

Transportation System Plan Update

Wood Village Transportation System Plan Update

Wood Village, Oregon

Draft: October 2016

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Wood Village, Oregon

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

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Section 1

Preface

PREFACE

This 2016 update to the Transportation System Plan (TSP) augments the 2012 TSP update. The Project Management Team (PMT), the Technical Advisory Committee (TAC), and the Citizen Advisory Committee (CAC) guided work and efforts during the 2012 update. The PMT, TAC, and CAC members are identified below, along with members of the consultant team. In 2012, the TAC and CAC members devoted a substantial amount of time and effort to the development of this plan and their participation was instrumental in the development of this document. The consultant team and PMT believe that the city's future transportation system will be better because of their commitment.

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The 2016 TSP update followed a similar management process to develop and update the plan. The focus of the 2016 effort was to update the street elements of the plan and coordinate with the Town Center Master Plan (TCMP), which includes street, pedestrian and bicycle elements. We would like to acknowledge the time and effort of those who participated in the most recent planning process.

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Section 2

Introduction

INTRODUCTION

Overview

The City of Wood Village completed and adopted the Transportation System Plan (TSP) in 1999. The city completed a special update of this plan in 2001, focusing on the motor vehicle and roadway capacity/safety element. Since that time, the transportation planning landscape within the city and amongst the surrounding communities has changed including the development of several facility plans for key roadway corridors and the adoption of new state/regional planning requirements. These changes, and the passage of time since the prior TSP work, necessitated an update to the city's TSP in 2012. The City of Wood Village, in conjunction with the Oregon Department of Transportation (ODOT), updated of the city's pedestrian, bicycle, and public transportation systems sections of the TSP in 2012.

The city prepared the 2012 TSP update to guide the management and implementation of the transportation facilities, policies, and programs related to pedestrian and bicycle connectivity within Wood Village. At that time, the city did not include the roadway and capacity element as Metro was working to complete its East Metro Connections Plan (EMCP). The EMCP included analysis and recommendations that influenced and affected roadways in Wood Village. In particular, one focus of the EMCP was to identify regional freight solutions. To avoid inconsistencies between the May 2012 TSP update and the East Metro Connections Plan, the city postponed the Roadway Element until after Metro adopted the EMCP in June of 2012. Further, the city initiated an update to the Wood Village Town Center Master Plan (TCMP) in 2015. A part of the TCMP effort was to identify bike, pedestrian and roadway network improvements within the town center.

This 2016 TSP updates the 2012 TSP with the roadway elements identified in the EMCP as well as the subsequent TCMP effort. This plan reflects the community's vision, while remaining consistent with state and other local plans and policies.

State of Oregon planning rules require that the TSP be based on the current comprehensive plan land use map and must provide a transportation system that accommodates the expected 20-year growth in population and employment that will result from implementation of the land use plan. Oregon Revised Statute (ORS) 197.712 and the Department of Land Conservation and Development (DLCD) administrative rule known as the Transportation Planning Rule (TPR) guide the contents of this TSP update. These laws and rules require that jurisdictions develop the following:

- a road plan for a network of arterial and collector streets;

- a bicycle and pedestrian plan;
- an air, rail, water, and pipeline plan;
- a transportation financing plan; and
- policies and ordinances for implementing the TSP.

The TPR requires that the transportation system plan incorporates the needs of all users and abilities. In addition, the TPR requires that local jurisdictions adopt land use and subdivision ordinance amendments to protect transportation facilities and to provide bicycle and pedestrian facilities between residential, commercial, and employment/institutional areas. It is further required that local communities coordinate their respective plans with the applicable county, regional, and state transportation plans.

TSP Organization and Methodology

The city started developing this TSP update with a review of the city's May 2012 TSP documents, the 1999 Wood Village Transportation System Plan (Reference 1), the 2001 Wood Village Transportation System Plan Roadway Element (Reference 2), and the 1999 Wood Village Comprehensive Plan (Reference 3), which provides the goals and policies used to guide land use and transportation planning decisions in the city. Section 3 of this report summarizes the plans, policies and standards reviewed as part of this TSP update as well as those reviewed as part of previous efforts.

The transportation system inventory summarized in Section 4 allowed for an objective assessment of the current pedestrian, bicycle, public transportation and roadway systems within Wood Village, while the existing traffic conditions presented in Section 5 provides an understanding of vehicle, pedestrian and bicycle safety at many of the city's major intersections. The needs, opportunities, and constraints presented in Section 6 along with the transportation system tools presented in Section 7 provided the basis for the transportation improvement projects identified in the Section 8 Transportation System Plan.

Ultimately, the city updated the long range implementation plan based on comments received from the technical and citizen advisory committees, elected officials, and community that reflects a consensus on which elements should be incorporated into the city's transportation system. The solutions in Section 8 include a roadway system plan, a public transportation system plan, a bicycle system plan, and a pedestrian system plan as well as plans for other transportation modes serving Wood Village.

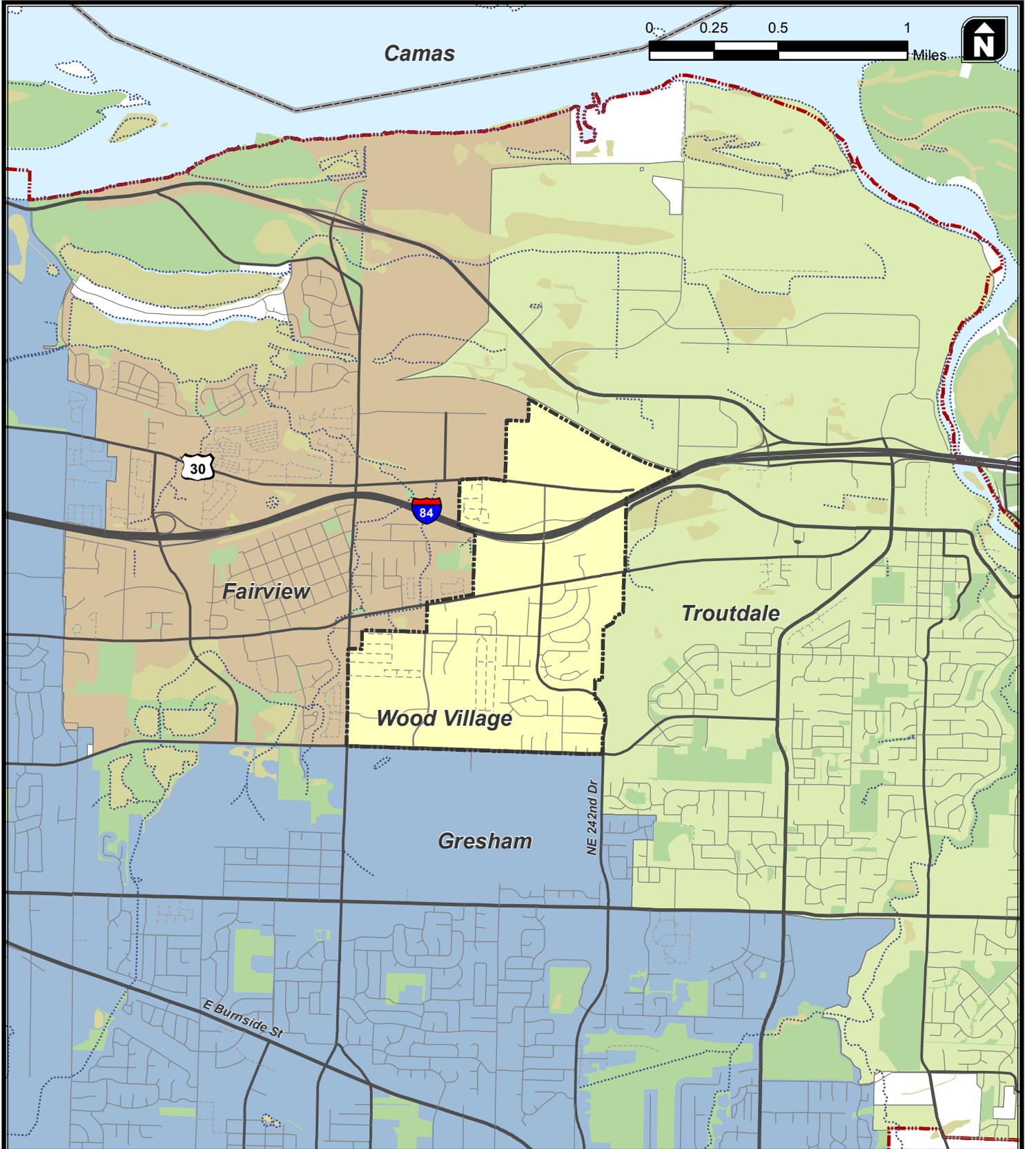
Finally, the Transportation Funding Plan in Section 9 provides several options for funding future pedestrian and bicycle improvements throughout the city.

Study Area

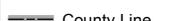
The City of Wood Village is located within Multnomah County on the eastern side of the Portland Metropolitan Region. Figure 1 illustrates the location of Wood Village with respect to the City of Troutdale to the east, the City of Fairview to the west and north, and the City of Gresham to the south.

Figure 2 illustrates a street map of Wood Village, with the city limits indicated by a dashed black line. The study area for the TSP consists of the area within the city limits. Based on the requirements of the TPR, the city focused the existing conditions assessment on significant roadways (arterials and collectors) as well as pedestrian and bicycle facilities, public transportation, and other transport facilities and services, including rail service, air service, pipelines and water service.

Figure 1 Contextual Study Area



Map Features

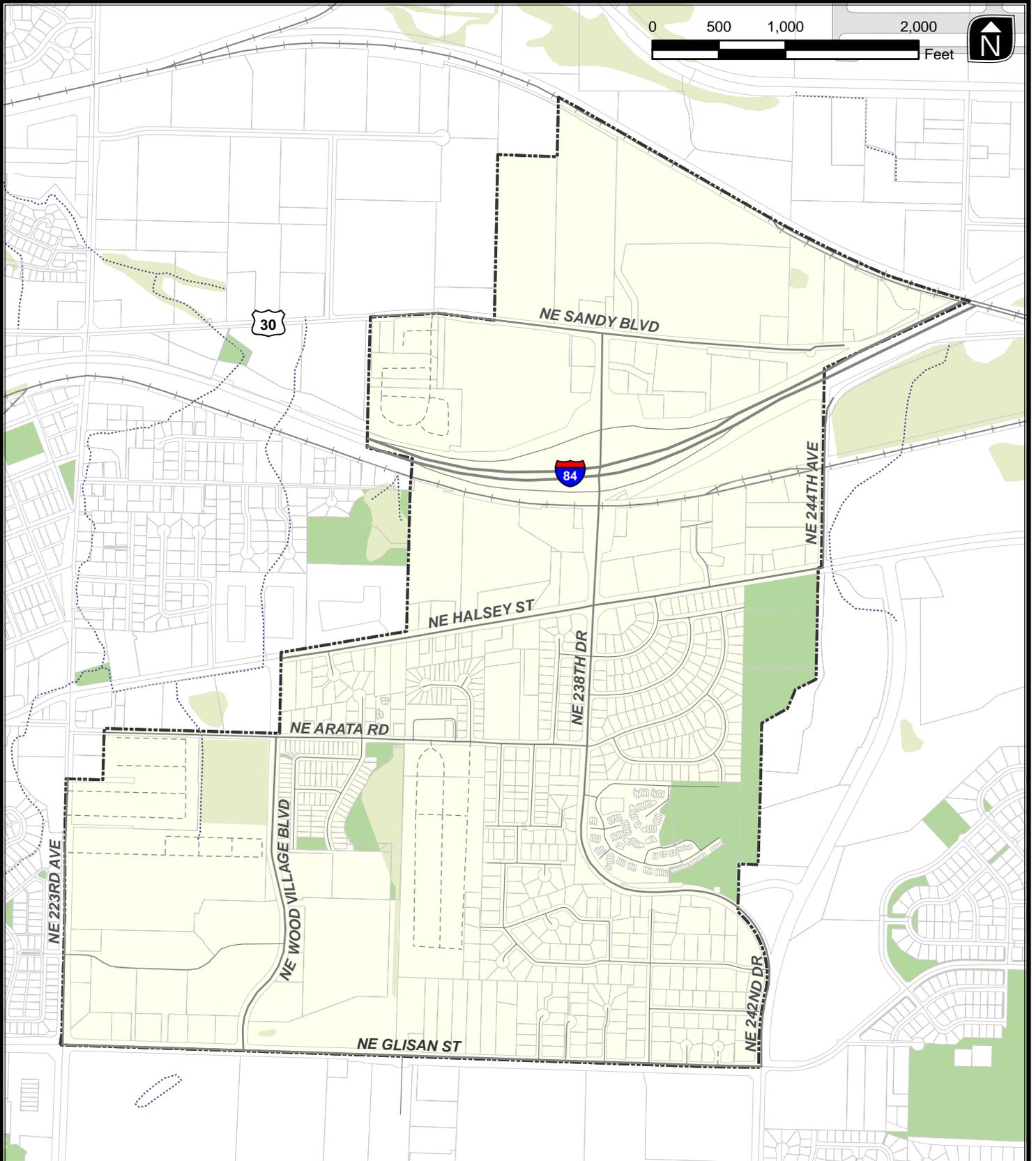
-  Stream Line
-  Wetlands
-  Open Spaces
-  Major Rivers
-  County Line
-  City Limits
-  Portland UGB

Contextual Study Area



Figure 1

Figure 2 Study Area/City Limits



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Map Features

- Streets
- Tax Lots
- Railroads
- Streams
- Wetlands
- Open Spaces
- City Limits

**Study Area/
City Limits**

Figure 2

Section 3

Plans, Policies, and Standards

PLANS, POLICIES, AND STANDARDS

The project team completed an evaluation of the 1999 Wood Village TSP and the 2001 Wood Village TSP Roadway Element to determine compliance with regional requirements. Specifically, the team reviewed the city's adopted transportation plans against requirements set out in the Metro Regional Transportation Plan (RTP), Regional Transportation Functional Plan (RTFP), and Urban Growth Management Functional Plan (UGMFP). The evaluation results guided this TSP update to ensure consistency with the RTFP. Appendix A (2012) and Appendix XX (memo 6) includes the results of the evaluation.

Section 4

Transportation System Inventory

TRANSPORTATION SYSTEM INVENTORY

Street System

The street system provides the primary means of mobility for Wood Village citizens, serving a majority of trips over multiple modes. In addition to motorists, pedestrians, bicyclists, and public transit riders all utilize the street system to access areas both locally and regionally.

JURISDICTION

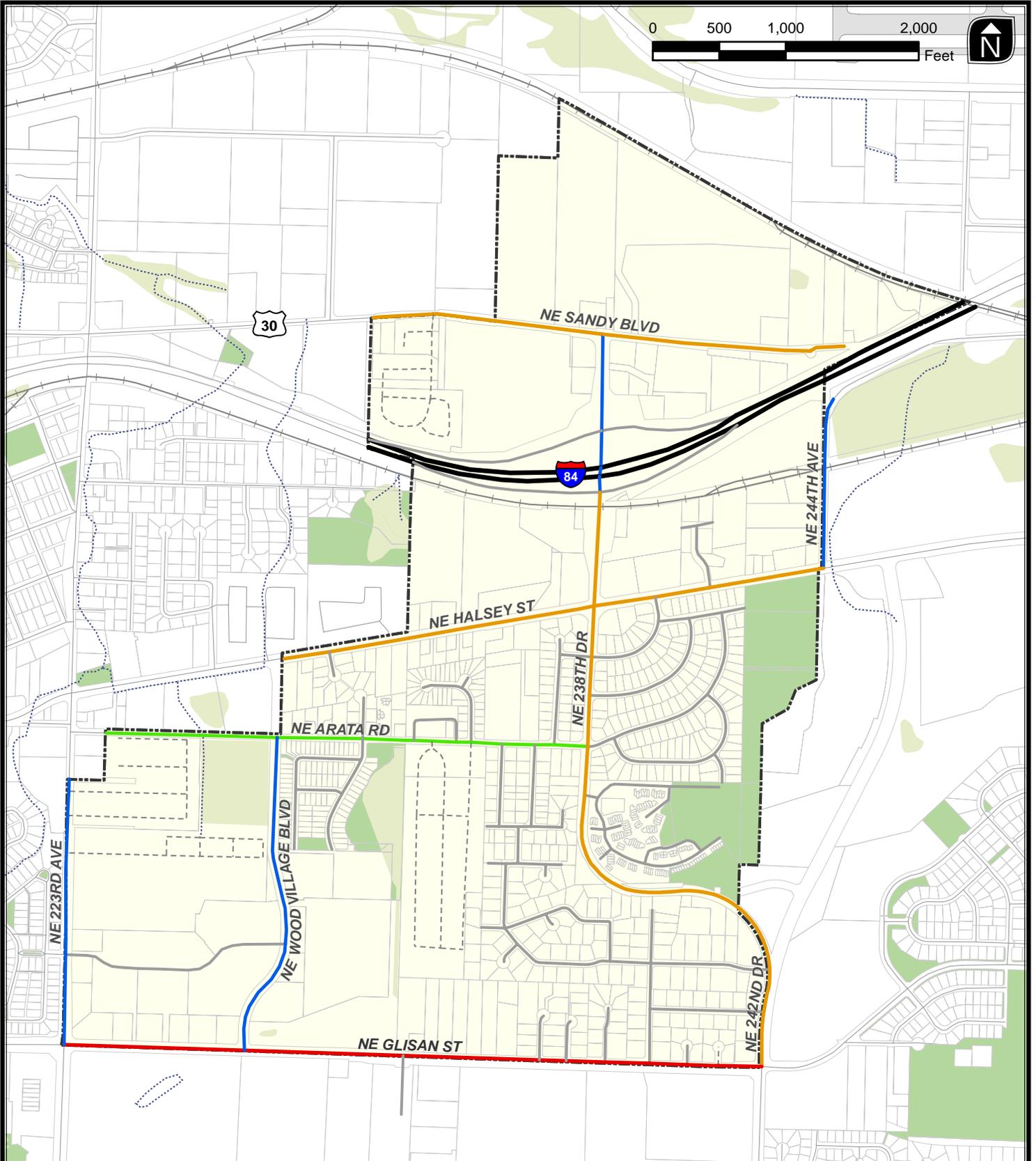
Streets within Wood Village are owned and operated by three separate jurisdictions: Multnomah County, the Oregon Department of Transportation (ODOT), and the City of Wood Village. All collector and higher roadways are owned and operated by Multnomah County (with the exception of I-84, under ODOT jurisdiction). The City of Wood Village is responsible for all local streets.

Each jurisdiction is responsible for determining the road's functional classification, defining the roadway's major design and multimodal features, maintenance, and approving construction and access permits. Coordination is required among the three jurisdictions to ensure that the transportation system is planned, operated, maintained, and improved to safely meet public needs.

FUNCTIONAL CLASSIFICATION

A street's functional classification reflects its role in the transportation system and helps define desired operational and design characteristics such as right-of-way requirements, pavement widths, pedestrian and bicycle features, and driveway (access) spacing requirements. The city follows Multnomah County's definition of functional classification for both collector and arterial streets. Figure 3 shows the existing Wood Village functional classification plan for all roadways within the city. Given the overlapping ownership/maintenance and jurisdictional relationships that exist amongst the study area roadways, the existing functional classifications reflect coordination between multiple jurisdictions to ensure consistency throughout the transportation system. Table 1 summarizes the functional classification comparison for all collector and higher roadways in Wood Village.

Figure 3 Existing Functional Classification Plan



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Roadway Classification	Map Features
Freeway	Other Streets
Major Arterial	Tax Lots
Minor Arterial	Railroads
Major Collector	Streams
Neighborhood Collector	Wetlands
Local Street	Parks
Private Street	City Limits

Existing Roadway Functional Classification

Figure 3

TRAFFIC CONTROL

There are seven signalized intersections within Wood Village. One-way, two-way, three-way or four-way stop signs control non-signalized intersections.

PAVEMENT CONDITION

ODOT and Multnomah County monitor pavement conditions on their roadways. According to ODOT's 2014 Pavement Condition map, pavement condition on I-84 is in good condition. There is no other roadway within Wood Village that is documented as part of the state's Pavement Management System (Reference 10). The City of Wood Village has a pavement management system in place for the municipally managed roadways, none of which are a part of this plan. The overall rating of local roads in Wood Village was 82.

TRAFFIC SPEED

Table 1 summarizes speed zones on arterials and collectors within the City of Wood Village. A residential district may be posted at 25 mph and school zones are posted at 20 mph. The community is concerned with vehicle speeds on several collector and residential streets. Enforcement of speed limits and education about the effects and dangers of speeding in the city is key to maintaining speed adherence in the city.

Table 1. Functional Classification Comparison by Jurisdiction, Posted Speed, and Pavement Condition

Roadway	ODOT	Multnomah County	Wood Village	Metro	Posted Speed (mph)	Pavement Condition
I-84	Interstate Highway	-	Freeway	Principal Arterial	55	Good
NE Sandy Boulevard	-	Minor Arterial	Minor Arterial	-	40	Excellent
NE 238 th Drive	-	Minor Arterial	Minor Arterial	Minor Arterial	35	Excellent
NE 223 rd Avenue	-	Major Collector	Major Collector	-	40	Excellent
NE Wood Village Boulevard	-	Major Collector	Major Collector	-	30	Good
NE Glisan Street	-	Major Arterial	Major Arterial	Major Arterial	40	Good
NE Arata Road	-	Neighborhood Collector	Neighborhood Collector	-	35	Good
NE 244 th Avenue	-	Major Collector	Major Collector	-	40	Fair
NE Halsey Street	-	Minor Arterial	Minor Arterial	Minor Arterial	35	Excellent

Note: Roadways in bold indicate ownership/maintenance responsibilities

Sources: Oregon Highway Plan; 2001 City of Wood Village Transportation System Plan Roadway Element; Multnomah County Functional Classification of Trafficways; Metro 2035 Regional Transportation Plan; Multnomah County Master Road List (pavement condition).

FREIGHT ROUTES

The 2035 Regional Freight Plan (RFP-Reference 8) identifies NE Sandy Boulevard, NE Glisan Street (via NE Fairview Parkway) and NE 238th Drive north of I-84 as regional freight routes. The plan also identifies the need for future connectivity along the eastern city limits between NE 242nd Drive, Sandy Boulevard, and Marine Drive. Further, the 2014 Regional Transportation Plan identifies I-84 as a Main Roadway Route and NE Sandy Boulevard, NE Glisan Street (via NE Fairview Parkway), NE 238th/242nd Drive, Airport Way, and Marine Drive in Wood Village as Road Connectors on the Regional Freight Network, in accordance with the 2012 EMCP. The plan also identifies the need for future connectivity along the eastern city limits between NE 242nd Drive, Sandy Boulevard, and Marine Drive.

Within Wood Village, NE Glisan Street and NE 238th Drive north of I-84 accommodate large vehicles, while the county has developed the intersections of these roadways with other major roadways to accommodate wide turning movements. Currently, the county prohibits trucks over 40 feet from 238th/242nd Avenues between Glisan St. and Halsey St. due to safety concerns.

Public Transportation System

TRANSIT ROUTES AND STOPS

TriMet provides public transportation within Wood Village. TriMet Line #21 from the Parkrose/Sumner Transit Center and the Gresham Central Transit Center, providing service along Sandy Boulevard and 223rd with scheduled service every 20 minutes from 5:00 A.M. to midnight. TriMet provided service seven days a week between 5:30 a.m. and 10:30 p.m. on 20-40 minute headways. TriMet Line #77 provides service between Montgomery Park and the City of Troutdale via NE Halsey Street on Monday through Friday between 5:30 a.m. and 11:30 p.m. on 20-minute headways, on Saturdays between 6:00 a.m. and 11:00 p.m. on 30-minute headways, and on Sunday between 6:00 a.m. and 11:00 p.m. on 30-minute headways. Several stops are currently located along both routes within Wood Village with various amenities.

Figure 4 illustrates TriMet's service routes and stops located within Wood Village along with the types of amenities available at each stop. A majority of stops currently do not provide shelters or seating. All stops in Wood Village are in areas with sidewalks, while the approaches to the stops from adjacent side streets do not have any pedestrian or bicycle facilities.

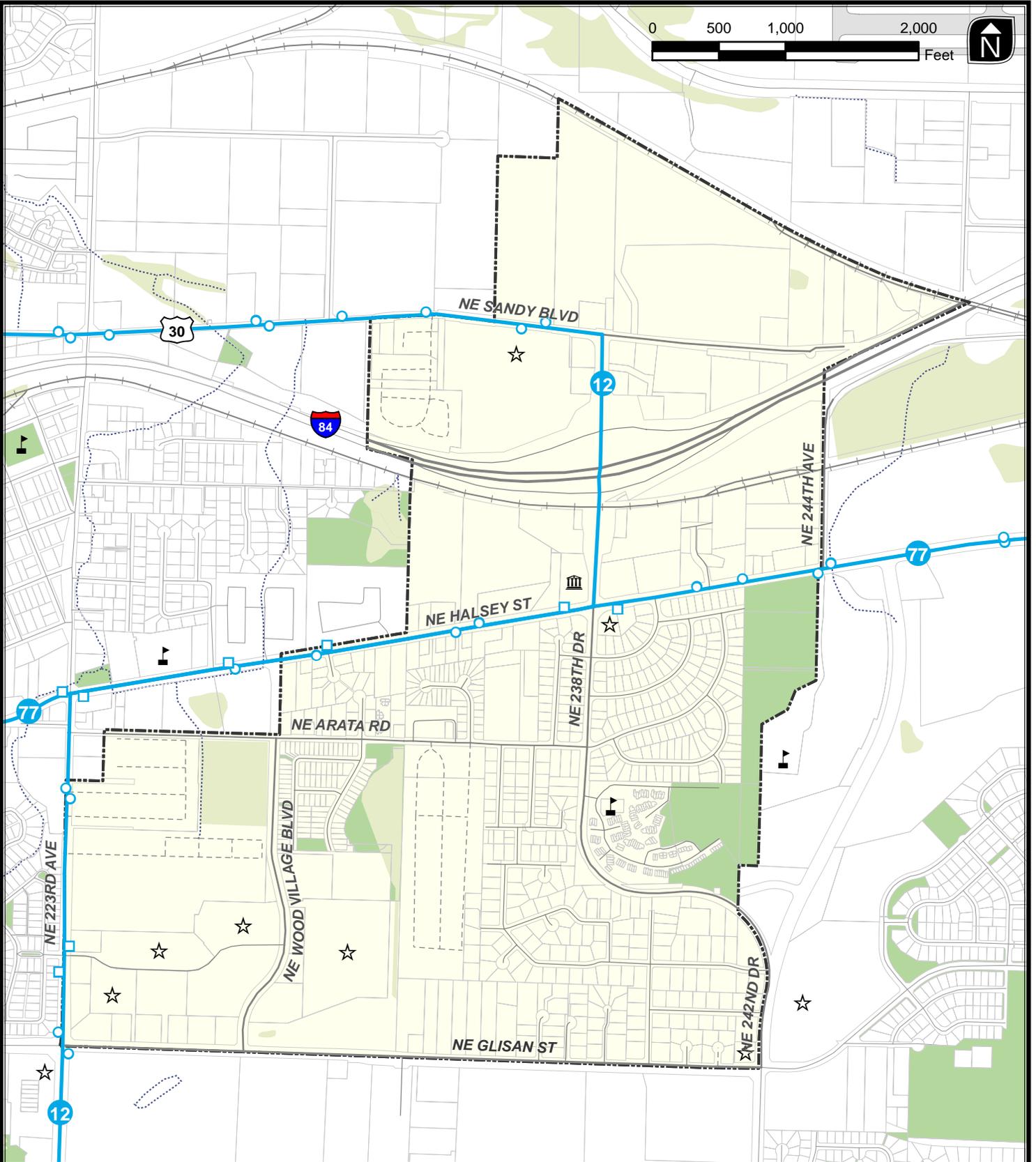
SERVICE COVERAGE

Service coverage is a measure of the area within walking distance of transit service. Areas must be within ¼-mile of a bus stop or ½ mile of a transit center or park & ride to be considered an area served by transit (There are currently no designated park & rides within Wood Village. The closest park & rides are located east along NE Halsey Street at the Reynolds School District Park & Ride and south along 223rd Avenue at the Gresham City Hall Park & Ride). Figure 5 illustrates the areas within Wood Village served by the existing transit routes and stops. A significant portion of the residential and commercial areas located south of NE Halsey Street and east of NE 233rd Avenue are not being served by transit. These deficiencies in service areas are being addressed by the proposed East Side Enhancement Plan adopted by TriMet.

RIDERSHIP

TriMet maintains average daily ridership data for each stop located within Wood Village. The data includes the average number of daily boardings and alightings reported at each stop over a three-month period. Figure 6 illustrates the average daily ridership data for spring 2011. The stops located at the NE 223rd Avenue/NE Halsey Street intersection generate significantly more trips than other stops located along NE 223rd Avenue and/or NE Halsey Street within the city limits.

Figure 4 Transit Service Routes and Stops (figure to be updated)



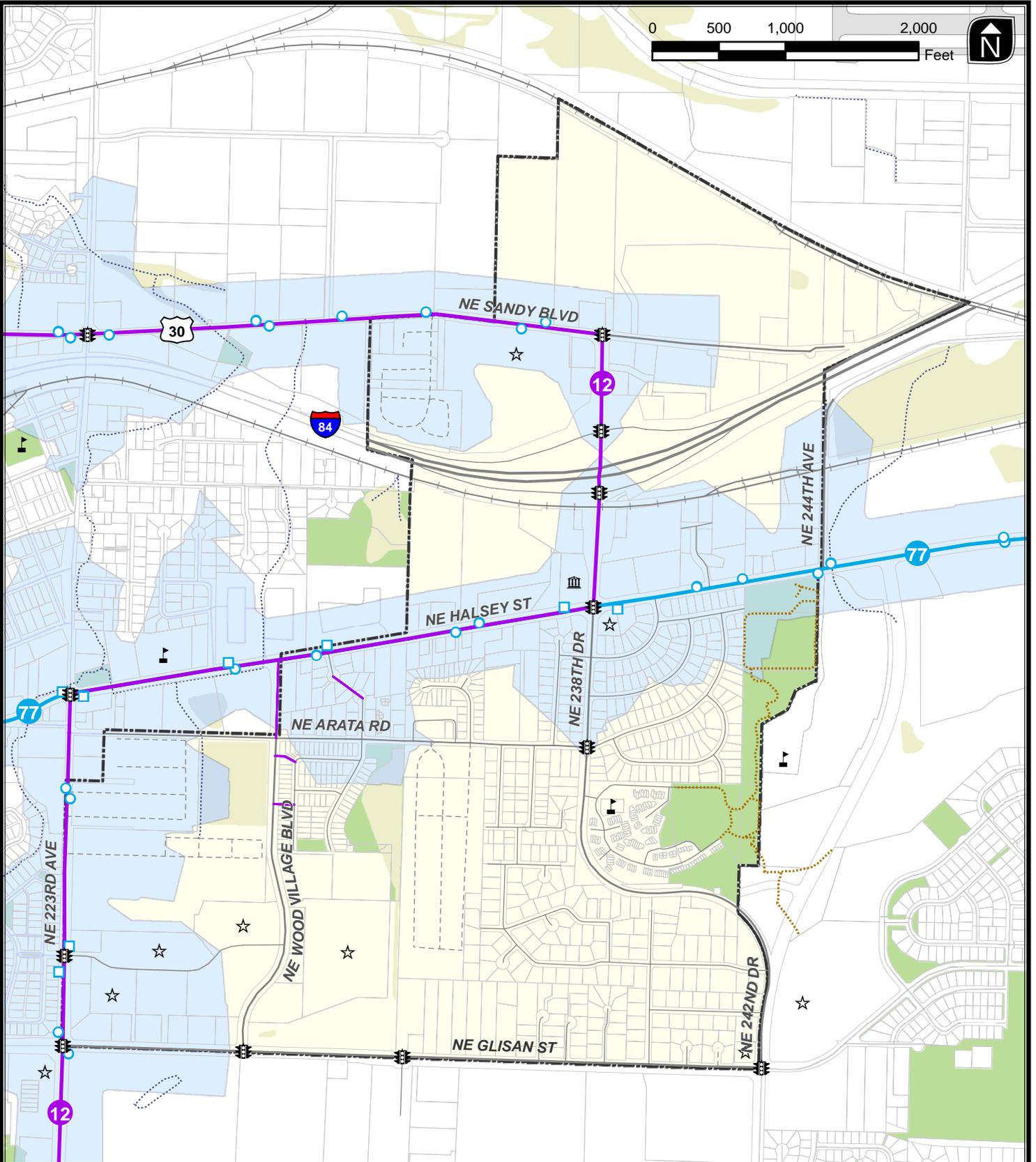
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Transit Facilities	Map Features
Bus Stop	Other Streets
Bus Stop with Shelter	Tax Lots
Bus Route	Railroads
	Streams
	Wetlands
	Parks
	City Limits
	City Hall
	School
	Shopping

Transit Service Routes & Stops

Figure 4

Figure 5 Transit Service Coverage Area (figure to be updated)



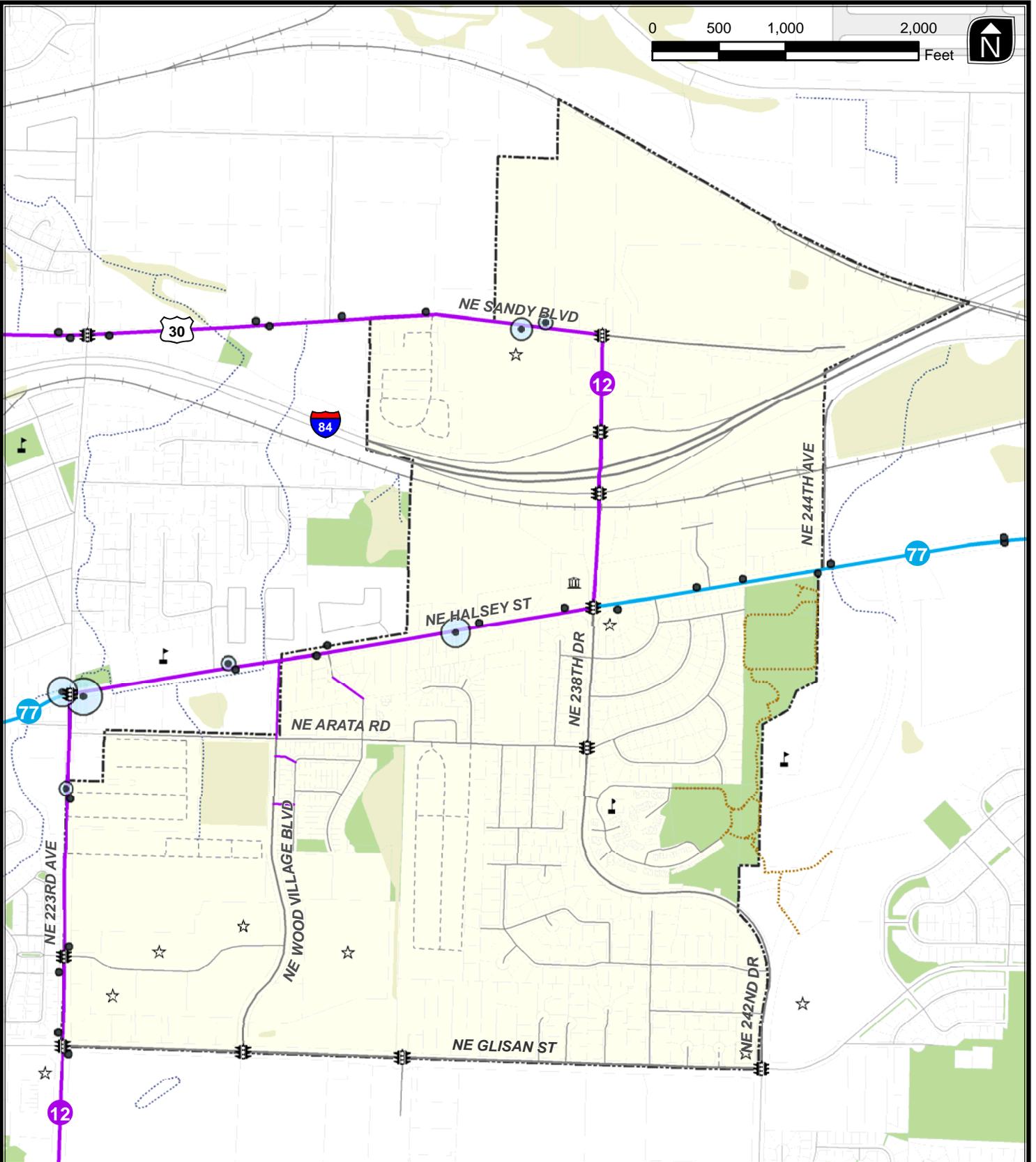
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Transit Facilities		Map Features	
Bus Stop	Other Streets	Signal	City Hall
Bus Stop with Shelter	Tax Lots	City Hall	School
Route 12	Railroads	School	Shopping
Route 77	Streams	Wetlands	
Transit Coverage Area	Parks	City Limits	

Transit Service Coverage Area

Figure 5

Figure 6 Transit Ridership (figure to be updated)



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Ridership		Map Features	
	0 - 15		Other Streets
	16 - 25		Tax Lots
	26 - 35		Railroads
	36 - 75		Streams
	75+		Wetlands
			Parks
			City Limits
			Signal
			City Hall
			School
			Shopping

Transit Ridership

Figure 6

The stops located along NE Halsey Street between NE Wood Village Boulevard and NE 238th Drive and along NE Sandy Boulevard adjacent to one the city's major commercial areas generate a significant number of trips. The city should prioritize access improvements to these stops. .

