Existing and Future Transportation Conditions

Wood Village Town Center Master Plan and Transportation System Plan Update

TGM 1D-14: Technical Memo #2

October 30, 2015

Final

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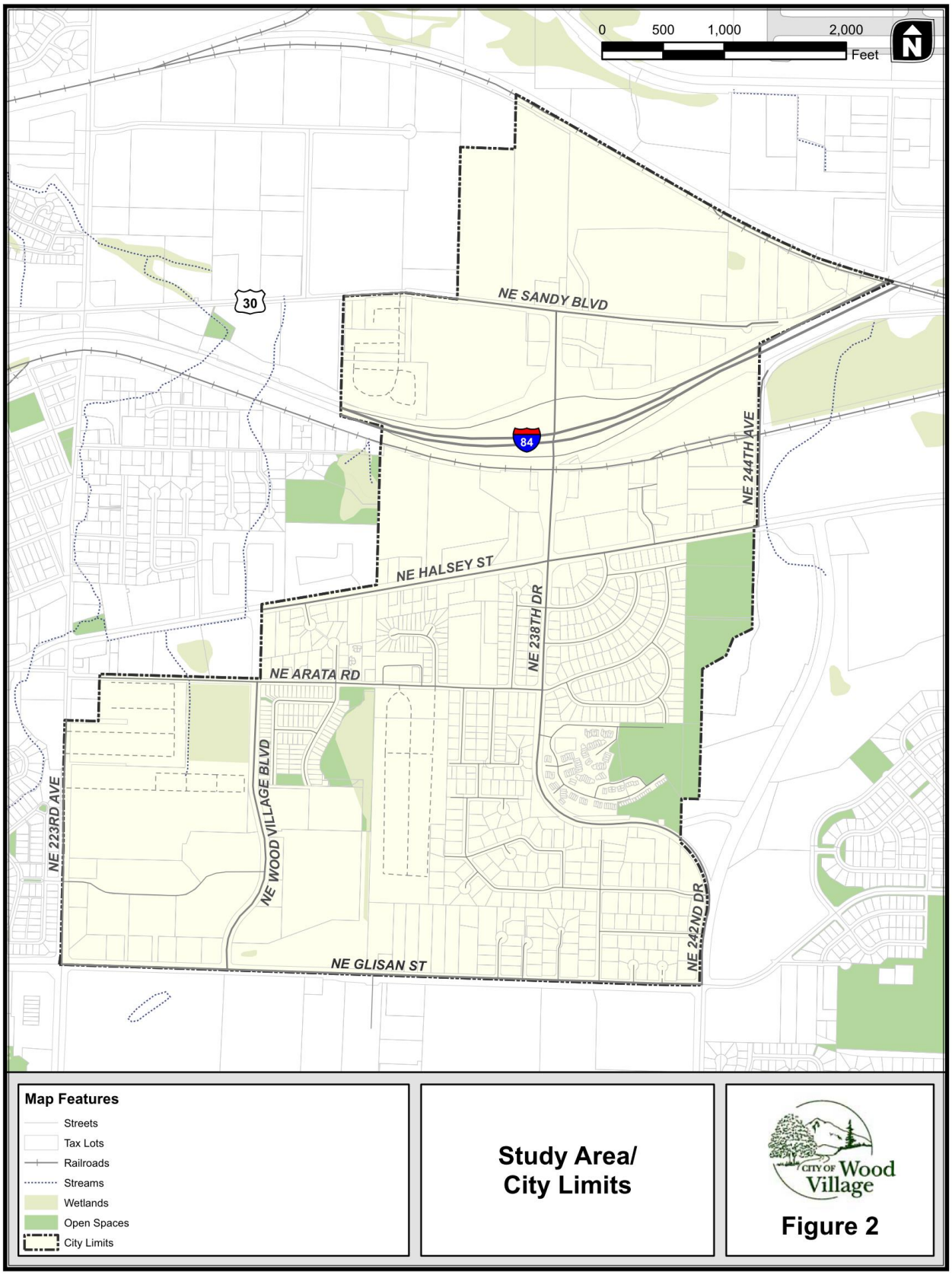
1 INTRODUCTION

In 2012, the City of Wood Village adopted an update to their Transportation System Plan (TSP). The 2012 TSP updated the city's pedestrian, bicycle, and public transportation systems. It did not develop an update to the Street Element because Metro was in the midst of developing the East Metro Connection Plan (EMCP). The EMCP developed a list of transportation investments within the study area that included Wood Village, Fairview, Troutdale, Gresham, Pleasant Valley and a small area of unincorporated Clackamas County called the Springwater District. The investments in the EMCP study area were developed to support economic and community development, and were targeted to enhance north-south connections, downtowns and employment areas, and regional mobility.

This memorandum summarizes existing and future conditions for the Wood Village transportation system as relevant to the TSP Street Element. Since it is based on work from other plans, all the information in this memorandum was prepared as a part of the EMCP, taken from the Wood Village 2012 TSP update or the 1999 Wood Village TSP Roadway Element. The information is organized such that it will be easily transferred into the final version of the TSP Street Element.

2 STUDY AREA

The City of Wood Village is located in eastern Multnomah County within the Portland Metropolitan Region. According to the 2010 census, Wood Village had a population of 3,878. The study area for the TSP Street Element is the same as identified in Wood Village's 2012 TSP update and is identified by the dashed black line on Figure 2 from that document which is shown on the next page. Wood Village is less than a square mile in size and is bounded to the north and east by Troutdale, to the south by Gresham, and to the west by Fairview.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Feet
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NE 244TH AVE
NE HALSEY ST
NE 238TH DR
NE ARATA RD
NE WOOD VILLAGE BLVD
NE 223RD AVE
NE 242ND DR
NE GLISAN ST
Map Features
Streets
Tax Lots
Railroads
Streams
Wetlands
Open Spaces
City Limits
Study Area/
City Limits
CITY OF Wood Village
Figure 2

3 SUMMARY OF PLANS, POLICIES AND STANDARDS

State, regional and local plans, policies and standards were reviewed to determine the relevance to the Wood Village TSP Street Element. The review is provided in a separate memorandum titled, Wood Village Policy and Framework Review.

4 TRANSPORTATION SYSTEM INVENTORY – EXISTING CONDITIONS

The 2012 TSP provided a lot of information about the existing transportation system in Wood Village. This section was compiled using information from the 2012 TSP as well as additional information prepared to during the EMPC.

4.1 STREET SYSTEM

Existing conditions within Wood Village have changed minimally since the 2012 TSP was prepared. The TSP Street Element is to be a standalone document; therefore some of the sections below are directly taken from the 2012 TSP.

4.1.1 Ownership

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 roadways designated a collector or higher classification 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.

