (36' curb-to-curb). In addition, there is a special local street cross section for the Town Center area that allows narrower widths (28' curb-to-curb). These cross sections are detailed in the *City of Troutdale Construction Standards for Public Works Facilities*. Refer to ODOT and Multnomah County standards for additional information related to all collector and arterial cross sections.

Parking Requirements: The City of Troutdale has off-street parking ratios (minimum and maximum) in Chapter 9 of the Development Code, which were adopted in 1998. These ratios are consistent with the TPR and RTP parking ratio requirements.

Transportation Demand Management (TDM)

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

Generally, TDM focuses on reducing vehicle miles traveled and promoting alternative modes of travel for large employers of an area. This is due in part to the Employee Commute Options (ECO) rules that were passed by the Oregon Legislature in 1993 to help protect the health of Portland area residents from air pollution and to ensure that the area complied with the Federal Clean Air Act.

The City of Troutdale should coordinate with Multnomah County and TriMet to implement strategies to assure that the TDM assumptions in the RTP are implemented. The TDM action plan includes:

- Support continued efforts by TriMet, Metro, ODOT, and Multnomah County to develop productive TDM measures that reduce commuter vehicle miles and peak hour trips.
- Encourage developments that effectively mix land uses to reduce vehicle trip generation. These plans may include development linkages (particularly non-auto) that support greater use of alternative modes.
- Continued implementation of motor vehicle minimum and maximum parking ratios for new development.
- Continued implementation of street connectivity requirements.
- Require new development to install bicycle racks.
- Implementation of bicycle, pedestrian, motor vehicle and transit system action plan.
- Monitor and manage the parking needs in the Troutdale Town Center, which could include long-term strategies such as parking pricing.

Roadway Improvements

Based on an evaluation of intersection capacity, some roadways in Troutdale are not expected to meet future demands without capacity improvements. Key issues to address include:

- Lack of north-south capacity. The only north-south arterial route to I-84 in Troutdale is via 257th Avenue. Although 242nd/238th Drive does provide an alternative route to I-84, the lack of parallel routes for travel to or from the freeway system is a constraint for the existing transportation system.
- Frontage Road Congestion. The existing configuration of the Troutdale interchange and the adjoining access provisions for fronting commercial properties is far below the capacity required to support peak period demands today and in the future. The interaction between truck traffic and motor vehicles significantly reduces the frontage road capacities.
- Lack of direct access to the north-industrial area. Access to the north-industrial area is provided through the congested I-84/257th Avenue interchange, which in some cases includes travel via Graham Road. An alternative access is the I-84/207th Avenue interchange, to Sandy Boulevard, to 223rd Avenue, to Marine Drive. However, this alternative includes significant out of direction travel.
- Lack of east-west capacity. The Stark Street corridor is expected to be significantly congested in the future. The Halsey Street/Historic Columbia River Highway corridor is the only other route passing east-west through Troutdale. The lack of alternative east-west connections between neighborhoods in Troutdale increases delay on the arterial roadways and increases neighborhood cut-through traffic.

The transportation improvement projects identified in the 2005 TSP were update to reflect the conclusions and recommendations from the 2011 IAMP and the 2012 EMCP. While many of the projects from the 2005 TSP update are included in the Motor Vehicle Master Plan, a few notable projects have been removed, including the 242nd Street extension, the 238th Street extension, the 2nd Street extension, and the 257th Avenue/Cherry Park Road (south) intersection improvements; the details of which are provided in Chapter 4. Figure 1-6 illustrates the Motor Vehicle Master Plan.

Several strategies were developed to help guide the selection and prioritization of the projects included in the Motor Vehicle Action Plan. The strategies were used to rank the projects identified in the Motor Vehicle Master Plan from highest to lowest in terms of priority. The highest ranking City projects were combined with projects from other agencies identified in previous planning studies to create the project list shown in Table 1-5, which are organized by location and type.

Motor Vehicle Master Plan

Figure **1-6**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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Table 1-5: Motor Vehicle Action Plan

Project ID	Location	Project Description	Cost ($1,000)
M2	Troutdale Road	Widen to 3 lanes from Stark Street to the south City limits. Includes sidewalks and bike lanes.	--
M4	Stark Street Widening (West)	Widen to 5 lanes between 257th Drive and Troutdale Road. Includes sidewalks and bike lanes.	$300
M6	Halsey Street Widening	Construct facilities according to the Main Streets on Halsey Plan with Planning Commission and City Council input and approval.	To Be Determined
M9	Marine Drive	Construct the Marine Drive Extension.	$980
M10	Marine Drive/Sundial Road	Improve intersection of Marine Drive/Sundial Road. Includes widening Marine Drive from approximately 500 feet west of intersection to existing five-lane section.	-
M11	Historic Columbia River Highway/Buxton Road	Signalize in coordination with 257th Drive/Historic Columbia River Highway.	$200
M12	257th Way	Explore options to extend 257th Way through the outlet mall to the urban renewal area.	-
M13	Parking Study	Conduct a parking study within the Troutdale Town Center – the study should include an evaluation of potential off-street parking facilities, including a parking structure at the Confluence site.	$50
M14	Dunbar Avenue	Reconstruct Dunbar Avenue.	$450
M16	Historic Columbia River Highway	Prepare a refinement plan for downtown Troutdale and consider changes to the street profile to improve mobility – Project B16 and P37 may be impacted by the refinement plan	$50
M17	Historic Columbia River Highway	Install traffic calming features along the Historic Columbia River Highway from Depot Park to east city limits	$150
M19	Historic Columbia River Highway/Depot Park	Install a traffic control device where E Columbia River Highway turns to the south	$150
		Total	**$2,330**

Note: Cost estimates indicate the estimated funding to be provided by the City of Troutdale. The projects shown in grey are under the jurisdiction of other agencies. Cost estimates are provided for these outside agency projects only where it is anticipated that the City will contribute funding to the project, and the cost figures shown represent only the City's estimated contribution. Projects shown in white are under the jurisdiction of the City.

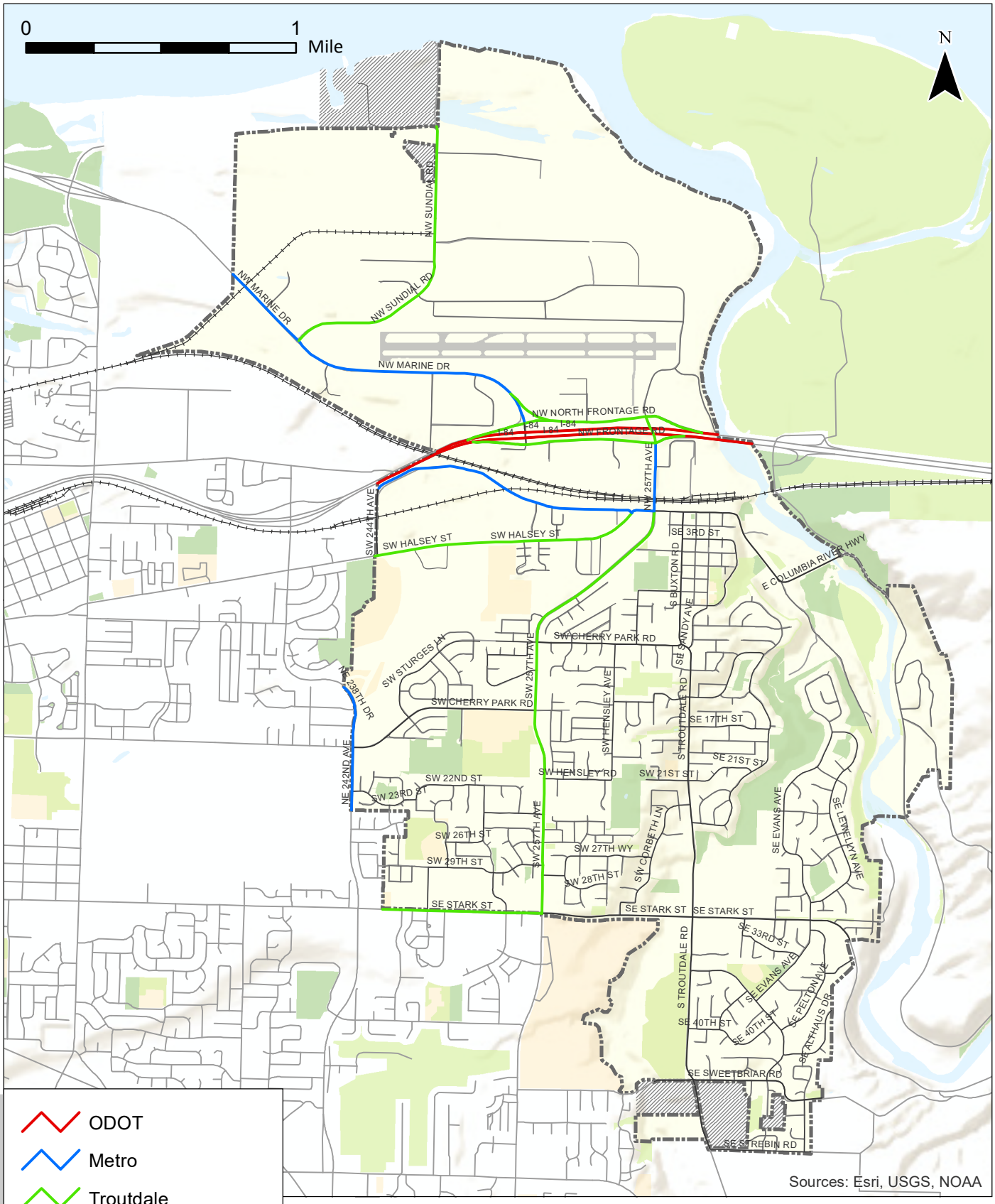
Other Modes

Future needs for freight, air and pipeline infrastructure are identified by their providers and are summarized below.

Freight

Efficient truck movement plays a vital role in the economical movement of raw materials and finished products. The establishment of through truck routes provides for this efficient movement while at the same time maintaining neighborhood livability, public safety, and minimizing maintenance costs of the roadway system. The freight plan is shown in Figure 1-7. The objective of this plan is to allow these streets to focus on design criteria that are "truck friendly"; i.e. 12-foot travel lanes, longer access spacing, 35-foot (or larger) curb returns, and pavement design that accommodates a larger share of trucks. The designated truck routes shown in Figure 1-7 are consistent with recent changes to the Regional Freight Plan as identified in the EMCP.

There are two rail freight lines, the Graham (2A) and the Kenton (2AE) that currently traverse the City of Troutdale, combining to transport over 53 million gross tons of freight in 2002. There are no passenger trains currently running through Troutdale. The volume, length and schedule of the freight trains are not expected to change significantly over the 20-year planning horizon.



Freight Plan

Figure **1-7**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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Gas Pipelines

Two high-pressure natural gas pipelines serve Troutdale. The future service of gas pipelines are not expected to change significantly over the 20 year planning horizon.

Air

The Troutdale Airport is located north of I-84 and is classified as a Category 2 – Business or High Activity General Aviation Airport. The Troutdale Airport Master Plan predicts a modest 2 percent growth in both the number of operations and number of aircraft based in Troutdale over the next 10 years, concluding that current infrastructure is adequate to meet demand.

Financing

Transportation funding is commonly viewed as a user fee system where the users of the system pay for infrastructure improvements through motor vehicle fees such as state and local gas taxes and vehicle registrations. However, virtually all of motor vehicle user fees go to road maintenance, operation, and preservation of the system rather than construction of new facilities. Much of what the public views as new construction is commonly funded (partially or fully) through property tax levies, traffic impact fees (Transportation System Development Charges) and transportation improvements required of private developers. The City of Troutdale utilizes a number of mechanisms to fund construction of its transportation infrastructure, including:

- State and Local Fuel Tax and Vehicle License Fees,
- System Development Charges, and
- Exactions (Developer Required Improvements).

The City of Troutdale currently collects approximately $890,000 in motor fuel taxes and license fees for street construction and repair each year. Annual System Development Charge revenue is highly variable, depending on the pace of development activity, and rates are adjusted in conjunction with updates to the City's Capital Improvement Plan to concur with projected costs of transportation improvement projects.

The costs outlined in the Transportation System Plan to implement the Action Plans for Motor Vehicles, Bicycles, Pedestrians, and Transit total $4.4 million, while the costs of ongoing transportation operations and maintenance programs and services total $27.7 million. The total cost of funding the transportation system over the next 20 years is then $32.1 million as shown in Table 1-6. Note that additional projects are listed in the Action Plans that are expected to be funded by Multnomah County or ODOT, with contributions from the City in some cases (i.e., Stark Street, Graham Road, Marine Drive, and Dunbar Avenue). The City's expected contributions to these projects are included in the estimates in Table 1-6 and should be considered in development of the City's Capital Improvement Plan and associated SDC rates.

Table 1-6: Troutdale Transportation Action Plans Costs Over 20 Years

Transportation Element	Approximate Cost ($1,000)
System Improvement Projects (Action Plans projects to be funded by City)	
Motor Vehicle	$2,330
Bicycle	$275
Transit	$0
Pedestrian	$1,770
Total Capital Projects	**$4,375**
Operations and Maintenance Programs and Services (2013 Dollars)	
Road Operation and Maintenance ($1,075,000 per year, increasing annually)	$21,500
Additional Pavement Preservation Need (300,000 per year)[1]	$6,000
Neighborhood Traffic Management ($10,000/year)	$200
Total Operations and Maintenance Programs	**$27,700**
20 Year Total	**$32,075**

[1]Based on further evaluation of the Operations and Maintenance Programs and Services, there is currently a need for an additional 6.6 million over the next ten years to fully fund the pavement preservation program in addition to the existing costs/expenditures for operation, maintenance and preservation.

The estimated $27.7 million for operations and maintenance exceeds the expected 20-year revenue estimate of $22.2 million (See Chapter 5) by approximately $5.5 million. Alternative solutions to address this funding deficit as well as provide funding for the Action Plan projects were analyzed, including General Fund Revenues, Transportation Utility Fee Revenues, Expanded Transportation SDC, and Debt Financing. A transportation utility fee could be enacted that would generate the roughly $300,000 per year of additional revenue needed, or $6.0 million over the next 20 years as shown in Table 1-7 below. These additional funds along with appropriately set and adjusted SDC rates would be sufficient to fully capitalize the Action Plan projects and maintenance programs.

Table 1-7: Potential Funding Sources for Troutdale Transportation Capital Improvements

Transportation Funding Source	Estimated Additional Annual Revenues ($1,000)
Transportation Utility Fee or Local Gas Tax	$300
Annual New Revenues	**$300**
20 Year Total	**$6,000**

Chapter 2 Goals & Policies

CHAPTER 2. GOALS AND POLICIES

OVERVIEW

The transportation-related goals and policies established by the 2005 TSP were adopted to guide transportation system development in Troutdale. Since 2005, there have been several changes to state and regional transportation plan policies and regulations. The following goals and policies include those that have been carried over from the 2005 TSP as well as new and modified ones to address changes to state and regional plan policies and regulations.

GOALS AND POLICIES

Goal 1. Transportation facilities shall be designed and constructed in a manner which enhances the livability of Troutdale.

Policy a. Minimize the "barrier" effect of large arterial streets (for example 257th Drive).

Action: The City shall develop and maintain pedestrian crossing spacing, traffic signal spacing and landscape standards for large arterial streets in Troutdale, in coordination with Multnomah County and Metro.

Policy b. Make streets as "unobtrusive" to the community as possible.

Action: The City shall maintain design standards for local streets which address landscaping, cross section width, and provision of alternative modes for each functional classification.

Policy c. Build neighborhood streets to minimize speeding.

Action: The City shall allow for neighborhood traffic management in new development as well as existing neighborhoods for City streets. Measures to be developed may include narrower streets, humps, traffic circles, curb/sidewalk bulbs, curving streets, diverters and/or other measures.

Policy d. Encourage pedestrian and bicycle accessibility by providing safe, secure and desirable walkway routes, with a preferred spacing of no more than 330 feet, between elements of the pedestrian network.

Action: The City shall develop and maintain a "pedestrian grid" in Troutdale, outlining pedestrian routes. Sidewalk standards shall be developed to define various widths, as necessary, for City street types.

Policy e. In residential areas, discourage extended use of on-street parking.

Action: The City shall maintain code provisions addressing extended on-street parking and on-street parking of vehicles used for commercial use or non-residential-type purposes (i.e. semi trucks or home businesses with extensive use of on-street parking).

Goal 2. Provide a transportation system in Troutdale which is safe, reduces length of travel and limits congestion.

Policy a. Design of streets should relate to their intended use.

Action: The City shall maintain a functional classification system that meets the City's needs and respects needs of other agencies (Multnomah County, ODOT, Metro, City of Gresham, City of Wood Village). Appropriate design standards for these roadways shall be developed by the appropriate jurisdictions.

Action: A primary emergency response route system shall be developed for roadways within Troutdale in coordination with the Gresham Fire Department and the County's Office of Emergency Management. Appropriate traffic calming guidelines for these routes shall be developed in coordination with the Gresham Fire Department and other agencies (City of Troutdale, Multnomah County, ODOT).

Policy b. Local streets shall be designed to encourage a reduction in trip length by providing connectivity and limiting out-of-direction travel. Provide connectivity to activity centers and designations with a priority for pedestrian connections. Wherever necessary, new streets built to provide connectivity shall incorporate traffic management design elements, particularly those which inhibit speeding. New or improved local streets should comply with adopted street spacing standards.

Action: The purpose of this policy is to provide accessibility to various designations within Troutdale without creating a grid-type network with long, straight streets which encourage speeding or through traffic.

Policy c. No City of Troutdale street (excluding County and State roads) shall exceed one travel lane in each direction, with turn lanes allowed to accommodate demand.

Action: To avoid impacts of land use on roadway capacity, land uses in the comprehensive plan should be followed. Unless designated and built as part of a transit oriented development (TOD), large retail land uses (greater than 20,000 SF) in areas not zoned commercial should be avoided (allowing for some commercial for adjacent uses) due to the significantly larger vehicle traffic generation. Retail developments would be responsible for improvements required to accommodate their associated traffic.

Policy d. Safe and secure pedestrian and bicycle ways shall be designed between parks and other activity centers in Troutdale.

Policy e. Monitor and participate in regional planning efforts, including the development of the Regional Transportation Plan (RTP), to secure funding for safety and capacity improvements to

the City of Troutdale's arterial and collector street system that are necessary to maintain acceptable levels of service for local and through traffic.

Policy f. Meet regional mobility targets within the designated Town Center and along roadways identified as Corridors through system management techniques and strategic capacity improvements, consistent with the adopted TSP.

Goal 3. Provide a balanced, multi-modal transportation system and reduce the number of trips by single occupant vehicles.

Policy a. Commercial, community service and high employment industrial uses shall be developed and sited to be supportive and convenient to pedestrians, bicyclists and transit riders. Pedestrians and bicycle amenities, transit facilities, ride-share programs or similar commute trip reduction measures shall be incorporated in commercial and industrial development to the maximum extent possible.

Action: The City will maintain standards for development adjacent to transit streets. Consistency with site design requirements will be required for such development. Pedestrian accessways, without vehicle conflicts, will need to be identified for every site for access to public right-of-way and the pedestrian system.

Policy b. Recreational trails, including the 40-Mile Loop, shall link to Troutdale's bicycle and pedestrian plans.

Action: The City shall develop and maintain standards for pedestrian connectivity to activity centers, residential areas, and recreational trails.

Policy c. Consistent with the Multnomah County Bicycle Master Plan, bicycle ways should be constructed on all arterials and collectors within Troutdale (with construction or reconstruction projects). All schools, parks, public facilities and retail areas shall have direct access to a bicycle lane or route.

Action: Standards for bicycle facilities within Troutdale shall be developed and maintained including guidelines for placement on sites. Where activity centers are on local streets, connections to bicycle lanes shall be designated.

Policy d. The City shall coordinate with TriMet to improve transit service to Troutdale. Fixed route TriMet transit service shall use arterial and collector streets and minimize use of local streets in Troutdale.

Action: The TriMet service plan shall be the guiding transit plan for Troutdale. Adding elements such as park-and-ride lots near I-84, circulation routes linking retail to residential in Troutdale and direct service to downtown Portland (or Columbia Corridor) are samples of the input to be provided to TriMet.

Action: The City shall adopt and maintain a Transit System Master Plan that designates existing and potential transit routes, as well as transit signal priority corridors in coordination with Multnomah County.

Action: The City shall coordinate with TriMet to provide additional rider amenities (shelters, lighting, trash cans, route information) at transit stops within the City that are consistent with TriMet guidelines.

Policy e. The City shall participate with other agencies in trip reduction strategies developed regionally, including employment, tourist and recreational trip programs.

Policy f. Establish local non-Single Occupant Vehicle (SOV) modal targets, subject to new data and methodology made available to local governments, for all relevant design types identified in the RTP. Targets will meet or exceed the regional modal targets for the 2040 Growth Concept land use design types as illustrated in the following table:

Table 2-1: 2040 Regional Metro Target Non-Single Occupant Vehicles

2040 Design Type	Modal Target
Regional centers, town centers, main streets, station communities, corridors	45 to 55 percent
Industrial areas, employment areas, inner neighborhoods, outer neighborhoods	40 to 45 percent

Policy g. It shall be the shared responsibility of the City, County, State, and developers to provide safe and regular pedestrian and bicycle crossings on arterials and on streets with major transit stops.

Policy h. Support implementation of regional policies and strategies as approved by City Council to reduce SOV trips, including Climate Smart Strategies aimed at reducing green-house-gas emissions.

Goal 4. Provide for efficient movement of goods.

Policy a. Grade separation or gate control should be considered for all railroad crossings.

Action: Support the upgrade of railroad grade crossings to current design standards.

Policy b. The City shall collaborate with the Port of Portland on its plans for the Troutdale Airport.

Policy c. Designated arterial routes and freeway access areas in Troutdale are essential for efficient movement of goods. Design of these facilities and adjacent land uses should reflect the needs of goods movement.

Action: Work with ODOT to improve the Frontage Road area to reduce conflicts between truck maneuvering and through moving residents and tourists.

Policy d. Access control standards shall be preserved on arterial routes to reduce conflicts between vehicles and trucks, as well as conflicts between vehicles and pedestrians.

Goal 5. Develop transportation facilities which are accessible to all members of the community.

Policy a. Construct transportation facilities to meet the requirements of the Americans with Disabilities Act (ADA).

Policy b. Improve ADA accessibility, including increasing the availability of ADA parking in the Town Center.

Policy c. Provide travel options that improve access and circulation for all members of the community, including transportation disadvantaged populations.

Policy D. Engage transportation disadvantaged populations in the planning process and in making decisions about transportation investments.

Goal 6: Develop a transportation system that is consistent with the City's adopted comprehensive land use plan, and with the adopted plans of state, local and regional jurisdictions.

Policy a. The City shall implement the transportation plan based on the functional classification of streets shown in Figure 4-10.

Policy b. The City transportation system plan shall be consistent with the city's adopted land use plan and with transportation plans and policies of other local jurisdictions, especially Multnomah County, City of Wood Village, City of Fairview and the City of Gresham.

Policy c. The City shall coordinate with Metro regarding implementation of the Regional Transportation Plan, the Regional Transportation Functional Plan and related transportation sections of the Urban Growth Management Functional Plan.

Policy d. The City shall work with Metro and other regional transportation partners to identify and implement effective transportation demand management programs, such as rideshare and employer vanpool programs, where appropriate.

Policy e. The City shall work cooperatively with the Port of Portland and local governments in the region to ensure sufficient air and marine passenger access.

Policy f. The City shall work cooperatively with Multnomah County, ODOT, and the Federal Highway Administration (FHWA) to support Intelligent Transportation System (ITS) implementation.

Goal 7: Establish a clear and objective set of transportation design and development regulations that address all elements of the city transportation system and promote access to and utilization of a multi-modal transportation system.

Policy a. The City shall evaluate land development projects to determine possible adverse traffic impacts and to ensure that all new development contributes a fair share toward on-site and off-site transportation system improvements.

Policy b. The City shall require dedication of land for future streets when development is approved. The property developer shall be required to make street improvements for their portion of the street commensurate with the proportional benefit that the improvement provides the development.

Policy c. The City shall require applicable developments to prepare a traffic impact analysis.

Policy d. The City shall adopt a uniform set of design guidelines that provide one or more typical cross sections associated with those functional street classifications under its jurisdiction. For example, the City may allow for a standard roadway cross-section and a boulevard cross-section for arterial and collector streets.

Policy e. The City shall adopt roadway design guidelines and standards that ensure sufficient right-of-way is provided for necessary roadway, bikeway, and pedestrian improvements.

Policy f. The City shall adopt roadway design guidelines and standards that ensure sidewalks be provided on all streets and bikeways be provided on all arterial and collector streets under its jurisdiction for the safe and efficient movement of pedestrians and bicyclists between residential areas, schools, employment, commercial, industrial and recreational areas.

Policy g. The City shall generally favor granting property access from the street with the lowest functional classification, including alleys. Where practicable, single family dwellings shall access from local streets; access to arterials and collectors for single family units shall be prohibited unless no other reasonable access exists.

Policy h. The City shall adopt access control and spacing standards for all arterial and collector streets under its jurisdiction to improve safety and promote efficient through street movement. Access control measures shall be generally consistent with Multnomah County access guidelines to ensure consistency on city and county roads.

Policy i. The City shall adopt parking control regulations for streets as needed. On-street parking shall not be permitted on any street designated as an arterial, unless allowed by special provision within the Town Center area. Parking regulations should allow the formation of a residential permit parking district.

Policy j. The City shall adopt off-street parking regulations, as needed, to provide guidelines for large lots (over 3 acres) to incorporate street-like features such as sidewalks, street lights, etc.

Policy k. Prior to, or in conjunction with the next TSP update, the City shall conduct a parking study for the Town Center. The parking study shall include an inventory and recommendations related to the need for a comprehensive parking management plan and management strategies such as permit parking, structured parking, ADA parking, and priced parking.

Policy l. The City shall adopt design standards that require new retail, office, and institutional buildings on sites at RTP designated major transit stops to meet RTP design requirements.

Policy m. The City supports innovative street design that balances multiple transportation objectives, ensuring that roadway facilities are safe and attractive to pedestrians, bicyclists, transit riders, and motor vehicle users.

Policy n. The City encourages integration of natural stormwater collection and treatment into street designs, provided that the associated design elements can be consistently applied and executed in construction, can be reasonably maintained, and allow emergency access.

Goal 8: Protect the function of the I-84 Troutdale interchange and support the recommendations of the I-84 Troutdale Interchange Area Management Plan (IAMP).

Policy a. It is the policy of the City to work with ODOT to protect the primary function of the I-84 Troutdale interchange as the key facility that provides access to industrial land between I-84 and the Columbia River and facilitates goods movement and access to the Troutdale Town Center.

Policy b. The City will inform ODOT of proposed land use actions, including development applications and legislative amendments such as Comprehensive Plan updates, or transportation improvements that could affect the function of the interchange. The City will ensure that any such amendments are consistent with the function of the interchange, as defined in the IAMP and the TSP, and are consistent with the Access Management Plan in the IAMP.

Policy c. Updates of the City of Troutdale's Transportation System Plan shall be reviewed for consistency with the IAMP.

Policy d. When proposing amendments to the land use designations or permitted uses in the IAMP management area, the applicant will be required to demonstrate that the proposed amendment will be consistent with the planned improvements in the IAMP.

Policy e. Because the Access Management Plan (AMP) in the IAMP is based on property configurations, development application approvals, and ownership existing at the time of the IAMP adoption, land use actions will be reviewed for consistency with the AMP.

PERFORMANCE TARGETS

Overview

The 2010 Regional Transportation Plan (RTP) includes performance targets that track the region's progress in developing an integrated, multi-modal, transportation system. Based on the RTP, the targets provide policy direction for developing the investment strategy recommended in the RTP and for updating local TSPs. Table 2-2 summarizes the performance targets considered as part of the Troutdale TSP along with specific performance measures, related system deficiencies, and associated TSP projects that help address the deficiencies.

Table 2-2: Performance Targets

2010 RTP Performance Target[1]	TSP Performance Measure	System Deficiency	TSP Project
Safety - By 2035, reduce the number of pedestrian, bicyclist, and motor vehicle occupant fatalities plus serious injuries each by 50% compared to 2005	Reduce the frequency and severity of crashes for all travel modes Address known deficiencies and high accident areas as high priority projects	Troutdale has four intersections on the most recent Multnomah County SPIS list (2000-2002) The four intersections are: 242nd Avenue/Cherry Park Road, 257th Drive/Historic Columbia River Highway, 257th Drive/Stark Street, and Troutdale Road/Stark Street	The pedestrian, bicycle, and motor vehicle master plans identify a variety of projects that are intended to reduce the potential for conflicts between movements Several new pedestrian crossings, sidewalks connections, and on-street bicycle lanes are proposed along roadways throughout Troutdale while new separate left and right turn lanes are proposed at a few intersections
Congestion - By 2035, reduce vehicle hours of delay (VHD) per person by 10 percent compared to 2005	Ensure that all City, County, and State facilities meet their respective mobility standards	The 2005 TSP update identified two intersections that are expected to exceed their respective mobility standards in the future The two intersections are: 257th Drive/Cherry Park Road (south) and Troutdale Road/Stark Street	The intersection capacity and signal optimization projects included in the motor vehicle master plan are intended to improve traffic flow and minimize congestion along major roadways Similarly, the pedestrian bicycle, and transit improvement projects are intended to help reduce vehicle demand on congested roadways
Freight reliability - By 2035, reduce vehicle hours of delay truck trip by 10 percent compared to 2005	Reduce vehicle delay and improve reliability on identified truck routes	A number of freight routes within the City currently experience delay during peak time periods Travel times are not predictable, and delay can vary from day to day, increasing transportation costs for businesses that rely on shipping	Several of the intersection capacity and signal optimization projects included in the motor vehicle master plan are located along major freight routes. These projects are also intended to improve traffic flow and help reduce delay for heavy vehicles
Climate change - By 2035, reduce transportation-related carbon dioxide emissions by 40 percent below 1990 levels	Strive to reduce VMT per capita by 10 percent compared to 2010	A majority of Troutdale residents commute to areas outside the City limits, which increases VMT per capita.	The TDM/TSM programs and strategies identified in the TSP along with improvements to the pedestrian, bicycle, and transit systems will help decrease per capita VMT and the associated transportation-related emissions to meet this performance measure

2010 RTP Performance Target[1]	TSP Performance Measure	System Deficiency	TSP Project
Active Transportation - By 2035, triple walking, biking and transit mode share compared to 2005	Implement policies and strategies that work towards achieving non SOV mode share targets as identified in the 2010 RTP Identify projects that support active transportation throughout the City	There are currently a number of gaps in the pedestrian, bicycle, and transit systems within Troutdale	The TDM/TSM programs and strategies identified in the TSP along with improvements to the pedestrian, bicycle, and transit systems will also help provide incentives and increase opportunities for Troutdale residents to choose active transportation

1. The 2018 RPT includes updates to the performance measures and targets used throughout the region. Some of the new measures include affordability, mode share, system completeness, carbon emissions, and vehicle miles traveled. The updates should be reviewed by City staff, as well as the Troutdale Citizens Advisory Committee, Planning Commission, and City Council, and incorporated into the next full TSP update, as applicable.