Pedestrian System

Traditionally, pedestrian facilities serve a variety of needs, including:

- Relatively short trips (generally considered to be under a mile) to major pedestrian attractors, such as schools, parks, and public facilities;
- Recreational trips (e.g., jogging or hiking) and circulation within parks;
- Access to transit (generally trips under ½-mile to bus stops); and,
- Commute trips, near mixed-use development and/or where people live near where they work.

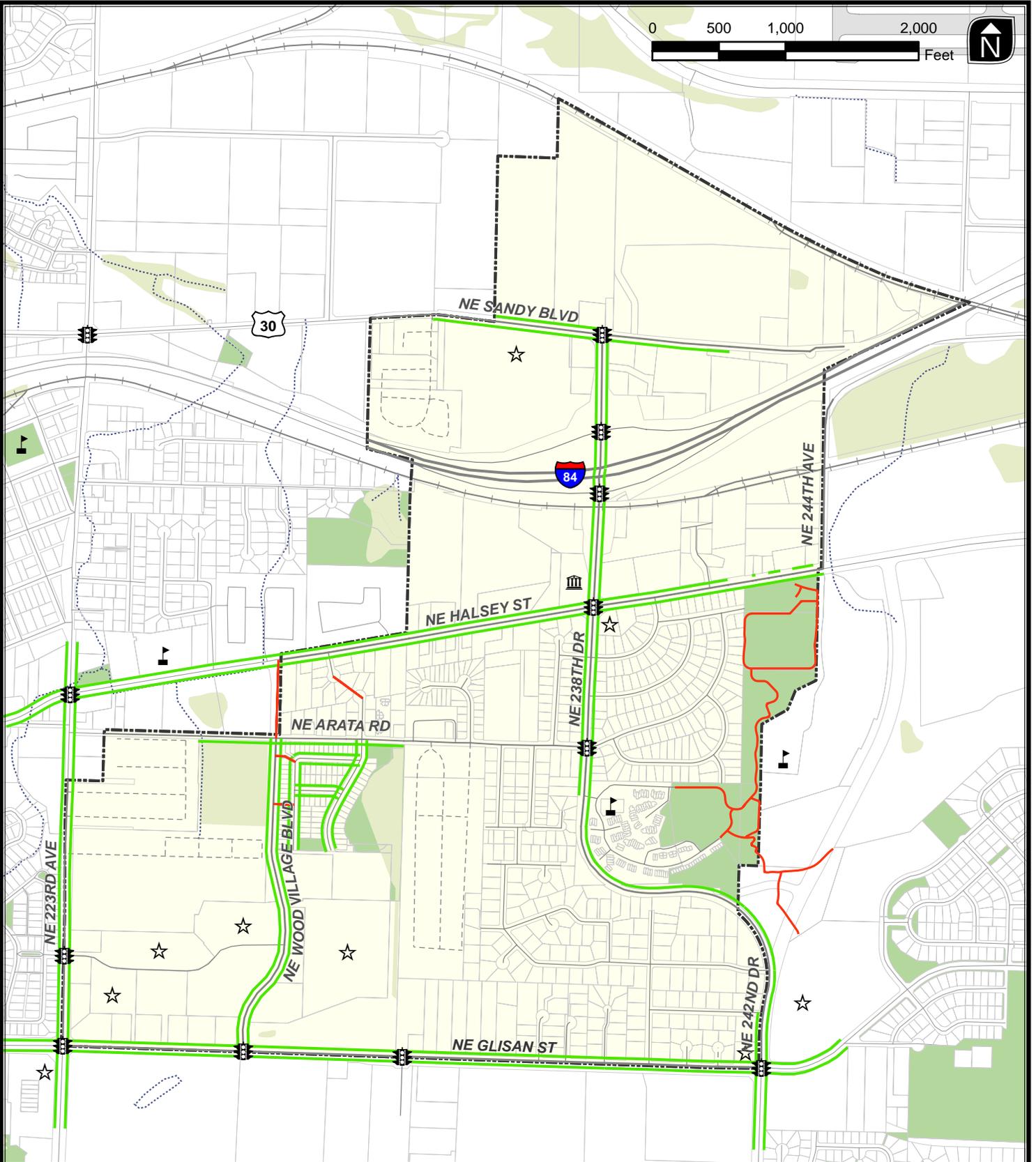
Pedestrian facilities should connect transit stops to residential, retail, and commercial areas throughout the city and effectively separate pedestrians from conflicts with vehicular traffic. Furthermore, pedestrian facilities should provide continuous connections among neighborhoods, employment areas, and nearby pedestrian attractors. Pedestrian facilities usually refer to sidewalks or paths, but also include pedestrian crossing treatments for high volume roadways such as NE Sandy Boulevard, NE Halsey Street, and NE Glisan Street.

The pedestrian system serving Wood village consists of sidewalks, multi-use paths and trails as well as marked and unmarked, signalized and unsignalized pedestrian crossings (multi-use paths and trails are addressed in a separate section below). Figure 7 shows the existing pedestrian facilities serving Wood Village along with major pedestrian generators and attractors such as parks, public schools, and transit stops. A majority of the arterial and collector streets within Wood Village currently provide sidewalks on both sides of the roadway.

PEDESTRIAN CROSSINGS

All unsignalized intersections in Oregon are considered legal crosswalks and motorists are required to yield the right-of-way to allow pedestrians to cross. However, compliance is not consistent statewide and pedestrians may have a difficult time crossing high volume roadways. The City of Wood Village has several intersections along key roadways with unmarked crossings that rely on drivers to yield the right-of-way. Along with the crosswalks at signalized intersections, one marked pedestrian crossing location is on Halsey just west of the intersection with Wood Village Boulevard. NE Halsey Street has a

Figure 7 Existing Pedestrian Facilities



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Pedestrian Facilities		Map Features	
	Pedestrian Path		Other Streets
	Sidewalks - Both Sides		Tax Lots
	Sidewalks - One Side Only		Railroads
			Streams
			Wetlands
			Parks
			City Limits
			Signal
			City Hall
			School
			Shopping

Existing Pedestrian Facilities

Figure 7

signalized crossing at the NE 223rd Avenue intersection, west of the Wood Village Boulevard intersection and then at the 238th Avenue intersection located approximately 1/2 mile to the east.

This and other roadways throughout the Wood Village tend to have long segments without a marked pedestrian crossing, requiring a significant amount of out-of-direction travel for the pedestrian. The Gresham Vista industrial property development in Gresham, immediately across Glisan from Wood Village, provides a pedestrian crossing at the signalized intersection at the entry to On Semiconductor and facilities at 242 and 223, leaving similar large distances between safe pedestrian crossings to a newly developing employment center. The city or county could enhance the pedestrian environment at these locations and will further review these locations in the opportunities analysis.

Bicycle System

Similar to pedestrian facilities, bicycle facilities (including dedicated bicycle lanes in the paved roadway, multi-use paths shared with pedestrians, etc.) serve a variety of trips. These include:

- Trips to major attractors, such as schools, parks and open spaces, retail centers, and public facilities;
- Commute trips, where changing and showering facilities are provided at the workplace;
- Recreational trips; and
- Access to transit, where bicycle storage facilities are available at the stop, or where space is available on bus-mounted bicycle racks.

OREGON BICYCLE AND PEDESTRIAN PLAN

The following general guidelines were derived from the *Oregon Bicycle and Pedestrian Plan* (Reference 4).

- Dedicated bicycle facilities should be provided along major streets where automobile traffic speeds are significantly higher than bicycle speeds.
- Bicycle facilities should connect residential neighborhoods to schools, retail centers, and employment areas.
- Allowing bicycle traffic to mix with automobile traffic in shared lanes is acceptable where the average daily traffic (ADT) on a roadway is less than 3,000 vehicles per day.
- Lower volume roadways should be considered for bike shoulders or lanes if anticipated to be used by children as part of a Safe Routes to School program.

- In areas where there is no street connection currently or where substantial out-of-direction travel would otherwise be required, a multi-use path may be appropriate to provide adequate facilities for bicyclists.

The city's TSP provides similar guidelines for bicycle facilities on local streets. Bikeways on local streets with less than 3,000 ADT consist of shared roadways, which is consistent with the cross sections for local streets provided in the city's 2001 update. Bicycle lanes are appropriate on all arterial and collector roadways.

Figure 8 illustrates the existing bicycle facilities within Wood Village. A majority of the collector and arterial roadways currently have bicycle facilities on both sides of the roadway with the exception of segments along NE Sandy Boulevard, NE Arata Road, NE 238th Drive, and the NE 244th Avenue connection to the Columbia river Highway.

Multi-Use Paths & Trails

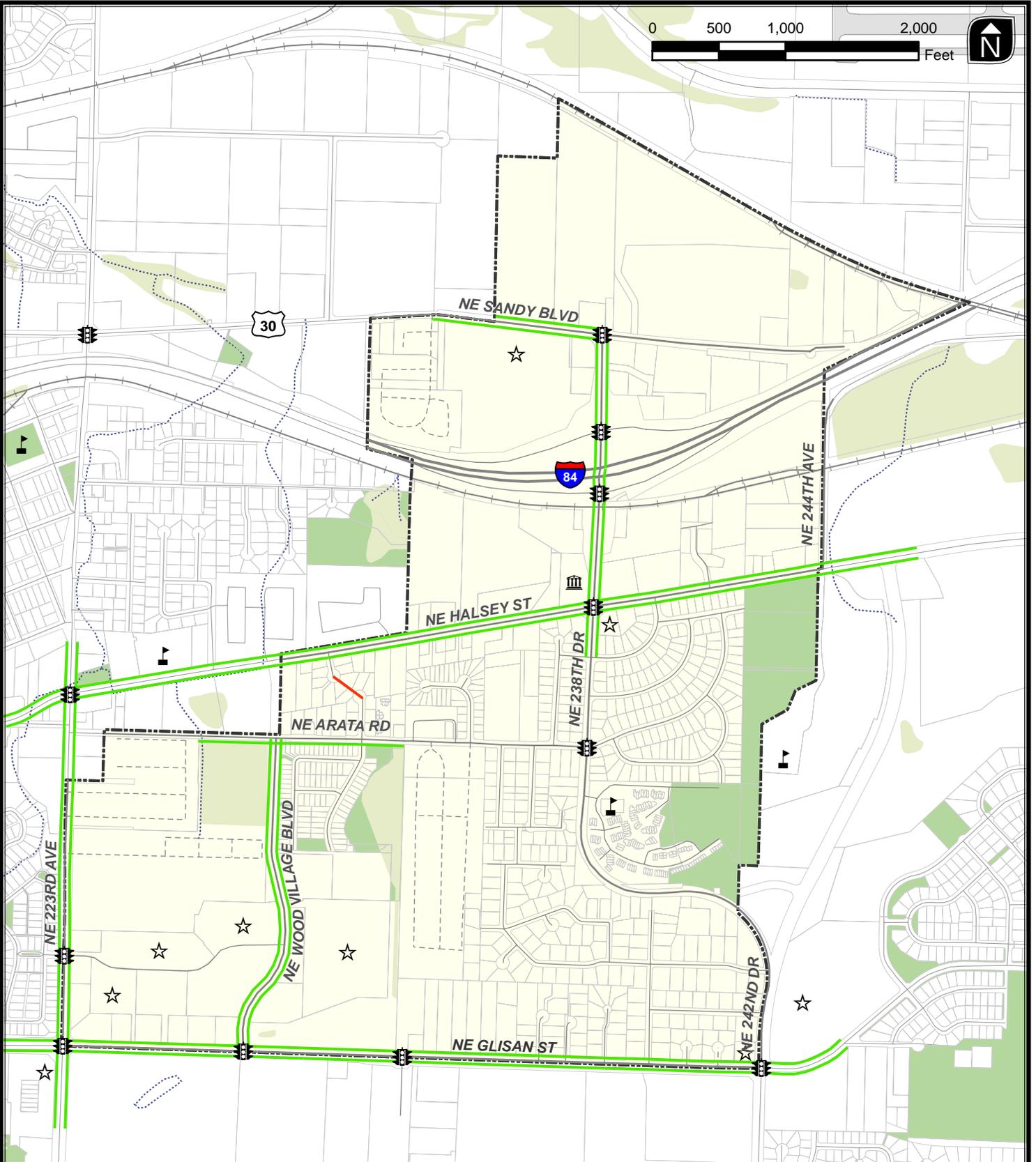
Figure 7 and Figure 8 also illustrate the multi-use paths and trails located within Wood Village that augment and support the pedestrian and bicycle systems. These paths and trails play an important role in providing pedestrian and bicycle circulation within the city. The most notable trail system is located within Donald L Robertson City Park. Pathways are under construction from Halsey to Bridge Street, and along Arata Road. These multi-use paths and trails provide off-street connections throughout the city.

Rail Service

There is one Union Pacific Railroad (UPRR) freight line that traverses the northern half of Wood Village. The UPRR Graham Line extends through Wood Village paralleling the south side of I-84 connecting the city of Portland to the west and the city of Boise to the east.

The maximum authorized speed for freight trains along the Graham Line is 55 mph under UPRR's current timetable. However, this is a Class 4 track so freight speeds could go as high as 60 mph if UPRR revises its timetable. There are on average approximately 33 train movements per day. Given the rail line's location adjacent to I-84, there is only one at-grade crossing within the city at NW 244th Avenue. This crossing is controlled by a gated signalized crossing. All other crossings are grade separated.

Figure 8 Existing Bicycle Facilities



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Pedestrian Facilities		Map Features	
	Bike Lanes - Both Sides		Other Streets
	Bike Lanes - One Side Only		Tax Lots
	Pedestrian Path		Railroads
			Streams
			Wetlands
			Parks
			City Limits
			Signal
			City Hall
			School
			Shopping

Existing Bicycle Facilities

Figure 8

Refer to Section 2 of the 1999 City of Wood Village TSP for additional information related to existing rail service within Wood Village.

Air Service

Refer to Section 2 of the 1999 City of Wood Village TSP for additional information related to existing air service within Wood Village.

Pipeline Service

Refer to Section 2 of the 1999 City of Wood Village TSP for information related to Pipeline Service within Wood Village.

Section 5 Existing Traffic Conditions

INTERSECTION OPERATIONS

Metro prepared intersection analyses within the EMCP study area. Table 2 shows three study area intersections within Wood Village. All intersections perform at or above the minimum requirements.

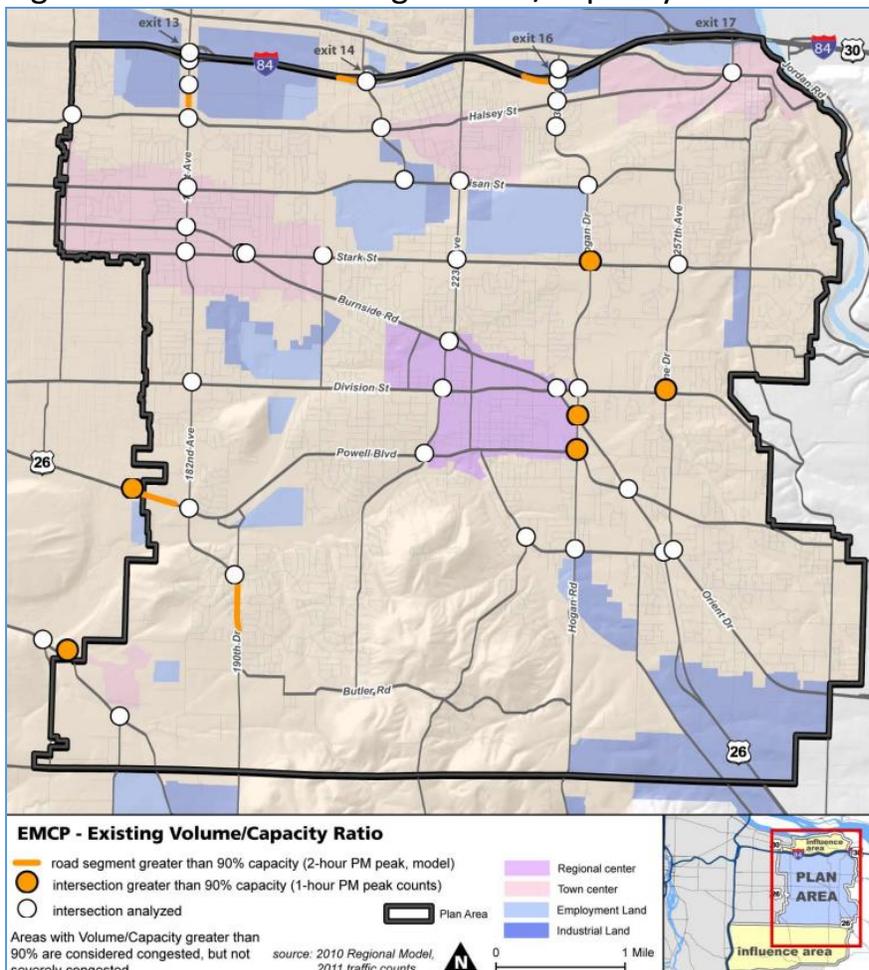
Table 2. Wood Village Intersection Performance, 2010

Intersection	Jurisdiction	Minimum LOS	2010	
			LOS	v/c
Glisan Street & 223rd Avenue	Multnomah County	D	C	0.75
Glisan Street & 242nd Drive	Multnomah County	D	D	0.87
Arata Street & 238th Drive	Multnomah County	D	A	0.62

LOS: Level of Service; v/c: volume to capacity

Figure 10 shows the EMCP existing conditions analysis, indicating the eastbound ramp off of I-84 performs at greater than 90% capacity during the 2-hour PM peak period.

Figure 10 EMCP Existing Volume/Capacity Ratio

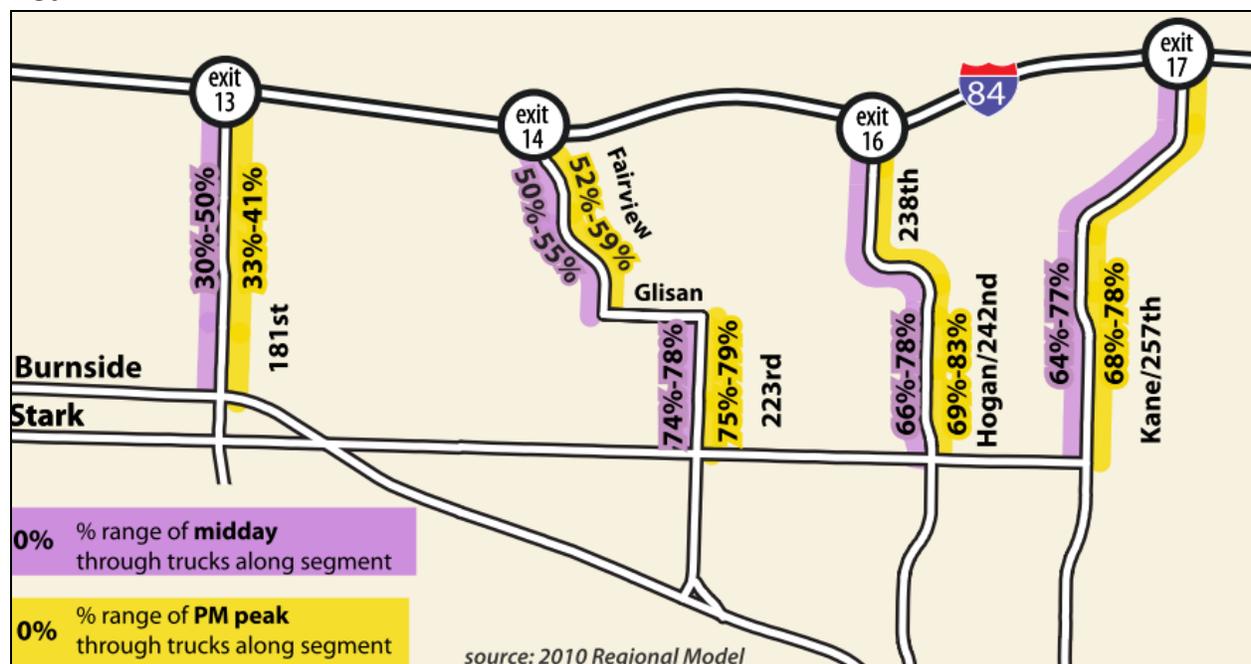


Source: EMCP July 27, 2011 Steering Committee Packet

FREIGHT OPERATIONS

Metro conducted a truck travel analysis within the EMCP study area as part of the plan. The analysis found that truck traffic represents only 1 to 2 percent of total vehicle trips in the EMCP study area and is evenly split on north-south and east-west arterials, which includes Glisan Street, Halsey Street, Sandy Boulevard, NE 223rd Avenue and NE 238th/242nd Drive. The majority of truck traffic on 238th/242nd/Hogan between I-84 and Glisan was traveling through the city rather than having an origin or destination in Wood Village and this was the preferred route for trucks traveling between I-84 and US 26. Through traffic was 66 to 78 percent of all trucks using the corridor during midday and 69 to 83 percent of PM peak trips. Because of this prominent through trip function, Metro added 238th/242nd/Hogan to the regional freight system. Figure 11 shows the through truck use compared to all truck trips during the midday and PM peak for several north-south arterials in the ECMP study area.

Figure 11 Truck through Trips as a Percentage of All Truck Trips, Midday and PM Peak



Source: Metro. EMCP. July 27, 2011. Steering Committee Meeting Materials.

Traffic Safety

This section provides an analysis of roadway safety information in Wood Village. The project team reviewed I-84 for areas on the ODOT Safety Priority Index System (SPIS). This is followed by an analysis of crash data at key intersections for the five-year period from January 1, 2005 to December 31, 2009. The EMCP included a safety conditions evaluation on major roadways in the study area. The section below includes safety analysis findings.

STATEWIDE PRIORITY INDEX SYSTEM

The Statewide Priority Index System (SPIS) is a system developed by ODOT for identifying hazardous locations on state highways through consideration of crash frequency, crash rate, and crash severity. As described by ODOT, a roadway segment is designated as a SPIS site if a location experiences three or more crashes or one or more fatal crashes over a three-year period. Under this method, all state highways are analyzed in 0.10 mile segments to identify SPIS sites. Statewide, there are approximately 6,000 SPIS sites. SPIS sites are typically intersections, but can also be roadway segments. Within Wood Village, ODOT has not identified sites in the top ten percent of ODOT’s SPIS ranking program for 2010¹. However, ODOT has included the segment of I-84 through Wood Village in the state’s Safety Investment Program (SIP), given that there have been three to five crashes over the last three-year period.

CRASH DATA ANALYSIS

ODOT provides detailed intersection crash data for all crashes that occurred in Wood Village for the five-year period from January 1, 2005 to December 31, 2009. Table 3 summarizes the frequency and types of crashes that occurred at major intersections during this time period.

Table 3. Intersection Crash History (January 1, 2005 – December 31, 2009)

Intersection	Collision Type				Severity			Total
	Rear-End	Turning	Angle	Other	PDO	Injury	Fatal	
NE 223 rd Avenue/ NE Glisan Street	12	6	1	2	7	14	0	21
NE 223 rd Avenue/ NE Park Lane	3	1	3	0	2	5	0	7
NE 238 th Drive/ NE Arata Road	4	13	1	1	12	7	0	19
NE 238 th Drive/ NE Halsey Street	11	3	1	0	5	10	0	15
NE 238 th Drive/ I-84 EB Ramp	11	10	2	1	15	9	0	24
NE 238 th Drive/ I-84 WB Ramp	5	6	0	3	10	4	0	14
NE 238 th Drive/ NE Sandy Boulevard	0	17	0	0	4	13	0	17

¹ It is important to note that the SPIS data reported for 2010 is based on 2007-2009 crash data whereas all other crash data analysis presented within this report reflects the period beginning January 1, 2005 through December 31, 2010.

NE 242 nd Avenue/ NE Glisan Street	6	4	5	3	7	11	0	18
NE 223 rd Avenue/ NE Arata Road	0	2	0	1	2	1	0	3
NE 223 rd Avenue/ NE Halsey Street	6	4	5	0	10	5	0	15
NE Wood Village Boulevard/ NE Arata Road	0	0	0	0	0	0	0	0
NE Wood Village Boulevard/ NE Glisan Street	1	0	1	2	2	2	0	4
NE Wood Village Boulevard/ NE Park Lane	0	2	0	1	3	0	0	3

PDO – Property Damage Only

The EMCP also examined safety data. The plan ranked arterial segments by the number and severity of crashes. Table 4 shows that the 238th/242nd/Hogan corridor between I-84 and Halsey Street was the only corridor segment in Wood Village that was ranked within the EMCP study area. It is in the top ten percent of ODOT’s SPIS ranking program as of February 2015.

Table 4. Wood Village Crash Analysis Ranking within the EMPC Study Area

Corridor	Segment		Miles	All Crashes in the EMCP Study Area		Ped/Bike Crashes in the EMCP Study Area	
	From	To		Rank	Statewide Priority Index System-based Relative Score	Rank	Ped/Bike Score
238th/242nd/Hogan	I-84 ramp	Halsey	0.16	8th	1,235	5 th	618

Section 6

Needs, Opportunities, & Constraints

NEEDS, OPPORTUNITIES, & CONSTRAINTS

This section summarizes the needs, opportunities, and constraints associated with the existing transportation system. The following sections address street system connectivity along with the pedestrian, bicycle, and transit facilities along each of the major arterial and collector roadways. The freight system is addressed separately as it pertains to only specific roadways within Wood Village.

Street System

A well-connected transportation network minimizes the need for out-of-direction travel while supporting efficient distribution of travel demand among multiple parallel roadways. The most common example of an efficient transportation network is the traditional grid system, with north-south and east-west streets spaced at generally equal distances. NE Sandy Boulevard, NE Halsey Street, NE Glisan Street, NE 223rd Avenue and NE 238th/242nd Drive are all part of a larger grid system that provides connectivity on a regional level as well as access within Wood Village. The only exceptions to the grid are due to topographical and other natural constraints as well as existing development patterns. The following sections highlight the needs associated with greater street system connectivity within Wood Village.

ARTERIAL CONNECTIVITY

The RTP identifies spacing guidelines of one mile between regional arterials. At a technical level, many of the major roadways within Wood Village meet these guidelines for arterial connectivity. However, the general lack of lower classification roadways that parallel these routes focuses excessive demand on only a few major roadways. NE Arata Road and NE Wood Village Boulevard provide alternative east-west and north-south connections through the south end of Wood Village, however, other areas within the city lack these types of alternative routes.

COLLECTOR AND LOCAL STREET CONNECTIVITY

The RTP identifies collector and local streets as general access facilities for neighborhood circulation and as support facilities for the regional transportation network. Connectivity at these levels is especially important for local pedestrian and bicycle trips. The RTP recommends a maximum spacing of 1/2 mile for collectors and 1/10 mile for local streets in order to encourage local traffic to use these streets instead of higher order facilities, such as arterials.

Many of the local streets within Wood Village are characterized by numerous cul-de-sacs and stub streets. These can limit traffic speeds and volumes on local streets. However, they also result in indirect travel paths and a reliance on arterials for local trips. Opportunities for new roadway connections in Wood Village are limited and may be very expensive due to topographical and other natural constraints as well as the built environment. Figure 13 illustrates the existing street stubs in Wood Village. As new development occurs, new roadways should be constructed to create a more efficient network consistent with the RTP guidelines.

There are gaps and opportunities for improvement for specific streets in Wood Village's existing roadway system. The following sections describe gaps and issues that should be addressed within the city's street network to provide better multimodal mobility and access for vehicles and trucks as well as pedestrians and bicyclists.

NE Sandy Boulevard

NE Sandy Boulevard is a minor arterial through Wood Village that provides local and regional access to major centers and commercial and industrial uses. The 2001 Sandy Boulevard corridor refinement plan identifies land use and transportation solutions to guide new development, redevelopment, and public investment along the Sandy Boulevard to achieve the Corridor Vision. The study identified land use solutions and modeled future transportation conditions. Other solutions facilitate neighborhood connectivity and encourage corridor investment. The EMCP analysis includes this corridor solution. In 2015, Multnomah County initiated a street design refinement keeping with the desires to see improved safety for all roadway users while responding to industrial and freight needs.

Opportunity: Reconstruct Sandy Boulevard to minor arterial standards, per the design refinement study ongoing (STIP ID 18020).