4.1.2 Functional Classification

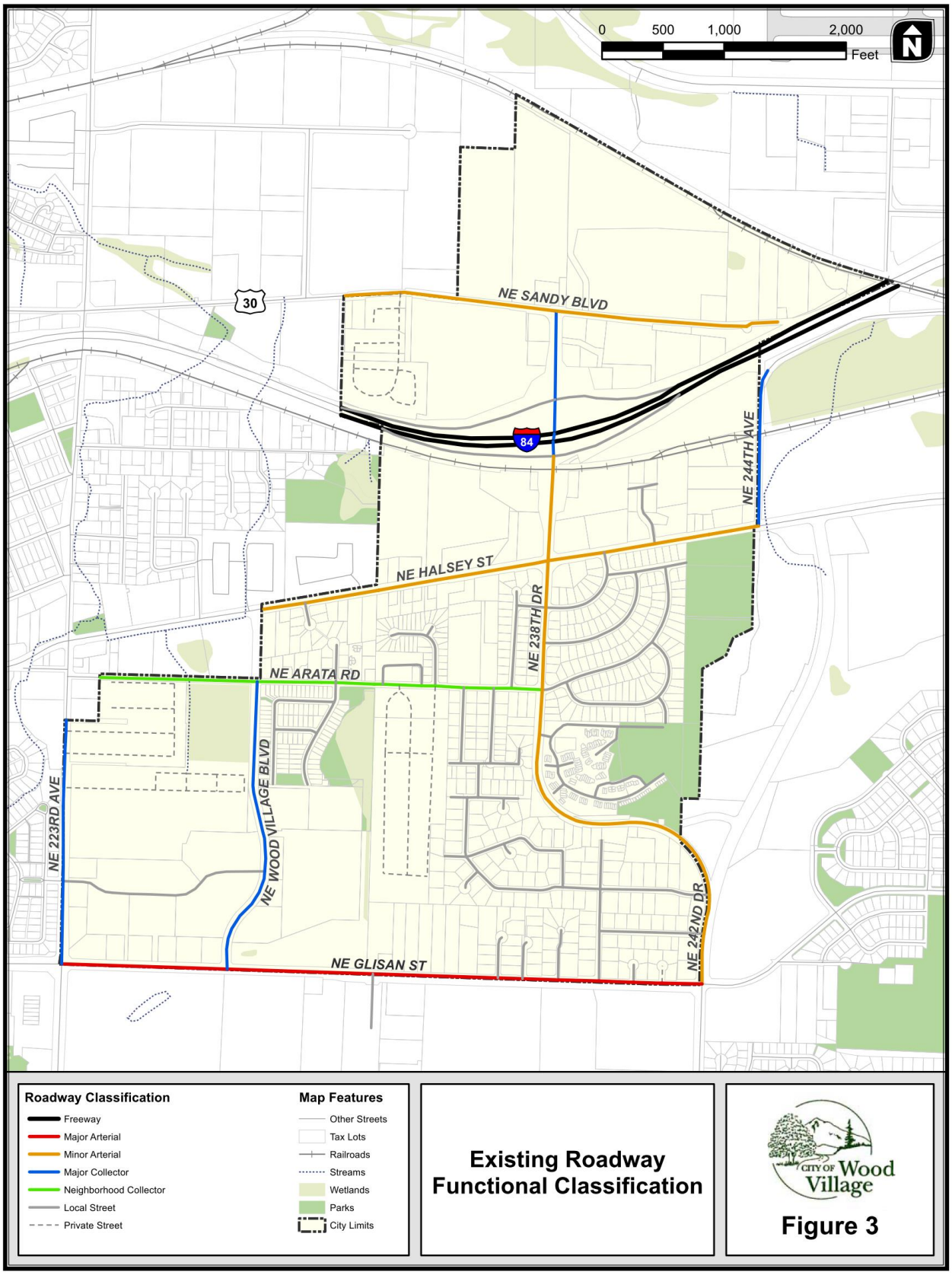
A street's functional classification reflects its role in the transportation system and helps define desired operational and design characteristics such as right-of-way requirements, pavement widths, pedestrian and bicycle features, and driveway (access) spacing requirements. Table 1 provides Multnomah County's description of the roadway functional classifications.

Table 1. Multnomah County Functional Classification Description

Functional Classification	Description
Freeway	Primary function is to carry high levels of regional vehicular traffic and public transit at high speeds; full access control with access limited to interchanges and street crossings with grade separations; widely spaced access points; serves motorized vehicle traffic only; contains a median.
Major Arterial	Major Arterial Streets carry high volumes of traffic between cities in the County as part of the regional trafficway system. Priority may be given to transit- and pedestrian-oriented land uses by way of regional boulevard design treatments. Design and management of major arterial streets emphasizes preservation of the ability to move auto and transit traffic by limiting accesses while also accommodating regional bikeways and pedestrian movements.
Minor Arterial	Minor Arterial Streets are the lowest order arterial facility in the urban regional street network. They typically carry less traffic volume than principal and major arterial streets, but have a high degree of connectivity between communities. Minor arterial streets provide major links in the regional road and bikeway networks; provide for truck mobility and transit corridors; and may serve as significant links in the local pedestrian system, especially where they are designed as community boulevards.
Major Collector	Major Collector Streets serve several purposes including linking neighborhoods to the regional system of bicycle and automobile streets, and basic transit service. They typically provide direct access between residential and commercial developments, schools, and parks.
Neighborhood Collector	Neighborhood Collector Streets provide access primarily to residential land uses and link neighborhoods to higher order roads. They generally have higher traffic volumes than local streets but through or nonlocal traffic is discouraged.
Local Street	Local streets provide access to abutting land uses and do not serve through traffic. Local streets may be further classified by adjacent land use, such as residential, commercial, and industrial. Their primary purpose is to serve local pedestrian, bicycle, and automobile trips in urban areas. In rural areas, local roads serve automobile and farm circulation, as well as local pedestrian, bicycle, and equestrian uses.

Source: Multnomah County Design Standards: Section 1 – Traffic Planning. https://multco.us/transportation-planning/plans-and-documents.

The existing Wood Village functional classification plan for all roadways within the city is illustrated in Figure 3 from the 2012 TSP, shown on the next page.



Source: Wood Village 2012 TSP Update

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 2 compares the functional classification that each of the relevant jurisdictions assigned to each collector and higher roadway.

As shown, the designation of Arata Road is not consistent between Multnomah County and Wood Village. The 2012 TSP recommends that Multnomah County revise its classification from major collector to neighborhood collector. This update to the TSP Street Element also recommends that Multnomah County revise its classification.