The goals and policies identified above along with the transportation improvement projects identified in Chapter 4 will help Metro work towards achieving the performance targets listed in the 2010 RTP by addressing safety concerns, reducing congestion, improving freight reliability, and providing more alternatives for active transportation that help affect mode split and VMT per capita. Combined with other cities in the Portland metropolitan area, actions and projects contained in Troutdale's TSP will help the region reach its 2035 Performance Targets.

Chapter 3 Existing Conditions

CHAPTER 3. EXISTING CONDITIONS

OVERVIEW

This chapter summarizes the existing physical, geometric, and operational characteristics of the pedestrian, bicycle, transit, motor vehicle, freight, water, air, and pipeline systems in Troutdale. An inventory was conducted of these systems in Fall 2012 to establish base year conditions for the TSP. This data provides a benchmark (basis of comparison) for future assessment of transportation performance in Troutdale relative to desired policies.

The study area is shown in Figure 3-1. Eleven intersections within the study area were selected for operational evaluation. Traffic data was gathered at these locations and analyzed in order to evaluate area traffic conditions including volumes and levels of service. In addition, regional transportation system inventories were used to map existing facilities. The following sections describe the existing systems, usage, and performance in the City of Troutdale.

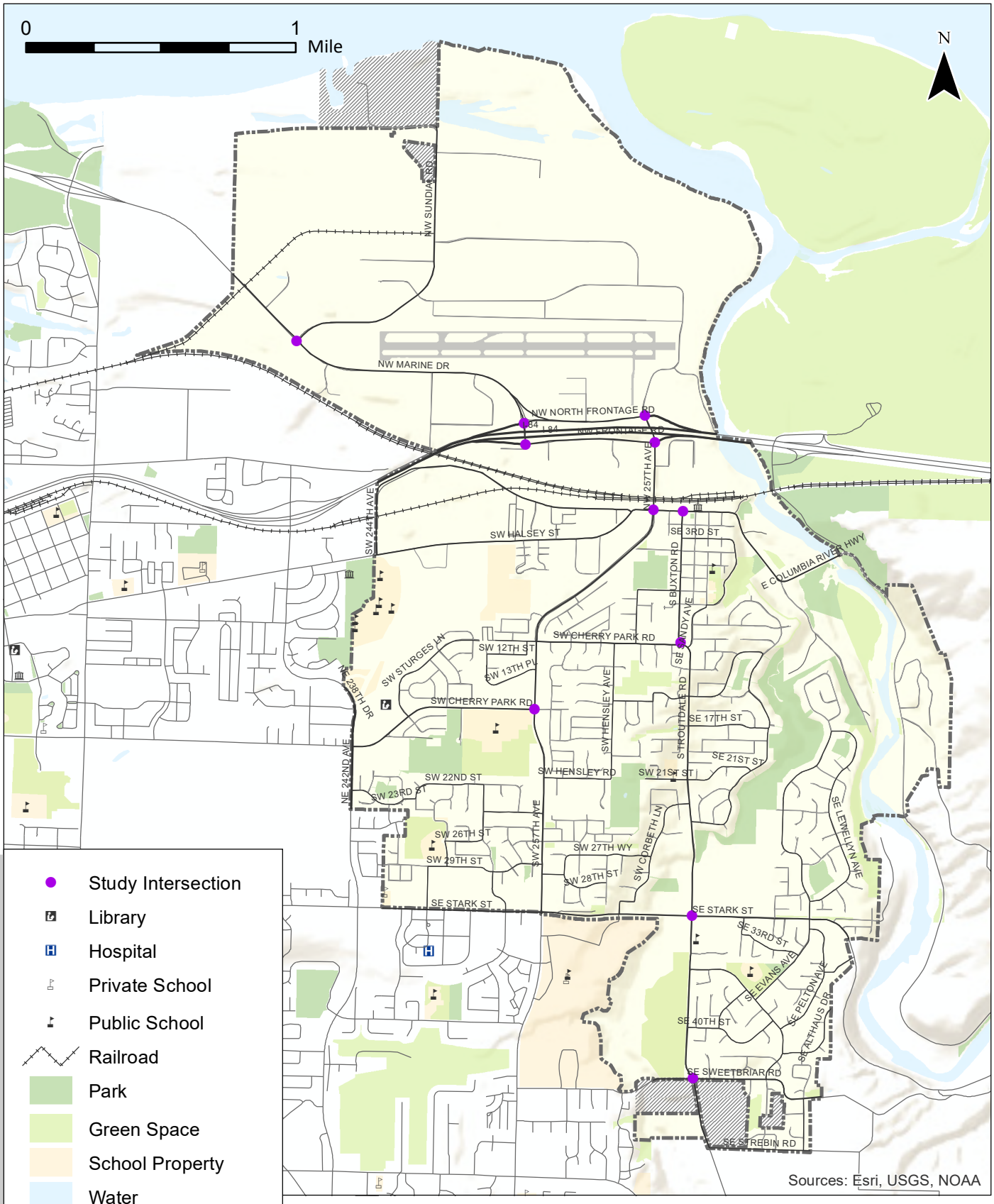
FINDINGS AND CONCLUSIONS

This section highlights specific transportation issues that should be addressed with the TSP. It outlines the deficiencies that are present under existing conditions and identifies areas that should be considered in subsequent steps of this process.

The existing conditions analysis includes an assessment of current transportation facilities in meeting travel demand based on agency standards. The major issues found after analyzing the existing transportation conditions in the Troutdale community fall into three distinct categories: connectivity, capacity and safety.

Connectivity: A well-connected transportation system provides three distinct advantages. First, it reduces travel time and miles of driving required as origins and destinations are connected through more direct routes. Secondly, local traffic is able to make trips to in-town destinations using well connected local streets as opposed to clogging up arterials. Thirdly, emergency vehicles have shorter response times to residential neighborhoods. Current connectivity issues that need to be addressed include:

- The southern I-84 frontage road has recurring issues with queuing and heavy traffic congestion. A parallel route should be considered to relieve the congestion and excessive queues along this route.
    - The Troutdale I-84 Interchange Area Management Plan (IAMP) identifies a new route that extends south from the Marine Drive/I-84 Eastbound Off-Ramp/South Frontage Road intersection to 257th Avenue at 257th Way.



Study Area

Figure **3-1**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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- There is a lack of adequate north/south connectivity to I-84 and the north-industrial area.
- Additional multi-use paths and trails connecting parks, retail centers and other trip generators with residential areas, increasing the opportunities for non-motorized trips and reducing single occupant vehicle trips.
    - The East Metro Connection Plan (EMCP) identifies new multi-use path and trail systems within Troutdale, including an extension of the 40-mile loop (RTP ID 99149) and the Beaver Creek Trail (RTP ID 10409).

Capacity: Deficiencies of existing conditions must be addressed so the transportation system can handle the future increase in vehicular volume. The major issue affecting future capacity concerns in the City of Troutdale is:

- Development of the former Alcoa Aluminum property now owned by the Port of Portland, which includes over 300 acres of developable land located north of the Troutdale Airport. Surrounding infrastructure must be improved to provide adequate access to these lands as they are developed.

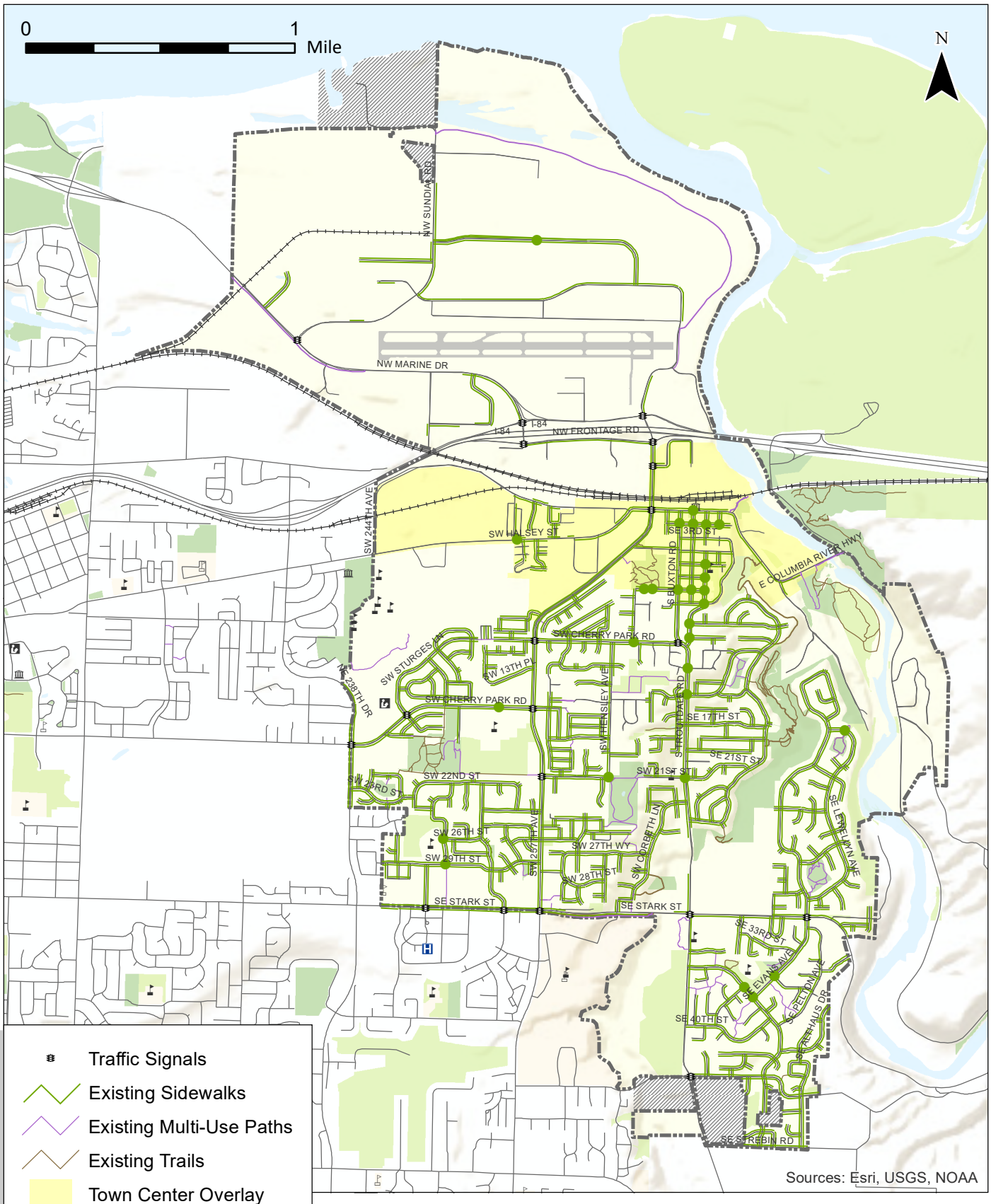
Safety: Transportation infrastructure must be safe and reliable for users of all modes, including pedestrians, bicyclists and motor vehicles. Identified safety issues in the existing conditions analysis include:

- Pedestrian crossings along 257th Avenue, within the town center area, and along all other corridors where pedestrian crossing opportunities are limited.
    - The EMCP identifies new pedestrian crossings improvements along 257th Avenue at intersections and mid-block crossing (RTP ID 10403).
- Four intersections are on the most recent County Safety Priority Index System (SPIS) rankings, meaning that these intersections have more severe safety issues than many other intersections in the County.

The following sections review existing conditions associated with each travel mode including pedestrian, bicycle, transit, motor vehicle and other modes (such as rail, marine and pipeline).

PEDESTRIAN SYSTEM

The pedestrian system within Troutdale consists of sidewalks, multi-use paths and trails as well as marked and unmarked, signalized and unsignalized pedestrian crossings. Figure 3-2 illustrates the existing pedestrian system along with the location of major pedestrian generators and attractors such as schools and parks.



Existing Pedestrian System

Figure **3-2**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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Pedestrian Facilities

As shown in Figure 3-2, a majority of the arterial and collector streets in Troutdale currently have continuous sidewalks on at least one side of the street. There are some locations where sidewalks are not connected; however, connectivity and pedestrian linkages are relatively good, particularly to parks and schools. A majority of the residential streets also have sidewalks on at least one side of the street, providing connections to major roadways and other neighborhoods.

A majority of the signalized intersections shown in Figure 3-2 currently have pedestrian push buttons that activate the traffic signals, signal heads that indicate when it is safe to cross, and striped crosswalks on two or more legs of the intersections, while a majority of the enhanced pedestrian crossings have signed and striped crosswalks. There are two regional multi-use paths shown in Figure 3-2; one that travels from Blue Lake Park along the south side of Marine Drive, terminating east of Sundial Road, and one that travels north of the Troutdale Airport along the flood control levee, terminating at Graham Road. Although there are several other multi-use paths and trails located throughout Troutdale, additional multi-use path connections between neighborhoods would help to complete the pedestrian grid system, and therefore should be considered in the TSP.

The area shown in yellow in Figure 3-2 has a Town Center overlay. Based on the Troutdale Development Code, town centers typically function as local activity areas and provide a range of local retail and service opportunities within a close proximately to each other and residents within a few miles of the designated area. Town centers offer special attractions of regional interest, simultaneously requiring and supporting a high-quality public transportation system and strong multi-modal arterial street access to regional centers and other major destinations. Troutdale's town center is characterized by a variety of small specialty retail shops, store front businesses and a historic grid street network. There are two parks and one school within the town center boundary. The majority of streets have sidewalks on both sides. Additional information on the town center is provided in Chapter 4.

Pedestrian Activity

Pedestrian activity was recorded at the 11 study intersections in June 2004. The total number of pedestrians that crossed each intersection during the weekday p.m. peak hour are shown in Table 3-1.

Table 3-1: PM Peak Hour Pedestrian Crossing Volumes at Study Intersections

Intersection	Pedestrian PM Peak Hour Volume	Intersection	Pedestrian PM Peak Hour Volume
Buxton Road/Historic Columbia River Highway	38	I-84 eastbound ramps/Marine Road	0
Marine Drive/Sundial Road	0	I-84 eastbound ramps/Graham Road	0
257th Drive/Cherry Park Road (south)	22	I-84 westbound ramps/Graham Road	2
257th Drive/Historic Columbia River Highway	19	Troutdale Road/Stark Street	44
Cherry Park Road/Buxton Street	2	Troutdale Road/Cochran Road	0
I-84 westbound ramps/Marine Road	2		

The most significant pedestrian movements occur near retail, recreational, educational and town center areas, including Buxton Road, Troutdale Road, Cherry Park Road, and 257th Avenue. Along major roadways, such as Halsey Street and 257th Avenue, and heavy freight routes, such as Marine Drive, pedestrian crossings are limited to locations with traffic signal controls due to high motor vehicle volumes and speeds. Additional crossings and connections to the pedestrian system could be provided to improve crossing spacing along 257th Avenue and Stark Street.

BICYCLE SYSTEM

The bicycle system within Troutdale consists of on-street bike lanes, shoulder bikeways, and off-street bike facilities, such as parking and wayfinding signs. Figure 3-3 illustrates the existing bicycle system along with the location of major bicycle generators and attractors such as schools and parks.

Bicycle Facilities

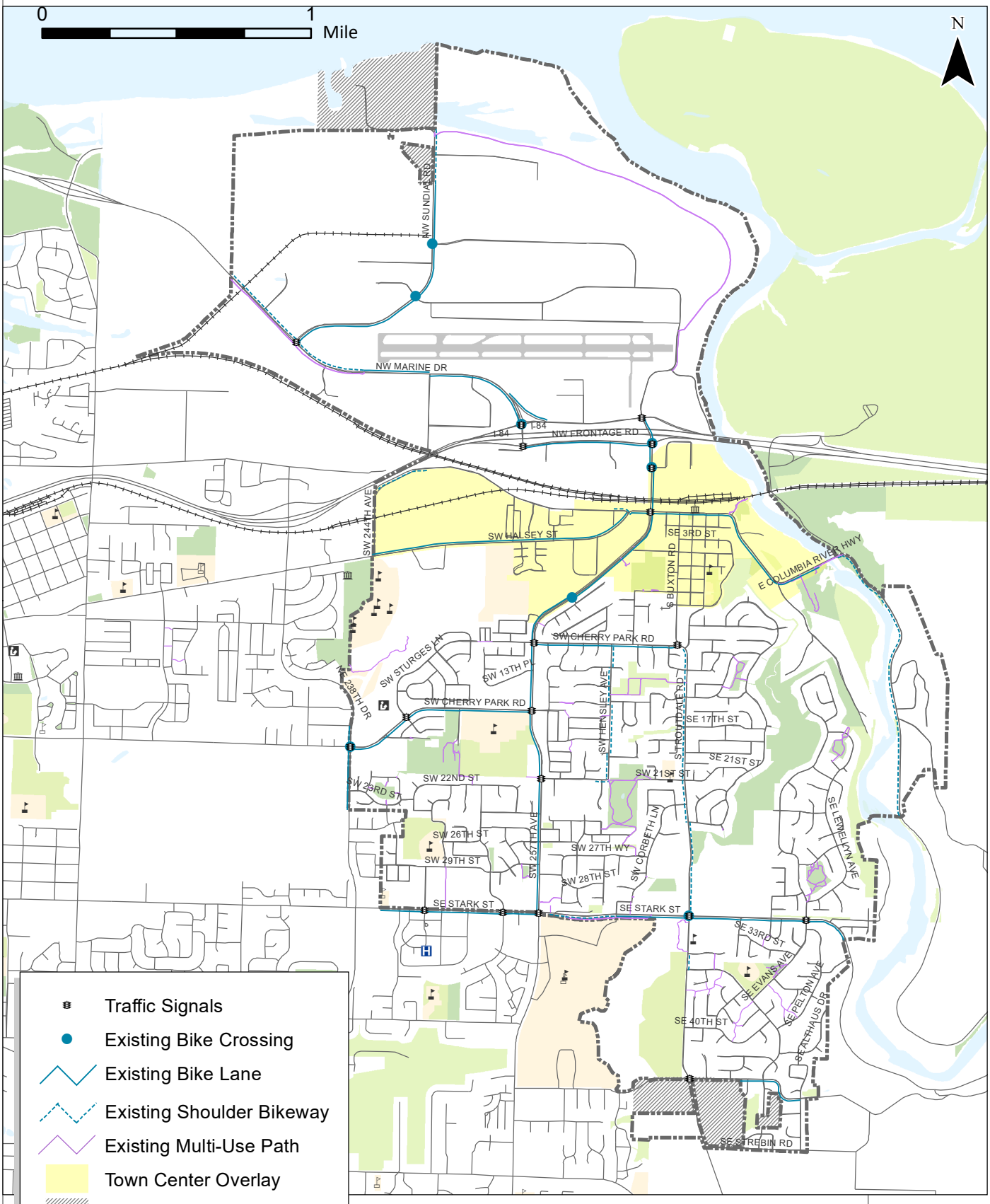
As shown in Figure 3-3, a majority of the collector and arterial streets in Troutdale currently provide on-street bike lanes or shoulder bikeways. Also shown, several major intersections currently provide bicycle crossings; these primarily consist of intersections with separate right-turn lanes where the on-street bike lane continues through the intersection. In general, the existing bicycle system currently provides adequate connections from neighborhoods to schools, parks, retail centers, and transit stops. Cyclists desiring to travel through the City can use the designated routes on the major streets or can share the road with motor vehicles on the lower volume, neighborhood streets to reach destinations. However, there are a few locations where new on-street bicycle lanes or other bicycle treatments, such as shared roadway signs could improve the overall bicycle system.

Bicycle Activity

Bicycle activity was recorded at the study intersections in June 2004. The total number of cyclists that travel through each intersection during the weekday p.m. peak hour is shown in Table 3-2.

Table 3-2: PM Peak Hour Bicycle Crossing Volumes at Study Intersections

Intersection	Bike PM Peak Hour Volume	Intersection	Bike PM Peak Hour Volume
Buxton Road/Historic Columbia River Highway	0	I-84 eastbound ramps/Marine Road	0
Marine Drive/Sundial Road	0	I-84 eastbound ramps/Graham Road	6
257th Drive/Cherry Park Road (south)	0	I-84 westbound ramps/Graham Road	0
257th Drive/Historic Columbia River Highway	0	Troutdale Road/Stark Street	7
Cherry Park Road/Buxton Street	0	Troutdale Road/Cochran Road	2
I-84 westbound ramps/Marine Road	0		



Existing Bicycle System

Figure **3-3**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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TRANSIT SYSTEM

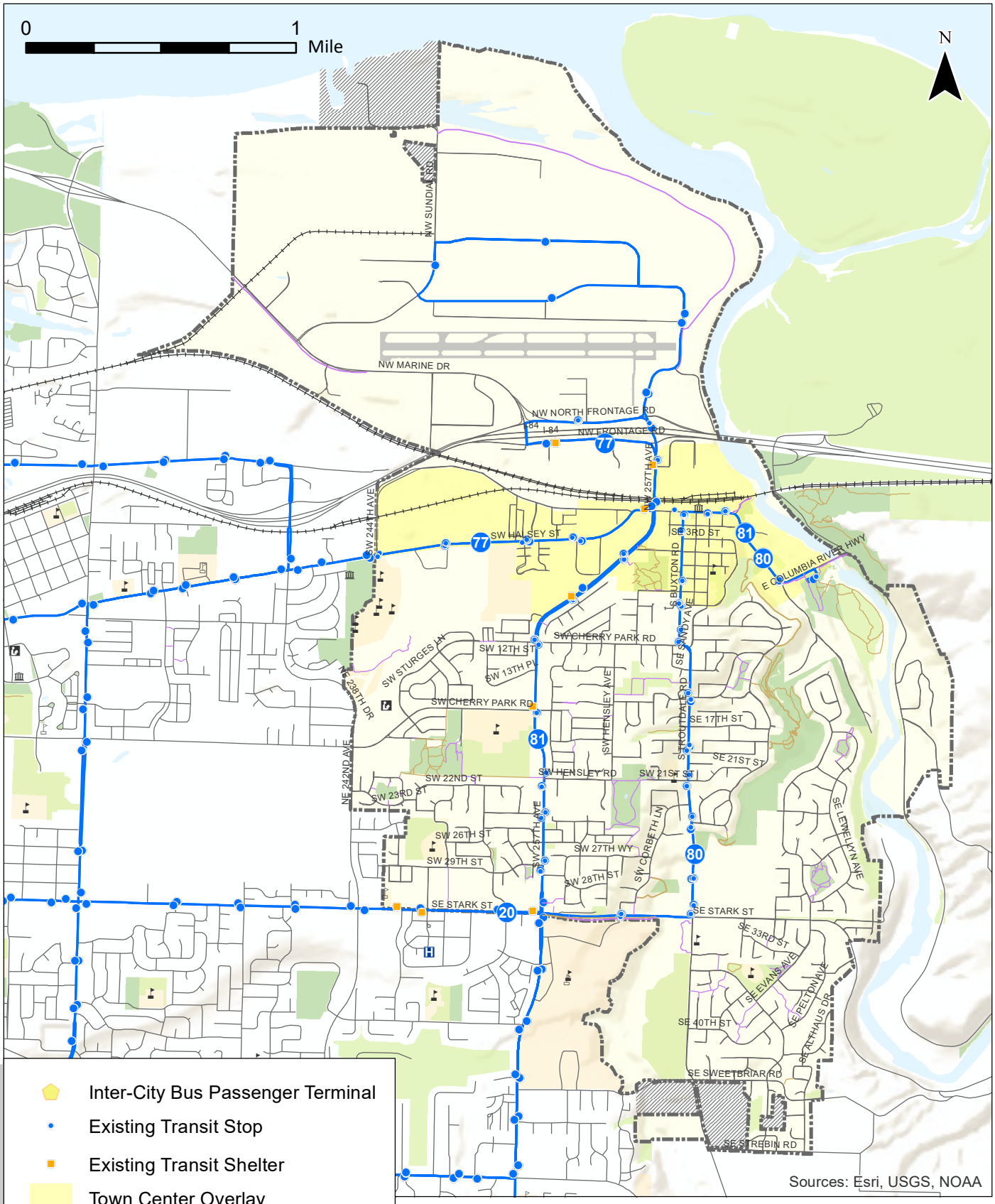
The public transportation system within Troutdale consists of fixed-route and dial-a-ride service. Frequent morning and evening peak hour service provides residents with the ability to use public transportation for daily commuting, while less frequent mid-day, Saturday, and Sunday service provides residents with the ability to use public transportation during non-commute times.

Fixed-Route Service

TriMet is the primary service provider in the Portland metropolitan area and operates four fixed-route bus lines in Troutdale, including Line 77-Broadway/Halsey, Line 80-Kane/Troutdale Road, Line 81-Kane/257th, and to a lesser extent, Line 20-Burnside Stark. A brief description of each route is provide below:

- Line 77 provides service between the northern portion of Troutdale and the Portland City Center via the I-84 Frontage Roads, 257th Avenue, and Halsey Street. Service is provided Monday through Friday from 6:00 a.m. to 10:00 p.m. on approximately 20-minute headways (the amount of time between transit vehicle arrivals at a stop) during peak time periods and on 30-minute headways during all other times of the day. Service is also provided on Saturday and Sunday on a more limited basis.
- Line 80 provides service between Glenn Otto Park and the Gresham Transit Center via the Columbia River Highway, Buxton Road-Troutdale Road, and Stark Street. Service is provided Monday through Friday from 7:00 a.m. to 6:00 p.m. on approximately 60-minute headways. Service is also provided on Saturday and Sunday on a more limited basis.
    - TriMet identified a need to change the route due to low ridership to Glenn Otto Park and difficulty turning around in the parking lot.
- Line 81 provides service between the northern portion of Troutdale and the Gresham Transit Center via the I-84 Frontage Roads and 257th Avenue. Service is provided Monday through Friday from 5:00 a.m. to 11:00 p.m. on approximately 15-minute headways during peak time periods and on 30 to 60-minute headways during all other times of the day. Line 81 does not operate on Saturday and Sunday.
    - Lines 80 and 81 connect to other fixed-route bus lines at the Gresham Transit Center as well as TriMet's Max Blue Line, Sandy Area Metro's Sandy to Gresham Bus Line, and Multnomah County's Troutdale Reynolds Industrial Park (TRIP) shuttle.
- Line 20 provides service between the Beaverton Transit Center and the Gresham Transit Center via Stark Street in Troutdale. Service is provided Monday through Friday from 4:00 a.m. to 11:00 p.m. on approximately 15-minute headways. Service is also provided on Saturday and Sunday on a more limited basis.

Figure 3-4 illustrates the existing transit system, including TriMet's fixed-route bus lines and the location of bus stops and shelters. As shown in Figure 3-4, transit service is currently focused along a few major roadways and transit stops are located adjacent to all of the major intersections along each route with shelters in select locations.



- Inter-City Bus Passenger Terminal
- Existing Transit Stop
- Existing Transit Shelter
- Town Center Overlay
- Urban Planning Area
- City Boundary

Existing Transit System

Figure **3-4**

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

Transit Level of Service

The transit level-of-service analysis was performed in accordance with the methodology described in Transit Cooperative Research Program (TCRP) Report 100: *Transit Capacity and Quality of Service Manual* (TCQSM). Of the six available measures, three were selected for this analysis as being most relevant to a long-range planning effort. Table 3-3 summarizes the TCQSM measures used and the ranges of values used to determine the LOS result for each measure.

Table 3-3: Transit Capacity and Quality of Service Manual - Level of Service (LOS) Measures

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

Service Frequency

From the user's perspective, *service frequency* determines how many times an hour a user has access to transit service, assuming that service is provided within acceptable walking distance and at the times the user wishes to travel. Service frequency also measures the convenience of transit service to choice riders (rider who choose to take transit) and is one component of overall transit trip time. Table 3-4 summarizes the transit level-of-service analysis results for service frequency.

Table 3-4: Service Frequency Level-of-Service Analysis

Provider	Routes	Service Frequency	LOS
TriMet	77	20-30 minutes	C-D
TriMet	80	60 minutes	E
TriMet	81	15, 30-60 minutes	C-E
TriMet	20	15 minutes	C

As shown, existing services currently operate at LOS C-E. At LOS C, service frequencies provide a reasonable choice of travel times, but the wait involved if a bus is missed becomes long. At LOS D, service is only available about twice per hour and requires passengers to adjust their routines to fit the transit service provided. At LOS E, service is provided approximately once per hour and puts passengers in the position of potentially spending long periods of time waiting for service and/or rearranging schedules to be able to take transit.

Hours of Service

Hours of service, also known as "service span," is the number of hours during the day when transit service is provided along a route, a segment of a route, or between two locations. It plays an important a role in determining the availability of transit service to potential users. If transit service is not provided at the time of day a potential passenger needs to take a trip, it does not matter where or how often transit service is provided the rest of the day. Table 3-5 summarizes the transit level-of-service analysis results for hours of service.