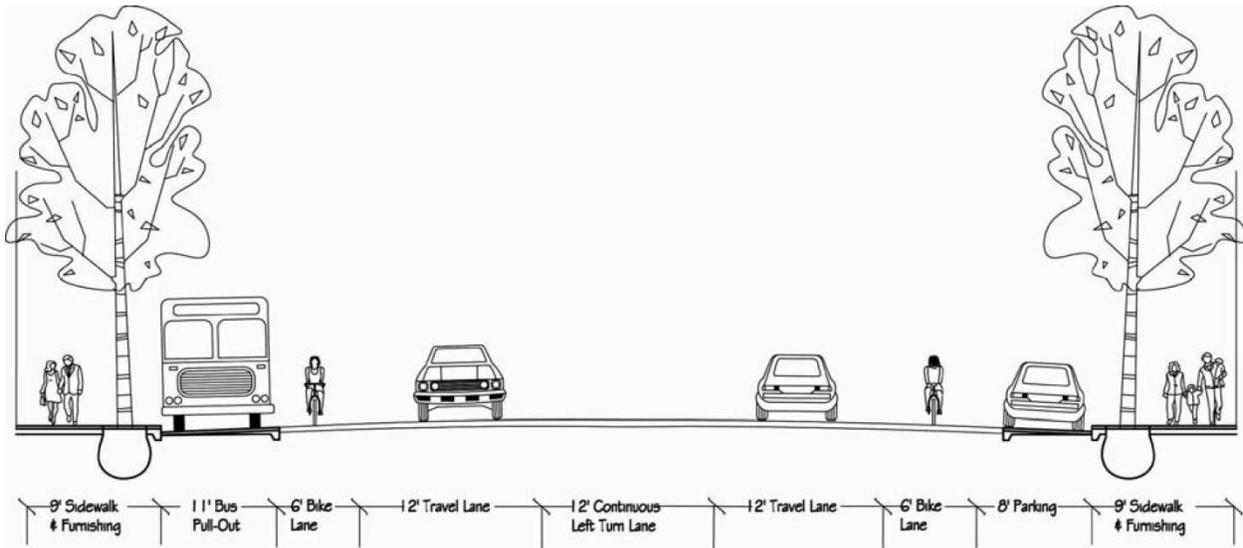
NE Halsey Street

Halsey Street provides access to residential areas through Wood Village. Beyond the city, Halsey Street provides connection to regional centers. In the fall of 2015, the cities of Wood Village, Troutdale and Fairview obtained a grant to study economic development opportunities along Halsey Street. The 2005 Halsey Street Conceptual Design Project (Reference 6) presented minor arterial improvements that focused on multimodal transportation improvements for bicycles, pedestrians and transit. The economic development project was initiated in July of 2016 and may refine the street cross section developed in 2005.

Opportunity: Reconstruct Halsey to minor arterial standards with construct any modifications determined by the economic development opportunities study. The 2005 cross section included one lane in each direction, adding a center turn lane/median, and providing sidewalks and bicycle lanes on

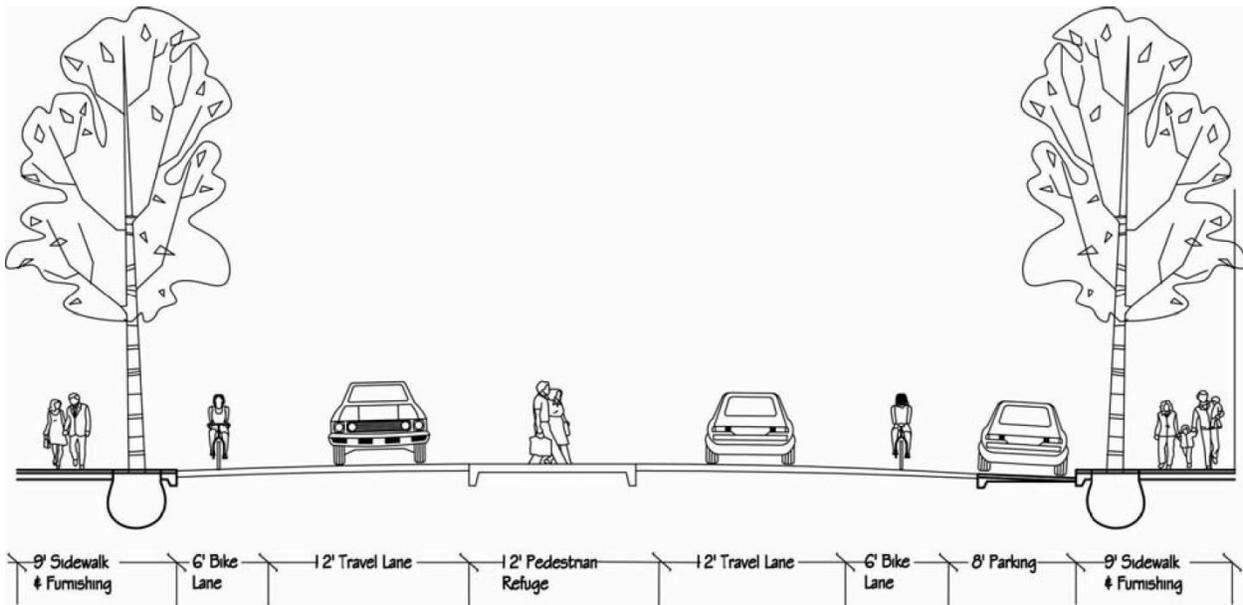
both sides of the street (RTP ID 11287). Exhibits 1 and 2 show the recommended cross-sections for NE Halsey Street from the Halsey Street Project, however, they may be modified as part of the new study. The cross sections are consistent with Multnomah County's standard cross-section for a minor arterial.

Exhibit 1: NE Halsey Street Cross Section with 12-foot continuous Left Turn Lane



Source: 2005 Halsey Street Conceptual Design Project

Exhibit 2: NE Halsey Street Cross Section with 12-foot Pedestrian Refuge



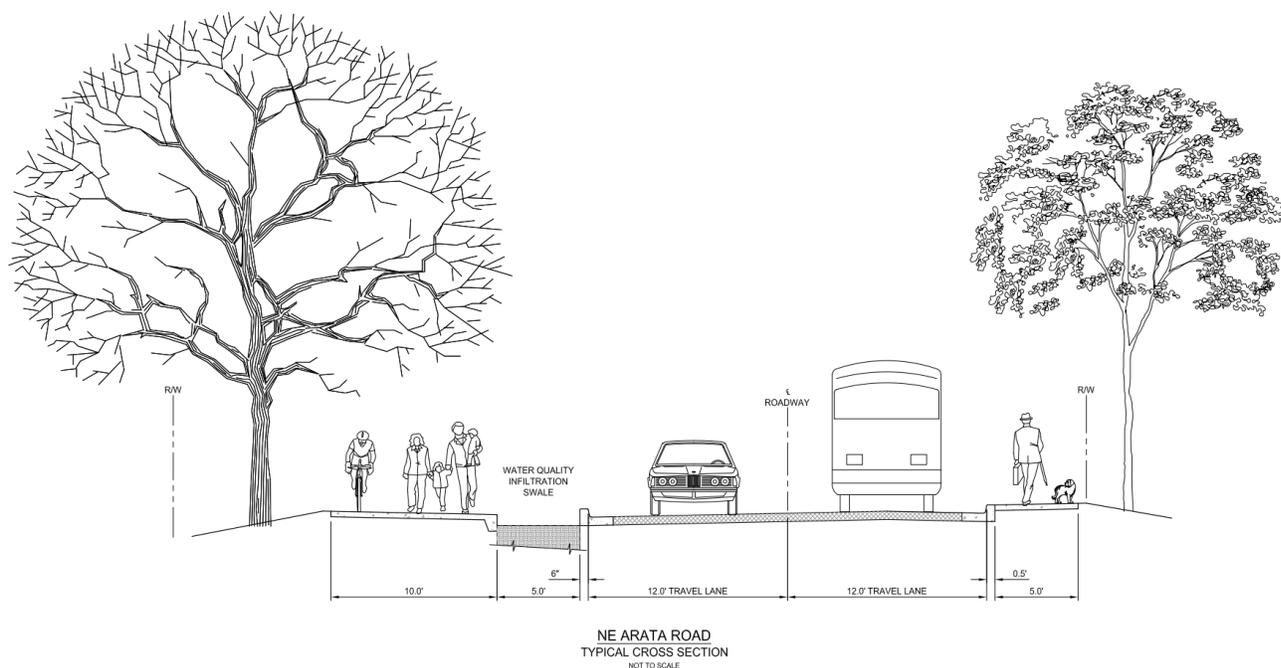
Source: 2005 Halsey Street Conceptual Design Project

The 2035 RTP project list includes reconstructing NE Halsey Street between NE 238th Drive and the Columbia River Highway to minor arterial standards with a center turn lane/median, sidewalk and bike lanes consistent with the Halsey Street Conceptual Design Plan. The time period for the reconstruction is 2008-2017.

NE Arata Road

The 2008 Arata Road Conceptual Design Plan (Reference 7) developed a multi-modal street design for Arata Road within the cities of Wood Village and Fairview to accommodate bicycles, pedestrians, and vehicles. The cities identified Arata Road as a substandard street with pedestrians and cyclist safety concerns and drainage issues. The street design has evolved as the project entered into preliminary and final design in 2014/2015. The typical street cross-section is provided in Exhibit 3. Construction began in the fall of 2016 and should be complete in late summer 2017 (RTP ID 10387, STIP ID 18019).

Exhibit 3: NE Arata Road Typical Cross Section (looking east)



Source: Arata Road Active Transportation Project, Multnomah County

NE 238th/NE 242nd/NE Hogan Drive

The Wood Village I-84 Interchange (exit 16) provides access to main thoroughfares in east metro, including NE 238th/Hogan Drive, Halsey and Glisan streets in Wood Village; further south to Stark and Division; and east and west toward NE 223rd and SW 257th Avenues. Significant destinations outside Wood Village include Mt. Hood Community College, Gresham Golf Course, and McMenamins Edgefield. There are current capacity, mobility and accessibility issues today and will likely increase into the future (between 2010 and 2035):

- Southbound NE 238th Drive (county owned) will continue to be congested and this condition will spread.
- Northbound on NE 238th Drive (county owned) will experience a 13 percent increase in traffic congestion over the planning period.
- Lack of sidewalks and bike lanes on the hill portion of 238th Drive.

Table 5 shows the projects identified through the various planning processes recommended for this corridor.

Table 5. Projects to Address Capacity and Mobility Issues

Opportunity	Description	Source
238th/242nd/Hogan corridor management (RTP ID 99143).	Install Adaptive Signal timing	EMCP
Reconfigure NE 238th Avenue (RTP ID 99132)	Repurpose the climbing lane on NE 238th Avenue between NE Glisan and NE Halsey avenues to construct the roadway to arterial standards, including wider lanes, median/turn lane, and bicycle/pedestrian facilities	EMCP
Widen NE 238th and Glisan Avenue (RTP ID 99132)	Address capacity issues at the intersection through widening	EMCP
Ramp queuing study at I-84/NE 238th Drive interchange	The study should develop strategies and improvements to reduce system backups onto I-84 and queuing on the off-ramps.	TCMP and TSP

Wood Village Town Center Local Street Network

The Wood Village Town Center is roughly 81 acres and is partially developed with just over 400,000 square feet of mainly larger retail outlets. The Town Center is bounded to the north by Arata Road, west by 223rd Avenue, south by Glisan Street, and to the east by a wetland. Wood Village Boulevard is the only public arterial street through the Town Center. There are private roadways through the big-box retail parking lots; however, these roadways do not provide adequate multimodal pedestrian, bicycle or freight accessibility.

The TCMP planning effort identified a preferred alternative that addresses both land use and transportation. Specific transportation related evaluation criteria of the TCMP support the hierarchy of solutions in the RTFP. They are:

- Block widths range from 225-250 feet, lengths from 250-425 feet and blocks have alleys or rear lanes.
- Local road network accommodates future traffic volumes at v/c of 0.99 or better.
- More people have ½ mile access to schools, recreation facilities, transit and shopping centers.

- Enhance safety and comfort of multimodal travel as measured through pedestrian level of service.

There are several local street network opportunities identified as part of the Town Center (bicycle and pedestrian opportunities are identified in the following section):

- Construct new east-west streets north of the old Multnomah Greyhound track and south of the Fred Meyer and Khol's at the appropriate block width ranges.
- Construct new north-south streets at the appropriate block width ranges.

Figure 12 displays the general street network for the Town Center.

Figure 12 [Draft] Town Center Street Network Plan



Pedestrian and Bicycle Systems

Section 2.2 of the Multnomah County Design and Construction Manual (Reference 5) provides standard cross-sections for all major arterial and collector streets through Wood Village, including NE Sandy Boulevard, NE Halsey Street, NE Arata Road, NE Glisan Street, NE 223rd Avenue, NE Wood Village Boulevard, and NE 238th/242nd Drive. Based on the manual, all arterial and collector streets should include sidewalks and bike lanes on both sides of the roadway unless significant restrictions in right-of-way exist.

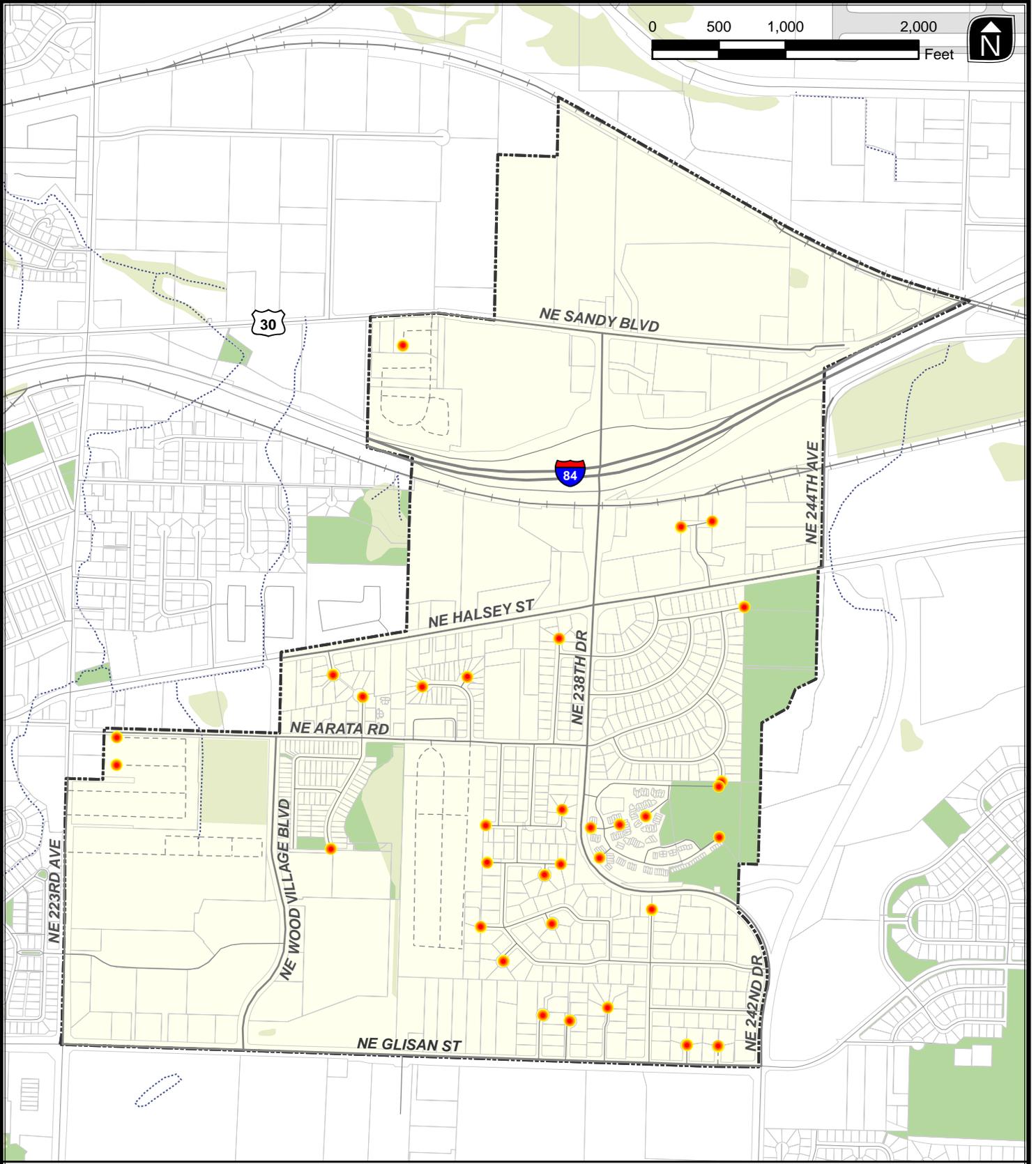
Most of the arterial and collector streets within Wood Village currently provide sidewalks and bike lanes on both sides of the roadway and most major intersections are signalized with marked pedestrian crossings. However, there are number of gaps in the pedestrian and bicycle systems and locations where opportunities to improve access and circulation exist. Figure 14 and Figure 15 illustrate the gaps in the pedestrian and bicycle systems as well as the location of major pedestrian generators within the city, such as parks, public schools, and transit stops. Also illustrated on the figures are the locations of major intersections throughout Wood Village and the types of traffic control (marked, unmarked, signalized, and unsignalized).

The following sections highlight the gaps in the pedestrian and bicycle systems as well as opportunities to improve access and circulation throughout Wood Village.

NE SANDY BOULEVARD

NE Sandy Boulevard provides access to several major commercial and industrial areas located within Wood Village as well as major regional centers west of the city limits. Figure 14 and Figure 15 shows pedestrian and bicycle facilities along the segment of NE Sandy Boulevard between the Wood Village Park mobile home park access and NE 238th Drive (adjacent to Walmart) and the NE 238th Drive/NE Sandy Boulevard intersection marked and signalized for pedestrian crossings.

Figure 13 Local Street Stubs (2012 TSP Figure 9)



Street Stubs

- Cul-De-Sacs/Dead-End Street Stubs

Map Features

- Other Streets
- Tax Lots
- Railroads
- Streams
- Wetlands
- Open Spaces
- City Limits

Local Street Stubs

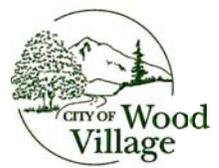
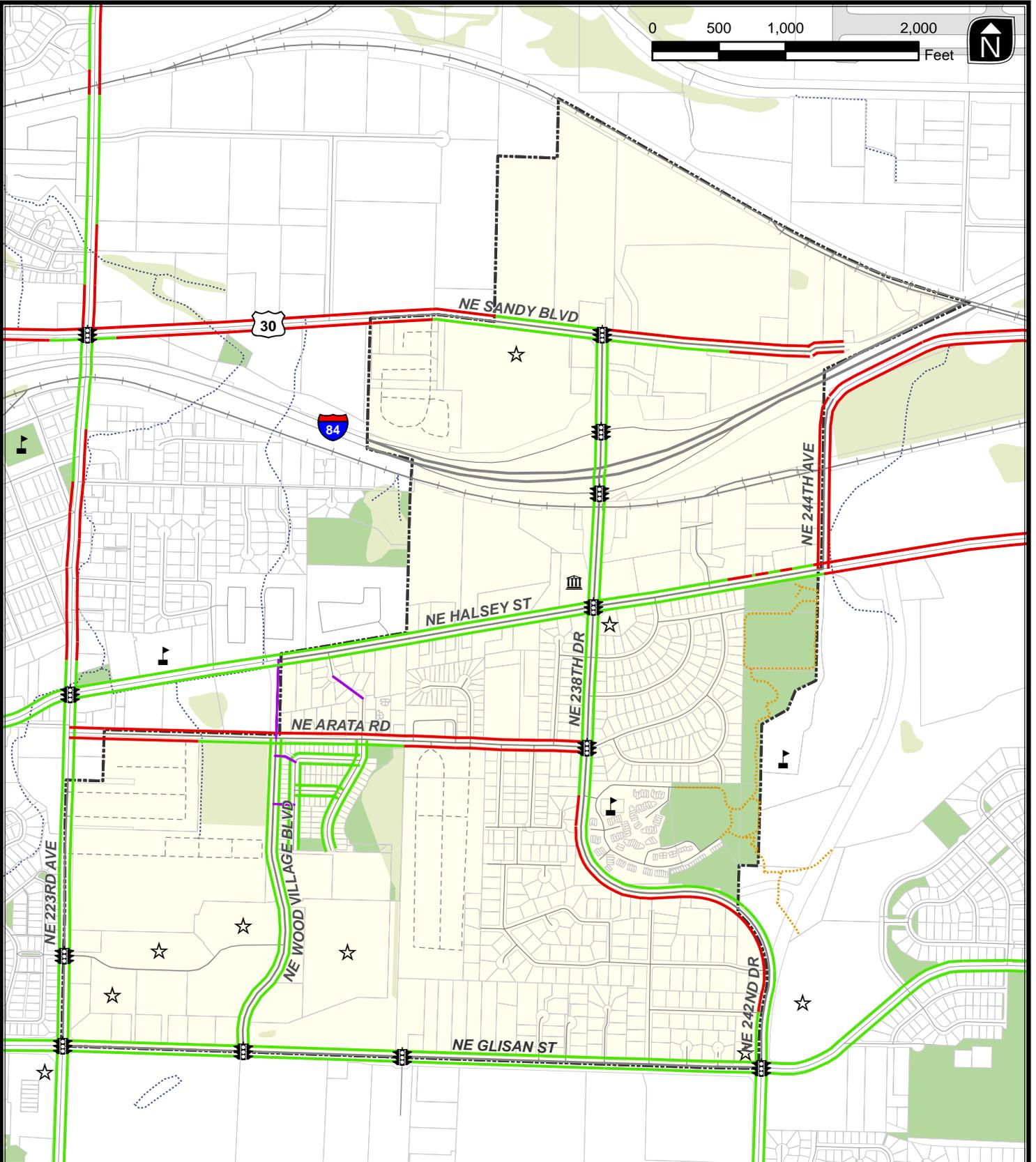


Figure 9

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Figure 14 Existing Pedestrian System Deficiencies (2012 TSP Figure 10)



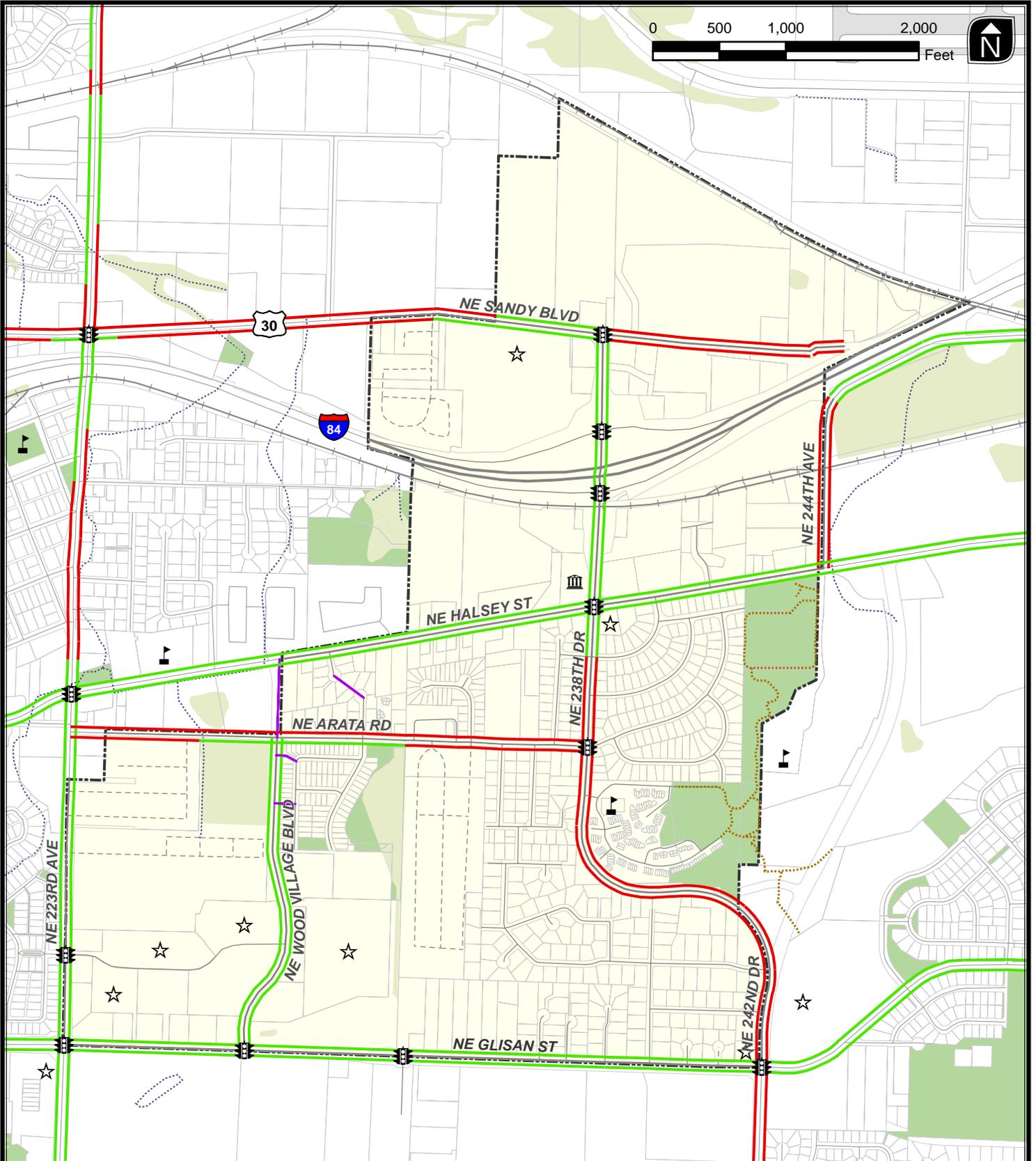
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Pedestrian Facilities	Map Features
Multi-Use Path	Other Streets
Nature Trail	Tax Lots
Sidewalks - Both Sides	Railroads
Sidewalks - North Side Only	Streams
Sidewalks - South Side Only	Wetlands
Sidewalks - Eastside Only	Parks
No Sidewalks	City Limits
	Signal
	City Hall
	School
	Shopping

Existing Pedestrian System Deficiencies

Figure 10

Figure 15 Existing Bicycle System Deficiencies (2012 TSP Figure 11)



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Bicycle Facilities	Map Features
Bike Lanes - Both Sides	Other Streets
Bike Lanes - One Side Only	Tax Lots
No Bike Lanes	Railroads
Multi-Use Path	Streams
Nature Trail	Wetlands
	Parks
	City Limits
	Signal
	City Hall
	School
	Shopping

Existing Bicycle System Deficiencies



Figure 11



NE Sandy Boulevard (Facing East)

The segment of NE Sandy Boulevard west of the Wood Village Park mobile home park access within the city limits currently lacks pedestrian and bicycle facilities and the entire stretch of the roadway between the city limits and NE 238th Drive lacks marked and/or signalized pedestrian crossings. Developing sidewalks along both sides of NE Sand Boulevard along with enhanced pedestrian crossings at key locations would help improve access to the land uses and transit stops located along both sides of the roadway. Coordination

with the City of Fairview may be required to develop continuous pedestrian and bicycle facilities further west of the city limits.

The 2035 RTP project list includes the reconstruction of NE Sandy Boulevard between NE 207th Avenue and NE 238th Drive to minor arterial standards with bike lanes sidewalks and drainage improvements. The time period for the reconstruction is 2008-2017.

NE HALSEY STREET

NE Halsey Street provides access to several of the residential areas located within Wood Village as well as major regional centers located east and west of the city limits. Figure 14 and Figure 15 shows continuous pedestrian and bicycle facilities along both sides of the roadway within the city limits. Also, NE 238th Drive/NE Halsey Street intersection and the NE 223rd Avenue/NE Halsey Street intersection (technically located outside the city limits) are marked and signalized for pedestrian crossings.



NE Halsey Street (Facing east)

NE Halsey Street, however, currently lacks pedestrian facilities east of NE 244th Avenue. Although technically outside the city limits, pedestrian facilities that extend further east would improve access to one of the area's largest attractors, McMenamins Edgefield. NE Halsey Street also lacks pavement makings and/or other enhanced pedestrian crossing treatments to help facilitate movement across the roadway between NE 238th Drive and NE 223rd Avenue (a distance of approximately ¾ mile).

The 2005 Halsey Street Conceptual Design Project (Reference 6) identified the need for sidewalks east of 244th Avenue to the Columbia River Highway as well as two locations for enhanced pedestrian crossings along NE Halsey Street; one adjacent to NE 230th Court and one across from the Best Western Hotel (approximately ¼ mile west of the NE 238th Drive/NE Halsey Street intersection). The Halsey Street Conceptual Design Project recommends that both crossings are offset to orientate pedestrians toward oncoming traffic and include raised median islands. *Section 8 includes examples of these types of pedestrian crossings treatments.*

The Street Systems section describes the economic development opportunities study in 2016 that Wood Village and the cities of Troutdale and Fairview started for the Halsey Street corridor. This effort may refine the street cross sections developed in 2005.

NE ARATA ROAD

NE Arata Road parallels NE Halsey Street to the south providing access to several residential areas located within Wood Village and two major roadway facilities (NE 223rd Avenue and NE 238th Drive). Figure 14 and Figure 15 show the pedestrian and bicycle facilities located along NE Arata Road are fairly limited.



Improved Section of NE Arata Road (Facing east)

NE Arata Road currently lacks pedestrian and bicycle facilities as well as pavement markings and/or other enhanced pedestrian crossing treatments to help facilitate movement across the roadway between NE 238th Drive and NE 223rd Avenue (a distance of approximately ¾ mile). Developing sidewalks along both sides of NE Arata Road along with enhanced pedestrian crossings at key locations would help improve access to the many residential properties located along both sides of the roadway including the Wood Village Green Mobile Home Park located along the south side of NE Arata Road between NE Wood Village Boulevard and NE 238th Drive.

As referenced in the Street System section, the Arata Road improvements are currently under construction. The improvements will address the pedestrian and bicycle needs. Exhibit 3 shows the typical cross section.

NE GLISAN STREET

As the only major arterial adjacent to Wood Village, NE Glisan Street provides fairly limited access to residential and commercial properties; however, it does provide major east-west connections throughout the region. Figure 14 and Figure 15 shows NE Glisan Street currently provides pedestrian and bicycle facilities along both sides of the roadway and multiple marked and signalized pedestrian crossings. However, as the area located south of NE Glisan Street (and the city of Wood Village) develops, the city may need to add new crossings opportunities to facilitate movement across the roadway.



NE Glisan Street (Facing east)

NE 223RD AVENUE

NE 223rd Avenue provides north-south connectivity regionally and access to one of Wood Village's major commercial centers in the southwest corner of the city limits. Figure 14 and Figure 15 show NE 223rd Avenue currently has pedestrian and bicycle facilities located along both sides of the roadway within the Wood Village city limits. However, both the pedestrian and bicycle facilities end approximately 250-feet north of NE Halsey Street. Although technically outside the city limits, adding these facilities would improve access for pedestrians and bicyclists to Fairview and destinations north of I-84.



NE 223rd Avenue (Facing South)

The 2035 RTP project list includes reconstructing NE 223rd Avenue between NE Halsey Street and NE Sandy Boulevard and then between NE Sandy Boulevard and NE Marine Drive. Both projects will bring NE 223rd Avenue to major collector standards with two travel lanes, a center turn lane/median, sidewalks, and bike lanes. The time period for the projects is 2008-2017 and 2018-2025, respectively.

NE 238TH/ 242ND DRIVE

NE 238th/242nd Drive provides north-south connectivity on a regional level as well as direct access to I-84. Locally, NE 238th/242nd Drive provides connections between the residential, retail, commercial, and industrial areas located north of I-84 to the areas located south. Figure 14 and Figure 15 show NE 238th/242nd Drive currently provides pedestrian and bicycle facilities along both sides of the roadway north of NE Arata Road and pedestrian facilities along the east side of the roadway to the south. Each of the major intersections located along NE 238th/242nd Drive within the city limits are also currently signalized with marked crosswalks.



NE 23th/242nd Drive (Facing North)

The lack of pedestrian facilities on Figure 10 and bicycle facilities on Figure 11 is primarily due to topographical constraints through the curved portion of the roadway. Significant grades on both sides of NE 238th/242nd Drive through the curves have prevented the county from adding pedestrian and/or bicycle facilities. While opportunities do exist to provide connections between the east and west sides of the road, the county is unlikely to develop additional facilities.

NE WOOD VILLAGE BOULEVARD

NE Wood Village Boulevard parallels NE 223rd Avenue providing access between multiple residential areas and the commercial center located in the southwest corner of the city. Figure 14 and Figure 15 show there are currently pedestrian and bicycle facilities located along both sides of NE Wood Village Boulevard between NE Glisan Street and Halsey and multiple pedestrian crossings located at regular intervals along the roadway.



NE Wood Village Boulevard (Facing North)

WOOD VILLAGE TOWN CENTER

The project team identified several pedestrian and bicycle opportunities as part of the Town Center master planning process. These include:

- Create a trail connection between Arata Road and Glisan Street through the wooded areas along the eastern edge of the Town Center with a trail connection westward to Wood Village Boulevard. These trail improvement should include with some park improvements to make it a community asset and minimize safety concerns.
- Create a new pedestrian connection between the existing plaza next to Fred Meyer and Multnomah Greyhound Park site.
- All new local streets should include bicycle facilities.

Public Transportation System

TRANSIT ROUTES AND STOPS

The existing conditions analysis identified the location of TriMet's existing transit routes and stops within Wood Village along with the types of amenities available at each stop. A majority of the stops currently do not provide shelters or seating and while many stops are located in areas with sidewalks, the stops located along the segment of NE Sandy Boulevard are not. While it may not be feasible to install shelters or benches in all locations, the city and TriMet should prioritize high activity stops for these types of facilities.

SERVICE COVERAGE

A significant portion of the residential and commercial areas located south of NE Halsey Street and east of NE 233rd Avenue are not being served by transit. Significant modifications are pending in the East Side Enhancement Plan proposed by TriMet, including increases in frequency, the addition of a Line N, and other modifications that will provide complete service coverage in Wood Village in accord with these standards. The adopted East Side Enhancement Plan is shown on Figure 16.