Table 2. Roadway Functional Classification

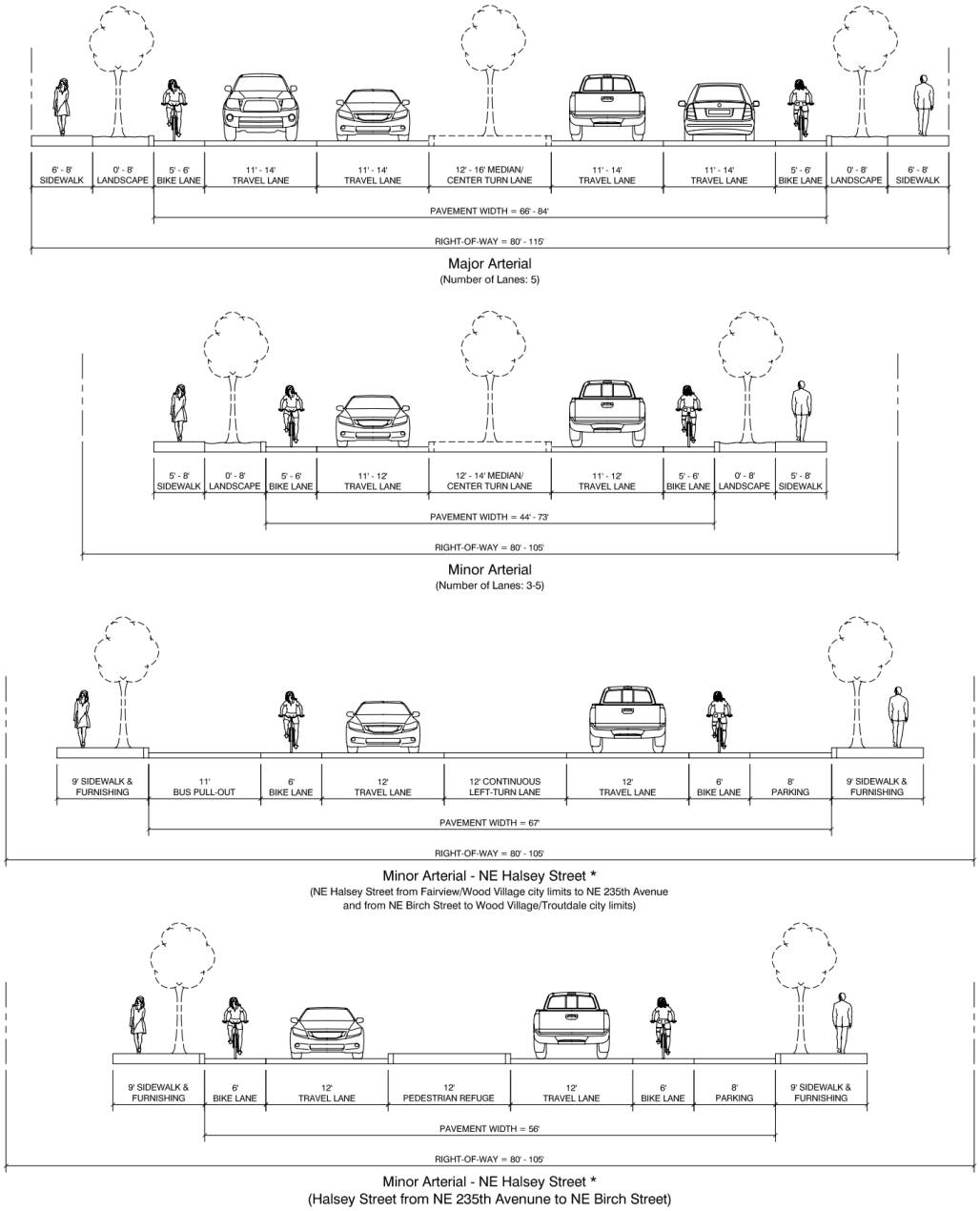
Roadway	ODOT	Multnomah County	Wood Village	Metro
I-84	**Interstate Highway**	-	Freeway	Principal Arterial
NE Sandy Boulevard	-	**Minor Arterial**	Minor Arterial	
NE Halsey Street	-	**Minor Arterial**	Minor Arterial	Minor Arterial
NE Arata Road	-	**Major Collector**	Neighborhood Collector	-
NE Glisan Street	-	**Major Arterial**	Major Arterial	Major Arterial
NE 223rd Avenue	-	**Major Collector**	Major Collector	-
NE Wood Village Boulevard	-	**Major Collector**	Major Collector	-
NE 238th/242nd Drive	-	**Minor Arterial**	Minor Arterial	Minor Arterial
NE 244th Avenue	-	**Major Collector**	Major Collector	-

Roadways in bold indicate ownership/maintenance responsibility.

4.1.3 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 cross sections are shown in Figures 17 and 18 from 2012 TSP provided on the next page. However, the City of Wood Village is currently in the process of re-examining the Halsey cross-section and the approved construction drawings for Arata Road are slightly different than detailed below. Arata Road will be constructed with a 10 foot wide combined pedestrian and bicycle way separated from the roadway surface; there will be no bicycle facilities constructed between the curb lines. The figures below will need to be updated. In general, the Wood Village preferred right of way (ROW) and pavement widths are as detailed in Table 3.



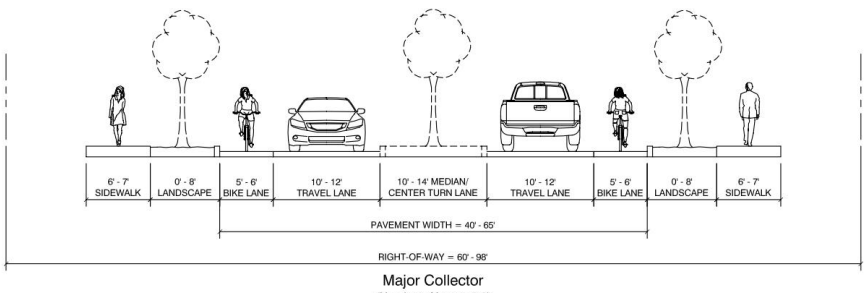
Note:
Typical rights-of-way and cross sections shown. Additional width may be needed to accommodate turn lanes at intersections.

*** Reference: Halsey Street Concept Plan**

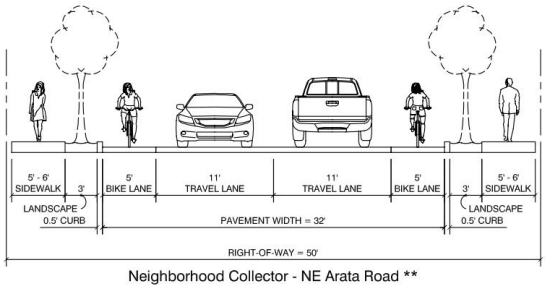
Standard Cross-Sections

CITY OF Wood Village

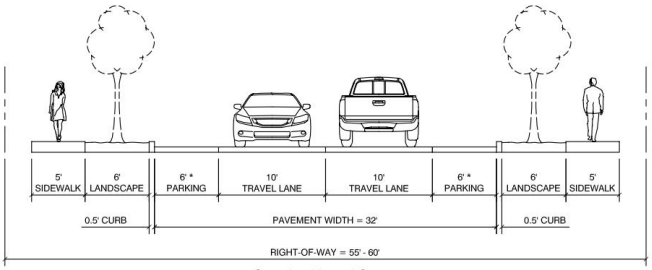
Figure 17



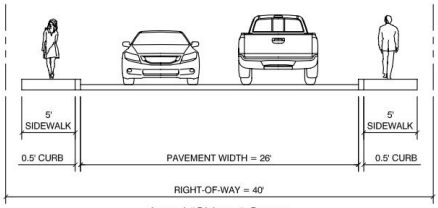
Major Collector
(Number of Lanes: 2-3)



Neighborhood Collector - NE Arata Road **



Standard Local Street



Local "Skinny" Street

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

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

**** Reference: Arata Road Concept Plan**

Standard Cross-Sections

Figure 18

Table 3. Wood Village Street Width Standards

Classification	Preferred ROW (in feet)	Preferred Pavement Width (in feet)
Major Arterial	80 – 115	66 – 84
Minor Arterial	80 – 105	44 – 73
Major Collector	60 – 98	40 – 65
Neighborhood Collector (NE Arata Road)	TBD	TBD
Standard Local Street	55 – 60	32
Skinny Local Street	40	26

Source: Wood Village 2012 TSP Update

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 Local 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.

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.

4.1.3.1 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).

4.1.3.2 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.

4.1.4 Traffic Control

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

4.1.5 Pavement Condition

ODOT and Multnomah County monitor pavement conditions on their roadways. According to ODOT's 2014 Pavement Condition map, pavement condition on I-84 is in good condition. There is no other roadway within Wood Village that is documented as part of the state's Pavement Management System.[1] Multnomah County has a scale from 0 to 100. These ratings are shown Table 4 for each major roadway in Wood Village.

Table 4. Pavement Conditions

Roadway	Owner	Category (within Wood Village)
I-84	ODOT	Good
NE Sandy Boulevard	Multnomah County	Excellent
NE Halsey Street	Multnomah County	Excellent
NE Arata Road	Multnomah County	Good
NE Glisan Street	Multnomah County	Good
NE 223rd Avenue	Multnomah County	Excellent
NE Wood Village Boulevard	Multnomah County	Good
NE 238th/242nd Drive	Multnomah County	Excellent
NE 244th Avenue	Multnomah County	Fair

Source: Multnomah County Master Road List. https://multco.us/roads/master-road-list.

