

May 27, 2026

Project# 30785.002

To: City of Sherwood TSP Project Management Team
From: Kittelson & Associates, Inc.
RE: Sherwood TSP Future Conditions Analysis Memorandum

The City of Sherwood (Sherwood) is updating their Transportation System Plan (TSP) to meet the needs of their growing community, comply with new state transportation planning requirements, and update their previous plan, completed in 2014. The purpose of this Future Conditions memorandum is to assess the transportation system’s performance under projected future conditions, assuming planned and funded improvements, and identify deficiencies and needs through the planning horizon.

Future conditions analysis is organized around four primary areas of inquiry.

1. Regionally agreed to population and employment forecasts establish the demographic and economic growth assumptions that underpin all subsequent analysis, drawing on regional travel demand model outputs to project changes through the planning horizon.
2. Future Conditions rely on Metro travel demand model forecasts to evaluate future traffic volumes and assess intersection and segment capacity under horizon year conditions.
3. Horizon year vehicle miles traveled (VMT) under the No Build Scenario provides a baseline metric for evaluating system-wide travel demand and informing future investment priorities.
4. Assessment of future deficiencies and needs examines gaps and shortfalls across all modes to identify where the existing transportation network will fall short of serving Sherwood's future community.

Together, these analyses build on the existing conditions baseline to define the transportation needs that the updated TSP must address. A summary of the contents is listed below.

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GLOSSARY OF ACRONYMS & TERMS

AADT - Average Annual Daily Traffic

ADT - Average Daily Traffic (may refer to bi-directional daily volume)

APM - (ODOT) Analysis Procedures Manual

AWSC - All-Way Stop Control (intersection control type)

BLTS - Bicycle Level of Traffic Stress

CA - Critical Approach (for unsignalized intersection reporting per APM)

CFA - Climate Friendly Area

CM - Critical Movement (for unsignalized intersection reporting per APM)

HCM - Highway Capacity Manual

LOS - Level of Service

LTS - Level of Traffic Stress (see BLTS for bicycle network comfort)

MEV - Million Entering Vehicles (exposure used for crash rates)

MPO - Metropolitan Planning Organization (Metro, for Portland region)

MUTCD - Manual on Uniform Traffic Control Devices

ODOT - Oregon Department of Transportation

RTP - Regional Transportation Plan

TSP - Transportation System Plan

TriMet - Tri-County Metropolitan Transportation District of Oregon

TWSC - Two-Way Stop Control (intersection control type)

UGB - Urban Growth Boundary

v/c - Volume-to-Capacity (ratio)

VISTRO / Vistro - PTV Vistro Software (HCM-based operations analysis)

APPENDICES

Appendix A. Metro Travel Demand Model Data and Post Processing Worksheets

Appendix B. Regional Transportation Plan 2023 Financially Constrained Projects in Sherwood

Appendix C. Future Traffic Conditions Vistro Worksheets

Appendix D. Vulnerability Index

Future Transportation Conditions Analysis Summary

Kittelton identified the following takeaways after reviewing future conditions information:

Critical Deficiencies

Pedestrian System

- Sherwood's low stress pedestrian network spans approximately 88 miles, encompassing all public streets within the city's UGB except OR 99W, including both on-street sidewalk facilities and shared use paths.
- 70 percent of the network (61 miles) has complete pedestrian facilities, comprising 49 miles of streets with sidewalks on both sides and 12 miles of shared use paths.
- 12 percent of the network (10 miles) is partially complete, with sidewalks on one side only, requiring targeted infill to achieve completeness.
- 5 percent of the network (5 miles) are already planned, including sidewalks in the Tonquin Employment Area and shared use path extensions along the Cedar Creek Trail, including a new grade-separated railway crossing that will improve north-south connectivity.
- Approximately 12 miles of the network remain without pedestrian facilities, representing the gap that must be addressed through the TSP update to achieve full system completeness.
- The concentration of incomplete facilities are in newer growth areas, particularly neighborhoods west of OR 99 and near Brookman Road and Tonquin Employment areas.

Bicycle System

- Sherwood's low stress bicycle network is organized into two tiers. The primary network consists of corridors where dedicated bicycle infrastructure such as buffered or protected bike lanes and shared use paths is needed to achieve LTS 2 or lower, providing safe and comfortable conditions for users of all ages and abilities. The secondary network consists of local streets that feed into and extend the reach of the primary network, where low traffic volumes and speeds inherently support low stress bicycling without the need for dedicated facilities. Together, the two tiers form a connected network that balances dedicated infrastructure investment on higher-stress corridors with the natural suitability of local streets for active transportation.
- Sherwood's low stress bicycle primary network spans approximately 49 miles, comprising on-street buffered or protected bike lanes and shared use paths.

- 36 percent of the primary network (18 miles) has existing low stress bicycle facilities, including 6 miles of on-street bike facilities and 12 miles of shared use paths, all at LTS 2 or lower.
- 5 miles of additional facilities are already planned, including low stress bicycle facilities along upcoming roadways in the Tonquin Employment Area and shared use path extensions along the Cedar Creek Trail, bringing planned network coverage to 45 percent.
- Approximately 27 miles of the primary network remain without bicycle facilities, representing 55 percent of the network gap to be addressed through the TSP update to achieve full system completeness.

Public Transportation

- Existing transit service in Sherwood is limited in both coverage and frequency, with fixed-route service concentrated in and around the Sherwood town center. Large portions of the city including the Langer Drive Commercial District, the Ice Age–Tonquin Road industrial area, Sherwood West, and residential neighborhoods south of Old Town are currently unserved by fixed-route transit.
- While the TriMet Forward Together 2.0 draft network proposes two meaningful service expansions by 2045, these improvements remain planned and unfunded, and their realization is not guaranteed.

Roadway Network and Traffic Operations

- Horizon year (2045) intersection capacity analysis was conducted at fifteen study intersections using HCM 7th Edition methodology. The analysis incorporates lane geometry changes from four financially constrained 2023 RTP projects: a two-lane roundabout at SW Oregon Street/SW Tonquin Road (Intersection 11), left turn lanes added to the north and south legs at OR 99W/SW Meinecke Parkway (Intersection 4), and 12-foot medians added at SW Langer Farms Parkway/SW Oregon Street (Intersection 15) and at OR 99W/SW Langer Farms Parkway (Intersection 1).
- Three intersections are projected to exceed adopted v/c mobility standards during the 2045 evening peak hours and represent the primary capacity deficiencies on the horizon year network. These locations will require further evaluation and mitigation as part of the TSP project development process.
 - OR 99W at SW Elwert Road/SW Sunset Boulevard (Intersection 5), with projected v/c ratios of 1.16 and 1.20 in Hours 1 and 2, above the 0.99 standard.
 - OR 99W at SW Chapman Road/SW Brookman Road (Intersection 6), a TWSC intersection, experiences critical movement v/c ratios exceeding 1.10 in both peak hours.
 - SW Main Street/SW Ladd Hill Road at SW Sunset Boulevard (Intersection 9) exceeds the 0.99 standard at v/c ratios of 1.01 and 1.00.

- The remaining twelve study intersections are projected to operate within adopted standards through the planning horizon, including those within the Sherwood Town Center climate friendly area where a 1.10 v/c threshold applies. Intersections along the OR 99W and SW Oregon Street corridors (notably Intersections 2, 3, and 12) approach their thresholds and should be monitored as regional growth and development activity continue through 2045.

Safety

- Safety concerns across the Sherwood network were identified and documented in detail in Technical Memorandum 5: Existing Conditions Analysis, which flagged ten study intersections and six additional locations through crash rate analysis, excess proportion analysis, and ODOT and Washington County Safety Priority Index System (SPIS) screening. These locations span a range of crash patterns, including pedestrian-involved crashes along SW Langer Farms Parkway and North Sherwood Boulevard and a bicycle-involved crash at Gerda Lane and SW Tualatin-Sherwood Road.
- A critical finding of the horizon year analysis is the overlap between locations already identified as safety priority areas and those projected to exceed adopted v/c mobility standards in 2045. All three intersections projected to fail mobility standards under the No Build Scenario —OR 99W at SW Elwert Road/SW Sunset Boulevard (Intersection 5), OR 99W at SW Chapman Road/SW Brookman Road (Intersection 6), and SW Main Street/SW Ladd Hill Road at SW Sunset Boulevard (Intersection 9) — are also flagged for existing safety concerns.
- Because these intersections already exhibit documented safety concerns and are projected to experience substantial operational strain through the planning horizon, they should be treated as priority locations for integrated safety and operations review as part of the TSP process.

Multimodal Network Gaps and Deficiencies Analysis

- The overlay of pedestrian and bicycle network gaps, future transit routes, key destinations, and community vulnerability identifies five corridors where multimodal deficiencies are most acute. Collectively, these corridors represent the highest priority locations for addressing Sherwood's future multimodal network deficiencies.
 - The SW Meinecke Road and SW Washington Street corridors present the highest concentration of overlapping deficiencies, serving as the primary east-west connection across the OR 99W barrier in an area with the greatest density of key destinations, vulnerability, and future transit service.
 - SW Handley Street- SW Elwert Road- SW Edy Road presents similar conditions in the central portion of the city, with limited non-auto travel options for residents in vulnerability areas.

- SW Sunset Boulevard emerges as a critical gap in the southern half of the city, where the absence of continuous active transportation facilities along a future transit corridor leaves vulnerable populations without viable first- and last-mile connections.
- East of the Town Center, SW Tualatin-Sherwood Road and SW Oregon Street have pedestrian and bicycle gaps compounded by the rail line barrier and limited connectivity to eastern activity centers.
- Finally, SW Roy Rogers Road, designated as the alignment for a new regional transit connection to Tigard and Hillsboro, currently lacks the active transportation infrastructure needed to support multimodal access to future service.

Town Center Summary

- While the Town Center benefits from comparatively better transportation infrastructure relative to outlying areas of the city, the future conditions analysis identifies persistent gaps across all modes that must be addressed to fully realize its role as a connected, accessible, and safe center for Sherwood's growing community.
- The **pedestrian network** has notable gaps along the west side of Sherwood Boulevard and along Oregon Street, two corridors with potential for high pedestrian demand given their proximity to schools, retail, civic, and residential uses.
- The **bicycle network** faces gaps along several key Town Center corridors, including Sherwood Boulevard, SW Baler Way, SW Langer Drive, and SW Washington Street. These corridors are important connectors within the primary low stress bicycle network, and the absence of dedicated low stress facilities along them limits comfortable and safe bicycle access to and through the Town Center for a broad range of users.
- **Transit connectivity** to and from the Town Center is expected to improve meaningfully through the planning horizon. The proposed transit connection on SW Washington Street is particularly significant, providing a link between neighborhoods on either side of Cedar Creek while also improving access to the Cedar Creek Trail. This connection would reinforce the Town Center's role as a multimodal hub by extending the reach of the transit network into adjacent residential areas currently separated by this natural barrier.
- Safety conditions along the Town Center's primary north-south corridors represent a significant horizon year concern. The existing crash history at SW Sherwood Boulevard and SW 12th Street/SW Century Drive (Intersection 13) and SW Langer Farms Parkway at SW Oregon Street (Intersection 15), both already flagged through ODOT and Washington County SPIS screening, may worsen as traffic volumes increase through the planning horizon.

- North Sherwood Boulevard, which has already recorded multiple pedestrian-involved crashes, faces heightened risk as growth in the Town Center and surrounding neighborhoods brings more residents into conflict with higher-volume auto traffic along this corridor. Without targeted intervention, the combination of increasing demand, existing geometric or operational deficiencies, and the concentration of non-motorized users in the Town Center creates conditions under which crash frequency and severity may increase.

Note on the Analysis Horizon Year

Although the Sherwood TSP planning horizon extends to 2047, the future conditions analysis presented in this memorandum uses 2045 as the horizon year for analysis. This reflects the availability of Metro's Regional Travel Demand Model, which produces forecasts through 2045 consistent with the 2023 Regional Transportation Plan (RTP).

Projecting household growth, employment, and traffic volumes beyond 2045 with a reasonable level of confidence is not feasible without updated regional model assumptions and forecast inputs. As part of the next RTP update cycle anticipated in 2028, Metro is expected to release an updated travel demand model with extended forecast years. Following that update, the City of Sherwood shall amend the TSP analysis, as appropriate, to incorporate revised socioeconomic forecasts, updated regional transportation network assumptions, and analysis extending through the full 2047 planning horizon.

Population and Employment Forecasts

Future population and employment values were provided by Oregon Metro. Their recently updated 2023 Regional Transportation Plan identifies the traffic analysis zones (TAZs) the travel demand model uses for estimating existing and future growth. Trip generation within each TAZ is influenced by the number of households, number of jobs, and multimodal transportation network. The change in households and jobs over the planning horizon directly influences the demand for the transportation network, and in turn helps identifies critical issues to be addressed across all modes. Figure 1 displays the TAZs in Sherwood.

Table 1 contains the population and household growth values for the Sherwood UGB between 2020 and 2045. Each item includes the source of information or whether it is a calculated value. The table includes values for the Sherwood UGB both including and excluding Sherwood West.

Table 1. Household and Population Between 2020 and 2045 in Sherwood

Item	Sherwood UGB	
	Excluding Sherwood West	Including Sherwood West
2020 Population (Decennial Census)	20,450	-
2020 Households (Metro)	7,207	7,504
2020 People Per Household (Calculated)	2.84	2.73
2045 Households (Metro)	11,597	20,807
2045 Population (Calculated)	32,907	56,704
Annual Growth Rate (2020-2045)	1.92%	4.16%

Including Sherwood West, the Sherwood UGB is expected to grow rapidly over the next 20 years, at a rate of 4+% per year. This amounts to nearly triple the number of household units, and a more than doubling in population. Without Sherwood West, growth is still expected to be nearly 2% annually. Table 2 and Table 3 detail the growth in households and employment per transportation analysis zone. Note that Sherwood West TAZs are relatively undeveloped and expect significant growth.

Table 2. Household Growth in Sherwood by TAZ Over the Planning Horizon

TAZ	Neighborhoods	2020 Households	2045 Households	Value Change	Percent Growth
987	Brookman Development Area	152	3,738	3,586	2359%
989	SE Sherwood	1,135	1,213	78	7%
990	Cedar Creek South	1,166	1,223	57	5%
991	Woodhaven	1,370	1,426	56	4%
992	Ridges	760	1,028	268	35%
993	Sherwood Middle	429	504	75	17%
994	Town Center	1,134	1,188	54	5%
995	Chicken Creek	443	480	37	8%
996	Oregon Trail Park	597	634	37	6%
997	Tonquin Employment Area	9	151	142	1578%
998	Rock Creek	12	12	0	0%
1428	Sherwood West Expansion Area	19	2,457	2,438	12832%
1429	Sherwood West Expansion Area	90	4,343	4,253	4726%
1432	Sherwood West Expansion Area	188	2,410	2,222	1182%
Total Households		7,504	20,807	13,303	177%

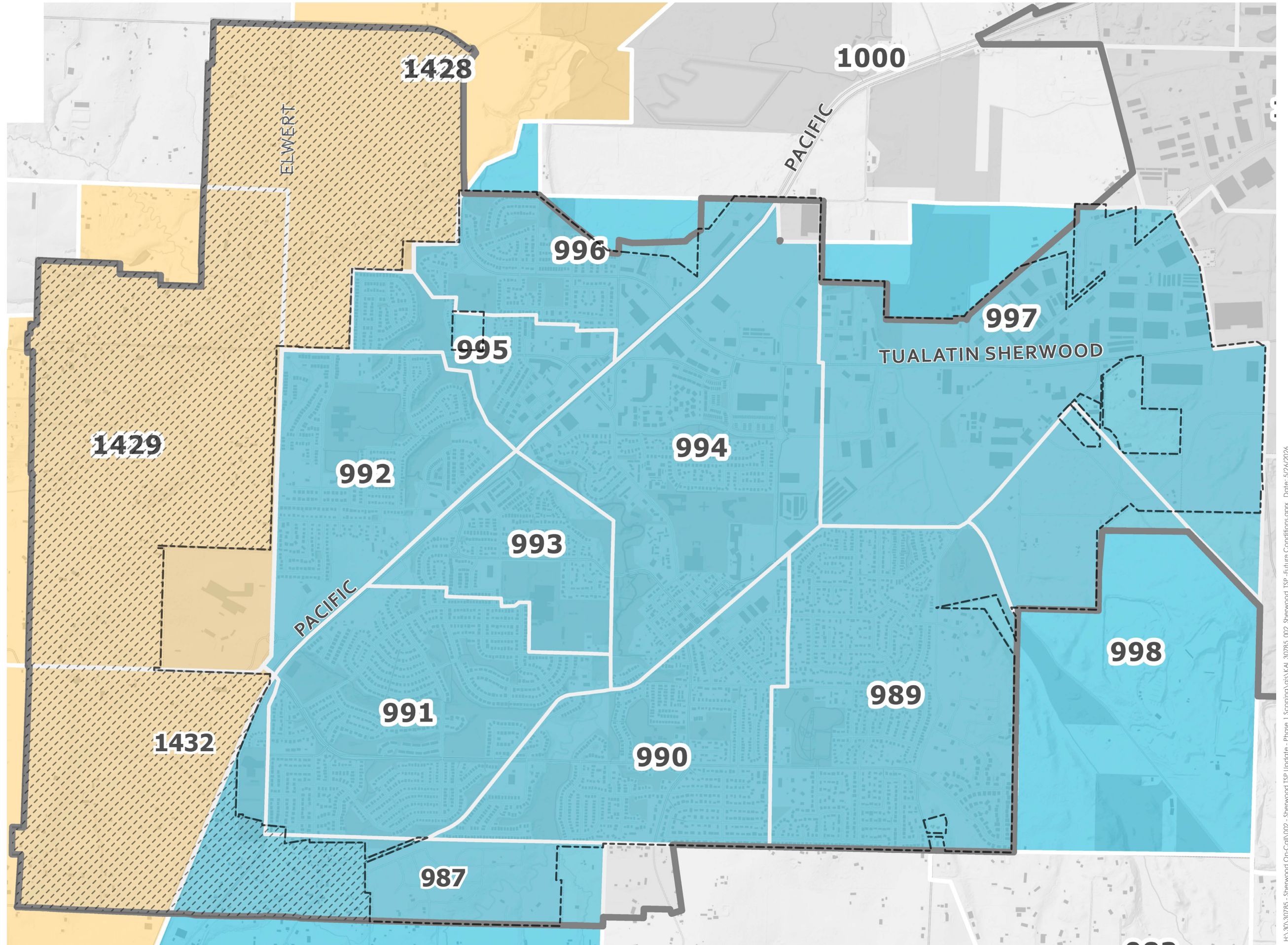
Table 3. Employment Growth in Sherwood by TAZ Over the Planning Horizon

TAZ	Neighborhoods	2020 Employment	2045 Employment	Value Change	Percent Growth
987	Brookman Development Area	130	500	370	285%
989	SE Sherwood	92	106	14	15%
990	Cedar Creek South	246	295	49	20%
991	Woodhaven	363	492	129	36%
992	Ridges	233	389	156	67%
993	Sherwood Middle	205	315	110	54%
994	Town Center	2,495	2,846	351	14%
995	Chicken Creek	124	189	65	52%
996	Oregon Trail Park	551	691	140	25%
997	Tonquin Employment Area	2,337	2,689	352	15%
998	Rock Creek Industrial Area	45	1,187	1,142	2538%
1428	Sherwood West Expansion Area	D	D		
1429	Sherwood West Expansion Area	18	186	168	933%
1432	Sherwood West Expansion Area	180	297	117	65%
Total Employment		7,019	10,182	3,163	45%
D – Data suppressed due to insufficient employment numbers					

Figure 1

Traffic Analysis Zones (TAZ) assigned to Sherwood

- LEGEND**
- TAZ in Sherwood
 - TAZ in Sherwood West Expansion Area
 - City Boundary
 - Sherwood West Area
 - Urban Growth Boundary (UGB)



Future Transportation Conditions

The No Build Scenario establishes a baseline against which future transportation investments and policy interventions can be evaluated. It reflects horizon year (2045) conditions assuming no new roadway capacity improvements beyond those already programmed or under construction as of the base year. This scenario is used to identify where and how the transportation system is expected to deteriorate under future travel demand, providing the analytical foundation for identifying deficiencies and prioritizing improvements in the updated TSP.

Performance Standards

This TSP update adopts revised non-auto and auto performance standards in alignment with the Climate Friendly and Equitable Communities (CFEC) framework, reflecting Oregon's statewide commitment to reducing vehicle miles traveled and supporting multimodal transportation options.

For non-motorized modes, performance is measured by system completeness rather than operational throughput. This approach reflects the understanding that walking and bicycling demand is in part a function of network availability and connectivity as people will not walk or bike where safe, comfortable, and connected facilities do not exist. System completeness evaluates the extent to which the pedestrian and bicycle network provides gap-free, low-stress connections between key origins and destinations within Sherwood, including residential areas, employment centers, schools, parks, and transit stops.

For auto-based performance, the standard is defined by volume-to-capacity (v/c) ratio thresholds applied during the two consecutive weekday evening peak hours. Outside of climate friendly areas a two-hour v/c ratio of 0.99 or less is the adopted standard, reflecting a traditional threshold that preserves a reasonable level of operating efficiency on the broader street network over a significant majority of each typical day. Within the Sherwood Town Center, designated as a climate friendly area, a more permissive v/c ratio of up to 1.10 is accepted, recognizing that some degree of congestion is consistent with and even supportive of compact, mixed-use, pedestrian-oriented development patterns where auto throughput is not the primary design objective.

Horizon Year Non-Motorized Traffic Conditions

2045 Non-Motorized Traffic Volumes

To be added when Metro shares the model data

Low Stress Active Transportation Network

A low stress active transportation network was identified in collaboration with City staff to establish a connected system of on-street and off-street facilities that enables pedestrians and bicyclists to travel across Sherwood with limited traffic stress. The network is designed to provide safe and comfortable connections across key infrastructure and natural barriers that currently fragment active transportation in the city, including OR 99W, the Union Pacific railway line, and Cedar Creek.

Low Stress Pedestrian Network

The low stress pedestrian network comprises of all public streets within the city’s UGB, except OR 99W. The facility types include on-street facilities (sidewalks) and shared use paths. The network was evaluated based on facility completeness, distinguishing between segments with complete facilities (sidewalks on both sides), partial facilities (sidewalk on one side only), planned facilities (facilities on upcoming city roads) and no facilities. These designations identify gaps where pedestrian infrastructure investment is needed to achieve a connected, accessible network.

The planned pedestrian facilities include sidewalks on upcoming roadways in the Tonquin Employment Area, shared use paths connections along Cedar Creek trail including a new grade-separated crossing of the Union Pacific railway line. This crossing will extend the existing Cedar Creek Trail southward, providing a continuous off-street connection to the southern edge of the Sherwood city boundary and improving north-south pedestrian connectivity.

Table 4. shows the existing and planned facilities on the low stress pedestrian network.

Sherwood's low stress pedestrian network spans approximately 88 miles (measured along the centerline). Table 4 summarizes the existing pedestrian facility coverage on this network.

Table 4. Low Stress Pedestrian Facilities in Sherwood

Pedestrian Facilities	Low Stress Pedestrian Network Miles		
	Complete facilities ¹	Partial facilities ²	Planned facilities ³
Pedestrian Network centerline miles with Sidewalks	49 miles	10 miles	2 miles
Pedestrian Network centerline miles with Shared Use Paths	12 miles	-	3 miles
Total Pedestrian Network centerline miles with pedestrian facilities	61 miles (70%)	10 miles (12%)	5 miles (5%)
1 - Complete facility refers to network segments with sidewalks of 5ft wide or more on both sides			
2 - Partial facility refers to streets with sidewalks only on one side			
3 - Planned facilities include upcoming city streets with sidewalks on both sides or shared use paths			

Of Sherwood's low stress pedestrian network, 75 percent has complete pedestrian facilities. This includes 49 miles of streets with sidewalks of 5 feet or wider on both sides and 12 miles of

shared use paths, totaling 61 miles of complete network coverage. An additional 10 miles, representing 12 percent of the network, are partially complete with a sidewalk present on one side of the street only, requiring one-sided sidewalk infill to achieve completeness. Five miles of facilities are already planned, including 2 miles of sidewalks along upcoming roadways in the Tonquin Employment Area and 3 miles of shared use path along the Cedar Creek Trail, leaving approximately 12 miles of the network gaps to be addressed through the TSP update. Closing this gap would achieve full system completeness across the low stress pedestrian network.














Figure 2

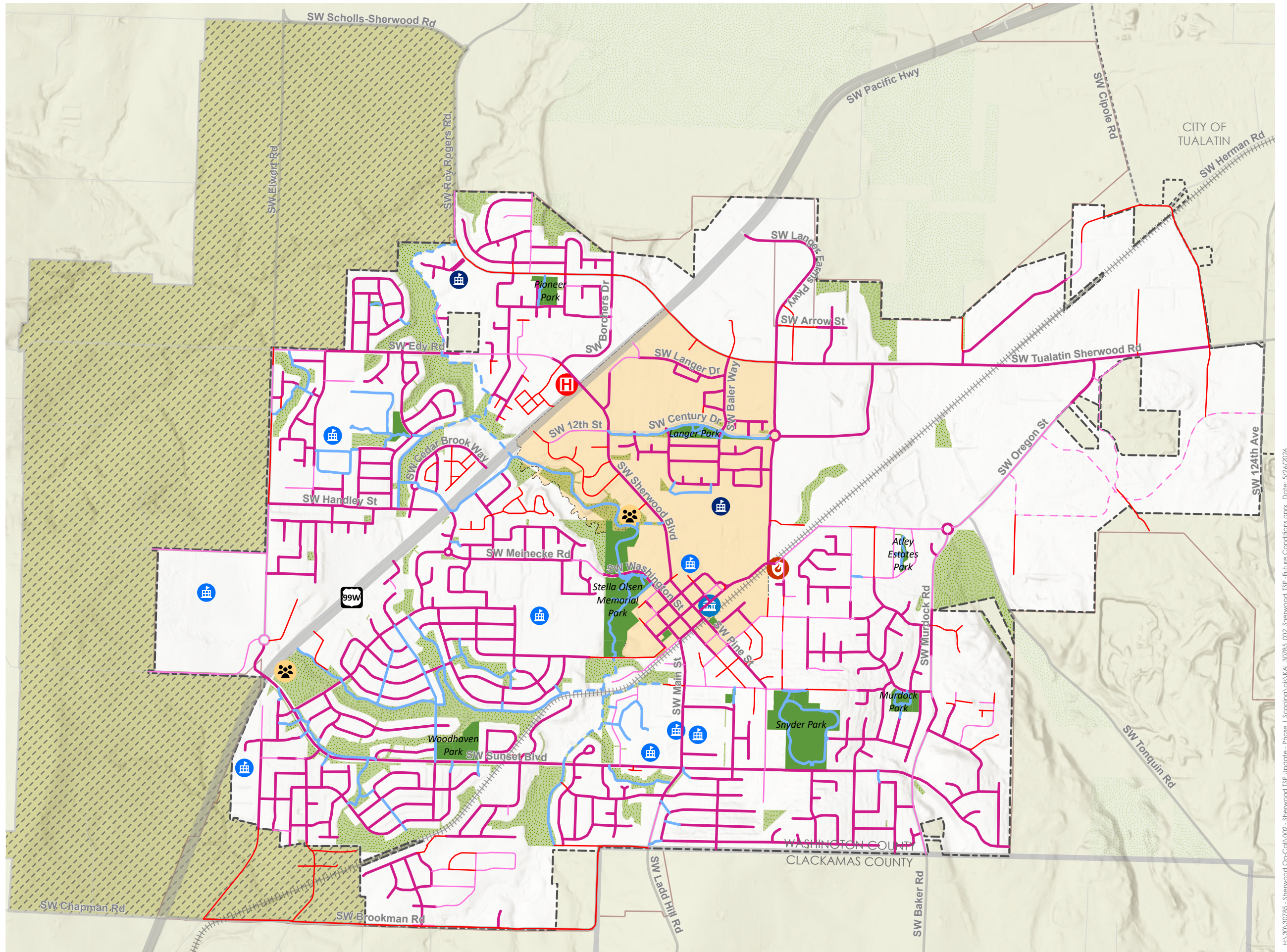
Low Stress Pedestrian Network

LEGEND

- Existing On Street Facilities - Complete
- Existing On Street Facilities - Partial
- - - Planned On Street Facilities
- Existing Shared Use Paths
- - - Planned Shared Use Paths
- Existing Streets with No Facilities

Key Destinations & Activity Centers

-  Public Schools
-  Private Schools
-  Fire Stations
-  Community Centers
-  City Hall & Library
-  Clinic
-  Parks
-  Open Spaces / Trails
-  Town Center
-  Sherwood West Area
-  City Boundaries
-  Urban Growth Boundary
-  County Boundaries



Low Stress Bicycle Network

The low stress bicycle network is envisioned as an interconnected system of on street and off-street facilities linking key destinations and neighborhoods throughout the city. On-street facilities include buffered or protected bike lanes, while off-street facilities consist of shared use paths.

The low stress bicycle network is organized into two tiers:

- **Primary Network** — A connected system of on-road and off-road facilities providing dedicated infrastructure for both bicycling and walking. All facilities within the primary network are designed to achieve a Level of Traffic Stress (LTS) of 2 or lower, ensuring that routes are comfortable for users of all ages and abilities.
- **Secondary Network** — Local roads and paths that feed into and extend the reach of the primary network. Secondary network facilities will include sidewalks along both sides of the street but may not include dedicated bicycle facilities. These streets will be maintained at an LTS of 2 or lower through traffic calming measures that keep volumes and speeds low, preserving their suitability for active transportation.

The TSP existing conditions analysis showed that within the Old Town area, 1.4 miles of local streets currently do not achieve a LTS 2 due to traffic volumes, speeds, or turning-conflict exposure. These streets will require targeted interventions such as traffic calming, turn restrictions, or signage to bring them into conformance with the low stress standard and ensure that Old Town remains well-connected to the primary network while maintaining its character as a walkable, bikeable neighborhood.

Primary Network facilities are classified into three categories for planning purposes: primary on-street facilities, primary shared use paths, and secondary local connections. Planned but not yet existing facilities are identified as such to distinguish the built network from future infrastructure needs. Table 5 shows the existing and planned facilities on the low stress bicycle network. The primary network spans approximately 49 miles (measured along the centerline). Table 5 summarizes existing and planned bicycle facility coverage along the low stress bicycle network, identifying the infrastructure needed to achieve system completeness.

Table 5. Low Stress Bicycle Facilities in Sherwood

Bicycle Facilities	Low Stress Bicycle Network Miles	
	Existing ¹	Planned ²
Primary Network centerline miles with On-Street Bike Facilities	6 miles	2 miles
Primary Network centerline miles with Shared Use Paths	12 miles	3 miles
Total Primary Network centerline miles with low-stress bicycle facilities	18 miles (36%)	5 miles (9%)
1 - Bike facilities with LTS 2 or lower		
2 - Planned facilities include upcoming city streets with bike facilities with LTS 2 or lower		

Across the primary bike network, 18 miles has complete facilities including 6 miles of network with bike facilities on both sides of the street and 12 miles of shared use paths. 5 miles of the network have planned bike facilities including 2 miles of upcoming roadways in Tonquin Employment Area and 3 miles of shared use paths along the Cedar Creek Trail.

Of Sherwood's primary bike network, 45 percent has biking facilities. This includes 18 miles of streets with low-stress bicycle facilities on both sides and 12 miles of shared use paths, totaling 61 miles of complete network coverage. Five miles of facilities are already planned, including 2 miles of low stress bicycle facilities along upcoming roadways in the Tonquin Employment Area and 3 miles of shared use path along the Cedar Creek Trail, leaving approximately 27 miles of the network gaps to be addressed through the TSP update. Closing this gap would achieve full system completeness across the low stress bicycle network.