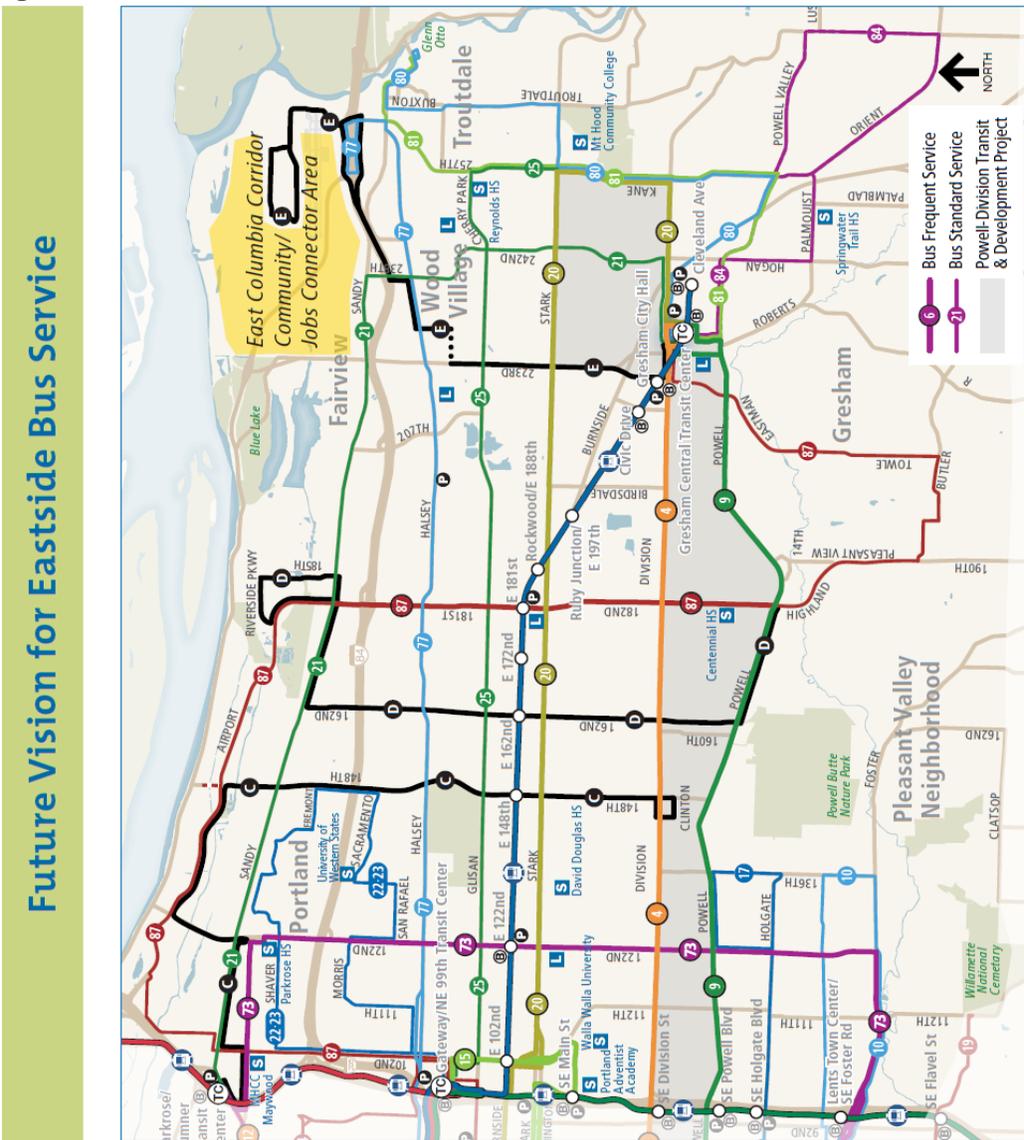


Transit Stop on NE Halsey Street (Facing West)

The project team assumed stops at all major intersections for each analysis and the distance from each stop at ¼ mile (the average distance a person is willing to walk to get to a transit stop with less than frequent service). The analysis results presented in the figures are intended for discussion purposes only and do not require TriMet and/or the city to re-route Route 12 or improve the roadway facilities to accommodate transit use. Service enhancements in the Wood Village will require the city to

appropriately plan for transit facilities in the Wood Village Town Center, as well as improvements on other identified routes.

Figure 16 Future Vision for Eastside Bus Service.



Future Vision for Eastside Bus Service

- Line C**
New north-south service on SE/NE 148th, NE Airport Way and NE Sandy between the Parkrose Transit Center and SE Clinton.
- Line D**
New north-south service on SE/NE 162nd and NE 185th between SE Powell and NE Riverside Pkwy.
- Line E**
New north-south service between the Gresham Transit Center and Troutdale Reynolds Industrial Park to serve NW Graham, SE/NE 223rd and the new Wood Village Town Center. TriMet will work closely with the City of Wood Village to identify the best routing through Wood Village Town Center as the timing and scale of future development there becomes clear.
- Line 20**
Increase to Frequent Service running every 15 minutes or better throughout most hours of the day, seven days a week.
- Line 21**
Increase frequency and hours of service and change route to serve NE 238th and NE 242nd between Gresham Transit Center and NE Sandy.
- Lines 22 and 23**
Combine lines to add service in both directions and change route to provide service on NE 148th. Increase frequency and hours of service and add weekend service on Line 23 to match service on Line 22. These improvements would require the extension of NE Fremont to NE 148th.
- Line 25**
Extend service to SW 257th along NE Glisan and SW Cherry Park and increase frequency and hours of service.
- Line 71 (Renumber to Line 73)**
Increase to Frequent Service and renumber to Line 73 along SE/NE 122nd between the Parkrose Transit Center and SE 94th and Foster. Split into two bus lines at Parkrose Transit Center.
- Line 77**
Increase frequency and hours of service.
- Line 80**
Route change to serve NE Burnside Rd, including Winco and Fred Meyer, and increase frequency and hours of service.
- Line 81**
Increase frequency and hours of service and add weekend service.
- Line 84**
Route change to serve SE Palmquist and SE Hogan and increase frequency and hours of service.
- Line 87**
Increase to Frequent Service along SE 182nd and SE/NE 181st between NE Sandy and SE Powell. Increase frequency and hours of service and add weekend service along NE Airport Way between NE Sandy and the Gateway Transit Center.
Potentially split into two bus lines at SE Powell and SW Highland to match ridership demand with bus service levels. Change route to serve SW Pleasant View and SW/SE Butler.
- East Columbia Corridor Community/jobs connector**
New community/jobs connector service in the East Columbia Corridor, generally between NE 223rd and the Troutdale Reynolds Industrial Park.

Subarea Access and Circulation

SOUTHEND

The southend includes the area located south of NE Halsey Street, north of NE Glisan Street, east of NE 233rd Avenue, and west of NE 242nd Drive. The southend includes a mix of single-family residential home developments, mobile home parks, and a large commercial/retail center that represents one of the area's largest trip generators.

A review of the city's development code indicates that existing developments are generally consistent with the desired use, suggesting that future developments or redevelopments will likely follow existing development patterns. As future development and redevelopment occurs it will be important for the city to secure the right-of-way for new roadways that will provide east-west and north-south connectivity in the Southend. Figure 17 identifies several non-motorized connectivity opportunities within the Southend. New opportunities for multimodal connectivity within the Town Center were extensively explored as part of the 2016 TCMP effort. The following provides a description of the each opportunity.



Multi-use Path between NE Arata Road and NE Halsey Street (Facing South)

East-West Connection Need/Opportunity #1

The existing Wood Village Commercial Town Center and the adjacent Upper/Lower Village residential areas lack direct pedestrian/bicycle connections. Pedestrians and bicyclists are forced to travel out-of-direction and utilize NE Glisan Street and NE Arata Road corridors. This out-of-direction travel plus the lack of existing sidewalks and bicycle lanes on Arata Road serves to minimize non-motorized travel or leads to an undesirable walking/bicycling condition.

The TCMP identifies a new east-west connection (conceptually illustrated as Opportunity #1 in Figure 17) from Wood Village Boulevard to the existing Wood Village Green Mobile Home Park to address this need. These connections could occur through the undeveloped portion of the town center located east of Wood Village Boulevard and south of the Riverwood Subdivision, using the currently stubbed Riverwood Subdivision street grid, new multi-use pathways, or a combination of both.

North-South & East-West Connection Need/Opportunity #2

The natural area along the eastern edge of the Town Center presents itself as an opportunity for a bicycle and pedestrian trail connecting NE Arata Road to Glisan Street and the southern portion of Wood Village Boulevard. As the Town Center develops and residential neighborhoods grow within and in the vicinity, this natural greenway is an asset and opportunity to provide access to nature to the community. This trail would connect to the larger street and pathway network in and around the Town Center.

North-South & East-West Connection Need/Opportunity #3

The existing Wood Village Green Mobile Home Park currently separates the Wood Village Commercial Town Center from the Upper/Lower Village residential neighborhood. Its design and internal private street layout is a barrier to establishing connections between the town center and adjacent residential neighborhoods.

While mobile home parks are an allowed use within the underlying zone, the city recognizes that this area is likely to redevelop over the long-term planning horizon. The city has an opportunity to plan for local street and bike/ped connections that could be established under a future redevelopment scenario. It will also provide an opportunity to provide central access to the Town Center from the east. Given the site's proximity, these connections could be developed as a continuation of the east-west connections identified under East-West Connectivity Opportunity #1 that ultimately link to the Stanley Street and Holladay Place street stubs to the west (conceptually illustrated as Opportunity #3 in Figure 17). While the Stanley Street and Holladay Place connections are logical, that there is specific language in the Wood Village Code that restricts the extension of these two streets westward. The city would need to revisit this policy restriction.

In addition to the east-west connections, there are opportunities for enhanced north-south connectivity under a potential future redevelopment scenario of the Wood Village Green Mobile Home Park. These connections in the form of local streets and/or bicycle-pedestrian connections would provide north-south connections between NE Arata Road, the previously mentioned east-west connections and undeveloped property to the south.

North-South Connection Need/Opportunity #4

There is a sizable portion of land located between Glisan Street to the south and the previously mentioned Wood Village Green Mobile Home Park that is largely undeveloped. While topographically challenged, this property could potentially develop as single family residential. Under that scenario, the city has an opportunity to plan for and establish a north-south connection that would link Glisan Street

to potential future redevelopment of the Wood Village Green Mobile Home Park and the associated east-west and north-south connections (conceptually illustrated as Opportunity #4 in 17). With this connection in place, it would establish a continuous north-south connection between Glisan Street and Arata Road.

East-West Connection Need/Opportunity #5

The former Multnomah Greyhound Park property is likely to redevelop in the near to mid-term time frame, as was explored in the TCMP. Given the site's size and proximity within the Wood Village Commercial Town Center, the city has an opportunity to provide an east-west connection that would link Wood Village Boulevard to 223rd Avenue (conceptually illustrated as Opportunity #5 in Figure 15, and in more detail within the TCMP). Depending upon how the city establishes the connection, it could potentially create a continuous east-west connection when coupled with the east-west connections identified under East-West Connectivity Opportunity #1 & #3.

North-South Connection Need/Opportunity #6

The Poplar Mobile Manor mobile home park between NE Arata Road and the former Multnomah Greyhound Park site and the undeveloped parcel to the west is a barrier between NE Arata Road and the Multnomah Greyhound Park site.

Like other mobile home park sites, the city recognizes the potential redevelopment of this area over the long-term planning horizon. The city has a long-term opportunity to plan for north-south local street and bike/ped connections under a future redevelopment scenario (conceptually illustrated as Opportunity #6 in Figure 17). Given the location, a north-south connection would enhance connectivity within and surrounding the Wood Village Town Center.

North-South Connection Need/Opportunity #7 & #8

With the exception of the multi-use path at the northern terminus of Wood Village Boulevard at NE Arata Road, there are limited connections between NE Arata Road and NE Halsey Street. The city needs to improve connectivity between these two corridors given the commercial retail located in the Wood Village Town Center and the presence of residences along NE Halsey Street.

To enhance these connections, the city has an opportunity to provide a formal non-motorized corridor along two existing private residential streets located east of 231st Court (conceptually illustrated as Opportunity #7 in Figure 17). These private streets currently have a fence at their respective end points that physically prevent motorized travel between NE Halsey Street and NE Arata Road.

Upgrading these streets to a public corridor (including sidewalks) would be costly and potentially have impacts, but would significantly enhance non-motorized opportunities.

The city has a second opportunity to provide a formal non-motorized corridor between Arata Road and Halsey Street further to the east. The Wood Village Baptist Church on the north side of Arata Road has a significant amount of property that is used for open space and recreation. In addition, there is a commercial property that abuts the north side of church's recreation field and that fronts onto Halsey Street (conceptually illustrated as Opportunity #8 in Figure 17). As the church proposes additional improvements and the commercial property along Halsey Street redevelops, the city could establish a non-motorized pathway between NE Halsey Street and NE Arata Road.

East-West Connection Need/Opportunity #9

The east end of NE Shannon Street currently ends at a city-owned parcel that contains an assortment of maintenance and pump facilities. This parcel separates NE Shannon Street from NE 238th Drive. Given that this parcel is city-owned, there is an opportunity to potentially modify it to include a pathway connection to NE 238th Drive that would better connect the Upper/Lower Village residential area to this important north-south corridor (conceptually illustrated as Opportunity #9 in Figure 17). However, it should be noted that there are currently no sidewalks on the west side of NE 238th Drive south of NE Arata Road. The need/desirability of this connection is contingent upon the development of a more complete sidewalk system on the west side of NE 238th Drive.

East-West Connection Need/Opportunity #10

The east end of NE Treehill Drive currently transitions from a paved roadway to an unpaved trail that provides access to the trail system within Donald L Robertson City Park. Although the trail currently provides access to pedestrians and bicyclists, the city has an opportunity to provide a new local street connection from NE Treehill Drive to NE Cedar Lane via NE Hawthorne Avenue. The new connection (conceptually illustrated as Opportunity #10 in Figure 17) would reduce reliance on NE 238th Drive for vehicular traffic between the two residential areas.

East Connection Need/Opportunity #11

Aside from sidewalks and bicycle lanes along NE 238th Drive and Halsey Street, there are no other east-west multimodal trail connections to the trail system within Donald Robertson City Park. An opportunity may present itself for the city to encourage connecting to trails that extend through Troutdale to the Sandy River and the 40 mile loop (conceptually illustrated as Opportunity #11 in Figure 17).

NORTHEND

The northend includes the area located north of NE Halsey Street within the city limits. The northend consists primarily of commercial/retail uses with some light industrial and residential uses located north and south of I-84. Figure 17 shows access between the areas located north and south of I-84 (including the Southend) is limited to NE 238th Drive. NE 238th/242nd Drive provides north-south connectivity on a region level as well as direct access to I-84. The combination has resulted in a seven lane cross section north of NE Halsey Street, traffic signals at all major intersections, and a significant amount of vehicular traffic. Although there are currently pedestrian and bicycle facilities along both sides of NE 238th Drive over I-84, the environment is not well suited for everyone.

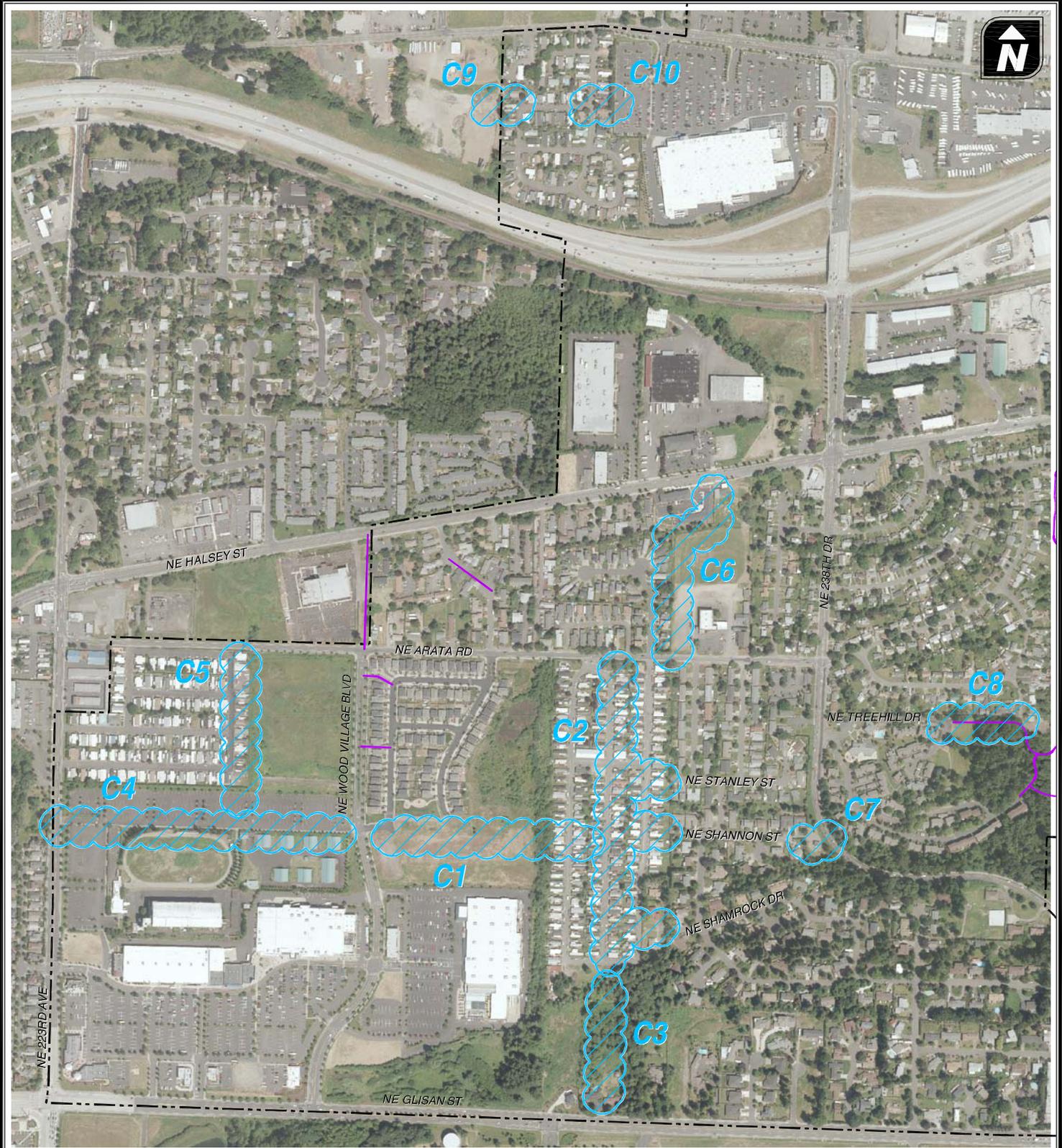
Additional opportunities to cross I-84 would require grade separation and would likely need to include both I-84 and the railroad. The costs associated with this type of crossing makes it highly unlikely in the near future.

East-West Connection Need/Opportunity #12 & #13

Access to the Wood Village mobile home park is provided by NE Eldeberry Street, which forms a loop throughout the park. There is limited access between the park and the commercial/retail areas to the east. As future development occurs, the city has an opportunity to provide a new local street connection between the commercial/retail properties to the east and west of the mobile home park. The new connections (conceptually illustrated as Opportunity #11 & #12 in Figure 17) would reduce reliance on NE Sandy Boulevard for vehicular traffic as well as pedestrians and bicyclists between the areas.

Figure 17 Pedestrian and Bicycle Connectivity (figure to be updated - 2012 TSP
Figure 15)

H:\profile\1686 - Wood Village Transportation Systems Plan\dwg\figs\TSP\1686fig15.dwg Feb 16, 2012 - 11:58am - mbell Layout Tab: Fig15



Multi-Modal Opportunity Corridors

C(#)

See Table 5 - Connectivity Improvement Program

Future Connectivity Improvements



Figure 15

Truck Freight System

The EMCP addressed long standing questions regarding freight designations in the study area. Rather than focus on one major route, it established a freight grid on several arterials in the ECMP study, which resulted in Metro adding NE 238th/242nd to the regional freight system.

The highest priority corridor improvements in the ECMP were to 238th/242nd from Halsey Street to Glisan Street in order to better accommodate freight and other needs. Multnomah County has received funding to develop multimodal improvements to this stretch intended to improve its safety and function for all modes, including trucks. The project will reduce the curvature of the road and construct multimodal facilities. Elements include constructing a cross-section that includes a southbound travel lane with a passing lane, and a northbound travel lane, and bike and pedestrian facilities on both sides.

Section 7

Transportation System Tools

TRANSPORTATION SYSTEM TOOLS

This section summarizes the tools that the city can apply toward the development of a comprehensive transportation system within Wood Village. These tools focus on improvements for pedestrian travel, bicycle travel, and other techniques that can be applied to the local street system for calming traffic and enhancing non-auto travel modes.

PLANS GOALS AND POLICIES

The city's existing transportation plans, goals, and policies are included in the 1999 Comprehensive Plan. Wood Village added several new draft policy statements to comply with the RTP. The project team used these new policy statements to formulate this TSP update.

- Improve/allow more access between Wood Village Town Center and neighborhoods to the east
- Generally improve connectivity in the city
- Ensure local and county street design consistency with regional street designs
- Allow for "green street" designs
- Increase and improve crossings
- Support measures to improve access management and safety
- Limit and prohibit residential driveways on collectors and arterials
- Improve pedestrian and bicycle connections to transit
- Expand parking management techniques as needed in the future
- Consider changes to plan amendment review criteria as needed to address potential transportation system capacity constraints in the future.

PEDESTRIAN FACILITIES

Pedestrian facilities are the elements of the transportation system that enable people to walk safely and efficiently to their desired destination. These facilities include sidewalks, multi-use paths and trails for pedestrian connectivity as well as marked and unmarked, signalized and unsignalized pedestrian crossings. Each of these facilities plays an important role in the comprehensive pedestrian system that promotes both walking trips and multi-modal trips such as using a combination of walking and transit to complete a trip.

The project team separated types of pedestrian facilities for Wood Village into two categories: sidewalks and pedestrian crossings.

Sidewalks

Ideally, all streets in Wood Village would have sidewalks on both sides, and current city development standards require sidewalks with any new construction project. However, there are currently several roadways with no sidewalks or sidewalks on only one side. For these roadways the city can use two tools to help develop a comprehensive pedestrian system:

- Develop sidewalks on both sides of street: This consists of installing sidewalks on both sides of an existing roadway which does not currently provide sidewalks or parallel multi-use pathways. In some cases the new sidewalks may require additional right-of-way.
- Sidewalks - fill in gaps: This includes installing sidewalks along sections of existing roadways where the pedestrian system is discontinuous or has short gaps on one side of the street or both.

Pedestrian Crossings

There are a number of treatments that the city could implement at key intersections throughout Wood Village to improve the safety and efficiency of pedestrian crossings. The section below presents a summary of these treatments, including advantages, challenges, and location types.

Marked crosswalks

Marked crosswalks are painted roadway markings that indicate the location of a crosswalk to motorists. Marked crosswalks can be accompanied by signs, curb extensions and/or median refuge islands, and may occur at intersections or at mid-block locations.

Marked Crosswalks

	Advantages	Challenges	Location Type
	<ul style="list-style-type: none"> • Increases visibility of crossing area • Improves driver yield rates • Concentrates crossings in one location 	<ul style="list-style-type: none"> • May not be suitable for all crossing locations • Requires maintenance 	<ul style="list-style-type: none"> • Low volume roadways

Research has shown that marked crosswalks in certain situations are not effective and may even reduce pedestrian safety. On multi-lane roadways (more than two lanes), the city should not install marked crosswalks without accompanying treatments (e.g., signalization) when traffic volumes exceed 12,000 ADT (no median refuge island) or 15,000 ADT (with median island).²

Unmarked Crosswalks

Under Oregon law, pedestrians have the right-of-way at any unsignalized intersection. On narrow, low-speed streets unmarked crosswalks are generally sufficient for pedestrians to cross the street safely, as the low-speed environment makes drivers more responsive to the presence of pedestrians. However, drivers are less likely to yield to pedestrians at unmarked crosswalks on high-speed and/or high-volume roadways, even when the pedestrian has stepped onto the roadway. In these situations, the city needs to add delineated pedestrian crossing facilities to remind drivers that they must yield when pedestrians are present.

Unmarked Crosswalks

	Advantages	Challenges	Location Type
	<ul style="list-style-type: none"> Does not require any action by city 	<ul style="list-style-type: none"> Low driver yielding rates 	<ul style="list-style-type: none"> Narrow, low speed streets

Curb Extensions

Curb extensions create additional space for pedestrians and allow pedestrians and vehicles to better see each other at crosswalks. Cities typically install curb extensions at intersections along roadways with on-street parking to help reduce crossing distances and the amount of exposure pedestrians have to vehicle traffic. Curb extension also narrow the vehicle path, slow down traffic, and prohibit fast turns.

² Zegeer, C., et. al. *Safety Effects of Marked versus Unmarked Crosswalks at Uncontrolled Locations: Final Report and Recommended Guidelines*, Report No. HRT-04-100. Federal Highway Administration. Washington, DC. September 2005.

Curb Extensions

 <p>Source:VeloTraffic.com</p>	<table border="1"> <thead> <tr> <th data-bbox="646 237 927 296">Advantages</th> </tr> </thead> <tbody> <tr> <td data-bbox="646 296 927 623"> <ul style="list-style-type: none"> • Shorten crossings distances for pedestrians • Reduces motorist turning speeds • Increased visibility between motorists and pedestrians </td> </tr> </tbody> </table>	Advantages	<ul style="list-style-type: none"> • Shorten crossings distances for pedestrians • Reduces motorist turning speeds • Increased visibility between motorists and pedestrians 	<table border="1"> <thead> <tr> <th data-bbox="927 237 1208 296">Challenges</th> </tr> </thead> <tbody> <tr> <td data-bbox="927 296 1208 623"> <ul style="list-style-type: none"> • Physical barrier can be exposed to traffic • Greater cost and time to install than high visibility crosswalks • May require changes to roadway drainage </td> </tr> </tbody> </table>	Challenges	<ul style="list-style-type: none"> • Physical barrier can be exposed to traffic • Greater cost and time to install than high visibility crosswalks • May require changes to roadway drainage 	<table border="1"> <thead> <tr> <th data-bbox="1208 237 1471 296">Location Type</th> </tr> </thead> <tbody> <tr> <td data-bbox="1208 296 1471 623"> <ul style="list-style-type: none"> • Streets with on-street parking </td> </tr> </tbody> </table>	Location Type	<ul style="list-style-type: none"> • Streets with on-street parking
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Raised Median Islands

Raised median islands provide a protected area in the middle of a crosswalk for pedestrians to stop while crossing the street. The raised median island allows pedestrians to complete a two-stage crossing if needed.

Raised Median Island

 <p>Source: http://streetswiki.wikispaces.com</p>	<table border="1"> <thead> <tr> <th data-bbox="630 957 915 1016">Advantages</th> </tr> </thead> <tbody> <tr> <td data-bbox="630 1016 915 1344"> <ul style="list-style-type: none"> • Provides pedestrian refuge in center of roadway • Requires shorter gaps in traffic to cross streets • Reduces the number of crashes at marked and unmarked crosswalks </td> </tr> </tbody> </table>	Advantages	<ul style="list-style-type: none"> • Provides pedestrian refuge in center of roadway • Requires shorter gaps in traffic to cross streets • Reduces the number of crashes at marked and unmarked crosswalks 	<table border="1"> <thead> <tr> <th data-bbox="915 957 1208 1016">Challenges</th> </tr> </thead> <tbody> <tr> <td data-bbox="915 1016 1208 1344"> <ul style="list-style-type: none"> • Must have at least 6 feet of space to accommodate wheelchairs; not all streets will have adequate space. • Physical barrier in the Street </td> </tr> </tbody> </table>	Challenges	<ul style="list-style-type: none"> • Must have at least 6 feet of space to accommodate wheelchairs; not all streets will have adequate space. • Physical barrier in the Street 	<table border="1"> <thead> <tr> <th data-bbox="1208 957 1484 1016">Location Type</th> </tr> </thead> <tbody> <tr> <td data-bbox="1208 1016 1484 1344"> <ul style="list-style-type: none"> • Preferred on multi-lane approaches or at an entry point into area of high pedestrian activity • Areas with high conflict or high pedestrian crash locations </td> </tr> </tbody> </table>	Location Type	<ul style="list-style-type: none"> • Preferred on multi-lane approaches or at an entry point into area of high pedestrian activity • Areas with high conflict or high pedestrian crash locations
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In general, the city should include median refuge islands with marked crosswalks to improve pedestrian safety wherever crossing distances are significant, pedestrian volumes are above average, vehicle speeds are above a residential standard, vehicle volumes make full crossings difficult, physical space is available, and/or pedestrians in the area are incapable of full crossings at standard pedestrian rates of speed.

Raised Crosswalk

A raised crosswalk is raised higher than the surface of the street to give motorists and pedestrians a better view of the crossing area. A raised crosswalk is similar to a speed table marked and signed for pedestrian crossing.

Raised Crosswalk

 <p>Source: http://streetswiki.wikispaces.com</p>	Advantages	Challenges	Location Type
	<ul style="list-style-type: none"> • Provides better view of pedestrians and motorists • Slows motorists travel speeds • Broad application on both arterial & collector streets 	<ul style="list-style-type: none"> • Can be difficult to navigate for large trucks, busses, and snow plows 	<ul style="list-style-type: none"> • Areas with high speeds and difficulty crossings the street

Rectangular Rapid Flashing Beacon

Rectangular Rapid Flashing Beacons, or RRFBs, are user-actuated amber lights that have an irregular flash pattern similar to emergency flashers on police vehicles. These supplemental warning lights are used at unsignalized intersections or mid-block crosswalks to improve safety and visibility for pedestrians using a crosswalk.

Rectangular Rapid Flashing Beacon

 <p>Source: http://www.elteccorp.com</p>	Advantages	Challenges	Location Type
	<ul style="list-style-type: none"> • Increases motorists yielding behavior • Provides warning to driver at eye level • Low-cost alternative to traffic signals and hybrid signals 	<ul style="list-style-type: none"> • Motorists may not understand flashing lights • Requires pedestrian activations 	<ul style="list-style-type: none"> • Areas with high speeds and difficulty crossing the street • Unsignalized intersections and mid-block crossings • Two-lane or multi-lane approaches

Pedestrian Hybrid Signal

The pedestrian hybrid signal is a pedestrian-actuated hybrid signal that stops traffic on the mainline to provide a protected crossing for pedestrians at an unsignalized location. Warrants for the installation of pedestrian-actuated hybrid signal are based on the number of pedestrian crossings per hour (PPH), vehicles per hour on the roadway, and the length of the crosswalk. Thresholds are available for two types of roadways: locations where prevailing speeds are above 35 mph and locations where prevailing speeds are below 35 mph.

Pedestrian Hybrid Signal

 <p>Source: achdidaho.org</p>	<p>Advantages</p> <ul style="list-style-type: none"> Increases motorists yielding behavior Drivers experience less delay at hybrid signals compared to other signalized intersections 	<p>Challenges</p> <ul style="list-style-type: none"> Expensive compared to other crossings treatments Requires pedestrian activations 	<p>Location Type</p> <ul style="list-style-type: none"> Larger roadways where mid-block crossing is difficult or crossings opportunities are limited
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Leading Pedestrian Interval

Leading Pedestrian Intervals allow pedestrians to begin crossing at the crosswalk before conflicting vehicles start moving. For example, left or right-turning vehicles may have a red light for five to seven seconds while pedestrians and through vehicles are allowed to begin moving through the intersection.

Leading Pedestrian Interval

 <p>Source: koonceportland.blogspot.com</p>	<p>Advantages</p> <ul style="list-style-type: none"> Minimal staff time for signal re-timing Reduces vehicle/pedestrian conflicts Increases motorists yielding behavior 	<p>Challenges</p> <ul style="list-style-type: none"> Reduces green time for conflicting vehicles Right-turn on red is often prohibited 	<p>Location Type</p> <ul style="list-style-type: none"> Signalized intersections with heavy turning volumes
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Grade-Separated Crossing

Grade-separated crossings are underpasses or overpasses that allow pedestrians to entirely avoid conflicts with automobiles when crossing a busy roadway. When used as part of a multi-use path, grade-separated crossings also accommodate bicycles. Grade-separated crossings are common on pedestrian-restricted facilities such as freeways and railroad crossings. However, pedestrians often perceive them as unsafe (especially under-crossings), and may result in significant out-of-direction travel for pedestrians. Grade-separated crossings can be relatively expensive to build. The city should use grade-separated crossings sparingly.

Grade-Separated Crossing

 <p>Source:VeloTraffic.com</p>	<p>Advantages</p> <ul style="list-style-type: none"> • Separates pedestrians from vehicular traffic 	<p>Challenges</p> <ul style="list-style-type: none"> • Very expensive 	<p>Location Type</p> <ul style="list-style-type: none"> • Where there is demand for freeway and/or railroad crossings
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BICYCLE FACILITIES

Bicycle facilities are the elements of the transportation system that enable cyclists to safely and efficiently travel to their desired destination. These facilities include bicycle lanes, multi-use paths and trails, signing and striping as well as off-road facilities secure parking, changing rooms and showers at worksites. Each facility plays an important role in developing a comprehensive bicycle system.

Types of Bicycle Facilities

The project team has separated the types of bicycle facilities appropriate for Wood Village into three categories: bicycle lanes, bicycle crossings, and off-road facilities.

Shared Roadways

Any roadway without a dedicated bicycle facility is generally considered a shared roadway. Where traffic volumes are low, shared roadways are generally safe and comfortable facilities for cyclists. However, the *ODOT Bicycle and Pedestrian Plan* (Reference 9) does not recommend shared roadways where automobile volumes or vehicle speeds are high. Thresholds for where shared-lanes are appropriate are based on several factors, including land-use and grade. Generally, bike lanes are preferred on most roadways with greater than 3,000 average daily trips or with a speed limit greater than 25 miles per hour. For these roadways, dedicated bicycle facilities, typically bicycle lanes, are recommended.