4.1.6 Traffic Speed

Speed zones on arterials and collectors within the City of Wood Village are summarized in Table 5. A residential district may be posted at 25 mph and school zones are posted at 20 mph. As identified in the 2012 TSP Update, vehicle speeds on several collector and residential streets are a concern for the community. In most cases, speeding becomes very noticeable to pedestrians when it is above 30-35 miles per hour. Speeding can usually be expected on local streets where the streets are wide and straight for long stretches or where downhill grades are extended.

Table 5. Roadway Functional Classification

Roadway	Posted Speed (mph)	Functional Classification in Wood Village
I-84	55	Freeway
NE Sandy Boulevard	40	Minor Arterial
NE Halsey Street	35	Minor Arterial
NE Arata Road	35	Neighborhood Collector
NE Glisan Street	40	Major Arterial
NE 223rd Avenue	40	Major Collector
NE Wood Village Boulevard	30	Major Collector
NE 238th/242nd Drive	35	Minor Arterial
NE 244th Avenue	40	Major Collector

[1] ODOT. 2014 Pavement Conditions Maps. Region 1. http://www.oregon.gov/ODOT/HWY/CONSTRUCTION/Pages/pavement_maps_14.aspx

4.1.7 Traffic Safety

The EMCP examined safety data. The study found that in the Metro region 59 percent of fatalities and serious injury accidents occur while traveling on arterials. In East Multnomah County, the rate of fatal/serious injury crashes per VMT was nearly double that of the Metro region with 6.9 per 100 million VMT to 3.7 per 100 million VMT respectively.[2]

The Statewide Priority Index System (SPIS) is a system developed by ODOT for identifying hazardous locations on state highways and city and county off-state highways through consideration of crash frequency, crash rate, and crash severity. 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. Each year, ODOT generates a list of the top 10 percent SPIS sites and the top 5 percent sites are investigated by the five Region Traffic manager's offices. These sites are evaluated and investigated for safety problems.

EMCP study area arterial segments were ranked by the number and severity of crashes. The corridor between the I-84 ramp and Halsey Street was the only corridor segment in Wood Village that was ranked within the EMCP study area as shown in Table 6. It is in the top ten percent of ODOT's SPIS ranking program as of February 2015.[3,4] The 2012 TSP also found that the segment of I-84 through Wood Village has been included in the State's Safety Investment Program (SIP), given that it has experienced three to five crashes between 2007 and 2009.

Table 6. Wood Village Crash Analysis Ranking within the EMPC Study Area

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

4.1.7.1 Crash Data Analysis

For the 2012 TSP update, ODOT provided 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 7 summarizes the frequency and types of crashes that occurred at major intersections during this time period.

As shown in Table 6, there were no fatal crashed in Wood Village during the five year period reviewed. Eight intersections had more than 10 crashes and four had between three and nine crashes. Only one of the major intersections had no crashes.

Table 7. Intersection Crash History (January 1, 2005 – December 31, 2009)

Intersection	Collision Type				Severity			Total
	Rear-End	Turning	Angle	Other	PDO[5]	Injury	Fatal	

[2] Metro. February 8, 2012. East Metro Connections Project. Transportation Safety and Operations Analysis. Technical Advisory Committee Presentation.
[3] ODOT. February 9, 2015. Trans Dev/Transportation Data. SPIS Region Maps. http://www.oregon.gov/ODOT/TD/TDATA/pages/gis/odotmaps.aspx#spis_sip_maps.
[4] The SPIS data reported for 2015 is based on 2011-2013 crash data.
[5] Property Damage Only.

NE 223rd Avenue/NE Glisan Street	12	6	1	2	7	14	0	21
NE 223rd Avenue/NE Park Lane	3	1	3	0	2	5	0	7
NE 228th Drive/NE Arata Road	4	13	1	1	12	7	0	19
NE 238th Drive/NE Halsey Street	11	3	1	0		10	0	15
NE 238th Drive/I-84 EB Ramp	11	10	2	1	15	9	0	24
NE 238th Drive/I-84 WB Ramp	5	6	0	3	10	4	0	14
NE 238th Drive/NE Sandy Boulevard	0	17	0	0	4	13	0	17
NE 242nd Avenue/NE Glisan Street	6	4	5	3	7	11	0	18
NE 223rd Avenue/NE Arata Road	0	2	0	1	2	1	0	3
NE 223rd 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

4.2 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 connectively within Wood Village.

4.2.1 Arterial Connectivity

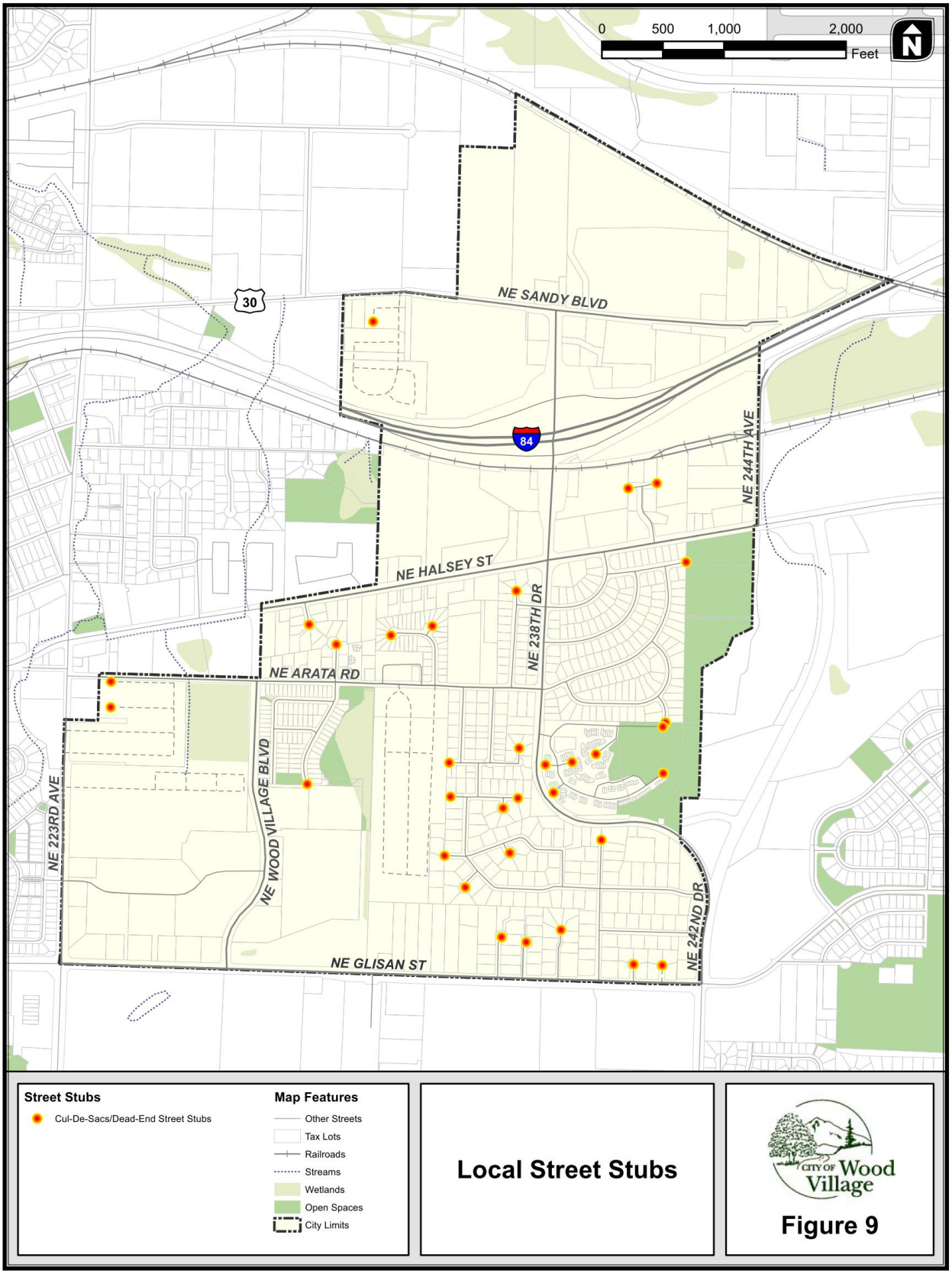
The RTP identifies spacing guidelines of one mile between regional arterials. At a technical level, many of the major roadways within Wood Village meet these guidelines for arterial connectivity. However, the general lack of lower classification roadways that parallel these routes focuses excessive demand 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, as shown on the 2012 TSP Figure 3, other areas within the city lack these types of alternative routes.