Table 3-5: Hours of Service Level-of-Service Analysis

Provider	Routes	Service Frequency	LOS
TriMet	77	16 hours	C
TriMet	80	11 hours	E
TriMet	81	18 hours	B
TriMet	20	19 hours	A

As shown, existing services currently operate at LOS A-E. At LOS A service is available for most or all of the day. Workers who do not work traditional 8-to-5 jobs receive service and all riders are assured that they will not be stranded until the next morning if a late-evening bus is missed. At LOS B service is available late into the evening, which allows a range of trip purposes other than commute trips to be served. At LOS C, service runs only into the early evening, but still provides some flexibility in one's choice of time for the trip home. At LOS E, midday service is limited or non-existent and/or commuters have limited choice of travel times.

Service Coverage

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

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

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

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

Figure 3-5 displays the transit level-of-service analysis results for service coverage based on population and employment estimates for 2000.. Areas defined as transit supportive that have service are shown in green. Areas defined as transit supportive that are lacking service are shown in red. Areas that have transit service, but do not qualify as a TSA, are shown in orange. A majority of the areas shown in red would require additional transit routes or the development of new pathway connections to existing transit routes in order to be served.

The percentage of TSA's served in Troutdale and the corresponding level of service has been identified using the Transit Level of Service (TLOS) methodology. As shown in Table 3-6, the percent of transit supportive areas served is less than 50 percent in terms of both households and employment areas. The corresponding LOS is F.

Table 3-6: Service Coverage Analysis

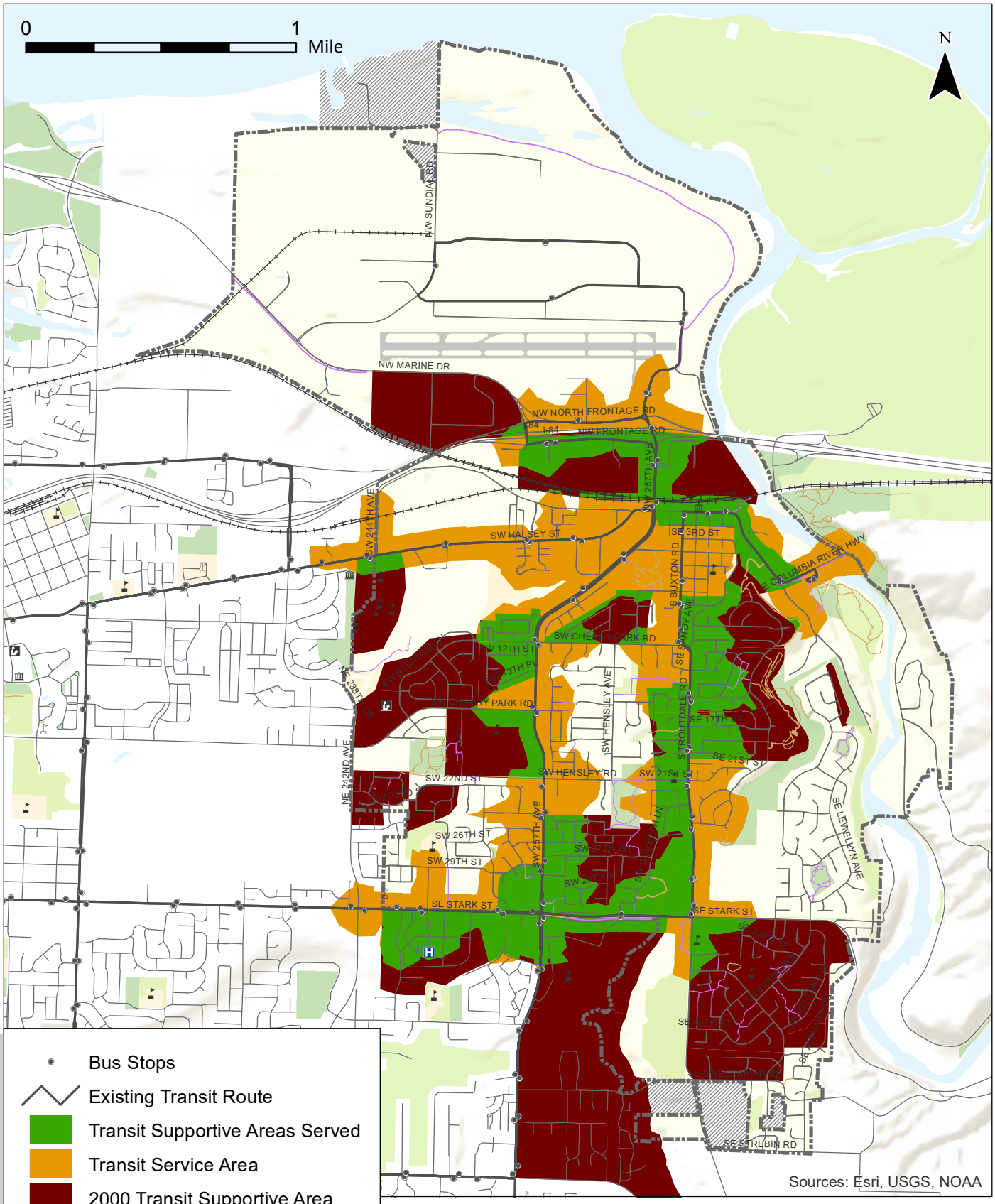
Area Type	Households	Employment
Transit Supportive Areas (TSA)[1]	2,699	5,260
Transit Supportive Areas Served[2]	1,339	2,485
Transit Supportive Areas NOT Served[3]	1,360	2,775
Percent TSA Served by Transit	49.6	47.2
Level of Service	F	F

1. Areas shown in green and red in Figure 3-5.
2. Areas shown in green in Figure 3-5.
3. Areas shown in red in Figure 3-5.

As shown in Table 3-6, 1,360 households and 2,775 jobs are located within areas that do not have transit service. These areas currently have a household and/or employment density that can support transit service and therefore should be included in future efforts to improve service routes and stop locations.

Future Transit Service Coverage

The future transit level-of-service analysis assumes that existing service frequencies, service hours, and service coverage is the same in the future. The only difference is the population and employment growth assumptions included in the 2025 regional traffic model and the resulting transit supportive areas. Figure 3-6 displays the transit level-of-service analysis results for service coverage. As shown, the number of transit supportive areas is expected to increase throughout most of Troutdale. While many of these areas are expected to be served by existing transit services, the remaining areas will require additional service routes or connections to existing routes in order to be served.



Existing Transit Coverage Level of Service

Figure 3-5

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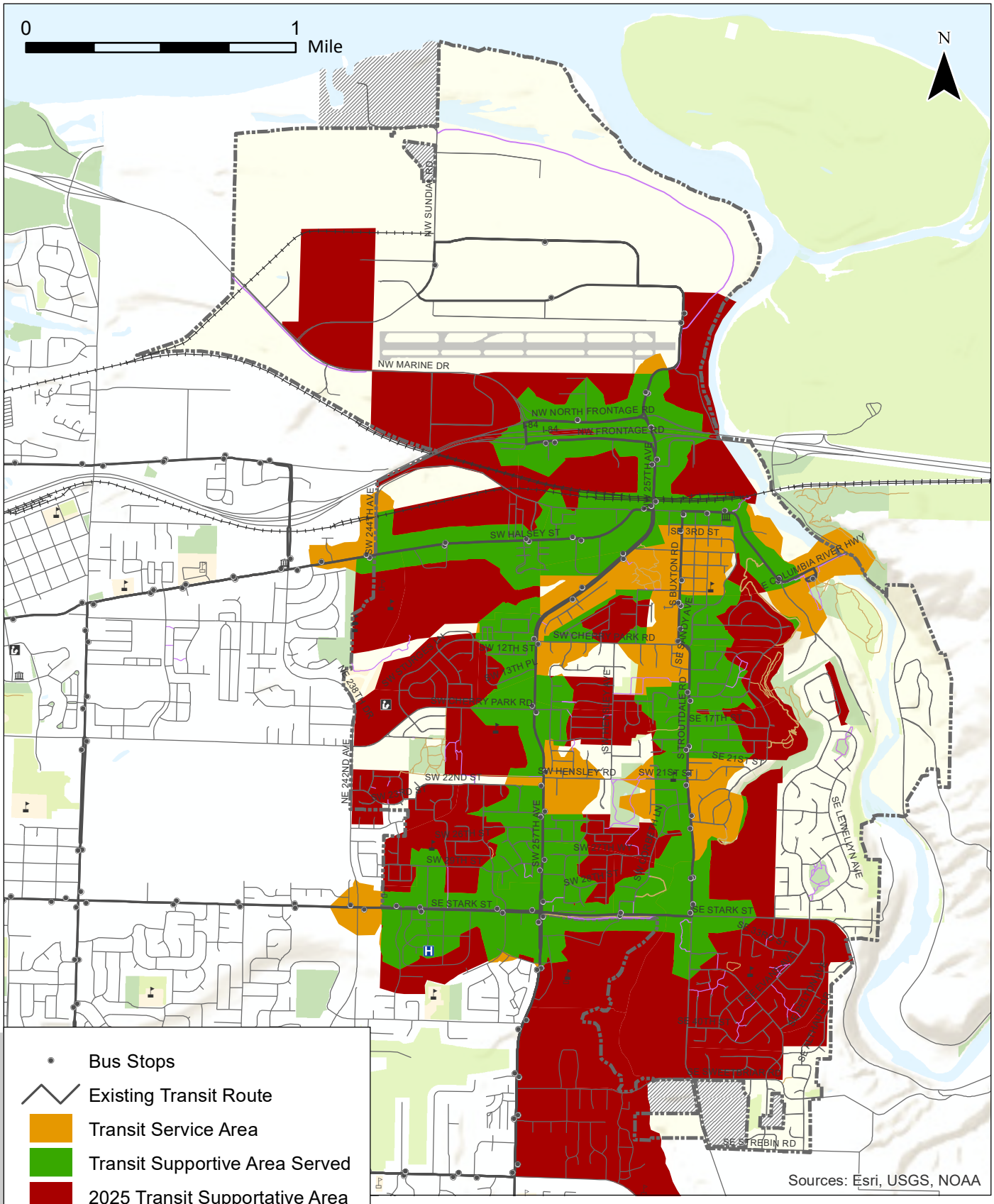
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center



- Bus Stops
- Existing Transit Route
- Transit Service Area
- Transit Supportive Area Served
- 2025 Transit Supportative Area
- Urban Planning Area
- City Boundary

Future (2025) Transit Coverage Level of Service

Figure **3-6**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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Ridership

Average weekday ridership data was obtained from TriMet that reflects the average number of boardings and alightings (ons and offs) that occurred at each stop in Troutdale in Spring 2012. TriMet typically considers locating transit shelters at stops with 35 or more boarding's per day. Based on a review of the TriMet ridership data, Troutdale has a few stops that meet this threshold, but do not currently have shelters. These stops include:

- Stop 8747: Historic Columbia River Highway & SW Kendall Road
- Stop 9792: Stark Street & SW Sundial Avenue
- Stop 5398: Stark Street & McGinnis Avenue
- Stop 13532: 257th Avenue & Historic Columbia River Highway

Dial-a-Ride Service

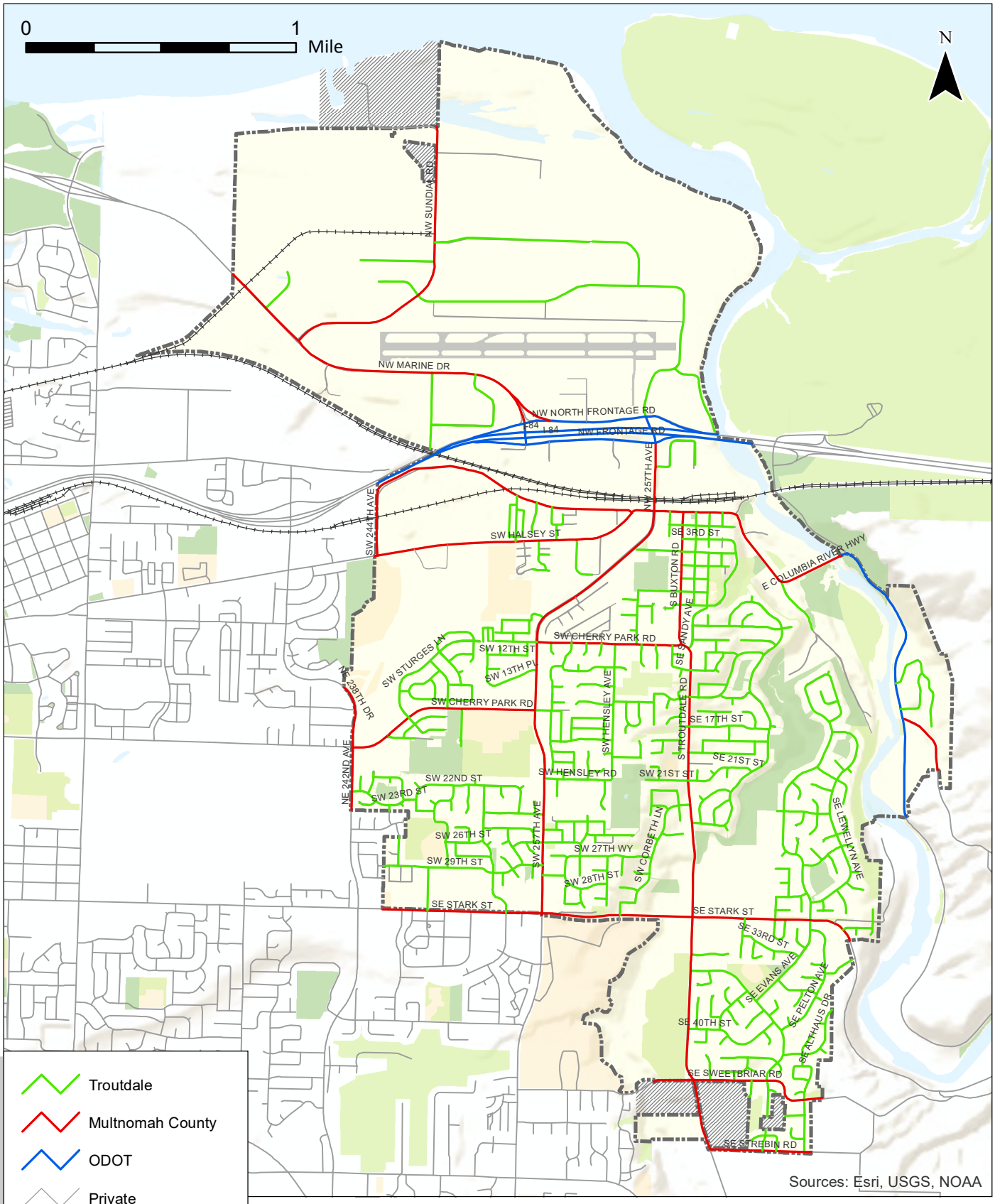
TriMet's LIFT Paratransit Program provides dial-a-ride service to residents who are unable to use regular fixed-route services due to disabilities or disabling health conditions. The service is offered within the service area and hours of service provide by the fixed-route lines.

MOTOR VEHICLES

The street system within Troutdale serves a majority of all trips over multiple modes. In addition to motorists, pedestrians, bicyclists, and public transit riders all use the street system to access areas locally and regionally.

Jurisdiction

Streets within Troutdale are owned and operated by three separate jurisdictions, including Multnomah County, the Oregon Department of Transportation (ODOT), and the City of Troutdale. Each jurisdiction is responsible for determining the street system's functional classifications, defining its major design and multimodal features, and approving construction and access permits. Coordination is required among the three jurisdictions to ensure that the street system is planned, operated, maintained, and improved to safely meet public needs. Figure 3-7 illustrates the jurisdiction of the streets within Troutdale. As described below, all of the arterial and collector streets are owned and operated by either ODOT or Multnomah County, while all the neighborhood and local streets are owned and operated by the City of Troutdale.



Roadway Jurisdiction

Figure **3-7**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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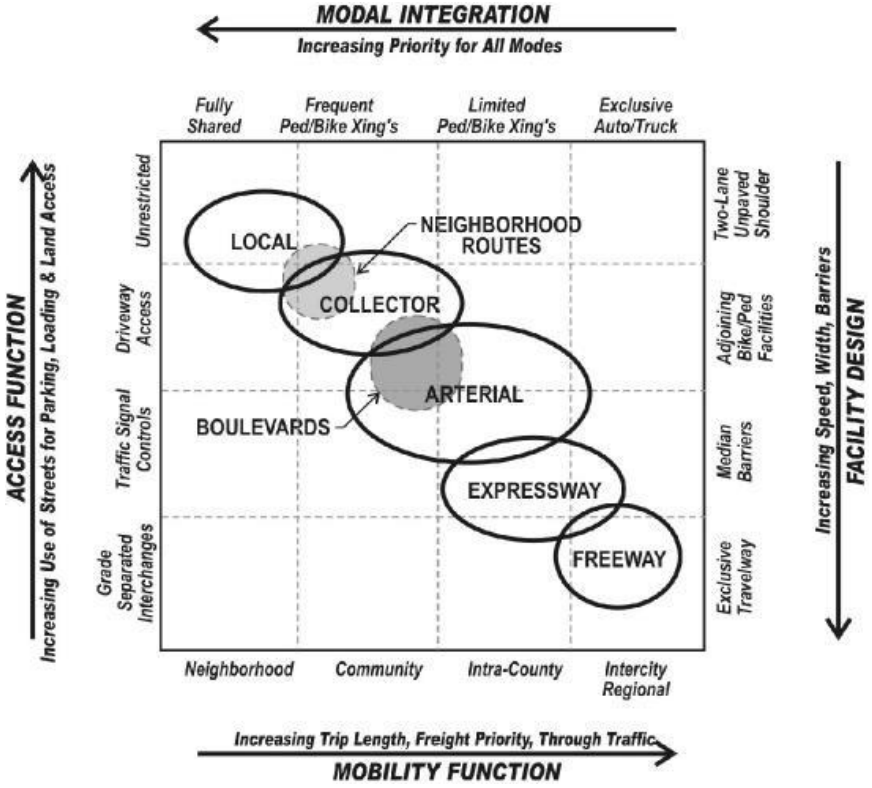
Functional Classification

A street's functional classification reflects its role in the transportation system and defines desired operational and design characteristics such as right-of-way requirements, pavement widths, pedestrian and bicycle features, and driveway (access) spacing standards.

The schematic diagram illustrates the relationship between access, mobility, multi-modal transport, and facility design for roadway facilities. The diagram is useful to understand how worthwhile objectives can have opposing effects. For example, as mobility is increased (bottom axis), the provision for non-motor vehicle modes (top axis) is decreased accordingly. Similarly, as access increases (left axis), the facility design (right axis) dictates slower speeds, narrower travelways, and non-exclusive facilities. The goal of selecting functional classes for particular roadways is to provide a suitable balance of these four competing objectives. The diagram shows that as street classes progress from local to collector to arterial to freeway (top left corner to bottom right corner) the following occurs:



- Mobility Increases – Longer trips between destinations, greater proportion of freight traffic movement, and a higher proportion of through traffic.
- Integration of Pedestrian and Bicycle Decreases – Provisions for adjoining sidewalks and bike facilities are required up through the arterial class, however, the frequency of intersection or mid-block crossings for non-motorized vehicles steadily decreases with higher functional classes. The expressway and freeway facilities typically do not allow pedestrian and bike facilities adjacent to the roadway and any crossings are grade-separated to enhance mobility and safety.

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

Two additional areas are noted on the diagram for Neighborhood Routes and Boulevards that span two conventional street classes.

The existing Troutdale functional class system for roadway facilities is shown in Figure 3-8. As shown, a majority of the streets classified as collector or higher offer continuous connections throughout the city. The only exceptions are in areas where the street network has not yet been completed/connected. This TSP should address the limitations of the existing functional classifications and establish a system that better meets City and regional policy issues. A functional classification system based primarily on connectivity would allow the design flexibility to handle each of the issues identified above.

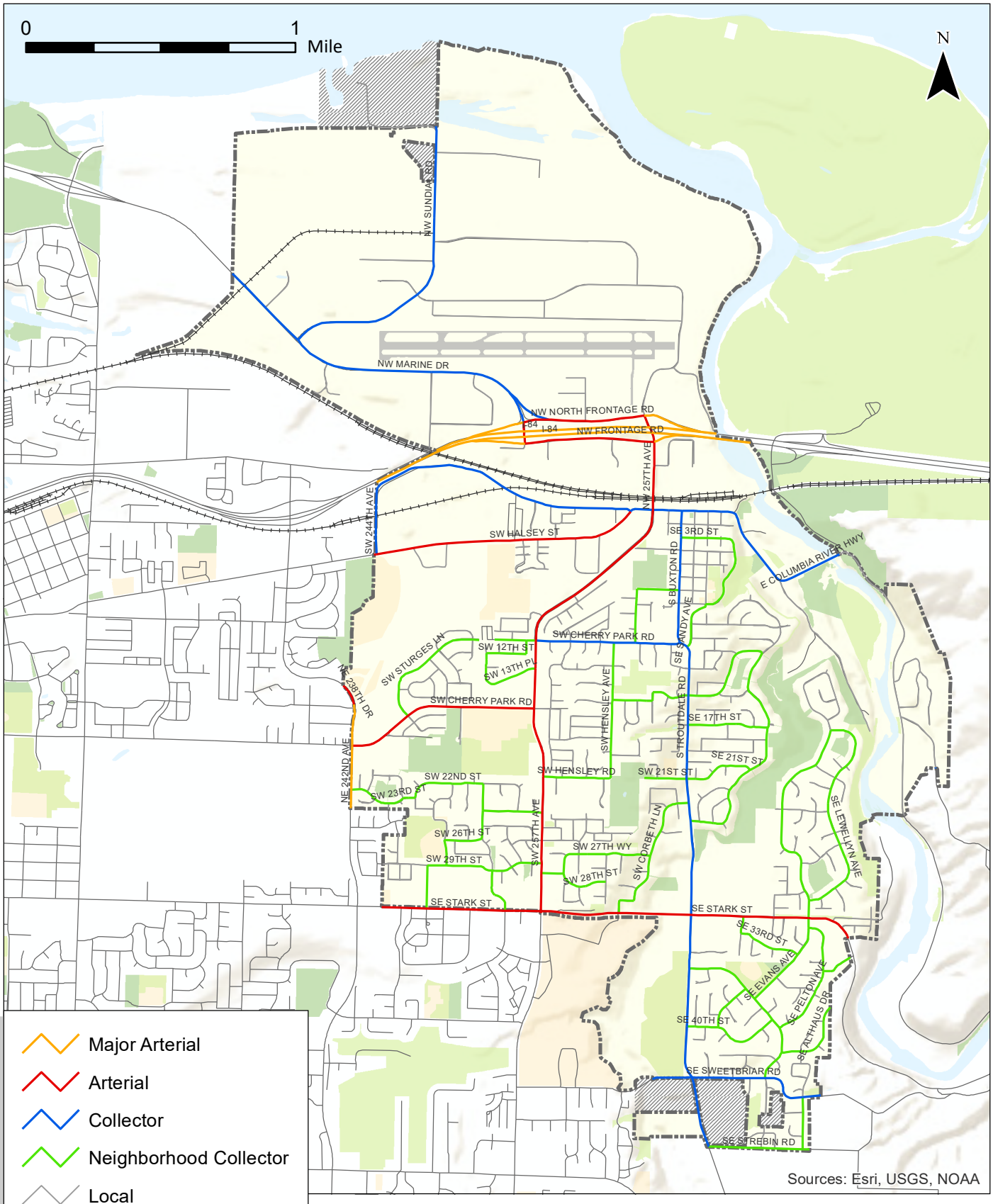
Table 3-7 summarizes the functional classifications of the arterial and collector streets within Troutdale and illustrates the overlapping ownership/maintenance and jurisdictional relationships that exist.

Table 3-7: Functional Classification Comparison of Collector and Higher Streets by Jurisdiction

Roadway	ODOT	Multnomah County	Troutdale	Metro
I-84	**Interstate**	-	Major Arterial	Principal Arterial
Marine Drive	-	**Major Collector**	Collector	-
Frontage Roads	**Minor Arterial**	**-**	Arterial	-
Sundial Road	-	**Major Collector**	Collector	-
Columbia River Highway (west of the Sandy River)	-	**Major Collector**	Collector	-
Columbia River Highway (east of the Sandy River)	**Minor Arterial**	**-**	Local Street	Rural Arterial
Halsey Street	-	**Minor Arterial**	Arterial	Minor Arterial
Cherry Park Road (west of 257th Avenue	-	**Major Collector**	Arterial	Minor Arterial
Cherry Park Road (east of 257th Avenue)	-	**Major Collector**	Collector	-
Woodard Road	-	**Neighborhood Collector**	Local Street	-
Stark Street (west of Troutdale Road)	-	**Major Arterial**	Arterial	Major Arterial
Stark Street (east of Troutdale Road)	-	**Minor Arterial**	Arterial	Minor Arterial
Sweetbriar Road	-	**Neighborhood Collector**	Collector	-
257th Avenue	-	**Major Arterial**	Arterial	Major Arterial
Troutdale Road	-	**Major Collector**	Collector	-
Buxton Road	-	**Major Collector**	Collector	-

Note: Roadways shown in bold indicate ownership/maintenance responsibilities. Sources: Oregon Department of Transportation, Multnomah County Functional Classification of Trafficways, 2005 City of Troutdale Transportation System Plan, Metro 2035 Regional Transportation Plan.

As shown in Table 3-7, the following streets currently have conflicting classifications:



Existing Troutdale Functional Classification

Figure 3-8

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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- Historic Columbia River Highway (east of the Sandy River) – This segment of the Historic Columbia River Highway is an ODOT facility and is currently classified as a minor arterial by ODOT, a rural arterial by Metro, and as a local street by the City of Troutdale. For consistency purposes, the TSP update should reclassify this segment of the Historic Columbia River Highway to an arterial.
- Cherry Park Road (west of 257th Avenue) – This segment of Cherry Park Road is a Multnomah County facility and is currently classified as a major collector by Multnomah County, an arterial by the City of Troutdale, and a minor arterial by Metro. For consistency purposes, the TSP update should reclassify this segment of Cherry Park Road as a collector.
- Woodard Road is a Multnomah County facility and is currently classified as a major collector by Multnomah County and as a local street by Troutdale. For consistency purposes, the TSP update should reclassify Woodard Road as a collector.

In addition, given the lack of a continuous east-west connection between Hensley Road and 21st Street, the TSP update should reclassify 21st Street as a local street west of Troutdale.

A general functional classification issue not related to Troutdale specifically involves when developments are proposed within the allowed range of uses in a comprehensive plan, but the estimated added demand exceeds functional class parameters for the fronting county streets. For example, a high intensity use such as a regional shopping center, sports facility, or medical center may require more travel lanes on a collector facility than the three lanes typically allowed.

Street Connectivity

A well-connected transportation network minimizes the need for out-of-direction travel while supporting an efficient distribution of travel demand among multiple parallel roadways. The most common example of an efficient transportation network is the traditional grid system, with north-south and east-west streets spaced at generally equal distances. SW 242nd Avenue, SW 257th Avenue, SW Halsey Street, SW Cherry Park Road – west of SW 257th Avenue, and SE Stark Street are all part of a larger grid system that provides connectivity on a regional level as well as access within Troutdale. There are currently several exceptions to the grid within Troutdale, primarily due to topographical or other natural constraints as well as existing development patterns.

Arterial Street Connectivity

The RTP provides designations for four types of arterials, including principal arterials, major arterials, minor arterials, and rural arterials; each of which are located within Troutdale. As shown in Table 3-7, I-84 is the only principal arterial that travels through Troutdale, SW 257th Avenue and SE Stark Street – west of SW 257th Avenue are the only major arterials, NE Halsey Street, SW Cherry Park Drive – west of SW 257th Avenue, and SE Stark Street – east of SW 257th Avenue are the only minor arterials, and the small portion of the E Columbia River Highway that travels through Troutdale east of the Sandy River is the only rural arterial.

Based on the RTP, arterials are intended to provide general mobility for travel within the region as well as connect major commercial, residential, industrial, and institutional centers. Arterials are usually spaced about 1-mile apart and are designed to accommodate motor vehicle and truck traffic as well as pedestrians, bicyclists, and transit riders. Figure 3-9 illustrates the existing deficiencies in the arterial street system spacing within Troutdale.

As shown in Figure 3-9, many of the arterials located within Troutdale meet the RTP's arterial spacing guidelines. However, there is a need for at least two new arterials within the city, including one located approximately 1-mile east of SW 257th Avenue and one located approximately 1-mile north of SE Stark Street. These potential connections could provide the needed north-south and east west connectivity between areas located within Troutdale and those located throughout the region. However, in addition to significant right-of-way and development costs, other constraints include existing development patterns, topography and the natural environment.

