

Transportation System Plan Update

Wood Village Transportation System Plan Update

Wood Village, Oregon

Draft

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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

The progress of this plan was guided by the Project Management Team (PMT), the Technical Advisory Committee (TAC), and the Citizen Advisory Committee (CAC). The PMT, TAC, and CAC members are identified below, along with members of the consultant team. 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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Section 2
Introduction

INTRODUCTION

Overview

The City of Wood Village's existing Transportation System Plan (TSP) was completed/adopted in 1999. A special update of this plan was completed 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, have necessitated an update to the city's TSP. As such, the City of Wood Village, in conjunction with the Oregon Department of Transportation (ODOT), initiated a focused update of the city's TSP in 2011. This update addresses the city's pedestrian, bicycle, and public transportation systems. The roadway and capacity element is not included in this update as Metro is working to complete its East Metro Connections Plan, which includes analysis and recommendations that may impact Wood Village Roadways. In order to avoid the potential for inconsistencies between this update and the East Metro Connections Plan, the Roadway Element is being postponed at this time. This TSP update, however, will help guide the management and implementation of the transportation facilities, policies, and programs related to pedestrian and bicycle connectivity within Wood Village over the next several years. This plan is reflective of 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. The contents of this TSP update are guided by Oregon Revised Statute (ORS) 197.712 and the Department of Land Conservation and Development (DLCD) administrative rule known as the Transportation Planning Rule (TPR). 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

Development of this TSP update began with a review of the city's existing TSP documents, including 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, and public transportation systems within Wood Village, while the existing traffic conditions presented in Section 5 provides an understanding of 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.

As indicated throughout this TSP update, several sections from the 1999 TSP and the 2001 TSP update as they relate to the roadway system are still relevant and provide additional information about the existing and future transportation systems. These documents will continue to be a resource to the city in making planning decisions in the future.

Ultimately, a long range implementation plan was developed 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 recommendations identified in Section 8 include a street 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 presented 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 focus of the existing conditions assessment is 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

Figure 2 Study Area/City Limits

Section 3
Plans, Policies, and Standards

PLANS, POLICIES, AND STANDARDS

An evaluation of the 1999 Wood Village TSP and the 2001 Wood Village TSP Roadway Element was completed to determine compliance with regional requirements. Specifically, the evaluation 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 results of the evaluation guided this TSP update to ensure consistency with the RTFP. The results of the evaluation are provided in Appendix A.

Refer to Chapter 1 of the 2001 City of Wood Village TSP Roadway Element for a summary of additional plans, policies and standards that relate to roadway system and capacity issues within Wood Village.

Section 4
Transportation System Inventory

TRANSPORTATION SYSTEM INVENTORY

The following transportation system inventory is intended to augment and update the 1999 Wood Village TSP and the 2001 Wood Village TSP update. Refer to each document for additional information related to the existing transportation systems where noted.

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 existing Wood Village functional classification plan for all roadways within the city is illustrated in Figure 3. 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.

Figure 3 Existing Functional Classification Plan

Table 1 Functional Classification Comparison by Jurisdiction

Roadway	ODOT	Multnomah County	Wood Village	Metro
I-84	Interstate Highway	-	Freeway	Principal Arterial
NE Sandy Boulevard	-	Minor Arterial	Minor Arterial	-
NE 238 th Drive	-	Minor Arterial	Minor Arterial	Minor Arterial
NE 223 rd Avenue	-	Major Collector	Major Collector	-
NE Wood Village Boulevard	-	Major Collector	Major Collector	-
NE Glisan Street	-	Major Arterial	Major Arterial	Major Arterial
NE Arata Road	-	Major Collector	Neighborhood Collector	-
NE 244 th Avenue	-	Major Collector	Major Collector	-
NE Halsey Street	-	Minor Arterial	Minor Arterial	Minor Arterial

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.

In review of Table 1, there is one functional classification inconsistency between Multnomah County and Wood Village. NE Arata Road is classified by Multnomah County as a Major Collector while Wood Village classifies this roadway as a Neighborhood Collector. It should also be noted that the City of Fairview classified NE Arata Road as a Major Collector. A recommendation to revise Multnomah County’s classification of NE Arata Road is made in Section 8: Transportation System Plan.

STREET DESIGN STANDARDS

Refer to Chapter 3 of the 2001 City of Wood Village TSP Roadway Element for sample street cross sections for each of the functional classifications shown in Table 1. Per the 2001 document, these cross sections are intended to be implemented with some flexibility recognizing unique and special situations as appropriate.

While local streets are not reviewed as part of the TSP update, the Oregon TPR requires that local governments offer “skinny street” standards for local streets in order to minimize pavement width and right-of-way. The Department of Land Conservation and Development’s *Neighborhood Street Design Guidelines* (DLCD – Reference 4), indicates a street with a paved section wider than 28 feet is by definition not a “narrow street.” The DLCD guidelines cite benefits of streets with reduced pavement widths including improved livability, improved safety, slower vehicle speeds, and reduced environmental impacts. The guidelines further indicate that narrow streets must meet the operational needs including pedestrian and bicycle circulation and emergency vehicle access. As shown in the figures, the City currently does not have an option that complies with DLCD guidelines.

Refer to the 2001 City of Wood Village TSP Roadway Element for additional information related to the existing street system.

Public Transportation System

TRANSIT ROUTES AND STOPS

Public transportation within Wood Village is provided by TriMet. TriMet Line #12 provides service between the City of Sherwood and the Gresham Transit Center via NE 223rd Avenue, NE Halsey Street, NE 238th Avenue, and NE Sandy Boulevard. Service is provided 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 10:30 p.m. on 20-minute headways, on Saturdays between 6:30 a.m. and 10:30 p.m. on 30-minute headways, and on Sunday between 7:30 a.m. and 10:30 p.m. on 30-minute headways. Several stops are currently located along both routes within Wood Village with various amenities.

Figure illustrates TriMet's service routes and stops located within Wood Village along with the types of amenities available at each stop. As shown, a majority of stops currently do not provide shelters or seating. Also, while a majority of stops are located in areas with sidewalks, the stops located along the segment of NE Sandy Boulevard (west of the city limits) are not.

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 (It should be noted that 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. As shown, 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.

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. The average daily ridership data for spring 2011 is illustrated in Figure 6. As shown, the

Figure 4 Transit Service Routes and Stops

Figure 5 Transit Service Coverage Area

Figure 6 Transit Ridership

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. Also shown, a significant number of trips are generated by 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. Improvements in access to these stops and the amenities should be prioritized.