4.2.2 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. Multnomah County requires street connections every 530 feet.

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 of the 2012 TSP illustrates the known street stubs in Wood Village and is provided on the next page. As new development occurs, new roadways should be constructed to create a more efficient network consistent with the RTP guidelines.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CITY OF Wood Village
Figure 9

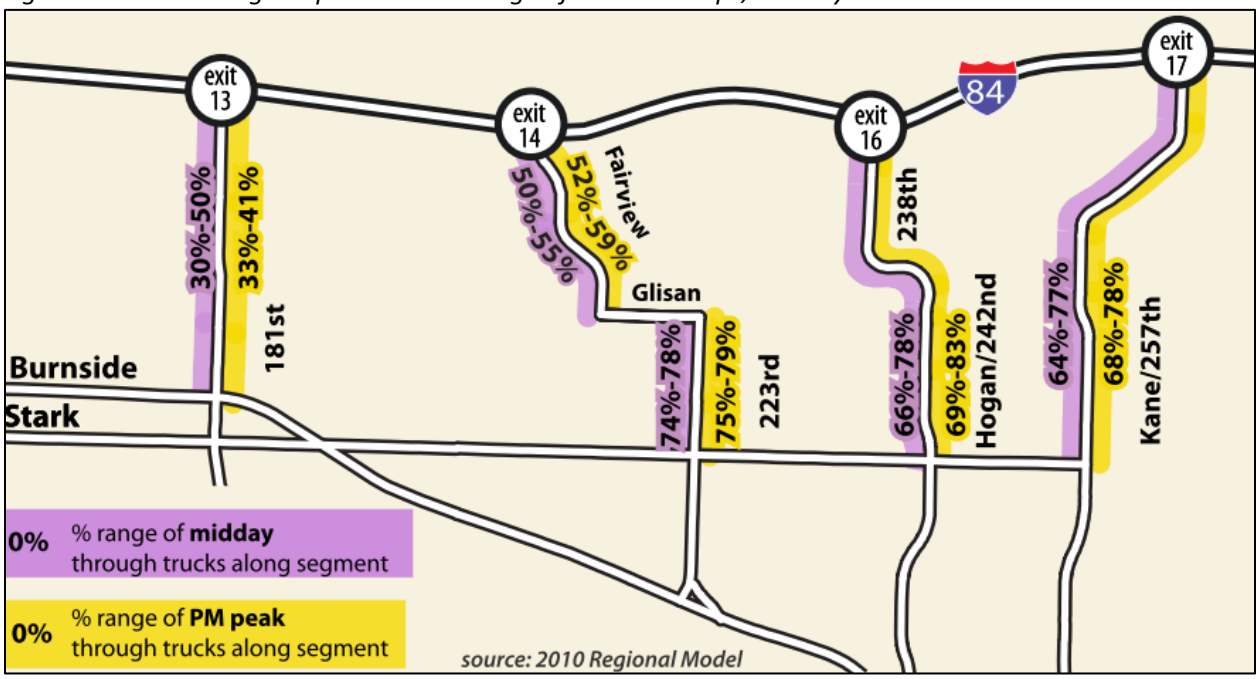
4.2.3 Freight Routes

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

The EMCP resolved some long standing questions regarding the freight designations in the study area. Rather than focus on one major route, it established a freight grid on several arterials in the ECMP study. The amendments associated with that plan resulted in the addition of NE 238th/242nd to the regional freight system (along with 232nd and Glisan) and the removal of a previous designation on Burnside and 181st. These new designations will need to be reflected in the Wood Village TSP Street Element.

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

Figure 1. Truck through Trips as a Percentage of All Truck Trips, Midday and PM Peak



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

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. Currently, trucks over 40 feet are prohibited from 238th/242nd Avenues between Glisan St. and Halsey St. due to safety concerns.

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

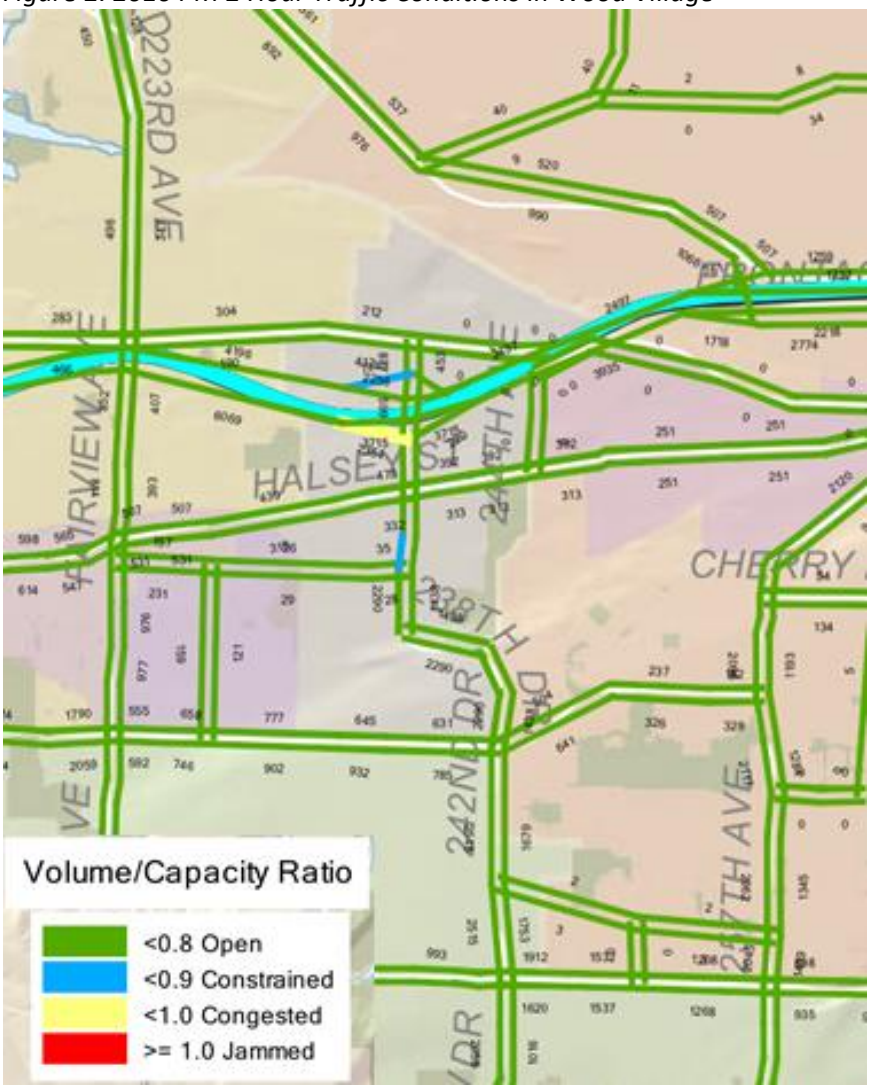
The projects identified in the RTP (and above) for NE Sandy Boulevard are generally aligned with the projects identified in the RTP to reconstruct the roadway to similar standards.