Figure 3

Low Stress Bicycle Network

LEGEND

Primary Network

- Existing On Road Facilities
- - - Planned On Road Facilities
- Existing Shared Use Paths
- - - Planned Shared Use Paths
- Existing Streets with No Facilities

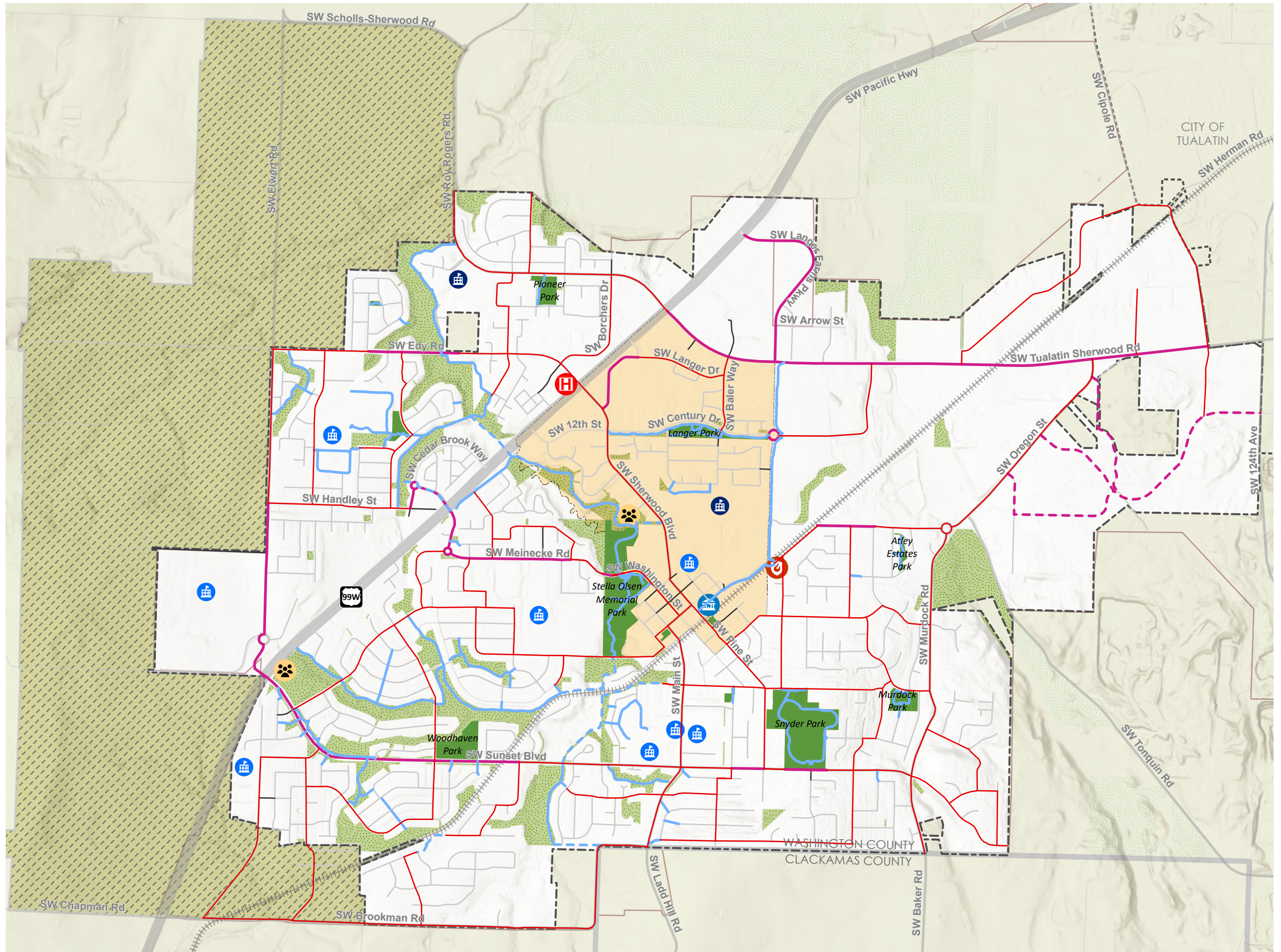
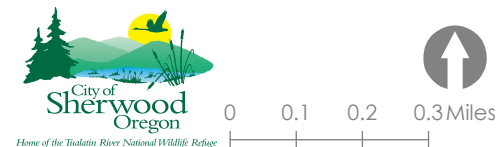
Secondary Network

- Existing On Street Facilities - High BLTS
- Existing On Street Facilities - Low BLTS

Key Destinations & Activity Centers

- Public Schools
- Private Schools
- Fire Stations
- Community Centers
- City Hall & Library
- Clinic
- Parks
- Open Spaces / Trails
- Town Center
- Sherwood West Area
- City Boundaries
- Urban Growth Boundary
- County Boundaries

Notes:
 BLTS - Bicycle Level of Traffic Stress
 High BLTS refers to a BLTS of 3 or higher
 Low BLTS refers to BLTS of 2 or lower



Horizon Year Public Transit Conditions

Future transit service in Sherwood is shaped by TriMet's Forward Together 2.0 draft network plan¹, which identifies two significant service upgrades for the city. These improvements represent a meaningful expansion of fixed-route transit coverage beyond the existing Sherwood town center, extending service to Tonquin Employment Area, residential neighborhoods, and key community destinations that are currently underserved or not served at all. Figure 4 shows the proposed service expansions in Sherwood.

Proposed Service Expansion

- Route W8 - New Standard Service from Sherwood to Tigard and Hillsboro via Roy Rogers Road

A new standard service route is proposed to connect Sherwood with Tigard and Hillsboro via Roy Rogers Road. This route would serve several key destinations within Sherwood, including the Langer Drive Commercial District, the Ice Age–Tonquin Road industrial area, and residential neighborhoods south of Old Town along SW Sunset Boulevard, with a terminus at Sherwood High School. This route would provide Sherwood's growing employment areas with their first fixed-route transit connection, supporting worker access to the city's emerging industrial and commercial corridors.

- Route 97b - Extension of Route 97 from Sherwood Boulevard to Sherwood West

The existing Route 97 is proposed to be extended westward from SW Sherwood Boulevard into the neighborhoods west of OR 99W. The extended route would travel through Old Town and Central neighborhoods, cross OR 99W via SW Meinecke Parkway and SW Handley Street, and continue along SW Elwert Road to connect to Sherwood High School on SW Haide Road. This extension would strengthen transit connectivity between established central neighborhoods and the rapidly growing Sherwood West area, while also providing a new cross-town connection across OR 99W, one of the city's most significant barriers to multimodal travel.

Horizon Year Transit Access and Coverage

The current transit services in Sherwood can serve approximately 3,700 people and 3,100 jobs within a quarter mile of existing stations. With the additional service in place, the 2045 transit network has the potential to substantially improve residential access to service and employment accessibility by transit. Approximately 16,000 people and 5,100 jobs are projected to be accessible within a quarter mile of proposed transit lines. These figures reflect a significant improvement over existing conditions.

¹ <https://experience.arcgis.com/experience/b628008128774469992c7ce362dfa4b5/>

Figure 4

Future Transit Network

LEGEND

Future Bus Routes

Existing Bus Routes

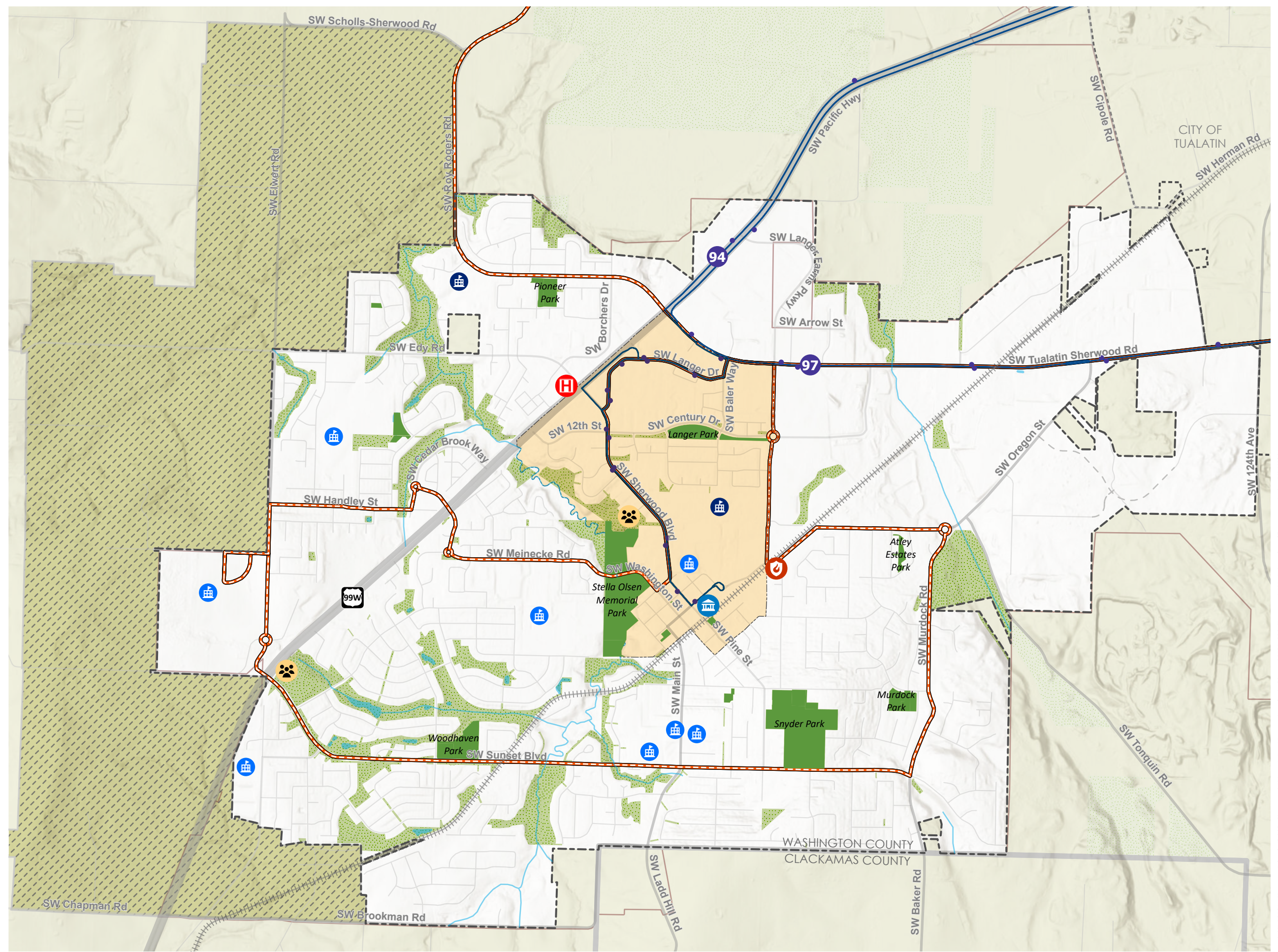
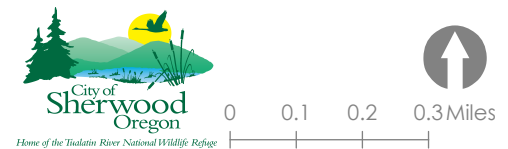
Key Destinations & Activity Centers

- Public Schools
- Private Schools
- Fire Stations
- Community Centers
- City Hall & Library
- Clinic

- Parks
- Open Spaces / Trails
- Town Center

- Rail Line
- Highway
- Arterial
- Collector
- Local
- Upcoming City Roadways
- Sherwood West Area
- City Boundaries
- Urban Growth Boundary
- County Boundaries

Data Source:
TriMet Forward Together 2.0 - Draft accessed from
TriMet DRAFT Forward Together 2 Network
May 2026



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Horizon Year Automobile Traffic Conditions

Horizon year traffic conditions were evaluated at the fifteen study intersection locations to assess how the transportation system is expected to perform in 2045 under the No Build Scenario.

Horizon Year Auto Traffic Volumes

Future traffic volumes for the No Build Scenario were derived from the Portland Metro Regional Travel Demand Model, which translates regional population and employment forecasts into estimated traffic volumes across the transportation network. The model incorporates land use inputs consistent with Metro's 2045 growth forecasts and reflects adopted regional transportation assumptions. Model outputs were post-processed and validated against existing count data to ensure consistency with observed travel behavior in and around Sherwood, and the resulting volume forecasts represent a reasonable projection of future demand on Sherwood's street network under the No Build Scenario.

Model Assumptions

Seven out of the fifteen study intersections have local street connections that were not modeled in the regional travel demand model. For these local street segments, horizon year volumes were estimated through a two-step process.

First, 2020 base year volumes were established by factoring down measured intersection turning movement counts. Two distinct growth rate assumptions were applied to translate measured counts back to the 2020 base year. All local segments were reduced at a rate of 1.5 percent per year, with the exception of Chapman Road, where a more conservative reduction rate of 0.5 percent per year was applied to reflect the limited development activity in the Sherwood West area during the intervening period.

Second, 2045 volumes were projected by applying a growth rate of 2 percent per year to all such segments. The growth rate was calculated based on the volumes on the centroid connectors in Sherwood in the 2020 and 2045 regional models.

A list of the segments and the corresponding volume assumptions is provided in Appendix A.

Manual Adjustments of Link Volumes

The link volumes were post-processed using the NCHRP 765 methodology, applying the post-processing tool provided in the Oregon Department of Transportation (ODOT) Analysis Procedures Manual, and assigned to Sherwood's street network.

At select locations that showed a notable discrepancy between the 2020 model outputs and field-measured 2025 volumes, modeled link volumes were replaced with adjusted volumes derived from 2025 measured counts. These are segments where the 2045 model volumes were found to be lower than the 2025 measured volumes. This outcome was inconsistent with projected regional growth trends that showed population growth of 1.86 percent per year.

The revised 2045 volumes were derived by applying a 1.33 percent per year growth over 25 years to the adjusted 2020 base year volumes. The growth factor was calculated based on the

volume growth rates reflected in the original regional model outputs, ensuring consistency with the broader modeling framework while correcting for the discrepancy at the local level.

The turning movement volumes for the evening peak hours (4:00 p.m. to 6:00 p.m.) were derived from post processing outputs. Future turning movement volumes reflect the cumulative effect of regional growth, including population and employment increases within Sherwood and in surrounding communities that contribute to through and pass-by travel demand on the local network.

Metro Regional Travel Demand Model data and the post processing spreadsheets are provided in Appendix A.

Intersection Capacity Analysis

Intersection capacity analysis was performed at study intersections using methodologies consistent with the Highway Capacity Manual (HCM) 7th Edition. Based ODOT Analysis Procedures Manual Section 10.6.3, signalized intersections were evaluated by retaining the signal parameters such as Flash Don't Walk, Walk, and Minimum Times from the existing conditions with the signal splits optimized to better serve the future traffic volume patterns.

The horizon year analysis incorporates projects associated with financially constrained list from the 2023 Regional Transportation Plan (RTP). Four RTP projects result in modifications to intersection geometry that were reflected in the capacity analysis.

- RTP ID 12044 Langer Farms Parkway Extension –
 - The project adds a 12-foot median to the west leg at study intersection 1: OR 99W at SW Langer Farms Parkway.
- RTP ID 10674 Oregon-Tonquin Intersection Improvements -
 - The project converts the study intersection 11: SW Oregon Street at SW Tonquin Road to a two-lane roundabout
- RTP ID 10699 Oregon Street Improvements –
 - The project adds a 12-foot median to the north leg at study intersection 15: SW Langer Farms Parkway at SW Oregon Street

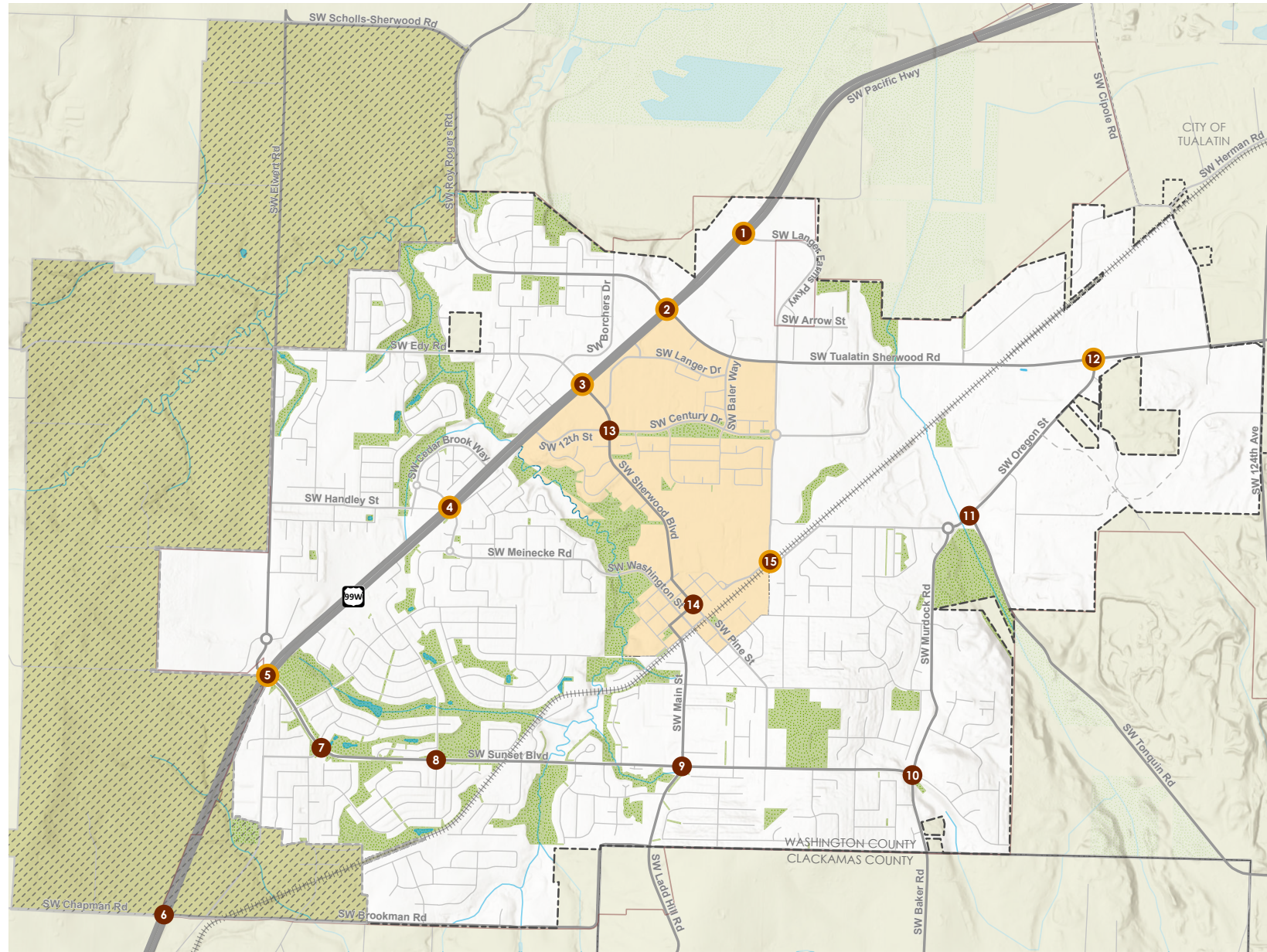
Appendix B contains detailed information on these projects.

All other study intersections retain their existing lane configurations in the horizon year analysis. Figure 5 shows the future lane configurations and traffic control devices at the study intersections.

Performance is reported in terms of volume-to-capacity ratio for each intersection and critical movement. Results were compared against the auto-based mobility targets previously mentioned to identify locations where horizon year operations are projected to fall below adopted standards and where mitigation or further study may be warranted. Figure 6 and Figure 7 show the intersection operations analysis summary for each analysis hour. VISTRO worksheets are provided in Appendix C.

Figure 5

Future Lane Configurations and Traffic Control Devices

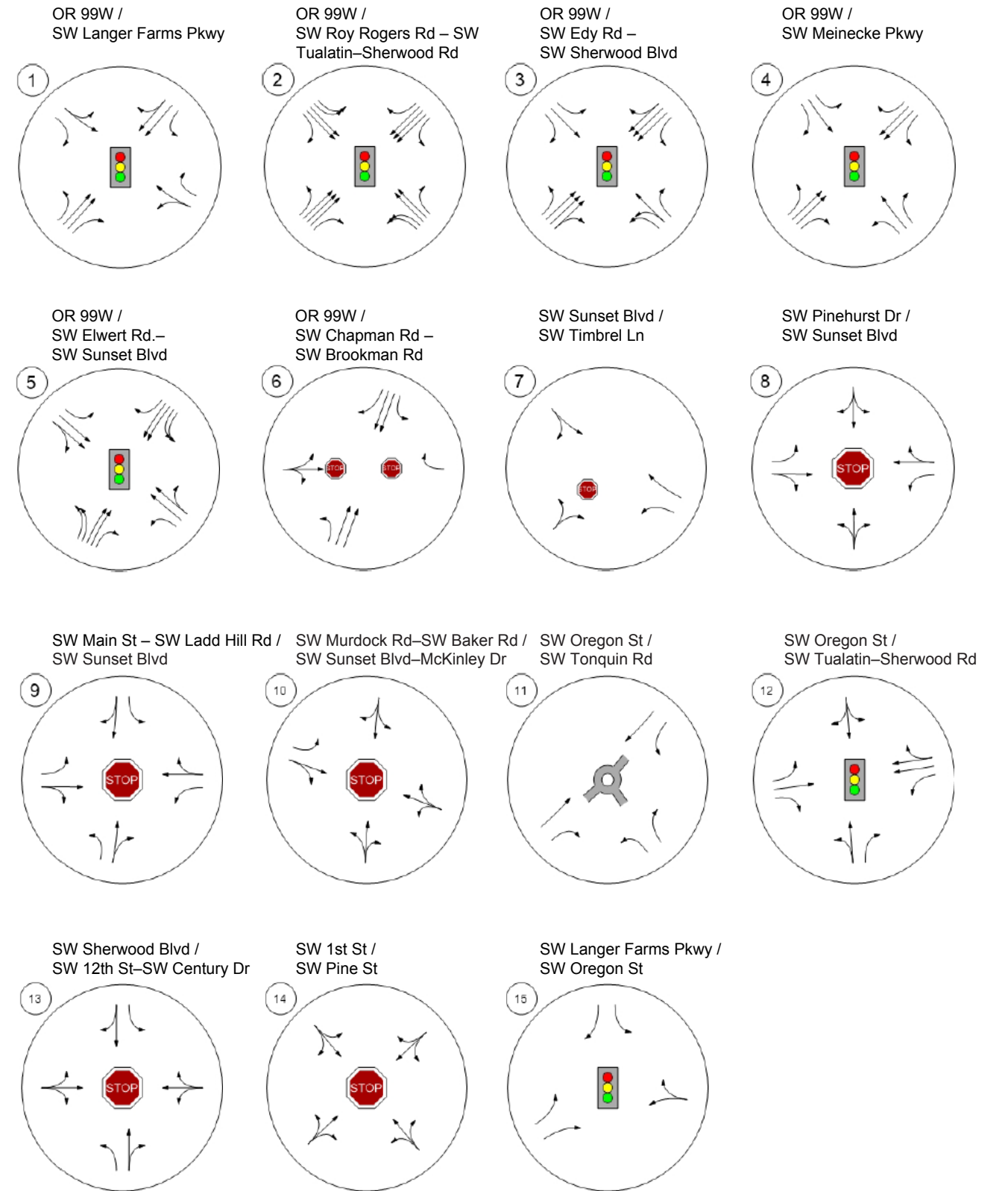


LEGEND

Study Intersections

- Signalized
- Unsignalized
- +++++ Rail Line
- Town Center
- Sherwood West Area
- City Boundaries
- Urban Growth Boundary
- County Boundaries

- CM** = Critical Movement (AWSC/TWSC)
- LOS** = Critical Movement/ Intersection Level of Service
- V/C** = Critical Volume-to-Capacity ratio
- Del** = Critical Movement/ Intersection Control Delay
- TWSC** = Two-Way Stop Control
- AWSC** = All-Way Stop Control

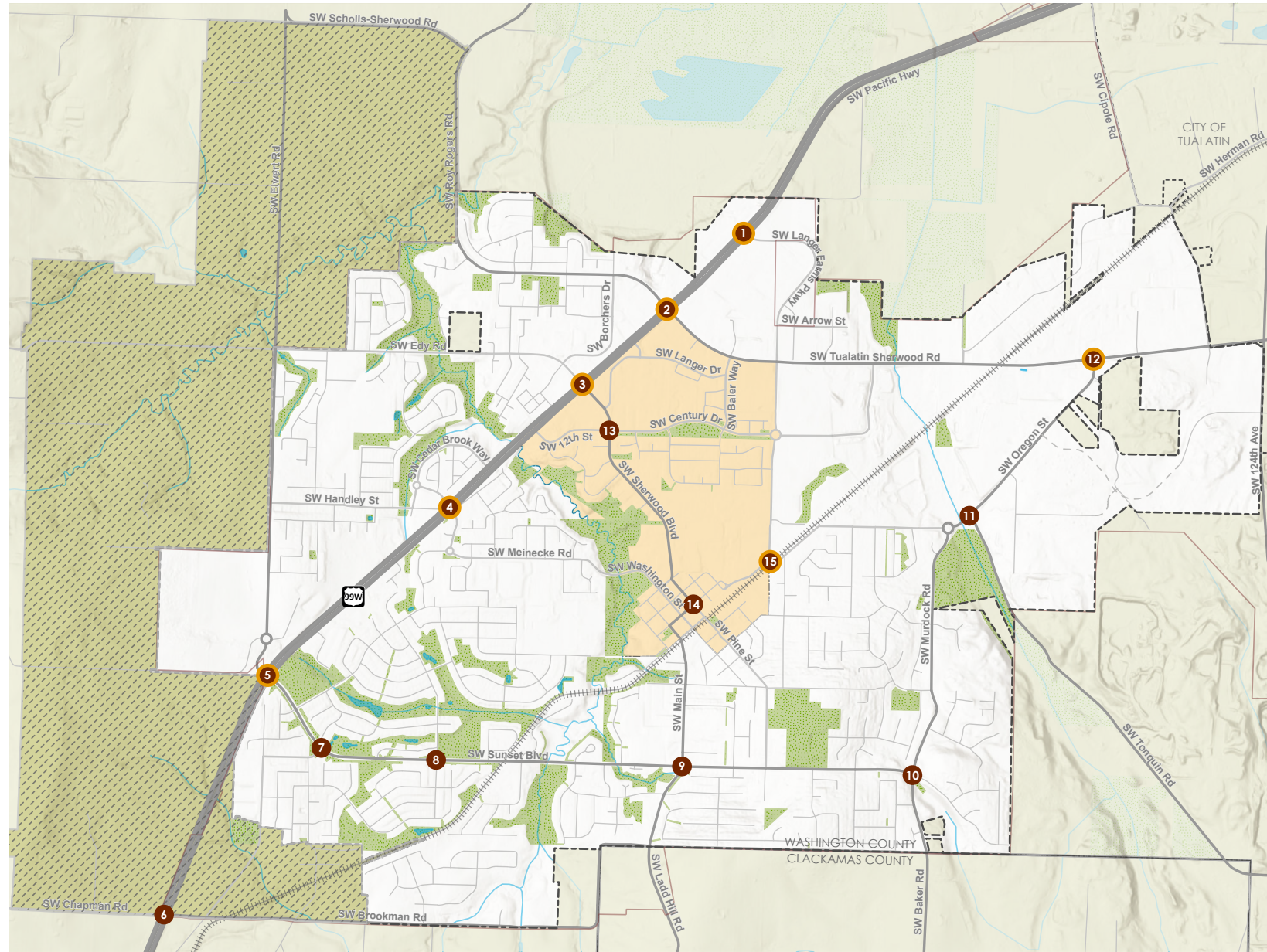


Data Source: Field Review & 2023 Regional Transportation Plan



Figure 6

Horizon Year Intersection Capacity Analysis — 4–5 p.m.



LEGEND

Study Intersections

- Signalized
- Unsignalized
- +++++ Rail Line
- Town Center
- Sherwood West Area
- City Boundaries
- Urban Growth Boundary
- County Boundaries

- CM** = Critical Movement (AWSC/TWSC)
- LOS** = Critical Movement/ Intersection Level of Service
- V/C** = Critical Volume-to-Capacity ratio
- Del** = Critical Movement/ Intersection Control Delay
- TWSC** = Two-Way Stop Control
- AWSC** = All-Way Stop Control



Data Source: Post-Processed Volumes from 2020 and 2045 Metro Regional Travel Demand Model

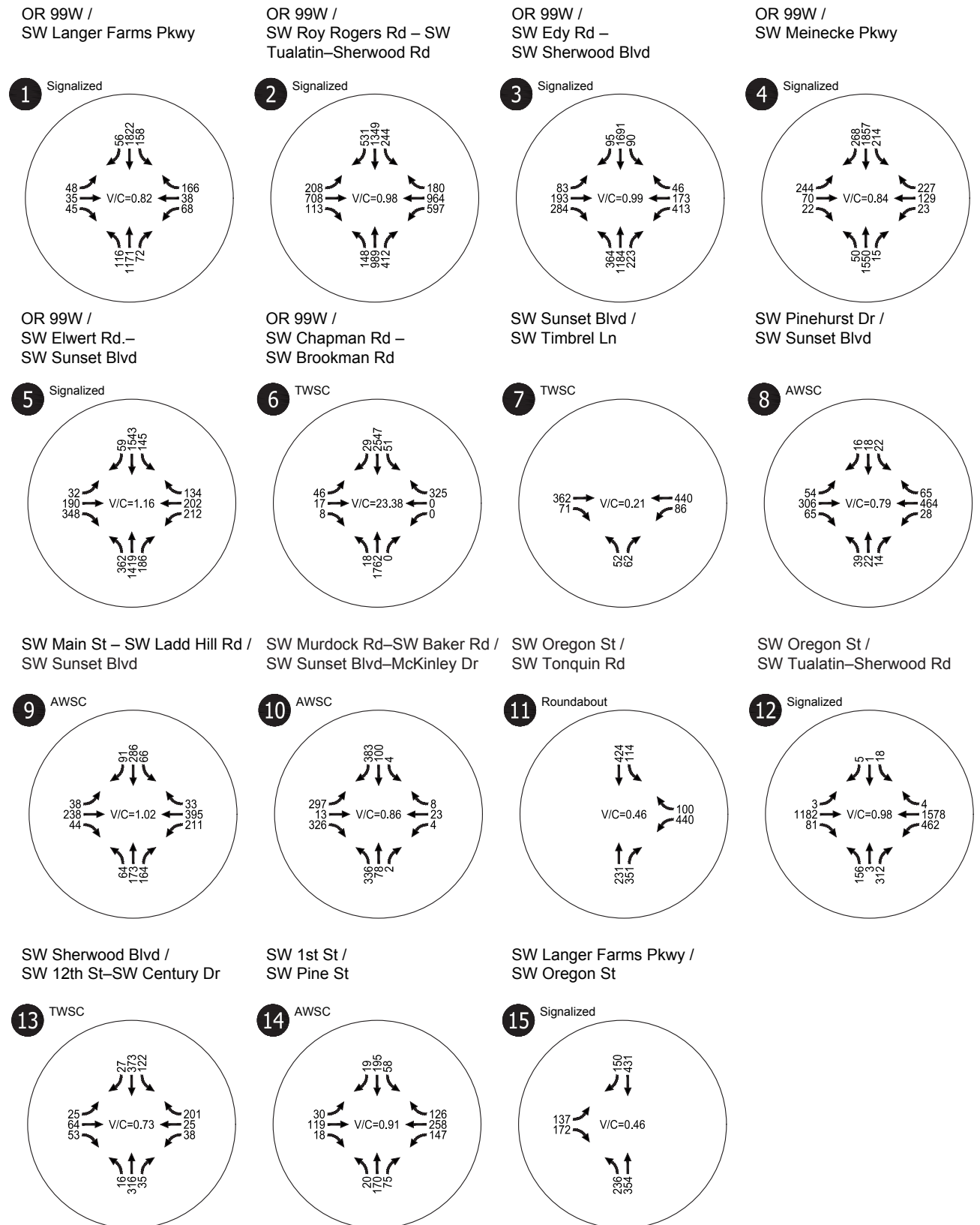
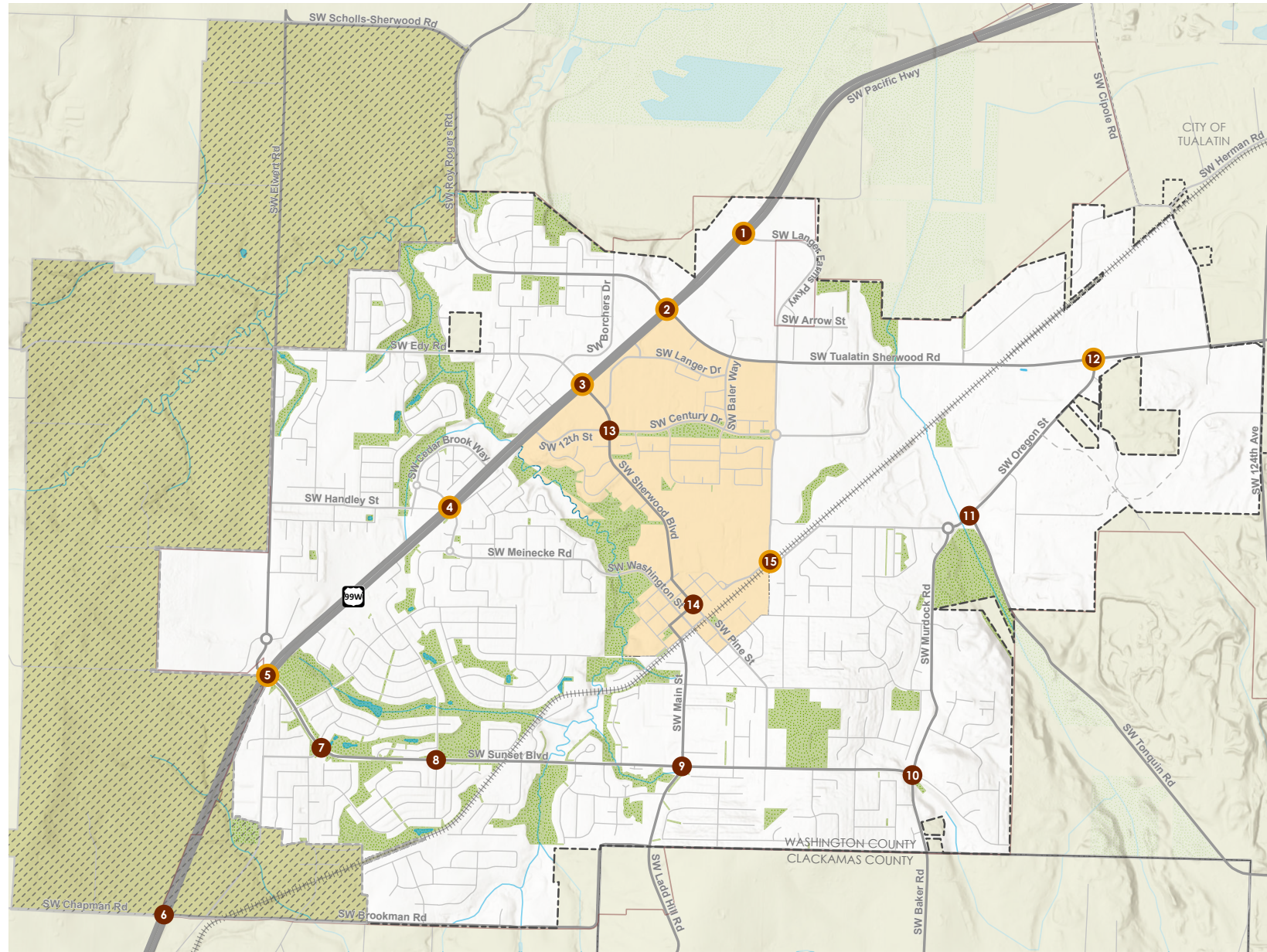


Figure 7

Horizon Year Intersection Capacity Analysis — 5–6 p.m.