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, where mixed-use development is provided and/or 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). The existing pedestrian facilities serving Wood Village are shown in Figure 7 along with major pedestrian generators and attractors such as parks, public schools, and transit stops. As shown, 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

Figure 7 Existing Pedestrian Facilities

currently has several intersections along key roadways with unmarked crossings that rely on drivers to yield the right-of-way. The only marked crosswalks are at signalized intersections, which in some cases are a significant distance from each other. NE Halsey Street, for example, has a signalized crossing at the NE 223rd Avenue intersection and then at the 238th Avenue intersection located approximately $\frac{3}{4}$ mile to the east. Residents of the Fairview Oaks Apartments attempting to access the transit stops on the opposite side of NE Halsey Street must walk nearly $\frac{1}{2}$ mile out of direction or risk crossing the street at random unmarked locations.

This and other roadways throughout the Wood Village tend to have long segments without a designated pedestrian crossing which requires a significant amount of out-of-direction travel for the pedestrian or a significant risk. The pedestrian environment at these locations could be enhanced and will be further reviewed 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 5).

- 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 no street connection currently exists 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 existing TSP provides similar guidelines for bicycle facilities on local streets. Based on the existing TSP, 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. The existing TSP and 2001 also identify the need for bicycle lanes on all arterial and collector roadways.

Figure 8 illustrates the existing bicycle facilities within Wood Village. As shown, 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

Figures 7 and 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 multi-use path is located at the north end of Wood Village Boulevard between NE Halsey Street and NE Arata Road, while the most notable trail system is located within Donald L Robertson City Park. 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

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

EXISTING TRAFFIC CONDITIONS

This TSP update does not address the vehicular operations element. As such, refer to Chapter 1 of the 2001 City of Wood Village TSP Roadway Element for information related to existing traffic conditions, such as traffic speed, volume, control, and level-of-service along arterial and collector roadways as well at several major intersections within Wood Village. However, updated roadway/intersection safety data was collected and evaluated as document below.

Traffic Safety

This section provides an analysis of roadway safety information in Wood Village. I-84 was reviewed for identification in 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.

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 the Wood Village, no sites have been identified to be in the top ten percent of ODOT's SPIS ranking program for 2010¹. The segment of I-84 through Wood Village, however, has been included in the States Safety Investment Program (SIP), given that it has experienced three to five crashes over the last three-year period.

CRASH DATA ANALYSIS

ODOT provides detailed intersection crash data covering all crashes that occurred in Wood Village for the five-year period from January 1, 2005 to December 31, 2009. Table 2 summarizes the frequency and types of crashes that occurred at major intersections during this time period.

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.

Table 2 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
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

Section 6
Needs, Opportunities, & Constraints

NEEDS, OPPORTUNITIES, & CONSTRAINTS

The purpose of this section is to summarize the needs, opportunities, and constraints associated with the existing transportation system. Street system connectivity is addressed in the following sections along with the pedestrian, bicycle, and transit facilities provided 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 Connectivity

A well-connected transportation network minimizes the need for out-of-direction travel while supporting an efficient distribution of travel demand among multiple parallel roadways. The most common example of an efficient transportation network is the traditional grid system, with north-south and east-west streets spaced at generally equal distances. 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 have the effect of limiting 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 9 illustrates the known 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.

Pedestrian and Bicycle Systems

Section 2.2 of the Multnomah County Design and Construction Manual (Reference 6) provides standard cross-sections for all major arterial and collector streets that travel 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 are to include sidewalks and bike lanes on both sides of the roadway unless significant restrictions in right-of-way exist.

As indicated in the transportation system inventory, 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. Figures 10 and 11 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) provided.

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. As shown in Figures 10 and 11, pedestrian and bicycle facilities are currently provided 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 is marked and signalized for pedestrian crossings.

Figure 9 Local Street Stubs

Figure 10 Existing Pedestrian System Deficiencies

Figure 11 Existing Bicycle System Deficiencies



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. The development of 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. As shown in Figures 10 and 11, continuous pedestrian and bicycle facilities are currently located along both sides of the roadway within the city limits. Also shown, the 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.



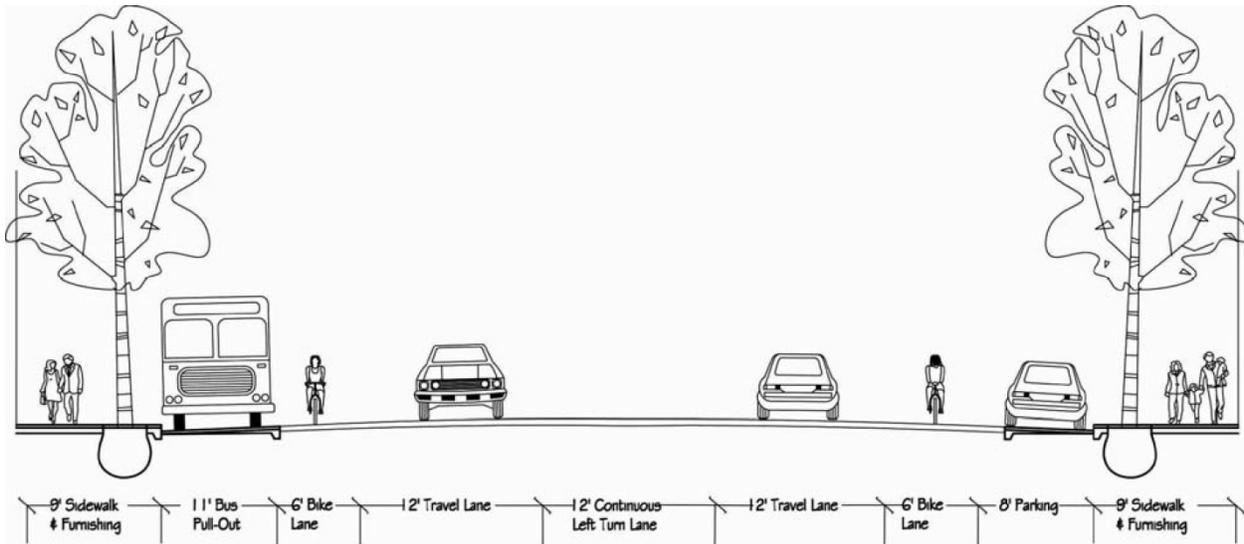
NE Halsey Street (Facing east)

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 7) 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. *Examples of these types of pedestrian crossings treatments are included in Section 8.*