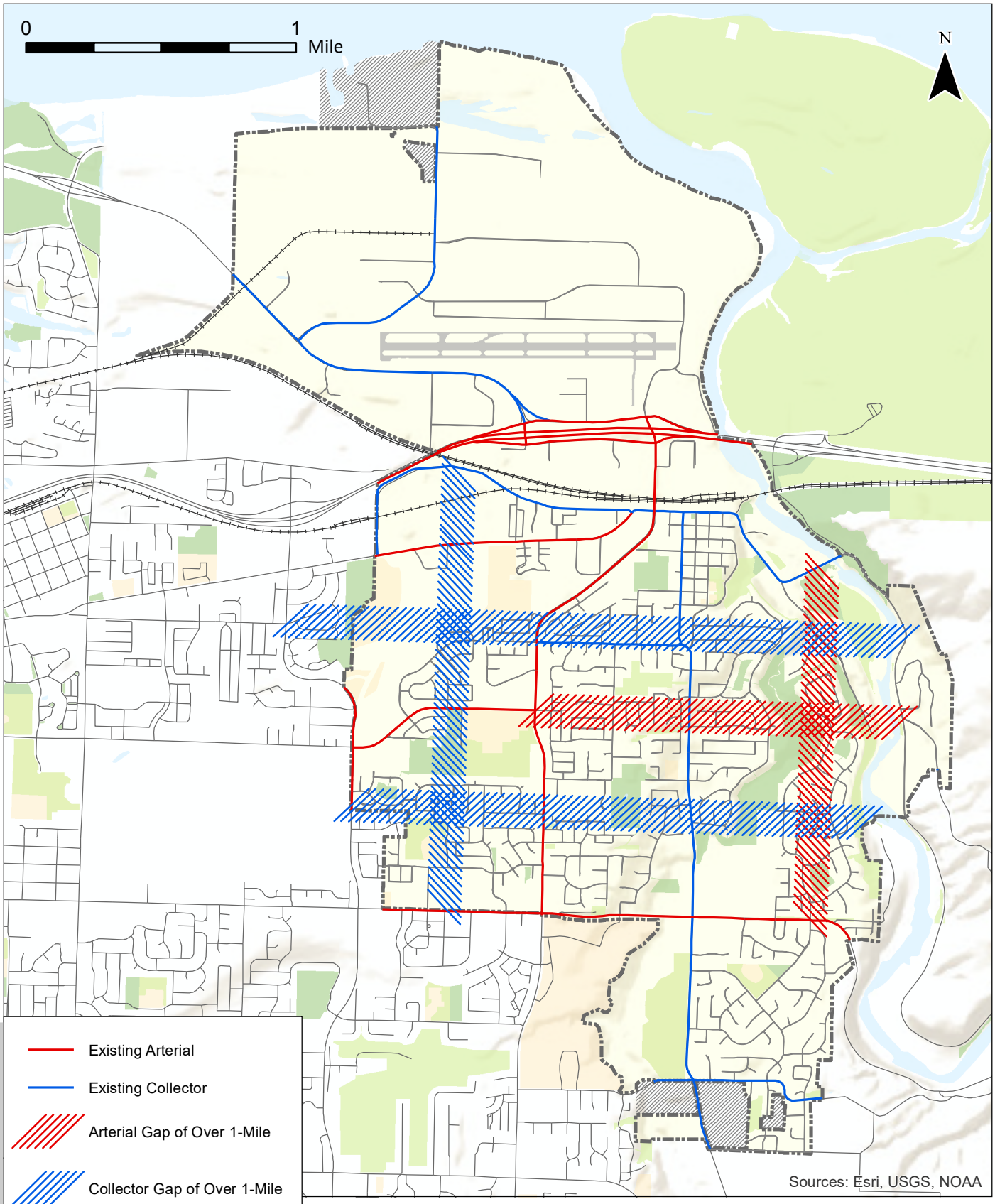
Collector Streets

The RTP identifies collector streets as general access streets for neighborhood circulation and as support streets for the regional transportation network. Connectivity at this level is especially important for pedestrian and bicycle trips. The RTP recommends a maximum spacing of 1/2 mile for collectors in order to encourage local traffic to use them instead of higher order facilities. Figure 3-9 illustrates the existing deficiencies in the collector street system.

As shown in Figure 3-9, there is a need for at least three new collectors within the city, including one located approximately ½ mile north and one located ½ mile south of Cherry Park Road and one located approximately ½ mile west of SW 257th Avenue. Each of these potential connections would enhance the north-south and east-west connectivity within the city and reduce reliance on the arterial street system. However, development of additional collector corridors is difficult due to significant right-of-way and development costs, existing development patterns, topography and the natural environment.

Local Street

Based on the RTP, local streets primarily provide direct access to adjacent land uses and therefore serve an important role for supporting pedestrian and bicycle travel. The RTP recommends a maximum spacing of 1/10 mile for local streets and suggests limiting cul-de-sacs to 200 feet in length. Much of the local street system within Troutdale is characterized by short, indirect streets with numerous cul-de-sacs. Although this type of system can have the effect of limiting traffic speeds and volumes on local streets, it can also result in indirect travel paths and a reliance on arterials for local trips. Based on a review of the local street system, opportunities to improve and expand local street connectivity exist in several areas throughout Troutdale. The Needs, Opportunities, Constraints, and tools report provided in the Appendix provides additional information related to local street connectivity.



RTP Spacing Standards

Figure **3-9**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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Roadway Characteristics

Field inventories were conducted in 2004 to determine the characteristics of the major roadways in Troutdale. Data collected includes posted speed limit limits, number of travel lanes, and intersection controls. These characteristics define roadway capacity and operating speeds throughout the street system, which affects travel path choices for drivers in Troutdale.

The majority of roadways in Troutdale are posted at 25 miles per hour (mph) as they are local access roads. Arterial roadways such as 257th Avenue, Halsey Street, Cherry Park Road and Stark Street are posted at higher speeds ranging from 40 to 45 mph. Collector roadways such as Troutdale Road, Sweetbriar Road and Historic Columbia River Highway are posted at 35 to 40 mph. The segment of Historic Columbia River Highway between 257th Avenue and the Sandy River, which is the primary street through the central business district, is posted at 25 mph.

Figure 3-10 shows the existing number of travel lanes along each roadway in Troutdale. As shown, the widest roadways are 257th Avenue, Stark Street and Marine Drive, which generally have 5-lane cross sections. A small section of 242nd Drive has a 4-lane cross section and 238th Drive, the I-84 eastbound frontage road, and the section of Cherry Park Road from the west City limits to 257th Drive, each have a 3-lane cross section. The remaining roads in the City of Troutdale have 2-lane cross sections.

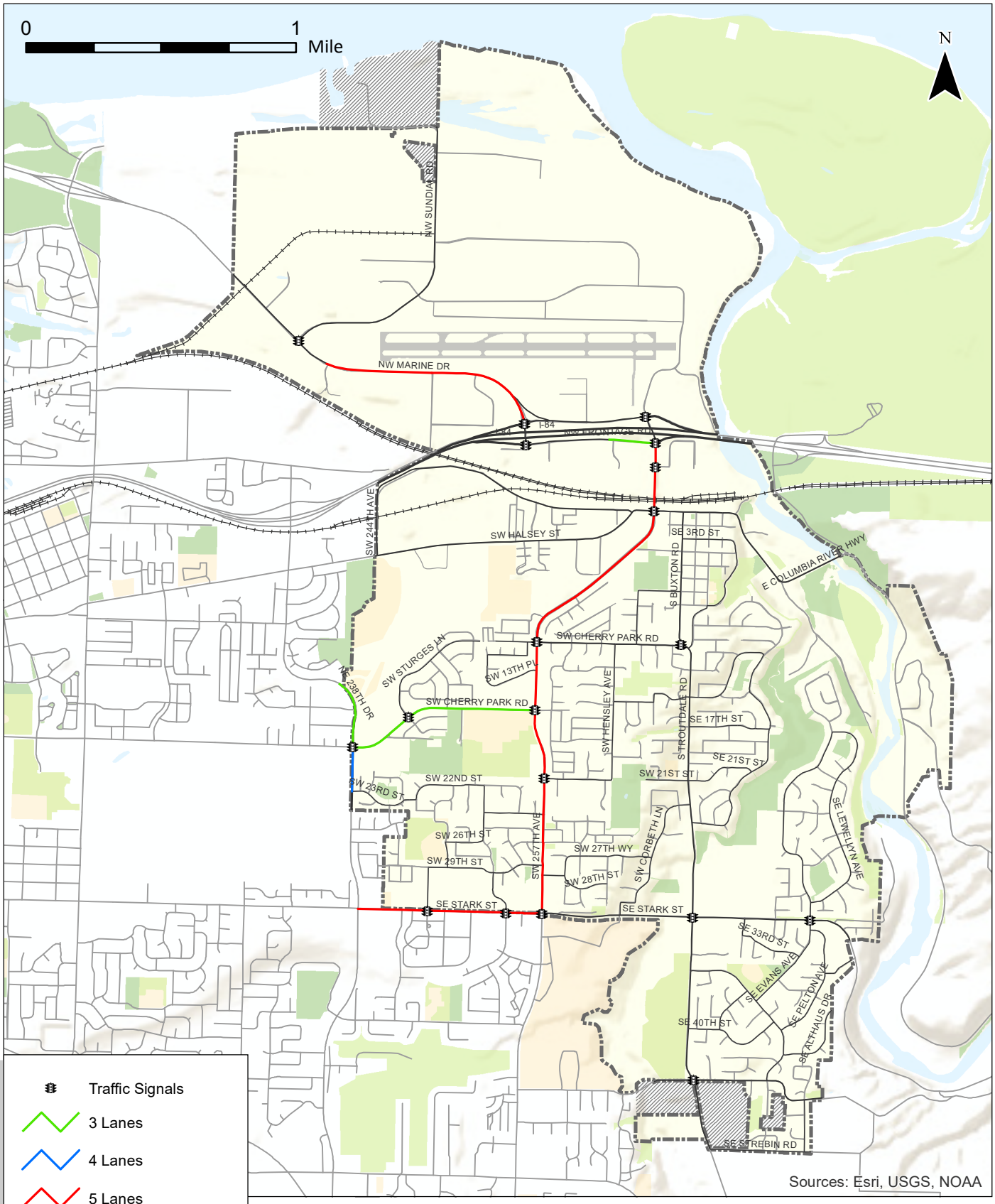
Figure 3-10 also shows the existing intersection controls at the study intersections. As shown, traffic signals exist along all of the major roadways within Troutdale, including Stark Street, 257th Avenue, Cherry Park Road, Troutdale Road, and the north and south Frontage Roads.

Emergency Response Routes

Emergency fire services are provided in Troutdale by Gresham Fire and Emergency Services (GFES). GFES's Troutdale fire station is located at the corner of Cherry Park Road and Hensley Road. Response times are a high priority for emergency services, as patient care is time-sensitive. Arterial and collector roadways are utilized by GFES as emergency routes in providing service to Troutdale. Figure 3-11 shows the primary and secondary emergency response routes in Troutdale in conjunction with existing traffic calming devices. Generally, restrictive or deflective traffic calming devices (e.g. speed humps, raised intersections, and diverters) should not be located on primary emergency response routes.

Motor Vehicle Volume

An inventory of peak hour traffic conditions was performed in the spring of 2004 as part of the 2005 TSP update and was augmented by traffic conditions calculated for the Troutdale Industrial Zoning District Traffic Study completed in August 2002. The traffic turn movement counts conducted as part of this inventory provided the basis for analyzing problem areas as well as establishing a base condition for future monitoring. Turn movement counts were conducted at 11 intersections during the weekday evening (4-6 PM) peak period to determine existing operating conditions. In addition, counts were conducted at three intersections during the weekend peak period. Study intersections were chosen in



Existing Travel Lanes and Traffic Control

Figure **3-10**

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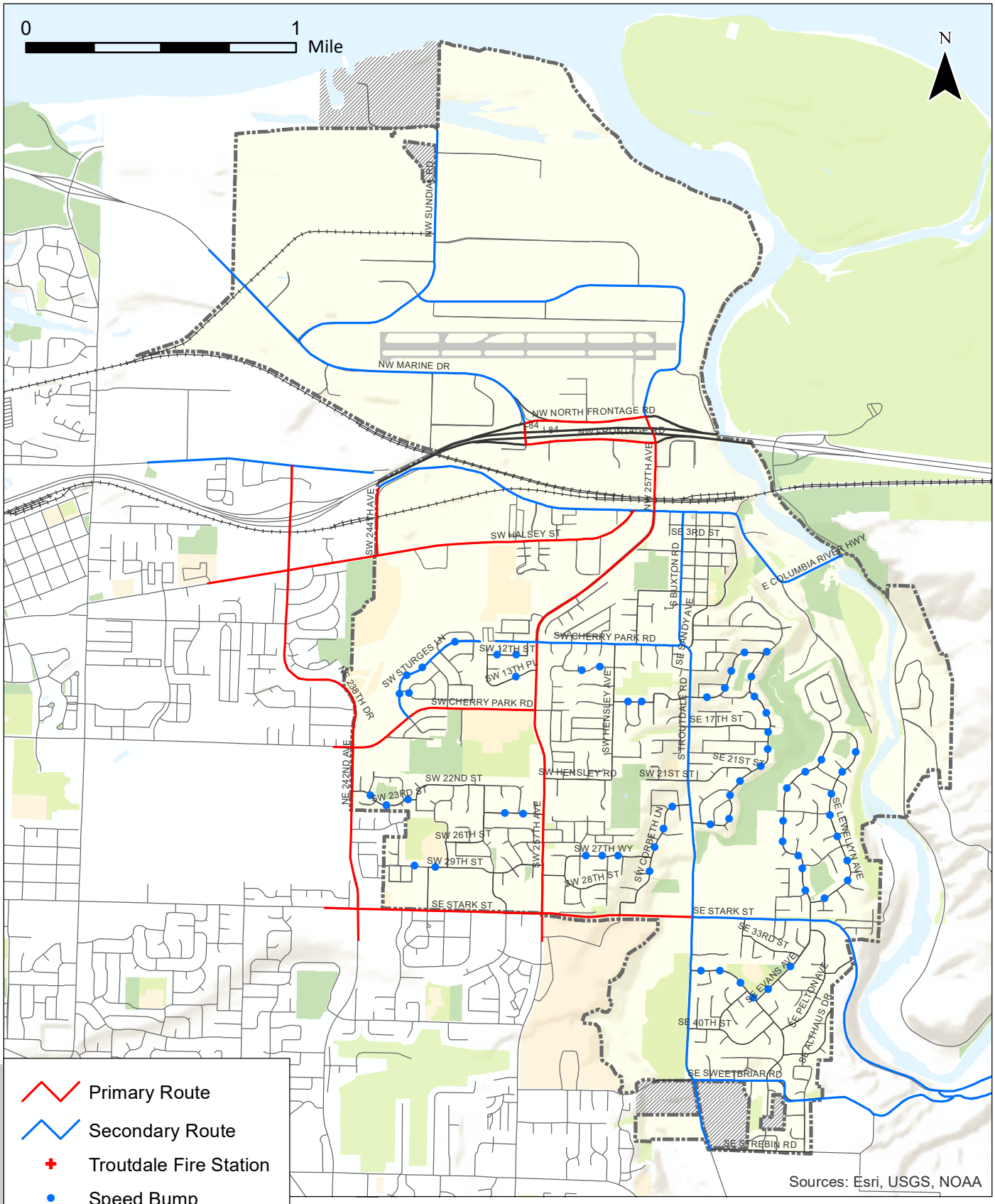
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center



Emergency Response Routes

Figure 3-11

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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coordination with the City of Troutdale staff in order to address major roadways and noted areas of concern.

Figure 3-12 shows the 2004 two-way traffic volumes in the Troutdale area. These volumes can vary from day to day and month to month based on weather, surrounding roadway conditions, and holidays. In addition, seasonal recreational traffic can vary the traffic volumes in the City.

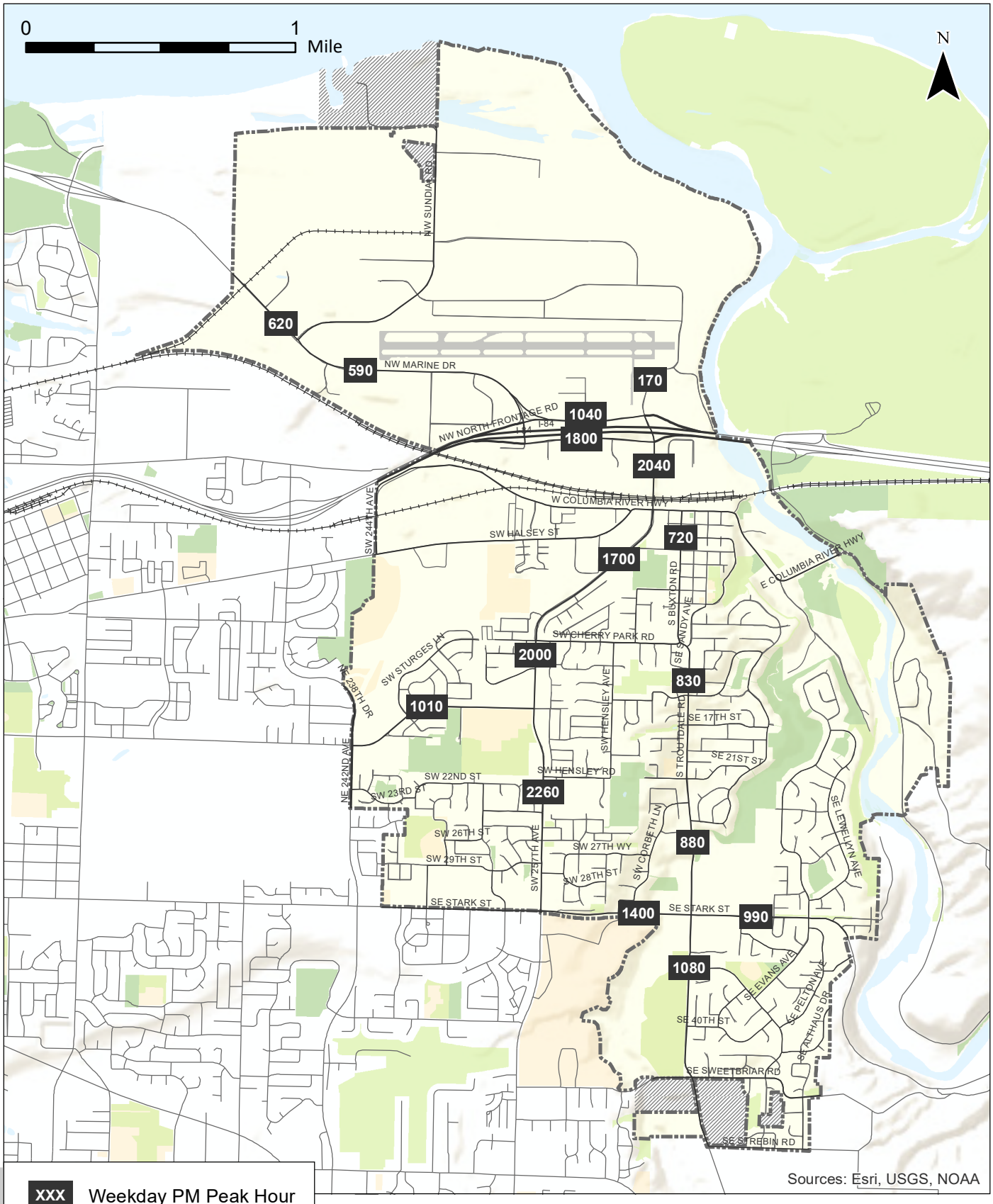
Land use plays a large role in driving transportation choices. Consequently, land use within the City of Troutdale is a key ingredient in understanding current transportation patterns and roadway traffic volumes. Figure 3-13 shows the land use zoning designations in the Troutdale area.

Traffic Levels of Service

Level of Service (LOS) and volume to capacity (v/c) ratios are used as a measure of effectiveness for intersection operation. LOS is similar to a "report card" rating based upon average vehicle delay. Level of Service A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. Level of Service D and E are progressively worse peak hour operating conditions. Level of Service F represents conditions where average vehicle delay exceeds 80 seconds per vehicle entering a signalized intersection and demand has exceeded capacity. This condition is typically evident in long queues and delays. Unsignalized intersections provide levels of service for major and minor street turning movements. For this reason, LOS E and even LOS F can occur for a specific turning movement; however, the majority of traffic may not be delayed (in cases where major street traffic is not required to stop). LOS E or F conditions at unsignalized intersections generally provide a basis to study intersections further to determine availability of acceptable gaps, safety and traffic signal warrants.

A volume to capacity ratio (v/c) is the peak hour traffic volume at an intersection divided by the maximum volume that intersection can handle. For example, when a v/c is 0.80, peak hour traffic is using 80 percent of the intersections capacity. If traffic volumes exceed capacity, queues will form and will lengthen until demand subsides below the available capacity. When v/c is less than, but close to 1.0, intersection operation becomes unstable and small disruptions can cause traffic flow to break down.

The intersection turn movement counts conducted during the evening peak periods were used to determine the 2004 LOS based on the 2000 Highway Capacity Manual methodology for signalized and unsignalized intersections. Table 3-8 lists the 2004 weekday PM peak hour intersection operation at the 11 study intersections. Each of the study intersections operated at a LOS of D or better and had an acceptable v/c ratio. Figure 3-14 provides a visual summary of the study intersection operating conditions.



2004 Two-Way Traffic Volumes Weekday PM Peak Hour

Figure **3-12**

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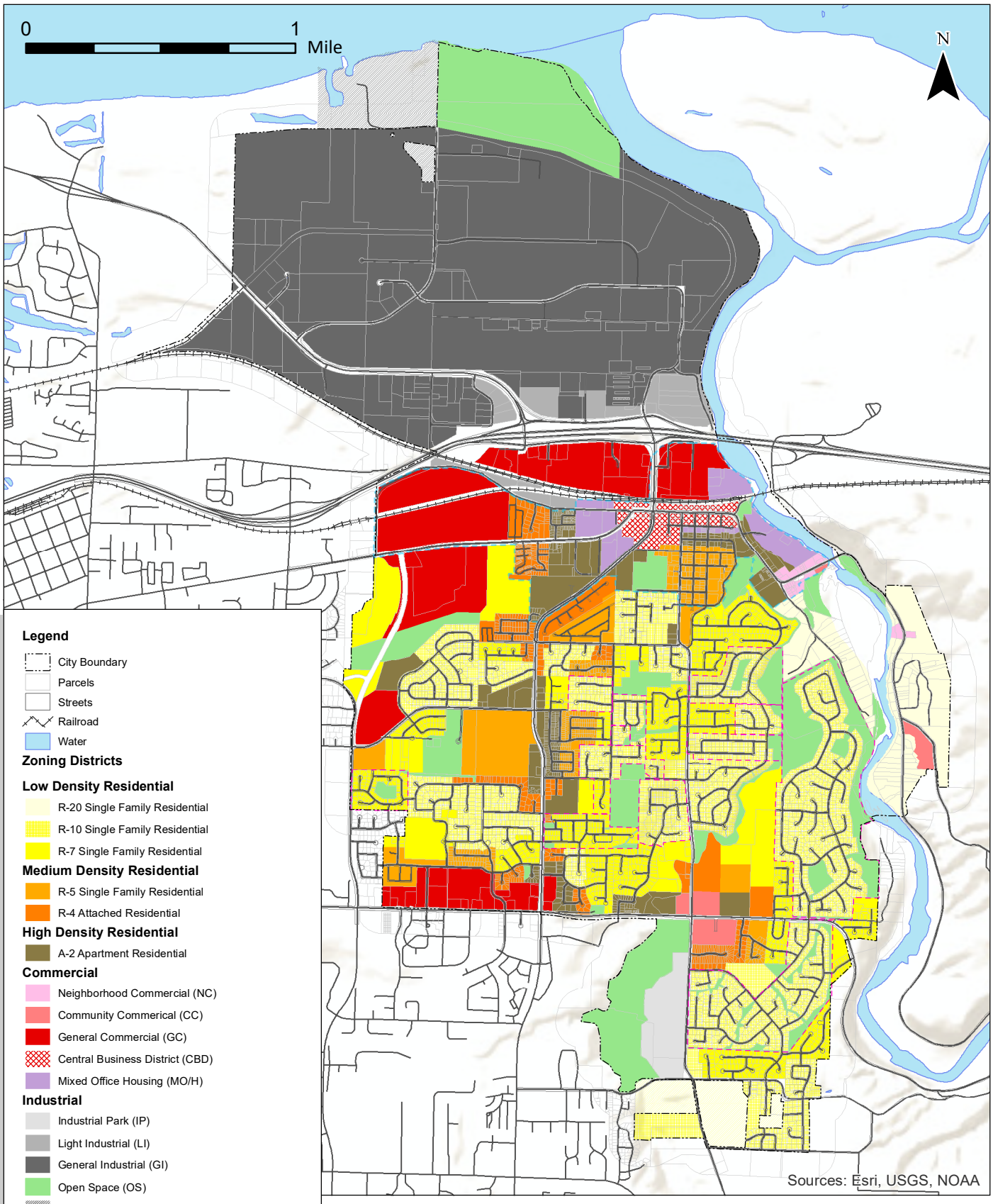
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center



Land Use Zoning Classifications

Figure **3-13**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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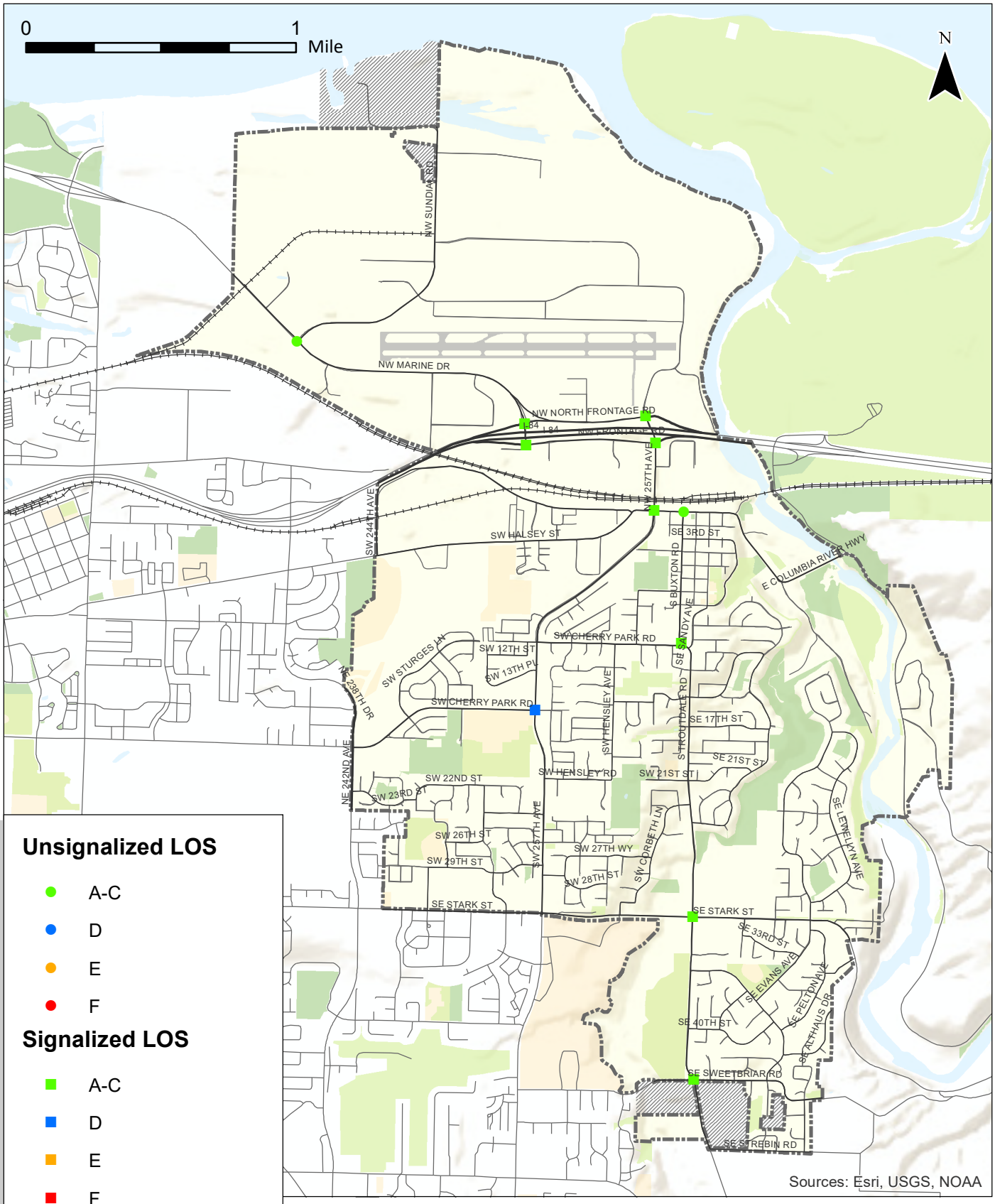

Unsignalized LOS

- A-C
- D
- E
- F

Signalized LOS

- A-C
- D
- E
- F

Urban Planning Area

City Boundary

2004 Intersection Operations Weekday PM Peak Hour

Figure **3-14**

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

Table 3-8: 2004 Weekday PM Peak Hour Intersection Level of Service

Intersection	Level of Service	Average Delay (Sec.)	Volume/Capacity
Unsignalized Intersection			
Buxton Road/Historic Columbia River Highway	A/C		
Marine Drive/Sundial Road	A/B		
Signalized Intersections			
257th Drive/Cherry Park Road (south)	D	39.4	0.91
257th Drive/Historic Columbia River Highway	C	31.5	0.68
Cherry Park Road/Buxton Street	B	11.8	0.44
I-84 westbound ramps/Marine Road	B	11.0	0.45
I-84 eastbound ramps/Marine Road	B	15.4	0.69
I-84 eastbound ramps/Graham Road	B	18.3	0.88
I-84 westbound ramps/Graham Road	B	12.6	0.45
Troutdale Road/Stark Street	C	31.0	0.76
Troutdale Road/Cochran Road	B	13.8	0.53

Notes: Unsignalized Intersection Level of Service:
A/A=Major Street turn LOS/Minor street turn LOS
Signalized and All-Way Stop Intersections:
Delay = Average vehicle delay in the peak hour for entire intersection in seconds.

Data was also collected for the weekend peak period for I-84 eastbound ramps/Graham Road, I-84 westbound ramps/Graham Road and 257th Drive/Historic Columbia River Highway intersections. Table 3-9 lists the existing weekend PM peak hour intersection operation at the 3 study intersections mentioned above.

Table 3-9: 2004 Weekend PM Peak Hour Intersection Level of Service

Intersection	Level of Service	Average Delay	Volume/Capacity
Signalized Intersections			
I-84 eastbound ramps/Graham Road	B	14.6	0.73
I-84 westbound ramps/Graham Road	B	12.4	0.48
257th Drive/Historic Columbia River Highway	C	29.5	0.58

The analysis conducted for the 2005 TSP update did not include adequate detail or simulation to address the I-84 interchange/frontage road/outlet mall access and queuing issues that commonly occur during midday or weekend periods. This issue was addressed in the 2011 I-84 Troutdale Interchange Area Management Plan (IAMP), which was conducted concurrent with the TSP. Findings from the IAMP are included in the future systems plans within this TSP.

Traffic Safety

Collision data was obtained from Multnomah County and used to create a high collision intersection list for intersections within Troutdale. The County ranks intersections in their Safety Priority Index System (SPIS) based on the most current three years of collision data. The SPIS rankings are derived from factors

such as the number of collisions, the type of collisions, the collision severity, and traffic volumes. The collision data only includes those collisions reported to the Oregon Department of Transportation. In addition, the County SPIS list only includes intersections that have at least one county controlled approach. Troutdale has four intersections on the County SPIS list (2000-2002). Table 3-10 lists each intersection.