LEGEND

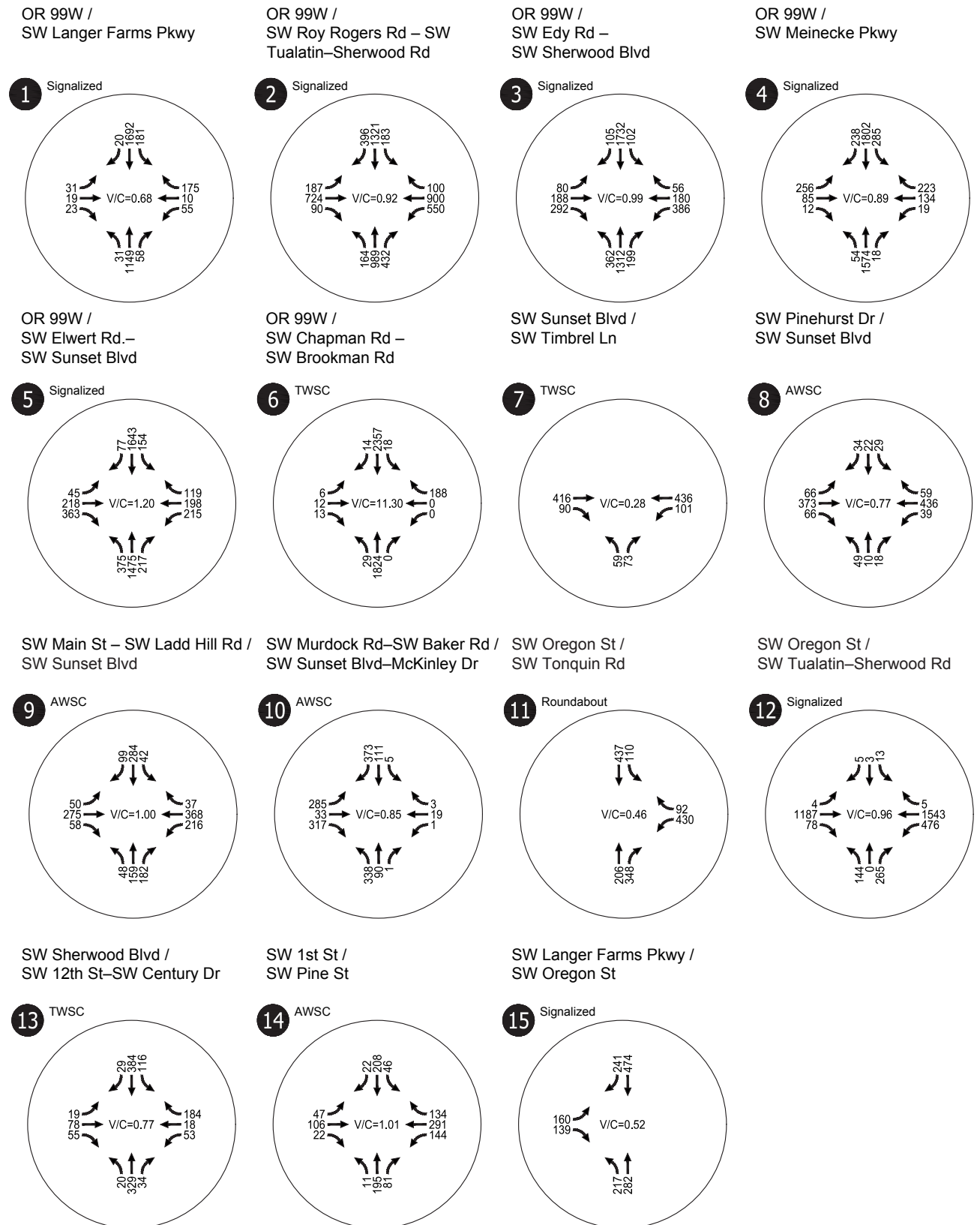
Study Intersections

- Signalized
- Unsignalized
- +++++ Rail Line
- Town Center
- Sherwood West Area
- City Boundaries
- Urban Growth Boundary
- County Boundaries

- CM** = Critical Movement (AWSC/TWSC)
- LOS** = Critical Movement/ Intersection Level of Service
- V/C** = Critical Volume-to-Capacity ratio
- Del** = Critical Movement/ Intersection Control Delay
- TWSC** = Two-Way Stop Control
- AWSC** = All-Way Stop Control



Data Source: Post-Processed Volumes from 2020 and 2045 Metro Regional Travel Demand Model



The results of the intersection operations analysis is presented in Table 6 and compares the results to the applicable mobility standards and targets. It should be noted that Sherwood being on the edge of the metropolitan region is one of the communities where the first hour v/c is typically lower than second hour.

Table 6. Existing Intersection Operations, Weekday Evening Peak Hours

Map ID	Intersection	Control Type	TSP Mobility Standard/ Target v/c ³	Intersection Operations			
				Hour 1 (4 – 5 pm)		Hour 2 (5 – 6 pm)	
				CM / CA	V/C	CM / CA	V/C
1	OR 99W at SW Langer Farms Parkway	Signalized	0.99/ 0.99	-	0.82	-	0.67
2	OR 99W at Tualatin-Sherwood Road	Signalized	1.10/ 1.10	-	0.98	-	0.91
3	OR 99W at SW Edy Road/SW Sherwood Boulevard	Signalized	1.10/ 1.10	-	0.99	-	0.98
4	OR 99W at SW Meinecke Parkway	Signalized	0.99/ 0.99	-	0.84	-	0.88
5	OR 99W at SW Elwert Road/SW Sunset Boulevard	Signalized	0.99/ 0.99	-	1.16	-	1.20*
6	OR 99W at SW Chapman Road/SW Brookman Road	TWSC¹	0.99/ 0.99	EBT	>1.10	EBT	>1.10
7	SW Timbrel Lane at SW Sunset Boulevard	TWSC	0.99/ 0.99	NBL	0.21	NBL	0.27
8	SW Pinehurst Drive at SW Sunset Boulevard	AWSC ²	0.99/ 0.99	WBT	0.78	WBT	0.76
9	SW Main Street/SW Ladd Hill Road at Sunset Boulevard	AWSC	0.99/ 0.99	WBT	1.01	WBT	1.00
10	SW Murdock Road/SW Baker Road at SW Sunset Boulevard /SW McKinley Drive	AWSC	0.99/ 0.99	SBR	0.86	SBR	0.84
11	SW Oregon Street at SW Tonquin Road	TWSC	0.99/ 0.99	SBT	0.46	SBT	0.46
12	SW Oregon Street at SW Tualatin-Sherwood Road	Signalized	0.99/ 0.99	-	0.98	-	0.95
13	SW Sherwood Boulevard at SW 12th Street/SW Century Drive	TWSC	1.10/ 1.10	SBT	0.73	SBT	0.76
14	SW Pine Street at SW 1st Street	AWSC	1.10/ 1.10	WBT	0.91	WBT	1.00
15	SW Langer Farms Parkway at SW Oregon Street	Signalized	1.10/ 1.10	-	0.45	-	0.52

**The City is currently exploring a new lane configuration for Intersection 5 that may add an additional left-turn lane. Because this project has not yet been adopted in any city or regional plan, it will be evaluated as an alternative during the TSP update process.*

1 TWSC = Two-way stop-control

2 AWSC = All-way stop-control

3 State Highway V/C Ratio / Side-Street V/C Ratio

CM = Critical movement; CA = Critical approach.

v/c = Intersection v/c (Signal); CM v/c (TWSC).

The horizon year results indicate that most of the study intersections are projected to operate within adopted mobility standards during the 2045 evening peak hours. However, three intersections are projected to exceed their respective v/c thresholds.

- OR 99W at SW Elwert Road/SW Sunset Boulevard (Intersection 5) with projected v/c ratios of 1.16 and 1.20 during Hours 1 and 2 respectively, exceeding the 0.99 standard applicable to this location.
- OR 99W at SW Chapman Road/SW Brookman Road (Intersection 6), a two-way stop-controlled intersection, is projected to operate with critical movement v/c ratios exceeding 1.10 during both peak hours, exceeding the 0.99 standard applicable to this location and indicating excessive delay on the minor-street approach.
- SW Main Street/SW Ladd Hill Road at SW Sunset Boulevard (Intersection 9) is projected to operate at a v/c ratio of 1.01 and 1.00 during Hours 1 and 2, exceeding the 0.99 standard.

These three locations represent the primary capacity deficiencies on the horizon year roadway network and will require further evaluation and mitigation consideration as part of the TSP project development process. The remaining twelve study intersections are projected to operate within their respective mobility standards through the planning horizon, including intersections within the Sherwood Town Center climate friendly area where the more permissive 1.10 v/c threshold applies.

Safety Considerations

Safety concerns across the Sherwood network were identified and documented in Technical Memorandum 5: Existing Conditions Analysis, which flagged ten study intersections and six additional locations through crash rate analysis, excess proportion analysis, and ODOT and Washington County Safety Priority Index System (SPIS) screening.

A notable finding of the horizon year capacity analysis is the spatial overlap between intersections projected to exceed adopted v/c mobility standards in 2045 and those already identified as safety priority locations. All three intersections projected to fail mobility standards under the No Build Scenario — OR 99W at SW Elwert Road/SW Sunset Boulevard (Intersection 5), OR 99W at SW Chapman Road/SW Brookman Road (Intersection 6), and SW Main Street/SW Ladd Hill Road at SW Sunset Boulevard (Intersection 9) — are also flagged for existing safety concerns through SPIS screening or excess proportion analysis.

The significance of these three intersections lies in the convergence of two independent concerns: documented existing safety issues and projected future mobility deficiency. That combination does not prove crashes will increase, but it strongly indicates that safety and operations should be analyzed together and that these locations merit early consideration for mitigation.

Horizon Year Vehicle Miles Traveled

As part of the new Transportation Planning Rule (OAR 660-012) requirements, an additional requirement to measure vehicle miles traveled per capita was established. Specifically, OAR 660-012-0160 sections:

- 4) *"Cities and counties may only adopt a transportation system plan if the vehicle miles traveled per capita at the horizon year using the financially constrained project list is lower than the estimated vehicle miles traveled per capita in the base year.*
- 5) *A city or county is not required to meet the requirements of this rule if the city or county has selected a financially constrained project list that does not contain any project that would require review as required in OAR 660-012-0830(1)*
- 6) *Metro shall adopt a regional transportation plan in which the projected vehicle miles traveled per capita at the horizon year using the financially constrained project list is lower than the estimated vehicle miles traveled per capita at the base year by an amount that is consistent with the metropolitan greenhouse gas reduction targets in OAR 660-044-0020. Metro may rely on assumptions on future state and federal actions, including the following state-led actions that affect auto operating costs:*
 - a. *State-led pricing policies, and energy prices; and*
 - b. *Vehicle and fuel technology, including vehicle mix, vehicle fuel efficiency, fuel mix, and fuel carbon intensity."*

Table 7 contains the calculated VMT per Capita within the Sherwood UGB for 2020 and 2045 as provided by the Metro travel demand model. Four scenarios are provided for 2045 including:

- No build: assumes projects under construction in 2020 would be completed.
- Fiscally Constrained: assumes projects in the 2023 Regional Transportation Plan with identified funding sources are constructed, AND regional mobility pricing is implemented.
- Fiscally Constrained Without Regional Mobility Pricing: assumes projects in the 2045 Regional Transportation Plan with identified funding sources are constructed, BUT regional mobility pricing is not implemented.
- Fiscally Unconstrained: assumes additional strategic projects are constructed over the planning horizon with currently unidentified funding sources.

Under the 2023 Fiscally Constrained scenarios, VMT per Capita in Sherwood is expected to decrease over the planning horizon. As such, Sherwood is in compliance with OAR 660-012-016 (6).

Table 7. VMT Per Capita Over the Planning Horizon in Sherwood

Scenario	VMT Per Capita
2020	17.88
2045 No Build	17.92
2045 Fiscally Constrained	17.20
2045 Fiscally Constrained without Regional Mobility Pricing	17.66
2045 Unconstrained	17.24

The current 2023 Regional Transportation Plan, which relies on the travel demand model used to calculate the VMT per capita, includes projects identified within the 2014 Sherwood TSP. As Sherwood develops a 2047 TSP, additional projects identified could impact the VMT per capita calculation, resulting in different values than identified in Table 7.

Multimodal Network Deficiencies Analysis

The multimodal network deficiencies analysis shown in Figure 8 is a spatial overlay of pedestrian and bicycle network gaps identified through the low stress network analysis, future transit routes from the TriMet Forward Together 2.0 draft network, key destinations and activity centers, and areas in the top 15th percentile of community vulnerability as documented in Appendix D. By layering these datasets geographically, the analysis identifies the corridors where transportation deficiencies compound one another. These are locations where gaps in the active transportation network coincide with vulnerable populations, limited transit access, and proximity to key destinations. This helps to identify the locations where multimodal investments would deliver the greatest connectivity and equity benefit to Sherwood's community.

Figure 8

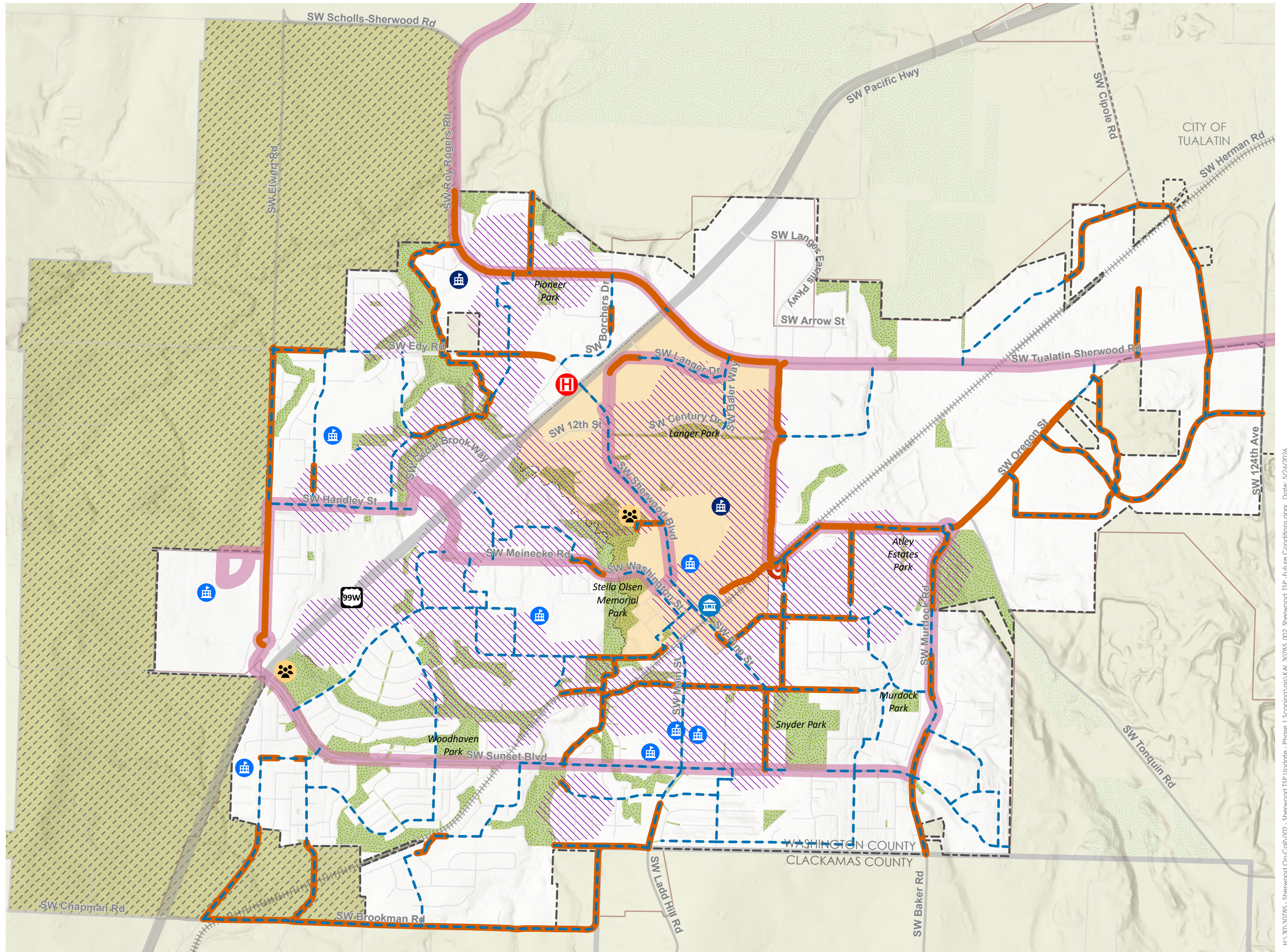
Future Multimodal Network Deficiencies

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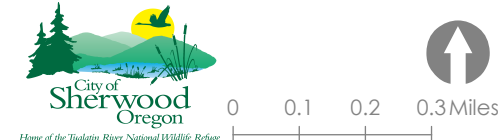
- Gaps in Bicycle Network
- Gaps in Pedestrian Network
- Future Bus Routes
- ▨ Highest Vulnerability Index Areas (Score 21–24)

Key Destinations & Activity Centers

- Public Schools
- Private Schools
- Fire Stations
- Community Centers
- City Hall & Library
- Clinic
- Open Spaces / Trails
- Town Center
- City Boundaries
- Sherwood West Area
- Urban Growth Boundary
- County Boundaries



Data Source:
TriMet Forward Together 2.0 - Draft
accessed in May 2026
Equity Analysis presented in Technical
Memorandum 5



The following areas are organized by their potential for project development, with specific corridors identified for active transportation improvements.

SW Meinecke Road / SW Washington Street Corridor (Stella Olsen Memorial Park Area)

The SW Meinecke Road and SW Washington Street corridors present the most significant concentration of overlapping deficiencies in Sherwood. Both corridors traverse a zone with the highest density of key destinations and activity centers, serve as the primary east-west connection across the OR 99W barrier, and are flanked by large vulnerability areas on both sides. The future TriMet Route 97 extension is proposed along this alignment, further underscoring the gap between existing active transportation conditions and the multimodal access needed to support future transit ridership.

SW Handley Street – SW Elwert Road – SW Edy Road Corridor

SW Handley Street – SW Elwert Road – SW Edy Road form a key corridor in the western portion of the city, connecting the western edge of Sherwood to OR 99W and the Town Center. Several pedestrian and bicycle gaps along this alignment run through vulnerability areas, with limited existing transit service and no future bus route planned in the immediate vicinity, leaving residents in this corridor with few viable non-auto travel options to reach key destinations.

SW Sunset Boulevard Corridor

SW Sunset Boulevard functions as a primary east-west spine through the southern half of the city, passing through extensive vulnerability areas and connecting multiple activity centers near Woodhaven Park, Snyder Park, and Murdock Park. The bus route W8, proposed as part of the TriMet Forward Together 2.0 (Draft) is along or parallel to this alignment, and the absence of continuous pedestrian and bicycle facilities along the corridor represents a significant gap in first- and last-mile connectivity to future transit service.

SW Tualatin-Sherwood Road and SW Oregon Street Corridors

SW Tualatin-Sherwood Road and SW Oregon Street serve as important connections between the Town Center and the eastern edge of the city near SW Tonquin Road. Bicycle and pedestrian gaps along portions of these corridors, particularly east of the Town Center, are compounded by proximity to the rail line and adjacency to vulnerability areas, limiting connectivity to the few activity centers on the east side.

SW Roy Rogers Road Corridor

SW Roy Rogers Road is the proposed alignment for the new standard transit service, Route 97b, connecting Sherwood to Tigard and Hillsboro. Existing pedestrian and bicycle gaps along this corridor, combined with its proximity to the Pioneer Park and its role as a future transit route, identify it as a corridor where active transportation deficiencies will become increasingly consequential as regional transit service expands.

Next Steps

The future conditions analysis for transportation system plans sets the proverbial stage for the identification of projects to meet the future transportation demands. The demand for needs will be identified through the performance standards selected in Technical Memo 4, as well as the prioritization criteria identified in Technical Memo 3.

Understanding the future performance of the transportation system in accordance with the selected standards will also inform the requirements of OAR 660-012-0900(5), which requires both a major and minor report to be submitted on city progress towards the overall goals of the updated Transportation Planning Rule. For minor reports, this includes:

- a) A narrative summary of the state of coordinated land use and transportation planning in the planning area over the reporting year, including any relevant activities or projects undertaken or planned by the city or county;
- b) The planning horizon date of the acknowledged transportation system plan, a summary of any amendments made to the transportation system plan over the reporting year, and a forecast of planning activities over the near future that may include amendments to the transportation system plan;
- c) Copies of reports made in the reporting year for progress towards centering the voices of underserved populations in processes at all levels of decision-making as provided in OAR 660-012-0130 and a summary of any equity analyses conducted as provided in OAR 660-012-0135; and
- d) Any alternatives reviews undertaken as provided in OAR 660-012-0830, including those underway or completed.

For major reports, more detailed information is required when the Metropolitan Planning Organization, in this case Oregon Metro, completes an update to their Regional Transportation Plan. Major reports include information required in a minor report as well as reporting on progress toward meeting local targets set against a set of performance measures. These performance measures are either adopted in a regional scenario plan, or provided in OAR 660-012-0905. It is expected the MPO will have a significant role in preparing the major report.

Appendix A:
Metro Travel Demand Model Data & Post
Processing Worksheets

Post Processing Methodology for Metro Model Link Volumes

Kittelsohn received regional travel demand model outputs from Metro covering two horizon years (2020 and 2045) and two peak hour periods (4-5 PM and 5-6 PM). The outputs contain automobile link volumes for Sherwood's street network, forming the foundation of the traffic volume analysis.

The four model outputs used as inputs to this analysis are shown in Figures 1 through 4 below.

Before the modeled volumes could be used in intersection capacity analysis, a multi-step post-processing approach was applied to ensure the volumes accurately reflect local conditions. The post-processing workflow consisted of three sequential steps:

1. Supplementing volumes on local street links that were absent from the regional model.
2. Manually correcting modeled volumes at select locations where the model diverged significantly from field-measured counts.
3. Selecting appropriate peak hour factors (PHF) for use in the future conditions analysis.
4. Incorporate post processed future volumes into intersection operations analysis.

Tualatin River
National
Wildlife Refuge

2020 Auto Volume 4-5 pm

- # Study Intersection ID
- N# Node ID for post processing spreadsheet
- NB/EB

link volume not available

link volume not available

link volume not available

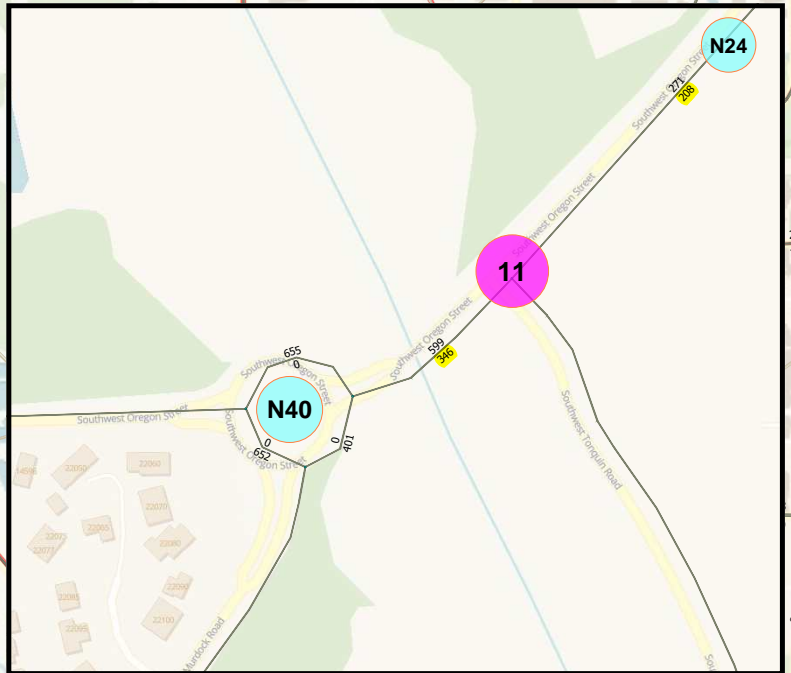
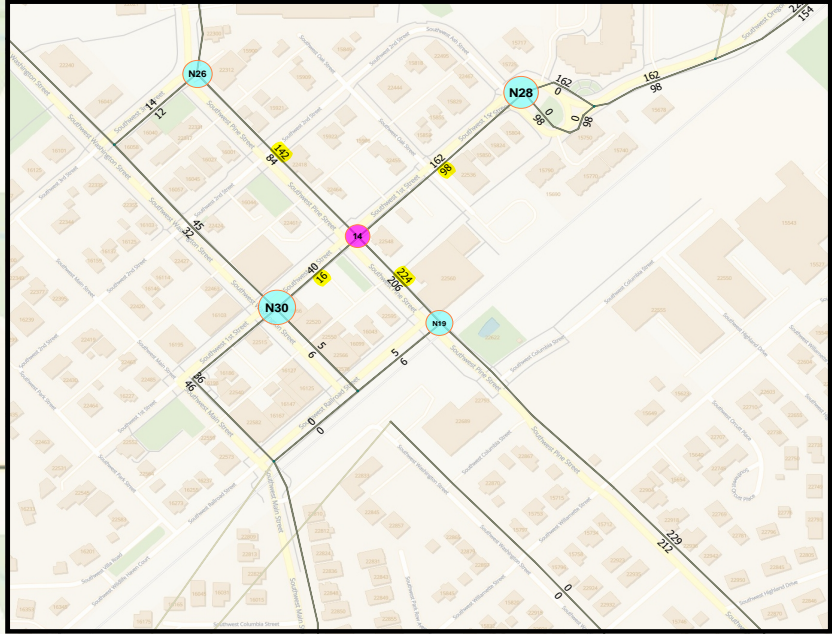
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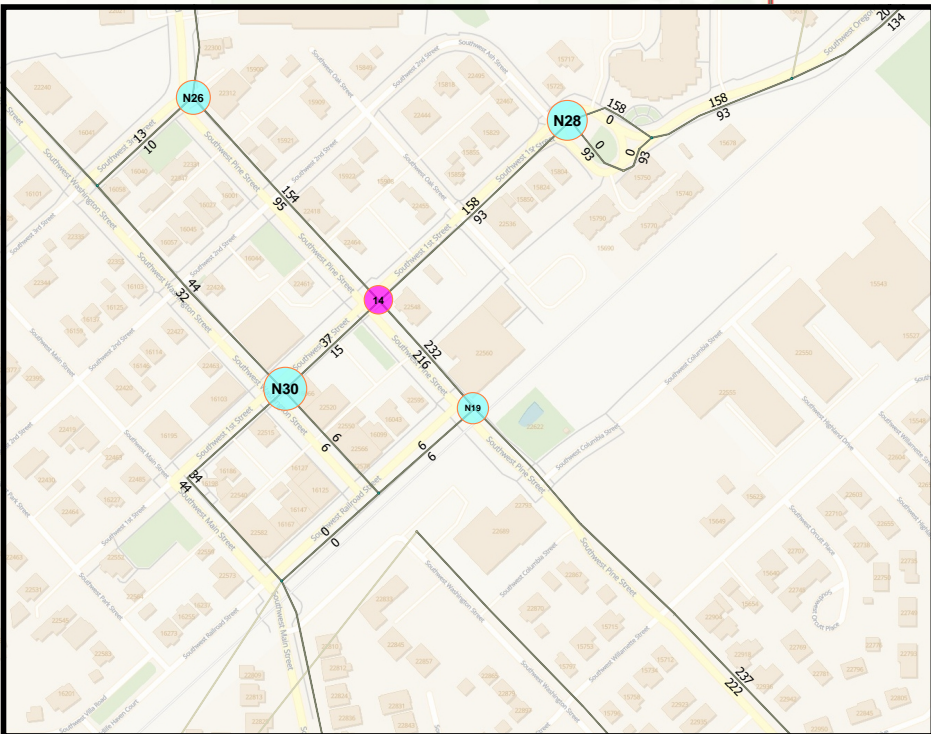
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link volume not available

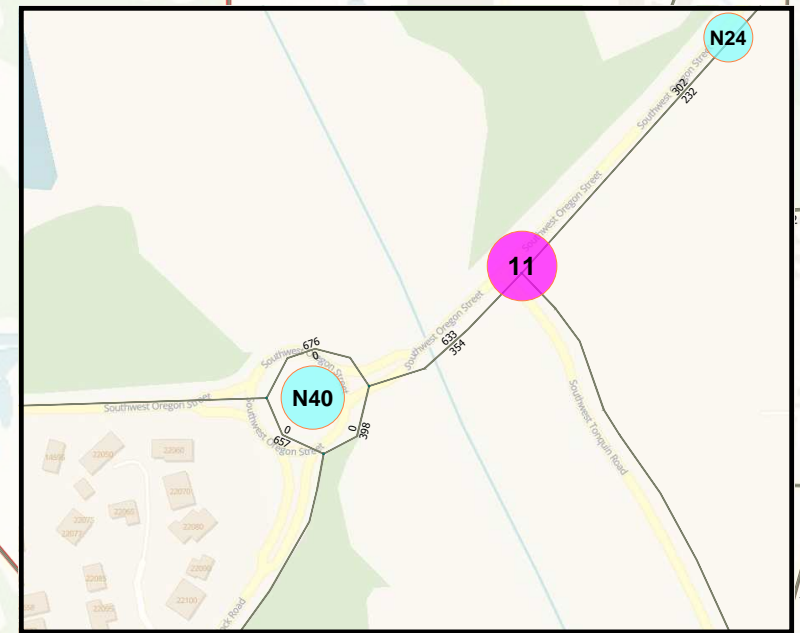
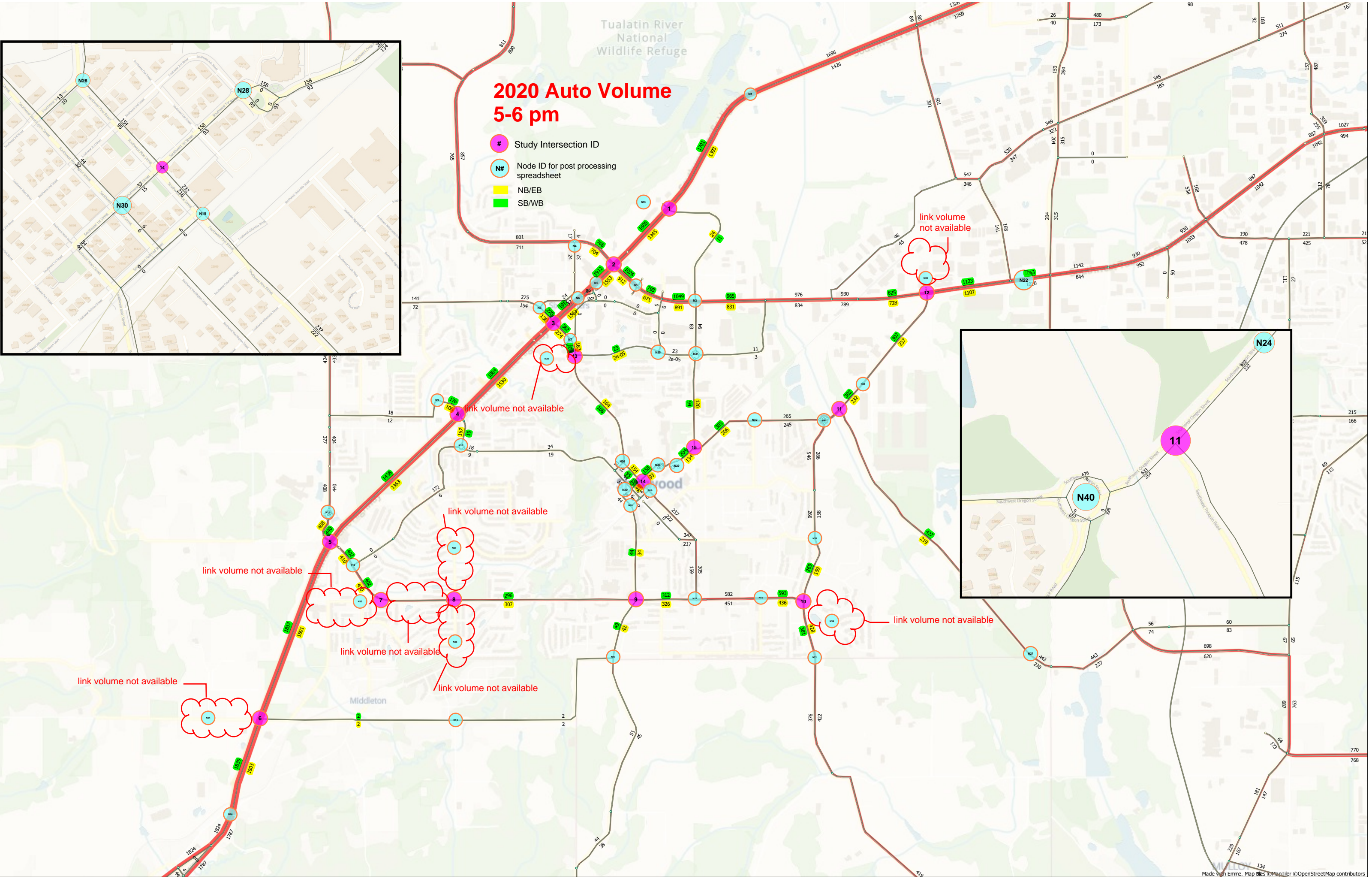
link volume not available