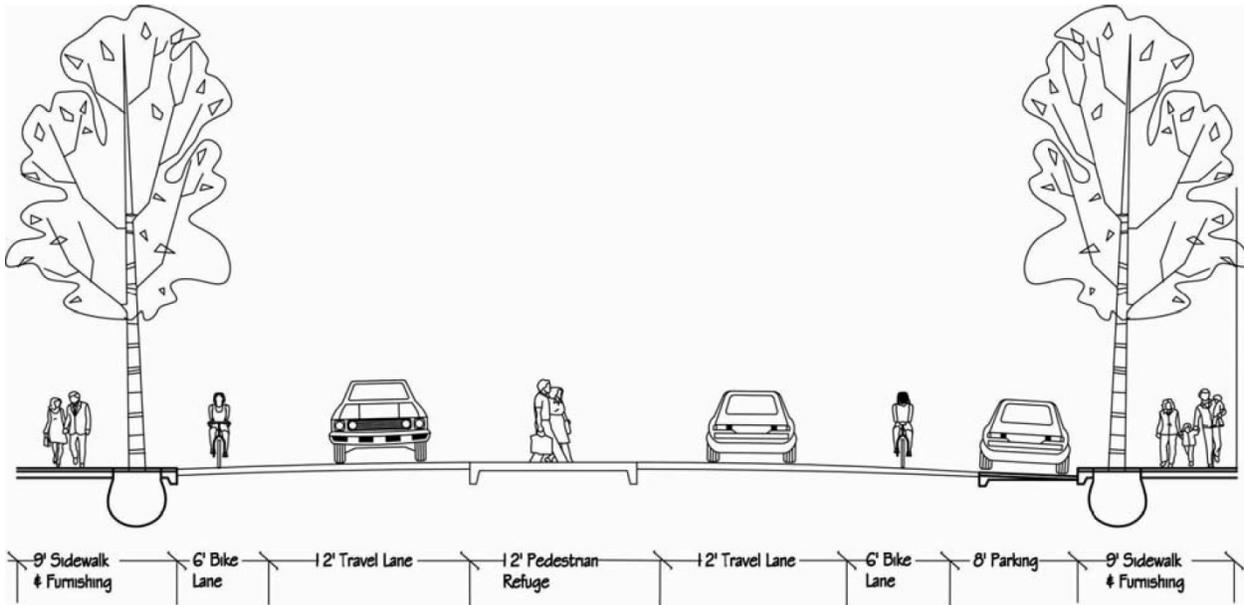
The recommended cross-sections for NE Halsey Street from the Halsey Street Project are shown in Exhibits 1 and 2. These cross sections are generally consistent with Multnomah County's standard cross-section for a minor arterial.

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 the reconstruction of 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

NE Arata Road parallels NE Halsey Street to the south providing access to several residential areas located within Wood Village as well as two major roadway facilities (NE 223rd Avenue and NE 238th Drive). As shown in Figures 10 and 11, the pedestrian and bicycle facilities located along NE Arata Road are fairly limited.



Improved Section of NE Arata Road (Facing east)

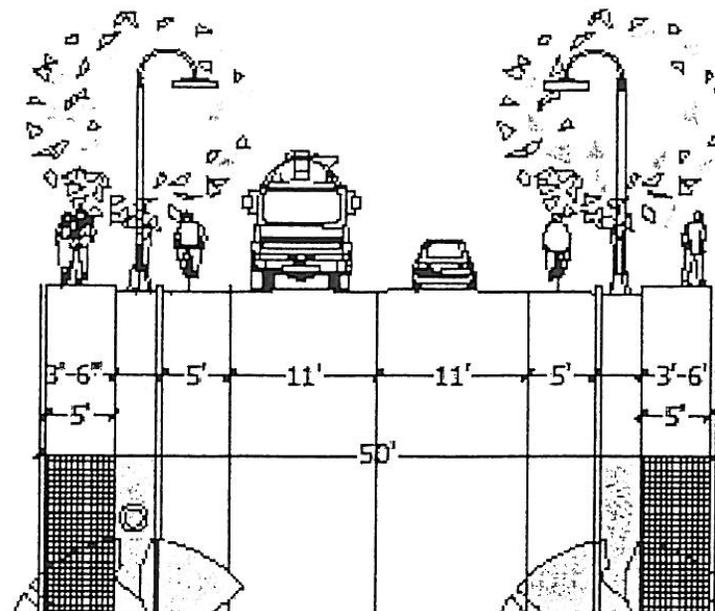
NE Arata Road currently lacks pedestrian and bicycle facilities as well as pavement makings and/or other enhanced pedestrian crossing treatments to help facilitate movement across the roadway between NE 238th Drive and NE 223rd Avenue (a distance of approximately $\frac{3}{4}$ mile). The development of 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.

The 2008 Arata Road Conceptual Design Plan (Reference 8) identifies the need for sidewalks and bike lanes along both sides of NE Arata Road as well as gateway treatments at NE 223rd Avenue and NE 238th Drive. The plan also identifies the need for the Cities of Wood Village and Fairview and Multnomah County to amend the appropriate street designations and standards in their respective Transportation System Plans so that Wood Village can retain the neighborhood collector designation (with a few exceptions) and Fairview and Multnomah County designate NE Arata Road as a minor collector. The plan also identifies the need for two multi-use paths; one extending north from the NE Wood Village Boulevard/NE Arata Road intersection as a short-term pedestrian and bicycle connection prior to construction of the NE Wood Boulevard extension, and one through the Wood Village Baptist church and abutting properties to the north.

The recommended cross-section for NE Arata Road from the Arata Road Conceptual Design Plan is shown in Exhibit 3. This cross section is generally consistent with Multnomah County's standard cross-section for a minor collector.

Exhibit 3: NE Arata Road Cross Section



Source: 2005 Halsey Street Conceptual Design Project

The 2035 RTP project list includes the reconstruction of NE Arata Road between NE 223rd Avenue and NE 238th Drive to neighborhood collector standards with a center turn lane/median, sidewalks, and bike lanes. The time period for the reconstruction is 2008-2017.

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. As shown in Figures 10 and 11, NE Glisan Street currently provides pedestrian and bicycle facilities along both sides of the roadway as well as multiple marked and signalized pedestrian crossings. However, as the area located south of NE Glisan Street (and the city of Wood Village) develops, new crossings opportunities may be required to facilitate movement across the roadway.



NE Glisan Street (Facing east)

NE 223RD AVENUE

NE 223rd Avenue provides north-south connectivity on a regional level as well as access to one of Wood Villages major commercial centers located in the southwest corner of the city limits. As shown on Figures 10 and 11, 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, the addition of 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 the reconstruction of 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. On a local level, NE 238th/242nd Drive provides connections between the residential, retail, commercial, and industrial areas located north of I-84 to the areas located south. As shown in Figures 10 and 11, 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 238th/242nd Drive (Facing North)

The lack of pedestrian facilities shown on Figure 10 and bicycle facilities shown 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 development of additional pedestrian and/or bicycle facilities. While opportunities do exist to provide connections between the east and west sides of the road, development of additional facilities is unlikely.

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. As shown in Figures 10 and 11, there are currently pedestrian and bicycle facilities located along both sides of NE Wood Village Boulevard between NE Glisan Street and NE Arata Road as well as multiple pedestrian crossings located at regular intervals along the roadway.