Table 3-10: SPIS Ranking of Troutdale TSP Study Area Intersections (1999-2001)

Ranking	Street	Cross Street	Number of Collisions	Fatal Collisions	Injury Collisions
24	257th Drive	Historic Columbia River Highway	20	0	7
23	Stark Street	Troutdale Road	21	0	9
19	Stark Street	257th Drive	42	0	19
17	Cherry Park Road	242nd Avenue	31	0	13

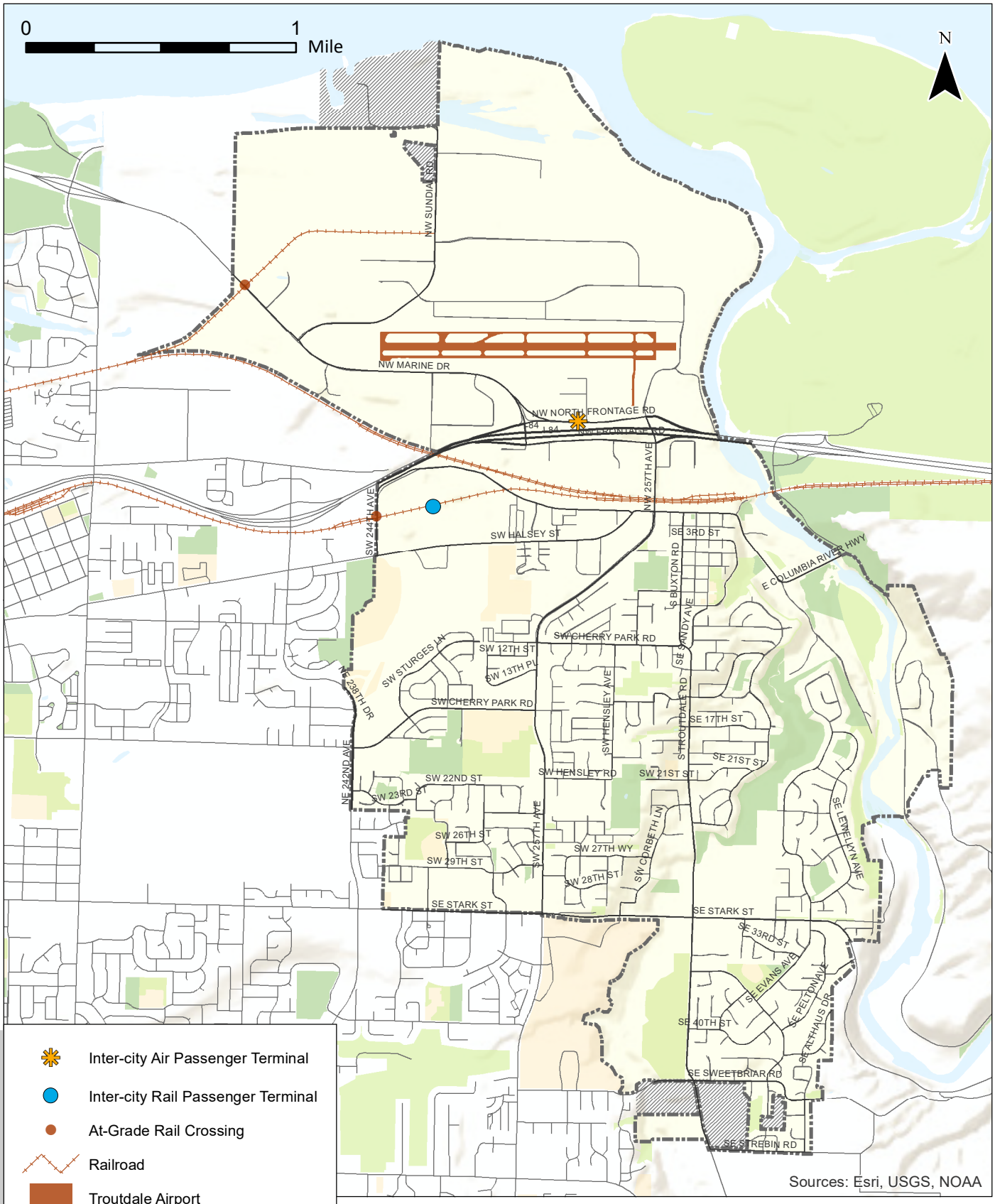
OTHER TRAVEL MODES

There are four other modes of transportation in Troutdale included in the TSP: freight, pipeline, air, and water. The Columbia River is located immediately north of the Troutdale city limits and serves as a major freight movement waterway. However, there is no port facility located within the Troutdale TSP study area. Figure 3-15 shows the rail, and air facilities in Troutdale.

Freight Truck

Efficient truck movement plays a vital role in the economical movements 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, Metro and the City of Troutdale all identify I-84 as a freight route. Metro and the City of Troutdale both identify Marine Drive, a small section of 257th Drive and a small section of Historic Columbia River Highway as freight routes. Metro also classifies Historic Columbia River Highway between I-84 and 257th Drive as a freight route. The City of Troutdale identifies through truck routes in Troutdale such as Stark Street, 257th Drive, Sundial Road and Graham Road.

The truck (heavy vehicle) volumes and percentages of the traffic stream were collected as part of the intersection turn movement counts. Figure 3-16 shows the PM peak hour truck volume and percentages at each of the study intersections. Truck volumes exceed 100 vehicles per hour (vph) along Marine Drive and the I-84 interchange intersections.



Other Modes

Figure **3-15**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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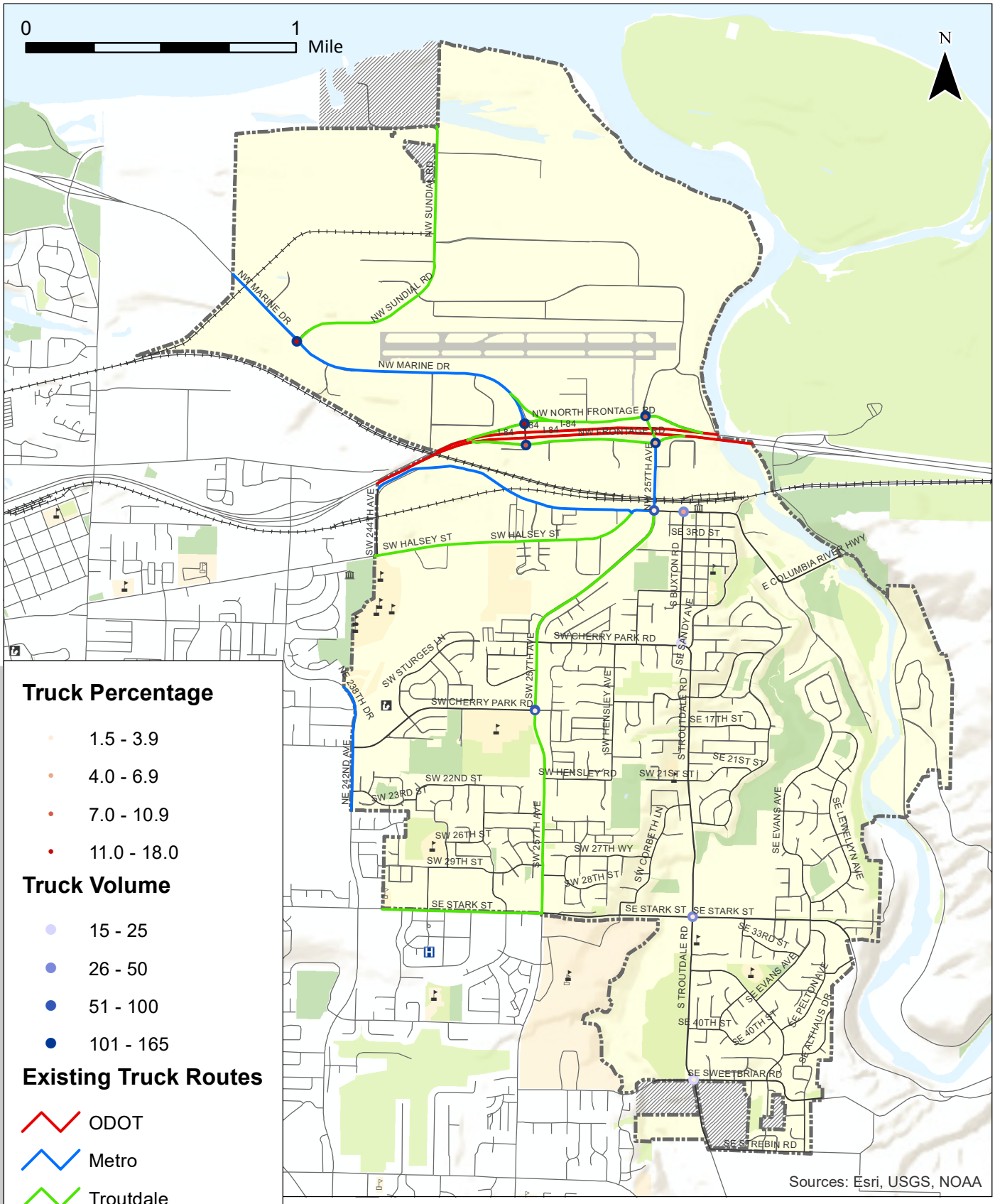

Existing Truck Routes w/ 2004 PM Peak Hour Truck Percentages & Volumes

Figure **3-16**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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Rail

There are two rail lines, the Graham (2A) and the Kenton (2AE) that currently traverse the City of Troutdale, combining to transport over 53 million gross tons of freight in 2002. Both lines are owned and operated as a Class 1 Railroad by Union Pacific Rail Road (UPRR). The Graham (2A) line runs 17 trains a day with a maximum authorized speed of 50 mph. It has one at-grade rail crossing in the study area at 244th Avenue. The Kenton (2AE) line runs 30 trains a day at a maximum authorized speed of 50 mph. The Kenton has one at-grade rail crossing in the study area located along a spur track off of the main line that serves the former aluminum plant. There are no passenger trains currently running through Troutdale.

Gas Pipelines

Two high-pressure natural gas pipelines serve Troutdale. One line runs north-south adjacent to 242nd Drive, crossing I-84 and continuing across the Columbia River into Washington. The second line runs east-west along Sandy Boulevard, until turning north at I-84 before terminating at the Kenton (2AE) UPRR rail line.

Airport

The Troutdale Airport is located north of I-84 and is classified as a Category 2 – Business or High Activity General Aviation Airport. The runway is 150 feet wide by 5,400 feet long, and has over 30,000 annual aircraft operations (take offs and landings).

Pavement condition varies over the length of the runway and was found to be deficient in meeting runway pavement strength by the Oregon Aviation Plan. However, reconstruction is not planned for several years. The Troutdale Airport Master Plan predicts a modest 2 percent growth in both the number of operations and number of aircraft based in Troutdale over the next 10 years, concluding that current infrastructure is adequate to meet demand. Consequently, the airport is considering leasing some of the land it does not currently require to be “airport conducive” land uses.

Chapter 4 Future Needs & Improvements

CHAPTER 4. FUTURE NEEDS & IMPROVEMENTS

OVERVIEW

This chapter presents the major elements of the Transportation System Plan (TSP) for the City of Troutdale, which addresses the City's existing transportation system needs and identifies additional facilities that will be needed to serve future growth in travel demand.

The pedestrian, bicycle, and transit system plans have been updated along with sections of the motor vehicle system plan to reflect all the policy changes, regulatory requirements, and developments that have occurred since 2005 as well as to incorporate the vision and goals of the *2020-2040 Town Center Plan*. The revisions include updated Master Plans and Action Plans that reflect the current and future needs of the City.

TRAVEL DEMAND AND LAND USE

Metro's urban area transportation forecast model was used in the development of the 2005 TSP, and more recently, in the 2011 Troutdale Interchange Area Management Plan (IAMP) and the 2012 East Metro Connections Plan (EMCP) to determine future traffic volumes in the Troutdale area. Metro's forecast model translates assumed land uses into person travel, selects modes, and assigns motor vehicles to the roadway network. These traffic volume projections form the basis for identifying potential roadway deficiencies and for evaluating alternative circulation improvements. As described throughout this chapter, the transportation improvement projects identified in the 2005 TSP were updated to reflect the conclusions and recommendations of a number of regional and local planning efforts, including the IAMP and the EMCP. The result is updated project lists that reflect the most recent modeling efforts by Metro as well as the most recent needs and perspectives of the City.

Pedestrian System

The existing conditions analysis presented in Chapter 3 identifies the pedestrian system needs within Troutdale, including new sidewalk connections, new pedestrian crossings, and new multi-use paths and trails that augment and support the pedestrian system. The Pedestrian Master Plan presented in this section includes all of the potential pedestrian improvement projects identified within Troutdale while the Pedestrian Action Plan includes all of the projects that are reasonably expected to be funded over the next 20 years.

Coordination with Regional Plan Designations

The 2010 Regional Transportation Plan (RTP) includes designations within Troutdale for pedestrian districts, transit/mixed use corridors, and regional trails as defined below:

- Pedestrian districts are areas of high or potentially high pedestrian activity where the region has placed a priority on creating a walkable environment. These areas should be designed to reflect an urban development and design pattern where walking is a safe, convenient, and enjoyable travel mode.
- Transit/mixed-use corridors are priority areas for pedestrian improvements. These corridors generate substantial pedestrian traffic near neighborhood retail developments, schools, parks, and bus stops. These corridors should be designed to promote pedestrian travel with features such as wide sidewalks with buffering from adjacent vehicle traffic, street crossings with special crossing amenities at select locations, special lighting, benches, bus shelters, awnings and street trees. Mid-block pedestrian crossings should also be used along these corridors to provide full access to transit stops.
- Regional trails are paved off-street regional facilities that accommodate pedestrian and bicycle travel and are used by people walking or bicycling to work, school, to access transit or travel to a store or library.

The 2040 Growth Concept Map includes Town Center and Corridor design types that correspond with the pedestrian district and transit/mixed-use corridors identified in the RTP. The City of Troutdale Development Code also includes a Town Center overlay that generally corresponds to the area designated as a pedestrian district in the RTP and requires new development in the area to comply with RTP guidelines. Figure 4-1 illustrates the area with a Town Center overlay in yellow. This area should include continuous sidewalk connections, pedestrian crossings, and other pedestrian amenities to be consistent with the RTP. By complying with the RTP designations and completing the pedestrian system within these areas, the Pedestrian Master Plan is consistent with plans developed by Metro, Multnomah County, and the State.

Pedestrian Master Plan

The Pedestrian Master Plan was developed based on the pedestrian system needs identified in the existing conditions analysis and reflects all the potential pedestrian improvement projects within Troutdale. The projects shown in Table 4-1 and on Figure 4-1 were evaluated based on the strategies identified below to create the Pedestrian Action Plan. Several of the projects identified in Table 4-1 and on Figure 4-1 are incorporated into the projects shown in the motor vehicle master plan.

Pedestrian Master Plan

Figure **4-1**

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

Table 4-1: Pedestrian Master Plan

Project ID	Location	Type	Project Description	Cost ($1,000)
P1	Troutdale Road	Complete Sidewalks	Install sidewalks on both sides of Troutdale Road from Beaver Creek Lane to Stark Street	-
P2	Troutdale Road	Complete Sidewalks	Install sidewalks on both sides of Troutdale Road from Stark Street to the south City limits	-
P3	Stark Street	Complete Sidewalks	Install sidewalks on both sides of Stark Street from 257th Drive to Troutdale Road	-*
P4	Stark Street	Complete Sidewalks	Install sidewalks on the north side of Stark Street from Troutdale Road to Hampton Avenue	-
P5	Halsey Street	Complete Sidewalks	Construct pedestrian facilities according to the Main Streets on Halsey Plan with Planning Commission and City Council input and approval	To Be Determined
P6	Historic Columbia River Highway/244th	Complete Sidewalks	Install sidewalks on both sides of Historic Columbia River Highway from 244th Avenue to Halsey Street	-
P8	Hensley Road	Complete Sidewalks	Install sidewalks on the east side of Hensley Road (N/S) from Hensley Road (E/W) to Cherry Park Road consistent with the Troutdale Elementary SRTS Plan	$350
P9	Kings Byway	Complete Sidewalks	Install sidewalks on the east side of Kings Byway from Cherry Park Road to 7th Street consistent with the Troutdale Elementary SRTS Plan	$50
P10	Evans Road	Complete Sidewalks	Install sidewalks on the northwest side of Evans Road from Sweetbriar Lane to 36th Street consistent with the Sweetbriar Elementary SRTS Plan	$45
P11	Sweetbriar Road	Complete Sidewalks	Install sidewalks on the south side of Sweetbriar Road from Troutdale Road to the east City limits	-
P12	Marine Drive	Complete Sidewalks	Install sidewalks on both sides of Marine Drive from the west City limits to North Frontage Road	-
P13	Sundial Road	Complete Sidewalks	Install sidewalks on both sides of Sundial Road from the north City limits to Marine Drive	-
P14	257th Drive at Hampton Heights Apartments Driveway	Pedestrian Crossing	Install enhanced pedestrian crossing treatments on 257th Drive at the Hampton Heights Apartments Driveway	-
P15	257th Drive at Jennings Lane	Pedestrian Crossing	Install enhanced pedestrian crossing treatments on 257th Drive at Jennings Lane	-
P16	257th Drive at 13th Place	Pedestrian Crossing	Install enhanced pedestrian crossing treatments on 257th Drive at 13th Place	-
P17	257th Drive at 26th Street	Pedestrian Crossing	Install enhanced pedestrian crossing treatments on 257th Drive at 26th Street	-
P19	Buxton Road at Cherry Park Road	Pedestrian Crossing	Reconfigure existing crossing on Buxton Road at Cherry Park Road consistent with the Troutdale Elementary SRTS Plan	-
P21	Troutdale Road at Beaver Creek Lane	Pedestrian Crossing	Install enhanced pedestrian crossing treatments on Troutdale Road at Beaver Creek Lane	-
P24	Cherry Park Road at Imagination Way	Pedestrian Crossing	Install additional enhanced pedestrian crossing treatments on Cherry Park Road at Imagination Way	-
P25	Stark Street at Corbeth Lane	Pedestrian Crossing	Install enhanced pedestrian crossing treatments on Stark Street at Corbeth Way	-
P28	Evans Avenue at Stark street	Pedestrian Crossing	Improve existing crossing at the Evans Avenue/Stark Street intersection consistent with the Sweetbriar Elementary SRTS Plan	-
P30	Columbia Park Trail	Trail	Improve existing trail from 18th Way to 22nd Street	$75
P31	Sturges Trail	Trail	Install a trail from the Halsey Street/Sturges Connector Trail to 257th Drive	$50
P37	Historic Columbia River Highway	Curb Extension	Install curb extensions along Historic Columbia River Highway at Kendal Avenue, Buxton Road, Harlow Avenue, and Kibling Street	$190

P38	Sandy River and Springwater Area Connections Trail Master Plan	Trail	Develop a master plan for the Beavercreek Trails to determine the alignment/recommended design treatments	-
P39	Hewitt Neighborhood Trail	Multi-Use Path	Complete the multi-use path that connects the Hewitt neighborhood to Stark Street to the south and 257th to the west.	$25
P40	Historic Columbia River Highway	Sidewalk	Install sidewalks on the east side of Historic Columbia River Highway from Depot Park to the Beaver Creek Bridge – Also widen sidewalks on the west side	-
P41	Historic Columbia River Highway	Sidewalks	Install sidewalks on the south side of Historic Columbia River Highway from the Beavercreek bridge to the Sandy River Bridge	-
P42	Downtown/Urban Renewal Area Connections	Pedestrian/Bicycle Bridge	Install a bicycle-pedestrian bridge from Historic Columbia River Highway at Harlow Avenue to the Confluence Site	$375**
P43	2nd Street Bridge	Pedestrian/Bicycle Bridge	Install a bicycle-pedestrian bridge over 257th Drive	$125**
P44	2nd Street Trail	Trail	Install a trail from Kendall Avenue at 2nd Street to Halsey Street via the 2nd Street Bridge	$135
P45	Beaver Creek West Trail	Trail	Install a trail from Depot Park to Glenn Otto Park on or near the west side of Beaver Creek	$175
P46	Confluence Riverfront Trail	Trail	Install a trail on the east side of the Confluence site from Depot Park to I-84	$200
P47	Sandy River Trail	Trail	Install a trail on the east side of Harlow Road from I-84 to the North Sandy River Trail	$160
P48	North Sandy River Trail	Trail	Install a trail from the Sandy River Trail to the 40-mile Loop Trail	$40**
P49	Columbia River Levee Trail	Trail	Install a trail from Sundial Road to the west city limits	$80**
P50	2nd Street Bridge	Refinement and Feasibility	Conduct a refinement plan to evaluate the feasibility of constructing the 2nd Street bridge	$150
			Total	**$2,225**

Note: Cost estimates indicate the estimated funding to be provided by the City of Troutdale. The projects shown in grey are under the jurisdiction of other agencies. Cost estimates are provided for these outside agency projects only where it is anticipated that the City will contribute funding to the project, and the cost figures shown represent only the City's estimated contribution. Projects shown in white are under the jurisdiction of the City.
* The City of Troutdale's contributions to these project costs are included in the Motor Vehicle Action Plan.
** The City of Troutdale's contribution to these project costs is assumed to be 15% of the overall project costs.

As shown in Table 4-1, the pedestrian improvement projects consist of installing new sidewalk connections, pedestrian crossings, and multi-use paths and trails. While several of the projects can be constructed within existing City right-of-way, others will require additional right-of-way to be developed. In addition, while several of the projects are located along Multnomah County streets, there are a few located along City streets.

It is important to note that several of the pedestrian crossing projects are located along streets with volumes and speeds that could require significant crossing enhancements. Crossings on 257th Drive and Stark Street, for example, could require flashing beacons or traffic signals, while crossings on Troutdale Road and Buxton Road could require striped crosswalks and crosswalk signs. The Needs, Opportunities, Constraints, and tools report provided in the Appendix provides a brief description of potential crossing treatments at each location.

Strategies

Several strategies have been identified to help guide the selection and prioritization of the pedestrian improvement projects included in the Pedestrian Action Plan. These strategies are intended to focus

community investment on those projects that are most effective at meeting critical needs, while deferring other projects of lesser value. The following strategies were used to select and prioritize the pedestrian improvement projects (listed in order of importance):

- Connect key pedestrian corridors to schools, parks, and activity centers
- Pedestrian corridors that connect neighborhoods
- Arterial crossing enhancements
- Pedestrian corridors that connect to major transit Locations
- Fill in gaps in the network where some sidewalks exist
- Reconstruct all sidewalks to City of Troutdale standards
- Pedestrian corridors that connect to major recreational uses
- Pedestrian corridors that commuters might use

Projects in the Pedestrian Action Plan were also reviewed to ensure an equitable distribution of projects throughout the town center, including areas with high concentrations of transportation disadvantaged populations.

Pedestrian Action Plan

The Pedestrian Action Plan identifies the pedestrian system improvement projects that are reasonably expected to be funded over the next 20 years, which meets the requirements of the updated Transportation Planning Rule (TPR). The strategies identified above were used to rank the pedestrian projects identified in the Pedestrian Master Plan from highest to lowest in terms of priority. The highest-ranking City projects that are reasonably expected to be funded were combined with projects from other agencies identified in previous planning studies to create the project list shown in Table 4-2, which are organized by location and type.

Table 4-2: Pedestrian Action Plan

Project ID	Location	Type	Project Description	Cost ($1,000)
P1	Troutdale Road	Complete Sidewalks	Install sidewalks on both sides of Troutdale Road from Beaver Creek Lane to Stark Street	-
P2	Troutdale Road	Complete Sidewalks	Install sidewalks on both sides of Troutdale Road from Stark Street to the south City limits	-
P3	Stark Street	Complete Sidewalks	Install sidewalks on both sides of Stark Street from 257th Drive to Troutdale Road	-*
P5	Halsey Street	Complete Sidewalks	Construct pedestrian facilities according to the Main Streets on Halsey Plan with Planning Commission and City Council input and approval	To Be Determined
P8	Hensley Road	Complete Sidewalks	Install sidewalks on the east side of Hensley Road (N/S) from Hensley Road (E/W) to Cherry Park Road consistent with the Troutdale Elementary SRTS Plan. Includes minor pavement widening and drainage.	$350
P17	257th Drive at 26th Street	Pedestrian Crossing	Install enhanced pedestrian crossing treatments on 257th Drive at 26th Street	-

P30	Columbia Park Trail	Trail	Improve existing trail from 18th Way to 22nd Street	$75
P31	Sturges Trail	Trail	Install a trail from the Halsey Street/Sturges Connector Trail to 257th Drive	$50
P37	Historic Columbia River Highway	Curb Extension	Install curb extensions along Historic Columbia River Highway at Kendall Avenue, Buxton Road, Harlow Avenue, and Kibling Street	$190
P39	Hewitt Neighborhood Trail	Multi-Use Path	Complete the multi-use path that connects the Hewitt neighborhood to Stark Street to the south and 257th to the west.	$25
P40	Historic Columbia River Highway	Sidewalk	Install sidewalks on the east side of Historic Columbia River Highway from Depot Park to the Beaver Creek Bridge – Also widen sidewalks on the west side	-
P41	Historic Columbia River Highway	Sidewalks	Install sidewalks on the south side of Historic Columbia River Highway from the Beavercreek bridge to the Sandy River Bridge	-
P42	Downtown/Urban Renewal Area Connections	Pedestrian/Bicycle Bridge	Install a bicycle-pedestrian bridge from Historic Columbia River Highway at Harlow Avenue to the Confluence Site	$375**
P43	2nd Street Bridge	Pedestrian/Bicycle Bridge	Install a bicycle-pedestrian bridge over 257th Drive	$125**
P44	2nd Street Trail	Trail	Install a trail from Kendall Avenue at 2nd Street to Halsey Street via the 2nd Street Bridge	$135
P45	Beaver Creek West Trail	Trail	Install a trail from Depot Park to Glenn Otto Park on or near the west side of Beaver Creek	$175
P48	North Sandy River Trail	Trail	Install a trail from the Sandy River Trail to the 40-mile Loop Trail	$40**
P49	Columbia River Levee Trail	Trail	Install a trail from Sundial Road to the west city limits	$80**
P50	2nd Street Bridge	Refinement and Feasibility	Conduct a refinement plan to evaluate the feasibility of constructing the 2nd Street bridge	$150
			Total	**$1,770**

Note: Cost estimates indicate the estimated funding to be provided by the City of Troutdale. The projects shown in grey are under the jurisdiction of other agencies. Cost estimates are provided for these outside agency projects only where it is anticipated that the City will contribute funding to the project, and the cost figures shown represent only the City's estimated contribution. Projects shown in white are under the jurisdiction of the City.
* The City of Troutdale's contributions to these project costs are included in the Motor Vehicle Action Plan.
** The City of Troutdale's contribution to these project costs is assumed to be 15% of the overall project costs.

As development occurs, streets are rebuilt, and other opportunities (such as grant programs) arise, the projects identified in the Pedestrian Master Plan should be completed as well. It should be noted that development of any of the projects identified in the Pedestrian Master Plan or Pedestrian Action Plan will ultimately help the City make progress toward achieving its non-single occupancy vehicle (SOV) modal targets.

BICYCLE SYSTEM

The existing conditions analysis presented in Chapter 3 identifies the bicycle system needs within Troutdale, including new on-street bike lanes, new bicycle crossings, and new multi-use paths and trails that augment and support the bicycle system. The Bicycle Master Plan presented in this section identifies all of the potential bicycle improvement projects identified within Troutdale while the Bicycle Action Plan identifies all of the projects that are reasonably expected to be funded over the next 20 years.

Coordination with Regional Plan Designations

The 2010 RTP includes designations within Troutdale for regional bikeways, community bikeways, and regional trails as defined below:

- Regional bikeways provide for travel to and within the central city, regional centers, and town centers. Travel time is an important factor as these bikeways generally have high volumes.
- Community bikeways provide for travel to and within main streets, corridors, and industrial and employment areas. These routes provide access to regional attractions such as schools and parks, and connect neighborhoods to the rest of the regional bicycle network.
- Regional trails are paved, off-street facilities serving bicyclists and other non-motorized uses. They typically serve as longer distance routes connecting neighborhoods to 2040 target areas, often providing access to parks, schools, and natural areas.