2020 Auto Volume 5-6 pm

- # Study Intersection ID
- N# Node ID for post processing spreadsheet
- NB/EB
- SB/WB



Tualatin River
National
Wildlife Refuge

2045 Auto Volume 4-5 pm

- # Study Intersection ID
- N# Node ID for post processing spreadsheet
- NB/EB
- SB/WB

link volume not available

link volume not available

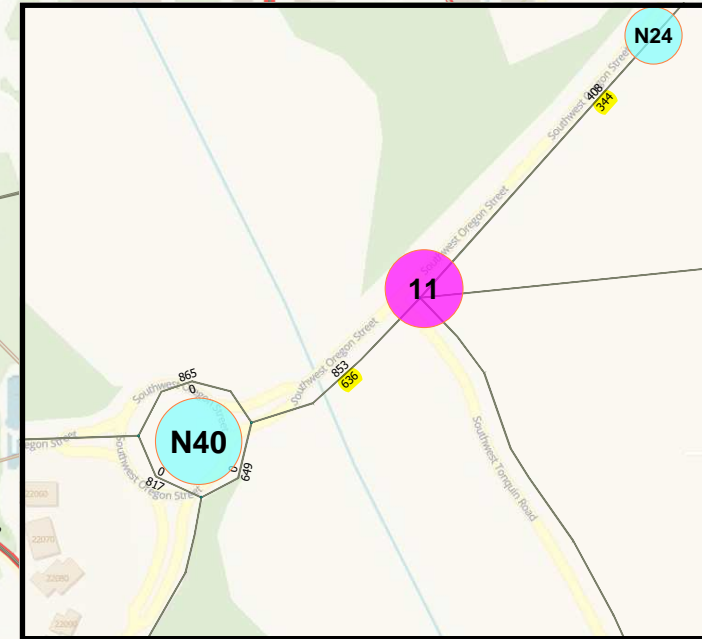
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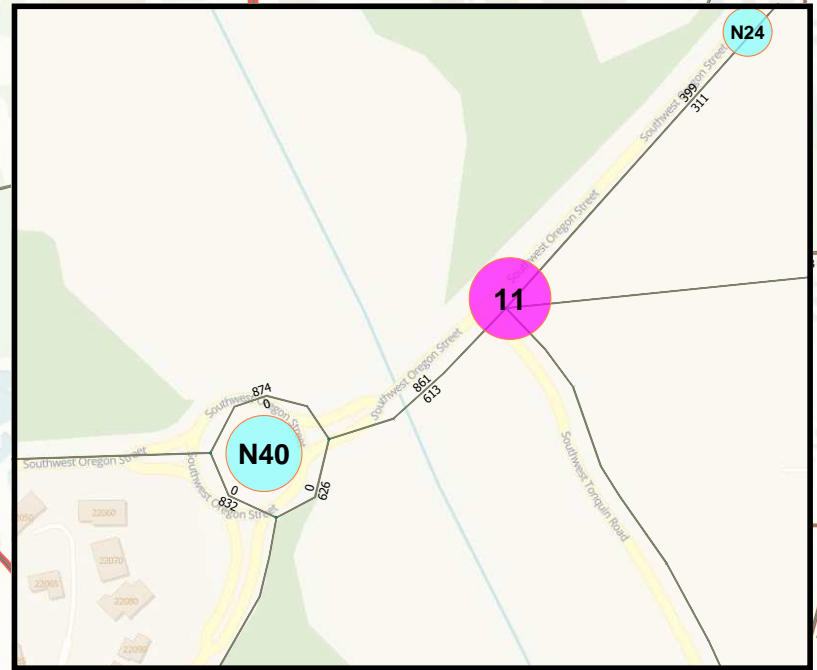
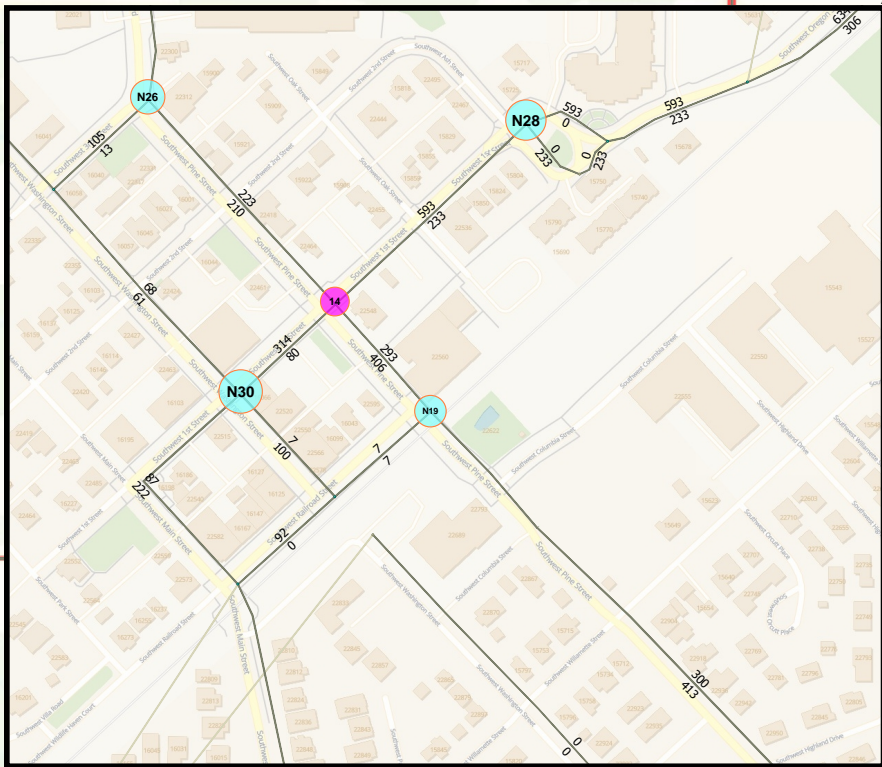
link volume not available



Tualatin River National Wildlife Refuge

2045 Auto Volume 5-6 pm

- # Study Intersection ID
- N# Node ID for post processing spreadsheet
- NB/EB
- SB/WB



link volume not available

link volume not available

link volume not available

link volume not available

link volume not available

link volume not available

link volume not available

link volume not available

Step 1: Estimating Volumes for Links Missing from the Regional Model

Regional travel demand models are built to capture major travel corridors and are not always configured to represent every local street nor intersection. In Sherwood, seven of the fifteen study intersections include local street connections that were not present in Metro's model on at least one leg of the intersection. This resulted in 18 directional link segments (e.g. 9 missing links leads to 18 directional link volumes) absent from the model. The missing links pertinent to the study intersections are listed in Table 1 below.

Table 1. Links Missing from the Regional Model

Intersection ID	Intersection	Missing Link
1	OR 99W at SW Langer Farms Parkway	Driveway to Sherwood Business Park
6	OR 99W at SW Chapman Road/SW Brookman Road	SW Chapman Road
7	SW Timbrel Lane at SW Sunset Boulevard	SW Timbrel Lane
7	SW Timbrel Lane at SW Sunset Boulevard	SW Sunset Boulevard from SW Timbrel Lane to SW Pinehurst Drive
8	SW Pinehurst Drive at SW Sunset Boulevard	SW Pinehurst Drive- north leg
8	SW Pinehurst Drive at SW Sunset Boulevard	SW Pinehurst Drive- south leg
10	SW Murdock Road/SW Baker Road at SW Sunset Boulevard /SW McKinley Drive	SW Mckinley Drive
12	SW Oregon Street at SW Tualatin-Sherwood Road	Driveway to Sherwood Business Center II
13	SW Sherwood Boulevard at SW 12th Street/SW Century Drive	SW 12th Street

How Base Year (2020) Volumes Were Established

Since no modeled volumes existed for these links, 2020 base year volumes were derived from the 2025 turning movement counts collected in the field. The measured 2025 counts were factored back in time to the 2020 base year using one of two annual reduction rates, depending on the characteristics of each segment:

- 1.5% per year reduction: Applied to all local segments except Chapman Road. This reflects typical pre-pandemic to post-pandemic traffic trends on local streets in Sherwood.
- 0.5% per year reduction: Applied specifically to SW Chapman Road. A more conservative rollback was used here because the Sherwood West area experienced limited development activity during the intervening period, meaning growth was slower than average.

Table 2. Estimated 2020 Volumes for Links Missing from the Regional Model

Int ID	Link	Node Key	Direction	2025 Measured Volume		Annual Reduction	2020 Adjusted Volume	
				4-5 PM	5-6 PM		4-5 PM	5-6 PM
1	Driveway to Sherwood Business Park	N33-1	EB	55	56	1.5%	51	52
1	Driveway to Sherwood Business Park	1-N33	WB	59	44	1.5%	55	41
6	SW Chapman Road	N34-6	EB	41	23	0.5%	40	22
6	SW Chapman Road	6-N34	WB	41	31	0.5%	40	30
7	SW Timbrel Lane	N35-7	NB	82	93	1.5%	76	86
7	SW Timbrel Lane	7-N35	SB	115	140	1.5%	106	130
7	SW Sunset Boulevard from SW Timbrel Lane to SW Pinehurst Drive	7-8	WB	416	394	1.5%	385	364
7	SW Sunset Boulevard from SW Timbrel Lane to SW Pinehurst Drive	8-7	EB	275	336	1.5%	254	311
8	SW Pinehurst Drive- south leg	N36-8	NB	54	54	1.5%	50	50

Int ID	Link	Node Key	Direction	2025 Measured Volume		Annual Reduction	2020 Adjusted Volume	
				4-5 PM	5-6 PM		4-5 PM	5-6 PM
8	SW Pinehurst Drive- south leg	8-N36	SB	81	92	1.5%	75	85
8	SW Pinehurst Drive- north leg	N37-8	SB	40	60	1.5%	37	56
8	SW Pinehurst Drive- north leg	8-N37	NB	103	99	1.5%	95	92
10	SW Mckinley Drive	N39-10	WB	25	16	1.5%	23	15
10	SW Mckinley Drive	10-N39	EB	14	28	1.5%	13	26
12	Driveway to Sherwood Business Center II	N39-12	SB	18	15	1.5%	17	14
12	Driveway to Sherwood Business Center II	12-N39	NB	8	7	1.5%	7	6
13	SW 12th Street	N38-13	EB	104	111	1.5%	96	103
13	SW 12th Street	13-N38	WB	50	49	1.5%	46	45

How Horizon Year (2045) Volumes Were Projected

From the 2020 base year volumes, the 2045 horizon year volumes were projected by applying a uniform growth rate of 2.0% per year across all missing link segments. This rate was derived from the growth observed in centroid connector volumes within the Sherwood area between the 2020 and 2045 regional model runs, ensuring the local projections are internally consistent with the broader model framework.

The resulting estimated volumes for all 18 missing link segments are shown in Table 3 below. Volumes are shown for both peak hours in each direction of travel.

Table 3. Estimated 2045 Volumes for Links Missing from the Regional Model

Int ID	Link	Node Key	Direction	2020 Adjusted Volume		Growth Rate	2045 Adjusted Volume	
				4-5 PM	5-6 PM		4-5 PM	5-6 PM
1	Driveway to Sherwood Business Park	N33-1	EB	51	52	2%	77	78
1	Driveway to Sherwood Business Park	1-N33	WB	55	41	2%	83	62
6	SW Chapman Road	N34-6	EB	40	22	2%	60	33
6	SW Chapman Road	6-N34	WB	40	30	2%	60	45
7	SW Timbrel Lane	N35-7	NB	76	86	2%	114	129
7	SW Timbrel Lane	7-N35	SB	106	130	2%	159	195
7	SW Sunset Boulevard from SW Timbrel Lane to SW Pinehurst Drive	7-8	WB	385	364	2%	578	546
7	SW Sunset Boulevard from SW Timbrel Lane to SW Pinehurst Drive	8-7	EB	254	311	2%	381	467
8	SW Pinehurst Drive- south leg	N36-8	NB	50	50	2%	75	75
8	SW Pinehurst Drive- south leg	8-N36	SB	75	85	2%	113	128
8	SW Pinehurst Drive- north leg	N37-8	SB	37	56	2%	56	84
8	SW Pinehurst Drive- north leg	8-N37	NB	95	92	2%	143	138
10	SW Mckinley Drive	N39-10	WB	23	15	2%	35	23
10	SW Mckinley Drive	10-N39	EB	13	26	2%	20	39
12	Driveway to Sherwood Business Center II	N39-12	SB	17	14	2%	26	21
12	Driveway to Sherwood Business Center II	12-N39	NB	7	6	2%	11	9
13	SW 12th Street	N38-13	EB	96	103	2%	144	155
13	SW 12th Street	13-N38	WB	46	45	2%	69	68

Step 2: Manual Adjustments Where the Model Diverges from Field Data

At several locations, the regional model's 2020 volumes showed a notable discrepancy compared to the 2025 field-measured counts. This can occur when the regional model does not fully capture local traffic patterns, such as traffic redistributing to driveways or side streets, or when model calibration does not closely match observed counts on specific corridors like OR 99W.

To address this, modeled link volumes at these locations were replaced with volumes derived from the 2025 field measurements. The 2025 measured counts were adjusted back to 2020 using the same methodology, applied to the missing links, using either a factor of 0.925 (representing a 1.5% per year reduction compounded over approximately five years, from 2025 to 2020) or a manual calibration approach for OR 99W corridor links.

Types of Adjustments Applied

Two distinct adjustment approaches were applied, depending on the cause of the discrepancy:

- Factor-based adjustment (0.925 multiplier): For locations where the model simply underestimated volumes, the 2025 measured volumes were multiplied by 0.925 to back-calculate the 2020 baseline. This factor corresponds to a 1.5% annual reduction applied over approximately five years.
- Manual calibration: For links along the OR 99W corridor and at locations where traffic had redistributed to nearby driveways or side streets (such as 12th Street), volumes were manually adjusted to reconcile the overall count patterns at each intersection and ensure directional consistency.

A representative selection of the manually adjusted volumes is shown in Table 4 below. The full set of adjustments includes 57 directional link segments spanning Intersections 1 through 15

Table 4. Manually Adjusted 2020 Base Year Volumes

Int ID	Node Key	Direction	4-5 PM		5-6 PM			Notes	
			2020 Model Volume	2025 Measured Volume	2020 Adjusted Volume	2020 Model Volume	2025 Measured Volume		2020 Adjusted Volume
1	N2-1	WB	17	226	209	11	203	188	Reduced measured volumes by 0.925
1	1-N2	EB	28	216	200	24	211	195	Reduced measured volumes by 0.925
1	1-N1	NB	1442	921	892	1393	979	993	Manually adjusted to account for the measured volumes on 99W
1	1-2	SB	1613	1823	1694	1605	1725	1775	Manually adjusted to account for the measured volumes on 99W
1	2-1	NB	1380	872	830	1345	917	945	Manually adjusted to account for the measured volumes on 99W
2	N4-2	EB	704	809	775	704	765	735	Manually adjusted to account for the shifting of volumes to driveway
2	2-N4	WB	760	1218	841	768	1091	938	Manually adjusted to account for the shifting of volumes to driveway
2	N3-2	WB	1046	1077	896	1076	957	926	Manually adjusted to account for the shifting of volumes to driveway & 12th st
2	2-N5	SB	1924	1812	1774	1912	1726	1762	Manually adjusted to account for the shifting of volumes to driveway & 12th st
3	N6-3	SB	1924	1812	1774	1912	1726	1762	Manually adjusted to account for the shifting of volumes to driveway & 12th st
3	N8-3	EB	138	545	504	136	544	503	Reduced measured volumes by 0.925
3	3-N8	WB	235	535	495	270	526	487	Reduced measured volumes by 0.925
3	N7-3	WB	376	583	539	382	597	552	Reduced measured volumes by 0.925

Int ID	Node Key	Direction	4-5 PM		5-6 PM			Notes	
			2020 Model Volume	2025 Measured Volume	2020 Adjusted Volume	2020 Model Volume	2025 Measured Volume		2020 Adjusted Volume
3	3-N7	EB	254	465	430	274	418	387	Reduced measured volumes by 0.925
3	3-2	NB	1617	1163	1067	1553	1187	1153	Manually adjusted to account for the measured volumes on 99W
4	4-3	NB	1573	1107	1023	1530	1156	1130	Manually adjusted to account for the measured volumes on 99W
4	5-4	NB	1408	970	858	1363	1122	963	Manually adjusted to account for the measured volumes on 99W
5	N11-5	EB	415	546	465	408	500	458	Manually adjusted to account for the measured volumes on 99W
5	5-N11	WB	430	522	480	440	532	490	Manually adjusted to account for the measured volumes on 99W
5	N12-5	WB	404	486	454	402	465	452	Manually adjusted to account for the measured volumes on 99W
5	5-N12	EB	355	425	405	410	480	460	Manually adjusted to account for the measured volumes on 99W
6	N13-6	WB	2	83	42	2	44	32	Manually adjusted to account for the shifting of volumes to Chapman Rd
6	6-N13	EB	2	86	42	2	107	24	Manually adjusted to account for the shifting of volumes to Chapman Rd
6	6-5	NB	1851	1313	1301	1801	1437	1401	Manually adjusted to account for the measured volumes on 99W
6	N14-6	NB	1853	1287	1303	1803	1464	1403	Manually adjusted to account for the measured volumes on 99W

Int ID	Node Key	Direction	4-5 PM		5-6 PM			Notes	
			2020 Model Volume	2025 Measured Volume	2020 Adjusted Volume	2020 Model Volume	2025 Measured Volume		2020 Adjusted Volume
8	9-8	WB	312	457	423	296	457	423	Reduced measured volumes by 0.925
8	8-9	EB	298	343	317	307	343	317	Reduced measured volumes by 0.925
10	N20-10	SB	286	394	364	269	399	369	Reduced measured volumes by 0.925
10	10-N20	NB	162	217	201	159	237	219	Reduced measured volumes by 0.925
10	N21-10	NB	423	301	278	428	302	279	Reduced measured volumes by 0.925
10	10-N21	SB	379	241	223	381	233	216	Reduced measured volumes by 0.925
10	N16-10	EB	421	250	231	436	268	248	Reduced measured volumes by 0.925
10	10-N16	WB	589	461	426	593	487	450	Reduced measured volumes by 0.925
11	N24-11	SB	271	440	288	302	466	316	Manually adjusted to account for shifting volumes to driveway on TSR
11	11-N24	NB	208	229	215	232	242	238	Manually adjusted to account for shifting volumes to driveway on TSR
12	N24-12	NB	241	288	221	237	270	243	Manually adjusted to account for shifting volumes to driveway on TSR
12	12-N24	SB	276	420	293	307	456	321	Manually adjusted to account for shifting volumes to driveway on TSR
13	N7-13	SB	97	429	397	108	427	395	Reduced measured volumes by 0.925
13	13-N7	NB	168	442	409	187	426	394	Reduced measured volumes by 0.925
13	N25-13	WB	14	217	201	23	205	190	Reduced measured volumes by 0.925
13	13-N25	EB	0	180	167	0	183	169	Reduced measured volumes by 0.925
13	N26-13	NB	154	301	278	164	309	286	Reduced measured volumes by 0.925

Int ID	Node Key	Direction	4-5 PM			5-6 PM			Notes
			2020 Model Volume	2025 Measured Volume	2020 Adjusted Volume	2020 Model Volume	2025 Measured Volume	2020 Adjusted Volume	
13	13-N26	SB	97	379	351	108	394	364	Reduced measured volumes by 0.925
14	N26-14	SB	84	228	211	95	222	205	Reduced measured volumes by 0.925
14	14-N26	NB	142	266	246	154	302	279	Reduced measured volumes by 0.925
14	N30-14	EB	16	139	129	15	141	130	Reduced measured volumes by 0.925
14	14-N30	WB	40	223	206	37	274	253	Reduced measured volumes by 0.925
14	N28-14	WB	162	314	290	158	373	345	Reduced measured volumes by 0.925
14	14-N28	EB	98	213	197	93	180	167	Reduced measured volumes by 0.925
14	N19-14	NB	224	173	160	232	191	177	Reduced measured volumes by 0.925
14	14-N19	SB	206	152	141	216	171	158	Reduced measured volumes by 0.925
15	N31-15	WB	98	315	291	94	191	177	Reduced measured volumes by 0.925
15	15-N31	EB	91	211	195	120	368	340	Reduced measured volumes by 0.925
15	N29-15	NB	154	410	379	134	388	359	Reduced measured volumes by 0.925
15	15-N29	SB	221	382	353	204	411	380	Reduced measured volumes by 0.925
15	N32-15	SB	283	477	441	303	555	513	Reduced measured volumes by 0.925
15	15-N32	NB	223	401	371	206	355	328	Reduced measured volumes by 0.925

2020
5-6 PM

- C#** Manually Adjusted Centroid
- Measured Link Volumes
- Calculations
- New Link Volume

Tualatin River
National
Wildlife Refuge

Reduction factor =
 $1 - (0.015 \times 5) = 0.925$

Reduction factor =
 $1 - (0.015 \times 5) = 0.925$

Reduction factor =
 $1 - (0.015 \times 5) = 0.925$

Reduction factor =
 $1 - (0.015 \times 5) = 0.925$

Reduction factor =
 $1 - (0.015 \times 5) = 0.925$

Reduction factor =
 $1 - (0.005 \times 5) = 0.975$



2020
4-5 PM

- C#** Manually Adjusted Centroid
- Measured Link Volumes
- Calculations
- New Link Volume

Tualatin River
National
Wildlife Refuge

Reduction factor =
 $1 - (0.015 \times 5) = 0.925$

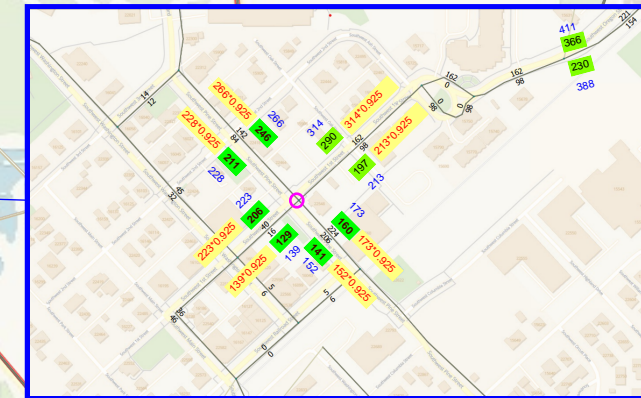
Reduction factor =
 $1 - (0.015 \times 5) = 0.925$

Reduction factor =
 $1 - (0.015 \times 5) = 0.925$

Reduction factor =
 $1 - (0.015 \times 5) = 0.925$

Reduction factor =
 $1 - (0.015 \times 5) = 0.925$

Reduction factor =
 $1 - (0.005 \times 5) = 0.975$



Correcting 2045 Volumes That Were Lower Than 2020 Adjusted Volumes

For a subset of the manually adjusted segments, the original 2045 regional model volumes were found to be equal to or lower than the 2020 adjusted volumes. This outcome was not consistent with regional growth projections, which indicate population growth of approximately 1.86% per year. A lower future volume than base year volume is not plausible under conditions of continued growth.

To correct this, revised 2045 volumes were derived by applying a 1.33% per year growth rate, compounded over 25 years, to the 2020 adjusted volumes. The 1.33% growth factor was calculated from the volume growth rates observed in the original regional model outputs across the broader Sherwood network, providing a locally grounded and model-consistent basis for the correction.

Table 5. Corrected 2045 Volumes

Int ID	Node Key	Direction	4-5 PM		5-6 PM	
			2020 Adjusted Volumes	2045 Adjusted Volumes	2020 Adjusted Volumes	2045 Adjusted Volumes
1	N2-1	WB	209	272	188	244
1	1-N2	EB	200	260	195	254
3	N7-3	WB	539	701	-	-
5	N12-5	WB	454	590	-	-
5	N11-5	EB	-	-	458	595
5	5-N12	EB	405	527	460	598
8	8-9	EB	317	412	317	412
7	N12-7	EB	355	462	410	533
13	N7-13	SB	397	516	395	525
13	13-N7	NB	409	532	394	524
13	N25-13	WB	201	261	190	253

Int ID	Node Key	Direction	4-5 PM		5-6 PM	
			2020 Adjusted Volumes	2045 Adjusted Volumes	2020 Adjusted Volumes	2045 Adjusted Volumes
13	13-N25	EB	167	217	169	225
13	N26-13	NB	278	361	286	380
13	13-N26	SB	351	456	364	484
14	N26-14	SB	211	274	205	273
14	14-N26	NB	246	320	279	371
14	N30-14	EB	129	168	130	173
15	N29-15	NB	379	493	359	477
15	N32-15	SB	-	-	513	682
15	15-N32	NB	371	482	328	436
15	15-N31	WB	-	-	340	452
15	N31-15	EB	291	378	-	-

The final post processed volumes for all links are shown in the following pages.

Existing Year	2025
Project Design Year	2045
Model Base Year	2020
Model Future Year	2045

Enter data in grey shaded cells



Use the closest model year (base, reference, interim, or future) to the desired project year (existing, build, design etc.).

Formulas to Update:
Column I: The existing year



The model link volumes in columns J and K MUST be reviewed before proceeding. Manual adjustments may be required.




See statement from NCHRP 255/765 below when choosing method. It is advised to evaluate results from both methods and choose preferred method. A suggestion is that if there is a very large (>25%) difference between future and base year model link volumes, use Difference method. Otherwise if there is a small difference between the Difference and Growth methods (<10%), use the Growth method. If Growth method is selected, use Weighted Growth method when a large difference between base and future link volumes exists. When there is a large difference between the Difference and Growth methods (>10%), use the Modified Average method.


4-5 PM Post-Processing - Future Year (2045) "Sherwood TSP 2025 Update" Directional Link Volumes


From Node	To Node	Node Key	Route	Direction	Missing Link Volumes	Manually Adjusted?	Balanced Existing Yr 30HV Counts	Model Volumes										Post Processed Project Design Year Volumes					Volume QA/QC	
								Model Assignment (enter manually if no access to Visum file)		Adjustment (model years to align w/ project years)			2045					Weighted Growth Method	Modified Average*** Diff & Wted Grwth	Method Suggested	Final Future No build 30HV Volumes	Percent Diff 2020 to 2040 (red when negative)	Existing DHV compared w/Base Yr Model ²	
								2020	2045	Annual Growth Rate (red when negative)	Model Base Adj. to Prj. Existing Yr	Model Future Adj. to Prj. Design Yr	Future/Base Model Ratio (red when >25%)	Percent Difference (yellow when >10%)	Difference Method*	Growth Method**								
								Raw Model Base Year	Raw Model Future No-build								2025							2045
N1	-	1	N1-1	OR 99W	SB	0	1866	1713	1984	0.006	1767	1984	1.12	0.58	2083	2095	2094	2088	wt grwth	2094	12.20	5.3%		
1	-	N1	1-N1	OR 99W	NB	0	921	892	1471	0.026	1008	1471	1.46	-2.92	1384	1344	1357	1371	diff	1384	50.29	-9.4%		
N2	-	1	N2-1	SW Langer Farms Pkwy	WB	0	226	209	272	0.012	222	272	1.23	0.36	276	277	277	277	wt grwth	277	22.56	2.0%		
1	-	N2	1-N2	SW Langer Farms Pkwy	EB	0	216	200	260	0.012	212	260	1.23	0.34	264	265	265	264	wt grwth	265	22.56	1.9%		
2	-	1	2-1	OR 99W	NB	0	923	830	1397	0.027	943	1397	1.48	-0.72	1377	1367	1370	1373	diff	1377	49.14	-2.2%		
1	-	2	1-2	OR 99W	SB	0	1833	1694	1815	0.003	1718	1815	1.06	0.33	1930	1936	1936	1933	wt grwth	1936	5.61	6.3%		
N33	-	1	N33-1	Driveway	EB	1	55	51	145	0.074	70	145	2.08	-13.05	130	114	123	126	diff	130	136.73	-26.9%		
1	-	N33	1-N33	Driveway	WB	1	59	55	245	0.138	93	245	2.63	-30.33	211	155	190	200	diff	211	257.63	-57.6%		
N4	-	2	N4-2	Roy Rogers	EB	0	809	775	934	0.008	807	934	1.16	0.04	936	937	936	936	wt grwth	936	15.76	0.3%		
2	-	N4	2-N4	Roy Rogers	WB	0	1218	841	1372	0.025	947	1372	1.45	7.13	1643	1764	1727	1685	diff	1643	34.88	22.2%		
N3	-	2	N3-2	TSR	WB	0	1077	896	1533	0.028	1023	1533	1.50	1.67	1587	1613	1604	1596	diff	1587	47.32	5.0%		
2	-	N3	2-N3	TSR	EB	0	929	915	1459	0.024	1024	1459	1.43	-3.00	1364	1324	1336	1350	diff	1364	46.85	-10.2%		
N5	-	2	N5-2	OR 99W	NB	0	1163	1617	2034	0.010	1700	2034	1.20	-7.30	1497	1391	1408	1453	wt grwth	1408	21.11	-46.2%		
2	-	N5	2-N5	OR 99W	SB	0	1812	1774	2087	0.007	1837	2087	1.14	-0.16	2062	2059	2059	2061	wt grwth	2059	13.66	-1.4%		
N6	-	3	N6-3	OR 99W	SB	0	1764	1774	2236	0.010	1866	2236	1.20	-0.95	2134	2113	2117	2125	wt grwth	2117	19.99	-5.8%		
3	-	N6	3-N6	OR 99W	NB	0	1122	1617	1953	0.008	1684	1953	1.16	-6.67	1391	1301	1313	1352	wt grwth	1313	17.06	-50.1%		
N7	-	3	N7-3	Sherwood Blvd	WB	0	583	539	701	0.012	571	701	1.23	0.37	712	715	715	713	wt grwth	715	22.56	2.0%		
3	-	N7	3-N7	Sherwood Blvd	EB	0	465	430	479	0.005	440	479	1.09	0.44	504	506	506	505	wt grwth	506	8.87	5.4%		
4	-	3	4-3	OR 99W	NB	0	1150	1023	2111	0.043	1241	2111	1.70	-3.20	2020	1957	1983	2002	diff	2020	75.69	-7.9%		
3	-	4	3-4	OR 99W	SB	0	1877	1906	2545	0.013	2034	2545	1.25	-1.66	2388	2349	2357	2372	diff	2388	27.23	-8.4%		
N8	-	3	N8-3	Edy Rd	EB	0	545	504	613	0.009	526	613	1.17	0.50	632	635	635	634	wt grwth	635	16.50	3.5%		
3	-	N8	3-N8	Edy Rd	WB	0	535	495	613	0.010	519	613	1.18	0.47	629	632	632	631	wt grwth	632	18.12	3.1%		
N9	-	4	N9-4	Meinecke Pkwy	EB	0	131	109	360	0.092	159	360	2.26	-11.33	332	296	316	324	diff	332	153.28	-21.5%		
4	-	N9	4-N9	Meinecke Pkwy	WB	0	122	167	573	0.097	248	573	2.31	-45.34	447	282	375	411	diff	447	266.23	-103.4%		
N10	-	4	N10-4	Meinecke Pkwy	WB	0	231	10	191	0.724	46	191	4.13	87.05	376	955	516	446	diff	376	62.68	80.0%		
4	-	N10	4-N10	Meinecke Pkwy	EB	0	272	177	200	0.005	182	200	1.10	3.11	290	300	299	295	wt grwth	299	9.82	33.2%		
5	-	4	5-4	OR 99W	NB	0	970	858	1627	0.036	1012	1627	1.61	-1.62	1585	1560	1569	1577	diff	1585	63.42	-4.3%		
4	-	5	4-5	OR 99W	SB	0	1623	1490	1826	0.009	1557	1826	1.17	0.60	1892	1903	1901	1897	wt grwth	1901	17.16	4.1%		
N11	-	5	N11-5	Elwert Rd	EB	0	532	465	567	0.009	485	567	1.17	1.27	614	621	620	617	wt grwth	620	16.60	8.8%		
5	-	N11	5-N11	Elwert Rd	WB	0	522	480	603	0.010	505	603	1.20	0.55	620	624	623	622	wt grwth	623	19.39	3.3%		
N12	-	5	N12-5	Sunset Blvd	WB	0	486	454	590	0.012	481	590	1.23	0.18	595	596	596	595	wt grwth	596	22.60	1.0%		
5	-	N12	5-N12	Sunset Blvd	EB	0	425	405	527	0.012	429	527	1.23	-0.19	522	521	521	522	wt grwth	521	22.68	-1.0%		
6	-	5	6-5	OR 99W	NB	0	1276	1301	2373	0.033	1515	2373	1.57	-6.56	2134	1998	2047	2090	diff	2134	67.21	-18.8%		
5	-	6	5-6	OR 99W	SB	0	2002	1967	2093	0.003	1992	2093	1.05	0.02	2103	2103	2103	2103	wt grwth	2103	5.06	0.5%		
N13	-	6	N13-6	Brookman Rd	WB	0	83	42	303	0.249	94	303	3.22	-8.89	292	267	284	288	diff	292	251.57	-13.5%		
6	-	N13	6-N13	Brookman Rd	EB	0	86	42	223	0.172	78	223	2.85	6.07	231	245	236	233	diff	231	168.37	9.1%		
N14	-	6	N14-6	OR 99W	NB	0	1287	1853	2316	0.010	1946	2316	1.19	-7.86	1657	1532	1552	1605	wt grwth	1552	20.60	-51.2%		
6	-	N14	6-N14	OR 99W	SB	0	2020	1969	2676	0.014	2110	2676	1.27	-0.94	2586	2561	2566	2576	diff	2586	28.00	-4.5%		
N34	-	6	N34-6	Chapman Rd	EB	1	41	40	60	0.020	44	60	1.36	-1.93	57	56	56	57	diff	57	39.02	-7.3%		
6	-	N34	6-N34	Chapman Rd	WB	1	41	40	60	0.020	44	60	1.36	-1.93	57	56	56	57	diff	57	39.02	-7.3%		
8	-	9	8-9	Sunset Blvd	EB	0	276	317	412	0.012	336	412	1.23	-3.94	352	338	341	347	wt grwth	341	23.55	-21.7%		
9	-	8	9-8	Sunset Blvd	WB	0	519	423	455	0.003	429	455	1.06	0.98	545	550	550	547	wt grwth	550	5.90	17.3%		
N17	-	9	N17-9	Ladd Hill Rd	NB	0	187	41	342	0.294	101	342	3.38	38.53	428	632	488	458	diff	428	128.77	45.9%		
9	-	N17	9-N17	Ladd Hill Rd	SB	0	211	52	464	0.317	134	464	3.45	29.61	541	728	595	568	diff	541	156.21	36.3%		
N15	-	9	N15-9	Sunset Blvd	WB	0	447	330	622	0.035	388	622	1.60	5.05	681	716	703	692	diff	681	52.26	13.1%		
9	-	N15	9-N15	Sunset Blvd	EB	0	258	314	577	0.034	367	577	1.57	-14.25	468	406	429	449	diff	468	81.55	-42.1%		
N18	-	9	N18-9	Main St	SB	0	267	46	303	0.223	97	303	3.11	54.94	473	831	588	530	diff	473	77.00	63.5%		
9	-	N18	9-N18	Main St	NB	0	199	36	92	0.062	47	92	1.95	45.62	244	388	318	281	diff	244	22.51	76.3%		
N21	-	10	N21-10	Baker Rd	NB	0	301	278	418	0.020	306	418	1.37	-0.44	413	411	412	412	diff	413	37.21	-1.7%		
10	-	N21	10-N21	Baker Rd	SB	0	241	223	459	0.042	270	459	1.70	-4.86	430	409	418	424	diff	430	78.34	-12.1%		
N16	-	10	N16-10	Sunset Blvd	EB	0	250	231	708	0.083	326	708	2.17	-15.22	632	542	590	611	diff	632	152.64	-30.6%		
10	-	N16	10-N16	Sunset Blvd	WB	0	498	426	731	0.029	487	731	1.50	0.74	742	748	746	744	diff	742	49.00	2.2%		
N20	-	10	N20-10	Murdock Rd	SB	0	394	364	472	0.012	386	472	1.22	0.39	480	482	482	481	wt grwth	482	22.32	2.1%		
10	-	N20	10-N20	Murdock Rd	NB	0	217	201	409	0.041	243	409	1.69	-4.69	383	366	373	378	diff	383	76.68	-11.8%		
N39	-	10	N39-10	Mckinley Dr	WB	1	25	23	35	0.021	25	35	1.38	-0.44	35	34	34	35	diff	35	38.40	-1.6%		
10	-	N39	10-N39	Mckinley Dr	EB	1	14	13	20	0.022	14	20	1.39	-0.80	20	19	19	20	diff	20	40.00	-2.9%		
N12	-	7	N12-7	Sunset Blvd	EB	0	339	355	462	0.012	376	462	1.23	-2.01	424	416	417	421	wt grwth	417	23.10	-11.0%		
7	-	N12	7-N12	Sunset Blvd	WB	0	447	404	458	0.005	415	458	1.10	0.68	490	494	493	492	wt grwth	493	10.34	7.2%		
N35	-	7	N35-7	Timbrel Rd	NB	1	82	76	114	0.020	84	114	1.36	-0.52	112	112	112	112	diff	112	37.07	-2.0%		
7	-	N35	7-N35																					