NE Wood Village Boulevard (Facing North)

The 2035 RTP project list includes the extension of NE Wood Village Boulevard from NE Arata Road to NE Halsey Street in order to complete this gap in the transportation network. The time period for the extension is 2008-2017.

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. As indicated in the existing conditions analysis, a majority of the stops currently do not provide shelters or seating and while a majority of the transit 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, high activity stops should be prioritized for these types of facilities..

SERVICE COVERAGE

As described in the transportation system inventory, 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. Rerouting Route 12 via NE Arata Road would improve coverage to many of the residential areas within Wood Village as would re-routing Route 12 along NE Glisan Street, NE Wood Village Boulevard, and NE Arata Road or rerouting Route 12 along NE Glisan Street and NE 242nd Drive. Figures 12, 13, and 14



Transit Stop on NE Halsey Street (Facing West)

illustrate the results of an analysis of each of these routes to show the changes in service coverage associated with each route. Stops were assumed at all major intersections for each analysis and the distance away from each stop was assumed to be ¼ mile (the average distance a person is willing to walk to get to a transit stop with less than frequent service). It should be noted that the analysis results presented in the figures are intended for discussion purposes only and not designed to condition TriMet and/or the City to re-route Route 12 or improve the roadway facilities to accommodate transit use.

However, should TriMet decide to re-reroute Route 12 following any of the three alternatives described above, additional transit facilities, such as poles, benches, shelters, etc. would be required at each stop to accommodate transit riders. In addition, the City would have to improve the pedestrian facilities along each of the roadways along with several potential pedestrian crossings locations to accommodate pedestrians. The City also would have to work with TriMet to both reroute Route 12 as well as provide the additional facilities.

Figure 12 Service Coverage with Route 12 Re-Route A

Figure 13 Service Coverage with Route 12 Re-Route B

Figure 14 Service Coverage with Route 12 Re-Route C

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 15 identifies several non-motorized connectivity opportunities within the Southend. 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. As such, 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.

As a first step in addressing this need, an opportunity exists to establish new east-west connections (conceptually illustrated as Opportunity #1 in Figure 15) from Wood Village Boulevard to points up to the existing Wood Village Green Mobile Home Park. 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 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, it is recognized that redevelopment of this area is a possibility over the long-term planning horizon. As such, a long-term opportunity exists to plan for local street and bike/ped connections that could be established under a future redevelopment scenario. 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 #2 in Figure 15). While the Stanley Street and Holladay Place connections are logical, it should be noted that there is specific language in the Wood Village Code that restricts the extension of these two streets westward. As such, this policy restriction would need to be revisited.

In addition to the east-west connections, opportunities for enhanced north-south connectivity exist 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 #3

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, there is the potential that some of this property could develop as single family residential. Under that scenario, there exists 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 #3 in Figure 15). With this connection in place, it would establish a continuous north-south connection between Glisan Street and Arata Road.

East-West Connection Need/Opportunity #4

The property that constitutes the former Multnomah Greyhound Park has the potential to be redeveloped in the near to mid-term time frame. Given the site's size and proximity within the Wood Village Commercial Town Center, an opportunity exists to provide an east-west connection that would link

Wood Village Boulevard to 223rd Avenue (conceptually illustrated as Opportunity #4 in Figure 15). Depending upon how the connection is established, it could potentially create a continuous east-west connection when coupled with the east-west connections identified under East-West Connectivity Opportunity #1 & #2.

North-South Connection Need/Opportunity #5

The existing Poplar Mobile Manor mobile home park currently exists between NE Arata Road and the former Multnomah Greyhound Park site. This use and the undeveloped parcel to the west is a barrier between NE Arata Road and the potential redevelopment of the Multnomah Greyhound Park site.

Like other mobile home park sites, it is recognized that redevelopment of this area is a possibility over the long-term planning horizon. As such, a long-term opportunity exists to plan for north-south local street and bike/ped connections that could be established under a future redevelopment scenario (conceptually illustrated as Opportunity #5 in Figure 15). Given the location, a north-south connection would enhance connectivity within and surrounding the Wood Village Town Center.

North-South Connection Need/Opportunity #6 & #7

With the exception of the multi-use path that exists at the northern terminus of Wood Village Boulevard at NE Arata Road, there are limited connections between NE Arata Road and NE Halsey Street. As such, there is a need 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, there exists an opportunity to provide a formal non-motorized corridor along two existing private residential streets located east of 231st Court (conceptually illustrated as Opportunity #6 in Figure 15). 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 impactful, but would significantly enhance non-motorized opportunities.

A second opportunity exists 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 #7 in Figure 15). As additional improvements to the church property are proposed and the commercial property along Halsey Street redevelops, a non-motorized pathway could be established between NE Halsey Street and NE Arata Road.

East-West Connection Need/Opportunity #8

The east end of NE Shannon Street currently stubs into 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, an opportunity exists 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 #8 in Figure 15). However, it should be noted that there are currently no sidewalks on the west side of NE 238th Drive south of NE Arata Road. As such, 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 #9

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, an opportunity exists 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 #9 in Figure 15) would reduce reliance on NE 238th Drive for vehicular traffic between the two residential areas.

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. As shown in Figure 15, access between the areas located north and south of I-84 (including the Southend) is limited to NE 238th Drive. As indicated previously NE 238th/242nd Drive provides north-south connectivity on a region level as well as direct access to I-84. The combination of which 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 pedestrian and bicycle facilities are currently provided 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 have 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 #10 & #11

Access to the Wood Village mobile home park is provided by NE Eldeberry Street, which forms a loop throughout the park. Access between the park and the commercial/retail areas to the east is limited to As future development occurs, an opportunity exists 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 #10 & #11 in Figure 15) would reduce reliance on NE Sandy Boulevard for vehicular traffic as well as pedestrians and bicyclists between the areas.

Freight Routes

The 2035 Regional Freight Plan (RFP-Reference 9) 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. These routes are generally consistent with the routes identified in the existing Wood Village TSP, with the exception of NE 238th/NE 242nd Drive, which prohibits trucks based on the TSP.

Within Wood Village, NE Glisan Street and NE 238th Drive north of I-84 have been developed to accommodate large vehicles, while the intersections of these roadways with other major roadways have been developed to accommodate wide turning movements. The projects identified in the RTP (and above) for NE Sandy Boulevard are generally aligned with the projects identified in the RFP to reconstruct the roadway to similar standards.

Figure 15 Pedestrian and Bicycle Connectivity

Section 7
Transportation System Tools

TRANSPORTATION SYSTEM TOOLS

The purpose of this section is to summarize the tools that can be applied 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. Several new draft policy statements have been added for the purposes of complying with the RTP as outlined below. These new policy statements have been used 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
- Ensuring 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
- Limiting and prohibiting 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 development of a 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 types of pedestrian facilities considered for implementation in Wood Village have been separated 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, as indicated previously, there are currently several roadways with no sidewalks or sidewalks on only one side. For these roadways there are two tools that can be used 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 potential treatments that could be implemented at key intersections throughout Wood Village to improve the safety and efficiency of pedestrian crossings. A summary of these treatments, including advantages, challenges, and location types are presented below.