4.3 Traffic Operations

4.3.1 Daily Traffic Volumes

Figure 2 shows pm traffic performance in 2010 on key roadway segments in Wood Village. As shown, most roadways perform very well and are open during the pm peak period. The only exceptions are the westbound onramp at NE 238th Drive which is constrained and the eastbound off ramp which is congested. Additionally, NE 238th Drive southbound becomes constrained as it approaches NE Arata Road.

Figure 2. 2010 PM 2 Hour Traffic Conditions in Wood Village



Source: EMCP Traffic Analysis

4.3.2 Intersection Operations

Intersection analysis was prepared for intersections within the EMCP study area. There were three intersections studied within Wood Village, as shown within Table 11. As shown, all intersections perform at or above the minimum requirements.

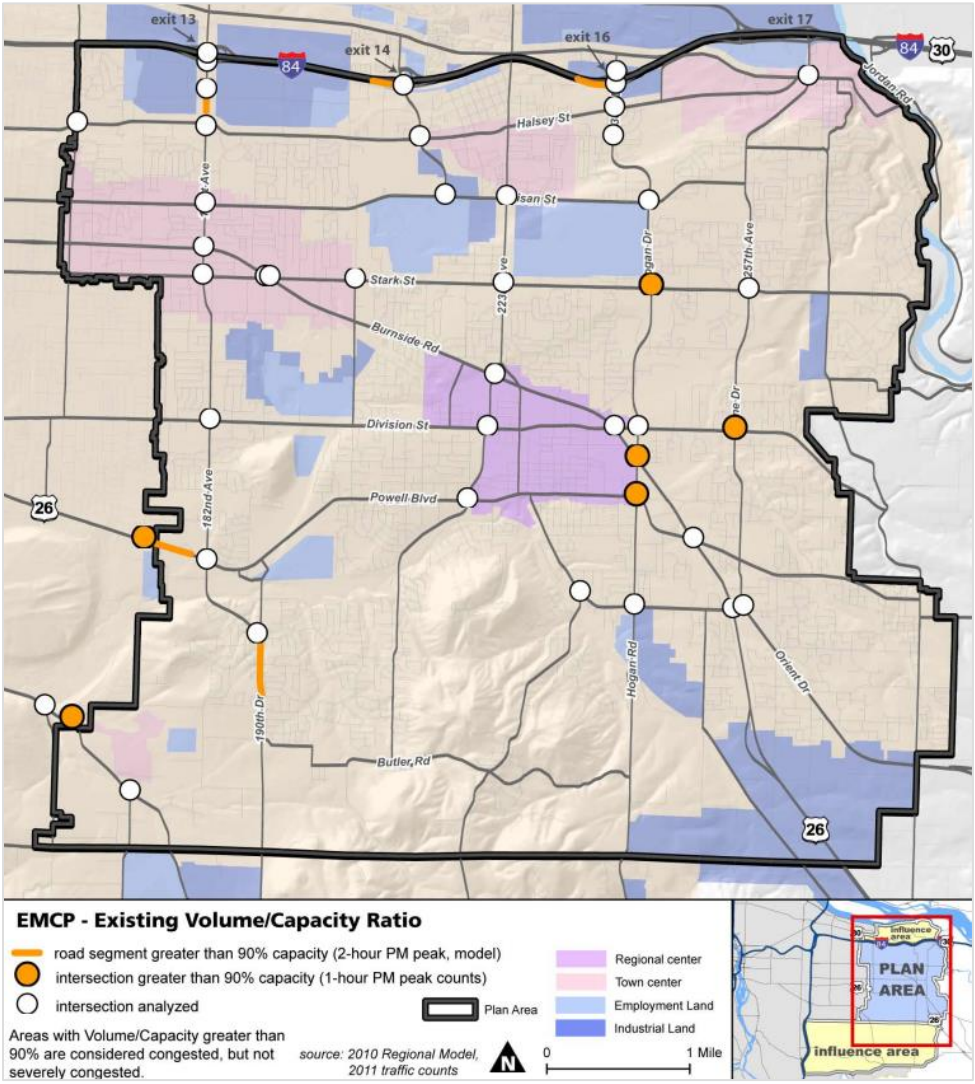
Table 8. Wood Village Intersection Performance, 2010

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

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

As shown on Figure 3, the EMCP existing conditions analysis shows the eastbound ramp off of I-84 performs at greater than 90% capacity during the 2-hour PM peak period.

Figure 3. EMCP Existing Volume/Capacity Ratio



Source: EMCP July 27, 2011 Steering Committee Packet

5 FUTURE CONDITIONS

As part of the EMCP, Metro conducted future analysis within Wood Village sufficient to meet the regional and state transportation planning requirements of the Oregon Transportation Plan, Oregon Highway Plan, the TPR, and Metro's Regional Transportation Plan. The study area traffic analysis was provided to understand how the transportation facilities are performing today (2010) and in the future (2035) under two scenarios: No Build, and 2035 with project implemented. Relevant analysis and findings of future conditions is provided within this section.

5.1 TRAVEL DEMAND AND LAND USE

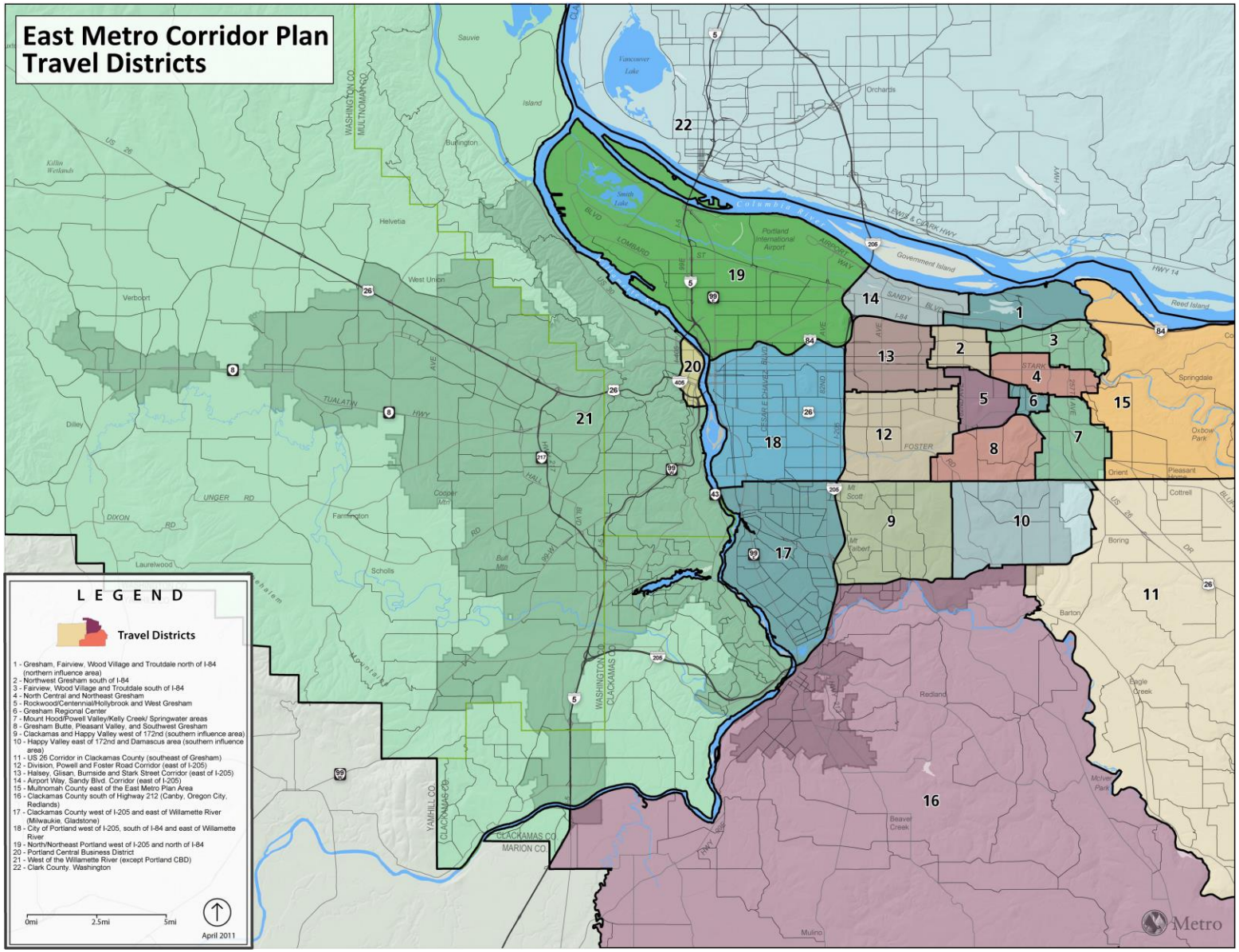
Land use is a key factor in the functionality of the transportation system today and in the future. The amount of land that is developed, the type of land uses, and how the land uses are mixed together have