Existing Year	2025
Project Design Year	2045
Model Base Year	2020
Model Future Year	2045

Enter data in grey shaded cells

 Use the closest model year (base, reference, interim, or future) to the desired project year (existing, build, design etc.).

 The model link volumes in columns J and K MUST be reviewed before proceeding. Manual adjustments may be required.

 See statement from NCHRP 255/765 below when choosing method. It is advised to evaluate results from both methods and choose preferred method. A suggestion is that if there is a very large (>25%) difference between future and base year model link volumes, use Difference method. Otherwise if there is a small difference between the Difference and Growth methods (<10%), use the Growth method. If Growth method is selected, use Weighted Growth method when a large difference between base and future link volumes exists. When there is a large difference between the Difference and Growth methods (>10%), use the Modified Average method.

5-6 PM							Post-Processing - Future Year (2045) "Sherwood TSP 2025 Update" Directional Link Volumes																					
From Node	To Node	Node Key	Route	Direction	Missing Link Volumes	Manually Adjusted?	Balanced Existing Yr 30HV Counts	Model Volumes												Post Processed Project Design Year Volumes							Volume QA/QC	
								Model Assignment (enter manually if no access to Visum file)		Adjustment (model years to align w/ project years)		2045							Weighted Growth Method		Modified Average*** Diff & Wted Grwth		Method Suggested	Final Future No build 30HV Volumes	Percent Diff 2020 to 2040 (red when negative)	Existing DHV compared w/Base Yr Model ²		
								2020	2045	Annual Growth Rate (red when negative)	2025	2045	Future/Base Model Ratio (red when >25%)	Percent Difference (yellow when >10%)	Difference Method*	Growth Method**	Weighted Growth Method	Average***	Method Suggested	Final Future No build 30HV Volumes	Percent Diff 2020 to 2040 (red when negative)	Existing DHV compared w/Base Yr Model ²						
								Raw Model Base Year	Raw Model Future No-build		Model Base Adj. to Prj. Existing Yr	Model Future Adj. to Prj. Design Yr																
N1	-	1	N1-1	OR 99W	SB	0	1783	1701	1961	0.006	1753	1961	1.12	0.18	1991	1995	1994	1994	wt grwth	1994	11.84	1.7%						
1	-	N1	1-N1	OR 99W	NB	0	979	993	1463	0.019	1087	1463	1.35	-2.80	1355	1318	1327	1355	diff	1355	38.41	-11.0%						
N2	-	1	N2-1	SW Langer Farms Pkwy	WB	0	203	188	244	0.012	199	244	1.23	0.34	248	249	249	248	wt grwth	249	22.56	1.8%						
1	-	N2	1-N2	SW Langer Farms Pkwy	EB	0	211	195	254	0.012	207	254	1.23	0.38	258	259	259	258	wt grwth	259	22.56	2.0%						
2	-	1	2-1	OR 99W	NB	0	929	945	1379	0.018	1032	1379	1.34	-2.75	1276	1242	1250	1263	diff	1276	37.37	-11.1%						
1	-	2	1-2	OR 99W	SB	0	1742	1775	1811	0.001	1782	1811	1.02	-0.04	1771	1770	1770	1770	grwth	1770	1.62	-2.3%						
N33	-	1	N33-1	Driveway	EB	1	56	52	78	0.020	57	78	1.36	-0.57	77	76	76	77	diff	77	37.14	-2.1%						
1	-	N33	1-N33	Driveway	WB	1	44	41	62	0.020	45	62	1.37	-0.74	61	60	60	61	diff	61	38.18	-2.7%						
N4	-	2	N4-2	Roy Rogers	EB	0	765	735	944	0.011	777	944	1.22	-0.27	932	930	930	931	wt grwth	930	21.58	-1.5%						
2	-	N4	2-N4	Roy Rogers	WB	0	1091	938	1399	0.020	1030	1399	1.36	1.48	1460	1482	1476	1468	diff	1460	33.80	5.6%						
N3	-	2	N3-2	TSR	WB	0	957	926	1534	0.026	1048	1534	1.46	-2.96	1443	1401	1415	1429	diff	1443	50.83	-9.5%						
2	-	N3	2-N3	TSR	EB	0	905	912	1455	0.024	1021	1455	1.43	-3.74	1339	1290	1305	1322	diff	1339	48.00	-12.8%						
N5	-	2	N5-2	OR 99W	NB	0	1187	1553	2015	0.012	1645	2015	1.22	-6.84	1557	1454	1473	1515	wt grwth	1473	24.05	-38.6%						
2	-	N5	2-N5	OR 99W	SB	0	1726	1762	2071	0.007	1824	2071	1.14	-0.67	1973	1960	1962	1967	wt grwth	1962	13.65	-5.7%						
N6	-	3	N6-3	OR 99W	SB	0	1751	1762	2224	0.010	1854	2224	1.20	-0.98	2121	2100	2103	2112	wt grwth	2103	20.13	-5.9%						
3	-	N6	3-N6	OR 99W	NB	0	1209	1553	1933	0.010	1629	1933	1.19	-5.32	1513	1435	1447	1480	wt grwth	1447	19.68	-34.7%						
N7	-	3	N7-3	Sherwood Blvd	WB	0	597	552	647	0.007	571	647	1.13	0.51	673	675	676	675	wt grwth	676	13.24	4.4%						
3	-	N7	3-N7	Sherwood Blvd	EB	0	418	387	473	0.009	404	473	1.17	0.48	487	489	489	488	wt grwth	489	16.94	3.3%						
4	-	3	4-3	OR 99W	NB	0	1279	1130	2098	0.034	1324	2098	1.59	-1.28	2053	2027	2037	2045	diff	2053	60.55	-3.5%						
3	-	4	3-4	OR 99W	SB	0	1895	1864	2508	0.014	1993	2508	1.26	-1.05	2410	2385	2390	2400	diff	2410	27.19	-5.2%						
N8	-	3	N8-3	Edy Rd	EB	0	544	503	581	0.006	519	581	1.12	0.50	606	609	609	608	wt grwth	609	11.97	4.7%						
3	-	N8	3-N8	Edy Rd	WB	0	526	487	636	0.012	517	636	1.23	0.33	645	647	647	646	wt grwth	647	22.99	1.7%						
N9	-	4	N9-4	Meinecke Pkwy	EB	0	151	108	363	0.094	159	363	2.28	-2.93	355	345	351	353	diff	355	135.10	-5.3%						
4	-	N9	4-N9	Meinecke Pkwy	WB	0	101	176	583	0.093	257	583	2.26	-60.38	427	229	339	383	diff	427	322.38	-154.9%						
N10	-	4	N10-4	Meinecke Pkwy	WB	0	228	10	199	0.756	48	199	4.16	85.82	379	949	516	448	diff	379	66.32	79.0%						
4	-	N10	4-N10	Meinecke Pkwy	EB	0	324	167	215	0.011	177	215	1.22	8.47	362	394	389	376	wt grwth	389	19.98	45.5%						
5	-	4	5-4	OR 99W	NB	0	1122	963	1609	0.027	1092	1609	1.47	0.86	1639	1653	1648	1644	diff	1639	46.06	2.7%						
4	-	5	4-5	OR 99W	SB	0	1559	1438	1770	0.009	1504	1770	1.18	0.53	1825	1834	1833	1829	wt grwth	1833	17.56	3.5%						
N11	-	5	N11-5	Elwert Rd	EB	0	500	458	595	0.012	485	595	1.23	0.54	610	613	613	611	wt grwth	613	22.52	2.9%						
5	-	N11	5-N11	Elwert Rd	WB	0	532	490	634	0.012	519	634	1.22	0.45	647	650	650	648	wt grwth	650	22.10	2.5%						
N12	-	5	N12-5	Sunset Blvd	WB	0	465	452	520	0.006	466	520	1.12	-0.01	519	519	519	519	wt grwth	519	11.69	-0.1%						
5	-	N12	5-N12	Sunset Blvd	EB	0	480	460	598	0.012	488	598	1.23	-0.29	590	589	589	590	wt grwth	589	22.71	-1.6%						
6	-	5	6-5	OR 99W	NB	0	1462	1401	2096	0.020	1540	2096	1.36	-1.41	2018	1990	1997	2008	diff	2018	38.03	-5.3%						
5	-	6	5-6	OR 99W	SB	0	1846	1837	2324	0.011	1934	2324	1.20	-0.80	2236	2218	2221	2228	wt grwth	2221	20.30	-4.8%						
N13	-	6	N13-6	Brookman Rd	WB	0	44	32	283	0.314	82	283	3.44	-47.10	245	151	218	231	diff	245	456.36	-86.8%						
6	-	N13	6-N13	Brookman Rd	EB	0	107	24	221	0.328	63	221	3.49	34.00	265	373	296	280	diff	265	147.29	40.7%						
N14	-	6	N14-6	OR 99W	NB	0	1464	1403	2317	0.026	1586	2317	1.46	-2.59	2195	2139	2157	2176	diff	2195	49.95	-8.3%						
6	-	N14	6-N14	OR 99W	SB	0	1807	1839	2607	0.017	1993	2607	1.31	-2.39	2421	2364	2378	2400	diff	2421	34.00	-10.3%						
N34	-	6	N34-6	Chapman Rd	EB	1	23	22	33	0.020	24	33	1.36	-1.38	32	31	31	32	diff	32	38.26	-5.2%						
6	-	N34	6-N34	Chapman Rd	WB	1	31	30	45	0.020	33	45	1.36	-1.71	43	42	42	43	diff	43	38.71	-6.5%						
8	-	9	8-9	Sunset Blvd	EB	0	343	317	412	0.012	336	412	1.23	0.38	419	421	420	420	wt grwth	420	22.56	2.0%						
9	-	8	9-8	Sunset Blvd	WB	0	462	423	486	0.006	436	486	1.12	0.59	512	515	515	514	wt grwth	515	11.50	5.7%						
N17	-	9	N17-9	Ladd Hill Rd	NB	0	183	42	347	0.290	103	347	3.37	36.32	427	617	483	455	diff	427	133.33	43.7%						
9	-	N17	9-N17	Ladd Hill Rd	SB	0	230	49	458	0.334	131	458	3.50	36.42	557	805	628	593	diff	557	142.26	43.1%						
N15	-	9	N15-9	Sunset Blvd	WB	0	426	312	631	0.041	376	631	1.68	4.88	681	715	702	691	diff	681	59.91	11.8%						
9	-	N15	9-N15	Sunset Blvd	EB	0	295	326	581	0.031	377	581	1.54	-9.31	499	455	470	485	diff	499	69.15	-27.8%						
N18	-	9	N18-9	Main St	SB	0	250	44	314	0.245	98	314	3.20	52.88	466	801	571	518	diff	466	86.40	60.8%						
9	-	N18	9-N18	Main St	NB	0	204	34	87	0.062	45	87	1.95	47.04	246	398	324	285	diff	246	20.78	78.1%						
N21	-	10	N21-10	Baker Rd	NB	0	302	279	434	0.022	310	434	1.40	-0.75	426	423	424	425	diff	426	41.06	-2.6%						
10	-	N21	10-N21	Baker Rd	SB	0	233	216	461	0.045	265	461	1.74	-5.67	429	405	415	422	diff	429	84.12	-13.7%						
N16	-	10	N16-10	Sunset Blvd	EB	0	268	248	701	0.073	339	701	2.07	-12.75	630	555	594	612	diff	630	135.22	-26.3%						
10	-	N16	10-N16	Sunset Blvd	WB	0	487	450	754	0.027	511	754	1.48	-1.56	730	719	723	726	diff	730	49.94	-4.9%						
N20	-	10	N20-10	Murdock Rd	SB	0	399	369	475	0.011	390	475	1.22	0.39	484	486	485	485	wt grwth	485	21.65	2.2%						
10	-	N20	10-N20	Murdock Rd	NB	0	237	219	395	0.032	254	395	1.55	-2.55	378	368	372	375	diff	378	59.41	-7.3%						
N39	-	10	N39-10	Mckinley Dr	WB	1	16	15	23	0.021	17	23	1.39	-1.04	22	22	22	22	diff	22	40.00	-3.8%						
10	-	N39	10-N39	Mckinley Dr	EB	1	28	26	39	0.020	29	39	1.36	-0.57	38	38	38	38	diff	38	37.14	-2.1%						
N12	-	7	N12-7	Sunset Blvd	EB	0	394	410	533	0.012	435	533	1.23	-1.88	492	483	485	489	wt grwth	485	23.07	-10.3%						
7	-	N12	7-N12	Sunset Blvd	WB	0	405	402	520	0.012	426	520	1.22	-0.92	499	495	496	498	wt grwth	496	22.39	-5.1%						
N35	-	7	N35-7	Timbrel Rd	NB	1	93	86	129	0.020	95	129	1.36	-0.46	127	127	127	127	diff	127	36.99	-1.7%						
7	-	N35	7-N35	Timbrel Rd	SB	1	140																					

N36	-	8	N36-8	Pinehurst Dr	NB	1	0	54	50	75	0.020	55	75	1.36	-0.49	74	74	74	74	diff	74	37.04	-1.9%
8	-	N36	8-N36	Pinehurst Dr	SB	1	0	92	85	128	0.020	94	128	1.37	-0.47	126	126	126	126	diff	126	37.39	-1.7%
N37	-	8	N37-8	Pinehurst Dr	SB	1	0	60	56	84	0.020	62	84	1.36	-0.71	82	82	82	82	diff	82	37.33	-2.7%
8	-	N37	8-N37	Pinehurst Dr	NB	1	0	99	92	138	0.020	101	138	1.36	-0.59	136	135	135	136	diff	136	37.17	-2.2%
N24	-	11	N24-11	Oregon St	SB	0	1	466	316	399	0.011	333	399	1.20	4.88	532	559	555	543	wt grwth	555	19.01	28.6%
11	-	N24	11-N24	Oregon St	NB	0	1	242	238	311	0.012	253	311	1.23	-0.82	300	298	298	299	wt grwth	298	23.31	-4.4%
N27	-	11	N27-11	Tonquin Rd	WB	0	0	393	427	597	0.016	461	597	1.30	-3.87	529	509	514	521	diff	529	34.61	-17.3%
11	-	N27	11-N27	Tonquin Rd	EB	0	0	285	219	437	0.040	263	437	1.66	3.19	459	474	468	464	diff	459	61.19	7.9%
N40	-	11	N40-11	Oregon St	NB	0	0	354	354	613	0.029	406	613	1.51	-4.83	561	535	544	552	diff	561	58.53	-14.6%
11	-	N40	11-N40	Oregon St	SB	0	0	686	633	861	0.014	679	861	1.27	0.23	868	870	870	869	diff	868	26.59	1.1%
N24	-	12	N24-12	Oregon St	NB	0	1	270	243	412	0.028	277	412	1.49	-0.82	405	402	403	404	diff	405	50.07	-2.5%
12	-	N24	12-N24	Oregon St	SB	0	1	456	321	420	0.012	341	420	1.23	4.88	535	562	557	546	wt grwth	557	22.13	25.3%
N23	-	12	N23-12	TSR	EB	0	0	711	728	1407	0.037	864	1407	1.63	-7.97	1254	1158	1195	1225	diff	1254	76.40	-21.5%
12	-	N23	12-N23	TSR	WB	0	0	807	825	1931	0.054	1046	1931	1.85	-12.72	1692	1490	1582	1637	diff	1692	109.64	-29.6%
N22	-	12	N22-12	TSR	WB	0	0	1035	1123	2365	0.044	1371	2365	1.72	-12.78	2029	1785	1887	1958	diff	2029	96.00	-32.5%
12	-	N22	12-N22	TSR	EB	0	0	761	1107	1987	0.032	1283	1987	1.55	-21.67	1465	1179	1280	1373	diff	1465	92.51	-68.6%
N7	-	13	N7-13	Sherwood Blvd	SB	0	1	427	395	525	0.013	421	525	1.25	0.28	531	533	532	532	wt grwth	532	24.70	1.4%
13	-	N7	13-N7	Sherwood Blvd	NB	0	1	426	394	524	0.013	420	524	1.25	0.28	530	532	531	531	wt grwth	531	24.70	1.4%
N25	-	13	N25-13	Century Dr	WB	0	1	205	190	253	0.013	203	253	1.25	0.24	255	256	256	255	wt grwth	256	24.71	1.2%
13	-	N25	13-N25	Century Dr	EB	0	1	183	169	225	0.013	180	225	1.25	0.31	228	228	228	228	wt grwth	228	24.69	1.6%
N26	-	13	N26-13	Sherwood Blvd	NB	0	1	309	286	380	0.013	305	380	1.25	0.27	385	386	385	385	wt grwth	385	24.70	1.3%
13	-	N26	13-N26	Sherwood Blvd	SB	0	1	394	364	484	0.013	388	484	1.25	0.30	490	492	491	491	wt grwth	491	24.69	1.5%
N38	-	13	N38-13	12th St	EB	1	0	111	103	155	0.020	113	155	1.37	-0.58	153	152	152	152	diff	153	37.48	-2.2%
13	-	N38	13-N38	12th St	WB	1	0	49	45	68	0.020	50	68	1.37	-0.33	67	67	67	67	diff	67	37.55	-1.2%
N26	-	14	N26-14	Pine St	SB	0	1	222	205	273	0.013	219	273	1.25	0.31	276	277	277	276	wt grwth	277	24.69	1.6%
14	-	N26	14-N26	Pine St	NB	0	1	302	279	371	0.013	297	371	1.25	0.30	376	377	377	376	wt grwth	377	24.69	1.5%
N30	-	14	N30-14	1st St	EB	0	1	141	130	173	0.013	139	173	1.25	0.34	175	176	176	176	wt grwth	176	24.68	1.7%
14	-	N30	14-N30	1st St	WB	0	1	274	253	314	0.010	265	314	1.18	0.50	323	324	324	323	wt grwth	324	18.31	3.2%
N28	-	14	N28-14	1st St	WB	0	1	373	345	593	0.029	395	593	1.50	-1.92	571	561	564	568	diff	571	53.19	-5.8%
14	-	N28	14-N28	1st St	EB	0	1	180	167	233	0.016	180	233	1.29	-0.03	233	233	233	233	diff	233	29.33	-0.1%
N19	-	14	N19-14	Pine St	NB	0	1	191	177	300	0.028	202	300	1.49	-1.80	289	284	286	288	diff	289	51.52	-5.5%
14	-	N19	14-N19	Pine St	SB	0	1	171	158	413	0.065	209	413	1.98	-10.41	375	338	356	366	diff	375	119.30	-22.2%
N29	-	15	N29-15	Oregon St	NB	0	1	388	359	477	0.013	383	477	1.25	0.27	483	484	484	483	wt grwth	484	24.70	1.4%
15	-	N29	15-N29	Oregon St	SB	0	1	411	380	634	0.027	431	634	1.47	-1.53	614	605	608	611	diff	614	49.44	-4.8%
N32	-	15	N32-15	Oregon St	SB	0	1	555	513	682	0.013	547	682	1.25	0.29	690	692	692	691	wt grwth	692	24.69	1.5%
15	-	N32	15-N32	Oregon St	NB	0	1	355	328	436	0.013	350	436	1.25	0.30	442	443	443	442	wt grwth	443	24.69	1.5%
N31	-	15	N31-15	SW Langer Farms Pkwy	EB	0	1	191	177	301	0.028	202	301	1.49	-1.85	290	285	287	288	diff	290	51.94	-5.7%
15	-	N31	15-N31	SW Langer Farms Pkwy	WB	0	1	368	340	452	0.013	362	452	1.25	0.30	458	459	459	458	wt grwth	459	24.69	1.5%
12	-	N39	12-N39	Driveway	NB	1	0	7	6	9	0.020	7	9	1.36	1.54	9	10	10	9	diff	9	34.29	5.7%
N39	-	12	N39-12	Driveway	SB	1	0	15	14	21	0.020	15	21	1.36	-0.71	21	20	20	21	diff	21	37.33	-2.7%

Step 3: Selecting Peak Hour Factors for Future Conditions

The peak hour factor (PHF) is used in HCM-based intersection capacity analysis to convert hourly volumes into peak flow rates that represent the busiest interval within the hour. For future conditions analysis, it is necessary to select a PHF that reflects expected future traffic behavior rather than simply using the existing measured value.

ODOT's Analysis Procedures Manual (APM) provides guidance on adjusting PHFs for future conditions and includes default PHF values by functional class combination. The existing PHFs measured during the 2025 counts were compared to the APM default values for each intersection, considering the functional classification of the intersecting streets.

In all cases, the existing measured PHF for at least one of the two peak hours was found to be higher than the APM default. Per APM guidance, when the existing PHF exceeds the default, the higher of the two existing peak hour PHFs is retained for use in the future conditions analysis. This approach is conservative, as a higher PHF results in higher peak flow rates and thus more demanding capacity conditions.

For intersections where the APM does not provide a default PHF (noted as N/A in the table), because the functional class combination is not represented in the APM's lookup matrix, the selection was based solely on the existing measured values.

Table 6. Future Peak Hour Factor Selection by Intersection

Int ID	North-South Corridor	N-S Functional Class	East-West Corridor	E-W Functional Class	APM Default PHF	Existing PHF 4-5 PM	Existing PHF 5-6 PM	Future PHF
1	Pacific Hwy W (OR 99W)	Principal Arterial	SW Langer Farms Pkwy	Collector	NA	0.94	0.91	0.94
2	Pacific Hwy W (OR 99W)	Principal Arterial	SW Tualatin-Sherwood Rd	Arterial	0.92	0.95	0.93	0.95
3	Pacific Hwy W (OR 99W)	Principal Arterial	SW Edy Rd/SW Sherwood Blvd	Collector-Arterial	0.92	0.96	0.94	0.96
4	Pacific Hwy W (OR 99W)	Principal Arterial	SW Meinecke Pkwy	Collector	NA	0.94	0.90	0.94
5	Pacific Hwy W (OR 99W)	Principal Arterial	SW Elwert Rd/SW Sunset Blvd	Arterial	0.92	0.97	0.97	0.97
6	Pacific Hwy W (OR 99W)	Principal Arterial	SW Chapman Rd/ SW Brookman Rd	Collector-Arterial	0.92	0.97	0.96	0.97
7	SW Timbrel Ln	Collector	SW Sunset Blvd	Arterial	0.88	0.88	0.91	0.91
8	SW Pinehurst Dr	Neighborhood	SW Sunset Blvd	Arterial	NA	0.87	0.92	0.92
9	SW Main St/ SW Ladd Hill Rd	Arterial	SW Sunset Blvd	Arterial	0.90	0.91	0.93	0.93
10	SW Murdock Rd/ SW Baker Rd	Arterial	SW Sunset Blvd/ SW McKinley Dr	Arterial	0.90	0.94	0.85	0.94
11	SW Oregon St	Arterial	SW Tonquin Rd	Arterial	0.90	0.92	0.91	0.92
12	SW Oregon St	Arterial	SW Tualatin-Sherwood Rd	Arterial	0.90	0.95	0.92	0.95
13	SW Sherwood Blvd	Arterial	SW 12th St/SW Century Dr	Collector	0.88	0.94	0.91	0.94
14	SW Pine St	Arterial	SW 1st St	Collector-Arterial	0.92	0.94	0.89	0.94
15	SW Oregon St	Collector	SW Langer Farms Pkwy	Collector	0.85	0.94	0.95	0.95

NA - Functional class combinations are not consistent with APM

Step 4: Incorporate post processed future volumes into intersection operations analysis

After the volumes were post processed as described in Steps 1-3, the volumes were incorporated into an intersection operations analysis to project future demand of the study intersections.