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

	<p>Advantages</p> <ul style="list-style-type: none"> • Increases visibility of crossing area • Improves driver yield rates • Concentrates crossings in one location 	<p>Challenges</p> <ul style="list-style-type: none"> • May not be suitable for all crossing locations • Requires maintenance 	<p>Location Type</p> <ul style="list-style-type: none"> • Low volume roadways
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Research has shown that marked crosswalks in certain situations do not improve pedestrian safety and can even make it worse. Recent research indicates that on multi-lane roadways (more than two lanes), marked crosswalks should not be installed 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, pedestrian crossing facilities are needed to delineate the pedestrian right-of-way and 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. Curb extensions are typically installed at intersections along roadways with on-street parking and 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="646 296 927 625"> <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 625"> <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 625"> <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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Location Type									
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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. The *ODOT Traffic Manual* states that for state highways a raised median island in combination with a marked crosswalk is desired when average daily traffic (ADT) volumes are greater than 10,000 such as on US 30.

Raised Median Island

 <p>Source: http://streetswiki.wikispaces.com</p>	<table border="1"> <thead> <tr> <th data-bbox="630 1062 915 1121">Advantages</th> </tr> </thead> <tbody> <tr> <td data-bbox="630 1121 915 1446"> <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 1062 1208 1121">Challenges</th> </tr> </thead> <tbody> <tr> <td data-bbox="915 1121 1208 1446"> <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 1062 1482 1121">Location Type</th> </tr> </thead> <tbody> <tr> <td data-bbox="1208 1121 1482 1446"> <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, median refuge islands should be included 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 crossing 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 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>	<table border="1"> <thead> <tr> <th data-bbox="644 411 912 443">Advantages</th> </tr> </thead> <tbody> <tr> <td data-bbox="644 443 912 764"> <ul style="list-style-type: none"> Increases motorists yielding behavior Drivers experience less delay at hybrid signals compared to other signalized intersections </td> </tr> </tbody> </table>	Advantages	<ul style="list-style-type: none"> Increases motorists yielding behavior Drivers experience less delay at hybrid signals compared to other signalized intersections 	<table border="1"> <thead> <tr> <th data-bbox="932 411 1190 443">Challenges</th> </tr> </thead> <tbody> <tr> <td data-bbox="932 443 1190 764"> <ul style="list-style-type: none"> Expensive compared to other crossings treatments Requires pedestrian activations </td> </tr> </tbody> </table>	Challenges	<ul style="list-style-type: none"> Expensive compared to other crossings treatments Requires pedestrian activations 	<table border="1"> <thead> <tr> <th data-bbox="1209 411 1451 443">Location Type</th> </tr> </thead> <tbody> <tr> <td data-bbox="1209 443 1451 764"> <ul style="list-style-type: none"> Larger roadways where mid-block crossing is difficult or crossings opportunities are limited </td> </tr> </tbody> </table>	Location Type	<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>	<table border="1"> <thead> <tr> <th data-bbox="630 1134 912 1165">Advantages</th> </tr> </thead> <tbody> <tr> <td data-bbox="630 1165 912 1499"> <ul style="list-style-type: none"> Minimal staff time for signal re-timing Reduces vehicle/pedestrian conflicts Increases motorists yielding behavior </td> </tr> </tbody> </table>	Advantages	<ul style="list-style-type: none"> Minimal staff time for signal re-timing Reduces vehicle/pedestrian conflicts Increases motorists yielding behavior 	<table border="1"> <thead> <tr> <th data-bbox="932 1134 1190 1165">Challenges</th> </tr> </thead> <tbody> <tr> <td data-bbox="932 1165 1190 1499"> <ul style="list-style-type: none"> Reduces green time for conflicting vehicles Right-turn on red is often prohibited </td> </tr> </tbody> </table>	Challenges	<ul style="list-style-type: none"> Reduces green time for conflicting vehicles Right-turn on red is often prohibited 	<table border="1"> <thead> <tr> <th data-bbox="1209 1134 1451 1165">Location Type</th> </tr> </thead> <tbody> <tr> <td data-bbox="1209 1165 1451 1499"> <ul style="list-style-type: none"> Signalized intersections with heavy turning volumes </td> </tr> </tbody> </table>	Location Type	<ul style="list-style-type: none"> Signalized intersections with heavy turning volumes
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Grade-Separated Crossing

Grade-separated crossings are either 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 necessary wherever pedestrian crossings of freeways are constructed and in other limited circumstances, such as railroad crossings. However, they are often perceived as unsafe (especially under-crossings), and may result in significant out-of-direction travel for pedestrians, grade-separated crossings should be used sparingly. Grade-separated crossings can be relatively expensive to build.

Grade-Separated Crossing

 <p>Source:VeloTraffic.com</p>	<table border="1"> <thead> <tr> <th data-bbox="646 247 928 296">Advantages</th> </tr> </thead> <tbody> <tr> <td data-bbox="646 296 928 625"> <ul style="list-style-type: none"> • Separates pedestrians from vehicular traffic </td> </tr> </tbody> </table>	Advantages	<ul style="list-style-type: none"> • Separates pedestrians from vehicular traffic 	<table border="1"> <thead> <tr> <th data-bbox="928 247 1206 296">Challenges</th> </tr> </thead> <tbody> <tr> <td data-bbox="928 296 1206 625"> <ul style="list-style-type: none"> • Very expensive </td> </tr> </tbody> </table>	Challenges	<ul style="list-style-type: none"> • Very expensive 	<table border="1"> <thead> <tr> <th data-bbox="1206 247 1469 296">Location Type</th> </tr> </thead> <tbody> <tr> <td data-bbox="1206 296 1469 625"> <ul style="list-style-type: none"> • Where there is demand for freeway and/or railroad crossings </td> </tr> </tbody> </table>	Location Type	<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 of which plays an important role in developing a comprehensive bicycle system.

Types of Bicycle Facilities

The types of bicycle facilities considered for implementation in Wood Village have been separated 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 10) 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

	<p>Advantages</p> <ul style="list-style-type: none"> • Reduce wrong way and sidewalk riding • Improve cyclists position in roadway • Informs motorists of bicyclists in roadway 	<p>Challenges</p> <ul style="list-style-type: none"> • Pavement marking maintenance • Not as effective as bike lane 	<p>Location Type</p> <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 streets, even when they include bicycle lanes. Multnomah County street standards currently include bicycle lanes on all arterial and collector streets.