a direct relationship to demands placed on the transportation system. Understanding the amount of land to be developed, and the type of land use is critical to understanding future operations and how improvements may best serve those land uses.

Traffic volume forecasts identified in this analysis are based on regional travel demand forecasting models prepared by Metro and coordinated with Multnomah County. Travel demand models translate assumed land uses into person trips, select travel modes and assign motor vehicles to the roadway network. The resulting traffic volume projections form the basis for identifying potential roadway deficiencies, and for evaluating alternative circulation improvements.

The modeling data presented herein was prepared during the EMCP development. The EMCP model outputs are detailed within Travel Districts as shown on Figure 4.

Figure 4. EMCP Travel Districts – District 3: Fairview, Wood Village and Troutdale south of I-84



5.2 Projected Land Use Growth

Projected land uses were developed for the EMCP study area, for Wood Village and for Metro's land use assumptions for the year 2035. Metro works cooperatively with local agencies to determine local existing and future land uses that incorporates existing land uses and reflects input from local agencies. Metro takes the regionally adopted population and employment projections and utilizes a land use model called Metroscope to initially distribute population and employment throughout the region. This requires numerous iterations each of which is reviewed by local jurisdictions. Refinements to the allocations are then made before the land use projection is finalized. These land uses are then regionally adopted and updated when new travel demand models are developed in the future.

For transportation modeling purposes, Wood Village and the surrounding areas were divided into transportation analysis zones (TAZs). These TAZs represent the sources of vehicle trips being generated from land uses within the study area. For the EMCP, land use data sets were developed for 2010 (existing base travel forecast for the region) and 2035 future conditions. At the time of the EMCP analysis, Metro was partway through an allocation process with the region. An interim land use forecast was reviewed by the local jurisdictions on the EMCP TAC before it was utilized.

The land use summary for all TAZs in the Wood Village TSP study area is identified in Table 9. The 2035 estimates show high employment growth primarily within the Town Center Zone, which projects going from no jobs in 2010 to over 1,700 in 2035. These figures were lowered only slightly in the 2014 Regional Transportation Plan (RTP) which estimated just over 1,600 jobs within the Town Center in 2040.

Table 9. Population and Employment Growth, 2010 to 2035 (select TAZs, subset of District 3)

	2010		2035*		Percent Increase	
	Households	**Total Employment**	**Households**	**Total Employment**	**Households**	**Total Employment**
Wood Village	1,332	233	1,458	2,298	9%	886%

** Metro interim Population and Employment Allocation used during the EMCP modeling effort.*

5.3 Travel Demand Process

The objective of the transportation planning process is to provide the information necessary to make decisions on where and when improvements should be made to the transportation system to meet future travel demand. A determination of future traffic system needs in Wood Village requires the ability to accurately forecast travel demand resulting from estimates of future population and employment for the City. Future travel demand forecasting can be divided into several distinct but integrated components that represent the logical sequence of travel behavior. These components and their general order in the traffic forecasting process are as follows:

- Trip Generation – This stage of the modeling process converts the land use into total person trips.
- Trip Distribution – This step determines the locations that these trips would go to and come from within the region.

- Mode Choice – Once the total person trips are generated, this step in the modeling process determines which mode of travel (i.e. motor vehicle, bicycle, pedestrian, transit, carpool, etc.) that each trip will make.
- Traffic Assignment – The final step in the modeling process assigns the trips by mode to specific routes in the transportation network that match the trip distribution locations.

5.3.1 Trip Generation

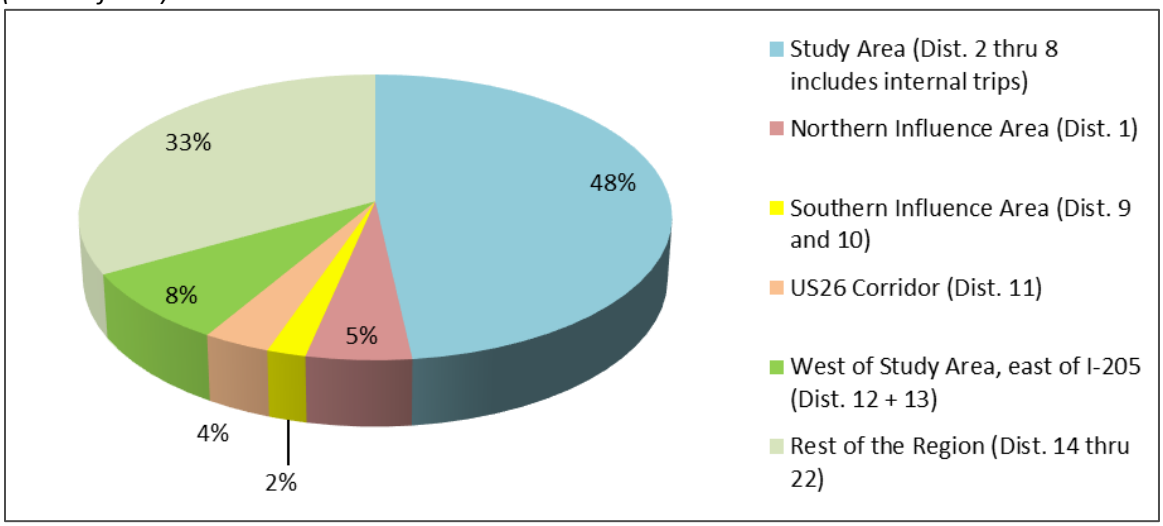
The trip generation process translates land use quantities (number of dwelling units, retail employees, service employees and other employees) into vehicle trip ends (number of vehicles entering or leaving a TAZ). The Metro model trip generation process is elaborate, entailing detailed trip characteristics for various types of housing, retail, service, and other employment, and special activities. The model process is tailored to variations in travel characteristics and activities in the region, and is based on survey data from around the region.

5.3.2 Trip Distribution & Mode Split

This step estimates how many trips travel from one area in the model to any other area. Distribution is based on the number of trip ends generated in each TAZ zone pair, and on factors that relate the likelihood of travel between any two TAZs to the travel time between the zones.

To better understand travel to and within District 3, Figure 5 shows vehicle trips to District 3. Nearly half of the people traveling to or within the Wood Village District are coming from the EMCP study area. Another third of the vehicle trips are coming from fairly far distances (outside of the EMCP influence areas). Refer to Figure 4, the map of the EMCP Travel Districts, for more details on where these vehicle trips are coming from.