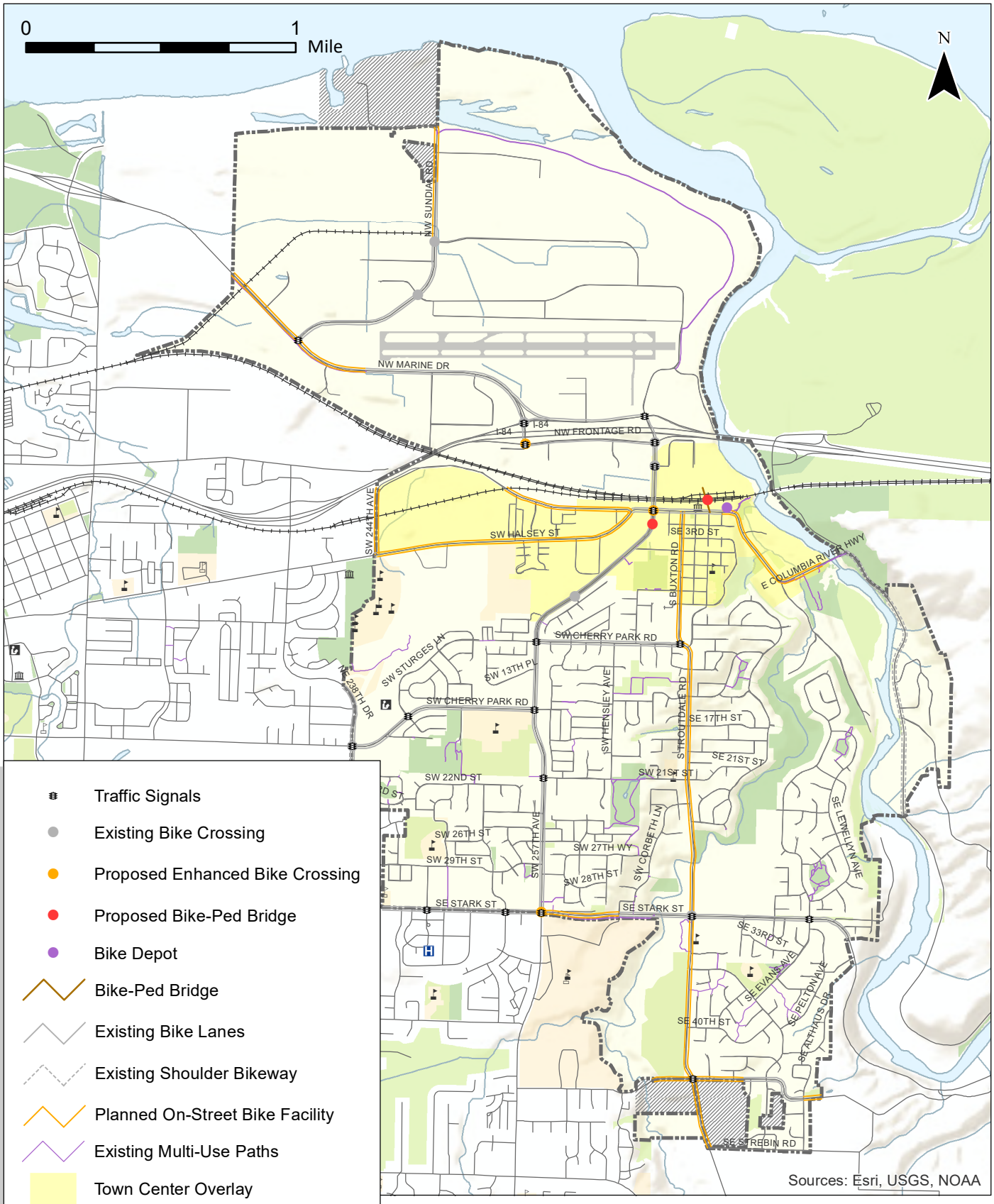
The 2010 RTP also includes a designation for regional bicycle parkways, although it has not yet been applied to any roadways. However, regional bicycle parkways will likely be comprised of routes currently designated as regional bikeways, community bikeways, and regional trails. Based on the RTP:

- Regional bicycle parkways will form the backbone of the regional bicycle network, providing for direct and efficient travel with minimal delays in different urban environments and to destinations outside the region.

There are several routes in Troutdale with RTP designations. These routes should include on-street bicycle lanes, multi-use paths, and other bicycle amenities to be consistent with the RTP. By complying with the RTP designations and completing the bicycle system along these routes, the Bicycle Master Plan is consistent with plans developed by Metro, Multnomah County, and the State.

Bicycle Master Plan

The Bicycle Master Plan was developed based on the bicycle system needs identified in the existing conditions analysis and reflects all of the potential bicycle improvement projects within Troutdale. The projects shown in Table 4-3 and on Figure 4-2 were evaluated based on the strategies identified below to create the Bicycle Action Plan. Several of the projects identified in Table 4-3 and on Figure 4-2 are incorporated into the projects shown in the motor vehicle master plan.



Bicycle Master Plan

Figure **4-2**

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

Table 4-3: Bicycle Master Plan

Project ID	Location	Type	Project Description	Cost ($1,000)
B1	Stark Street	Bike Lane	Install on-street bike lanes from 257th Drive to Troutdale Road	-
B2	Buxton Road	Enhanced Bike Lane	Install enhanced on-street bike lanes from Historic Columbia River Highway to Cherry Park Road	-
B3	Historic Columbia River Highway	Bike Lane	Install on-street bike lanes from Halsey Street to 244th Avenue	-
B4	Troutdale Road	Bike Lane	Install on-street bike lanes from Cherry Park Road to Stark Street	-
B5	Troutdale Road	Bike Lane	Install on-street bike lanes from Stark Street to the south City limits	-
B6	Cochran Road	Bike Lane	Install on-street bike lanes from the west City limits to Troutdale Road	-
B7	Sweetbriar Road	Bike Lane	Install on-street bike lanes from Troutdale Road to the east City limits	-
B8	Marine Drive	Bike Lane	Install on-street bike lanes from west City limits to approximately 1,500-feet east of Sundial Road	-
B9	Sundial Road	Bike Lane	Install on-street bike lanes from the north City limits to Swigert Way	-
B16	257th Drive at Historic Columbia River Highway	Bike Crossing	Improve existing crossing conditions with combined bike lane/turn lane pavement markings and signs	$5
B17	257th Drive at Stark Street	Bike Crossing	Improve existing crossing conditions with continuous bicycle lane striping along the north side of the east leg of the intersection	$5
B19	Halsey Street	Bike Lanes	Construct bike facilities according to the Main Streets on Halsey Plan with Planning Commission and City Council input and approval	To be Determined
B20	Historic Columbia River Highway	Enhanced Bike Lane	Install enhanced on-street bike lanes from Depot Park to east city limits	-
B21	2nd Street/Kibling Avenue	Shared Roadways	Install shared roadway signs on 2nd Street from Kendall Avenue to Kibling Avenue and on Kibling Avenue from 2nd Street to Historic Columbia River Highway	$25
B22	Depot Park	Other	Construct a bike/transit hub at Depot Park	$250
			Total	**$285**

Note: Cost estimates indicate the estimated funding to be provided by the City of Troutdale. The projects shown in grey are under the jurisdiction of other agencies. Cost estimates are provided for these outside agency projects only where it is anticipated that the City will contribute funding to the project, and the cost figures shown represent only the City's estimated contribution. Projects shown in white are under the jurisdiction of the City.
* The City of Troutdale's contributions to these project costs are included in the Motor Vehicle Action Plan.

As shown in Table 4-3, the bicycle improvement projects consist of installing on-street bike lanes, enhanced bike lanes (e.g., buffered bike lanes, cycle tracks), shared roadway signage and improving existing bicycle crossings. While several of the bike lane projects can be completed by striping the existing roadway, others will require widening and potentially additional right-of-way to be developed. Each of the shared roadway projects can be completed within the existing right-of-way. In addition, while each of the bike lane projects (and bicycle crossing projects) are located along Multnomah County streets, each of the shared roadway projects are located along City streets.

Strategies

Several strategies have been identified to help guide the selection and prioritization of the bicycle improvement projects included in the Bicycle Action Plan. These strategies are intended to focus

community investment on those projects that are most effective at meeting critical needs, while deferring other projects of lesser value. The following strategies were used to select and prioritize the bicycle improvement projects (listed in order of importance):

- Connect key bicycle corridors to schools, parks, and activity centers
- Finish the 40-mile Loop in Troutdale
- Bicycle corridors that connect neighborhoods
- Bicycle corridors that connect to major recreational facilities
- Fill in gaps in the network where some bikeways exist (arterials and collectors)
- Arterial Crossing Enhancements
- Bicycle corridors that commuters might use
- Bicycle corridors that access retail areas
- Upgrade existing bikeways to Multnomah County standards

Projects in the Bicycle Action Plan were also reviewed to ensure an equitable distribution of projects throughout the town center, including areas with high concentrations of transportation disadvantaged populations.

Bicycle Action Plan

The Bicycle Action Plan identifies the bicycle improvement projects that are reasonably expected to be funded over the next 20 years, which meets the requirements of the updated TPR. The strategies identified above were used to rank the bicycle projects from highest to lowest in terms of priority. The highest-ranking City projects that are reasonably expected to be funded were combined with projects from other agencies identified in previous planning studies to create the project list shown in Table 4-4, which are organized by location and type.

Table 4-4: Bicycle Action Plan

Project ID	Location	Type	Project Description	Cost ($1,000)
B1	Stark Street	Bike Lane	Install on-street bike lanes from 257th Drive to Troutdale Road	-*
B2	Buxton Road	Enhanced Bike Lane	Install enhanced on-street bike lanes from Historic Columbia River Highway to Cherry Park Road	-
B3	Historic Columbia River Highway	Bike Lane	Install on-street bike lanes from Halsey Street to 244th Avenue	-
B4	Troutdale Road	Bike Lane	Install on-street bike lanes from Cherry Park Road to Stark Street	-
B5	Troutdale Road	Bike Lane	Install on-street bike lanes from Stark Street to the south City limits	-
B19	Halsey Street	Bike Lanes	Construct bike facilities according to the Main Streets on Halsey Plan with Planning Commission and City Council input and approval	To be Determined
B20	Historic Columbia River Highway	Enhanced Bike Lane	Install enhanced on-street bike lanes from Depot Park to east city limits	-

B21	2nd Street/Kibling Avenue	Shared Roadways	Install shared roadway signs on 2nd Street from Kendall Avenue to Kibling Avenue and on Kibling Avenue from 2nd Street to Historic Columbia River Highway	$25
B22	Depot Park	Other	Construct a bike/transit hub at Depot Park	$250
			Total	**$275**

Note: Cost estimates indicate the estimated funding to be provided by the City of Troutdale. The projects shown in grey are under the jurisdiction of other agencies. Cost estimates are provided for these outside agency projects only where it is anticipated that the City will contribute funding to the project, and the cost figures shown represent only the City's estimated contribution. Projects shown in white are under the jurisdiction of the City.
* The City of Troutdale's contributions to these project costs are included in the Motor Vehicle Action Plan.

As development occurs, streets are rebuilt, and other opportunities (such as grant programs) arise, the projects identified in the Bicycle Master Plan should be completed as well. It should be noted that development of any of the projects identified in the Bicycle Master Plan or Bicycle Action Plan will ultimately help the City make progress toward achieving its non-SOV modal targets.

TRANSIT SYSTEM

TriMet is the primary regional transit service provider for the Portland metropolitan area. TriMet provides both fixed-route and dial-a-ride service in Troutdale, which is located in the northeast corner of their service area. Due to its location, Troutdale is an end point for the regional transit system. TriMet's Transit Investment Plan (TIP) identifies strategies for meeting regional public transportation needs, focusing on investments and improvements to the total transit system, such as improvements on existing lines. Therefore, the TIP focuses on targeted, strategic improvements to the system, with priorities in the following order: maintain the quality of the existing system; expand the high-capacity transit system (MAX Light rail or bus rapid transit); expand the frequent service system; and improve local service.

Troutdale is not served by high-capacity transit or frequent service routes. The 2035 HCT System Plan identifies 257th Drive as a Developing Regional Priority Corridor, which is a corridor where projected 2035 land use and commensurate ridership potential are not supportive of HCT implementation, but which have long-term potential due to political aspirations. Therefore, the Transit Master Plan includes potential transit improvement projects that focus on the quality of the existing transit service and local service enhancements.

Coordination with Regional Plan Designations

The 2010 RTP includes designations within Troutdale for Frequent Bus Service and Regional Bus Service as defined below:

- Frequent Bus service offers local and regional bus service with stops approximately every 750 to 1,000 feet, providing corridor service rather than nodal service along selected arterial streets. This service typically runs at least every 15 minutes throughout the day and on weekends. Frequency may increase based on demand, and can include transit preferential treatments such as reserved bus lanes and signal preemption and enhanced passenger infrastructure along the corridor and at major bus stops, such as covered bus shelters, curb extensions, special lighting and median stations.

- Regional Bus service operates on arterial streets with typical frequencies of 15 minutes during most of the day, though midday headways may drop to 30 minutes. Regional bus may operate seven days per week, but not necessarily, based on demand or policy. Stops are generally spaced every 750 to 1,000 feet. Transit preferential treatments and passenger infrastructure such as bus shelters, special lighting, transit signal priority and curb extensions are appropriate at some locations such as those with high ridership.

Transit Master Plan

The Transit Master Plan was developed based on the transit system needs identified in the existing conditions analysis and reflects all of the potential transit improvement projects within Troutdale. The projects shown in Table 4-5 and on Figure 4-3 were evaluated based on the strategies identified below to create the Transit Action Plan.

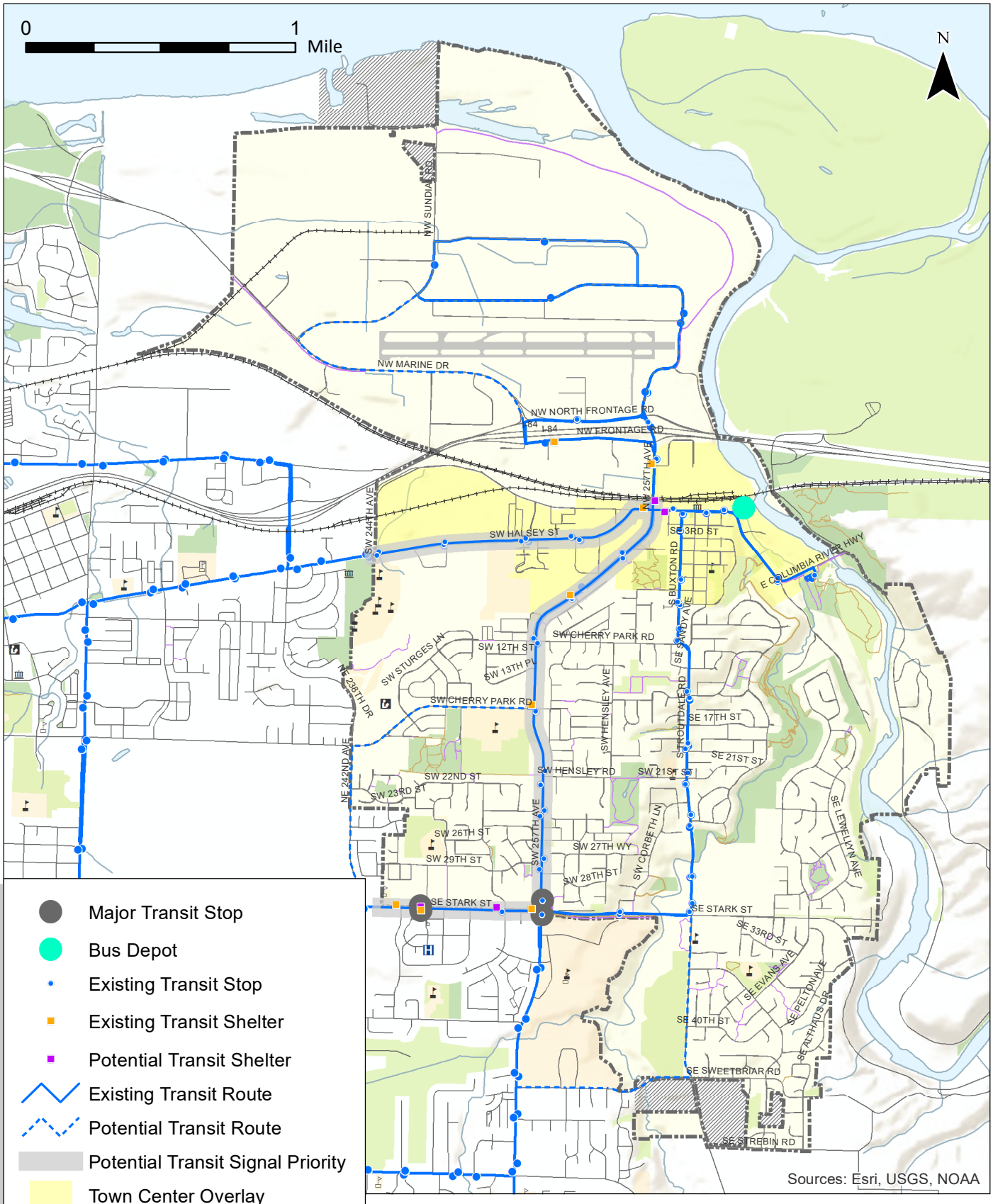
Table 4-5: Transit Master Plan

Project ID	Location	Description	Cost ($1,000's)
T2	Cherry Park Road	Coordinate with TriMet to provide a new route between 242nd and 257th Drive.	-
T3	Bus Stop Enhancements	Coordinate with TriMet to provide bus shelters at transit stops that meet TriMet's minimum thresholds and support community goals for local transit service	-
T4	Park-and-Ride Lot	Coordinate with TriMet to study the feasibility of a Park-and-ride lot in the I-84 interchange area that would serve Troutdale and communities to the east and in potential conjunction with a parking structure facility at The Confluence site. This lot should provide access to the 40-Mile Loop Regional Trail, the Sandy Riverfront Trail, and the bike/transit hub at Depot Park.	$50
T5	Transit Signal Priority	Coordinate with TriMet and Multnomah County to implement transit signal priority on Halsey Avenue, 257th Drive and Stark Street.	-
T6	Marine/Sundial/Graham	Coordinate with TriMet to further enhance service to the north industrial area.	-
T7	Troutdale Road/17th Street/Cochran Road	Coordinate with TriMet to provide a new route serving the southeast Troutdale area.	-
T8	Stark/Sweetbriar/Evans	Study the feasibility of a local shuttle service to serve neighborhoods not covered by TriMet routes (including the Stark/Sweetbriar/Evans area).	$50
T9	Existing Transit Routes	Coordinate with TriMet to reduce transit route headways (the amount of time between transit vehicle arrivals at a stop).	-
T10	Transit Corridors	Direct growth to increase the density of development along transit routes in the City of Troutdale in an effort to support regional transit service goals.	-
		Total	**$100**

Note: Cost estimates indicate the estimated funding to be provided by the City of Troutdale. The projects shown in grey are under the jurisdiction of other agencies. Cost estimates are provided for these outside agency projects only where it is anticipated that the City will contribute funding to the project, and the cost figures shown represent only the City's estimated contribution. Projects shown in white are under the jurisdiction of the City.

Strategies

Several strategies have been identified to help guide the selection and prioritization of the transit improvement projects included in the Transit Action Plan. These strategies are intended to focus community investment on those projects that are most effective at meeting critical needs, while deferring other projects of lesser value. The following strategies, which rely on coordination with TriMet, were used to select and prioritize the transit improvement projects (listed in order of importance):



Transit Master Plan

Figure **4-3**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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- Provide direct/express access to MAX
- Provide access to employment areas
- Provide park-and-ride lots
- Provide express routes to regional employment centers
- Provide frequent service in peak commute periods
- Provide access to commercial areas
- Provide access to activity and service centers
- Provide bus shelters

Transit system enhancements with the TriMet service area are ultimately decided based on regional transit goals. As such, Troutdale has limited control over dictating the expansion of local service or increasing route frequency. These decisions can be influenced if the proper density is achieved along transit corridors or if roadway infrastructure is built to serve transit routes, a decision over which the City has more control. Another tactic for increasing transit service to the City is through inter-governmental agreements and funding strategies between Troutdale and TriMet in order to leverage transit dollars for local projects, providing better connections to transit facilities and supply transit amenities at transit locations.

Transit Action Plan

The Transit Action Plan identifies the transit improvement projects that are reasonably expected to be funded over the next 20 years, which meets the requirements of the updated TPR. The strategies identified above were used to rank the transit projects from highest to lowest in terms of priority. The highest-ranking City projects that are reasonably expected to be funded were combined with projects from other agencies identified in previous planning efforts to create the project list shown in Table 4-6, which are organized by location and type.

Table 4-6: Transit Action Plan

Project ID	Location	Description	Cost ($1,000)
T2	Cherry Park Road	Coordinate with TriMet to provide a new route between 242nd and 257th Drive.	-
T3	Bus Stop Enhancements	Coordinate with TriMet to provide bus shelters at transit stops that meet TriMet's minimum thresholds and support community goals for local transit service	-
T5	Transit Signal Priority	Coordinate with TriMet and Multnomah County to implement transit signal priority on Halsey Street, 257th Drive, and Stark Street.	-
T6	Marine/Sundial/Graham	Coordinate with TriMet to further enhance service to the north industrial area.	-
T7	Troutdale Road/17th Street/Cochran Road	Coordinate with TriMet to provide a new route serving the southeast Troutdale area.	-
T9	Existing Transit Routes	Coordinate with TriMet to reduce transit route headways (the amount of time between transit vehicle arrivals at a stop).	-
T10	Transit Corridors	Direct growth to increase the density of development along transit routes in the City of Troutdale in an effort to support regional transit service goals	-
		Total	**$0**

Note: Cost estimates indicate the estimated funding to be provided by the City of Troutdale. The projects shown in grey are under the jurisdiction of other agencies. Cost estimates are provided for these outside agency projects only where it is anticipated that the City will contribute funding to the project, and the cost figures shown represent only the City's estimated contribution. Projects shown in white are under the jurisdiction of the City.

Motor Vehicles

The existing conditions analysis presented in Chapter 3 identifies several corridors within Troutdale that do not meet performance standards, including 238th/242nd, 257th/Kane, Troutdale/Buxton, Stark, and the Troutdale Interchange. To meet performance standards and serve future growth, the future transportation system needs significant multi-modal improvements and strategies to manage the forecasted travel demand.

The following sections outline the type of improvements that would be necessary as part of a long-range master plan. Phasing of implementation will be necessary since all of the improvements cannot be done at once. This will require prioritization of projects and periodic updating to reflect current needs. Most importantly, it should be understood that the improvements outlined in the following sections are a guide to managing growth in Troutdale.

Transportation System Management (TSM)

Transportation System Management (TSM) focuses on low-cost strategies to enhance operational performance of the transportation system by seeking solutions to immediate transportation problems, finding ways to better manage transportation, maximizing urban mobility, and treating all modes of travel as a coordinated system. These types of measures include such things as signal improvements, ramp metering, traffic calming, access management, local street connectivity, intelligent transportation systems (ITS) and programs that enhance and smooth transit operations. Typically, the most significant measures that can provide tangible benefits to the traveling public are traffic signal coordination and systems. Measures that are more difficult to measure but provide system reliability to maintain transportation flows include transit signal priority and incident management.

TSM measures focus primarily on region wide improvements, however there are a number of TSM measures that could be used in a smaller scale environment such as the Troutdale area. The following sections discuss TSM measures that could be appropriate for the Troutdale area.

Intelligent Transportation Systems (ITS)

ITS involves the application of advanced technologies and proven management techniques to relieve congestion, enhance safety, provide services to travelers, and assist transportation system operators in implementing suitable traffic management strategies. ITS focuses on increasing the efficiency of existing transportation infrastructure, which enhances the overall system performance and reduces the need to add capacity (e.g., travel lanes). Efficiency is achieved by providing services and information to travelers so they can (and will) make better travel decisions and to transportation system operators so they can better manage the system and improve system reliability. Multnomah County has developed an ITS deployment plan that includes projects in the Troutdale area, such as:

- Traffic monitoring and surveillance
- Signal coordination and optimization
- Signal priority
- Information availability
- Incident management

The devices and communications planned to implement these projects are shown in the Traffic Control Master Plan on Figure 4-4. Signal priority corridors are shown in the Transit Master Plan (Figure 4-3).

Neighborhood Traffic Management (NTM)

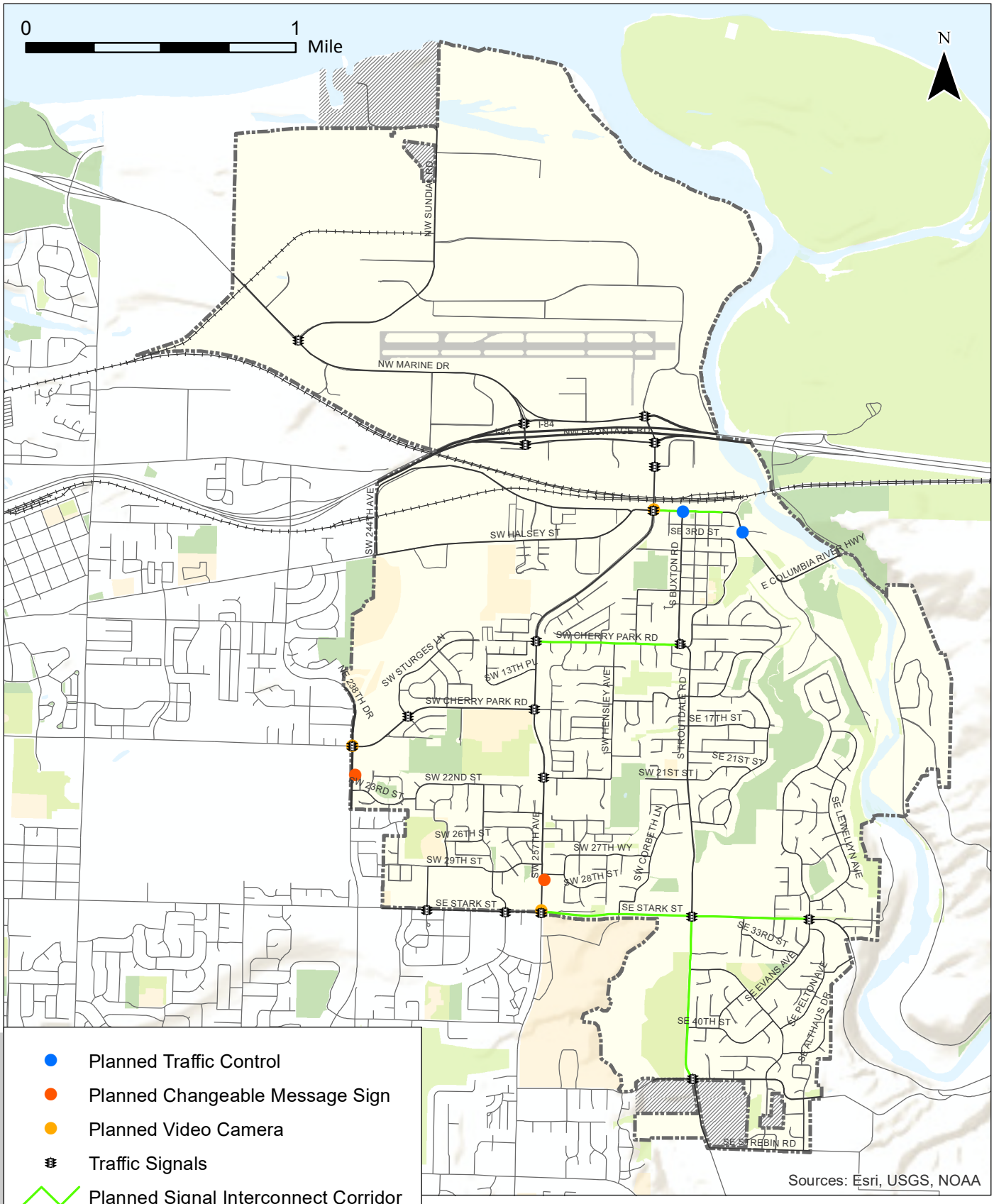
The City of Troutdale has a Speed Hump Program that establishes a process to guide speed hump installation through neighborhood involvement. This program includes considerations of street classification and emergency response needs, but it does not provide the opportunity for application of other NTM devices.

The Speed Hump Program could be updated to consider other traffic calming measures and work with the community to find the traffic calming solution that best meets their needs and maintains roadway function. Table 4-7 lists common NTM applications and suggests which devices might be supported by Gresham Fire and Emergency Services. Additional NTM measure descriptions that include diagrams, benefits, and costs are included in the technical appendix. Any NTM project should include coordination with emergency agency staff to assure public safety.

Table 4-7: Traffic Calming Measures by Roadway Functional Classification[1]

Traffic Calming Measure	Roadway Classification		
	Arterial	Collector	Neighborhood/Local Street
Curb Extension			Calming measures are okay on Lesser response routes that have connectivity (more than two accesses) and are accepted and field tested by Gresham Fire and Emergency Services.
Raised Median Island			
Pavement Texture			
Speed Hump	Not Supported	Not Supported	
Roundabout			
Raised Crosswalk	Not Supported	Not Supported	
Speed Cushion (provides emergency pass-through with no vertical deflection)	Not Supported		
Choker[2]	Not Supported	Not Supported	
Narrow Travel Lanes			
On-Street Parking			
Pedestrian and Bicycle Facilities			
Traffic Circle	Not Supported	Not Supported	
Diverter (with emergency vehicle pass through)	Not Supported	Not Supported	
Signage			
Street Trees			

[1]It is desired to have all traffic calming measures meet Gresham Fire Department guidelines including minimum street width, emergency vehicle turning radius, and accessibility/connectivity.
[2]Chokers are not supported when they do not shadow parking. If parking is shadowed, see curb extensions.



Traffic Control Master Plan

Figure **4-4**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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Access Management

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 the individual destination. ODOT and Multnomah County have clear access management policies and the supporting documentation to ensure that the highway system is managed as wisely as possible for the traveling public. Proper implementation of Access Management techniques should guarantee reduced congestion, reduced accident rates, less need for highway widening, conservation of energy, and reduced air pollution.

Access management involves controlling or limiting access on arterial and collector facilities to preserve their functional capacity. Numerous driveways erode the capacity of arterial and collector roadways. Preservation of capacity is particularly important on higher volume roadways for maintaining traffic flow and mobility. Whereas local and neighborhood streets function to provide access, collector and arterial streets serve greater traffic volume. Numerous driveways or street intersections increase the number of conflicts and potential for accidents and decrease mobility and traffic flow.

Troutdale, as with every city, needs a balance of streets that provide access with streets that serve mobility. The following access management strategies are identified to improve access and mobility in Troutdale:

- Provide left turn lanes where warranted for access onto cross streets
- Work with land use development applications to consolidate driveways where feasible
- Meet Multnomah County access requirements on arterials and collectors
- Establish City access standards for new developments on collectors and arterials
- New development and roadway projects should meet the requirements summarized in Table 4-8. The minimum spacing of roadways and driveways listed in this table is consistent with Multnomah County's access spacing standards.

Table 4-8: Access Spacing Standards for City Street Facilities

Street Facility	Maximum spacing of roadways and driveways	Minimum spacing of roadways and Driveways
Arterials	1,000 Feet	530 Feet
Collector	530 Feet	150 Feet
Neighborhood/Local	530 Feet	-
All Roads	Require an access report for new access points stating that the driveway/roadway is safe as designed meeting adequate stacking, sight distance and deceleration requirements as set by ODOT, Multnomah County and AASHTO.	