Bicycle Lanes

	<p>Advantages</p> <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 	<p>Challenges</p> <ul style="list-style-type: none"> • May still have conflicts with motorists • Motorists may block bike lane 	<p>Location Type</p> <ul style="list-style-type: none"> • Non-local streets with adequate space for accommodation
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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. Bicycling conditions are improved by reducing stop signs to a minimum along the route and providing wayfinding information specific to bicyclists. Traffic calming is often used to slow automobile speeds and eliminate the cut-through automobile traffic that the removal of stop signs would otherwise attract.

Low-Traffic Bikeway (Bike Boulevard)

 <p>Source: Dave Parisi</p>	<table border="1"> <thead> <tr> <th data-bbox="643 254 919 296">Advantages</th> </tr> </thead> <tbody> <tr> <td data-bbox="643 296 919 615"> <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 615"> <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 615"> <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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Bicycle Detection

Many traffic signals in Wood Village are actuated, meaning that green indications are only given to a movement when the signal detects the presence of a vehicle. However, actuating a signal as a cyclist is difficult if there is no information about the location of detection equipment. Pavement markings should be used, including actuated left-turn lanes, to show cyclists where to stand to actuate a signal. Additionally, the sensitivity of all loop detectors should be set 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 1203 1123">Challenges</th> </tr> </thead> <tbody> <tr> <td data-bbox="927 1123 1203 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
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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="643 254 919 296">Advantages</th> </tr> </thead> <tbody> <tr> <td data-bbox="643 296 919 573"> <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="935 254 1195 296">Challenges</th> </tr> </thead> <tbody> <tr> <td data-bbox="935 296 1195 573"> <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 254 1471 296">Location Type</th> </tr> </thead> <tbody> <tr> <td data-bbox="1211 296 1471 573"> <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="634 884 911 926">Advantages</th> </tr> </thead> <tbody> <tr> <td data-bbox="634 926 911 1201"> <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="927 884 1203 926">Challenges</th> </tr> </thead> <tbody> <tr> <td data-bbox="927 926 1203 1201"> <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="1219 884 1471 926">Location Type</th> </tr> </thead> <tbody> <tr> <td data-bbox="1219 926 1471 1201"> <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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Multi-Use Paths and Trails

Multi-use paths and trails can augment and support the 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

	Advantages	Challenges	Location Type
	<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 	<ul style="list-style-type: none"> • Requires adequate space to accommodate buffer from street and width to allow passing • Bicycle and pedestrian conflicts 	<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

Several potential traffic calming measures can be considered and applied to the local street network to calm traffic and enhance the non-auto travel modes such as bicycle and pedestrian. A short description of these measures is outlined below.

Traffic Diverter

A traffic diverter is a raised channelization island that is most often used at intersections. Traffic diverters are designed to 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 vary with size and design.

Traffic Calming Circle

A traffic calming circle is an elevated circular island that can be placed 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 development of 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. The roadway capacity element is not included in this update as Metro is working to complete its East Metro Connections Plan, which includes analysis and recommendations that may impact Wood Village Roadways. In order to avoid the potential for inconsistencies between this update and the East Metro Connections Plan, the roadway capacity element is being postponed at this time. This TSP update, however, will help guide the management and implementation of the transportation facilities, policies, and programs related to pedestrian and bicycle connectivity 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 a balanced transportation system can be developed that facilitates mobility for all modes of transportation as well as access to adjacent land uses. A roadway's functional classification helps determine 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. It is imperative that a roadway's functional classification consider the adjacent land uses and the transportation modes that should be accommodated. The public right-of-way must also provide sufficient space for utilities to serve adjacent land uses.

The functional classification plan for Wood Village is shown in Figure 16. The plan incorporates four functional categories: freeways, arterials (major and minor), collectors (major and neighborhood), and local streets. It should be noted that 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 access is limited. 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 as well as 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 control of access (compared to arterials), and provide access to residential neighborhoods. These roadways distribute trips to and from the neighborhood and local street system. NE Wood Villabe 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 16 Functional Classification Plan

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. As such, local streets should primarily serve passenger cars, pedestrians, and bicyclists; heavy 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.

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 are necessary to ensure that the system of streets, as it develops, 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 have been coordinated with the Multnomah County street design standards for all collector and higher streets. The local street design standards are unique to Wood Village.

The street design standards are shown as cross sections in Figures 17 and 18. The cross sections are intended to be used for planning purposes for new road construction, as well as for those locations where it is physically and economically feasible to improve existing streets. As shown in the figures, on-street parking is identified 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 are intended to define typical cross-sections of streets between intersections.

Figure 17 Standard Cross Sections

Figure 18 Standard Cross Sections

As indicated previously, this TSP update is focused on the city's pedestrian, bicycle and transit systems, not the roadway system. However, recent planning efforts have resulted in the development of new roadway cross sections standards for NE Halsey Street and NE Arata Road. The new standard cross sections shown for NE Halsey Street and NE Arata Road are based on the conceptual design plans prepared for each roadway as part of previous planning efforts.

It should be noted that 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 modification of the landscape area or other street design standards to accommodate this evolving practice. The street design standards shown are not intended to preclude green street treatments.

Local Street Options

The standard cross-section for local streets includes a total paved width of 32 feet, which is intended to accommodate parking on one or both sides of the street. A skinny street option is identified for application in local street settings where low traffic volumes and narrow roadway elements are desired. 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 refuse/recycling trucks, school busses, and other delivery vehicles. The City can permit construction of the 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

Each of the City's street design standards includes a landscape strip separating the roadway curb from the sidewalk. This landscaping strip serves to better separate motorized vehicle and pedestrian traffic and creates an opportunity for landscaping in the form of street trees or other elements. The City will incorporate street trees in all street landscaping areas where possible.

Pedestrian System Plan

Providing connections between major activity centers is a key objective of the pedestrian and bicycle system plans. Major activity centers are defined as 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 recommended pedestrian improvement projects include the provision of sidewalks and off road multi-use paths and trails to facilitate pedestrian travel throughout the transportation system, as well as treatments to aid pedestrians crossing traffic. The street design standards presented in this TSP can help ensure that pedestrian facilities are provided in conjunction with all new public streets. For existing roadways without sidewalks, the inclusion of sidewalks should be required with any redevelopment of adjacent properties or with significant improvements in the roadways.

The recommended pedestrian system plan is intended to improve 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 19 and Project Summary Tables 3, 4, & 5 provided at the end of this section present the projects included in the recommended pedestrian system plan. It is important to note that 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 the addition of 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, two pedestrian crossing projects are also recommended for prioritization. Examples of the types of crossing improvements needed are discussed below.

Raised Median Islands

Raised median islands are included in the recommended 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 can provide pedestrians with a refuge area within the crosswalk to stop while crossing the street and complete a two-stage crossing if needed.