Shared-lane Pavement Marking

Shared-lane pavement markings (often called “sharrows”) are a tool designed to help accommodate bicyclists on roadways where bicycle lanes are desirable but infeasible to construct. The sharrow marking indicates a shared roadway space, and are typically centered approximately four feet from the edge of the travelway to encourage cyclists to ride further away from parked and parking cars and/or the curb. Typically, sharrows are suitable on roadways with fewer than 3,000 average daily trips.

Shared-Lane Pavement Marking

	<table border="1"> <thead> <tr> <th data-bbox="641 254 912 296">Advantages</th> </tr> </thead> <tbody> <tr> <td data-bbox="641 302 912 569"> <ul style="list-style-type: none"> • Reduce wrong way and sidewalk riding • Improve cyclists position in roadway • Informs motorists of bicyclists in roadway </td> </tr> </tbody> </table>	Advantages	<ul style="list-style-type: none"> • Reduce wrong way and sidewalk riding • Improve cyclists position in roadway • Informs motorists of bicyclists in roadway 	<table border="1"> <thead> <tr> <th data-bbox="930 254 1201 296">Challenges</th> </tr> </thead> <tbody> <tr> <td data-bbox="930 302 1201 569"> <ul style="list-style-type: none"> • Pavement marking maintenance • Not as effective as bike lane </td> </tr> </tbody> </table>	Challenges	<ul style="list-style-type: none"> • Pavement marking maintenance • Not as effective as bike lane 	<table border="1"> <thead> <tr> <th data-bbox="1219 254 1471 296">Location Type</th> </tr> </thead> <tbody> <tr> <td data-bbox="1219 302 1471 569"> <ul style="list-style-type: none"> • Streets with moderate speeds and traffic volumes and where space for bike lane markings is limited </td> </tr> </tbody> </table>	Location Type	<ul style="list-style-type: none"> • Streets with moderate speeds and traffic volumes and where space for bike lane markings is limited
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Bicycle lanes

Bicycle lanes are striped lanes on the roadway dedicated for the exclusive use of bicycles. Typically, bicycle lanes are placed at the outer edge of pavement (but to the inside of right-turn lanes and/or on-street parking). Bicycle lanes improve bicycle safety, improve cyclist security, and (if comprehensive) can provide direct connection between origins and destinations. However, inexperienced cyclists often feel uncomfortable riding on busy and high-speed streets, even when they include bicycle lanes. Multnomah County street standards currently include bicycle lanes on all arterial and collector streets.

Bicycle Lanes

	<table border="1"> <thead> <tr> <th data-bbox="641 1144 912 1186">Advantages</th> </tr> </thead> <tbody> <tr> <td data-bbox="641 1192 912 1470"> <ul style="list-style-type: none"> • Improves safety and comfort by increasing the visibility and awareness of cyclists • Provides defined space in roadway for cyclists </td> </tr> </tbody> </table>	Advantages	<ul style="list-style-type: none"> • Improves safety and comfort by increasing the visibility and awareness of cyclists • Provides defined space in roadway for cyclists 	<table border="1"> <thead> <tr> <th data-bbox="930 1144 1201 1186">Challenges</th> </tr> </thead> <tbody> <tr> <td data-bbox="930 1192 1201 1470"> <ul style="list-style-type: none"> • May still have conflicts with motorists • Motorists may block bike lane </td> </tr> </tbody> </table>	Challenges	<ul style="list-style-type: none"> • May still have conflicts with motorists • Motorists may block bike lane 	<table border="1"> <thead> <tr> <th data-bbox="1219 1144 1471 1186">Location Type</th> </tr> </thead> <tbody> <tr> <td data-bbox="1219 1192 1471 1470"> <ul style="list-style-type: none"> • Non-local streets with adequate space for accommodation </td> </tr> </tbody> </table>	Location Type	<ul style="list-style-type: none"> • Non-local streets with adequate space for accommodation
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Location Type									
<ul style="list-style-type: none"> • Non-local streets with adequate space for accommodation 									

Low-Traffic Bikeway (Bike Boulevard)

Low-traffic bikeways are also known as bike boulevards and provide high-quality bicycle facilities on continuous street corridors with low vehicular traffic volumes. Typically, low-traffic bikeways are made from existing local streets, which are reconfigured to prioritize bicycle trips and reduce through automobile trips. Local automobile access is retained. Cities improve bicycling conditions by reducing stop signs along the route and providing bicyclist-specific wayfinding information. Cities often use traffic calming to slow automobile speeds and eliminate the cut-through automobile traffic that stop sign removal would otherwise attract.

Low-Traffic Bikeway (Bike Boulevard)

 <p>Source: Dave Pansi</p>	<table border="1"> <thead> <tr> <th data-bbox="643 254 919 296">Advantages</th> </tr> </thead> <tbody> <tr> <td data-bbox="643 296 919 617"> <ul style="list-style-type: none"> Treatments facilities continuous bicycle movement along roadway Improves cyclists experience </td> </tr> </tbody> </table>	Advantages	<ul style="list-style-type: none"> Treatments facilities continuous bicycle movement along roadway Improves cyclists experience 	<table border="1"> <thead> <tr> <th data-bbox="935 254 1195 296">Challenges</th> </tr> </thead> <tbody> <tr> <td data-bbox="935 296 1195 617"> <ul style="list-style-type: none"> Motorists may choose to use roadway given low traffic volumes </td> </tr> </tbody> </table>	Challenges	<ul style="list-style-type: none"> Motorists may choose to use roadway given low traffic volumes 	<table border="1"> <thead> <tr> <th data-bbox="1211 254 1471 296">Location Type</th> </tr> </thead> <tbody> <tr> <td data-bbox="1211 296 1471 617"> <ul style="list-style-type: none"> Low speed and traffic volume roadways </td> </tr> </tbody> </table>	Location Type	<ul style="list-style-type: none"> Low speed and traffic volume roadways
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Challenges									
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Location Type									
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Bicycle Detection

Many traffic signals in Wood Village are actuated, meaning that the signal allocates green phases to a movement when the signal detects a vehicle. However, actuating a signal as a cyclist is difficult if there is no information about the location of detection equipment. The city should use pavement markings, including actuated left-turn lanes, to show cyclists where to stand to actuate a signal. Additionally, the city or county should set the sensitivity of all loop detectors to allow for bicycle activation.

Bicycle Detection

 <p>Source: http://garyridesbikes.blogspot.com</p>	<table border="1"> <thead> <tr> <th data-bbox="634 1081 911 1123">Advantages</th> </tr> </thead> <tbody> <tr> <td data-bbox="634 1123 911 1442"> <ul style="list-style-type: none"> Cyclists can activate traffic signal without dismounting </td> </tr> </tbody> </table>	Advantages	<ul style="list-style-type: none"> Cyclists can activate traffic signal without dismounting 	<table border="1"> <thead> <tr> <th data-bbox="927 1081 1187 1123">Challenges</th> </tr> </thead> <tbody> <tr> <td data-bbox="927 1123 1187 1442"> <ul style="list-style-type: none"> None </td> </tr> </tbody> </table>	Challenges	<ul style="list-style-type: none"> None 	<table border="1"> <thead> <tr> <th data-bbox="1211 1081 1471 1123">Location Type</th> </tr> </thead> <tbody> <tr> <td data-bbox="1211 1123 1471 1442"> <ul style="list-style-type: none"> At signalized intersections </td> </tr> </tbody> </table>	Location Type	<ul style="list-style-type: none"> At signalized intersections
Advantages									
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Challenges									
<ul style="list-style-type: none"> None 									
Location Type									
<ul style="list-style-type: none"> At signalized intersections 									

Bicycle Parking

Bicyclists also benefit from several other types of bicycle support facilities, such as secure bicycle parking, either open or covered U-shaped racks, and storage lockers for clothing and gear. Areas that typically provide secured bicycle parking are often located at areas of high bicycle and pedestrian traffic such as transit stations, shopping centers, schools, and multi-use trails. The city currently requires bicycle parking included in new development as a condition of approval. TriMet buses are outfitted with bicycle racks that allow cyclists to bring their bikes with them on transit. Allowing bicycles on transit vehicles increases the range of trips possible by both transit and bicycling, and reduces cyclists' fears of being stranded in the event of a mechanical or physical breakdown.

Bicycle Parking

	<table border="1"> <thead> <tr> <th data-bbox="643 247 919 296">Advantages</th> </tr> </thead> <tbody> <tr> <td data-bbox="643 296 919 583"> <ul style="list-style-type: none"> • Provides a secure location to store and lock bicycles • Relatively inexpensive and easy to install • Encourages bicycle use </td> </tr> </tbody> </table>	Advantages	<ul style="list-style-type: none"> • Provides a secure location to store and lock bicycles • Relatively inexpensive and easy to install • Encourages bicycle use 	<table border="1"> <thead> <tr> <th data-bbox="935 247 1195 296">Challenges</th> </tr> </thead> <tbody> <tr> <td data-bbox="935 296 1195 583"> <ul style="list-style-type: none"> • Requires space in potentially busy area • May remove on-street parking space </td> </tr> </tbody> </table>	Challenges	<ul style="list-style-type: none"> • Requires space in potentially busy area • May remove on-street parking space 	<table border="1"> <thead> <tr> <th data-bbox="1211 247 1471 296">Location Type</th> </tr> </thead> <tbody> <tr> <td data-bbox="1211 296 1471 583"> <ul style="list-style-type: none"> • Location that are generally close to and visible from the point of interest • Areas of high bicycle ridership and pedestrian traffic </td> </tr> </tbody> </table>	Location Type	<ul style="list-style-type: none"> • Location that are generally close to and visible from the point of interest • Areas of high bicycle ridership and pedestrian traffic
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Wayfinding Signs

Wayfinding signs direct pedestrians and bicyclists towards destinations in the area. They typically include distances and average walk/cycle times.

Wayfinding Signs

	<table border="1"> <thead> <tr> <th data-bbox="638 877 914 926">Advantages</th> </tr> </thead> <tbody> <tr> <td data-bbox="638 926 914 1207"> <ul style="list-style-type: none"> • Provides guidance to residents and visitors to destinations within the city • Offers another indication to motorists of the presence of bicyclists </td> </tr> </tbody> </table>	Advantages	<ul style="list-style-type: none"> • Provides guidance to residents and visitors to destinations within the city • Offers another indication to motorists of the presence of bicyclists 	<table border="1"> <thead> <tr> <th data-bbox="930 877 1206 926">Challenges</th> </tr> </thead> <tbody> <tr> <td data-bbox="930 926 1206 1207"> <ul style="list-style-type: none"> • Signs require maintenance • Vandalism </td> </tr> </tbody> </table>	Challenges	<ul style="list-style-type: none"> • Signs require maintenance • Vandalism 	<table border="1"> <thead> <tr> <th data-bbox="1222 877 1466 926">Location Type</th> </tr> </thead> <tbody> <tr> <td data-bbox="1222 926 1466 1207"> <ul style="list-style-type: none"> • Areas adjacent to bicycle and pedestrian facilities </td> </tr> </tbody> </table>	Location Type	<ul style="list-style-type: none"> • Areas adjacent to bicycle and pedestrian facilities
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Location Type									
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Multi-Use Paths and Trails

Multi-use paths and trails can augment and support pedestrian and bicycle facilities located throughout the city. They can also provide children and seniors with safe, off-street alternatives to substandard roadways with no bike lanes, shoulders, or sidewalks. They can provide safe, traffic-free path for walkers, joggers, cyclists, and others to exercise and enjoy the outdoors. They can support downtown economic development by providing an off-street transportation route to downtown businesses. And finally, they can provide direct, non-motorized access to bus stops.

Multi-Use Paths and Trails

	<p>Advantages</p> <ul style="list-style-type: none"> • Separate pedestrians and bicyclists from vehicle traffic • Combination of pedestrian and bicyclists requires less space than separate facilities for each 	<p>Challenges</p> <ul style="list-style-type: none"> • Requires adequate space to accommodate buffer from street and width to allow passing • Bicycle and pedestrian conflicts 	<p>Location Type</p> <ul style="list-style-type: none"> • Non-urban areas with few or no driveways
---	---	---	--

There are several existing multi-use paths and trails located within Wood village dedicated to pedestrians and bicyclists, such as the multi-use path between NE Arata Road and NE Halsey Street and the trail system located along the eastern city limits. It will be important for the city to include new multi-use path and trail projects in the TSP update along with standards for the development and maintenance for each.

TRAFFIC CALMING

The city can consider and apply several potential traffic calming measures to the local street network to calm traffic and enhance the non-auto travel modes.

Traffic Diverter

A traffic diverter is a raised channelization island that cities most often use at intersections. Traffic diverters eliminate through trips or other forms of intersection turning movements and divert them to other streets, thereby changing travel patterns and altering traffic volumes. The cost of diverters varies with size and design.

Traffic Calming Circle

A traffic calming circle is an elevated circular island that cities can place in the middle of intersections. Traffic calming circles force traffic to slowly navigate in a counterclockwise manner around the island as they pass through the intersection. Depending on the design, traffic calming circles can cost anywhere from \$5,000-\$15,000 per intersection.

Modification of Intersection Traffic Control Devices

Modification of traffic control devices include the conversion of uncontrolled movements to controlled movements or the replacement of yield signs with stop signs. The cost of the measures is typically very minimal ~ \$500.

Speed Humps and Speed Cushions

A speed hump is a raised hump (approximately 3.5 inches high) in the roadway with a parabolic shape that extends across the street at right angles to traffic. Typically placed in groups along a roadway, speed humps are primarily used to slow traffic down. Sometimes they can result in a reduction of traffic volumes on streets where they are employed by diverting traffic to other nearby streets that don't have speed reduction devices. Depending on the design, speed humps can cost anywhere from \$2,000-\$2,500 per location.

Speed cushions are typically asphalt or rubber mounds that are 3-4 inches in height and 10 feet in length. Spaces between the cushions allow emergency vehicles to straddle or partially straddle the devices, thus resulting in minimal impact to emergency response times. Depending on the manufacturer, speed cushions can cost anywhere from \$3,000-\$5,000 per location.

Section 8 Transportation System Plan

TRANSPORTATION SYSTEM PLAN

This section presents the individual elements of the Wood Village Transportation System Plan (TSP). The TSP addresses those components necessary for the future transportation network, including Roadway, Public Transportation, Pedestrian, and Bicycle System Plans as well as plans for Air, Rail, and Pipeline service.

This update addresses the city's pedestrian, bicycle, and public transportation systems. This TSP update guides the management and implementation of the transportation facilities, policies, and programs within Wood Village over the next twenty years.

Roadway System Plan

FUNCTIONAL CLASSIFICATION PLAN

The purpose of the functional classification plan is to create a mechanism through which the city can develop a balanced transportation system that facilitates mobility for all transportation modes and access to adjacent land uses. A roadway's functional classification helps the city codify its intended purpose, the amount and character of traffic it is expected to carry, the degree to which non-auto travel is emphasized, and the roadway's design standards and overall management approach. A roadway's functional classification should consider the adjacent land uses and the transportation modes that need to be accommodated. The public right-of-way must also provide sufficient space for utilities to serve adjacent land uses.

Figure 18 shows the functional classification plan for Wood Village. The plan incorporates four functional categories: freeways, arterials (major and minor), collectors (major and neighborhood), and local streets. Wood Village does not own/operate any roadways above local streets. As a result, the functional classification plan mirrors the functional classification of Multnomah County in order to ensure interjurisdictional consistency.

Freeway

Freeways are state facilities that provide the highest level of regional mobility and connectivity. These roadways usually extend across several jurisdictions and are often characterized by limited access points and high travel speeds. I-84 is the only freeway within Wood Village.

Major Arterials

Major arterial streets provide a high level of regional mobility and connectivity, but also serve local trips to and from major commercial, residential, industrial, and institutional areas. Major Arterial streets maintain mobility as a priority and therefore limit access. NE Glisan Street is the only major arterial in Wood Village.

Minor Arterials

Minor arterial streets serve to connect and support the freeway and major arterial system. These streets link major commercial, residential, industrial, and institutional areas. Minor arterial streets maintain mobility as a priority and therefore access is limited, but not to the extent of major arterials. Within Wood Village, NE Sandy Boulevard, NE Halsey Street, and NE 242nd-NE 238th Drive are all minor arterials that provide connections to other cities and I-84.

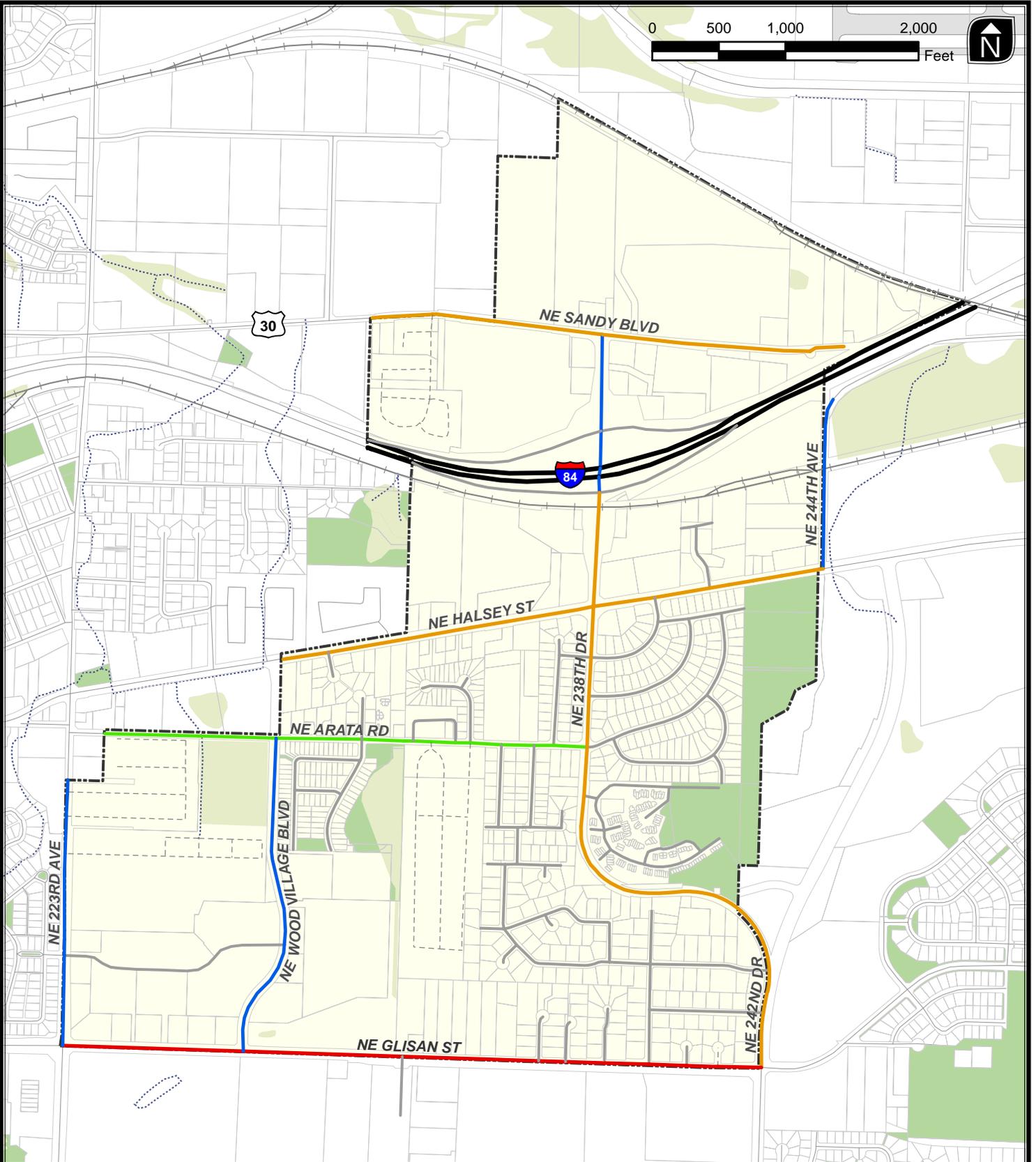
Major Collectors

Collector streets provide both access and mobility within and between residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of an intra-city circulation function, do not require as extensive access control (compared to arterials), and provide access to residential neighborhoods. These roadways distribute trips to and from the neighborhood and local street system. NE Wood Village Boulevard and NE 244th Avenue are major collector roadways.

Neighborhood Collectors

Neighborhood Collectors are long relative to local streets and provide connectivity to major collectors and/or arterials. Neighborhood collectors have greater connectivity and are used by residents in the area to get into and out of the neighborhood, but do not serve citywide/large area circulation. NE Arata Road is the only neighborhood collector in Wood Village.

Figure 18 Functional Classification Plan (figure to be updated - 2012 TSP Figure 16)



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Roadway Classification	Map Features
Freeway	Other Streets
Major Arterial	Tax Lots
Minor Arterial	Railroads
Major Collector	Streams
Neighborhood Collector	City Limits
Local Street	Wetlands
Private	Parks

Functional Classification Plan

Figure 16

Local Streets

Local streets are primarily intended to provide access to abutting land uses. Local streets offer the lowest level of mobility and consequently tend to be short, low-speed facilities. Local streets should primarily serve passenger cars, pedestrians, and bicyclists; heavy through truck traffic is discouraged. On-street parking is common while bike lanes are not, though the relatively low travel speeds and traffic volumes allow bicycles to share the vehicle travel lanes.

TRUCK FREIGHT SYSTEM COMPONENTS

Based on the design capacity described in the functional classification plan, certain roads are ideal for truck freight movements through Wood Village. Roads that comprise the freight network in Wood Village include those listed in Table 6.

Table 6. Freight Routes and Functional Classification

Roadway	Route Type	Functional Classification in Wood Village
I-84	Main Roadway Route	Freeway
NE Sandy Boulevard	Regional Freight Route	Minor Arterial
NE Glisan Street	Regional Freight Route	Major Arterial
NE 238 th Drive north of I-84	Regional Freight Route	Minor Arterial
NE 238th/242nd Drive	Road Connector	Minor Arterial

Figure 19 Street System Plan (new figure to be prepared)

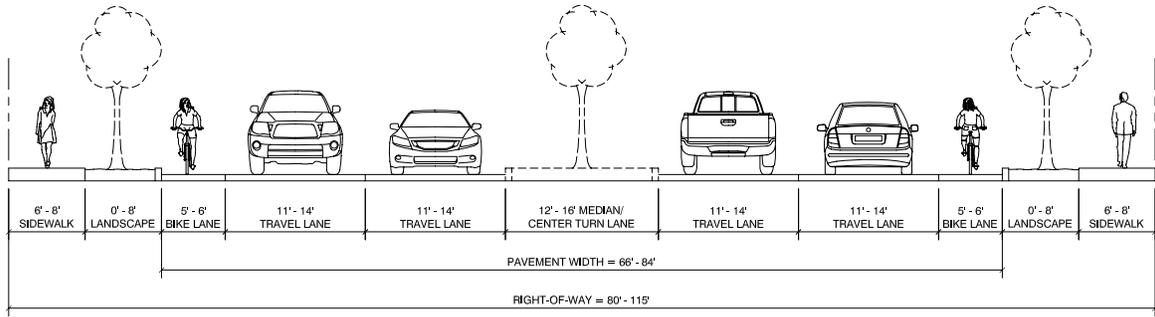
STREET DESIGN STANDARDS

Street design standards support the functional and operational needs of the community's roadway network. The standards provide guidance on the operations, appearance and function of a roadway by defining factors such as the type of pedestrian and bicycle facilities, the number of travel lanes, capacity, operating speed, and safety. The standards ensure that the street network will be capable of safely and efficiently serving the traveling public while also accommodating the orderly development of adjacent lands. Within Wood Village, all major roadways are owned and operated by Multnomah County, which is also responsible for administering street design standards. To ensure consistency with Multnomah County, the Wood Village street design standards are consistent with the Multnomah County street design standards for all collector and higher streets. The local street design standards are unique to Wood Village.

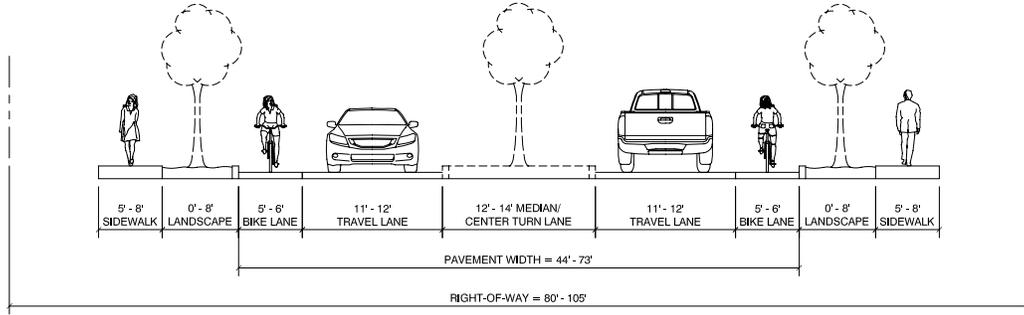
Figure 20 and Figure 21 show the street design standards as cross sections. The city uses these cross sections for planning purposes for new road construction, as well as for those locations where it is physically and economically feasible to improve existing streets. The figures identify on-street parking along the city's 32 foot Standard Residential Streets only. Within the context of the streets owned and operated by Wood Village, on-street parking is a natural component of the local street network, where adjacent land uses support the use of on-street parking. Also, additional width for turn lanes may be needed at specific intersections based on an engineering investigation; these are not shown in the street design standards. The standards shown define typical cross-sections of streets between intersections and the city may implement them with some flexibility recognizing unique and special situations as appropriate.

The Town Center Master Plan created several new road types only employed within the Town Center. These roadways address the unique character and sense of place desired within the Town Center. Figure 22, 23 and 24 detail the cross sections for specific roadways within the Town Center.

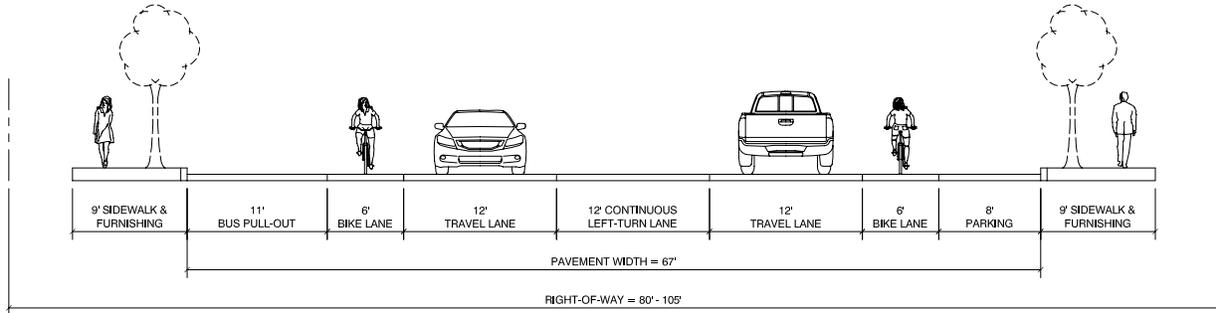
Figure 20 Standard Cross Sections (2012 TSP Figure 17)



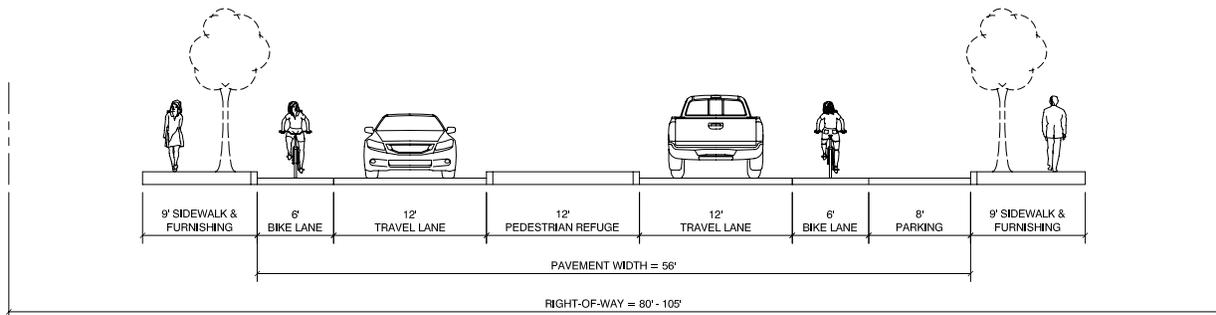
Major Arterial
(Number of Lanes: 5)



Minor Arterial
(Number of Lanes: 3-5)



Minor Arterial - NE Halsey Street *
(NE Halsey Street from Fairview/Wood Village city limits to NE 235th Avenue
and from NE Birch Street to Wood Village/Troutdale city limits)



Minor Arterial - NE Halsey Street *
(Halsey Street from NE 235th Avenue to NE Birch Street)

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Note:
Typical rights-of-way and cross sections shown.
Additional width may be needed to accommodate turn lanes at intersections.

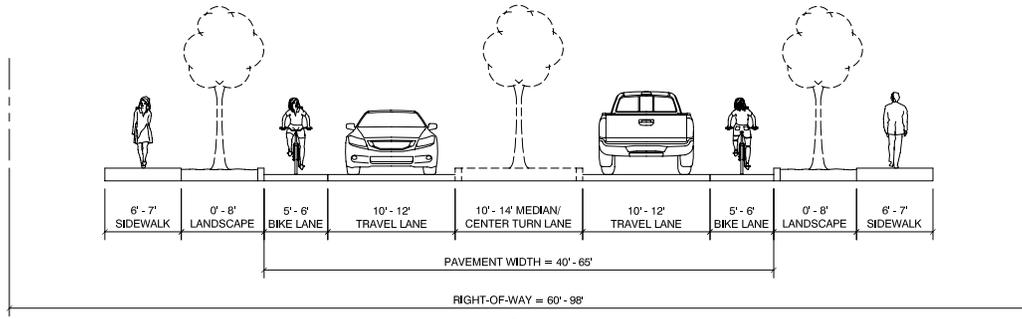
* Reference: Halsey Street Concept Plan

Standard Cross-Sections

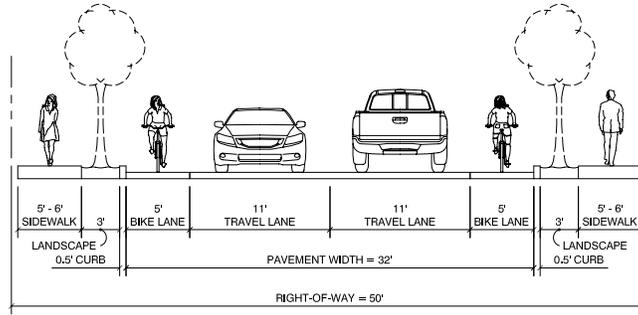


Figure 17

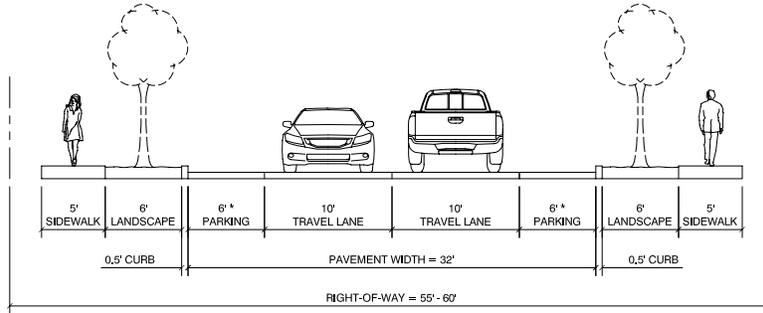
Figure 21 Standard Cross Sections (2012 TSP Figure 18)



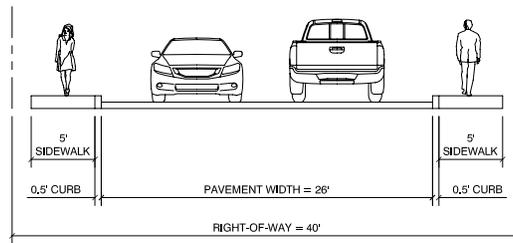
Major Collector
(Number of Lanes: 2-3)



Neighborhood Collector - NE Arata Road **



Standard Local Street



Local "Skinny" Street

Note:

Typical rights-of-way and cross sections shown. Additional width may be needed to accommodate turn lanes at intersections.

* Certain adjacent land-use conditions may warrant the elimination of on-street parking. These situation will be determined at the discretion of the public works director.

** Reference: Arata Road Concept Plan

**Standard
Cross-Sections**



Figure 18

Recent planning efforts have developed new roadway cross sections standards for NE Halsey Street and NE Arata Road. The county based the new standard cross sections for NE Halsey Street and NE Arata Road on the conceptual design plans prepared for each roadway as part of previous planning efforts.

Many agencies are developing “green street” programs that incorporate stormwater management features involving natural absorption and treatment. While green street treatments are independent of functional class, they may require landscape area modification or other street design standards to accommodate this evolving practice. The street design standards shown should not preclude green street treatments.

Local Street Options

Skinny Street Option

The standard cross-section for local streets includes a total paved width of 32 feet, which accommodates parking on one or both sides of the street. The city identifies a skinny street option for local street settings where the community desires low traffic volumes and narrow roadway elements. Skinny streets typically result in slower vehicle speeds, making them attractive in residential areas. Other benefits include reduced impervious surface area (reduced stormwater and environmental impact) and improved pedestrian and bicycle safety related to the lower vehicle speeds.

On-street parking along skinny streets can pose challenges for emergency vehicles as well as other service providers such as garbage/recycling trucks, school busses, and other delivery vehicles. The city can permit 26 foot wide streets, accommodating parking on only one side of the street. This option is most appropriate for lower volume streets (typically less than 400 vehicles per day).