Figure 5. In 2010 - Average Weekday Vehicle Trips to Fairview, Wood Village & Troutdale (south of I-84) District 3



In projecting long-range future traffic volumes, it is important to consider potential changes in regional travel patterns. Although the locations and amount of traffic generation in Wood Village are essentially a function of future land use in the city, the distribution of trips is influenced by expected congestion on roadways and regional growth. Another key to understanding travel patterns is understanding the

percent of trips using different travel modes such as single occupant vehicle, transit, walking or bicycles; this is called mode choice.

Table 10 quantifies the trips to District 3 by mode, as estimated for 2010 and 2035. As shown, the total trips coming to the area is expected to grow by more than 30% over the next twenty years. The majority of people drive to the district today and it is expected that this will continue into the future. However, the use of alternative modes is anticipated to grow in pace with vehicle use. Transit trips in particular, are expected to increase more quickly than vehicle trips.

Table 10. 2010 and 2035 - Average Weekday (AWD) Person Trips by Alternative Mode (Transit, Walk and Bike) to District 3, Fairview, Wood Village & Troutdale (south of I-84)

	2010	2035	
	Fairview, Wood Village & Troutdale (south of I-84)	**Fairview, Wood Village & Troutdale (south of I-84)**	**Percent Change from 2010 to 2035**
Total Person Trips to:	65,110	94,620	31.2%
Vehicle Trips to:	59,910	86,790	31.0%
Percent of Total Person Trips in Vehicles:	92.0%	91.7%	-
Transit Person Trips to:	880	1,590	44.7%
Percent of Total Person Trips on Transit:	1.4%	1.7%	-
Walk Person Trips to:	3,670	5,330	31.1%
Percent of Total Person Trips Walking:	5.6%	5.6%	-
Bike Person Trips to:	650	910	28.6%
Percent of Total Person Trips Bicycling:	1.0%	1.0%	-

5.3.3 Traffic Assignment

In this process, trips from one zone to another are assigned to specific travel routes in the network, and resulting trip volumes are accumulated on links of the network until all trips are assigned. Network travel times are updated to reflect the congestion effects of the traffic assigned through an equilibrium process. Congested travel times are estimated using what are called “volume-delay functions”. There are different forms of volume/delay functions, all of which attempt to simulate the impact of congestion on travel times (greater delay) as traffic volume increases. The volume-delay functions take into account the specific characteristics of each roadway link, such as capacity, speed and facility type. This allows the model to reflect conditions somewhat similar to driver behavior.

The travel demand models represent PM peak period traffic flows for every major roadway segment within Wood Village and most minor arterials and collector streets. Some local streets were included in the model, but most neighborhood streets are represented by TAZ connectors in the model process. The performance of the network is described in section 5.4.2.

5.4 Model Application to Wood Village

The modeling process for the Wood Village TSP Street Element update was based upon the EMCP 2010 and 2035 travel demand models developed by Metro for the PM peak period. The Metro model is built from travel survey data and is calibrated to traffic volume counts at specific locations on key arterials.

Metro uses VISUM, a computer based transportation modeling program, to process the large amounts of data related to land use and person trips for all modes of travel for the Portland Metropolitan area.

Intersection turn movements were extracted from the model at study area intersections for both the base year 2010 and forecast year 2035 model scenarios. A "post processing" technique is utilized to refine model travel forecasts to the turn movement volume forecasts utilized for 2035 intersection analysis. Post processing is a methodology that uses existing 2011 count data, base year model data and future year model data to help determine future volumes. The methodology adds the increment of growth, the calculated difference in volumes between the future and base year models, to the existing count data. This methodology minimizes the effects of any model error by adding the increment of growth projected based on changes in land use to the base year counts.

Several modeled scenarios were run, which varied from a low build option that only included projects that were funded and programed with the EMCP study area to runs that included a varied number of identified yet unfunded projects within the EMCP study area and a run that included enhanced transit. From this analysis, the low build option was selected as the reasonable project to show the "no build" conditions in 2035. These results are described below.

5.4.1 Assumed Future Roadway Projects

The EMCP modeled future 2035 roadway system included projects within the study area that were funded and programed and considered reasonably likely to be constructed within the next five years. Everywhere else in the Metro region assumed a year 2035 Metro Regional Transportation Plan (RTP) financially constrained model auto network. This is considered to represent the future 'no-build' scenario. The locally-significant roadway projects assumed for the Wood Village TSP future 'no-build' scenario are listed in Table 11.

Table 11. RTP Financially Constrained Projects within Wood Village

RTP ID	Description	Start and End Locations	Facility Owner & Wood Village Functional Class
10385	Widen NE Halsey Street from City Line to NE 238th Drive to a 3 lane arterial with median and center turn lane, bicycle lanes, and sidewalk consistent with Halsey Street Conceptual Design Plan. **This project was constructed in 2014. The final approved construction drawings vary from the description.*	238th Avenue to Historic Columbia River Highway	Multnomah Co. Minor Arterial
10387	Reconstruct NE Arata Road to 3 lane collector standards with median and center turn lane, bicycle lanes, and sidewalks. **This project is contracted and will be constructed in 2016.*	223rd Ave. To 238th Ave.	Multnomah Co. Local Street
10398	Construct new extension of NE Wood Village Boulevard as a major collector with 2 travel lanes, median and center turn lane, bicycle lanes, and sidewalks. **This project was constructed in 2014.*	Arata Rd. to Halsey St.	Multnomah Co. Local Street

5.4.2 Traffic Operations

5.4.2.1 Future Daily Traffic Volumes

Figure 6 shows how pm traffic will perform in 2035 on key roadway segments in Wood Village with the projects constructed in Metro's constrained project list (see Table 11). Wood Village will experience significant traffic growth. While many roadways will continue to perform well into the future, several

key roadway segments that will experience congested conditions and delays during the 2 hour pm peak. Specifically, the westbound I-84 on-ramp at NE 238th Drive will experience a 36 percent increase in traffic volumes over the planning period, going from constrained in 2010 conditions to jammed in 2035 and the eastbound off ramp will continue to be congested. Southbound NE 238th Drive will continue to be congested and this condition will spread. Southbound outside of the city, 238th Drive will experience nearly a 40 percent increase in traffic and will become constrained. Northbound on NE 238th Drive will experience a 13 percent increase in traffic congestion over the planning period. A short southbound segment of Fairview Avenue as it approaches Halsey Street will be constrained.

EMCP identifies the 238th/242nd/Hogan corridor as a promising corridor for adaptive signal timing.

Figure 6. 2035 PM 2 Hour Traffic Conditions in Wood Village

Source: EMCP Traffic Analysis Scenario 1B

5.4.2.2 Future Intersection Operations

As discussed in section 4.3.2, intersection analysis was prepared for intersections within the EMCP study area. The three intersections studied within Wood Village performed above the minimum LOS in 2010. However, as shown in Table 12, in the future, both the 223rd Avenue and 242nd Drive intersections with Glisan Street fail.

Table 12. Wood Village Intersection Performance, 2035

Intersection	Jurisdiction	Minimum LOS	2010		2035	
			LOS	v/c	LOS	v/c
Glisan Street & 223rd Avenue	Multnomah County	D	C	0.75	E	1.0
Glisan Street & 242nd Drive	Multnomah County	D	D	0.87	F	1.20
Arata Street & 238th Drive	Multnomah County	D	A	0.62	B	0.77

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

Further, the traffic analysis identified transportation system bottlenecks (defined as greater than 110 percent of capacity) and where system management is needed (where demand is between 100 and 110 percent of capacity).One bottleneck was identified within Wood Village at NE 242nd and NE Glisan Street.[6]

[6] Metro. April 2, 2012. 2nd Steering Committee Meeting Packet.