Figure 19 Pedestrian System Plan

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, an engineering study should be conducted to evaluate the types of pedestrian crossing treatments needed at the mid-block crossings.

Other Pedestrian Crossing Treatments

Several additional pedestrian crossing treatments are presented in the Transportation System Tools section 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 is intended to 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. The recommended bicycle improvement projects are shown in Figure 20 and are included in the Project Summary Tables 3, 4, & 5. The various types of bicycle facilities included in the bicycle system plan are described below.

Bicycle Lanes

A majority of the bicycle improvement projects prioritized 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 20 Bicycle System Plan

Multi-Use Paths and Trails

The continued use of the existing multi-use paths and trails as well as the future development of new multi-use paths and trails is included in the prioritized TSP project list. It should, however, be noted that one of the long-term projects call for the existing multi-use path located north of NE Wood Village Boulevard to be replaced by a new roadways extension with bicycle lanes, curbs, and sidewalks when significant development occurs in the area or when funds become available.

Public Transportation Plan

The public transportation plan is intended to establish a comprehensive transit system that provides access to areas within the city as well as areas too far to walk or bike. The following service enhancements, capital improvements, and policy improvements were identified as part of this TSP update.

TRANSIT STREET DESIGNATIONS

Figure 21 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's service enhancements are determined through its five-year Transit Investment Plan (TIP), which identifies 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 any service enhancements within Wood Village are included.

CAPITAL IMPROVEMENTS

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

Figure 21 Designated Transit Streets

POLICY AMENDMENTS

The following recommended policy amendments are intended to improve transit conditions in the city.

Improve Service to “Transit Dependent” Population

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.

Improve Transit Safety

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

Maintain Transit Facilities

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

Other Transit Policies

- Park-n-Ride Facilities: explore opportunities to establish a park-n-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.

Bicycle/Pedestrian Projects Implementation Plan

This section outlines the transportation system improvement projects identified for Wood Village as part of this TSP update as well as a basic timeline for implementation. The implementation plan

presented does not identify specific years when infrastructure should be constructed, but rather prioritizes projects to be developed 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.

A prioritization of transportation improvements in the city for the near-term and long-term are listed in Tables 3 and 4, respectively. The projects shown in the tables were selected based on their ability to enhance pedestrian and bicycle travel within and through the city. The implementation plan recognizes that only a certain amount of money will be available to fund projects. As a result, only those projects with a reasonably likely funding source are included 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 3 Near-Term Bicycle/Pedestrian Improvement Program

Project No. (see Figures 18-19)	Project Location	Project Description	Potential Funding Source	Estimated Cost
<i>Pedestrian Improvement Projects</i>				
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	G, PDF	\$2,255,000 ²
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	G, PDF	
P3	Wood Village Boulevard to Halsey Street	Enhance the existing multi-use path that exists between Wood Village Boulevard and Halsey Street	G	
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	G, PDF	\$300,000
<i>Bicycle Improvement Projects</i>				
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	G, PDF	\$2,255,000 ²
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	G, PDF	
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	\$150,000

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)

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

² The cost of the identified bicycle and pedestrian improvements is included in the overall Arata Road improvement program.

Table 4 Long-Term Bicycle/Pedestrian Improvement Program

Project No. (see Figures 18-19)	Project Location	Project Description	Potential Funding Source	Estimated Cost
<i>Pedestrian Improvement Projects</i>				
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
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
<i>Bicycle Improvement Projects</i>				
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 5 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. These projects have been separated from the near- and long-term bicycle/pedestrian improvements given that the vast majority of them would likely be constructed as part of private development projects. Figure 15 illustrates the general location of the projects identified in Table 5.

Table 5 Connectivity Improvement Program

Project No. (see Figure 15)	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	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
C3	North-South Connection #3	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
C4	East-West Connection #4	Provide an east-west connection between NE 223 rd Avenue and NE Wood Village Boulevard	PDF
C5	North-South Connection #5	Provide a north-south connection between NE Arata Road and east-west connection #4	PDF
C6	North-South Connection #6	Provide a north-south multi-use path connection between NE Arata Road and NE Halsey Street	CF, PDF
C7	East-West Connection #7	Provide an east-west multi-use path connection between NE Shannon Street and NE 238 th Drive	CF, G
C8	East-West Connection #8	Provide an east-west multi-use path connection between NE Treehill Drive and NE Hawthorne Avenue	CF, G, PDF
C9	East-West Connection #9	Provide an east-west connection between the Wood Village Park mobile home park and the industrial property located west of the city limits	PDF
C10	East-West Connection #10	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

As part of the process to update the city of Wood Village TSP, regulatory language was recommended for the Zoning and Development Ordinance (ZDO) to implement the TSP, as well as ensure consistency with the RTFP and the state Transportation Planning Rule (OAR 660-12). The complete code analysis and recommended amendments are included as part of Appendix B, Proposed Implementation Language. The recommended code amendments are expected to be adopted through a separate adoption ordinance, but concurrently with the TSP.

Section 9
Transportation Funding Plan

TRANSPORTATION FUNDING PLAN

Chapter 4 of the 2001 City of Wood Village TSP Roadway Element provides additional information related to Transportation Funding.

The remainder of this section provides an overview of funding and financing options that are available for consideration and 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. No effort has been made to screen funding options according to their political or legal feasibility. The funding environment is dynamic so the list shown should not be considered exhaustive.

FEDERAL RESOURCES

Community Development Block Grants (CDBG)

Community Development Block Grants (CDBG) are offered through the Federal Department of Housing and Urban Development. To receive CDBG funds, 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. CDBG funds can also be used 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. CDBG funding requests should be coordinated 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. These funds can be used 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. Funding requests for EDA grants should be coordinated 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 one percent of the fuel tax returned to cities and counties is designated for bike paths and lanes.

Potential: With an increase in population, number of registered vehicles, and fuel sales, the total revenue from the State Motor Vehicle 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. 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 for the purpose of helping cities repair or reconstruct local streets that are inadequate for the capacity that they serve or are in a condition detrimental to safe travel.

Potential: These funds are limited to streets that are owned or maintained by the local government (State or County owned streets are ineligible). Example applications would therefore be 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 in order to support local economic development and create new jobs.

Existing Application: SPWF and IOF funds have been used in a number of cities for the construction of water, sewer, and limited street improvements.

Potential: These funds are limited to situations where it can be documented that a project will contribute to economic development and family-wage job creation. 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 located on both sides of the streets and facilitate walking trips for customers accessing retail businesses. Funding applications should be coordinated with Multnomah County, OECDD, and ODOT.