Appendix B: Regional Transportation Plan 2023 Financially Constrained Projects in Sherwood

RTP ID	Project Name	Start Location	End Location	Description	Estimated Cost (in 2023 dollars)
10682	Brookman Road Improvements	SW Pacific Highway	SW Ladd Hill Rd.	Arterial road between OR 99W and SW Ladd Hill Road, all-phases including additional Plan Development, Design, ROW Acquisition, Construction, Construction Administration, Inspections.	\$ 21,400,000
10691	Sherwood Blvd Improvements	SW Century Dr.	SW 3rd St.	Reconstruct road to 3-lane arterial standards. Median/turn lane, landscape strip, ADA compliant sidewalks. Reconstruct intersection at 3rd St to increase capacity. Assume SW Century Drive improved by development and/or local funds.	\$ 2,900,000
10692	Edy Rd Improvements	SW Elwert Rd	SW Cherry Orchards Pl.	Reconstruct road to 3-lane collector standards w/ sidewalks and bike lanes. Partial Washington County jurisdictions and assumed to become City's jurisdiction upon completion of project.	\$ 13,000,000
10699	Oregon Street Improvements	SW Murdock Rd	SW Langer Farms Pkwy	Widen existing substandard 2-lane road (no sidewalks, no median) to a 3-lane collector meeting current TSP standards (8' sidewalks, 5' landscape strip, 12' travel, 14' median, 12' travel, 5' landscape, 8' sidewalks, plus 2 on-street bike lanes or 4' added to each 8' sidewalk). On-street bike lanes vs. 2 multi-use paths TBD with future development.	\$ 8,400,000
10701	Cedar Creek Trail	SW Oregon St	SW Roy Rogers Rd	Regional trail between OR 99W (Pacific Highway) & SW Edy Rd and SW Edy Rd to SW Roy Rogers Rd, all-phases including additional Plan Development, Design, ROW Acquisition, Construction, Construction Administration, Inspections.	\$ 9,700,000
11404	Baler Way Extension	SW Langer Farms Parkway	SW Tualatin-Sherwood Road	Extend SW Baler Way (3-lane collector) between SW Tualatin-Sherwood Road and SW Langer Farms Parkway, possibly SW Pacific Highway depending upon results of widening of SW Tualatin-Sherwood Road project by Washington County.	\$ 2,700,000
12044	Langer Farms Parkway Extension	SW Pacific Hwy	SW Roy Rogers Rd	Extends SW Langer Farms Parkway (3-lane collector street) west across OR 99W to serve undeveloped land within city limits and UGA expansion areas.	\$ 4,500,000
12046	Tonquin Area East-West Collector	SW 124th Avenue	SW Tonquin Road	Construct 3-lane collector status road between SW 124th Avenue and SW Tonquin Road through the Tonquin employment area to serve recent UGB annexation area.	\$ 13,000,000
10681	Elwert Road Improvements	SW Handley St	SW Edy Rd	Construct arterial status roadway between new roundabout (~800' NW of Pacific Hwy) and SW Edy Rd.	\$ 10,500,000
10684	Cedar Brook Way: Elwert to 99W	99W	Elwert Rd	Construct collector status road between SW Elwert Rd @ intersection with SW Handley St and SW Pacific Hwy (OR 99W).	\$ 8,400,000
10689	Old Town Arterials-Collectors	SW 3rd St	SW Willamette St	Complete arterials and collector streets within old town overlay per City TSP.	\$ 8,100,000
10693	Ladd Hill Road Improvements	SW Sunset Blvd	UGB Southern Boundary (SW Brookman Rd)	Widen SW Ladd Hill Road to 3-lane collector street standards between SW Sunset Blvd and UGB southern boundary, potentially between SW Brookman Rd improvements.	\$ 8,800,000
10698	Sunset Blvd.	SW Aldergrove Ave	SW Eucalyptus Lane	Reconstruct road to 3 lane arterial standards in sections not already to TSP section for arterial. Fix vertical crest sight distance issue at Pine St intersection. Possible signal or roundabout at Sunset/Main/Ladd Hill and complete streets to west of SW Main St.	\$ 11,600,000
10700	Arrow Street Improvements: Langer Farms Prkwy to Gerda Lane	SW Langer Farms Parkway	SW Gerda Lane	Reconstruct 3-lane collector street to TSP standards between SW Langer Farms Parkway and SW Gerda Lane.	\$ 11,500,000
10703	Pedestrian Links to Schools & Town Center	Various	Various	Pedestrian upgrades, new sidewalks, sidewalk infill at: Sunset, Division, Edy, Elwert, Meinecke, Pine, Roy, Ladd Hill, Timbrel, Washington, Willamette, Old Pacific Hwy.	\$ 10,200,000
11614	Pine St Phase 2	SW Division St	SW Sunset Blvd	Reconstruct SW Pine St to the 2-lane collector standard per City TSP. Existing street is 2-lanes w/ non-ADA compliant sidewalks and this project will improve storm drainage and address ADA issues, but not add any capacity increasing features.	\$ 2,900,000
11660	Century-Langer Intersection Capacity and Safety Improvements	Century Dr	Langer Dr	Improve intersection capacity and safety. Possible roundabout at Century Dr. Restrict Langer movements to right-in/right-out, possible EB left-in. In TSP. Can be combined with RTP 10691.	\$ 2,900,000
10674	Oregon-Tonquin Intersection Improvements	SW Oregon Street	SW Tonquin Rd	Reconstruct and realign three leg intersection with a roundabout (partial two-lane roundabout) approx. 400 feet northeast of existing roundabout at SW Oregon St & Murdock Rd. ROW, PE, design & construction.	\$ 2,500,000
10706	OR 99W Pedestrian Improvements	UGB Northern Boundary	UGB Southern Boundary	Pedestrian upgrades. Completes pedestrian links along 99W from north to south end of city limits. Includes ADA upgrades as required at intersection and local connections. Assumes bike lanes already provided along OR 99W (SW Pacific Highway).	\$ 2,000,000
10707	OR 99W Regional Trail Crossing	SW Pacific Hwy. (west side)	SW Pacific Hwy. (east side)	Constructs separated grade crossing for Cedar Creek Trail (regional trail system) under SW Pacific Hwy (OR 99W).	\$ 21,000,000
10717	Cipole Street Reconstruction (OR 99W - OR 99W Tualatin-Sherwood)		Tualatin-Sherwood	Reconstruct/widen to 3 lanes from 99W to Tualatin-Sherwood Road and include shared-use path for the Ice Age Tonquin Trail. The project or a portion of the project is outside the UGB.	\$ 10,000,000
11914	Roy Rogers Rd	UGB	Chicken Creek Bridge	Improve roadway to 4-5 lanes, includes sidewalks and bike lanes. The project or a portion of the project is outside the designated urban growth boundary.	\$ 35,000,000

Appendix C: Future Intersection Operations Worksheets

Vistro File: H:\...\30785.vistro

Scenario 5 Future 4 to 5 pm + NLC

Report File: H:\...\Future 4 - 5 pm + NLC.pdf

5/14/2026

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Pacific Hwy W (OR 99W) And SW Langer Farms Pkwy	Signalized	HCM 7th Edition	SB Left	0.822	30.5	C
2	Pacific Hwy W (OR 99W) And SW Tualatin-Sherwood Rd	Signalized	HCM 7th Edition	SB Left	0.983	78.5	E
3	Pacific Hwy W (OR 99W) And SW Edy Rd/SW Sherwood Blvd	Signalized	HCM 7th Edition	NB Left	0.991	129.7	F
4	Pacific Hwy W (OR 99W) And SW Meinecke Pkwy	Signalized	HCM 7th Edition	EB Left	0.843	397.1	F
5	Pacific Hwy W (OR 99W) And SW Elwert Rd/SW Sunset Blvd	Signalized	HCM 7th Edition	WB Left	1.162	166.3	F
6	Pacific Hwy W (OR 99W) And SW Chapman Rd/SW Brookman Rd	Two-way stop	HCM 7th Edition	EB Thru	23.377	10,000.0	F
7	SW Timbrel Ln And SW Sunset Blvd	Two-way stop	HCM 7th Edition	NB Left	0.210	23.7	C
8	SW Pinehurst Dr And SW Sunset Blvd	All-way stop	HCM 7th Edition	WB Thru	0.787	19.7	C
9	SW Main St/SW Ladd Hill Rd And Sunset Blvd	All-way stop	HCM 7th Edition	WB Thru	1.018	65.7	F
10	SW Murdock Rd/SW Baker Rd And SW Sunset Blvd/SW McKinley Dr	All-way stop	HCM 7th Edition	SB Right	0.862	33.8	D
11	SW Oregon St And SW Tonquin Rd	Roundabout	HCM 7th Edition	SB Thru		6.9	A
12	SW Oregon St And SW Tualatin-Sherwood Rd	Signalized	HCM 7th Edition	EB Thru	0.981	235.9	F
13	SW Sherwood Blvd And SW 12th St/SW Century Dr	All-way stop	HCM 7th Edition	SB Thru	0.734	20.2	C
14	SW Pine St And SW 1st St	All-way stop	HCM 7th Edition	WB Thru	0.910	34.0	D
15	SW Langer Farms Pkwy And SW Oregon St	Signalized	HCM 7th Edition	EB Left	0.459	12.2	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Pacific Hwy W (OR 99W) And SW Langer Farms Pkwy

Control Type:	Signalized	Delay (sec / veh):	30.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.822

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	240.00	100.00	280.00	530.00	100.00	100.00	100.00	100.00	100.00	200.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	116	1171	72	158	1822	56	48	35	45	68	38	166
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	5.00	6.00	2.00	2.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	116	1171	72	158	1822	56	48	35	45	68	38	166
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	311	19	42	485	15	13	9	12	18	10	44
Total Analysis Volume [veh/h]	123	1246	77	168	1938	60	51	37	48	72	40	177
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	1			1			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	65.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	18.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Maximum Green [s]	16	71	0	16	71	0	0	43	0	0	43	0
Amber [s]	3.5	5.0	0.0	3.5	5.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	7	0	0	13	0	0	0	0	0	10	0
Pedestrian Clearance [s]	0	12	0	0	10	0	0	0	0	0	33	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.5	4.0	0.0	2.5	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	16	71	0	16	71	0	0	43	0	0	43	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	4	10	0	8	10	0	0	6	0	0	6	0
Vehicle Extension [s]	1.0	4.0	0.0	1.0	2.5	0.0	0.0	2.0	0.0	0.0	1.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	R	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.50	6.00	6.00	4.50	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.50	4.00	4.00	2.50	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	10	80	80	12	81	81	22	22	22	22
g / C, Green / Cycle	0.08	0.61	0.61	0.09	0.63	0.63	0.17	0.17	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.06	0.34	0.05	0.09	0.50	0.51	0.14	0.03	0.10	0.10
s, saturation flow rate [veh/h]	1810	3475	1507	1781	1870	1848	609	1615	1017	1615
c, Capacity [veh/h]	140	2135	926	158	1170	1156	147	275	219	275
d1, Uniform Delay [s]	59.12	14.58	10.14	59.25	18.32	18.54	56.01	46.04	49.34	49.88
k, delay calibration	0.04	0.50	0.50	0.15	0.50	0.50	0.04	0.04	0.04	0.04
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.87	1.02	0.16	82.20	6.16	6.62	1.26	0.10	0.62	0.80
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.83	0.55	0.08	1.00	0.80	0.81	0.56	0.16	0.48	0.60
d, Delay for Lane Group [s/veh]	63.99	15.60	10.30	141.45	24.48	25.16	57.27	46.14	49.95	50.68
Lane Group LOS	E	B	B	F	C	C	E	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	3.96	10.06	0.88	8.79	22.08	22.45	2.75	1.26	3.22	5.07
50th-Percentile Queue Length [ft/ln]	99.04	251.38	21.91	219.71	551.91	561.14	68.70	31.53	80.62	126.77
95th-Percentile Queue Length [veh/ln]	7.13	15.26	1.58	13.67	29.78	30.22	4.95	2.27	5.80	8.76
95th-Percentile Queue Length [ft/ln]	178.27	381.39	39.43	341.63	744.55	755.39	123.66	56.76	145.11	219.10

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	63.99	15.60	10.30	141.45	24.81	25.16	57.27	57.27	46.14	49.95	49.95	50.68
Movement LOS	E	B	B	F	C	C	E	E	D	D	D	D
d_A, Approach Delay [s/veh]	19.45			33.87			53.36			50.40		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	30.55											
Intersection LOS	C											
Intersection V/C	0.822											

Emissions

Vehicle Miles Traveled [mph]	38.04	384.02	23.61	21.96	130.53	130.53	3.32	1.80	10.35	16.21
Stops [stops/h]	109.70	556.90	24.27	243.37	611.34	621.57	76.10	34.93	89.30	140.42
Fuel consumption [US gal/h]	3.68	22.60	1.26	6.80	13.43	13.62	1.52	0.69	2.00	3.15
CO [g/h]	257.40	1579.97	87.87	475.05	938.68	951.74	106.54	48.19	139.59	220.53
NOx [g/h]	50.08	307.40	17.10	92.43	182.63	185.17	20.73	9.38	27.16	42.91
VOC [g/h]	59.65	366.17	20.36	110.10	217.55	220.58	24.69	11.17	32.35	51.11

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0			14.0			0.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			51.75			0.00			54.47		
I_p,int, Pedestrian LOS Score for Intersectio	0.000			3.051			0.000			2.132		
Crosswalk LOS	F			C			F			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1000			1000			569			569		
d_b, Bicycle Delay [s]	16.26			16.26			33.27			33.27		
I_b,int, Bicycle LOS Score for Intersection	2.681			3.239			1.771			2.008		
Bicycle LOS	B			C			A			B		

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







Intersection Level Of Service Report

Intersection 2: Pacific Hwy W (OR 99W) And SW Tualatin-Sherwood Rd

Control Type:	Signalized	Delay (sec / veh):	78.5
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.983

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	650.00	100.00	300.00	350.00	100.00	230.00	255.00	100.00	230.00	500.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	2	0	0	1	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	49.21	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	148	989	412	244	1349	531	208	708	113	597	964	180
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	4.00	8.00	5.00	2.00	1.00	4.00	7.00	3.00	4.00	3.00	12.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	148	989	412	244	1349	531	208	708	113	597	964	180
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	260	108	64	355	140	55	186	30	157	254	47
Total Analysis Volume [veh/h]	156	1041	434	257	1420	559	219	745	119	628	1015	189
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	1			1			0			2		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	81.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	24.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Maximum Green [s]	25	55	0	21	52	0	19	36	0	24	42	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.5	4.5	0.0	4.5	5.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	8	0	0	9	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	28	0	0	22	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.0	0.0	3.5	3.5	0.0	3.5	4.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	25	51	0	21	47	0	19	34	0	24	39	0
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	4	10	0	4	10	0	6	4	0	6	6	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.00	6.00	5.50	5.50	5.50	5.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.00	4.00	3.50	3.50	3.50	3.50	4.00	4.00
g_i, Effective Green Time [s]	13	43	43	16	46	46	10	29	29	21	39	39
g / C, Green / Cycle	0.10	0.33	0.33	0.12	0.35	0.35	0.08	0.22	0.22	0.16	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.08	0.20	0.28	0.14	0.26	0.34	0.06	0.21	0.07	0.18	0.27	0.12
s, saturation flow rate [veh/h]	1781	5012	1494	1738	5094	1582	3403	3418	1577	3403	3532	1442
c, Capacity [veh/h]	176	1645	490	214	1795	557	269	749	346	546	1048	428
d1, Uniform Delay [s]	57.66	36.62	40.39	57.10	37.16	40.86	58.82	50.06	42.76	54.67	44.28	36.72
k, delay calibration	0.11	0.50	0.50	0.31	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.13	1.65	18.20	289.29	3.02	43.15	4.85	8.20	0.55	175.35	4.12	0.66
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.84	0.60	0.84	1.14	0.75	0.95	0.77	0.94	0.33	1.09	0.92	0.42
d, Delay for Lane Group [s/veh]	68.79	38.27	58.60	346.39	40.17	84.01	63.67	58.26	43.30	230.02	48.40	37.38
Lane Group LOS	E	D	E	F	D	F	E	E	D	F	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.34	9.04	14.60	24.23	13.05	22.97	3.55	12.17	3.14	22.24	15.53	4.70
50th-Percentile Queue Length [ft/ln]	133.47	226.03	364.90	605.83	326.19	574.30	88.75	304.14	78.41	555.90	388.26	117.54
95th-Percentile Queue Length [veh/ln]	9.13	13.97	20.86	34.31	18.97	30.83	6.39	17.89	5.65	31.36	21.99	8.26
95th-Percentile Queue Length [ft/ln]	228.21	349.31	521.54	857.72	474.28	770.81	159.76	447.14	141.13	784.08	549.83	206.44

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	68.79	38.27	58.60	346.39	40.17	84.01	63.67	58.26	43.30	230.02	48.40	37.38
Movement LOS	E	D	E	F	D	F	E	E	D	F	D	D
d_A, Approach Delay [s/veh]	46.59			86.31			57.71			109.54		
Approach LOS	D			F			E			F		
d_I, Intersection Delay [s/veh]	78.47											
Intersection LOS	E											
Intersection V/C	0.983											

Emissions

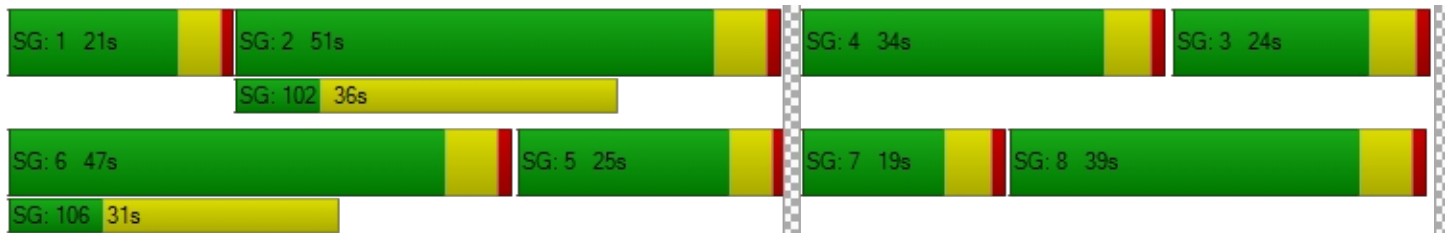
Vehicle Miles Traveled [mph]	51.94	347.08	144.59	80.02	442.39	174.14	24.59	83.70	13.36	94.21	152.13	28.41
Stops [stops/h]	147.71	750.41	403.83	670.46	1082.95	635.56	196.45	673.17	86.77	1230.40	859.35	130.07
Fuel consumption [US gal/h]	5.03	26.14	13.10	24.19	35.22	19.76	4.79	15.56	2.02	38.62	20.50	3.26
CO [g/h]	351.30	1826.85	915.38	1691.19	2462.02	1380.97	334.99	1087.51	141.55	2699.26	1433.29	227.66
NOx [g/h]	68.35	355.44	178.10	329.04	479.02	268.69	65.18	211.59	27.54	525.18	278.87	44.30
VOC [g/h]	81.42	423.39	212.15	391.95	570.60	320.05	77.64	252.04	32.80	625.58	332.18	52.76

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0		33.0		13.0		12.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	0.00		36.24		52.71		53.61	
I_p,int, Pedestrian LOS Score for Intersectio	0.000		3.153		2.982		3.043	
Crosswalk LOS	F		C		C		C	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	692		630		438		507	
d_b, Bicycle Delay [s]	27.85		30.53		39.68		36.28	
I_b,int, Bicycle LOS Score for Intersection	2.412		2.728		2.409		2.996	
Bicycle LOS	B		B		B		C	

Sequence

Ring 1	1	2	4	3	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	7	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Pacific Hwy W (OR 99W) And SW Edy Rd/SW Sherwood Blvd

Control Type:	Signalized	Delay (sec / veh):	129.7
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.991

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	480.00	100.00	100.00	440.00	100.00	100.00	240.00	100.00	240.00	160.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	2	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	49.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	364	1184	223	90	1691	95	83	193	284	413	173	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	5.00	2.00	1.00	3.00	0.00	1.00	1.00	4.00	1.00	0.00	4.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	364	1184	223	90	1691	95	83	193	284	413	173	46
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	95	308	58	23	440	25	22	50	74	108	45	12
Total Analysis Volume [veh/h]	379	1233	232	94	1761	99	86	201	296	430	180	48
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	1			1			3			2		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	86.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	14.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	7	0	3	8	0
Auxiliary Signal Groups												
Maximum Green [s]	20	55	0	16	46	0	25	25	0	5	24	0
Amber [s]	3.5	5.0	0.0	3.5	5.0	0.0	4.5	4.5	0.0	3.0	4.0	0.0
All red [s]	1.0	0.5	0.0	1.0	0.5	0.0	0.5	0.5	0.0	1.0	1.0	0.0
Walk [s]	0	8	0	0	9	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	27	0	0	28	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk												
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.5	3.5	0.0	2.5	3.5	0.0	3.0	3.0	0.0	2.0	3.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	24	50	0	22	48	0	23	23	0	9	35	0
Lead / Lag	Lead	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	10	0	4	10	0	6	6	0	5	6	0
Vehicle Extension [s]	3.0	4.4	0.0	2.3	4.4	0.0	3.0	3.0	0.0	3.0	2.3	0.0
Minimum Recall	No	Yes		No	Yes			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	4
Pedestrian Walk [s]	9
Pedestrian Clearance [s]	49

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.50	5.50	5.50	4.50	5.50	5.50	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	3.50	3.50	2.50	3.50	3.50	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	20	54	54	8	43	43	25	25	25	23	23	23
g / C, Green / Cycle	0.15	0.41	0.41	0.06	0.33	0.33	0.19	0.19	0.19	0.18	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.20	0.27	0.28	0.05	0.33	0.34	0.05	0.10	0.18	0.16	0.16	0.03
s, saturation flow rate [veh/h]	1795	3475	1662	1795	3532	1798	1795	1885	1540	1795	1861	1541
c, Capacity [veh/h]	269	1443	690	114	1160	591	341	358	292	319	331	274
d1, Uniform Delay [s]	55.29	30.58	30.75	60.09	43.68	43.68	44.75	47.55	52.15	52.35	52.33	45.28
k, delay calibration	0.50	0.50	0.50	0.07	0.50	0.50	0.11	0.11	0.39	0.18	0.18	0.07
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	658.80	2.38	5.16	7.85	72.11	100.03	0.37	1.27	69.14	17.07	16.06	0.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.35	0.66	0.67	0.79	1.02	1.02	0.24	0.54	0.97	0.90	0.90	0.17
d, Delay for Lane Group [s/veh]	714.09	32.96	35.92	67.94	115.79	143.71	45.12	48.82	121.29	69.42	68.39	45.46
Lane Group LOS	F	C	D	E	F	F	D	D	F	E	E	D
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	58.07	12.36	12.59	3.18	30.10	35.22	2.33	5.79	14.76	10.72	10.99	1.28
50th-Percentile Queue Length [ft/ln]	1451.72	308.97	314.84	79.53	752.41	880.54	58.21	144.83	369.03	267.90	274.71	32.10
95th-Percentile Queue Length [veh/ln]	81.17	18.12	18.41	5.73	39.60	45.74	4.19	9.74	21.06	16.08	16.42	2.31
95th-Percentile Queue Length [ft/ln]	2029.33	453.10	460.34	143.15	989.89	1143.44	104.77	243.51	526.55	402.12	410.62	57.79

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	714.09	33.55	35.92	67.94	124.21	143.71	45.12	48.82	121.29	69.11	68.39	45.46
Movement LOS	F	C	D	E	F	F	D	D	F	E	E	D
d_A, Approach Delay [s/veh]	173.72			122.50			85.03			67.19		
Approach LOS	F			F			F			E		
d_I, Intersection Delay [s/veh]	129.68											
Intersection LOS	F											
Intersection V/C	0.991											

Emissions

Vehicle Miles Traveled [mph]	201.07	523.19	254.04	31.58	414.49	212.29	6.60	15.36	22.60	22.89	23.67	3.66
Stops [stops/h]	1607.57	684.27	348.64	88.07	1666.39	975.07	64.46	160.37	408.65	296.66	304.20	35.55
Fuel consumption [US gal/h]	70.04	31.67	15.74	3.03	54.10	31.81	1.39	3.44	10.20	6.65	6.80	0.77
CO [g/h]	4895.97	2213.75	1100.57	211.86	3781.30	2223.77	97.16	240.14	712.76	464.87	475.37	53.99
NOx [g/h]	952.58	430.72	214.13	41.22	735.70	432.67	18.90	46.72	138.68	90.45	92.49	10.50
VOC [g/h]	1134.69	513.06	255.07	49.10	876.35	515.38	22.52	55.66	165.19	107.74	110.17	12.51

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0		13.0		13.0		13.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	0.00		52.67		52.67		52.67	
I_p,int, Pedestrian LOS Score for Intersectio	0.000		3.054		2.438		2.425	
Crosswalk LOS	F		C		B		B	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	684		654		277		461	
d_b, Bicycle Delay [s]	28.15		29.48		48.34		38.52	
I_b,int, Bicycle LOS Score for Intersection	2.534		2.591		2.484		2.602	
Bicycle LOS	B		B		B		B	

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	7	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 4: Pacific Hwy W (OR 99W) And SW Meinecke Pkwy

Control Type:	Signalized	Delay (sec / veh):	397.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.843

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	400.00	100.00	175.00	370.00	100.00	250.00	335.00	100.00	250.00	200.00	100.00	250.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	50	1550	15	214	1857	268	244	70	22	23	129	227
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	5.00	0.00	1.00	3.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	1550	15	214	1857	268	244	70	22	23	129	227
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	412	4	57	494	71	65	19	6	6	34	60
Total Analysis Volume [veh/h]	53	1649	16	228	1976	285	260	74	23	24	137	241
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	1			1			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	8.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Maximum Green [s]	12	60	0	31	69	0	11	34	0	11	34	0
Amber [s]	3.0	5.0	0.0	3.5	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	9	0
Pedestrian Clearance [s]	0	18	0	0	10	0	0	35	0	0	36	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	4.0	0.0	2.5	2.0	0.0	2.0	4.0	0.0	2.0	4.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	16	58	0	31	73	0	15	45	0	15	45	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	4	10	0	5	6	0	5	6	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	Yes		No	Yes		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	149	149	149	149	149	149	149	149	149	149	149	149
L, Total Lost Time per Cycle [s]	4.00	6.00	6.00	4.50	4.00	4.00	4.00	6.00	6.00	4.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	4.00	4.00	2.50	2.00	2.00	2.00	4.00	4.00	2.00	4.00	4.00
g_i, Effective Green Time [s]	12	52	52	27	69	69	11	39	39	11	39	39
g / C, Green / Cycle	0.08	0.35	0.35	0.18	0.46	0.46	0.07	0.26	0.26	0.07	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.03	0.45	0.01	0.12	0.53	0.17	0.14	0.04	0.01	0.01	0.07	0.14
s, saturation flow rate [veh/h]	1810	3475	1581	1795	3532	1581	1781	1900	1615	1781	1870	1615
c, Capacity [veh/h]	146	1213	552	319	1636	732	131	497	423	131	489	423
d1, Uniform Delay [s]	64.77	48.50	31.87	57.17	40.00	25.75	69.00	42.16	41.16	64.74	43.61	47.24
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.42	507.48	0.09	11.25	252.61	1.42	1569.61	0.59	0.23	2.90	1.31	4.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	1.28	0.03	0.67	1.14	0.37	1.86	0.14	0.05	0.17	0.26	0.54
d, Delay for Lane Group [s/veh]	71.19	555.98	31.96	68.42	292.61	27.17	1638.61	42.75	41.40	67.64	44.93	52.15
Lane Group LOS	E	F	C	E	F	C	F	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.07	107.88	0.38	8.56	86.84	6.50	62.36	2.09	0.64	0.93	4.01	7.89
50th-Percentile Queue Length [ft/ln]	51.71	2697.00	9.46	214.10	2170.91	162.55	1558.93	52.32	16.12	23.30	100.32	197.13
95th-Percentile Queue Length [veh/ln]	3.72	146.89	0.68	13.36	112.91	10.68	89.92	3.77	1.16	1.68	7.22	12.49
95th-Percentile Queue Length [ft/ln]	93.07	3672.23	17.02	334.09	2822.86	267.09	2247.92	94.18	29.01	41.93	180.58	312.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	71.19	555.98	31.96	68.42	292.61	27.17	1638.61	42.75	41.40	67.64	44.93	52.15
Movement LOS	E	F	C	E	F	C	F	D	D	E	D	D
d_A, Approach Delay [s/veh]	536.10			241.68			1201.56			50.63		
Approach LOS	F			F			F			D		
d_I, Intersection Delay [s/veh]	397.09											
Intersection LOS	F											
Intersection V/C	0.843											

Emissions

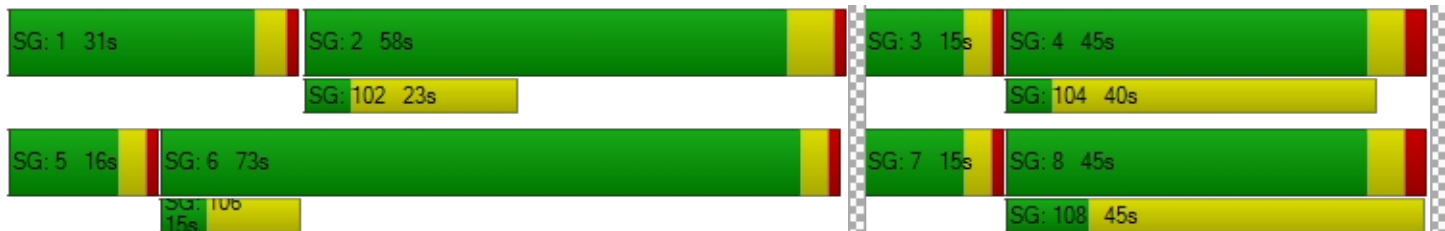
Vehicle Miles Traveled [mph]	37.94	1176.28	11.38	118.21	1025.81	148.04	25.32	7.26	2.28	2.20	12.33	21.69
Stops [stops/h]	49.97	5213.00	9.14	206.92	4196.13	157.09	1506.62	50.57	15.57	22.51	96.96	190.52
Fuel consumption [US gal/h]	2.56	252.55	0.62	8.99	175.96	8.44	90.71	1.19	0.37	0.53	2.22	4.35
CO [g/h]	179.11	17653.5	43.10	628.31	12299.9	590.22	6340.61	82.99	25.54	37.14	155.34	304.38
NOx [g/h]	34.85	3434.74	8.39	122.25	2393.12	114.84	1233.65	16.15	4.97	7.23	30.22	59.22
VOC [g/h]	41.51	4091.39	9.99	145.62	2850.63	136.79	1469.50	19.23	5.92	8.61	36.00	70.54

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			13.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	65.77			62.07			65.77			65.77		
I_p,int, Pedestrian LOS Score for Intersectio	3.109			3.224			2.347			2.322		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	698			926			523			523		
d_b, Bicycle Delay [s]	31.59			21.49			40.60			40.60		
I_b,int, Bicycle LOS Score for Intersection	2.892			3.489			2.114			2.185		
Bicycle LOS	C			C			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 5: Pacific Hwy W (OR 99W) And SW Elwert Rd/SW Sunset Blvd

Control Type:	Signalized	Delay (sec / veh):	166.3
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	1 hour	Volume to Capacity (v/c):	1.162

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T			T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	600.00	100.00	100.00	470.00	100.00	290.00	260.00	100.00	100.00	190.00	100.00	190.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	362	1419	186	145	1543	59	32	190	348	212	202	134
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	5.00	0.00	2.00	3.00	0.00	5.00	3.00	4.00	2.00	1.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	362	1419	186	145	1543	59	32	190	348	212	202	134
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	93	366	48	37	398	15	8	49	90	55	52	35
Total Analysis Volume [veh/h]	373	1463	192	149	1591	61	33	196	359	219	208	138
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			1			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	24.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Maximum Green [s]	30	50	0	30	50	0	15	30	0	15	30	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	3.0	0.0	4.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.7	0.0	1.7	1.7	0.0	1.7	1.7	0.0
Walk [s]	0	9	0	0	10	0	0	12	0	0	12	0
Pedestrian Clearance [s]	0	21	0	0	24	0	0	40	0	0	38	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.7	0.0	3.7	2.7	0.0	3.7	3.7	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	15	45	0	15	45	0	15	25	0	15	25	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.70	6.70	5.70	4.70	4.70	5.70	5.70	5.70
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.70	4.70	3.70	2.70	2.70	3.70	3.70	3.70
g_i, Effective Green Time [s]	10	43	43	6	38	38	3	20	20	9	26	26
g / C, Green / Cycle	0.10	0.43	0.43	0.06	0.38	0.38	0.03	0.20	0.20	0.09	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.10	0.41	0.12	0.04	0.44	0.04	0.02	0.10	0.22	0.12	0.09	0.10
s, saturation flow rate [veh/h]	3486	3475	1615	3459	3532	1615	1738	1855	1556	1781	1885	1640
c, Capacity [veh/h]	350	1492	694	213	1356	620	52	375	314	166	481	419
d1, Uniform Delay [s]	45.03	27.54	18.41	45.99	30.84	19.72	47.99	35.51	39.94	45.39	30.64	30.73
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.25	0.22	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	87.24	19.22	0.95	3.83	259.07	0.31	11.94	1.07	219.00	523.97	0.47	0.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.04	0.95	0.27	0.68	1.14	0.10	0.62	0.51	1.11	1.28	0.37	0.38
d, Delay for Lane Group [s/veh]	132.27	46.76	19.36	49.82	289.90	20.02	59.93	36.57	258.94	569.37	31.12	31.29
Lane Group LOS	F	D	B	D	F	C	E	D	F	F	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	8.54	19.55	2.91	1.87	64.46	0.93	0.96	4.19	26.72	28.19	3.55	3.19
50th-Percentile Queue Length [ft/ln]	213.40	488.70	72.79	46.73	1611.51	23.13	23.92	104.81	667.95	704.76	88.80	79.67
95th-Percentile Queue Length [veh/ln]	13.51	26.80	5.24	3.36	85.29	1.67	1.72	7.55	37.25	40.62	6.39	5.74
95th-Percentile Queue Length [ft/ln]	337.79	669.97	131.01	84.11	2132.20	41.63	43.06	188.65	931.22	1015.60	159.84	143.40

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	132.27	46.76	19.36	49.82	289.90	20.02	59.93	36.57	258.94	569.37	31.14	31.29
Movement LOS	F	D	B	D	F	C	E	D	F	F	C	C
d_A, Approach Delay [s/veh]	59.90			260.86			173.64			239.39		
Approach LOS	E			F			F			F		
d_I, Intersection Delay [s/veh]	166.33											
Intersection LOS	F											
Intersection V/C	1.162											

Emissions

Vehicle Miles Traveled [mph]	289.14	1133.38	148.56	110.04	1170.97	44.77	3.41	20.26	37.11	22.39	18.75	16.73
Stops [stops/h]	614.31	1406.78	104.76	134.51	4638.96	33.29	34.43	150.85	961.40	1014.37	127.81	114.67
Fuel consumption [US gal/h]	25.04	67.93	7.43	6.74	164.85	2.27	0.72	3.08	25.17	31.08	2.60	2.33
CO [g/h]	1750.25	4748.35	519.18	471.33	11522.8	158.50	50.40	215.40	1759.63	2172.81	181.91	162.94
NOx [g/h]	340.54	923.86	101.01	91.70	2241.93	30.84	9.81	41.91	342.36	422.75	35.39	31.70
VOC [g/h]	405.64	1100.48	120.33	109.24	2670.53	36.73	11.68	49.92	407.81	503.57	42.16	37.76

Other Modes

g_Walk,mi, Effective Walk Time [s]	16.0			16.0			14.0			13.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	35.30			35.30			37.00			37.87		
I_p,int, Pedestrian LOS Score for Intersectio	3.161			3.058			2.535			2.511		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	780			766			406			386		
d_b, Bicycle Delay [s]	18.62			19.05			31.80			32.59		
I_b,int, Bicycle LOS Score for Intersection	3.182			3.001			2.030			2.012		
Bicycle LOS	C			C			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 6: Pacific Hwy W (OR 99W) And SW Chapman Rd/SW Brookman Rd

Control Type:	Two-way stop	Delay (sec / veh):	10,000.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	1 hour	Volume to Capacity (v/c):	23.377

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach												
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	0	0	0	0	0	0
Entry Pocket Length [ft]	265.00	100.00	100.00	260.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	18	1762	0	51	2547	29	46	17	8	0	0	325
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	17.00	5.00	2.00	5.00	4.00	0.00	7.00	0.00	0.00	2.00	2.00	1.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	1762	0	51	2547	29	46	17	8	0	0	325
Peak Hour Factor	0.9700	0.9700	1.0000	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	1.0000	1.0000	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	454	0	13	656	7	12	4	2	0	0	84
Total Analysis Volume [veh/h]	19	1816	0	53	2626	30	47	18	8	0	0	335
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.02	0.00	0.15	0.03	0.00	0.00	23.38	0.05	0.00	0.00	1.11
d_M, Delay for Movement [s/veh]	36.68	0.00	0.00	17.55	0.00	0.00	10000.0	10000.0	10000.0	0.00	0.00	307.37
Movement LOS	E	A		C	A	A	F	F	F			F
95th-Percentile Queue Length [veh/ln]	0.47	0.00	0.00	0.53	0.00	0.00	38.28	38.28	38.28	0.00	0.00	31.89
95th-Percentile Queue Length [ft/ln]	11.79	0.00	0.00	13.28	0.00	0.00	957.05	957.05	957.05	0.00	0.00	797.15
d_A, Approach Delay [s/veh]	0.37			0.34			10000.00			307.37		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	168.95											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 7: SW Timbrel Ln And SW Sunset Blvd