Landscaping

The city’s local street design standards include a landscape strip between the roadway curb and the sidewalk. This landscaping strip separates motorized vehicle and pedestrian traffic and creates an opportunity for landscaping including street trees or other elements. The city will incorporate street trees in all street landscaping areas where possible.

Town Center Street Options

The Town Center Master Plan identifies several specific new local street types applicable only within the Town Center.

Main Street

A traditional main street with on-street parking that prioritizes access to commercial activity for people on foot or bicycle as well as local vehicular trips. Main streets are an important component of the Town Center street and path network. Main streets may accommodate high frequency bus.

Universal Street

Universal streets prioritize bicycle and pedestrian mobility and provide pedestrian and local internal vehicular connectivity. Universal streets are an important component of the Town Center bicycle network.

Service Street

Within the Town Center, these streets prioritize business access for freight and deliveries. As a minor role, they provide bicycle, pedestrian and local vehicular connectivity.

Figure 22 Town Center Main Street Cross Section

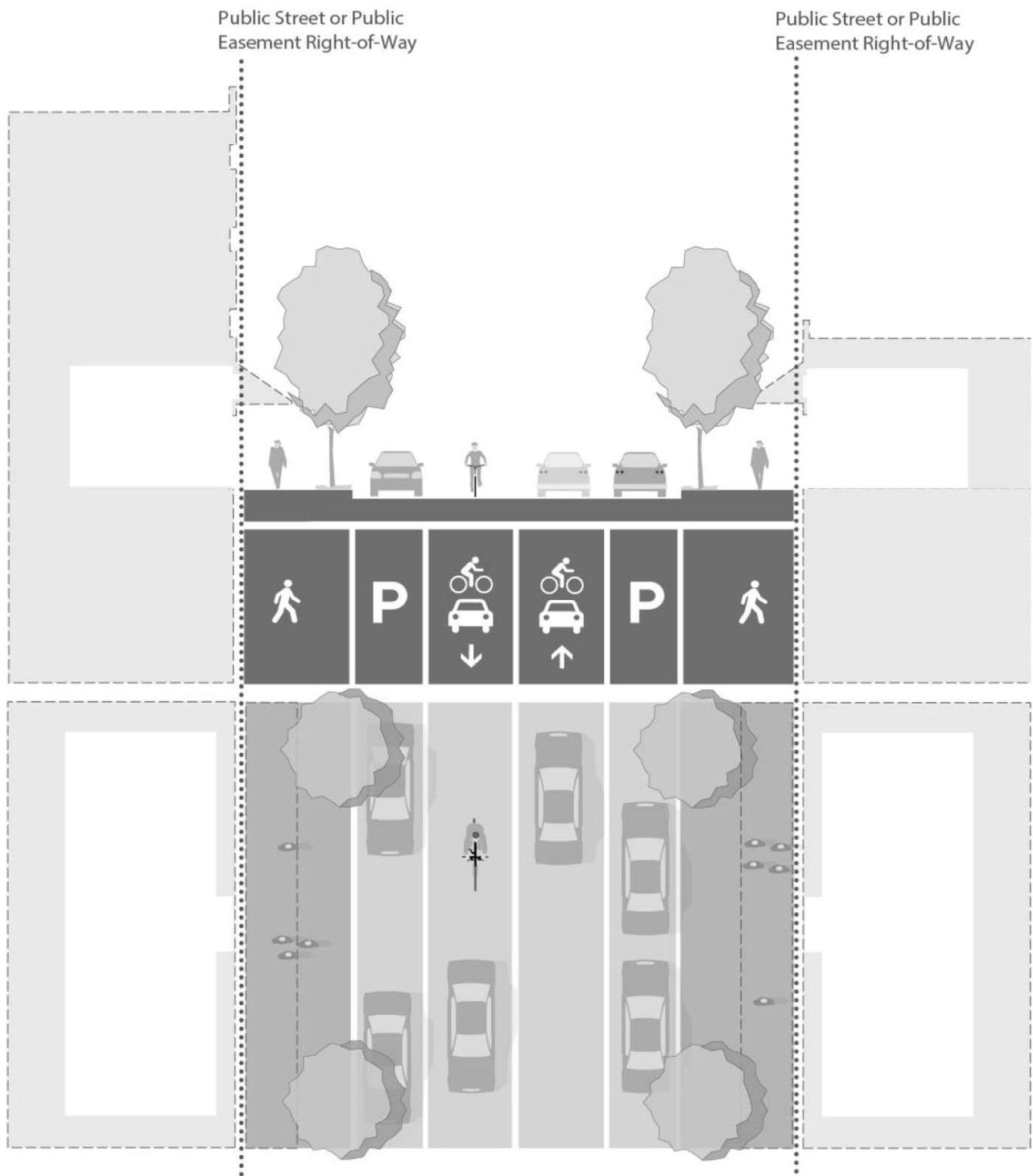


Figure 23 Town Center Local Street Cross Section

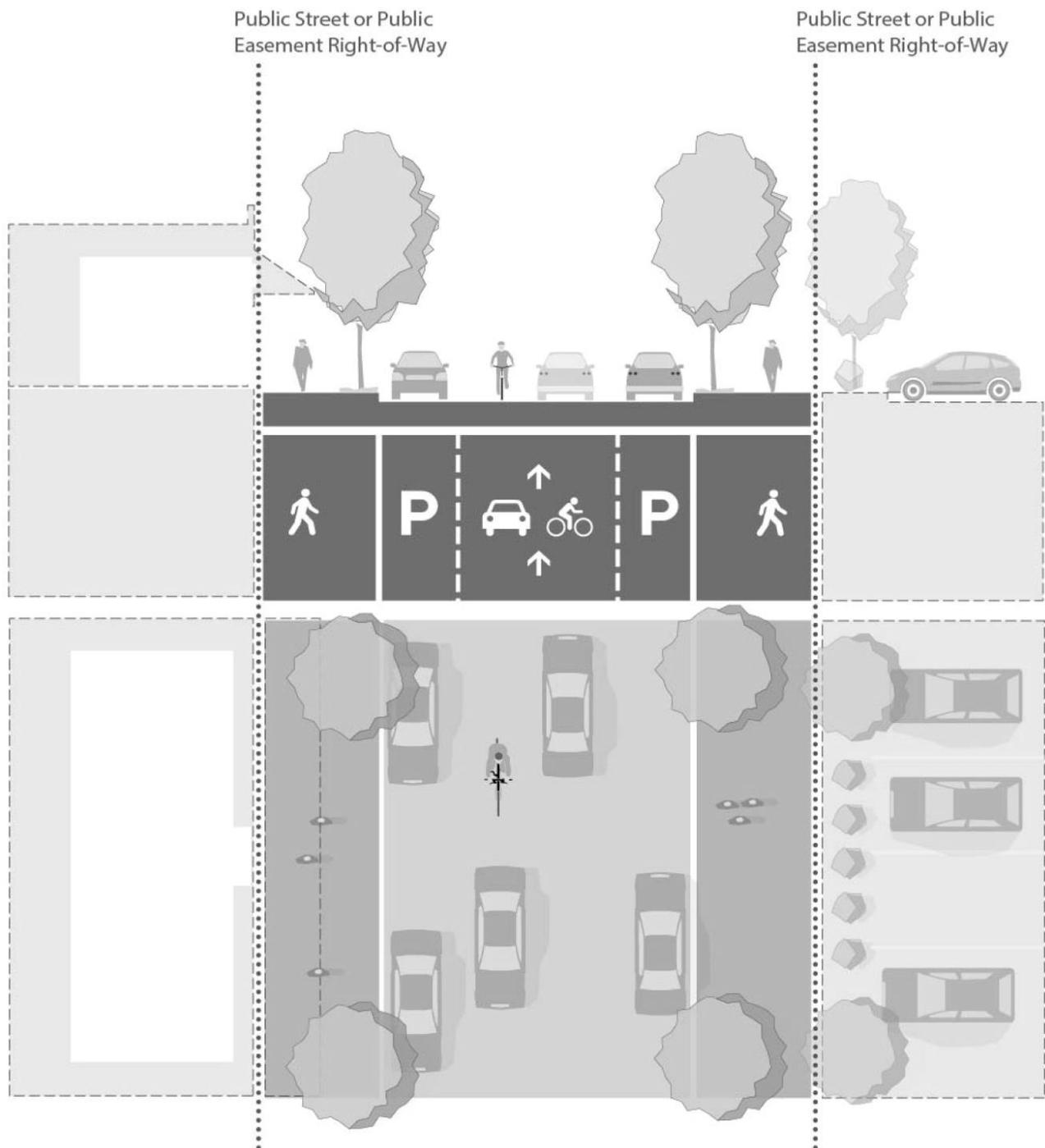


Figure 24 Town Center Universal Street Cross Section

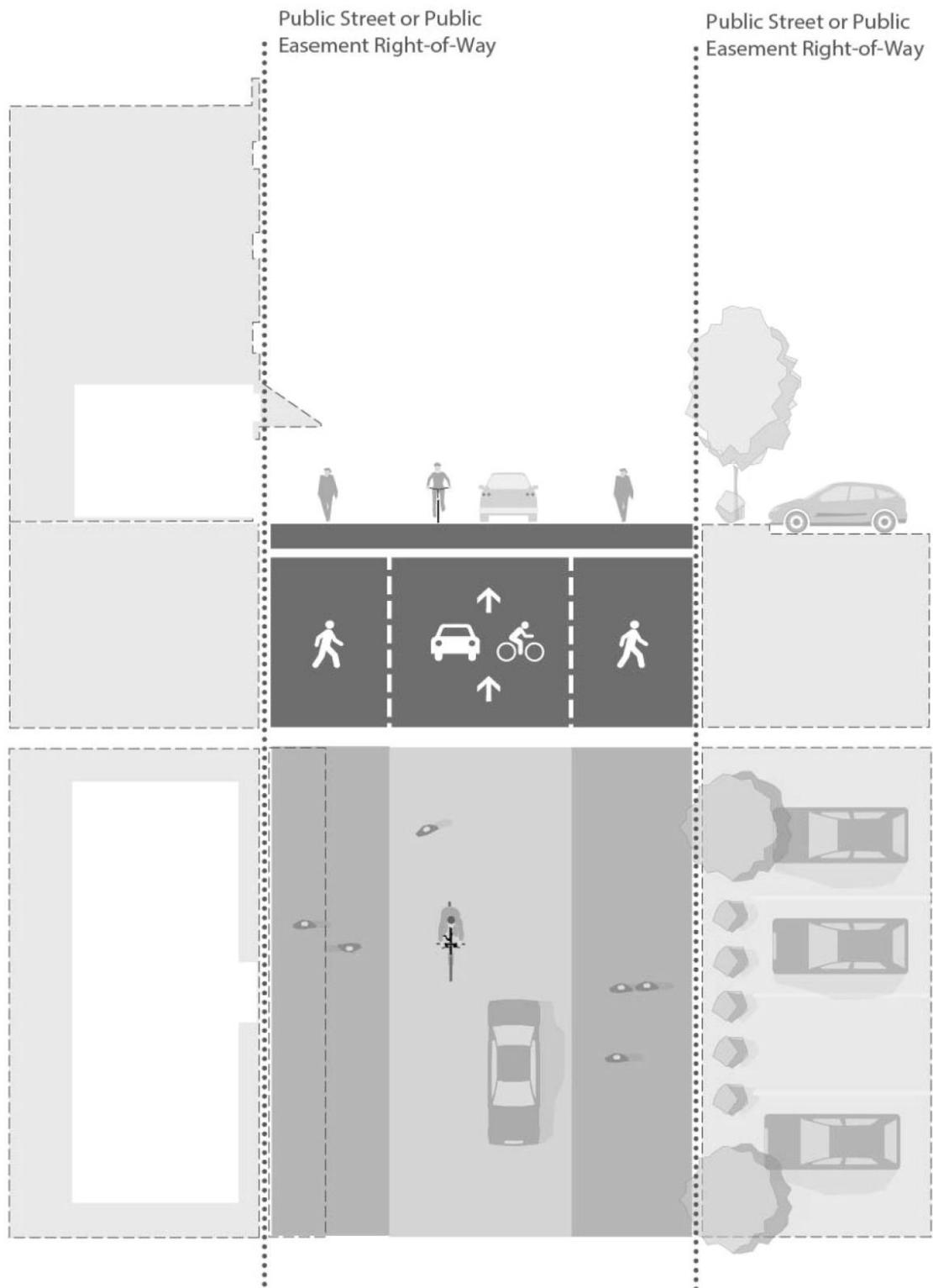


Figure 25 Town Center Service Street Cross Section

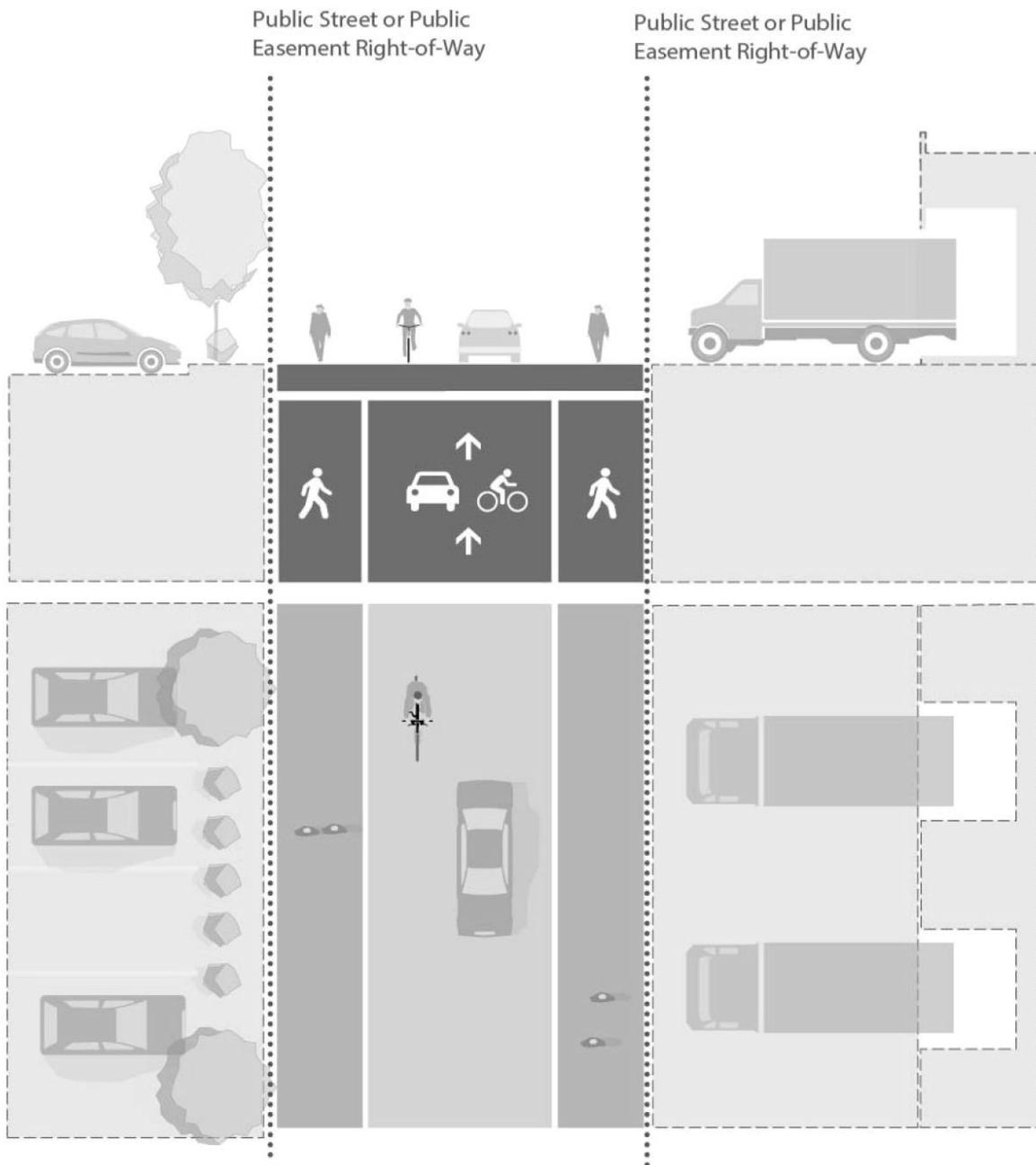
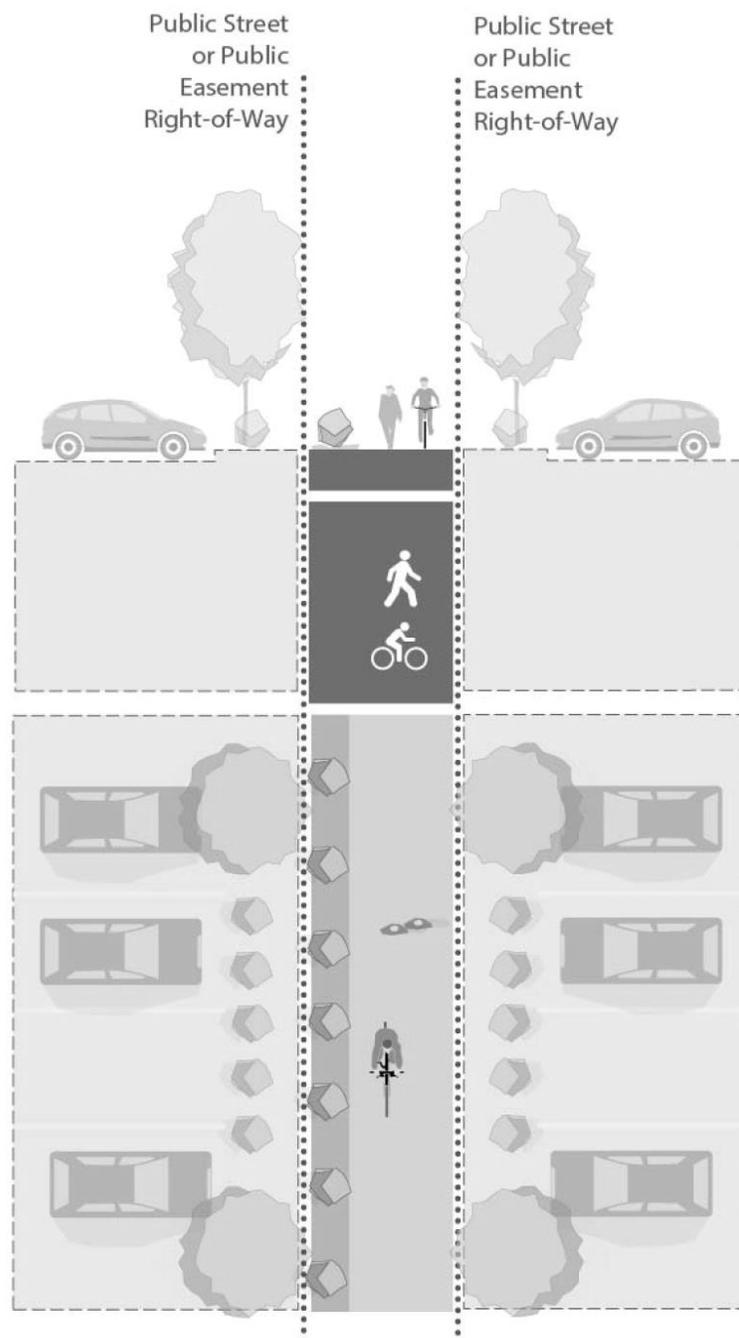


Figure 26 Town Center Service Street Cross Section



Pedestrian System Plan

Providing connections between major activity centers is a key objective of the pedestrian and bicycle system plans. Major activity centers are locations that typically attract high levels of pedestrian and bicycle activity on a regular basis. Within Wood Village, these activity centers include the retail and commercial areas located along NE Glisan Street and NE Sandy Boulevard, city parks and schools located along NE Halsey Street, and the multiple transit stops located along TriMet Routes 12 and 77. This section identifies specific pedestrian and bicycle priorities for local connectivity and access.

PEDESTRIAN SYSTEM COMPONENTS

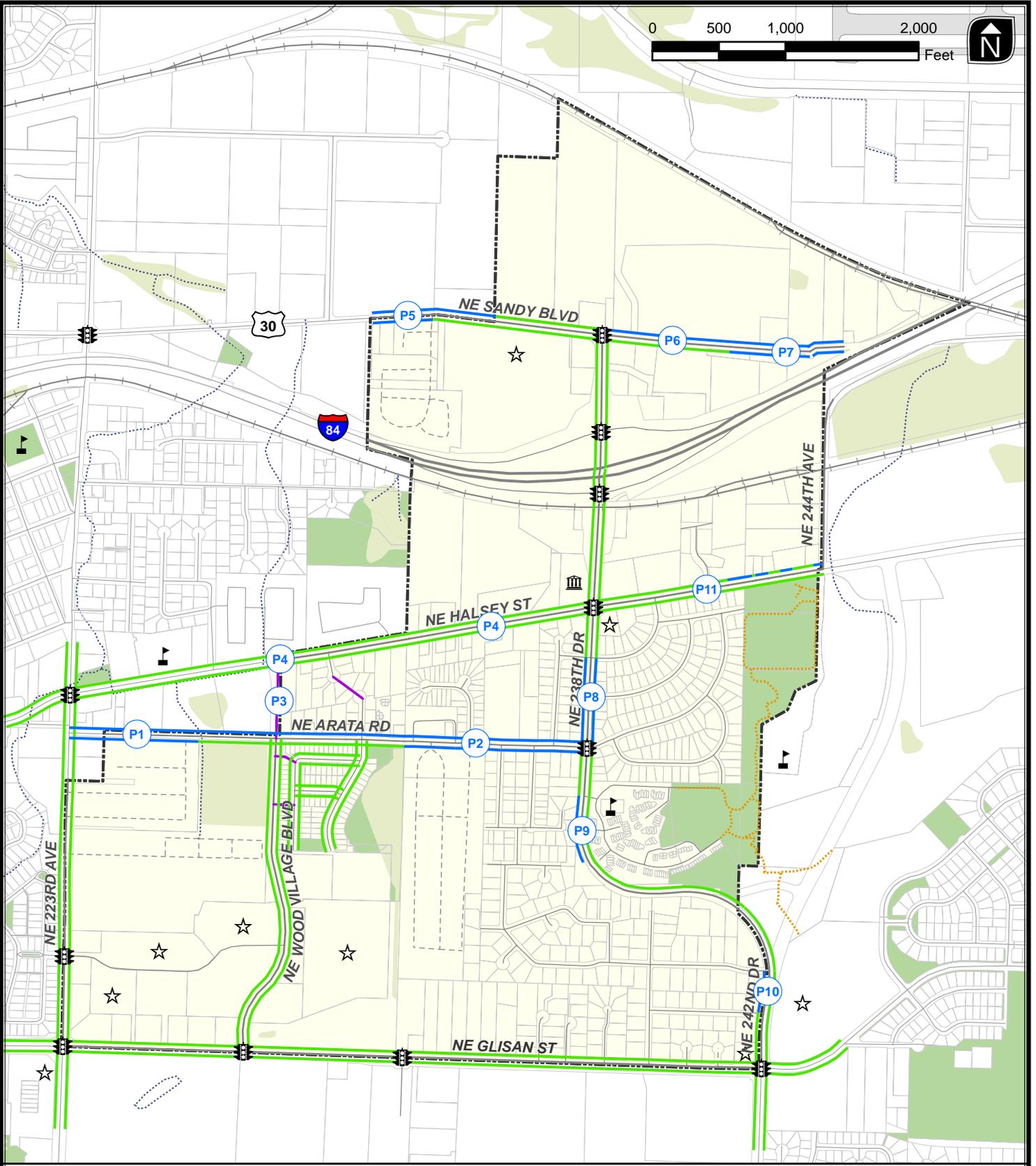
The pedestrian improvement projects include providing sidewalks and off road multi-use paths and trails to facilitate pedestrian travel throughout the transportation system, and treatments to aid pedestrians crossing traffic. Street design standards can help ensure that the city provides pedestrian facilities in conjunction with all new public streets. For existing roadways without sidewalks, the city should require sidewalks with any redevelopment of adjacent properties or with significant improvements in the roadways.

The pedestrian system plan improves pedestrian access and circulation in a number of areas throughout the city. Many of the priority areas identified during the TSP process are located along major commercial and residential streets, such as NE Sandy Boulevard, NE Arata Road, and NE 242nd-238th Drive. Figure 27 and Project Summary Tables 9, 10, & 11 present the projects for the pedestrian system plan. The plan does not include a project for new sidewalks along the segment of NE 242nd-238th Drive located along the west side of the roadway between NE Holladay Street and NE Shannon Street. Topographical conditions along this segment make adding sidewalks or other pedestrian facilities cost prohibitive. It is also important to note that in addition to the several sidewalk projects included in the plan, there are two priority pedestrian crossing projects. Examples of the crossing improvement types are below.

Raised Median Islands

This TSP includes raised median islands in the street design standards for NE Halsey Street to accommodate pedestrian crossings at the two mid-block crossings identified in the NE Halsey Street Design Plan. Raised median islands provide pedestrians with a refuge area within the crosswalk to stop while crossing the street and complete a two-stage crossing if needed.

Figure 27 Pedestrian System Plan (figure to be updated - 2012 TSP Figure 19)



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Pedestrian Facilities		Map Features	
	Install Sidewalks on Both Sides		Other Streets
	Install Sidewalks on One Side		Tax Lots
	Sidewalks - Both Sides		Railroads
	Sidewalks - One Side Only		Streams
	Multi-Use Path		Wetlands
	Nature Trail		Parks
	Railroads		City Limits
	Signal		City Hall
	School		Shopping

Pedestrian System Plan

Figure 19

Rectangular Rapid Flashing Beacon

Given the relatively high traffic volumes expected along NE Halsey Street during peak time periods, Rectangular Rapid Flashing Beacons, or RRFBs, can help facilitate pedestrian crossings at the proposed mid-block crossings. However, the city should conduct an engineering study to evaluate the types of pedestrian crossing treatments needed at the mid-block crossings.

Other Pedestrian Crossing Treatments

The Transportation System Tools section includes several additional pedestrians crossing treatments that can also be applied on future projects. As part of all street and intersection improvement projects in the future, the city will work with Multnomah County to ensure that the pedestrian system includes treatments to further enhance the comfort, convenience and safety of pedestrian crossings at intersections throughout the city.

Bicycle System Plan

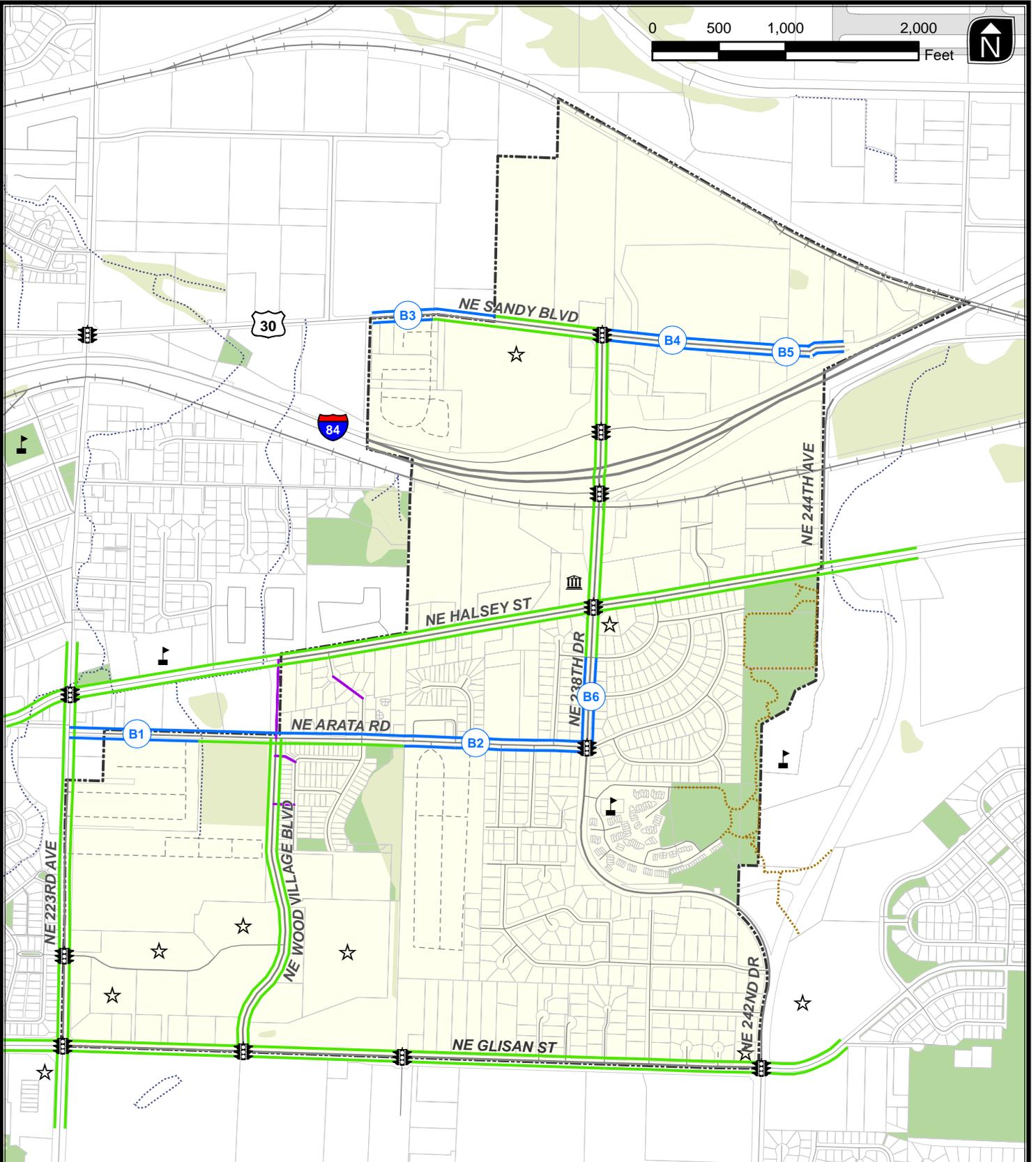
The bicycle plan will establish a network of bicycle lanes and routes that connect the city's bicycle generators and provide a safe and effective system. Although bicycle lanes are required along all arterials and collectors per city code, many of the arterial and collector roadways in Wood Village do not have sufficient width to accommodate bicycle lanes. Therefore, the projects included in the TSP represent a prioritization of the most important bicycle facility needs, most of which require widening.

These designated facilities will provide essential connections between many of the residential neighborhoods, commercial areas, schools, and various recreational areas within the city. Figure 28 shows the bicycle improvement projects and are included in the Project Summary Tables 9, 10, & 11.

BICYCLE LANES

A majority of the bicycle improvement projects in the TSP update involve widening to accommodate striped bicycle lanes. Striped bicycle lanes can improve bicycle safety along high speed and higher volume roadways by separating slower moving bicyclists from faster moving motorists. A comprehensive system of bicycle lanes can provide direct connections between major commercial, residential, industrial, and institutional areas throughout the city.

Figure 28 Bicycle System Plan (figure to be updated - 2012 TSP Figure 20)



H:\profile\11686 - Wood Village Transportation Systems Plan\gis

Bicycle Facilities	Map Features
Install Bike Lanes on Both Sides	Other Streets
Install Bike Lanes on One Side	Tax Lots
Bike Lanes - Both Sides	Railroads
Bike Lanes - One Side Only	Streams
Multi-Use Path	Wetlands
Nature Trail	Parks
	City Limits
	Signal
	City Hall
	School
	Shopping

Bicycle System Plan

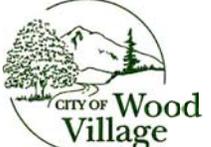


Figure 20

MULTI-USE PATHS AND TRAILS

The prioritized TSP project list includes the continued use of the existing multi-use paths and trails as well as new multi-use paths.

Public Transportation Plan

The public transportation plan establishes a comprehensive transit system that provides access to areas within the city as well as destinations too far to walk or bike. The TSP update identifies the following service enhancements, capital improvements, and policy improvements.

TRANSIT STREET DESIGNATIONS

Figure 29 depicts the streets that are designated as transit streets: streets that currently have fixed-route transit service, or there is a desire to potentially see fixed-route transit service along them over the next 20 years.