Access management is not easy to implement and requires long institutional memory of the impacts of short access spacing – increased collisions, reduced capacity, poor sight distance and greater pedestrian exposure to vehicle conflicts. The most common opposition response to access control is that "there are driveways all over the place at closer spacing than mine – just look out there". These statements are

commonly made without historical reference. Many of the pre-existing driveways that do not meet access spacing requirements were put in when traffic volumes were substantially lower and no access spacing criteria were mandated. With higher and higher traffic volume in the future, the need for access control on all arterial roadways is critical – the outcome of not managing access properly is additional wider roadways which have much greater impact than access control.

Local Street Connectivity

Much of the local street network in Troutdale is built out and, in many cases, fairly well connected. In other words, multiple access opportunities exist for entering or exiting neighborhoods. However, there are still a number of locations where the majority of neighborhood traffic is funneled onto one single street. This results in out-of-direction travel for motorists and an imbalance of traffic volumes that impacts residential frontage. The outcome can result in the need for wider roads, traffic signals and turn lanes (all of which negatively impact traffic flow and degrade safety). By providing connectivity between neighborhoods, out-of-direction travel and vehicle miles traveled (VMT) can be reduced, accessibility between various modes can be enhanced and traffic levels can be balanced out between various streets. Additionally, public safety response time is reduced.

In Troutdale, some of these local connections can contribute with other street improvements to mitigate capacity deficiencies by better dispersing traffic. Several roadway connections will be needed within neighborhood areas to reduce out of direction travel for vehicles, pedestrians and bicyclists. This is most important in the areas where a significant amount of new development is possible.

Figure 4-5 shows the Local Street Connectivity Plan for Troutdale. In most cases, the connector alignments are not specific and are aimed at reducing potential neighborhood traffic impacts by better balancing traffic flows on neighborhood routes. The arrows shown in the figures represent potential connections and the general direction for the placement of the connection. In each case, the specific alignments and design will be better determined upon development review. The criteria used for providing connections are as follows:

- Every 300 feet, a grid for pedestrians and bicycles
- Every 530 feet, a grid for automobiles

To protect existing neighborhoods from potential traffic impacts of extending stub end streets, connector roadways should incorporate NTM into their design and construction. All stub streets should have signs indicating the potential for future connectivity. Additionally, any new development that involves the construction of a new street or street extension is required by the current development code to meet the following connectivity standards:

- Provides full street connections with spacing of no more than 530 feet between connections except where prevented by barriers
- Provides bike and pedestrian access ways in lieu of streets with spacing of no more than 330 feet except where prevented by barriers

- Limits use of cul-de-sacs and other closed-end street systems to situations where barriers prevent full street connections
- Includes no close-end street longer than 200 feet or having no more than 25 dwelling units
- Includes street cross-sections demonstrating dimensions of ROW improvements, with streets designed for posted or expected speed Limits

The arrows shown on Figure 4-5 indicate priority connections only. Topography, railroads and environmental conditions limit the level of connectivity in some areas of Troutdale. Other stub end streets in the City's road network may become cul-de-sacs, extended cul-de-sacs or provide local connections. Pedestrian connections from the end of any stub end street that results in a cul-de-sac should be considered mandatory as future development occurs. The goal would continue to be improved city connectivity for all modes of transportation.

Functional Classification

A street's functional classification defines its role in the transportation system and reflects desired operational and design characteristics such as right-of-way requirements, pavement widths, pedestrian and bicycle features, and driveway (access) spacing standards. Figure 4-6 illustrates the functional classification plan for Troutdale, which includes the following designations:

- Major Arterials Streets carry high volumes of traffic between cities as part of the regional transportation system. Priority may be given to transit- and pedestrian-oriented land uses by way of regional boulevard design treatments. Design and management of major arterial streets emphasizes preservation of the ability to move auto and transit traffic
- Arterial streets typically carry less traffic volume than major arterials, but have a higher degree of connectivity between communities. Access management may be implemented to preserve traffic capacity. Land uses along the corridor are a mixture of community and regional activities. Arterial streets provide major links in the regional road and bikeway networks; provide for truck mobility and transit corridors; and are significant links in the local pedestrian system.
- Collector streets serve several purposes including linking neighborhoods to the regional system of bicycle and automobile streets, and basic transit services. They typically provide direct access between residential and commercial developments, schools and parks and carry higher volumes of traffic than neighborhood streets. Collector streets are also utilized to access industrial and employment areas and other locations with large truck and over-sized load volumes.
- Neighborhood collector streets provide access primarily to residential land uses and link neighborhoods to higher order roads. They generally have higher traffic volumes than local streets.
- Local streets provide access to abutting land uses on low traffic volume and low speed facilities. Their primary purpose is to serve local pedestrian, bicycle and automobile trips and limited public transportation use in urban areas; and auto and farm vehicle circulation with local pedestrian, bicycle and equestrian use in rural areas.

Conceptual Street Connection

Urban Planning Area

City Boundary

Local Street Connectivity Plan

Figure **4-5**

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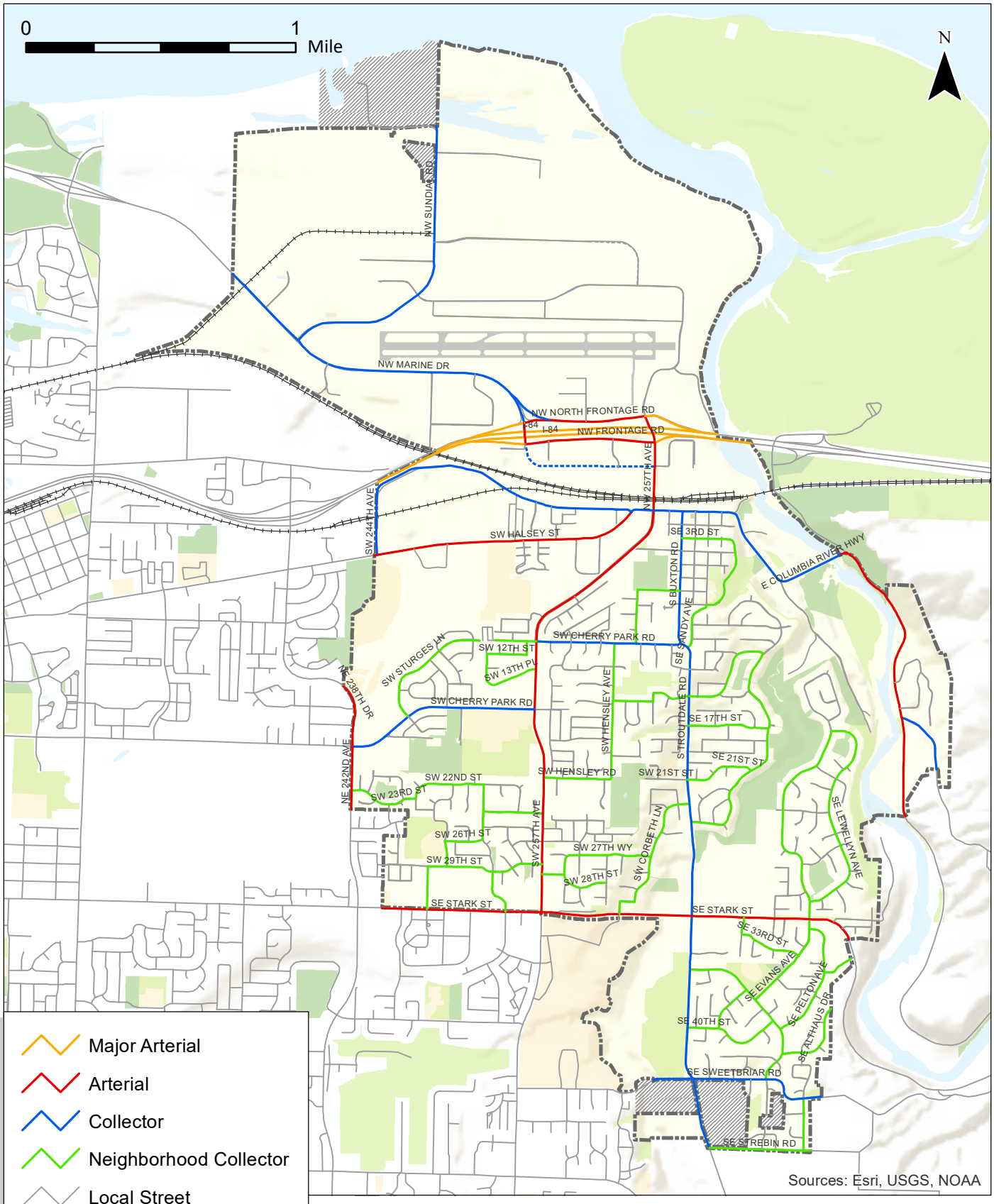
Data Source: City of Troutdale and Metro Data Resource Center



Functional Classification Plan

Figure **4-6**

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

The City of Troutdale has adopted standards for street cross sections that apply citywide to local streets (32' curb-to-curb), neighborhood collector streets (36' curb-to-curb), and commercial/industrial streets (36' curb-to-curb). In addition, there is a special local street cross section for the town center area that allows narrower widths (28' curb-to-curb). These cross sections are detailed in the *City of Troutdale Construction Standards for Public Works Facilities*. Refer to ODOT and Multnomah County standards for additional information related to all collector and arterial cross sections.

Street Right-of-Way Needs

Wherever arterial or collectors cross each other, planning for additional right-of-way to accommodate turn lanes should be considered within 500 feet of the intersection. Figure 4-7 summarizes the Troutdale streets that are anticipated within the Transportation System Plan horizon to require right-of-way for more than two lanes. Planning level right-of-way needs can be determined utilizing street cross-sections and the lane geometry outlined later in this chapter. Specific right-of-way needs will need to be monitored continuously through the development review process to reflect current needs and conditions. This will be necessary since more specific detail may become evident in development review which requires improvements other than these outlined in this 20-year general planning assessment of street needs.

Parking Requirements

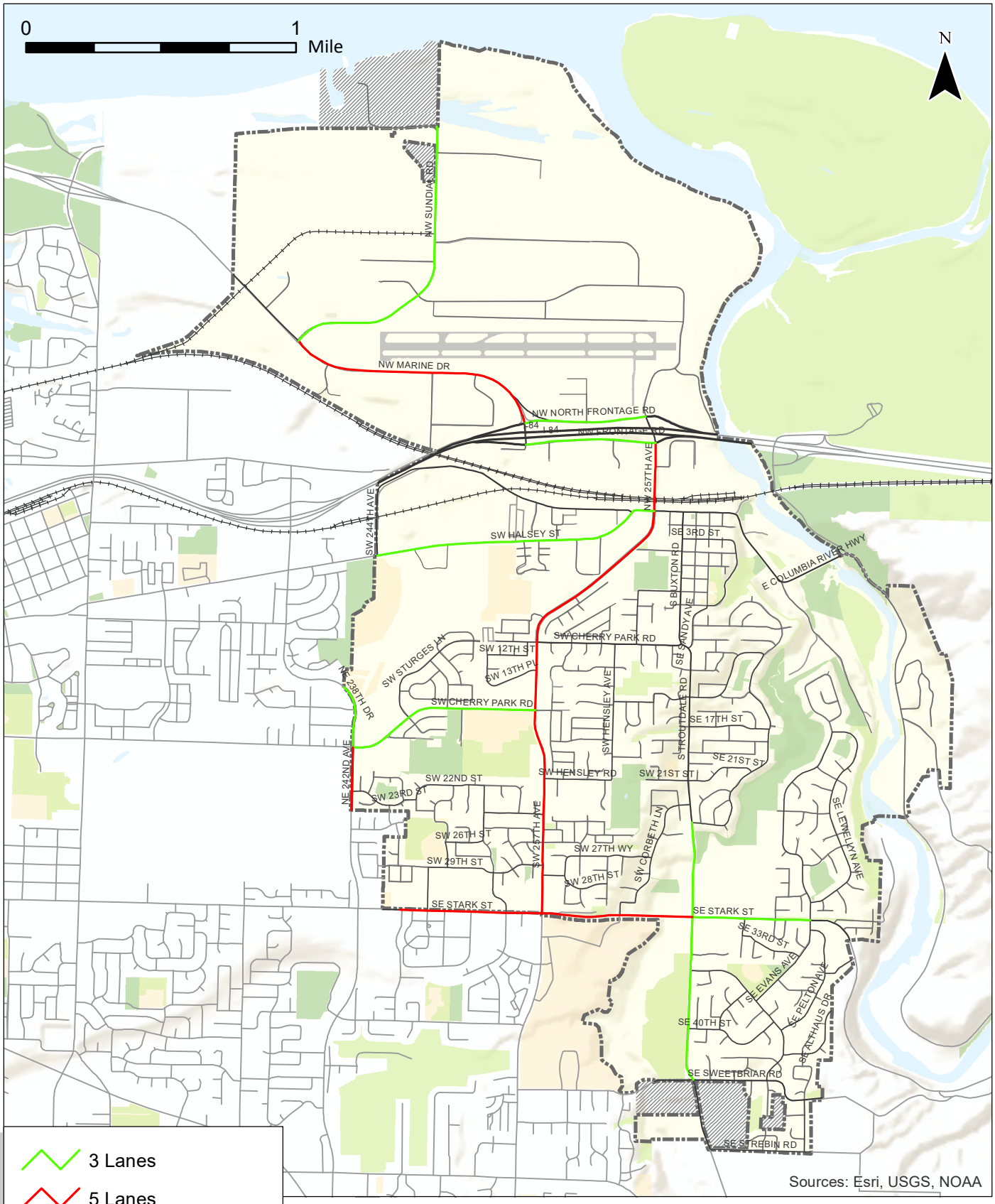
The City of Troutdale has off-street parking ratios (minimum and maximum) in Chapter 9 of the Development Code. These ratios are consistent with the TPR and RTP parking ratio requirements.

Transportation Demand Management (TDM)

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

Generally, TDM focuses on reducing vehicle miles traveled and promoting alternative modes of travel for large employers of an area. This is due in part to the Employee Commute Options (ECO) rules that were passed by the Oregon Legislature in 1993 to help protect the health of Portland area residents from air pollution and to ensure that the area complied with the Federal Clean Air Act.

Research has shown that a comprehensive set of complementary policies implemented over a large geographic area can have an effect on the number of vehicle miles traveled to/from that area. However, the same research indicates that in order for TDM measures to be effective, they should go beyond the low-cost, uncontroversial measures commonly used such as carpooling, transportation coordinators/associations, priority parking spaces, etc.



Streets with Right-of-Way of More than 2-Lanes

Figure **4-7**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

The more effective TDM measures include elements related to parking and congestion pricing, improved services for alternative modes of travel, and other market-based measures. However, TDM includes a wide variety of actions that are specifically tailored to the individual needs of an area. Table 4-9 provides a list of several strategies outlined in the ECO program that could be applicable to the Troutdale area.

Table 4-9: Transportation Demand Management Strategies

Strategy	Description	Potential Trip Reduction
Telecommuting	Employees perform regular work duties at home or at a work center closer to home, rather than commuting from home to work. This can be full time or on selected workdays. This can require computer equipment to be most effective.	82-91% (Full Time) 14-36% (1-2 day/week)
Compressed Work Week	Schedule where employees work their regular scheduled number of hours in fewer days per week.	7-9% (9 day/80 hour) 16-18% (4 day/40 hour) 32-36% (3 day/36 hour)
Transit Pass Subsidy	For employees who take transit to work on a regular basis, the employer pays for all or part of the cost of a monthly transit pass.	19-32% (full subsidy, high transit service) 2-3% (half subsidy, medium transit service)
Cash Out Employee Parking	An employer that has been subsidizing parking (free parking) discontinues the subsidy and charges all employees for parking. An amount equivalent to the previous subsidy is then provided to each employee, who then can decide which mode of travel to use.	Reduction Transit 8-20% High 5-9% Medium 2-4% Low
Reduced Parking Cost for HOVs	Parking costs charged to employees are reduced for high occupancy vehicles (HOV) such as carpools and vanpools.	1-3%
Alternative Mode Subsidy	For employees that commute to work by modes other than driving alone, the employer provides a monetary bonus to the employee.	21-34% (full subsidy of cost, high alternative modes) 2-4% (half subsidy of cost, medium alternative modes)
Bicycle Program	Provides support services to those employees that bicycle to work. Examples include: safe/secure bicycle storage, shower facilities and subsidy of commute bicycle purchase.	0-10%
On-site Rideshare Matching for HOVs	Employees who are interested in carpooling or vanpooling provide information to a transportation coordinator regarding their work hours, availability of a vehicle and place of residence. The coordinator then matches employees who can reasonably rideshare together.	1-2% (without support strategies 6-8% (with support strategies)
Provide Vanpools	Employees that live near each other are organized into a vanpool for their trip to work. The employer may subsidize the cost of operation and maintaining the van.	15-25% (company provided van with fee) 30-40% (company subsidized van)
Gift/Awards for Alternative Mode Use	Employees are offered the opportunity to receive a gift or an award for using modes other than driving alone.	0-3%
Walking Program	Provide support services for those who walk to work. This could include buying walking shoes or providing lockers and showers.	0-3%
Company Cars for Business Travel	Employees are allowed to use company cars for business-related travel during the day	0-1%
Guaranteed Ride Home Program	A company owned or leased vehicle or taxi fare is provided in the case of an emergency for employees that use alternative modes.	1-3%
Time off with Pay for Alternative Mode Use	Employees are offered time off with pay as an incentive to use alternative modes.	1-2%

Source: Guidance for Estimating Trip Reductions from Commute Options, Oregon Department of Environmental Quality, August 1996.

Employment development north of I-84 will allow for TDM friendly development. Setting TDM goals and policies for new development will be necessary to help implement TDM measures in the future. With many regional trips destined to, or traveling through, the Troutdale area, region wide TDM measures

should help to reduce congestion. Metro has established non-SOV (Single Occupancy Vehicle) mode share targets to be achieved by 2040. The 2040 non-SOV model target for town centers and main streets (downtown Troutdale) is 45-55%.[1]

Metro's regional travel demand model provides an analysis tool for monitoring non-SOV trip percentages between the various RTP funding scenarios. The forecasted non-SOV trip percentages take into account all RTP improvement projects (including transit, pedestrian, and bicycle system improvements), as well as the TAZ performance factors (which includes an increase in parking pricing and a decrease in transit pass fees paid by individual riders). Parking factors are based on a ratio of parking costs in comparison to a South/North Draft Environmental Impact Study (DEIS) parking survey. Transit Pass factors represent the amount of full transit fare that a transit rider is expected to pay (considering ECO rule and discount downtown fares). The RTP projects included in the 2025 financially constrained and priority models are shown in Table 4-10 and Table 4-11, respectively.

Table 4-10: TDM Improvements included in the 2004 RTP Financially Constrained System

RTP#	Location	Improvement	Jurisdiction	Time-Line	Cost ($1,000s)
-	Troutdale Town Center	Implement Parking Pricing	Troutdale	-	-
2120	Sandy Boulevard Bicycle and Pedestrian Improvements	Retrofit bike lanes and sidewalks on existing street between 162nd to Troutdale Road.	Multnomah Co.	2016-25	$8,316
2124	Halsey Street Improvements -Troutdale	Improve Halsey Street to 3 lanes and complete boulevard design improvements	Multnomah Co.	2010-15	$3,742
2125	Troutdale TC Pedestrian Improvements	Improve sidewalks, lighting, crossings, bus shelters and benches	Multnomah Co./Troutdale	2016-25	$116
2126	257th Drive Pedestrian Improvements	Improve sidewalks, lighting, crossings, bus shelters and benches	Troutdale	2004-09	$1,155
8028	Region-wide	Vehicle purchases to provide for expanded service – 1.5% per year	TriMet	2004-25	$169,785
8032	Region-wide	Bus operating facilities	TriMet	2004-25	$75,000
8043	Region-wide	Bus stop improvements	TriMet	2004-25	$7,939
8046	Region-wide	Transit Signal Priority	TriMet	2004-25	$19,892
8049	Region-wide	Construct improvements that enhance pedestrian access to transit – sidewalks, crosswalks, ADA improvements	TriMet	2004-25	$20,000
8050	Region-wide	Regional employer outreach, transit marketing, vanpool and carpool, station cars and car sharing program	TriMet	2004-25	$1,500
8052	Region-wide	Regional Travel Options TDM Program	TriMet	2004-25	$16,978
				Total	**$324,423**

Note: These improvements are assumed in Metro's 2004 RTP Financially Constrained System and do not necessarily correspond with the action plan of this TSP.

[1] *Based on the 2000 Metro Regional Transportation Plan*, Ordinance No. 00-869A (August 10, 2000), page 1-62.

Table 4-11: Additional TDM Improvements included in the 2004 RTP Priority System

RTP#	Location	Improvement	Jurisdiction	Time-Line	Cost ($1,000s)
-	Troutdale	50% increase of parking costs in the Town Center	Troutdale	2004-25	-
-	Troutdale	Increase in street connectivity (from >8 per mile to >10 per mile)	Troutdale	2004-25	-
8030	Region-wide	Vehicle purchases to provide for expanded service – 3.8% per year	TriMet	2004-25	$546,000
8033	Region-wide	Bus operating facilities	TriMet	2004-25	$152,062
8045	Region-wide	Bus stop improvements	TriMet	2004-25	$13,212
8048	Region-wide	Transit Signal Priority	TriMet	2004-25	$83,746
8051	Region-wide	Regional Travel Options TDM Program	TriMet	2004-25	$47,124
				Total	**$842,114**

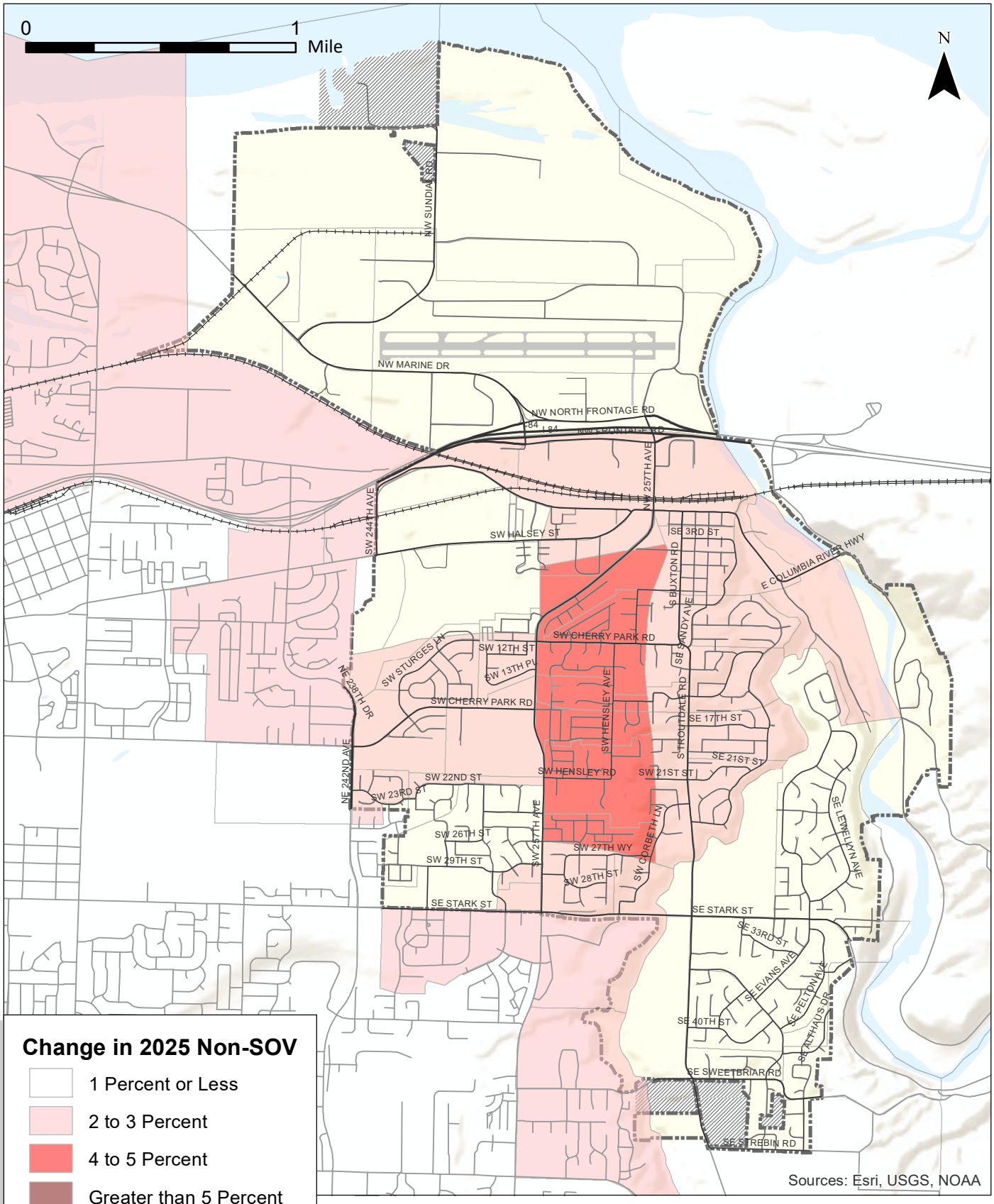
Note: These improvements are assumed in Metro's 2004 RTP Priority System and do not necessarily correspond with the action plan of this TSP.

The overall Troutdale study area forecasted non-SOV percentage with the RTP financially constrained improvements is 37.6%. Additional improvements in the RTP priority scenario increase the overall non-SOV percentage to 39.4%, which corresponds to an increase of approximately 2%.

Figure 4-8 shows the non-SOV percentage increase at the TAZ level, which shows the areas with the greatest growth toward meeting the 2040 targets.

These forecasted non-SOV percentages can only be achieved with significant improvements to the transportation system and implementation of trip reduction strategies. The City of Troutdale should coordinate with Multnomah County and TriMet to implement strategies to assure that the TDM assumptions in the RTP are implemented. The TDM action plan includes:

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



Growth in Non-SOV Use

Figure **4-8**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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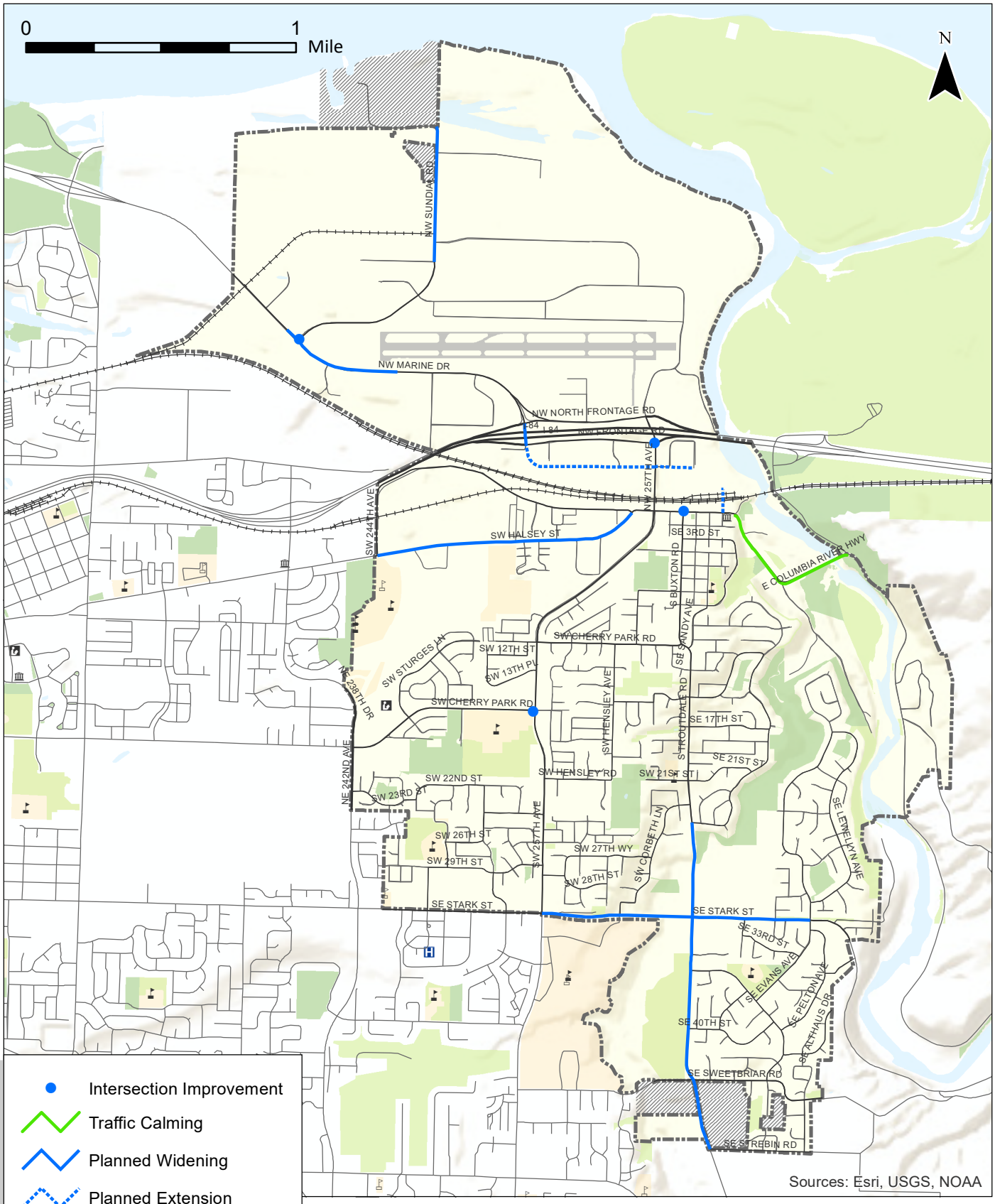
- Implementation of bicycle, pedestrian, motor vehicle and transit system action plan.
- Monitor and manage the parking needs in the Troutdale Town Center, which could include long-term strategies such as parking pricing.

Motor Vehicle Master Plan

The transportation improvement projects identified in the 2005 TSP were updated to reflect the conclusions and recommendations of a number of regional and local planning efforts, including the 2011 IAMP and the 2012 EMCP. The result is an updated project list that reflects the most recent modeling efforts by Metro as well as the most recent needs and perspectives of the City. As a result, a few notable projects from the 2005 TSP have been removed from this latest TSP update, including:

- 242nd Street Extension – This extension was removed from the Motor Vehicle Master Plan as part of the EMCP planning effort.
- 238th Street Extension – This extension was removed from the Motor Vehicle Master Plan as it is no longer consistent with other local and regional planning efforts.
- 2nd Street Extension – This extension was removed from the Motor Vehicle Master Plan due access management concerns along 257th Drive.
- 257th Drive/Cherry Park Road (south) – the addition of dual left turn lanes was removed from the Motor Vehicle Master Plan due to right of way constraints and long-term need.