Control Type:	Two-way stop	Delay (sec / veh):	23.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.210

Intersection Setup

Name	Northbound		Eastbound		Westbound	
Approach						
Lane Configuration	↔		↗		↖	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	120.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Northbound		Eastbound		Westbound	
Base Volume Input [veh/h]	52	62	362	71	86	440
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	3.00	1.00	0.00	3.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	62	362	71	86	440
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	17	99	20	24	121
Total Analysis Volume [veh/h]	57	68	398	78	95	484
Pedestrian Volume [ped/h]	0		0		2	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.09	0.00	0.00	0.08	0.00
d_M, Delay for Movement [s/veh]	23.71	14.71	0.00	0.00	8.42	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	1.30	1.30	0.00	0.00	0.25	0.00
95th-Percentile Queue Length [ft/ln]	32.52	32.52	0.00	0.00	6.13	0.00
d_A, Approach Delay [s/veh]	18.81		0.00		1.38	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	2.67					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 8: SW Pinehurst Dr And SW Sunset Blvd

Control Type:	All-way stop	Delay (sec / veh):	19.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.787

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	+			+			+			+		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	75.00	100.00	100.00	80.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	39	22	14	22	18	16	54	306	65	28	464	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	0.00	5.00	25.00	0.00	0.00	0.00	2.00	4.00	0.00	2.00	3.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	39	22	14	22	18	16	54	306	65	28	464	65
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	6	4	6	5	4	15	83	18	8	126	18
Total Analysis Volume [veh/h]	42	24	15	24	20	17	59	333	71	30	504	71
Pedestrian Volume [ped/h]	5			5			1			9		

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	559	554	597	662	609	672
Degree of Utilization, x	0.13	0.10	0.09	0.56	0.05	0.79

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.46	0.34	0.30	3.73	0.14	9.75
95th-Percentile Queue Length [ft]	11.58	8.43	7.45	93.30	3.61	243.76
Approach Delay [s/veh]	10.43	10.24	14.30		26.00	
Approach LOS	B	B	B		D	
Intersection Delay [s/veh]	19.69					
Intersection LOS	C					

Intersection Level Of Service Report

Intersection 9: SW Main St/SW Ladd Hill Rd And Sunset Blvd

Control Type:	All-way stop	Delay (sec / veh):	65.7
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	1 hour	Volume to Capacity (v/c):	1.018

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↔			↔			↔			↔		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	150.00	100.00	100.00	100.00	100.00	100.00	150.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	64	173	164	66	286	91	38	238	44	211	395	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	2.00	0.00	2.00	1.00	7.00	3.00	3.00	3.00	3.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	64	173	164	66	286	91	38	238	44	211	395	33
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	47	44	18	77	24	10	64	12	57	106	9
Total Analysis Volume [veh/h]	69	186	176	71	308	98	41	256	47	227	425	35
Pedestrian Volume [ped/h]	1			1			1			4		

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	391	429	398	428	379	407	394	428
Degree of Utilization, x	0.16	0.79	0.17	0.88	0.10	0.69	0.54	1.02

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.59	9.18	0.59	14.35	0.33	6.16	3.34	27.34
95th-Percentile Queue Length [ft]	14.64	229.53	14.86	358.82	8.35	154.03	83.41	683.56
Approach Delay [s/veh]	35.64		54.96		28.74		110.63	
Approach LOS	E		F		D		F	
Intersection Delay [s/veh]	65.74							
Intersection LOS	F							

Intersection Level Of Service Report

Intersection 10: SW Murdock Rd/SW Baker Rd And SW Sunset Blvd/SW McKinley Dr

Control Type:	All-way stop	Delay (sec / veh):	33.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.862

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach												
Lane Configuration	+			+			+ +			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	336	78	2	4	100	383	297	13	326	4	23	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	5.00	0.00	0.00	9.00	4.00	3.00	0.00	7.00	50.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	336	78	2	4	100	383	297	13	326	4	23	8
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	89	21	1	1	27	102	79	3	87	1	6	2
Total Analysis Volume [veh/h]	357	83	2	4	106	407	316	14	347	4	24	9
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	512	565	449	523	411
Degree of Utilization, x	0.81	0.86	0.66	0.65	0.09

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	10.68	13.83	5.48	5.23	0.28
95th-Percentile Queue Length [ft]	267.09	345.79	136.99	130.71	6.98
Approach Delay [s/veh]	38.33	44.27	23.90		12.59
Approach LOS	E	E	C		B
Intersection Delay [s/veh]	33.77				
Intersection LOS	D				

Intersection Level Of Service Report
Intersection 11: SW Oregon St And SW Tonquin Rd

Control Type:	Roundabout	Delay (sec / veh):	6.9
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	1 hour		

Intersection Setup

Name	Northbound		Southbound		Westbound	
Approach						
Lane Configuration	↑↱		↰↑		↰↱	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	0	0	1
Entry Pocket Length [ft]	100.00	200.00	175.00	100.00	100.00	200.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Northbound		Southbound		Westbound	
Base Volume Input [veh/h]	231	351	114	424	440	100
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	7.00	3.00	11.00	3.00	3.00	10.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	231	351	114	424	440	100
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	95	31	115	120	27
Total Analysis Volume [veh/h]	251	382	124	461	478	109
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Number of Conflicting Circulating Lanes	1		1		1	
Circulating Flow Rate [veh/h]	127		453		247	
Exiting Flow Rate [veh/h]	890		357		488	
Demand Flow Rate [veh/h]	231	351	114	424	440	100
Adjusted Demand Flow Rate [veh/h]	231	351	114	424	440	100

Lanes

Override Calculated Critical Headway	No	No	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00	4.00	4.00
Override Calculated Follow-Up Time	No	No	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00	3.00	3.00
A (intercept)	1420.00	1420.00	1420.00	1420.00	1420.00	1420.00
B (coefficient)	0.00091	0.00091	0.00091	0.00091	0.00091	0.00091
HV Adjustment Factor	0.93	0.97	0.90	0.97	0.97	0.91
Entry Flow Rate [veh/h]	248	362	127	437	454	111
Capacity of Entry and Bypass Lanes [veh/h]	1266	1266	941	941	1134	1134
Pedestrian Impedance	1.00	1.00	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1183	1229	847	913	1101	1031
X, volume / capacity	0.20	0.29	0.13	0.46	0.40	0.10

Movement, Approach, & Intersection Results





Lane LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.73	1.20	0.47	2.58	1.99	0.32
95th-Percentile Queue Length [ft]	18.18	29.91	11.65	64.39	49.63	8.05
Approach Delay [s/veh]	5.22		8.81		6.87	
Approach LOS	A		A		A	
Intersection Delay [s/veh]	6.92					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 12: SW Oregon St And SW Tualatin-Sherwood Rd

Control Type:	Signalized	Delay (sec / veh):	235.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.981

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	75.00	100.00	100.00	100.00	125.00	100.00	175.00	375.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	156	3	312	18	1	5	3	1182	81	462	1578	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	0.00	6.00	0.00	0.00	0.00	33.00	6.00	11.00	2.00	5.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	156	3	312	18	1	5	3	1182	81	462	1578	4
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	1	82	5	0	1	1	311	21	122	415	1
Total Analysis Volume [veh/h]	164	3	328	19	1	5	3	1244	85	486	1661	4
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			1			6		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	25	0	0	25	0	10	75	0	35	85	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	3.0	4.5	0.0	3.0	4.5	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	18	0	0	14	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	0.0	0.0	2.5	0.0	2.0	3.5	0.0	2.0	3.5	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	0	14	0	0	14	0	9	14	0	9	14	0
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	5	10	0	5	10	0
Vehicle Extension [s]	0.0	1.5	0.0	0.0	1.5	0.0	1.5	3.5	0.0	1.5	3.5	0.0
Minimum Recall		No			No		No	Yes		No	Yes	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	L	C	R	L	C	C
C, Cycle Length [s]	149	149	149	149	149	149	149	149	149
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.00	5.50	5.50	5.50	5.50	5.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50	0.00	3.50	3.50	0.00	3.50	3.50
g_i, Effective Green Time [s]	25	25	25	111	75	75	114	109	109
g / C, Green / Cycle	0.17	0.17	0.17	0.74	0.50	0.50	0.77	0.73	0.73
(v / s)_i Volume / Saturation Flow Rate	0.11	0.20	0.06	0.00	0.65	0.06	0.53	0.43	0.43
s, saturation flow rate [veh/h]	1433	1538	406	917	1810	1444	875	1825	1823
c, Capacity [veh/h]	288	258	110	790	911	727	520	1339	1338
d1, Uniform Delay [s]	58.04	62.00	61.86	8.13	37.00	19.44	48.48	9.32	9.32
k, delay calibration	0.13	0.50	0.04	0.13	0.50	0.13	0.50	0.30	0.30
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.04	412.44	0.36	0.00	543.83	0.08	24.44	1.16	1.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.55	1.21	0.22	0.00	1.30	0.11	0.89	0.59	0.59
d, Delay for Lane Group [s/veh]	60.08	474.44	62.23	8.13	580.83	19.52	72.93	10.48	10.49
Lane Group LOS	E	F	E	A	F	B	E	B	B
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.81	39.36	0.90	0.02	170.04	1.53	7.80	11.77	11.78
50th-Percentile Queue Length [ft/ln]	145.20	984.05	22.40	0.60	4251.04	38.27	194.97	294.28	294.55
95th-Percentile Queue Length [veh/ln]	9.76	54.69	1.61	0.04	232.49	2.76	12.38	17.40	17.41
95th-Percentile Queue Length [ft/ln]	244.00	1367.16	40.32	1.07	5812.37	68.89	309.47	434.95	435.29

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	60.08	60.08	474.44	62.23	62.23	62.23	8.13	580.83	19.52	72.93	10.48	10.49
Movement LOS	E	E	F	E	E	E	A	F	B	E	B	B
d_A, Approach Delay [s/veh]	334.56			62.23			543.56			24.60		
Approach LOS	F			E			F			C		
d_I, Intersection Delay [s/veh]	235.87											
Intersection LOS	F											
Intersection V/C	0.981											

Emissions

Vehicle Miles Traveled [mph]	10.46	20.53	0.69	0.22	86.14	5.90	30.16	51.63	51.63
Stops [stops/h]	140.32	951.03	21.65	0.58	4108.39	36.99	188.43	284.41	284.67
Fuel consumption [US gal/h]	3.15	36.22	0.45	0.02	165.92	0.77	9.14	5.38	5.39
CO [g/h]	220.16	2531.50	31.58	1.20	11598.0	53.77	638.68	376.30	376.56
NOx [g/h]	42.83	492.54	6.14	0.23	2256.56	10.46	124.26	73.21	73.26
VOC [g/h]	51.02	586.70	7.32	0.28	2687.97	12.46	148.02	87.21	87.27

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	63.91	63.91	63.91	63.91
I_p,int, Pedestrian LOS Score for Intersectio	2.634	1.757	3.132	3.047
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	336	336	1007	1141
d_b, Bicycle Delay [s]	51.60	51.60	18.39	13.79
I_b,int, Bicycle LOS Score for Intersection	2.337	1.599	3.649	3.246
Bicycle LOS	B	A	D	C

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 13: SW Sherwood Blvd And SW 12th St/SW Century Dr

Control Type:	All-way stop	Delay (sec / veh):	20.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.734

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			Yes		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	16	316	35	122	373	27	25	64	53	38	25	201
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	0.00	2.00	2.00	0.00	6.00	4.00	0.00	6.00	0.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	316	35	122	373	27	25	64	53	38	25	201
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	84	9	32	99	7	7	17	14	10	7	53
Total Analysis Volume [veh/h]	17	336	37	130	397	29	27	68	56	40	27	214
Pedestrian Volume [ped/h]	0			0			0			2		

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	489	529	502	545	510	561
Degree of Utilization, x	0.03	0.66	0.24	0.73	0.28	0.47

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.10	5.56	0.96	7.50	1.15	2.63
95th-Percentile Queue Length [ft]	2.53	139.12	23.94	187.52	28.73	65.64
Approach Delay [s/veh]	22.09		23.45		12.77	15.11
Approach LOS	C		C		B	C
Intersection Delay [s/veh]	20.19					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 14: SW Pine St And SW 1st St

Control Type:	All-way stop	Delay (sec / veh):	34.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.910

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	+			+			+			+		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	20	170	75	58	195	19	30	119	18	147	258	126
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.00	3.00	7.00	3.00	3.00	0.00	0.00	0.00	3.00	1.00	4.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	170	75	58	195	19	30	119	18	147	258	126
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	45	20	15	52	5	8	32	5	39	69	34
Total Analysis Volume [veh/h]	21	181	80	62	207	20	32	127	19	156	274	134
Pedestrian Volume [ped/h]	11			14			17			18		

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	526	515	508	583
Degree of Utilization, x	0.50	0.53	0.33	0.91

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.97	3.28	1.46	18.00
95th-Percentile Queue Length [ft]	74.31	81.89	36.40	449.93
Approach Delay [s/veh]	16.71	17.77	13.54	57.27
Approach LOS	C	C	B	F
Intersection Delay [s/veh]	33.95			
Intersection LOS	D			

Intersection Level Of Service Report

Intersection 15: SW Langer Farms Pkwy And SW Oregon St

Control Type:	Signalized	Delay (sec / veh):	12.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.459

Intersection Setup

Name	Northbound		Southbound		Eastbound	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↵		↵		↵↵	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	375.00	100.00	100.00	100.00	100.00	375.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	236	354	431	150	137	172
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	2.00	0.00	1.00	4.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	236	354	431	150	137	172
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	62	93	113	39	36	45
Total Analysis Volume [veh/h]	248	373	454	158	144	181
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	4		1		3	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	5	2	6	0	7	0
Auxiliary Signal Groups						
Maximum Green [s]	25	60	60	0	30	0
Amber [s]	3.0	3.5	3.5	0.0	3.0	0.0
All red [s]	1.0	2.5	2.5	0.0	2.5	0.0
Walk [s]	0	5	5	0	5	0
Pedestrian Clearance [s]	0	10	10	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk						
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	4.0	4.0	0.0	3.5	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	9	14	14	0	9	0
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	5	10	10	0	5	0
Vehicle Extension [s]	2.0	3.8	3.8	0.0	2.0	0.0
Minimum Recall	No	Yes	Yes		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	3
Pedestrian Walk [s]	5
Pedestrian Clearance [s]	11

Lane Group Calculations

Lane Group	L	C	C	L	R
C, Cycle Length [s]	38	38	38	38	38
L, Total Lost Time per Cycle [s]	4.00	6.00	6.00	5.50	5.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	4.00	4.00	0.00	3.50
g_i, Effective Green Time [s]	7	10	21	6	6
g / C, Green / Cycle	0.17	0.26	0.56	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.13	0.19	0.33	0.11	0.11
s, saturation flow rate [veh/h]	1781	1900	1778	1204	1539
c, Capacity [veh/h]	308	491	1004	213	249
d1, Uniform Delay [s]	15.02	12.86	5.36	15.60	15.03
k, delay calibration	0.04	0.14	0.14	0.04	0.04
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.54	2.70	0.71	1.23	1.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.72	0.58	0.64	0.69
d, Delay for Lane Group [s/veh]	16.56	15.57	6.07	16.82	16.33
Lane Group LOS	B	B	A	B	B
Critical Lane Group	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.72	2.51	1.67	0.96	1.24
50th-Percentile Queue Length [ft/ln]	43.01	62.79	41.66	23.89	31.00
95th-Percentile Queue Length [veh/ln]	3.10	4.52	3.00	1.72	2.23
95th-Percentile Queue Length [ft/ln]	77.42	113.02	74.99	42.99	55.81

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	16.56	15.57	6.07	6.07	16.82	16.33
Movement LOS	B	B	A	A	B	B
d_A, Approach Delay [s/veh]	15.96		6.07		16.55	
Approach LOS	B		A		B	
d_I, Intersection Delay [s/veh]	12.20					
Intersection LOS	B					
Intersection V/C	0.459					

Emissions

Vehicle Miles Traveled [mph]	14.79	22.19	40.93	6.93	8.70
Stops [stops/h]	163.36	238.46	158.23	90.72	117.76
Fuel consumption [US gal/h]	2.31	3.35	3.28	1.26	1.58
CO [g/h]	161.28	234.34	229.04	87.76	110.47
NOx [g/h]	31.38	45.59	44.56	17.07	21.49
VOC [g/h]	37.38	54.31	53.08	20.34	25.60

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	0.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	11.03	0.00	11.03
I_p,int, Pedestrian LOS Score for Intersectio	2.375	0.000	2.120
Crosswalk LOS	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	3165	3165	1583
d_b, Bicycle Delay [s]	6.45	6.44	0.83
I_b,int, Bicycle LOS Score for Intersection	2.533	2.518	1.560
Bicycle LOS	B	B	A

Sequence

Ring 1	5	2	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	3	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Vistro File: H:\...\30785.vistro

Scenario 6 Future 5 to 6 pm + NLC

Report File: H:\...\Future 5 - 6 pm + NLC.pdf

5/14/2026

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Pacific Hwy W (OR 99W) And SW Langer Farms Pkwy	Signalized	HCM 7th Edition	SB Left	0.679	33.7	C
2	Pacific Hwy W (OR 99W) And SW Tualatin-Sherwood Rd	Signalized	HCM 7th Edition	WB Left	0.918	67.2	E
3	Pacific Hwy W (OR 99W) And SW Edy Rd/SW Sherwood Blvd	Signalized	HCM 7th Edition	NB Left	0.988	133.4	F
4	Pacific Hwy W (OR 99W) And SW Meinecke Pkwy	Signalized	HCM 7th Edition	EB Left	0.889	379.7	F
5	Pacific Hwy W (OR 99W) And SW Elwert Rd/SW Sunset Blvd	Signalized	HCM 7th Edition	WB Left	1.201	208.8	F
6	Pacific Hwy W (OR 99W) And SW Chapman Rd/SW Brookman Rd	Two-way stop	HCM 7th Edition	EB Thru	11.297	10,000.0	F
7	SW Timbrel Ln And SW Sunset Blvd	Two-way stop	HCM 7th Edition	NB Left	0.277	29.3	D
8	SW Pinehurst Dr And SW Sunset Blvd	All-way stop	HCM 7th Edition	WB Thru	0.767	20.3	C
9	SW Main St/SW Ladd Hill Rd And Sunset Blvd	All-way stop	HCM 7th Edition	WB Thru	1.003	70.5	F
10	SW Murdock Rd/SW Baker Rd And SW Sunset Blvd/SW McKinley Dr	All-way stop	HCM 7th Edition	SB Right	0.847	32.4	D
11	SW Oregon St And SW Tonquin Rd	Roundabout	HCM 7th Edition	SB Thru		6.7	A
12	SW Oregon St And SW Tualatin-Sherwood Rd	Signalized	HCM 7th Edition	EB Thru	0.957	220.0	F
13	SW Sherwood Blvd And SW 12th St/SW Century Dr	All-way stop	HCM 7th Edition	SB Thru	0.765	21.9	C
14	SW Pine St And SW 1st St	All-way stop	HCM 7th Edition	WB Thru	1.009	64.6	F
15	SW Langer Farms Pkwy And SW Oregon St	Signalized	HCM 7th Edition	EB Left	0.523	11.2	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Pacific Hwy W (OR 99W) And SW Langer Farms Pkwy

Control Type:	Signalized	Delay (sec / veh):	33.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.679

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	240.00	100.00	280.00	530.00	100.00	100.00	100.00	100.00	100.00	200.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	31	1149	58	181	1692	20	31	19	23	55	10	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	4.00	0.00	1.00	2.00	8.00	6.00	0.00	0.00	4.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	1149	58	181	1692	20	31	19	23	55	10	175
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	306	15	48	450	5	8	5	6	15	3	47
Total Analysis Volume [veh/h]	33	1222	62	193	1800	21	33	20	24	59	11	186
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	65.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	18.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Maximum Green [s]	16	71	0	16	71	0	0	43	0	0	43	0
Amber [s]	3.5	5.0	0.0	3.5	5.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	7	0	0	13	0	0	0	0	0	10	0
Pedestrian Clearance [s]	0	12	0	0	10	0	0	0	0	0	33	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.5	4.0	0.0	2.5	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	16	71	0	16	71	0	0	43	0	0	43	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	4	10	0	8	10	0	0	6	0	0	6	0
Vehicle Extension [s]	1.0	4.0	0.0	1.0	2.5	0.0	0.0	2.0	0.0	0.0	1.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	R	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.50	6.00	6.00	4.50	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.50	4.00	4.00	2.50	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	3	86	86	12	95	95	16	16	16	16
g / C, Green / Cycle	0.02	0.66	0.66	0.09	0.73	0.73	0.12	0.12	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.02	0.33	0.04	0.10	0.46	0.46	0.05	0.01	0.05	0.11
s, saturation flow rate [veh/h]	1810	3503	1615	1795	1870	1862	969	1615	1334	1615
c, Capacity [veh/h]	41	2316	1067	159	1359	1354	165	200	216	200
d1, Uniform Delay [s]	63.23	11.13	7.76	59.30	8.95	8.98	54.61	50.70	52.68	56.05
k, delay calibration	0.04	0.50	0.50	0.23	0.50	0.50	0.04	0.04	0.04	0.04
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.54	0.76	0.10	285.07	2.25	2.28	0.38	0.09	0.29	5.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.75	0.50	0.05	1.14	0.63	0.63	0.30	0.12	0.30	0.88
d, Delay for Lane Group [s/veh]	73.77	11.89	7.85	344.36	11.19	11.25	54.99	50.79	52.96	61.08
Lane Group LOS	E	B	A	F	B	B	D	D	D	E
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.14	8.23	0.59	17.85	11.82	11.86	1.58	0.68	1.99	5.93
50th-Percentile Queue Length [ft/ln]	28.59	205.84	14.77	446.19	295.57	296.52	39.57	16.93	49.83	148.28
95th-Percentile Queue Length [veh/ln]	2.06	12.94	1.06	26.08	17.46	17.51	2.85	1.22	3.59	9.93
95th-Percentile Queue Length [ft/ln]	51.45	323.49	26.59	651.95	436.55	437.72	71.23	30.47	89.70	248.13

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	73.77	11.89	7.85	344.36	11.22	11.25	54.99	54.99	50.79	52.96	52.96	61.08
Movement LOS	E	B	A	F	B	B	D	D	D	D	D	E
d_A, Approach Delay [s/veh]	13.25			43.08			53.67			58.88		
Approach LOS	B			D			D			E		
d_I, Intersection Delay [s/veh]	33.68											
Intersection LOS	C											
Intersection V/C	0.679											

Emissions

Vehicle Miles Traveled [mph]	10.17	376.80	19.02	25.16	119.02	118.97	2.00	0.92	6.35	17.09
Stops [stops/h]	31.65	455.80	16.35	494.00	327.24	328.29	43.81	18.74	55.17	164.16
Fuel consumption [US gal/h]	1.06	20.81	0.97	16.45	8.66	8.67	0.88	0.38	1.27	3.79
CO [g/h]	74.00	1454.67	67.53	1149.62	605.22	606.14	61.77	26.50	88.54	264.59
NOx [g/h]	14.40	283.03	13.14	223.67	117.75	117.93	12.02	5.16	17.23	51.48
VOC [g/h]	17.15	337.13	15.65	266.44	140.26	140.48	14.32	6.14	20.52	61.32

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0		14.0		0.0		11.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	0.00		51.79		0.00		54.50	
I_p,int, Pedestrian LOS Score for Intersectio	0.000		2.993		0.000		2.120	
Crosswalk LOS	F		C		F		B	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	1000		1000		569		569	
d_b, Bicycle Delay [s]	16.27		16.27		33.30		33.30	
I_b,int, Bicycle LOS Score for Intersection	2.581		3.121		1.680		1.956	
Bicycle LOS	B		C		A		A	

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







Intersection Level Of Service Report

Intersection 2: Pacific Hwy W (OR 99W) And SW Tualatin-Sherwood Rd

Control Type:	Signalized	Delay (sec / veh):	67.2
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.918

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	650.00	100.00	300.00	350.00	100.00	230.00	255.00	100.00	230.00	500.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	2	0	0	1	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	49.21	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	164	989	432	183	1321	396	187	724	90	550	900	100
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	4.00	4.00	6.00	1.00	1.00	3.00	5.00	3.00	1.00	1.00	10.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	164	989	432	183	1321	396	187	724	90	550	900	100
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	260	114	48	348	104	49	191	24	145	237	26
Total Analysis Volume [veh/h]	173	1041	455	193	1391	417	197	762	95	579	947	105
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			2			1		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	81.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	24.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Maximum Green [s]	25	55	0	21	52	0	19	36	0	24	42	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.5	4.5	0.0	4.5	5.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	8	0	0	9	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	28	0	0	22	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.0	0.0	3.5	3.5	0.0	3.5	4.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	25	51	0	21	47	0	19	34	0	24	39	0
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	4	10	0	4	10	0	6	4	0	6	6	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.00	6.00	5.50	5.50	5.50	5.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.00	4.00	3.50	3.50	3.50	3.50	4.00	4.00
g_i, Effective Green Time [s]	14	46	46	16	47	47	9	29	29	18	37	37
g / C, Green / Cycle	0.11	0.35	0.35	0.12	0.36	0.36	0.07	0.22	0.22	0.14	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.09	0.20	0.28	0.11	0.26	0.25	0.05	0.21	0.06	0.16	0.25	0.07
s, saturation flow rate [veh/h]	1795	5012	1564	1724	5135	1602	3431	3475	1555	3486	3589	1468
c, Capacity [veh/h]	192	1756	548	207	1869	583	247	762	341	491	1021	418
d1, Uniform Delay [s]	57.12	34.20	37.93	56.32	35.44	34.96	59.27	50.10	42.06	55.89	44.46	35.71
k, delay calibration	0.11	0.50	0.50	0.17	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.48	1.32	11.86	19.89	2.31	6.46	4.89	8.88	0.41	222.42	2.80	0.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.86	0.56	0.79	0.88	0.71	0.68	0.76	0.95	0.26	1.12	0.88	0.24
d, Delay for Lane Group [s/veh]	68.61	35.52	49.78	76.22	37.75	41.42	64.17	58.98	42.47	278.32	47.26	36.01
Lane Group LOS	E	D	D	E	D	D	E	E	D	F	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.92	8.67	14.10	7.06	12.32	11.62	3.20	12.52	2.46	23.22	14.18	2.49
50th-Percentile Queue Length [ft/ln]	147.92	216.87	352.50	176.59	308.05	290.59	79.97	312.99	61.39	580.48	354.38	62.33
95th-Percentile Queue Length [veh/ln]	9.91	13.51	20.26	11.42	18.08	17.22	5.76	18.32	4.42	32.87	20.35	4.49
95th-Percentile Queue Length [ft/ln]	247.65	337.63	506.46	285.56	451.97	430.38	143.95	458.06	110.51	821.80	508.74	112.20

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	68.61	35.52	49.78	76.22	37.75	41.42	64.17	58.98	42.47	278.32	47.26	36.01
Movement LOS	E	D	D	E	D	D	E	E	D	F	D	D
d_A, Approach Delay [s/veh]	42.83			42.22			58.46			128.52		
Approach LOS	D			D			E			F		
d_I, Intersection Delay [s/veh]	67.24											
Intersection LOS	E											
Intersection V/C	0.918											

Emissions

Vehicle Miles Traveled [mph]	57.55	347.08	151.61	60.01	433.21	129.86	22.11	85.59	10.64	86.80	142.03	15.78
Stops [stops/h]	163.78	720.35	390.29	195.52	1023.20	321.74	177.09	693.07	67.97	1285.39	784.73	69.02
Fuel consumption [US gal/h]	5.56	25.42	12.77	6.39	33.63	10.46	4.33	16.04	1.59	41.82	18.84	1.76
CO [g/h]	388.89	1776.57	892.87	446.57	2351.01	731.24	302.66	1121.28	111.23	2923.15	1316.74	123.28
NOx [g/h]	75.66	345.66	173.72	86.89	457.42	142.27	58.89	218.16	21.64	568.74	256.19	23.99
VOC [g/h]	90.13	411.74	206.93	103.50	544.87	169.47	70.15	259.87	25.78	677.47	305.17	28.57

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0			33.0			13.0			12.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			36.22			52.68			53.58		
I_p,int, Pedestrian LOS Score for Intersectio	0.000			3.114			2.953			3.013		
Crosswalk LOS	F			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	692			630			438			507		
d_b, Bicycle Delay [s]	27.81			30.49			39.69			36.23		
I_b,int, Bicycle LOS Score for Intersection	2.431			2.605			2.385			2.838		
Bicycle LOS	B			B			B			C		

Sequence

Ring 1	1	2	4	3	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	7	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Pacific Hwy W (OR 99W) And SW Edy Rd/SW Sherwood Blvd

Control Type:	Signalized	Delay (sec / veh):	133.4
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.988

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↵ ↑ ↵			↵ ↑ ↵			↵ ↑			↵ ↑ ↵		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	480.00	100.00	100.00	440.00	100.00	100.00	240.00	100.00	240.00	160.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	2	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	49.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	362	1312	199	102	1732	105	80	188	292	386	180	56
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	4.00	2.00	0.00	2.00	1.00	1.00	0.00	0.00	1.00	0.00	3.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	362	1312	199	102	1732	105	80	188	292	386	180	56
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	94	342	52	27	451	27	21	49	76	101	47	15
Total Analysis Volume [veh/h]	377	1367	207	106	1804	109	83	196	304	402	188	58
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			1		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	86.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	14.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	7	0	3	8	0
Auxiliary Signal Groups												
Maximum Green [s]	20	55	0	16	46	0	25	25	0	5	24	0
Amber [s]	3.5	5.0	0.0	3.5	5.0	0.0	4.5	4.5	0.0	3.0	4.0	0.0
All red [s]	1.0	0.5	0.0	1.0	0.5	0.0	0.5	0.5	0.0	1.0	1.0	0.0
Walk [s]	0	8	0	0	9	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	27	0	0	28	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk												
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.5	3.5	0.0	2.5	3.5	0.0	3.0	3.0	0.0	2.0	3.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	24	50	0	22	48	0	23	23	0	9	35	0
Lead / Lag	Lead	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	10	0	4	10	0	6	6	0	5	6	0
Vehicle Extension [s]	3.0	4.4	0.0	2.3	4.4	0.0	3.0	3.0	0.0	3.0	2.3	0.0
Minimum Recall	No	Yes		No	Yes			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	4
Pedestrian Walk [s]	9
Pedestrian Clearance [s]	49

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.50	5.50	5.50	4.50	5.50	5.50	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	3.50	3.50	2.50	3.50	3.50	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	20	53	53	9	43	43	25	25	25	22	22	22
g / C, Green / Cycle	0.15	0.41	0.41	0.07	0.33	0.33	0.19	0.19	0.19	0.17	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.20	0.29	0.29	0.06	0.34	0.34	0.04	0.10	0.18	0.15	0.15	0.04
s, saturation flow rate [veh/h]	1781	3503	1719	1810	3560	1816	1795	1900	1615	1795	1865	1556
c, Capacity [veh/h]	267	1435	704	128	1176	600	347	368	312	310	322	269
d1, Uniform Delay [s]	55.32	31.89	31.96	59.59	43.59	43.59	44.31	46.98	51.68	52.69	52.67	46.18
k, delay calibration	0.50	0.50	0.50	0.07	0.50	0.50	0.11	0.11	0.36	0.16	0.16	0.07
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	665.85	2.98	6.15	7.29	91.47	114.91	0.34	1.11	43.77	15.03	14.13	0.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.36	0.71	0.71	0.80	1.03	1.04	0.23	0.51	0.93	0.90	0.89	0.21
d, Delay for Lane Group [s/veh]	721.17	34.87	38.11	66.88	135.06	158.50	44.64	48.09	95.45	67.72	66.80	46.41
Lane Group LOS	F	C	D	E	F	F	D	D	F	E	E	D
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	58.11	13.71	14.17	3.58	33.66	38.24	2.23	5.59	13.15	10.18	10.47	1.59
50th-Percentile Queue Length [ft/ln]	1452.71	342.82	354.33	89.46	841.46	955.93	55.75	139.72	328.84	254.45	261.72	39.65
95th-Percentile Queue Length [veh/ln]	81.30	19.79	20.35	6.44	44.20	49.65	4.01	9.47	19.10	15.41	15.77	2.85
95th-Percentile Queue Length [ft/ln]	2032.62	494.64	508.69	161.03	1104.90	1241.22	100.34	236.65	477.54	385.25	394.37	71.37

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	721.17	35.61	38.11	66.88	142.05	158.50	44.64	48.09	95.45	67.47	66.80	46.41
Movement LOS	F	D	D	E	F	F	D	D	F	E	E	D
d_A, Approach Delay [s/veh]	168.38			138.99			72.29			65.38		
Approach LOS	F			F			E			E		
d_I, Intersection Delay [s/veh]	133.36											
Intersection LOS	F											
Intersection V/C	0.988											