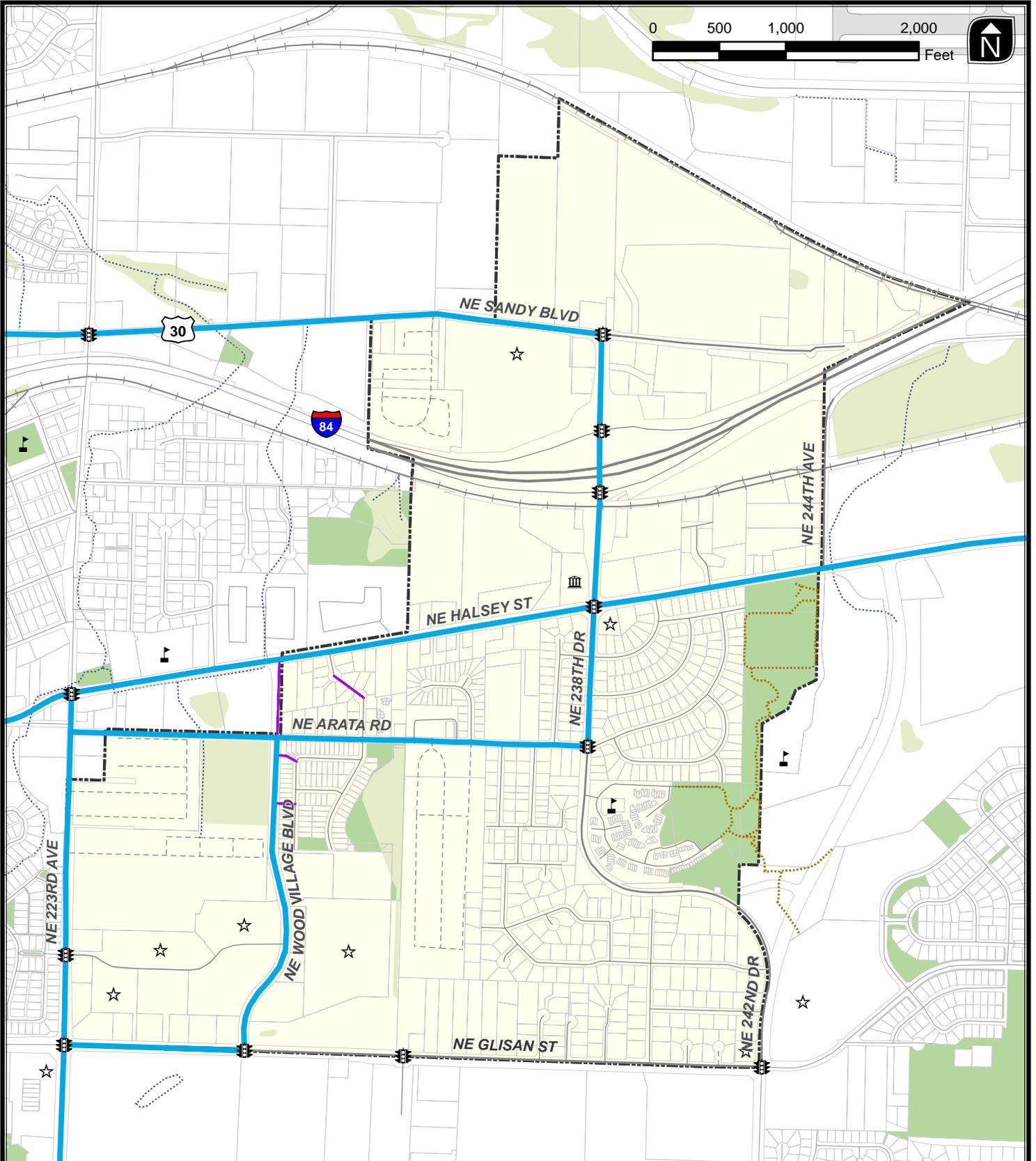
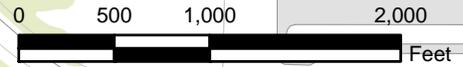
SERVICE ENHANCEMENTS

TriMet determines its service enhancements through five-year Transit Investment Plans (TIP), which identify the agency's programs and strategies to meet regional transportation and livability goals. The Regional Transportation Plan and local Transportation System Plans help guide the TIP, which is updated annually. The city will coordinate with TriMet on the annual TIP update process to ensure that TriMet includes any service enhancements within Wood Village.

CAPITAL IMPROVEMENTS

TriMet prioritizes capital improvements based on the number of boardings, the type of service (local, express, frequent, Max, etc.) and special circumstances, such as the presence of a nearby senior center. Most stops in Wood Village have a single pole with schedule display while a few stops have shelters with and without information. As ridership increases, the city will work with TriMet to provide additional facilities such as shelters, stops, and park & ride facilities and ensure that access to transit service is provided by consistent pedestrian and bicycle facilities.

Figure 29 Designated Transit Streets (2012 TSP Figure 21)



H:\profile\11686 - Wood Village Transportation Systems Plan\gis

Transit Facilities		Map Features	
	Transit Streets		Other Streets
	Tax Lots		Signal
	Railroads		City Hall
	Streams		School
	Wetlands		Shopping
	Parks		
	City Limits		

Designated Transit Streets



Figure 21

POLICY AMENDMENTS

The following policy amendments will improve transit conditions in the city.

Improve Service to “Transit Dependent” Populations

Designate 238th Drive and Sandy Boulevard as transit streets to reflect current transit routes. Designate Wood Village Boulevard and Arata Road as transit streets to reflect the potential for future transit service along these key corridors, along with the proposed roadway through the Wood Village Town Center.

Improve Transit Safety

Work with TriMet to ensure that consistent pedestrian and bicycle facilities provide access to all existing and future transit stops, including enhanced pedestrian crossings in key locations, and that all transit stops are well lit and patrolled by local police.

Maintain Transit Facilities

Work with TriMet to ensure all transit service stops are maintained, and that the information is up-to-date and available.

Other Transit Policies

- **Park & Ride Facilities:** explore opportunities to establish a park & ride facility within existing retail, commercial, or institutional parking lots within the city limits.
- **Frequency of Service:** explore opportunities to increase the frequency of transit service along existing transit routes.
- **North-South Travel:** Explore opportunities to establish a north-south transit route between the Wood Village city center and areas to the south.

Air Service / Rail Service / Pipeline Service

Refer to Section 2 of the 1999 City of Wood Village TSP for additional information related to Air, Rail, and Pipeline Service within Wood Village.

Transportation System Implementation Plan

This section outlines the transportation system improvement projects for Wood Village as part of this TSP update as well as a basic timeline for implementation. The implementation plan does not identify specific years when the city should construct infrastructure, but rather prioritizes projects for the city to develop within near-term (1-5 year) and long-term (6-20 year) horizons. The City of Wood Village will periodically update its TSP and will review the need and timing for longer-term improvements as conditions evolve.

Table 7 and Table 8 list transportation improvement prioritization in the city for the near-term and long-term, respectively. The project team selected projects based on their ability to enhance pedestrian and bicycle travel within and through the city. The implementation plan recognizes that a limited amount of money will be available to fund projects. As a result, the team included only those projects with a reasonably likely funding source in the near-term category. The longer project timelines reflect a combination of anticipated future needs and the reality that many of the long-term projects will need to secure a future funding source.

Table 7. Near-Term Transportation Improvement Program

Project No. (see Figures 21, 27 & 28)	Project Location	Project Description	Potential Funding Source	Estimated Cost
Roadway Improvement Projects				
R1	Arata Road: NE 223 rd Avenue and NE 238 th Drive	Reconstruct Arata Road with safety and connectivity improvements, per Exhibit 3	Funded G, PDF	\$3,620,340
R2	238th/242nd Avenue: NE Halsey Street and NE Glisan Street	Reconstruct 238th/242nd Avenue to arterial standards including adaptive signal timing and improvements	Funded G, PDF	\$8,421,944
R3	Sandy Boulevard: NE 230 th Avenue to NE 238 th Drive	Correct substandard conditions on Sandy Blvd as part of a pavement preservation project	Funded G	\$558,674
Pedestrian Improvement Projects				
P1	NE Arata Road: NE 223 rd Avenue to Poplar Home Manor Property Line	Install sidewalks on both sides of the roadway per Arata Road Concept Plan	Funded G, PDF	See R1
P2	NE Arata Road: Poplar Home Manor Property Line to 238 th Drive	Install sidewalks on both sides of the roadway per Arata Road Concept Plan	Funded G, PDF	See R1
P4	NE Halsey Street	Install mid-block crossings (2 locations) ¹ consistent with the Halsey Street Concept Plan	G	\$45,000
P5	NE Sandy Boulevard: NE 230 th Avenue to NE 238 th Drive	Install sidewalks on both sides of the roadway per Minor Arterial design standards	Funded G	See R3
P6	Wood Village Town Center	Trail connection between Arata Road and Glisan Street through the wooded areas along the eastern edge of the Town Center with a trail connection westward to Wood Village Boulevard	PDF	TBD

Project No. (see Figures 21, 27 & 28)	Project Location	Project Description	Potential Funding Source	Estimated Cost
P7	238th/242nd Avenue: NE Halsey Street and NE Glisan Street	Complete pedestrian and bicycle improvements on 238 th along with R2	Funded G, PDF	See R2
Bicycle Improvement Projects				
B1	NE Arata Road: NE 223 rd Avenue to Poplar Home Manor Property Line	Widen both sides of the roadway to accommodate bicycle lanes per Arata Road street design standards	Funded G, PDF	See R1
B2	NE Arata Road: Poplar Home Manor Property Line to NE 238 th Drive	Widen both sides of the roadway to accommodate bicycle lanes per Arata Road street design standards	Funded G, PDF	See R1
B3	NE Sandy Boulevard: NE 230 th Avenue to NE 238 th Drive	Widen both sides of the roadway to accommodate bicycle lanes per Minor Arterial design standards	G, PDF	See R3
B4	238th/242nd Avenue: NE Halsey Street and NE Glisan Street	Complete pedestrian and bicycle improvements on 238 th	G, PDF	See R2

CF – Capital Funds (Motor Vehicle Tax, Bonds, User Fees, Local Improvement District)

G – Grants (Any Federal, State, or Local Grants)

PDF – Private Development Funds (Developer Dedications of Right-of-Way and Local Street Improvements)

¹ The exact location of mid-block crossings along Halsey Street will be determined based a more detailed planning/engineering study.

Table 8. Long-Term Transportation Improvement Program

Project No. (see Figures 21, 27 & 28)	Project Location	Project Description	Potential Funding Source	Estimated Cost
Roadway Improvement Projects				
R4	NE Halsey Street: NE 223 rd and NE 238 th	Evaluation and refinement, along with improvements to the roadway. Improvements will need to consider safe pedestrian crossings, as well as accommodating all modes	CF, G, PDF	TBD
R5	238/242 at Glisan intersection modification	System Management: Employ adaptive signal timing and other system management techniques to improve intersection performance	CF, G, PDF	TBD
R6	I-84 on-ramp	Evaluate ramp queuing issues on I-84 at 238 th	CF, G, PDF	TBD
R7	Wood Village Boulevard: NE Glisan Street and NE Halsey Drive	Corridor safety evaluation of Wood Village Boulevard and all intersections with public and private roadways	CF, G, PDF	TBD
R8	NE 223 rd and NE Glisan Street intersection modifications	Address capacity issues	CF, G, PDF	TBD
Pedestrian Improvement Projects				
P6	NE Sandy Boulevard: NE 238 th Drive to Camp World Driveway (See Figure 19)	Half-Street Improvements - Install sidewalks on the north side of the roadway per street design standards	PDF	\$130,000
P7	NE Sandy Boulevard: Camp World Driveway to Roadway Terminus	Install sidewalks on both sides of the roadway per street design standards	PDF	\$235,000
P8	NE 238 th Drive: NE Birch Avenue to NE Arata Road	Install sidewalks on both sides of the roadway per street design standards	CF, G, PDF	\$183,000
P9	NE 238 th Drive: NE Treehill Drive to Shannon Street	Install sidewalk on the west side of the roadway per street design standards	CF, G, PDF	\$43,000
P10	NE 238 th Drive: NE Holladay Street to NE Oregon Street	Install sidewalk on the west side of the roadway	CF, G, PDF	\$28,000

Project No. (see Figures 21, 27 & 28)	Project Location	Project Description	Potential Funding Source	Estimated Cost
P11	NE Halsey Street: NE 238 th Drive to NE 244 th Avenue	Infill sidewalk gaps with 6' sidewalks, driveway cuts, and retaining walls consistent with Halsey Street Concept Plan.	CF, G, PDF	\$571,000
Bicycle Improvement Projects				
B4	NE Sandy Boulevard: NE 238 th Drive to Camp World Driveway (See Figure 20)	Half-Street Improvements - Widen the north side of the roadway to accommodate bicycle lanes per street design standards	PDF	\$12,000
B5	NE Sandy Boulevard: Camp World Driveway to Roadway Terminus	Widen both sides of the roadway to accommodate bicycle lanes per street design standards	PDF	\$102,000
B6	NE 238 th Drive: NE Birch Avenue to NE Arata Road	Widen both sides of the roadway to accommodate bicycle lanes per street design standards	CF, G, PDF	\$65,000

CF – Capital Funds (Motor Vehicle Tax, Bonds, User Fees, Local Improvement District)

G – Grants (Any Federal, State, or Local Grants)

PDF – Private Development Funds (Developer Dedications of Right-of-Way and Local Street Improvements)

CONNECTIVITY IMPROVEMENTS

Table 9 summarizes the connectivity improvement program for Wood Village. This program includes a mixture of improvements to local street connectivity as well as pedestrian/bicyclist access and circulation. The project team has separated these projects from the near- and long-term bicycle/pedestrian improvements given that the vast majority would likely be constructed as part of private development projects. Figure 17 illustrates the general location of the projects identified in Table 9.

Table 9. Connectivity Improvement Program

Project No. (see Figure 17)	Project Location	Project Description	Potential Funding Source
Local Street Connectivity Improvement Projects			
C1	East-West Connection #1	Provide an east-west connection that would link NE Wood Village Boulevard to potential future redevelopment to the east (Wood Village Green Mobile Home Park)	PDF
C2	North-South & East-West Connection #2	Provide a north-south multi-use trail connection along the eastern edge of the Town Center between NE Arata Road and NE Glisan Street.	PDF
C3	North-South & East-West Connection #3	Upon potential redevelopment of the Wood Village Green Mobile Home Park, provide a north-south connection to Arata Road along with east-west connections from NE Stanley Street, NE Shannon Street and NE Holladay Place	PDF

Project No. (see Figure 17)	Project Location	Project Description	Potential Funding Source
C4	North-South Connection #4	Provide a north-south multi-use trail connection that would link NE Glisan Street and potential future redevelopment of the Wood Village Green Mobile Home Park	PDF
C5	East-West Connection #5	Provide an east-west connection between NE 223 rd Avenue and NE Wood Village Boulevard	PDF
C6	North-South Connection #6	Provide a north-south connection between NE Arata Road and east-west connection #5	PDF
C7	North-South Connection #7	Provide a north-south multi-use path connection between NE Arata Road and NE Halsey Street east of NE 131 st Court	CF, PDF
C8	North-South Connection #8	Provide a north-south multi-use path connection between NE Arata Road and NE Halsey Street adjacent to the Wood Village Baptist Church	CF, PDF
C9	East-West Connection #9	Provide an east-west multi-use path connection between NE Shannon Street and NE 238 th Drive	CF, G
C10	East-West Connection #10	Provide an east-west multi-use path connection between NE Treehill Drive and NE Hawthorne Avenue	CF, G, PDF
C11	Easterly Connection #11	Complete the bicycle/pedestrian connections from Arata Road easterly to the trail system through the park. Encourage connection connecting to trails that extend through Troutdale to the Sandy River and the 40 mile loop	G, PDF
C12	East-West Connection #12	Provide an east-west connection between the Wood Village Park mobile home park and the industrial property located west of the city limits	PDF
C13	East-West Connection #13	Provide an east-west connection between the Wood Village Park mobile home park and the retail/commercial property to the east	PDF

CF – Capital Funds (Motor Vehicle Tax, Bonds, User Fees, Local Improvement District)

G – Grants (Any Federal, State, or Local Grants)

PDF – Private Development Funds (Developer Dedications of Right-of-Way and Local Street Improvements)

ORDINANCE AMENDMENTS

The project team recommended regulatory language for the Zoning and Development Ordinance (ZDO) to implement the TSP, and to ensure consistency with the RTFP and the state Transportation Planning Rule (OAR 660-12). That language, contained in Appendix B Proposed Implementation Language of the 2012 TSP, included the complete code analysis and amendments. All of the proposed code amendments were adopted by the City in conjunction with the 2012 TSP. The remaining requirement to meet the RTFP is for the city to adopt a street element and the required performance standards, both of which are contained in this TSP update.

Section 9 Transportation Funding Plan

TRANSPORTATION FUNDING PLAN

This chapter provides an overview of funding and financing options that may be of interest to the City of Wood Village. Funding describes methods that generate revenue for transportation projects, while financing refers to how projects are paid for over time. For each of the funding options listed below, there is a brief description and a short discussion. The project team has not screened funding options according to their political or legal feasibility. The funding environment is dynamic so the following list should not be considered exhaustive.

FEDERAL RESOURCES

Community Development Block Grants (CDBG)

The Federal Department of Housing and Urban Development offers Community Development Block Grants (CDBG). Cities must compete for grants based upon a formula that includes factors such as rural/urban status, demographics, local funding match, and potential benefits to low-to-moderate income residents, including new job creation. Cities may also use CDBG funds for emerging public work needs.

Potential: In small communities such as Wood Village, this program has limited application but may be a source of street funds for roads serving new developments supporting job creation or multifamily housing. The city should coordinate CDBG funding requests through Multnomah County.

Federal Economic Development Administration (EDA)

The Federal Economic Development Administration provides annual grant funding on a competitive basis for public works improvements that directly generate or retain jobs in local communities. Cities can use these funds for local utilities and transportation facilities that serve new development sites.

Potential: EDA funds are difficult to obtain but could be considered for targeted improvements for local industry expansion. The city should coordinate funding requests for EDA grants with Multnomah County and the Oregon Economic and Community Development Department (OECDD).

remaining amount in the State Motor Vehicle Fund is used to maintain and enhance the state highway system. The state operates a grant program available to cities for bicycle-related transportation system improvements and state law requires a minimum of one percent of the state fuel tax and vehicle registration funds be set aside for pedestrian and bicyclist facilities.

Potential: With an increase in population, number of registered vehicles, and fuel sales, the total revenue from the State Highway Fund will rise but if the fees (tax per gallon) remain at current levels, there will be a reduction in buying power due to inflation and more fuel-efficient vehicles. The gas tax will however continue to be a source of funds for the city through ODOT for highway and pedestrian and bicycle projects.

Special City Allotment

Description: The State of Oregon, through the League of Oregon Cities, provides grants to Oregon cities with populations less than 5,000 to help cities repair or reconstruct local streets that are over capacity or are in poor condition.

Potential: These funds are limited to streets that are owned or maintained by the local government (state- or county-owned streets are ineligible). Applications are limited to local streets within Wood Village.

Special Public Works Funds (SPWF) and Immediate Opportunity Funds (IOF) — Lottery Program

Description: The State of Oregon, through the Economic and Community Development Department (OECDD), provides grants and loans to local governments to construct, improve, and repair public infrastructure to support local economic development and create new jobs.

Existing Application: The state has used SPWF and IOF funds in a number of cities to construct water, sewer, and limited street improvements.

Potential: The state limits these funds to situations where a project will contribute to economic development and creating family-wage jobs. An example of the application of these funds in Wood Village may be for street improvements along NE Sandy Boulevard and NE Halsey Street such as medians, landscape strips, curb extensions, and sidewalks to better facilitate access to businesses on both sides of the streets and facilitate walking trips for customers accessing retail businesses. The city should coordinate funding applications with Multnomah County, OECDD, and ODOT.

ODOT Statewide Transportation Improvement Program⁶

Description: The Statewide Transportation Improvement Program (STIP) provides federal highway funds for projects in a number of programs. There is a Bridge Program, an Enhance Program, an Interstate Maintenance Program, an Operations Program, a Preservation Program and a Safety Program. ODOT distributes most of the Program funds based on internal management systems, but the Program most applicable to the City of Wood Village is the Enhance Program that focuses funding on activities that enhance, expand, or improve the transportation system.

Existing Application: The Enhance Program funds non-highway projects that may be on or off the state system that are consistent with state and local plans and are demonstrate the greatest benefits in relation to costs. These projects typically make key connections between modes or facilities, improve access to economic opportunities and/or address identified system bottlenecks. Given the limited funding ODOT has, the primary focus of the Enhance Program is to ensure funds are allocated to high priority and strategic transportation investments that directly or indirectly benefit the state's multimodal transportation system. These funds are highly competitive and jurisdictions throughout the Portland Metro area compete for funding. For the 2018-2021 cycle there was \$30 million available for the Enhance Program.

Potential: The City of Wood Village could seek Enhance Program funds in the next round as ODOT has already developed the 2018-2021 Enhanced Program, though the competitive and regional nature of these projects could make it difficult for the city to compete for funds.

State Parks Funds⁷

Description: The Oregon Parks and Recreation Department (OPRD) administers Recreational Trails Grants for recreational trail-related projects, such as hiking, running, bicycling, off-road motorcycling and all-terrain vehicle riding.

Existing Application: OPRD distributes more than \$4 million annually to Oregon communities for outdoor recreation projects, and has awarded more than \$40 million in grants across the state since 1999. OPRD can award grants to non-profits, cities, counties, and state and federal agencies.

⁶ Source: <https://www.oregon.gov/ODOT/HWY/REGION1/Pages/stip/index.aspx>

⁷ Source: <http://www.oregon.gov/OPRD/GRANTS/trails.shtml>

Potential: Funding is primarily intended for recreational trail projects, so the City of Wood Village could seek funding for additions to the trail systems located in the Donald L Robertson City Park.

LOCAL FUNDING OPTIONS

Cities commonly use the following local funding programs in the funding of transportation improvements.

Metro Regional Flexible Fund

Description: Regional flexible funds come from two different federal grant programs: the Surface Transportation Program and the Congestion Mitigation/Air Quality Program. Metro allocates the funds every two years based on projects identified in the Regional Transportation Plan. Projects and program applications may be nominated by jurisdictions, transportation or transit agencies within the metropolitan region. Jurisdictions can spend the funds on a number of different types of improvements, except local street construction.

Existing Application: Multnomah County recently received funding from the Regional Flexible Fund for two projects within Wood Village. The first project constructed Arata Road, including adding sidewalks, bike lanes, lighting, landscaping and drainage improvements on the south side of Arata Road between NE Wood Village Boulevard and NE 238th Drive. The second project is NE Sandy Boulevard between NE 230th Avenue and NE 238th Drive. This project will improve NE Sandy Boulevard to urban design standards with two 12 foot travel lanes, one 14 foot turn lane, and two 6 foot sidewalks and bike lanes on both sides of the roadway.

Potential: Multnomah County and the City of Wood Village could use Regional Flexible Funds to complete the pedestrian and bicycle facilities located along NE Arata Road as well as along many other streets within the city.

General Obligation Bonds (G.O. Bonds)

Description: Municipal governments often sell bonds to fund transportation (or other types) of improvements, and then repay the bonds with property tax revenue generated by the local government. Under Oregon Measure 50, voters must approve G.O. Bond sales with at least a 50 percent voter turnout.

Existing Application: Cities all over the state use this method to finance transportation improvement construction. For smaller jurisdictions, the cost of issuing bonds in relation to the amount that they can reasonably issue creates a problem. Underwriting costs can become a high percentage of the total cost

for smaller jurisdictions. According to a representative of the League of Oregon Cities, the state is considering developing a “Bond Pool” for smaller jurisdictions. By pooling together several small bond issues, they will be able to achieve an economy of scale and lower costs.

Potential: Within the limitations outlined above, G.O. bonding can be a viable alternative for funding transportation improvements for specific projects.

Serial Levy/Property Taxes within the Limits of Ballot Measure 50

Description: The city or county could use local property tax revenue to fund transportation improvements through a serial bond levy.

Existing Application: Revenue from property taxes ends up in the local government general fund where it is used for a variety of purposes. Examples of jurisdictions using property taxes as a funding source for transportation capital improvements are throughout the state. However, with the limitations resulting from Measure 50, using property taxes for transportation capital improvements will continue to compete with other general government services under the three percent assessed value increase allowed by Measure 50 and the local tax limits of \$15 per \$1,000 of assessed value established under Measure 5. Under Measure 50, however, there is no limit on assessed value generated by new construction.

Potential: Because the potential for increased funding from property tax revenue is limited by Ballot Measures 5 and 50 and by competition from other users who draw funds from the general fund, serial levies and/or property taxes are not practical sources for financing major local street improvements but could finance a package of minor improvement projects.

Local Street Utility/User Fee

Description: The City of Wood Village has an adopted Street Utility Fee. The fee combines fees for storm water and transportation and includes a minor annual allocation to the TSP elements. The city dedicates most of the funds from the fee to local roadway maintenance.

Existing Application: Many Oregon cities assess street user fees through a monthly fee charged to local dwelling units and businesses. The assessment formulas range from a flat rate per dwelling unit and per business to fees tied to trip rates calculated for each property individually based on the Institute of Transportation Engineers Trip Generation Manual. Wood Village assesses its Street Utility Fee based on trip generation.

Potential: In Wood Village, The transportation utility fee generates \$223,700 for fiscal year 2016-17, and is inflation adjusted annually.

Local Improvement District (LID)

Description: A LID is a special district within which properties are voluntarily assessed in order to pay for specific infrastructure improvements that benefit the district. Revenues can be collected up front or paid over a fixed period of time in annual assessments.

Existing Application: LID programs have wide application for funding new or reconstructed streets, sidewalks, water/sewer or other public works projects that benefit the district. The LID method is used primarily for local or collector roads, though arterials have been built using LID funds in certain jurisdictions.

Potential: LIDs continue to offer a good mechanism for funding projects such as new sidewalks and street surface upgrades. The City of Wood Village may be able to fund the cost of sidewalks on collector streets to provide a connected pedestrian system for current and future residents in the previously developed areas of the city lacking sidewalks.

Urban Renewal District and Tax Increment Financing (TIF)

Description: TIF captures the net new property taxes generated by real estate development within an Urban Renewal Area (URA) and directs those funds towards needed infrastructure improvements in the district. Therefore, when working properly, TIF creates a “virtuous cycle” of needed public infrastructure and actions, and private investments. The Wood Village URA was adopted in 2010.

Existing Application: Over 50 cities have Urban Renewal Areas, including Wood Village. The plan for the URA includes limited investment in identified roadways, and significant funding for right of way enhancements on major roadways.

Potential: The city can use Urban Renewal dollars to fund infrastructure projects such as roadway, sidewalk, or transit improvements. The Wood Village URA has a focus on Arata Road, Halsey, and right of way improvements other than roadway.

Developer Dedications of Right-of-Way and Local Street Improvements

Description: A developer provides new local streets required to serve new development areas in accordance with the tentative and final plan approvals granted by the City Council.

Existing Application: Current city ordinance requires developers to provide local streets and utilities in accordance with the adopted Land Use Plan, and the zoning ordinance and subdivision ordinance. This includes dedication of street/utility right-of-way and construction of streets, pedestrian/bicycle facilities, and utilities to city design standards.

Potential: Private developer street dedications are an excellent means of funding new local street/utility extensions, and are most effective if guided by a local roadway network plan. This funding mechanism could apply to all new local street extensions in Wood Village within the 20-year planning period.

Section 10
Performance Measures

PERFORMANCE MEASURES

The RTPFP requires local jurisdictions to develop performance targets and measures, periodically measuring transportation system performance against targets to monitor progress towards achieving regional goals. Figure 2 illustrates the cyclical Performance Measurement System in the RTP which includes plan development and evaluation, plan implementation, and monitoring. This TSP includes Wood Village’s performance measures to better understand and monitor the extent to which transportation system investments achieve desired outcomes and provide the best return on public investments. The performance measurement system also satisfies benchmarks mandated by the TPR and federal requirements to use performance monitoring as part of the region’s Congestion Management Program (CMP).

Figure 30. RTP Performance Measurement System

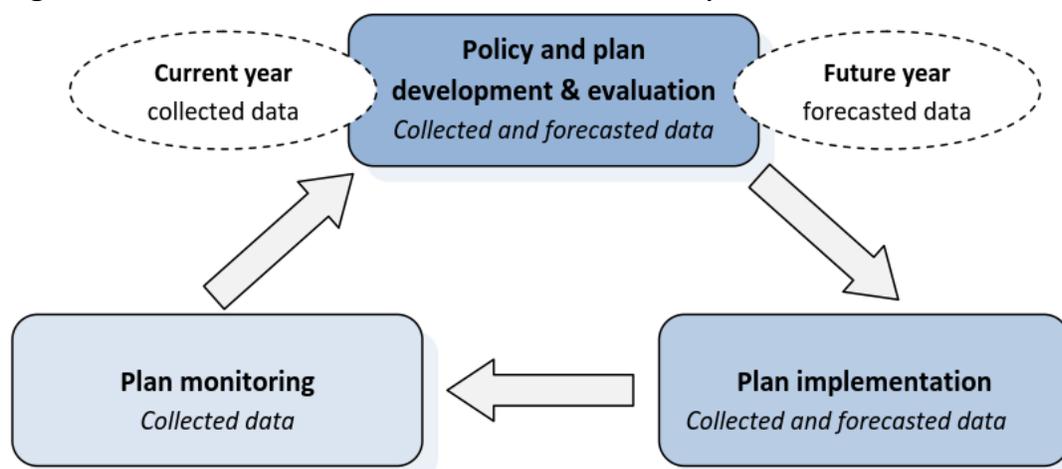


Table 10 lists the Wood Village Performance Measures and Targets. These are compatible with the 2014 Metro RTP performance measures for safety, congestion, freight reliability, active transportation, and travel. These will be used to track progress towards local and regional goals.

Table 10. Wood Village Performance Targets

Measure	Performance Target
Safety	By 2040, reduce the number of fatal and severe injury crashes for pedestrians, bicyclists, and motor vehicle occupants each by 50% compared to 2007 – 2011 average.
Congestion	By 2040, reduce vehicle hours of delay (VHD) per person by 10 percent compared to 2010.
Freight Reliability	By 2040, reduce vehicle hours of delay per truck trip by 10 percent compared to 2010.
Active transportation	By 2040, triple walking, biking and transit mode shares compared to 2010 modeled mode shares.
Travel	By 2040, reduce vehicle miles traveled per person by 10 percent compared to 2010.

Section 11 References

REFERENCES

1. City of Wood Village. *Wood Village Transportation System Plan*, 1999.
2. City of Wood Village. *Wood Village Transportation System Plan Roadway Element*, 2001.
3. City of Wood Village. *Wood Village Comprehensive Plan*, 1999.
4. Oregon Department of Transportation. *Oregon Bicycle and Pedestrian Plan*. 1995
5. Multnomah County. *Multnomah County Design and Construction Manual*, 2005.
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7. Spencer & Kupper; Donald Genasci & Associates; Warren Greaser GIS. *Arata Road Conceptual Design Plan*, 2008.
8. Metro. *Regional Freight Plan*, 2010.
9. Oregon Department of Transportation. *Oregon Bicycle and Pedestrian Plan*, 1995.
10. ODOT Region 1. *Pavement Conditions Maps*, 2014.

APPENDIX A: TSP EVALUATION

Memorandum

TO: Technical Advisory Committee and Public Advisory Committee
FROM: Darci Rudzinski, AICP
Shayna Rehberg, AICP
DATE: October 18, 2011
CC: Frank Angelo, Principal
FILE #: 024-029
RE: City of Wood Village Transportation System Plan (TSP) Update
Task 3.1: TSP Evaluation

Introduction

This memorandum provides an evaluation of the adopted City of Wood Village 1999 TSP and the TSP Roadway Element (adopted 2001) given regional requirements set out in the Metro Regional Transportation Plan (RTP), Regional Transportation Functional Plan (RTFP), and Urban Growth Management Functional Plan (UGMFP), as part of fulfilling Task 3.1. The evaluation in this memorandum focuses on consistency of the City TSP with the RTFP. The RTFP implements and incorporates the elements of the RTP and UGMFP that are pertinent to local TSP updates. Metro has provided agency members and consultants with a draft “checklist” for reviewing local TSPs, codes, and comprehensive plans for compliance with the RTFP. This memorandum uses the checklist for presenting findings of City TSP compliance with RTFP requirements. In some cases the code or comprehensive plan addresses the RTFP requirement in the TSP checklist and this is called out accordingly.

As has been described in the project scope and in the first Technical and Project Advisory Committee meetings, this TSP update is focusing primarily on local street connectivity, bicycle and pedestrian systems, and transit. It will not include roadway capacity and related infrastructure analysis. Roadway capacity analysis and recommendations for improvements based on analysis findings are to be completed as part of the East Metro Connections Plan (EMCP). This is a separate and subsequent planning study that will consider alternative corridors for providing connections between I-84 and US 26. Results from the EMCP will need to be incorporated into the Wood Village TSP at a later date. How the RTFP requirements are expected to be addressed – as either part of this TSP update or the EMCP process or both – is indicated in the findings below.