State Bicycle-Pedestrian Grants

Description: ODOT's Bicycle and Pedestrian Program administers two grant programs to assist in the development of walking and bicycling improvements: local grants and Small-Scale Urban Highway

Pedestrian Improvement (SUPI) programs. For both these grants, cities that have adopted plans with identified projects will be in the best position to secure grant funds. Cities and counties can apply for local grants for bicycle and pedestrian projects within the right-of-way of local streets. Local grants up to \$100,000 are shared 80 percent State and 20 percent local. Projects that consider the needs of children, elderly, disabled, and transit users are given special consideration.

To apply, there must be support for the project from local elected officials. Applications for the Local Grant program are mailed out to all Oregon jurisdictions every other year. In the SUPI process, cities and counties help ODOT identify sections of urban highways where improvements are needed. Examples of eligible projects include:

- completing short missing sections of sidewalks;
- ADA upgrades;
- crossing improvements (e.g., curb extensions, refuges, crosswalks); and,
- intersection improvements (e.g., islands and realignment).

SUPI projects are located on highways that have no modernization projects scheduled for the foreseeable future. Projects that have a local funding match are typically viewed the most favorably because this indicates strong local support. Projects on highways that cost more than \$100,000, require right-of-way, or have environmental impacts need to be submitted to ODOT for inclusion in the STIP. Cities and counties can apply annually for bike path or sidewalk grants of projects they have selected. Grants for projects on local street systems have a match of 20 percent and projects next to state highways have a lower match requirement. Bicycle-pedestrian grants are generally below \$125,000 per project. Project evaluation and selection is made annually statewide by the Statewide Bicycle/Pedestrian Committee.

Potential: Communities throughout Oregon have successfully received these grants for bicycle and sidewalk improvements. Wood Village may be able to do the same.

ODOT Enhancement Program⁶

Description: The Transportation Enhancement program provides federal highway funds for projects that strengthen the cultural, aesthetic, or environmental value of the transportation system. The funds are available for twelve “transportation enhancement activities,” that are categorized as:

⁶ Source: <http://www.oregon.gov/ODOT/HWY/LGS/enhancement.shtml>

- Pedestrian and bicycle projects;
- Historic preservation related to surface transportation;
- Landscaping and scenic beautification; and
- Environmental mitigation.

Existing Application: The Enhancement Program funds special or additional activities not normally required on a highway or transportation project. So far, Oregon has funded more than 190 projects for a total of \$97 million.

Potential: The City of Wood Village could seek Enhancement Program funds for bicycle and sidewalk projects throughout the city.

State Parks Funds⁷

Description: Recreational Trails Grants are national grants administered by the Oregon Parks and Recreation Department (OPRD) 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 project, and has awarded more than \$40 million in grants across the state since 1999. Grants can be awarded to non-profits, cities, counties, and state and federal agencies.

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

The following local funding programs are commonly used by cities 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. The funds are allocated 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

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

metropolitan region. The funds can be spent 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 includes the first phase of the Arata Road Conceptual Design Plan, which includes the construction of 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 project also includes the development of a 500-foot long multi-use path near the end of NE Wood Village Boulevard that connects Arata Road with Halsey Street to the North. The second project includes improvements along 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: Bonds are often sold by a municipal government to fund transportation (or other types) of improvements, and are repaid with property tax revenue generated by that 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 the construction of transportation improvements. For smaller jurisdictions, the cost of issuing bonds vs. the amount that they can reasonably issue creates a problem. Underwriting costs can become a high percentage of the total cost for smaller issues. 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 when focused on specific projects.

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

Description: Local property tax revenue (City or County) could be used 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. Precedents for the use of property taxes as a source of funding for transportation capital improvements can be found throughout the state. However, with the limitations resulting from Measure 50, use of 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: This maintenance fee is premised on viewing public streets as utilities used by citizens and businesses similar to a public water or sewer system. Fees are typically assessed by usage (e.g., average number of vehicle trips per property).

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. For example, the City of Hillsboro charges a flat fee of \$3.10 per residential unit, while businesses government agencies, schools, and non-profits are assessed based on the number of trips generated by their employees, vendors and customers. By comparison, the City of Oregon City charges single-family residential properties \$4.50 per month the first year and gradually increases the fee over the next five years to \$11 per month. The revenues generated by these fees are used for operations and maintenance (as opposed to capital projects).

Potential: In Wood Village, a \$5.00 monthly fee charged to the estimated 1,249 households would generate approximately \$74,940 per year in revenue from residential uses alone. As households grow in the future, revenues would also grow. These fees can be used to finance both operating costs (maintenance) and capital costs.

Local Improvement District (LID)

Description: Under a local improvement district (LID), a street or other transportation improvement is built and the adjacent properties that benefit are assessed a fee to pay for the improvement.

Existing Application: LID programs have wide application for funding new or reconstructed streets, sidewalks, water/sewer or other public works projects. 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

Description: An Urban Renewal District is an area that is designated by a community as a “blighted area” to assist in revitalization. Funding for the revitalization is provided by urban renewal taxes that are generated by the increase in total assessed values in the district from the time it was first established.

Existing Application: Urban Renewal Districts have been formed in over 50 cities in Oregon, generally focused on revitalizing downtowns.

Potential: Urban Renewal dollars can be used to fund infrastructure projects such as roadway, sidewalk, or transit improvements. Because funding relies on taxes from future increases in property value, the City of Wood Village may seek to create a District where such improvements will likely result in such an increase.

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

Description: New local streets required to serve new development areas are provided at the developer’s expense in accordance with the tentative and final plan approvals granted by the City Council.

Existing Application: Current City ordinance requires local streets and utilities to be provided 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.

SAFE ROUTES TO SCHOOL PROGRAMS⁸

Description: The Oregon Safe Routes to School (SRTS) Program administers federal funds received from the 2005 SAFETEA-LU transportation bill. The Oregon program received over \$5 million in federal funds through the initial 2005-2009 period for projects at schools serving grades K-8.

The national Safe Routes to School Program has not been reauthorized but is operating on a continuing resolution. \$2.2 million infrastructure funds are available for construction for 2012-2013. The call for applications opened October 1, 2010.

The goals of the program are to increase the ability and opportunity for children to walk and bicycle to school, promote walking and bicycling to school and encourage a healthy and active lifestyle at an early age, and facilitate the planning, development and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption and air pollution within two miles of a given school.

Potential: The two types of project that can receive funding through the SRTS program include infrastructure projects within two miles of a school, and non-infrastructure activities such as education, encouragement, and traffic enforcement activities within two miles of a school.

Infrastructure projects chosen for funding are selected through a statewide competitive process based on written applications and field review. Local matching funds are not required to receive SRTS funds. For the City of Wood Village to pursue SRTS funding, the local school district will first have to complete a survey of its parents and students as part of a SRTS needs assessment. Infrastructure applications and information are available online.

⁸ Source: <http://www.oregon.gov/ODOT/TS/saferoutes.shtml>

Section 10
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Appendix A
TSP Evaluation

Appendix B
Proposed Implementation
Language