The Motor Vehicle Master plan was developed based on the motor vehicle system needs identified in the existing conditions analysis, the I-84 IAMP, and the EMCP and reflects all of the potential motor vehicle improvement projects within Troutdale. The projects shown in Table 4-12 and on Figure 4-9 were evaluated based on the strategies identified below to create the Motor Vehicle Action Plan. Several of the projects identified in Table 4-12 and on Figure 4-9 incorporate improvements shown in other mode master plans, including the pedestrian and bicycle master plans. The cost estimates shown in the table were taken from prior plan documents, or are estimated using standard assumptions for new facilities. Further refinements should be made of these estimates prior to capital budgeting.



Motor Vehicle Master Plan

Figure **4-9**

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

Table 4-12: Motor Vehicle Master Plan

No.	Location	Description	Cost ($1,000)
M1	Troutdale Road	Widen to 3 lanes from Beavercreek Road to Stark Street. Includes sidewalks and bike lanes.	-
M2	Troutdale Road	Widen to 3 lanes from Stark Street to the south City limits. Includes sidewalks and bike lanes.	-
M4	Stark Street Widening (West)	Widen to 5 lanes between 257th Drive and Troutdale Road. Includes sidewalks and bike lanes.	$300
M5	Stark Street Widening (East)	Widen to 3 lanes between Troutdale Road and Evans Avenue. Includes sidewalks and bike lanes.	-
M6	Halsey Street Widening	Construct facilities according to the Main Streets on Halsey Plan with Planning Commission and City Council input and approval.	To Be Determined
M9	Marine Drive	Construct the Marine Drive Extension.	$980
M10	Marine Drive/Sundial Road	Improvement intersection of Marine Drive/Sundial Road. Includes widening Marine Drive from approximately 500 feet west of intersection to existing five-lane section.	-
M11	Historic Columbia River Highway/Buxton Avenue	Signalize in coordination with 257th Drive/Historic Columbia River Highway	$200
M12	257th Way	Explore options to extend 257th Way through the outlet mall to the urban renewal area.	-
M13	Parking Study	Conduct a parking study within the Troutdale Town Center – the study should include an evaluation of potential off-street parking facilities, including a parking structure at the Confluence site.	$50
M14	Dunbar Avenue	Reconstruct Dunbar Avenue.	$450
M16	Historic Columbia River Highway	Prepare a refinement plan for downtown Troutdale and consider changes to the street profile to improve mobility – Project B16 and P37 may be impacted by the refinement plan.	$50
M17	Historic Columbia River Highway	Install traffic calming features along the Historic Columbia River Highway from Depot Park to east city limits	$150
M18	Downtown/Urban Renewal Area Connections	Construct a vehicular connection that extends Kibling Avenue and crosses the railroad tracks at-grade and continues into the Confluence site.	$255**
M19	Historic Columbia River Highway/Depot Park	Install a traffic control device where E Columbia River Highway turns to the south	$150
		Total	**$2,585**

Note: Cost estimates indicate the estimated funding to be provided by the City of Troutdale. The projects shown in grey are under the jurisdiction of other agencies. Cost estimates are provided for these outside agency projects only where it is anticipated that the City will contribute funding to the project, and the cost figures shown represent only the City's estimated contribution. Projects shown in white are under the jurisdiction of the City.
* The City of Troutdale's contributions to these project costs are included in the Pedestrian and Bicycle Plans.
** The City of Troutdale's contribution to these project costs is assumed to be 15% of the overall project costs.

Strategies

Several strategies have been identified to help guide the selection and prioritization of the motor vehicle improvement projects included in the Motor Vehicle Action Plan. These strategies are intended to focus community investment on those projects that are most effective at meeting critical needs, while deferring other projects of lesser value. The following strategies were used to select and prioritize the motor vehicle improvement projects (listed in order of importance):

- Provision of left turning lanes on collectors
- Regional circulation

- Adopt TSM measures to improve system efficiency (including ITS, NTM, access management, local street connectivity, and functional classification)
- Circulation enhancements
- Mitigate all intersections to level of service D in the PM peak hour
- Intersection modifications
- Additional signals on arterial/collector intersections
- Improve circulation of residential areas
- Develop TDM programs to reduce peak traffic for employers in Troutdale
- Neighborhood traffic management

Projects in the Motor Vehicle Action Plan were also reviewed to ensure an equitable distribution of projects through the town center, including areas with high concentration of transportation disadvantaged populations.

Motor Vehicle Action Plan

The Motor Vehicle Action Plan identifies the motor vehicle improvement projects that are reasonably expected to be funded over the next 20 years, which meets the requirements of the updated Transportation Planning Rule. The strategies identified above were used to rank the motor vehicle projects from highest to lowest in terms of priority. The highest-ranking City projects that are reasonably expected to be funded were combined with projects from other agencies identified in previous planning studies to create the project list shown in Table 4-13, which are organized by location and type.

Table 4-13: Motor Vehicle Action Plan

No.	Location	Description	Cost ($1,000)
M2	Troutdale Road	Widen to 3 lanes from Stark Street to the south City limits. Includes sidewalks and bike lanes.	-
M4	Stark Street Widening (West)	Widen to 5 lanes between 257th Drive and Troutdale Road. Includes sidewalks and bike lanes.	$300
M6	Halsey Street Widening	Construct facilities according to the Main Streets on Halsey Plan with Planning Commission and City Council input and approval.	To Be Determined
M9	Marine Drive	Construct the Marine Drive Extension.	$980
M10	Marine Drive/Sundial Road	Improve intersection of Marine Drive/Sundial Road. Includes widening Marine Drive from approximately 500 feet west of intersection to existing five-lane section.	-
M11	Historic Columbia River Highway/Buxton Road	Signalize in coordination with 257th Drive/Historic Columbia River Highway	$200
M12	257th Way	Explore options to extend 257th Way through the outlet mall to the urban renewal area.	-
M13	Parking Study	Conduct a parking study within the Troutdale Town Center – the study should include an evaluation of potential off-street parking facilities, including a parking structure at the Confluence site.	$50
M14	Dunbar Avenue	Reconstruct Dunbar Avenue.	$450
M16	Historic Columbia River Highway	Prepare a refinement plan for downtown Troutdale and consider changes to the street profile to improve mobility – Project B16 and P37 may be impacted by the refinement plan.	$50

No.	Location	Description	Cost ($1,000)
M17	Historic Columbia River Highway	Install traffic calming features along the Historic Columbia River Highway from Depot Park to east city limits	$150
M19	Historic Columbia River Highway/Depot Park	Install a traffic control device where E Columbia River Highway turns to the south	$150
		Total	$2,330

Note: Cost estimates indicate the estimated funding to be provided by the City of Troutdale. The projects shown in grey are under the jurisdiction of other agencies. Cost estimates are provided for these outside agency projects only where it is anticipated that the City will contribute funding to the project, and the cost figures shown represent only the City's estimated contribution. Projects shown in white are under the jurisdiction of the City.
* The City of Troutdale's contributions to these project costs are included in the Pedestrian and Bicycle Plans.

OTHER MODES

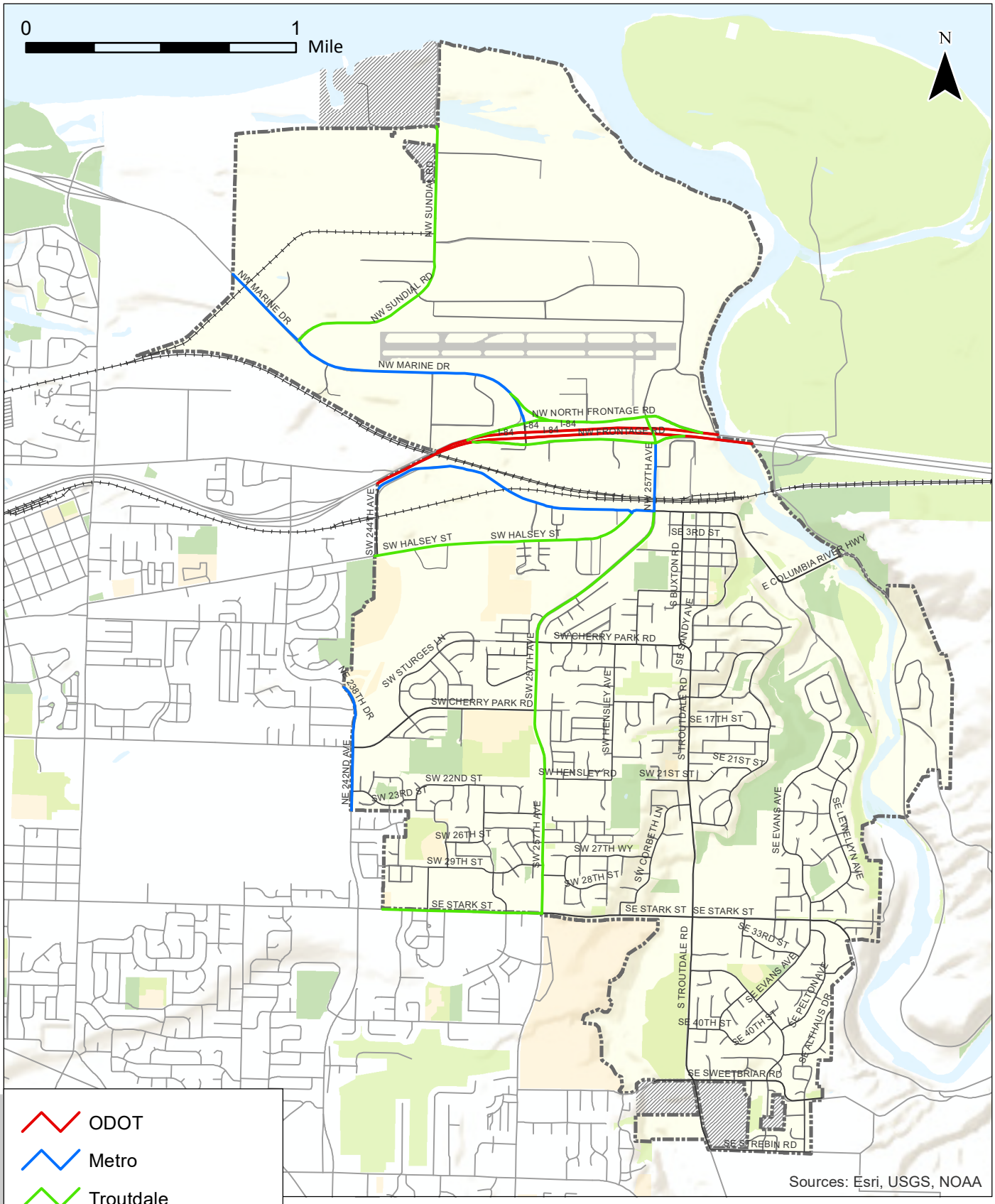
Future needs for freight, air and pipeline infrastructure are identified by their providers and are summarized below.

Freight

This update incorporates the conclusions and recommendations of the 2012 East Metro Connections Plan. The projects identified in this planning effort have been incorporated into the updated Master Plans as well as the designation of 257th Drive as a road connection on the regional freight network. This change was partially due to the cancellation of the 242nd Avenue extension as previously identified in the RTP. Given the existing character of 257th Drive as a freight route, this change will have little impact on the TSP.

Trucks

Efficient truck movement plays a vital role in the economical movement of raw materials and finished products. The establishment of through truck routes provides for this efficient movement while at the same time maintaining neighborhood livability, public safety, and minimizing maintenance costs of the roadway system. The freight plan is shown in Figure 4-10. The objective of this plan is to allow these streets to focus on design criteria that are "truck friendly"; i.e. 12-foot travel lanes, longer access spacing, 35-foot (or larger) curb returns, and pavement design that accommodates a larger share of trucks. The designated truck routes shown in Figure 4-10 are consistent with recent changes to the Regional Freight Plan as identified in the East Metro Connections Plan.



Freight Plan

Figure **4-10**

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Troutdale and Metro Data Resource Center

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Rail

There are two rail lines, the Graham (2A) and the Kenton (2AE) that currently traverse the City of Troutdale, combining to transport over 53 million gross tons of freight in 2002. Both lines are owned and operated as a Class 1 Railroad by Union Pacific Railroad (UPRR). The Graham (2A) line runs 17 trains a day with a maximum authorized speed of 50 mph. It has one at-grade rail crossing in the study area at 244th Avenue. The Kenton (2AE) line runs 30 trains a day at a maximum authorized speed of 50 mph. The Kenton has one at-grade rail crossing in the study area located along a spur track off of the main line that serves the former aluminum plant. There are no passenger trains currently running through Troutdale. The volume, length and schedule of the freight trains are not expected to change significantly over the 20-year planning horizon.

Gas Pipelines

Two high-pressure natural gas pipelines serve Troutdale. One line runs north-south adjacent to 242nd Drive, crossing I-84, then turning eastward and northeasterly through the Troutdale Reynolds Industrial Park to the NE corner of the City, and continuing across the Columbia River into Washington. The second line runs east-west along Sandy Boulevard, until turning north at I-84 before terminating at the Kenton (2AE) UPRR rail line. The future service of gas pipelines are not expected to change significantly over the 20 year planning horizon.

Air

The Troutdale Airport is located north of Interstate 84 and is classified as a Category 2 – Business or High Activity General Aviation Airport. The runway is 150 feet wide by 5,400 feet long, and has over 30,000 annual aircraft operations (take offs and landings). Pavement condition varies over the length of the runway and was found to be deficient in meeting runway pavement strength by the Oregon Aviation Plan. However, reconstruction is not planned for several years. The Troutdale Airport Master Plan predicts a modest 2 percent growth in both the number of operations and number of aircraft based in Troutdale over the next 10 years, concluding that current infrastructure is adequate to meet demand. Consequently, the airport is considering leasing some of the land it does not currently require for their operations. The RTP designates the Troutdale airport as an Inter-city air passenger terminal.

ENVIRONMENTAL JUSTICE

Socioeconomic conditions within the City of Troutdale were considered in the development of the TSP update to ensure that the future transportation system meets the needs of the entire population. The transportation improvement projects identified in the pedestrian, bicycle, transit, and motor vehicle plans were selected to ensure that the transportation system meets the needs while not creating adverse conditions for select segments of the population. These projects will ensure that the transportation disadvantaged will have equal access to public facilities and services located throughout Troutdale as well as in neighboring communities.

Chapter 5 Financing & Implementation

CHAPTER 5. FINANCING & IMPLEMENTATION

This chapter outlines the City's current funding strategies and presents several potential new funding sources and opportunities that can be used to meet the needs of the transportation system. The costs associated with each element of the transportation system plan are compared to potential revenue sources. Options are discussed regarding how costs of the plan and revenues can be balanced.

CURRENT FUNDING STRATEGIES

Transportation funding is commonly viewed as a user fee system where the users of the system pay for infrastructure improvements through motor vehicle fees such as state and local gas taxes and vehicle registrations. However, virtually all of motor vehicle user fees go to road maintenance, operation, and preservation of the system rather than construction of new facilities. Much of what the public views as new construction is commonly funded (partially or fully) through property tax levies, traffic impact fees (Transportation System Development Charges) and transportation improvements required of private developers.

The City of Troutdale utilizes a number of mechanisms to fund construction of its transportation infrastructure as described below. The first two collect revenue each year that is used to repair street facilities or construct new streets, with some restrictions on the type and location of projects. The last is different in that it does not generate on-going revenue, but is a means to acquire needed property (Exaction) as development occurs.

Fuel Tax and Vehicle License Fee

The State of Oregon Highway Trust Fund collects various taxes and fees on fuel, vehicle licenses, and permits. A portion is paid to cities annually on a per capita basis. By statute, the money may be used for any road-related purpose. Troutdale uses it for street operating needs.

Oregon gas taxes are collected as a fixed amount per gallon of gasoline served. The Oregon gas tax is currently 38 cents per gallon. There is an additional tax of 3 cents per gallon within Multnomah County and 3 cents per gallon within Troutdale. Gas taxes do not vary with changes in gasoline prices and there is no adjustment for inflation, so the net revenue collected has gradually eroded over time as the cost to construct and repair transport systems increase. Fuel efficiency in new vehicles has further reduced the total dollars collected through this system.

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 for passenger vehicles range from $126 to $316 depending on the age of the vehicle, the estimated miles per gallon (MPG), and the fuel type. There is an additional fee for vehicles registered in Multnomah County or $112. There is no adjustment for inflation tied to vehicle registration fees.

In fiscal year 2012/2013, Troutdale will receive approximately $890,000 in gas tax and vehicle license fee revenue for streets, bikeways and sidewalks. Essentially all of these funds will be spent on operation and pavement preservation of local streets.

System Development Charge

The System Development Charge (SDC) fee for streets is used as a funding source for all capacity adding projects for the transportation system. The funds can be used to construct or improve portions of the 42 miles of local streets within the city, or be used as a partial match on county street projects within the city limits. The SDC fee is collected from developers based on the PM peak hour vehicle trips that are expected from a proposed development. The current SDC rate is $1,181 per trip end, which is among the lowest transportation SDC rates in the State of Oregon. By comparison, the City of Troutdale charges $1,169 per single-family home (SFH) whereas City of Gresham charges $2,565 per SFH, which is about average for the Portland-Vancouver Metropolitan area.

For fiscal year 2012/2013, the estimated income from the Street SDC is $27,000. However, the estimated growth in vehicle trips in the horizon of the TSP is 2,872[1] within the City of Troutdale based on land use forecasts for build-out (assuming annexation of land within the Troutdale Urban Planning Boundary). Applying the SDC fee rate of $1,181 to that amount of growth would generate $3.4 million over 20 years, or about $170,000 each year for the next 20 years. This is slightly higher than the current year's estimate, but it accounts for substantial available land development, particularly north of I-84. The higher rate was used to estimate future revenues since it reflects average expected land development over the next 20 years, and not just the rate of development over the current year, which is the basis used for the current fiscal year estimate.

Exactions

These are improvements that are conditioned when development is permitted. Developers are required to improve their frontage and, in some cases, provide off-site improvements depending upon their level of traffic generation and the impact to the transportation system.

Summary

Under the above funding programs, the City of Troutdale will collect approximately $890,000 for street construction and repair each year, with the previously noted restrictions. Total revenues collected over 20 years would be $19.9 million with the current sources. Table 5-1 summarizes the current funding sources available to fund the transportation system. As shown, it is reasonable to expect that adding

[1] This estimate was generated during the 2005 TSP update. An update of this estimate was not within the scope of the TSP update, but should be updated based on current Metro projects prior to calculating an updated SDC rate.

more capital or maintenance responsibilities to the city will require new or expanded revenue sources since there is already a funding deficit for these services.

Table 5-1: Summary of Current Revenues for Transportation

Funding Category	Annual Amount ($1,000)
State and Local Fuel Apportionment & Vehicle License Fee	$890
System Development Charge (Streets) **	$170
County Road	$15
Other (Interest, etc.)	$35
Total Revenues	**$1,110**
20 Year Total	
Estimated 20 Year Revenues	**$22,200**

PROJECTS AND PROGRAMS

This section presents the recommended projects and programs developed for the City of Troutdale to serve local travel for the next 20 years. The Pedestrian, Bicycle, Transit, and Motor Vehicle projects were identified in the Action Plan for each mode, and represent those projects that have the highest short-term need for implementation to satisfy performance standards, or other policies established for the Troutdale Transportation System Plan. Other projects on the Master Plan list require additional funding, and they are expected to be built beyond the 20 year horizon.

Project Cost Estimates

Cost estimates (general, order of magnitude) were developed for the projects identified in the pedestrian, bicycle, transit, and motor vehicle plans. Cost estimates from the City's Capital Improvement Plan were used in this study, if available. Other projects were estimated using general unit costs for transportation improvements, but do not reflect the unique project elements that can significantly add to project costs.[2] Development of more detailed project costs can be prepared in the future with more refined financial analysis. Since many of the projects overlap elements of various modes, the costs were developed at a project level incorporating all modes, as appropriate. It may be desirable to break project mode elements out separately, however, in most cases, there are greater cost efficiencies of undertaking a combined, overall project. Each of these project costs will need further refinement to detail right-of-way requirements and costs associated with special design details as projects are pursued.

[2] General plan level cost estimates do not reflect specific project construction costs, but represent an average estimate. Further preliminary engineering evaluation is required to determine impacts to right-of-way, environmental mitigation and/or utilities. Experience has shown that individual projects costs can increase by 25 to 75 percent as a result of the above factors.

Other Transportation Programs and Services

In addition to the physical system improvements identified in the previous section, the transportation facilities will require on-going operation and maintenance improvements across a variety of areas. These other transportation programs are recommended to respond to the specific policies and needs in maintaining roadway pavement quality, allocations for implementing neighborhood traffic management, and on-going update and support of related planning documents.

Roadway Maintenance

The annual cost of operations and maintenance programs and services for the 42 miles of streets within Troutdale was estimated at $1,075,000 with an additional need of 300,000 for pavement preservation, the bulk of which is paid for by gas tax revenues. This does not include road maintenance responsibilities on the arterial streets that are serviced by Multnomah County. Over 20 years, the City's road maintenance responsibility accounts for $21.5 million, which is the highest cost component of the transportation plan. The actual maintenance costs could vary from this estimate.

Neighborhood Traffic Management (NTM)

Specific NTM projects are not defined. These projects will be subject to neighborhood consensus based upon City placement and design criteria. A City-wide NTM program, if desired, should be developed with criteria and policies adopted by the City Council. Speed humps can cost $2,000 to $4,000 each and traffic circles can cost $3,000 to $8,000 each. A speed trailer can cost about $10,000. It is important, where appropriate, that any new development incorporate elements of NTM as part of its on-site mitigation of traffic impacts. Annual allocation of $10,000 is identified for the program development, and implementation of NTM projects.

Troutdale Costs for TSP Action Plans

The costs outlined in the Transportation System Plan to implement the Action Plans for Streets, Transit, Bicycles, and Pedestrians total $4.4 million, and several other recommended transportation operations and maintenance programs would add $27.7 million for a total cost over 20 years of $32.1 million. Refer to Chapter 4 for details on the individual projects by travel mode. Note that additional projects are listed in the Action Plans that are expected to be funded by Multnomah County, or ODOT. These non-City costs have not been included in the estimates in Table 5-2, but are identified in Chapter 4.

Table 5-2: Troutdale Transportation Action Plans Costs Over 20 Years

Transportation Element	Approximate Cost ($1,000)
System Improvement Projects (Action Plans projects to be funded by City)	
Motor Vehicle	$2,330
Bicycle	$275
Transit	$0
Pedestrian	$1,770
Total Capital Projects	**$4,375**
Operations and Maintenance Programs and Services (2013 Dollars)	
Road Operation and Maintenance ($1,075,000 per year, increasing annually)	$21,500
Additional Pavement Preservation Need (300,000 per year)[1]	$6,000
Neighborhood Traffic Management ($10,000/year)	$200
Total Operations and Maintenance Programs	**$27,700**
20 Year Total	**$32,075**

The estimated $27.7 million for operations and maintenance exceeds the expected 20-year revenue estimate of $22.2 million (see Table 5-1) by approximately $5.5 million. Alternative solutions to address this funding deficit as well as provide funding for the Action Plan projects are discussed in the next section.

NEW FUNDING SOURCES AND OPPORTUNITIES

The recommended transportation improvement projects and programs included in the TSP update will require funding beyond the levels currently collected by the City. There are, however, several potential funding sources for transportation improvements, many of which have been used in the past by agencies in Oregon. In most cases, these funding sources, when used collectively, are sufficient to fund transportation improvements for local communities. Due to the complexity of today's transportation projects, it is necessary to seek several avenues of funding projects. Unique or hybrid funding of projects generally will include these funding sources combined in a new package.

Within the Portland region, funding for major transportation projects often is brought to a vote of the public for approval. This is usually for a large project or list of projects. Examples of this public funding include the Major Streets Transportation Improvement Program (MSTIP) in Washington County or the Westside Light Rail Project. Because of the need to gain public approval for transportation funding, it is important to develop a consensus in the community that supports needed transportation improvements. That is the value of the Transportation System Plan. In most communities where time is taken to build a consensus regarding a transportation plan, funding sources can be developed to meet the needs of the community.

Transportation program funding options range from local taxes, assessments, and charges to 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 and competitiveness of state and federal funds. Nonetheless, it is important for the City to consider all of its options and understand where its power may exist to provide and enhance funding for its Transportation programs.

The following funding 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 new needs identified in the Transportation System Plan.

General Fund Revenues

At the discretion of the City Council, the City can allocate General Fund revenues to pay for its Transportation program. (General Fund revenues primarily include property taxes, use taxes, and any other miscellaneous taxes and 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 to fund new aspects of the Transportation program are only available to the extent that either General Fund revenues are increased or City Council directs and diverts funding from other City programs.

Street Utility Fee

A number of Oregon cities supplement their street funds with street utility fees. Local cities with adopted street utility fees include Lake Oswego, Wilsonville and Tualatin. Establishing user fees to fund applicable transportation activities and/or capital construction ensures that those who create the demand for service pay for it proportionate to their use. The street utility fees are recurring monthly or bi-monthly charges that are paid by all residential, commercial, industrial, and institutional users. The fees are typically charged proportionate with the amount of traffic generated, so a retail commercial user pays a higher rate than a residential user.

From a system health perspective, forming a utility also helps to support the ongoing viability of the program by establishing a source of reliable, dedicated funding for that specific function. Fee revenues can be used to secure revenue bond debt used to finance capital construction. A street utility can be formed by Council action and does not require a public vote.

A transportation utility fee could be enacted that would generate the roughly $300,000 per year of additional revenue needed, or $6,000,000 over the next 20 years. A specific fee study would be required to establish a fee program for the City of Troutdale to determine specific allocations to its residents and businesses.

Expanded SDC Rate for Transportation

As noted previously, the City's transportation SDC rate is among the lowest in the State of Oregon. At the current rate of $1,181 per trip end, the SDC program would not provide adequate funding for the Action Plans. It is suggested that the SDC program and rate be re-examined to adjust for the additional TSP recommended Action Plans and changes in population and employment growth projections.

Other Funding Sources

Urban Renewal District

An Urban Renewal District (URD) is a tax-funded district within the City. An URD is 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. Uses of the funding include, but are not limited to, transportation. It is tax-increment funded rather than fee funded and the URD could provide for renewal that includes, but is not limited to, transportation projects. In 2006 Troutdale created an URD encompassing properties between 257th Avenue and the Sandy River and between the Troutdale Town Center and I-84. Although tax increment funds can be used for transportation improvements within the district, the funds have been earmarked for other public improvements to benefit this specific redevelopment area.

Local Improvement District Assessment Revenue

The City may set up Local Improvement Districts (LIDs) to fund specific capital improvement projects within defined geographic areas, or zones of benefit. LIDs impose assessments on properties within its boundaries. LIDs may not fund ongoing maintenance costs. They require separate accounting, and the assessments collected may only be spent on capital projects within the geographic area. Citizens representing 33% of the assessment can terminate a LID and overturn the planned projects so projects and costs of a LID must meet with broad approval of those within the boundaries of the LID.

Direct Appropriations

The City can seek direct appropriations from the State Legislature and / or U.S. Congress for transportation capital improvements. There may be projects identified in the Motor Vehicle Action Plan for which the City may want to pursue these special, one-time appropriations.

Special Assessments

A variety of special assessments are available in Oregon to defray costs of sidewalks, curbs, gutters, street lighting, parking and CBD or commercial zone transportation improvements. These assessments would likely fall within the Measure 50 limitations. A regional example would be the Westside LRT where the local share of funding was voter approved as an addition to property tax.

Employment Taxes

TriMet collects a tax for transit operations in the Portland region through payroll and self employment taxes. Approximately $145 million are collected annually in the Portland region for transit.

Debt Financing

Also, while not direct funding sources, 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.

- **Voter-Approved General Obligation Bond Proceeds:** Subject to voter approval, the City can issue General Obligation (G.O.) bonds to debt finance capital improvement projects. G.O. bonds are backed by the increased taxing authority of the City, and the annual principal and interest repayment is funded through a new, voter-approved assessment on property City-wide (a property tax increase). Depending on the critical nature of any projects identified in the Transportation Plan, and the willingness of the electorate to accept increased taxation for transportation improvements, voter-approved G.O. bonds may be a feasible funding option for specific projects. Proceeds may not be used for ongoing maintenance.
- **Revenue Bonds:** Revenue bonds are debt instruments secured by rate revenue. In order for the City to issue revenue bonds for transportation projects, it would need to identify a stable source of ongoing rate funding. Interest costs for revenue bonds are slightly higher than for general obligation bonds, due to the perceived stability offered by the “full faith and credit” of a jurisdiction.

Recommendations for New Transportation Funds

It is recommended that the City consider establishing a transportation, or street, utility as the backbone of its operations and maintenance funding approach. Street utility fees can provide a stable source of dedicated revenue useable for transportation system operations and maintenance and / or capital construction. Rate revenues can also secure revenue bond debt if used to finance capital improvements. Street utilities can be formed by Council action, and billed through the City utility billing system.

It is also recommended that the City consider updating its transportation SDC to cover the new City funded non-auto capital projects identified in the TSP. This would help to ensure that local growth pays its fair share of new transportation facilities that are required to serve this planned development.

In addition, the City should actively pursue grant and other special program funding in order to mitigate the costs to its citizens of transportation capital construction.

A transportation utility fee could generate roughly 300,000 per year, or $6.0 million over the next 20 years, as shown in Table 5-3. These additional funds along with appropriately set and adjusted SDC rates would be expected to generate sufficient revenues to fully capitalize the Action Plan projects and maintenance programs.

Table 5-3: Recommended New Funding Sources for Troutdale Transportation

Transportation Funding Source	Estimated Additional Annual Revenues ($1,000)
Transportation Utility Fee	$300
Annual New Revenues	**$300**
20 Year Total	**$6,000**