Table 1. Checklist for Compliance with Regional Transportation Functional Plan (RTFP)

Regional Transportation Functional Plan Requirement	Findings Regarding Local TSP
<p>Include, to the extent practicable, a network of major arterial streets at one-mile spacing and minor arterials or collectors at half-mile spacing, considering:</p> <ul style="list-style-type: none"> • existing topography; • rail lines; freeways; pre-existing development, leases, easements or covenants; • requirements of Metro’s Urban Growth Management Functional Plan Title 3 (Water Quality and Flood plains) and Title 13 (Nature in Neighborhoods), such as streams, rivers, flood plains, wetlands, riparian and upland fish and wildlife habitat areas. • arterial design concepts in chapter 2 of RTP • best practices and designs as set forth in regional state or local plans and best practices for protecting natural resources and natural areas <p>(Title 1, Street System Design Sec 3.08.110C)</p>	<p>The City of Wood Village Street Plan was developed in its 1999 TSP (Section 3). The 1999 plan indicated that the city was largely built-out and that the main opportunity for connections was in the Town Center, both in terms of the Metro land use designation and as had already begun to be developed and so named.</p> <p>The City only has jurisdiction over local streets- all streets functionally classified as collectors or above are under the jurisdiction of Multnomah County or the Oregon Department of Transportation (ODOT). Local street spacing standards are currently not found in the City TSP but in the code for the Town Center Zone, which requires streets to be provided every 530 feet and bicycle path connections every 330 feet, and limits cul-de-sacs in Sections 235.390(I) and (J). The Town Center Zone allows for the kinds of conditions called out under these RTFP provisions, requiring the specified spacing <i>“unless impractical due to existing development, topography, physical barriers, or environmental constraints.”</i></p> <p>Transportation policies are housed in the City Comprehensive Plan and not the TSP. Existing transportation policies related to connectivity include:</p> <ol style="list-style-type: none"> 7. <i>Except where precluded by existing development, topographical or natural constraints, new development shall include local street designs that discourage cul-de-sacs and extend existing streets, or connect residential areas with services and institutions by short, direct public pedestrian and bicycle ways.</i> 9. <i>Encourage the City of Fairview and Multnomah County to extend Wood Village Blvd. from Arata Road north to Halsey Street in order to improve transportation circulation in the City.</i> 10. <i>Improve bicycle and pedestrian access to the Town Center, the City park and institutional uses from existing and new residential areas in Wood Village.</i> <p>The following Comprehensive Plan transportation policy <u>does not</u> support connectivity:</p> <ol style="list-style-type: none"> 16. <i>It is City policy that NE Stanley Street and Holladay Place shall never be extended west from their current terminus.</i> <p><i>The TSP update will address connectivity in terms of policy and possible connections for bicyclists, pedestrians, and motorists. The East Multnomah Connections Project (EMCP) will address new roadway and roadway system improvements needed based on forecasted capacity demand.</i></p>

Regional Transportation Functional Plan Requirement	Findings Regarding Local TSP
<p>Include a conceptual map of new streets for all contiguous areas of vacant and re-developable lots and parcels of five or more acres that are zoned to allow residential or mixed-use development. The map shall identify street connections to adjacent areas and should demonstrate opportunities to extend and connect new streets to existing streets, provide direct public right-of-way routes and limit closed-end street designs consistent with Title 1, Sec 3.08.110E (Title 1, Street System Design Sec 3.08.110D)</p>	<p>The 1999 City of Wood Village TSP includes a Street Plan (Section 3) to which 2001 Roadway Element refers. The plan shows proposed connections at the eastern border of the city running north-south between I-84 and Glisan, Wood Village Boulevard between Halsey and Glisan, and east-west Park Lane between 223rd and Wood Village Boulevard.</p> <p>The TSP does not include proposed street plans in terms of vacant and re-developable lots of five acres or more zoned for residential or mixed use. However, other than in the Town Center, these conditions are probably minimal to none.</p> <p><i>The TSP update will address connectivity in terms of policy and possible connections for bicyclists, pedestrians, and motorists. The EMCP is expected to provide an updated map of proposed new streets.</i></p>
<p><u>Applicable to both Development Code and TSP</u> To the extent feasible, restrict driveway and street access in the vicinity of interchange ramp terminals, consistent with Oregon Highway Plan Access Management Standards, and accommodate local circulation on the local system. Public street connections, consistent with regional street design and spacing standards, shall be encouraged and shall supersede this access restriction. Multimodal street design features including pedestrian crossings and on-street parking shall be allowed where appropriate. (Title 1, Street System Design Sec 3.08.110G)</p>	<p>The 2001 Roadway Element (Section 3, Motor Vehicles, p. 3-24) recommends adopting County and ODOT standards for access management on arterials and collectors. It includes the standards in an appendix. It does not address interchange areas.</p> <p>Existing cross sections in the 2001 Roadway Element (Figures 2-4) include on-street parking but do not address pedestrian crossings.</p> <p>The City code includes a section on block requirements (Subsection 460.020.B) in Section 460 (Transportation and Utility Design Standards). That is the closest the code comes to addressing access management.</p> <p><i>While considering access management may begin during the TSP update, it is expected to be completed as part of the EMCP process.</i></p>
<p>Include investments, policies, standards and criteria to provide pedestrian and bicycle connections to all existing transit stops and major transit stops designated in Figure 2.15 of the RTP. (Title 1, Transit System Design Sec 3.08.120A)</p>	<p>Figure 2.15 in the RTP identifies transit stops and centers along Halsey Boulevard and at the intersection of Sandy Boulevard and 238th Avenue as part of the Regional Transit Network.</p> <p>Transportation policies in the Comprehensive Plan are generally supportive of bicycle and pedestrian facility planning and implementation but there is no specific policy about connecting with transit facilities.</p> <p>Section 2 (Existing Conditions & Future Needs) of the 1999 TSP makes recommendations about code requirements for pedestrian connections to transit facilities for commercial, industrial, and institutional development and in parking areas.</p>

Regional Transportation Functional Plan Requirement	Findings Regarding Local TSP
	<p>The City code Town Center Zone (Section 235) and Neighborhood Commercial Zone (Section 230) set requirements for pedestrian connections to transit facilities, but this is not universal for all zones in the city.</p> <p><i>Connections and access to transit facilities – and associated proposed code and implementation language – are expected to be addressed in the TSP update.</i></p>
<p>Include a transit plan consistent with transit functional classifications shown in Figure 2.15 of the RTP that shows the locations of major transit stops, transit centers, high capacity transit stations, regional bike-transit facilities, inter-city bus and rail passenger terminals designated in the RTP, transit-priority treatments such as signals, park-and-ride facilities, and bicycle and pedestrian routes, consistent with sections 3.08.130 and 3.08.140, between essential destinations and transit stops. (Title 1, Transit System Design Sec 3.08.120B(1))</p>	<p>Figure 2.15 in the RTP identifies transit stops and centers along Halsey Boulevard and at the intersection of Sandy Boulevard and 238th Avenue as part of the Regional Transit Network. None of the other designations listed in RTFP Section 3.08.120B(1) are identified in the city in this figure.</p> <p>The transit plan provided in the 1999 TSP (Section 3) designates Halsey Boulevard, 223rd Avenue, and Glisan Street as part of the city’s public transportation system. The plan does not designate Sandy Boulevard or 238th as part of the transit network. So the TSP and RTP are not consistent.</p> <p><i>Updating the transit plan is expected to be part of the TSP update.</i></p>
<p>Include a pedestrian plan, for an interconnected network of pedestrian routes within and through the city or county. The plan shall include:</p> <ul style="list-style-type: none"> • An inventory of existing facilities that identifies gaps and deficiencies in the pedestrian system; • An evaluation of needs for pedestrian access to transit and essential destinations for all mobility levels, including direct, comfortable and safe pedestrian routes; • A list of improvements to the pedestrian system that will help the city or county achieve the regional Non-SOV modal targets in Table 3.08-1 of the RTFP, and other targets established pursuant to section 3.08.230; • Provisions for sidewalks along arterials, collectors and most local streets, except that sidewalks are not required along controlled roadways, such as freeways; • Provision for safe crossings of streets and controlled pedestrian crossings on major arterials 	<p>Section 2 (Existing Conditions & Future Needs) of the 1999 TSP identifies deficiencies and needs for the pedestrian system. It does not make specific provisions for transit access nor access for all mobility levels.</p> <p>Cross sections in the 2001 Roadway Element (Figure 2 - Figure 4) include sidewalks on all local, collector, and arterial roadways.</p> <p>Recommended projects are described in Section 2 and shown in Section 4 (Transportation System Plan Map).</p> <p>Other than reference to crosswalk standards in the 1996 Multnomah County Pedestrian Plan, no specific provisions are made in the TSP for safe or controlled crossings.</p> <p><i>Updating the pedestrian plan is expected to be part of the TSP update.</i></p>

Regional Transportation Functional Plan Requirement	Findings Regarding Local TSP
<p>(Title 1, Pedestrian System Design Sec 3.08.130A)</p> <p>Include a bicycle plan for an interconnected network of bicycle routes within and through the city or county. The plan shall include:</p> <ul style="list-style-type: none"> • An inventory of existing facilities that identifies gaps and deficiencies in the bicycle system; • An evaluation of needs for bicycle access to transit and essential destinations, including direct, comfortable and safe bicycle routes and secure bicycle parking, considering <i>TriMet Bicycle Parking Guidelines</i>; • A list of improvements to the bicycle system that will help the city or county achieve the regional Non-SOV modal targets in Table 3.08-1 of the RTFP and other targets established pursuant to section 3.08.230; • Provision for bikeways along arterials, collectors and local streets, and bicycling parking in centers, at major transit stops shown in Figure 2.15 in the RTP, park-and-ride lots and associated with institutional uses; • Provision for safe crossing of streets and controlled bicycle crossings on major arterials <p>(Title 1, Bicycle System Design Sec 3.08.140)</p>	<p>Section 2 (Existing Conditions & Future Needs) of the 1999 TSP identifies deficiencies and needs. It does not make specific provisions for bicycle access to transit facilities.</p> <p>Recommended projects are described in Section 2 and shown in Section 4 (Transportation System Plan Map).</p> <p>Cross sections in the 2001 Roadway Element (Figures 2-4) include bike lanes on all collector and arterial roadways but not on local residential roadways.</p> <p>The TSP does not make specific provisions for safe or controlled crossings.</p> <p>The City code addresses bicycle parking. Section 350.045(6) establishes basic provisions for the number of bicycle parking spaces for multi-family, industrial, commercial, and industrial uses and their location and design, but not with detail to the level of the TriMet Bicycle Parking Guidelines or specifically regarding parking at transit facilities.</p> <p><i>Updating the bicycle plan is expected to be part of the TSP update.</i></p>
<p>Include a freight plan for an interconnected system of freight networks within and through the city or county. The plan shall include:</p> <ul style="list-style-type: none"> • An inventory of existing facilities that identifies gaps and deficiencies in the freight system; • An evaluation of freight access to freight intermodal facilities, employment and industrial areas and commercial districts; • A list of improvements to the freight system that will help the city or county increase reliability of freight movement, reduce freight delay and achieve targets established pursuant to section 3.08.230. <p>(Title 1, Freight System Design Sec 3.08.150)</p>	<p>The 1999 TSP includes a general inventory and description of future needs of rail and air facilities in the city or vicinity.</p> <p>Chapter 1, Existing Conditions, of the 2001 Roadway Element provides more detail about existing truck routes in the city (p. 1-16). Figure 8 in Chapter 3, Motor Vehicles, presents a truck route plan. The plan includes regional freight routes from the draft RTP (December 1997) at the time – I-84, Sandy Boulevard, and Glisan Street – and shifts truck traffic from 238th to a proposed connection in the 242nd corridor between I-84 and Glisan, pending further study.</p> <p>There is no analysis in the TSP that is particular to freight intermodal facilities, employment and industrial areas, and commercial districts.</p> <p>The improvements shown in the project list (Table 4-2) of the 2001 Roadway Element include a new interchange and connection south to Stark Street, pending further study, and shifting the freight route</p>

Regional Transportation Functional Plan Requirement	Findings Regarding Local TSP
	<p>designation from Burnside/181st to the new alternative corridor.</p> <p><i>Updating the freight plan is expected to be part of the EMCP process.</i></p>
<p>Include a transportation system management and operations (TSMO) plan to improve the performance of existing transportation infrastructure within or through the city or county. A TSMO plan shall include:</p> <ul style="list-style-type: none"> • An inventory and evaluation of existing local and regional TSMO infrastructure, strategies and programs that identifies gaps and opportunities to expand infrastructure, strategies and programs • A list of projects and strategies, consistent with the Regional TSMO Plan, based upon consideration of the following functional areas: <ul style="list-style-type: none"> ○ Multimodal traffic management investments ○ Traveler Information investments ○ Traffic incident management investments ○ Transportation demand management investments <p>(Title 1, Transportation System Management and Operations Sec 3.08.160)</p>	<p>The 2001 Roadway Element includes a discussion about transportation system management and intelligent transportation systems (ITS) in Chapter 3, Motor Vehicles (p. 3-25). However, the discussion is general, recognizes ODOT as playing a primary role in TSMO regionally, and does not constitute a plan consistent with these requirements.</p> <p><i>Developing a TSMO plan is expected to be completed as part of the EMCP process.</i></p>
<p>Incorporate regional and state transportation needs identified in the 2035 RTP as well as local transportation needs. The determination of local transportation needs based upon:</p> <ul style="list-style-type: none"> • System gaps and deficiencies identified in the inventories and analysis of transportation system pursuant to Title 1; • Identification of facilities that exceed the Deficiency Thresholds and Operating Standards in Table 3.08-2 or the alternative thresholds and standards established pursuant to section 3.08.230; • Consideration and documentation of the needs of youth, seniors, people with disabilities and environmental justice populations within the city of county, including minorities and low-income families. 	<p>In terms of regional and state transportation needs, the 1999 TSP and 2001 Roadway Element both acknowledge the need for alternative connections between I-84 and US 26. However, the EMCP has been scoped since the adoption of these documents, so this latest development is not yet captured in the City TSP.</p> <p>In terms of local transportation needs, the most recent determination was based on Metro modeling and data available from previous RTPs and not the most current one (2035 RTP). Similarly, the City TSP will need to account for the most recent standards for mode splits and roadway performance standards represented in Tables 3.08-1 and 3.08-2. It is expected that this analysis will be part of the EMCP rather than this TSP update.</p> <p>Recommendations made in the TSP update and EMCP processes related to I-84, Sandy Boulevard, 223rd Avenue, 238th Avenue, 242nd Avenue, Halsey Street, and Glisan Street will need to be consistent with the designations shown in Table 2 following this evaluation table.</p>

Regional Transportation Functional Plan Requirement	Findings Regarding Local TSP
<p>A local determination of transportation needs must be consistent with the following elements of the RTP:</p> <ul style="list-style-type: none"> • The population and employment forecast and planning period of the RTP, except that a city or county may use an alternative forecast for the city or county, coordinated with Metro, to account for changes to comprehensive plan or land use regulations adopted after adoption of the RTP; • System maps and functional classifications for street design, motor vehicles, transit, bicycles, pedestrians and freight in Chapter 2 of the RTP; • Regional non-SOV modal targets in Table 3.08-1 and the Deficiency Thresholds and Operating Standards in Table 3.08-2. <p>When determining its transportation needs, a city or county shall consider the regional needs identified in the mobility corridor strategies in Chapter 4 of the RTP. (Title 2, Transportation Needs Sec 3.08.210)</p>	<p>While access to pedestrian, bicycle, and transit facilities are called out in the 1999 TSP and 2001 Roadway Element, youth, seniors, people with disabilities, and environmental justice populations are not specified or targeted.</p> <p><i>Determination of pedestrian, bicycle, and transit needs is expected to be made as part of the TSP update. Determination of motor vehicle needs and roadway capacity recommendations will be made as part of the EMCP process.</i></p>
<p>Consider the following strategies in the order listed, to meet the transportation needs determined pursuant to section 3.08.210 and performance targets and standards pursuant to section 3.08.230. The city or county shall explain its choice of one or more of the strategies and why other strategies were not chosen:</p> <ul style="list-style-type: none"> • TSMO, including localized TDM, safety, operational and access management improvements; • Transit, bicycle and pedestrian system improvements; • Traffic-calming designs and devices; • Land use strategies in OAR 660-012-0035(2) • Connectivity improvements to provide parallel arterials, collectors or local streets that include pedestrian and bicycle facilities, consistent with the connectivity standards in section 3.01.110 and design 	<p>The 2001 Roadway Element includes discussion of safety, ITS, and transportation demand management (TDM), but makes no specific plans or proposals related to these elements</p> <p>Bicycle and pedestrian improvements are called out in the 1999 TSP, Section 2 (Existing Conditions & Future Needs). Transit improvements include four recommendations of TriMet service modifications/extensions. The 1999 TSP makes recommendations about requirements for pedestrian connections to transit facilities for commercial, industrial, and institutional development and in parking areas. (Note: The City code Town Center Zone (Section 235) and Neighborhood Commercial Zone (Section 230) set requirements for pedestrian connections to transit facilities.)</p> <p>Traffic calming measures are not currently included in the 1999 TSP or 2001 Roadway Element.</p> <p>Connectivity issues are addressed in response to RTFP Sec 3.08.110 C and D (Street System Design) above.</p> <p>Motor vehicle system improvements, consistent with the RTP Arterial and Throughway Design and</p>

Regional Transportation Functional Plan Requirement	Findings Regarding Local TSP
<p>classifications in Table 2.6 of the RTP,</p> <ul style="list-style-type: none"> • Motor vehicle capacity improvements, consistent with the RTP Arterial and Throughway Design and Network Concepts in Table 2.6 and Section 2.5.2 of the RTP, only upon a demonstration that other strategies in this subsection are not appropriate or cannot adequately address identified transportation needs <p>A city or county shall coordinate its consideration of the above strategies with the owner of the transportation facility affected by the strategy. Facility design is subject to the approval of the facility owner.</p> <p>If analysis under subsection 3.08.210A (Local Needs determination) indicates a new regional or state need that has not been identified in the RTP, the city or county may propose one of the following actions:</p> <ul style="list-style-type: none"> • Propose a project at the time of Metro review of the TSP to be incorporated into the RTP during the next RTP update; or • Propose an amendment to the RTP for needs and projects if the amendment is necessary prior to the next RTP update. <p>(Title 2, Sec 3.08.220 Transportation Solutions)</p>	<p>Network Concepts in Table 2.6 and Section 2.5.2 of the RTP, will need to be updated by the EMCP.</p> <p>Land use strategies would be implemented through the City code and not the TSP. Of the strategies identified in OAR 660-012-0035(2)¹, there are currently no general provisions for minimum densities (or maximum lot size). The code does, however, establish a minimum floor area ratio (FAR) in the Town Center Zone. The Town Center Zone has been applied to land for a community shopping center, and is adjacent to or nearby residential development. It is not clear how the code – or the Comprehensive Plan or TSP for that matter – addresses jobs/housing balance.</p> <p><i>Development of transportation solutions and prioritization will begin during the TSP update and completed as part of the EMCP process.</i></p>

¹ OAR 660-012-0035(2):

(2) Local governments in MPO areas of larger than 1,000,000 population shall, and other governments may also, evaluate alternative land use designations, densities, and design standards to meet local and regional transportation needs. Local governments preparing such a strategy shall consider:

- (a) Increasing residential densities and establishing minimum residential densities within one quarter mile of transit lines, major regional employment areas, and major regional retail shopping areas;
- (b) Increasing allowed densities in new commercial office and retail developments in designated community centers;
- (c) Designating lands for neighborhood shopping centers within convenient walking and cycling distance of residential areas; and
- (d) Designating land uses to provide a better balance between jobs and housing considering:
 - (A) The total number of jobs and total of number of housing units expected in the area or subarea;
 - (B) The availability of affordable housing in the area or subarea; and
 - (C) Provision of housing opportunities in close proximity to employment areas.

Regional Transportation Functional Plan Requirement	Findings Regarding Local TSP
<p>Demonstrate that solutions adopted pursuant to section 3.08.220 (Transportation Solutions) will achieve progress toward the targets and standards in Tables 3.08-1, and 3.08-2 and measures in subsection D (local performance measures), or toward alternative targets and standards adopted by the city or county. The city or county shall include the regional targets and standards or its alternatives in its TSP.</p> <p>A city or county may adopt alternative targets or standards in place of the regional targets and standards upon a demonstration that the alternative targets or standards:</p> <ul style="list-style-type: none"> • Are no lower than the modal targets in Table 3.08-1 and no lower than the ratios in Table 3.08-2; • Will not result in a need for motor vehicle capacity improvements that go beyond the planned arterial and throughway network defined in Figure 2.12 of the RTP and that are not recommended in, or are inconsistent with, the RTP; and • Will not increase SOV travel to a degree inconsistent with the non-SOV modal targets in Table 3.08-1. <p>If the city or county adopts mobility standards for state highways different from those in Table 3.08-2, it shall demonstrate that the standards have been approved by the Oregon Transportation Commission.</p> <p>Each city and county shall also include performance measures for safety, vehicle miles traveled per capita, freight reliability, congestion, and walking, bicycling and transit mode shares to evaluate and monitor performance of the TSP.</p> <p>To demonstrate progress toward achievement of performance targets in Tables 3.08-1 and 3.08-2 and to improve performance of state highways within its jurisdiction as much as feasible and avoid their further</p>	<p>Neither the 1999 TSP nor the 2001 Roadway Element includes the regional targets and standards.</p> <p>The City has not adopted alternative standards nor is it expected that it will propose to do so as part of the TSP update or EMCP process. Demonstrating progress toward the targets will rely on results from both the TSP update and the EMCP process, so ways to measure progress will likely need to be developed concurrent with or directly following the EMCP process. It is anticipated that, particularly regarding parking, this will entail amendments to the City code, Section 350 (Parking and Loading), which currently establishes only minimum requirements for the number of parking spaces, not maximum requirements.</p> <p><i>Compliance with regional targets and performance measures are expected to be addressed as part of and subsequent to the EMCP process.</i></p>

Regional Transportation Functional Plan Requirement	Findings Regarding Local TSP
<p>degradation, the city or county shall adopt the following:</p> <ul style="list-style-type: none"> • Parking minimum and maximum ratios in Centers and Station Communities consistent with subsection 3.08.410A; • Designs for street, transit, bicycle, freight and pedestrian systems consistent with Title 1: and • TSMO projects and strategies consistent with section 3.08.160; and • Land use actions pursuant to OAR 660-012-0035(2). <p>(Title 2, Performance Targets and Standards Sec 3.08.230)</p>	
<p>Specify the general locations and facility parameters, such as minimum and maximum ROW dimensions and the number and width of traffic lanes, of planned regional transportation facilities and improvements identified on general location depicted in the appropriate RTP map. Except as otherwise provided in the TSP, the general location is as follows:</p> <ul style="list-style-type: none"> • For new facilities, a corridor within 200 feet of the location depicted on the appropriate RTP map; • For interchanges, the general location of the crossing roadways, without specifying the general location of connecting ramps; • For existing facilities planned for improvements, a corridor within 50 feet of the existing right-of-way and • For realignments of existing facilities, a corridor within 200 feet of the segment to be realigned as measured from the existing right-of-way depicted on the appropriate RTP map. <p>A City or county may refine or revise the general location of a planned regional facility as it prepares or revises impacts of the facility or to comply with comprehensive plan or statewide planning goals. If, in developing or amending its TSP, a city or county</p>	<p>“Regional transportation facilities” are not clearly defined in the RTP or RTFP, but the assumption is that these facilities are existing facilities that have any type of regional designation or planned facilities identified in RTP project list (RTP, Appendix 1).</p> <p>Existing facilities in the city with regional designations include: I-84, Sandy Boulevard, 223rd Avenue, 238th Avenue, 242nd Avenue, Halsey Street, and Glisan Street. These are all either State or County facilities.</p> <p>Planned facilities – or existing facilities slated for planned improvements – in the city that are identified in the 2035 RTP project list include:</p> <ul style="list-style-type: none"> • Reconstruct Halsey St. with Improvements • Reconstruct Arata Rd. • Wood Village Blvd. Extension • Halsey St. Improvements • Travel Options: Individualized Marketing • 238th/242nd Ave/Hogan Dr.: Arterial Corridor Management with Adaptive Signal Timing. <p>Of the planned improvements above, only the Wood Village Boulevard extension is a new facility. There is no map that accompanies the project list in the RTP, Appendix 1, so it is unclear whether this will be consistent with the location standards of this RTFP section. Otherwise, the planned improvements are working within existing right-of-way and are consistent with the location requirements of this section.</p> <p>Cross sections in the existing TSP need to be made consistent with Multnomah County cross sections</p>

Regional Transportation Functional Plan Requirement	Findings Regarding Local TSP
<p>determines the general location of a planned regional facility or improvement is inconsistent with its comprehensive plan or a statewide goal requirement, it shall:</p> <ul style="list-style-type: none"> Propose a revision to the general location of the planned facility or improvement to achieve consistency and, if the revised location lies outside the general location depicted in the appropriate RTP map, seek an amendment to the RTP; or Propose a revision to its comprehensive plan to authorize the planned facility or improvement at the revised location. <p>(Title 3, Defining Projects in Transportation System Plan Sec 3.08.310)</p>	<p>and recent refinement plans addressing Arata Road, Sandy Boulevard, and Halsey Boulevard.</p> <p>The 1999 TSP and 2001 Roadway Element do not propose changes to the segment of I-84 in the city. However, the 2001 Roadway Element project list (Table 4-2) does propose a new interchange and connection south to Stark Street. This needs to be confirmed/reconciled through the EMCP process.</p> <p><i>Projects will be defined as part of both the TSP update and EMCP process.</i></p>
<p><u>(Could be adopted in TSP or other adopted policy document)</u> Adopt parking policies, management plans and regulations for Centers and Station Communities. Plans may be adopted in TSPs or other adopted policy documents and may focus on sub-areas of Centers. Plans</p>	<p>Parking is not addressed in the existing TSP but in the City code, Section 350 (Parking and Loading). Section 350 addresses both motor vehicle and bicycle parking. The code establishes both minimums and maximums for the number of required motor vehicle parking spaces. The code also allows for joint use parking under certain conditions. Special parking provisions are established for the Town Center Zone.² The provisions address carpool parking and allow for “blended” calculations of minimum parking including counting on-street parking.</p>

² Section 235.390

C. Parking and Loading.

(1) The requirements of Section 350 apply.

(2) In addition, parking requirements in the Town Center zone may be met by blending parking rates. Calculating parking stalls for a use may include counting adjacent on-street spaces, nearby public parking, cross-patronage, and shared parking possibilities due to variation in hours of operation and as per Section 350.045(5).

(3) In addition to the requirements of Section 350, for all institutional, office and industrial uses having more than 20 auto parking spaces on the site, the following standards must be met:

(a) Five spaces or five percent of the parking spaces on the site for such institutional, office and industrial uses, whichever is less, must be reserved for carpool use before 9:00 AM on weekdays.

(b) The spaces will be those closest to the building entrance or elevator, but not closer than the spaces for disabled parking and those signed for exclusive customer use.

(c) Signs must be posted indicating these spaces are reserved for carpool use before 9:00 AM on weekdays.

(4) A parking area other than on-street parking shall not be located between a street and a main building entrance described in Section 235.345.F(1). A street between a main building entrance described in Section 235.345.F(1) and a parking area may be a private street, as long as it satisfies the applicable pedestrian standards of Section 235.345.

Functional Plan	Findings Regarding Local TSP
<p>of parking supply and usage, parking needs with consideration <i>Guidelines</i>. Policies shall be es, plans and regulations must he following range of</p> <p>m minimum parking</p> <p>employee parking and parking and patients; nation;</p> <p>ment Sec 3.08.410I)</p>	<p>Parking plans currently required by the code are a component of development site plans, not the comprehensive management plans as laid out in this section of the RTFP. There are no parking inventories or parking-specific policies in the existing City code, TSP, or Comprehensive Plan.</p> <p><i>While not included in the scope for the project, parking standards may be reviewed and refined as part of the TSP update.</i></p>
<p>s a transportation project that and will result in a significant or exceeds the planned function igned in the RTP, it shall ith the following in its project</p> <p>n subsection 3.08.220A(1-5) d system improvements, traffic ies, connectivity</p> <p>consistent with regional street</p> <p>sistent with federal regulations</p>	<p>Potential projects or improvements that relate SOV capacity or facility function and capacity fall within the scope of the EMCP. So these provisions will need to be addressed as part of that process.</p> <p><i>Roadway capacity issues are expected to be addressed as part of the EMCP process.</i></p>

Regional Transportation Functional Plan Requirement	Findings Regarding Local TSP
<p>for stream protection.</p> <p>If the city or county decides not to build a project identified in the RTP, it shall identify alternative projects or strategies to address the identified transportation need and inform Metro so that Metro can amend the RTP. This section does not apply to city or county transportation projects that are financed locally and would be undertaken on local facilities. (Title 5, Amendments of City and County Comprehensive and Transportation System Plans Sec 3.08.510C)</p>	

The following table summarizes regional designations that are made in the RTP and are referred to in the preceding evaluation table. The text following the table are descriptions and policy statements from the RTP related to the designations.

Table 2. Designations for Regional Facilities in Wood Village

	Regional Design	Regional Street and Throughway System	Regional Bicycle System	Regional Pedestrian System*
I-84	Throughway (Freeway)	Principal arterial	(not classified)	(not classified)
Sandy Boulevard	Regional street	(not classified)	Regional bikeway	(not classified)
223rd Avenue	Community boulevard	(not classified)	Regional bikeway	Mixed-use corridor
238th Avenue	Community street	Minor arterial	Community bikeway	(not classified)
242nd Avenue	Regional Street	Major arterial	Community bikeway	(not classified)
Halsey Street	Community street	Minor arterial	Regional bikeway	Mixed-use corridor
Glisan Street	Regional street	Major arterial	Regional bikeway	(not classified)

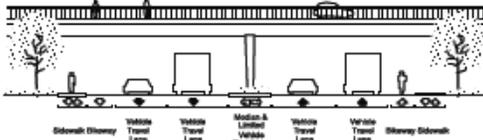
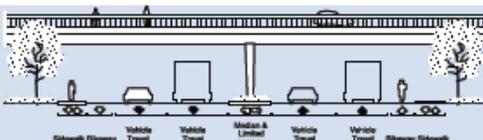
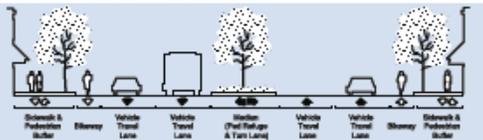
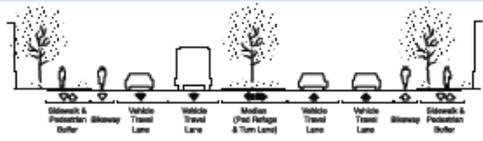
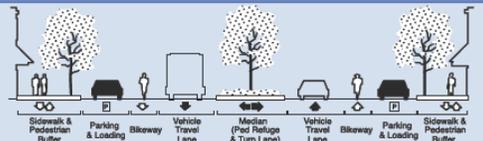
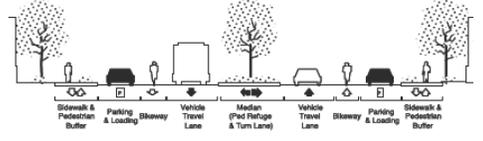
* A pedestrian district or mixed-use center is located between Halsey Street, 222nd Avenue, and Glisan Street in Wood Village.

Regional Street and Throughway System Designations

Throughways currently carry between 50,000 to 100,000 vehicles per day, providing for high-speed travel on longer motor vehicle trips and serving as the primary freight routes, with an emphasis on mobility. Throughways help serve the need to move both trucks and autos through the region. Throughways connect major activity centers within the region, including the central city, regional centers, industrial areas and intermodal facilities.

Arterial streets usually carry between 10,000 and 40,000 vehicles per day and allow higher speeds than collector and local streets. Major arterial streets accommodate longer-distance through trips and serve more of a regional traffic function. Minor arterial streets serve shorter trips that are localized within a community.

Figure 1. Throughway and Arterial Design Concepts

Trip Type	2040 Design Concept	Network Function	Illustrative Design Concept	Typical number of planned travel lanes ⁷
THROUGHWAYS				
Interstate/ regional	Throughway (Freeway)	Principal arterial		6 through lanes (plus auxiliary lanes) with grade separated interchanges
Interstate/ regional	Throughway (Highway)	Principal arterial		6 through lanes (plus auxiliary lanes) with grade separated intersections/ interchanges
Interstate/ regional	Throughway (Parkway)	Principal arterial		6 through lanes (plus auxiliary lanes) with grade separated intersections/ interchanges
ARTERIAL STREETS				
Regional / City	Regional Boulevard 2040 centers Station communities Main streets	Major Arterial		4 through lanes with turn lanes
Regional / City	Regional Street Industrial areas Employment areas Corridors Intermodal facilities	Major Arterial		4 through lanes with turn lanes
City	Community Boulevard 2040 centers Station communities Main streets	Minor Arterial		2 through lanes with turn lanes
City	Community Street Industrial areas Employment areas Corridors Intermodal facilities	Minor Arterial		2 through lanes with turn lanes

Regional Bicycle System Designations

Regional Bicycle Parkways 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.

(Note: No Regional Bicycle Parkways have been designated yet. These will be developed as part of the upcoming regional Active Transportation Action Plan.)

Regional Bikeways provide for travel to and within the Central City, Regional Centers, and Town Centers.

Community Bikeways provide for travel to and within other 2040 Target Areas. These routes also provide access to regional attractions such as schools and parks and connect neighborhoods to the rest of the regional bicycle network.

Regional Pedestrian System Designations

Transit/mix-use corridors are priority areas for pedestrian improvements. They are located along good-quality transit lines and will be redeveloped at densities that are somewhat higher than today. These corridors will generate substantial pedestrian traffic near neighborhood-oriented retail development, schools, parks and bus stops.

These corridors should be designed to promote pedestrian travel with such features as wide sidewalks with buffering from adjacent motor vehicle traffic, street crossings at a minimum of 530 feet – though an ideal spacing is 200 to 400 feet where possible (unless there are no intersections, bus stops or other pedestrian attractions), special crossing amenities at some locations, special lighting, bus shelters, awnings and street trees.

Pedestrian districts are areas of high, or potentially high, pedestrian activity where the region places priority on creating a walkable environment. These include the central city, regional and town centers and light rail station communities where sidewalks, plazas and other public spaces are integrated with civic, commercial and residential development...They are often characterized by compact mixed-use development served by transit...These areas will be characterized by buildings oriented to the street and boulevard-type street design features such as wide sidewalks with buffering from adjacent motor vehicle traffic, marked street crossings at all intersections with special crossing amenities at some locations, special lighting, benches, bus shelters, awnings and street trees. All streets within pedestrian districts are important pedestrian connections.

Regional Transit System Designations

Other than transit stops and a transit center, there are no transit designations for roadways or corridors in Wood Village.

Regional Freight System Designations

The freight designations in Wood Village include two Main Railroad Lines, a Main Roadway (I-84), and two Road Connectors (Sandy Boulevard and Glisan Street).

Figure 2.20 (Regional Freight Network) in the RTP notes: “The Main Roadway designation on Burnside/181st Avenue is the current NHS route. The proposed I-84/US 26 corridor refinement plan will identify the main roadway freight route and long-term mobility strategy in this area.”