Emissions

Vehicle Miles Traveled [mph]	199.97	558.95	275.73	35.80	426.48	218.19	6.37	14.96	23.23	22.09	22.89	4.45
Stops [stops/h]	1608.19	759.01	392.25	99.04	1863.05	1058.25	61.71	154.68	364.04	281.68	289.73	43.89
Fuel consumption [US gal/h]	70.23	34.38	17.39	3.41	61.24	34.88	1.33	3.31	8.64	6.30	6.46	0.95
CO [g/h]	4909.20	2403.44	1215.47	238.27	4281.01	2438.06	92.95	231.37	603.83	440.02	451.47	66.72
NOx [g/h]	955.15	467.62	236.49	46.36	832.93	474.36	18.08	45.02	117.48	85.61	87.84	12.98
VOC [g/h]	1137.75	557.02	281.70	55.22	992.17	565.04	21.54	53.62	139.94	101.98	104.63	15.46

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0		13.0		13.0		13.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	0.00		52.69		52.69		52.69	
I_p,int, Pedestrian LOS Score for Intersectio	0.000		3.082		2.442		2.418	
Crosswalk LOS	F		C		B		B	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	684		653		277		461	
d_b, Bicycle Delay [s]	28.15		29.48		48.28		38.52	
I_b,int, Bicycle LOS Score for Intersection	2.590		2.626		2.484		2.586	
Bicycle LOS	B		B		B		B	

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	7	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 4: Pacific Hwy W (OR 99W) And SW Meinecke Pkwy

Control Type:	Signalized	Delay (sec / veh):	379.7
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.889

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	400.00	100.00	175.00	370.00	100.00	250.00	335.00	100.00	250.00	200.00	100.00	250.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	8.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Maximum Green [s]	12	60	0	31	69	0	11	34	0	11	34	0
Amber [s]	3.0	5.0	0.0	3.5	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	9	0
Pedestrian Clearance [s]	0	18	0	0	10	0	0	35	0	0	36	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	4.0	0.0	2.5	2.0	0.0	2.0	4.0	0.0	2.0	4.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	16	58	0	31	73	0	15	45	0	15	45	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	4	10	0	5	6	0	5	6	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	Yes		No	Yes		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	149	149	149	149	149	149	149	149	149	149	149	149
L, Total Lost Time per Cycle [s]	4.00	6.00	6.00	4.50	4.00	4.00	4.00	6.00	6.00	4.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	4.00	4.00	2.50	2.00	2.00	2.00	4.00	4.00	2.00	4.00	4.00
g_i, Effective Green Time [s]	12	52	52	27	69	69	11	39	39	11	39	39
g / C, Green / Cycle	0.08	0.35	0.35	0.18	0.46	0.46	0.07	0.26	0.26	0.07	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.03	0.45	0.01	0.16	0.50	0.15	0.14	0.04	0.01	0.01	0.07	0.14
s, saturation flow rate [veh/h]	1810	3503	1615	1810	3589	1615	1795	1900	1615	1810	1900	1593
c, Capacity [veh/h]	146	1223	564	322	1662	748	133	497	423	134	497	417
d1, Uniform Delay [s]	64.92	48.50	31.93	59.77	40.00	25.19	69.00	42.51	40.91	64.58	43.68	47.11
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.22	523.83	0.11	36.73	164.44	1.12	1704.56	0.75	0.12	2.23	1.33	4.94
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.37	1.29	0.03	0.89	1.08	0.32	1.93	0.17	0.03	0.14	0.27	0.53
d, Delay for Lane Group [s/veh]	72.15	572.33	32.04	96.50	204.44	26.31	1773.56	43.25	41.03	66.82	45.02	52.04
Lane Group LOS	E	F	C	F	F	C	F	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.25	111.54	0.45	13.82	67.89	5.63	67.83	2.57	0.35	0.76	4.17	7.73
50th-Percentile Queue Length [ft/ln]	56.25	2788.59	11.36	345.47	1697.26	140.78	1695.64	64.13	8.73	19.09	104.34	193.27
95th-Percentile Queue Length [veh/ln]	4.05	152.14	0.82	19.92	86.92	9.52	97.71	4.62	0.63	1.37	7.51	12.29
95th-Percentile Queue Length [ft/ln]	101.26	3803.56	20.45	497.89	2172.96	238.07	2442.87	115.44	15.71	34.36	187.81	307.27

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	72.15	572.33	32.04	96.50	204.44	26.31	1773.56	43.25	41.03	66.82	45.02	52.04
Movement LOS	E	F	C	F	F	C	F	D	D	E	D	D
d_A, Approach Delay [s/veh]	550.01			172.98			1298.01			50.29		
Approach LOS	F			F			F			D		
d_I, Intersection Delay [s/veh]	379.70											
Intersection LOS	F											
Intersection V/C	0.889											

Emissions

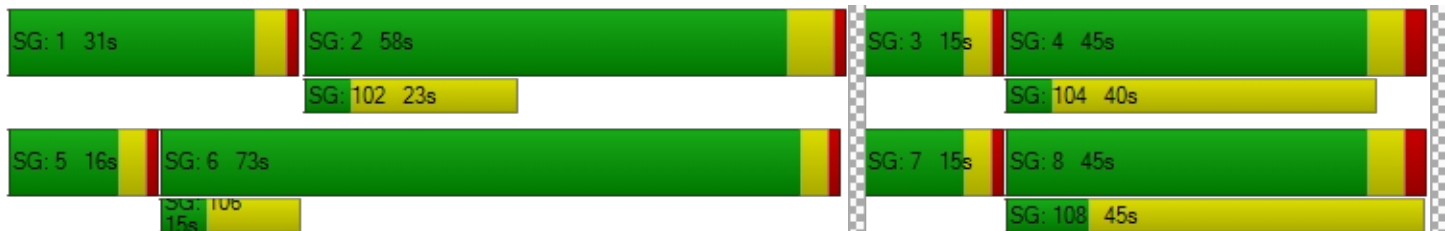
Vehicle Miles Traveled [mph]	40.98	1194.49	13.66	157.43	995.43	131.47	26.56	8.82	1.25	1.82	12.80	21.31
Stops [stops/h]	54.37	5390.02	10.98	333.88	3280.60	136.05	1638.74	61.98	8.44	18.45	100.84	186.79
Fuel consumption [US gal/h]	2.78	262.23	0.74	13.92	134.06	7.44	102.52	1.45	0.20	0.43	2.31	4.27
CO [g/h]	194.33	18330.0	51.75	973.12	9370.72	519.92	7166.12	101.61	13.84	30.40	161.59	298.52
NOx [g/h]	37.81	3566.36	10.07	189.33	1823.20	101.16	1394.27	19.77	2.69	5.92	31.44	58.08
VOC [g/h]	45.04	4248.17	11.99	225.53	2171.76	120.50	1660.82	23.55	3.21	7.05	37.45	69.18

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			13.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	65.77			62.07			65.77			65.77		
I_p,int, Pedestrian LOS Score for Intersectio	3.104			3.227			2.346			2.342		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	698			926			523			523		
d_b, Bicycle Delay [s]	31.57			21.48			40.60			40.64		
I_b,int, Bicycle LOS Score for Intersection	2.918			3.478			2.142			2.180		
Bicycle LOS	C			C			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 5: Pacific Hwy W (OR 99W) And SW Elwert Rd/SW Sunset Blvd

Control Type:	Signalized	Delay (sec / veh):	208.8
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	1 hour	Volume to Capacity (v/c):	1.201

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T			T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	600.00	100.00	100.00	470.00	100.00	290.00	260.00	100.00	100.00	190.00	100.00	190.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	375	1475	217	154	1643	77	45	218	363	215	198	119
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	4.00	4.00	0.00	1.00	2.00	3.00	0.00	2.00	1.00	1.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	375	1475	217	154	1643	77	45	218	363	215	198	119
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	97	380	56	40	423	20	12	56	94	55	51	31
Total Analysis Volume [veh/h]	387	1521	224	159	1694	79	46	225	374	222	204	123
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			2			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	24.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Maximum Green [s]	30	50	0	30	50	0	15	30	0	15	30	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	3.0	0.0	4.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.7	0.0	1.7	1.7	0.0	1.7	1.7	0.0
Walk [s]	0	9	0	0	10	0	0	12	0	0	12	0
Pedestrian Clearance [s]	0	21	0	0	24	0	0	40	0	0	38	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.7	0.0	3.7	2.7	0.0	3.7	3.7	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	15	45	0	15	45	0	15	25	0	15	25	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.70	6.70	5.70	4.70	4.70	5.70	5.70	5.70
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.70	4.70	3.70	2.70	2.70	3.70	3.70	3.70
g_i, Effective Green Time [s]	10	43	43	6	38	38	4	20	20	9	25	25
g / C, Green / Cycle	0.10	0.43	0.43	0.06	0.38	0.38	0.04	0.20	0.20	0.09	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.11	0.42	0.14	0.04	0.46	0.05	0.03	0.11	0.23	0.12	0.09	0.09
s, saturation flow rate [veh/h]	3486	3503	1564	3514	3589	1589	1767	1900	1592	1795	1885	1634
c, Capacity [veh/h]	350	1497	668	224	1378	610	64	384	322	167	469	407
d1, Uniform Delay [s]	45.03	28.35	19.06	45.87	30.84	19.97	47.72	36.00	39.94	45.39	30.96	31.08
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.26	0.22	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	145.20	34.81	1.29	3.77	354.51	0.43	14.39	1.33	255.03	537.69	0.46	0.56
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.07	0.99	0.32	0.69	1.19	0.13	0.71	0.57	1.13	1.29	0.36	0.37
d, Delay for Lane Group [s/veh]	190.22	63.16	20.35	49.64	385.34	20.39	62.12	37.33	294.96	583.08	31.42	31.64
Lane Group LOS	F	E	C	D	F	C	E	D	F	F	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	11.35	23.85	3.53	1.98	83.77	1.23	1.36	4.89	30.55	29.05	3.35	3.03
50th-Percentile Queue Length [ft/ln]	283.76	596.15	88.13	49.52	2094.14	30.63	33.96	122.24	763.87	726.31	83.72	75.86
95th-Percentile Queue Length [veh/ln]	17.36	31.85	6.35	3.57	111.96	2.21	2.45	8.52	42.38	41.81	6.03	5.46
95th-Percentile Queue Length [ft/ln]	434.00	796.36	158.63	89.14	2798.99	55.14	61.13	212.90	1059.62	1045.29	150.69	136.55

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	190.22	63.16	20.35	49.64	385.34	20.39	62.12	37.33	294.96	583.08	31.45	31.64
Movement LOS	F	E	C	D	F	C	E	D	F	F	C	C
d_A, Approach Delay [s/veh]	81.72			342.76			188.51			254.43		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	208.79											
Intersection LOS	F											
Intersection V/C	1.201											

Emissions

Vehicle Miles Traveled [mph]	299.52	1178.11	173.32	116.87	1246.86	58.43	4.80	23.25	38.71	22.70	17.62	15.86
Stops [stops/h]	816.86	1716.10	126.85	142.56	6028.29	44.09	48.88	175.94	1099.46	1045.40	120.50	109.19
Fuel consumption [US gal/h]	31.36	76.94	8.73	7.15	213.45	2.97	1.04	3.59	29.45	32.22	2.46	2.22
CO [g/h]	2191.87	5377.89	610.55	500.08	14920.0	207.51	72.45	250.60	2058.78	2251.92	171.80	155.37
NOx [g/h]	426.46	1046.34	118.79	97.30	2902.91	40.37	14.10	48.76	400.56	438.14	33.43	30.23
VOC [g/h]	507.99	1246.38	141.50	115.90	3457.88	48.09	16.79	58.08	477.14	521.90	39.82	36.01

Other Modes

g_Walk,mi, Effective Walk Time [s]	16.0			16.0			14.0			13.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	35.30			35.30			37.00			37.87		
I_p,int, Pedestrian LOS Score for Intersectio	3.191			3.083			2.551			2.521		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	780			766			406			386		
d_b, Bicycle Delay [s]	18.62			19.05			31.81			32.63		
I_b,int, Bicycle LOS Score for Intersection	3.265			3.106			2.076			1.999		
Bicycle LOS	C			C			B			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 6: Pacific Hwy W (OR 99W) And SW Chapman Rd/SW Brookman Rd

Control Type:	Two-way stop	Delay (sec / veh):	10,000.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	1 hour	Volume to Capacity (v/c):	11.297

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	0	0	0	0	0	0
Entry Pocket Length [ft]	265.00	100.00	100.00	260.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	29	1824	0	18	2357	14	6	12	13	0	0	188
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	4.00	2.00	0.00	3.00	3.00	0.00	0.00	0.00	2.00	2.00	5.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	29	1824	0	18	2357	14	6	12	13	0	0	188
Peak Hour Factor	0.9700	0.9700	1.0000	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	1.0000	1.0000	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	470	0	5	607	4	2	3	3	0	0	48
Total Analysis Volume [veh/h]	30	1880	0	19	2430	14	6	12	13	0	0	194
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.02	0.00	0.05	0.02	0.00	11.19	11.30	0.07	0.00	0.00	0.69
d_M, Delay for Movement [s/veh]	25.09	0.00	0.00	16.18	0.00	0.00	10000.0	10000.0	10000.0	0.00	0.00	47.04
Movement LOS	D	A		C	A	A	F	F	F			E
95th-Percentile Queue Length [veh/ln]	0.48	0.00	0.00	0.17	0.00	0.00	17.47	17.47	17.47	0.00	0.00	5.96
95th-Percentile Queue Length [ft/ln]	12.07	0.00	0.00	4.19	0.00	0.00	436.85	436.85	436.85	0.00	0.00	149.06
d_A, Approach Delay [s/veh]	0.39			0.12			10000.00			47.04		
Approach LOS	A			A			F			E		
d_I, Intersection Delay [s/veh]	71.70											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 7: SW Timbrel Ln And SW Sunset Blvd

Control Type:	Two-way stop	Delay (sec / veh):	29.3
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.277

Intersection Setup

Name	Northbound		Eastbound		Westbound	
Approach						
Lane Configuration	↔		↗		↖	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	120.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Northbound		Eastbound		Westbound	
Base Volume Input [veh/h]	59	73	416	90	101	436
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	6.00	2.00	1.00	0.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	73	416	90	101	436
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	20	114	25	28	120
Total Analysis Volume [veh/h]	65	80	457	99	111	479
Pedestrian Volume [ped/h]	0		0		12	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.28	0.13	0.00	0.00	0.09	0.00
d_M, Delay for Movement [s/veh]	29.31	18.65	0.00	0.00	8.72	0.00
Movement LOS	D	C	A	A	A	A
95th-Percentile Queue Length [veh/ln]	1.99	1.99	0.00	0.00	0.31	0.00
95th-Percentile Queue Length [ft/ln]	49.76	49.76	0.00	0.00	7.82	0.00
d_A, Approach Delay [s/veh]	23.41		0.00		1.64	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	3.38					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 8: SW Pinehurst Dr And SW Sunset Blvd

Control Type:	All-way stop	Delay (sec / veh):	20.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.767

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	+			+			+T			+T		
Lane Configuration	+			+			+T			+T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	75.00	100.00	100.00	80.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	49	10	18	29	22	34	66	373	66	39	436	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	3.00	0.00	0.00	0.00	2.00	7.00	2.00	1.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	10	18	29	22	34	66	373	66	39	436	59
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	3	5	8	6	9	18	101	18	11	118	16
Total Analysis Volume [veh/h]	53	11	20	32	24	37	72	405	72	42	474	64
Pedestrian Volume [ped/h]	6			6			0			13		

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	545	559	584	642	582	645
Degree of Utilization, x	0.14	0.15	0.11	0.68	0.07	0.77

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.49	0.54	0.38	6.12	0.22	8.83
95th-Percentile Queue Length [ft]	12.31	13.42	9.56	153.04	5.38	220.79
Approach Delay [s/veh]	10.69	10.59	18.82		24.67	
Approach LOS	B	B	C		C	
Intersection Delay [s/veh]	20.32					
Intersection LOS	C					

Intersection Level Of Service Report

Intersection 9: SW Main St/SW Ladd Hill Rd And Sunset Blvd

Control Type:	All-way stop	Delay (sec / veh):	70.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	1 hour	Volume to Capacity (v/c):	1.003

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	↔			↔			↔			↔		
Lane Configuration	↔			↔			↔			↔		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	150.00	100.00	100.00	100.00	100.00	100.00	150.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	48	159	182	42	284	99	50	275	58	216	368	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	5.00	0.00	1.00	2.00	0.00	2.00	0.00	1.00	1.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	159	182	42	284	99	50	275	58	216	368	37
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	43	49	11	76	27	13	74	16	58	99	10
Total Analysis Volume [veh/h]	52	171	196	45	305	106	54	296	62	232	396	40
Pedestrian Volume [ped/h]	2			2			0			2		

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	380	415	387	415	378	403	378	405
Degree of Utilization, x	0.13	0.82	0.11	0.92	0.13	0.83	0.57	1.00

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.43	10.71	0.36	17.28	0.46	10.92	3.80	25.00
95th-Percentile Queue Length [ft]	10.82	267.86	9.12	431.88	11.40	272.89	95.08	625.07
Approach Delay [s/veh]	43.13		74.01		45.00		101.00	
Approach LOS	E		F		E		F	
Intersection Delay [s/veh]	70.51							
Intersection LOS	F							

Intersection Level Of Service Report

Intersection 10: SW Murdock Rd/SW Baker Rd And SW Sunset Blvd/SW McKinley Dr

Control Type:	All-way stop	Delay (sec / veh):	32.4
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.847

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach												
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	338	90	1	5	111	373	285	33	317	1	19	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	0.00	0.00	0.00	4.00	1.00	4.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	338	90	1	5	111	373	285	33	317	1	19	3
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	24	0	1	30	99	76	9	84	0	5	1
Total Analysis Volume [veh/h]	360	96	1	5	118	397	303	35	337	1	20	3
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	523	577	452	535	416
Degree of Utilization, x	0.82	0.85	0.63	0.65	0.06

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	11.07	12.87	4.84	5.36	0.18
95th-Percentile Queue Length [ft]	276.73	321.75	120.89	134.00	4.39
Approach Delay [s/veh]	38.68	40.29	22.83		12.16
Approach LOS	E	E	C		B
Intersection Delay [s/veh]	32.41				
Intersection LOS	D				

Intersection Level Of Service Report
Intersection 11: SW Oregon St And SW Tonquin Rd

Control Type:	Roundabout	Delay (sec / veh):	6.7
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	1 hour		

Intersection Setup

Name	Northbound		Southbound		Westbound	
Approach						
Lane Configuration	↑↱		↰↑		↰↱	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	0	0	1
Entry Pocket Length [ft]	100.00	200.00	175.00	100.00	100.00	200.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Northbound		Southbound		Westbound	
Base Volume Input [veh/h]	206	348	110	437	430	92
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	7.00	1.00	2.00	15.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	206	348	110	437	430	92
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	56	95	30	119	117	25
Total Analysis Volume [veh/h]	224	378	120	475	467	100
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Number of Conflicting Circulating Lanes	1		1		1	
Circulating Flow Rate [veh/h]	118		439		212	
Exiting Flow Rate [veh/h]	880		318		476	
Demand Flow Rate [veh/h]	206	348	110	437	430	92
Adjusted Demand Flow Rate [veh/h]	206	348	110	437	430	92

Lanes

Override Calculated Critical Headway	No	No	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00	4.00	4.00
Override Calculated Follow-Up Time	No	No	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00	3.00	3.00
A (intercept)	1420.00	1420.00	1420.00	1420.00	1420.00	1420.00
B (coefficient)	0.00091	0.00091	0.00091	0.00091	0.00091	0.00091
HV Adjustment Factor	0.97	0.97	0.93	0.99	0.98	0.87
Entry Flow Rate [veh/h]	213	359	118	442	439	106
Capacity of Entry and Bypass Lanes [veh/h]	1276	1276	953	953	1171	1171
Pedestrian Impedance	1.00	1.00	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1239	1239	891	944	1148	1018
X, volume / capacity	0.17	0.28	0.12	0.46	0.37	0.09

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.60	1.17	0.42	2.56	1.79	0.30
95th-Percentile Queue Length [ft]	14.94	29.23	10.56	64.09	44.71	7.45
Approach Delay [s/veh]	5.03		8.57		6.44	
Approach LOS	A		A		A	
Intersection Delay [s/veh]	6.68					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 12: SW Oregon St And SW Tualatin-Sherwood Rd

Control Type:	Signalized	Delay (sec / veh):	220.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.957

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	75.00	100.00	100.00	100.00	125.00	100.00	175.00	375.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	144	0	265	13	3	5	4	1187	78	476	1543	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	4.00	0.00	0.00	0.00	0.00	6.00	14.00	1.00	3.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	144	0	265	13	3	5	4	1187	78	476	1543	5
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	0	70	3	1	1	1	312	21	125	406	1
Total Analysis Volume [veh/h]	152	0	279	14	3	5	4	1249	82	501	1624	5
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	1			0			0			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	25	0	0	25	0	10	75	0	35	85	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	3.0	4.5	0.0	3.0	4.5	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	18	0	0	14	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	0.0	0.0	2.5	0.0	2.0	3.5	0.0	2.0	3.5	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	0	14	0	0	14	0	9	14	0	9	14	0
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	5	10	0	5	10	0
Vehicle Extension [s]	0.0	1.5	0.0	0.0	1.5	0.0	1.5	3.5	0.0	1.5	3.5	0.0
Minimum Recall		No			No		No	Yes		No	Yes	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	L	C	R	L	C	C
C, Cycle Length [s]	149	149	149	149	149	149	149	149	149
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.00	5.50	5.50	5.50	5.50	5.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50	0.00	3.50	3.50	0.00	3.50	3.50
g_i, Effective Green Time [s]	25	25	25	111	75	75	114	109	109
g / C, Green / Cycle	0.17	0.17	0.17	0.74	0.50	0.50	0.77	0.73	0.73
(v / s)_i Volume / Saturation Flow Rate	0.12	0.17	0.05	0.00	0.66	0.05	0.54	0.42	0.42
s, saturation flow rate [veh/h]	1223	1529	400	1247	1810	1436	881	1855	1853
c, Capacity [veh/h]	253	257	106	1037	911	723	524	1359	1357
d1, Uniform Delay [s]	58.76	61.72	55.51	7.72	37.00	19.43	49.03	9.14	9.15
k, delay calibration	0.17	0.44	0.04	0.13	0.50	0.13	0.50	0.28	0.28
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.11	141.09	0.33	0.00	553.59	0.08	28.93	0.98	0.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.57	1.03	0.20	0.00	1.30	0.11	0.91	0.57	0.57
d, Delay for Lane Group [s/veh]	61.87	202.82	55.85	7.72	590.59	19.51	77.96	10.12	10.13
Lane Group LOS	E	F	E	A	F	B	E	B	B
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.39	19.74	0.79	0.03	172.51	1.47	8.64	11.22	11.24
50th-Percentile Queue Length [ft/ln]	134.87	493.58	19.65	0.79	4312.82	36.83	216.01	280.57	280.88
95th-Percentile Queue Length [veh/ln]	9.20	27.50	1.41	0.06	236.28	2.65	13.46	16.72	16.73
95th-Percentile Queue Length [ft/ln]	230.10	687.51	35.37	1.42	5906.92	66.30	336.53	417.93	418.31

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	61.87	61.87	202.82	55.85	55.85	55.85	7.72	590.59	19.51	77.96	10.13	10.13
Movement LOS	E	E	F	E	E	E	A	F	B	E	B	B
d_A, Approach Delay [s/veh]	153.19			55.85			553.65			26.08		
Approach LOS	F			E			F			C		
d_I, Intersection Delay [s/veh]	220.04											
Intersection LOS	F											
Intersection V/C	0.957											

Emissions

Vehicle Miles Traveled [mph]	9.48	17.44	0.60	0.29	86.51	5.68	31.07	50.52	50.52
Stops [stops/h]	130.35	477.02	18.99	0.76	4168.09	35.60	208.76	271.16	271.45
Fuel consumption [US gal/h]	2.92	14.29	0.37	0.02	169.22	0.74	9.98	5.17	5.18
CO [g/h]	204.33	998.77	25.75	1.57	11828.3	51.75	697.74	361.50	361.78
NOx [g/h]	39.75	194.32	5.01	0.31	2301.36	10.07	135.76	70.33	70.39
VOC [g/h]	47.35	231.47	5.97	0.36	2741.32	11.99	161.71	83.78	83.85

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	63.91	63.91	63.91	63.91
I_p,int, Pedestrian LOS Score for Intersectio	2.628	1.755	3.106	3.024
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	336	336	1007	1141
d_b, Bicycle Delay [s]	51.62	51.60	18.38	13.77
I_b,int, Bicycle LOS Score for Intersection	2.234	1.594	3.653	3.229
Bicycle LOS	B	A	D	C

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 13: SW Sherwood Blvd And SW 12th St/SW Century Dr

Control Type:	All-way stop	Delay (sec / veh):	21.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.765

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	←↑→			←↑→			↑			↑		
Lane Configuration	←↑→			←↑→			↑			↑		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			Yes		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	20	329	34	116	384	29	19	78	55	53	18	184
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	3.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	329	34	116	384	29	19	78	55	53	18	184
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	88	9	31	102	8	5	21	15	14	5	49
Total Analysis Volume [veh/h]	21	350	36	123	409	31	20	83	59	56	19	196
Pedestrian Volume [ped/h]	0			0			0			4		

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	486	524	498	540	507	550
Degree of Utilization, x	0.04	0.69	0.23	0.77	0.30	0.46

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.13	6.26	0.91	8.61	1.28	2.55
95th-Percentile Queue Length [ft]	3.22	156.59	22.69	215.16	31.89	63.80
Approach Delay [s/veh]	23.87		26.15		13.13	15.19
Approach LOS	C		D		B	C
Intersection Delay [s/veh]	21.87					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 14: SW Pine St And SW 1st St

Control Type:	All-way stop	Delay (sec / veh):	64.6
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	1 hour	Volume to Capacity (v/c):	1.009

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	+			+			+			+		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Northbound			Southbound			Eastbound			Westbound		
Base Volume Input [veh/h]	11	195	81	46	208	22	47	106	22	144	291	134
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.00	2.00	5.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	195	81	46	208	22	47	106	22	144	291	134
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	52	22	12	55	6	13	28	6	38	77	36
Total Analysis Volume [veh/h]	12	207	86	49	221	23	50	113	23	153	310	143
Pedestrian Volume [ped/h]	4			11			7			22		

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	513	501	489	569
Degree of Utilization, x	0.56	0.55	0.36	1.01

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.69	3.57	1.65	30.48
95th-Percentile Queue Length [ft]	92.31	89.22	41.32	761.96
Approach Delay [s/veh]	18.85	18.91	14.44	125.22
Approach LOS	C	C	B	F
Intersection Delay [s/veh]	64.58			
Intersection LOS	F			

Intersection Level Of Service Report

Intersection 15: SW Langer Farms Pkwy And SW Oregon St

Control Type:	Signalized	Delay (sec / veh):	11.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.523

Intersection Setup

Name	Northbound		Southbound		Eastbound	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↵		↵		↵↵	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1
Entry Pocket Length [ft]	375.00	100.00	100.00	100.00	100.00	375.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	217	282	474	241	160	139
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	0.00	1.00	1.00	0.00	1.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	217	282	474	241	160	139
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	74	125	63	42	37
Total Analysis Volume [veh/h]	228	297	499	254	168	146
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	2		0		3	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	5	2	6	0	7	0
Auxiliary Signal Groups						
Maximum Green [s]	25	60	60	0	30	0
Amber [s]	3.0	3.5	3.5	0.0	3.0	0.0
All red [s]	1.0	2.5	2.5	0.0	2.5	0.0
Walk [s]	0	5	5	0	5	0
Pedestrian Clearance [s]	0	10	10	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk						
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	4.0	4.0	0.0	3.5	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	9	14	14	0	9	0
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	5	10	10	0	5	0
Vehicle Extension [s]	2.0	3.8	3.8	0.0	2.0	0.0
Minimum Recall	No	Yes	Yes		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	3
Pedestrian Walk [s]	5
Pedestrian Clearance [s]	11

Lane Group Calculations

Lane Group	L	C	C	L	R
C, Cycle Length [s]	36	36	36	36	36
L, Total Lost Time per Cycle [s]	4.00	6.00	6.00	5.50	5.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	4.00	4.00	0.00	3.50
g_i, Effective Green Time [s]	6	9	20	5	5
g / C, Green / Cycle	0.16	0.26	0.56	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.12	0.15	0.40	0.13	0.09
s, saturation flow rate [veh/h]	1795	1900	1779	1255	1575
c, Capacity [veh/h]	287	503	997	227	223
d1, Uniform Delay [s]	14.34	11.34	5.77	15.03	14.41
k, delay calibration	0.04	0.14	0.14	0.04	0.04
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.56	1.31	1.32	1.51	1.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.56	0.72	0.70	0.62
d, Delay for Lane Group [s/veh]	15.90	12.65	7.09	16.55	15.48
Lane Group LOS	B	B	A	B	B
Critical Lane Group	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.46	1.63	2.11	1.08	0.92
50th-Percentile Queue Length [ft/ln]	36.61	40.85	52.77	26.98	22.99
95th-Percentile Queue Length [veh/ln]	2.64	2.94	3.80	1.94	1.65
95th-Percentile Queue Length [ft/ln]	65.90	73.52	94.99	48.57	41.37

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	15.90	12.65	7.09	7.09	16.55	15.48
Movement LOS	B	B	A	A	B	B
d_A, Approach Delay [s/veh]	14.06		7.09		16.05	
Approach LOS	B		A		B	
d_I, Intersection Delay [s/veh]	11.16					
Intersection LOS	B					
Intersection V/C	0.523					

Emissions

Vehicle Miles Traveled [mph]	13.60	17.68	50.37	8.09	7.03
Stops [stops/h]	148.22	165.37	213.65	109.24	93.06
Fuel consumption [US gal/h]	2.08	2.37	4.29	1.48	1.24
CO [g/h]	145.47	165.49	299.56	103.13	86.77
NOx [g/h]	28.30	32.20	58.28	20.07	16.88
VOC [g/h]	33.71	38.35	69.43	23.90	20.11

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	0.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	9.92	0.00	9.92
I_p,int, Pedestrian LOS Score for Intersectio	2.351	0.000	2.136
Crosswalk LOS	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	3374	3374	1687
d_b, Bicycle Delay [s]	8.40	8.39	0.44
I_b,int, Bicycle LOS Score for Intersection	2.383	2.739	1.560
Bicycle LOS	B	B	A

Sequence

Ring 1	5	2	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	3	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D: Vulnerability Index

Equity Analysis

This Equity Analysis examines how historical and current land use, transportation, housing, and environmental conditions in Sherwood have created or reinforced inequities affecting underserved populations. Using American Community Survey (ACS) data, regional context, and historical documentation, the analysis identifies populations that are disproportionately burdened by limited housing choice, auto-dependent transportation systems, affordability challenges, and climate-related risks. These findings provide a foundation for equity-centered planning as the City considers future growth, including development of the Sherwood West urban reserve area.

Historical and Structural Context

The Sherwood area lies on the ancestral lands of the Atfalati band of the Kalapuya Indians, who inhabited the Tualatin Valley for over 10,000 years prior to displacement caused by colonization, disease, and forced relocation. By the late 1800s, settlement patterns in what is now Sherwood were shaped by land acquisition by white settlers and the expansion of rail infrastructure. The construction of railroads relied heavily on Chinese laborers, whose contributions were essential yet met with exclusionary laws, economic exploitation, and social discrimination. Communities of color including Indigenous, Black, Asian, Latino, Middle Eastern and North African populations, have long been part of the Tigard, Tualatin, and Sherwood subregion.

Land Use Patterns and Equity Implications

Sherwood's land use policies have historically favored low-density, single-family residential development, with higher-density housing concentrated in a limited number of locations near the Town Center and along major corridors such as Highway 99W and Tualatin-Sherwood Road. This pattern has constrained the availability of diverse housing types and limited where renters, lower-income households, and communities of color can live within the city.

2023 5-yr American Community Survey (ACS) data show that lower-income households and higher renter concentrations are clustered in these higher-density areas, while much of the city remains characterized by high rates of owner-occupied housing. This spatial concentration reinforces inequities by contributing to affordability pressures.

Transportation Equity and Access

Sherwood functions primarily as a bedroom community within the southwest portion of the Portland metropolitan region. Transportation access is shaped by a highly auto-oriented system and limited transit service. Only two regional transit routes serve the city, and both are oriented toward intercity travel rather than intracity mobility. As a result, residents without access to a private vehicle particularly seniors, youth, people with disabilities, low-income households, and some communities of color face significant barriers to accessing employment, education, medical care, and daily services.

Housing Affordability and Tenure

Housing affordability is a significant equity concern in Sherwood. Compared to Washington County overall, Sherwood has fewer multifamily and rental housing options, contributing to higher housing costs and limited choice. ACS housing tenure data show that two of the three census tracts exceed 70 percent owner occupancy, indicating a narrow range of housing types and limited availability for renters.

Based on the report by Coalition of Communities of Color¹, more than half of African American, Latino, Asian, Native American, and Middle Eastern/North African renters in the Tigard–Tualatin–Sherwood area are cost-burdened, spending more than 30 percent of their income on housing. These disparities reflect long-standing structural barriers, including restrictive zoning, limited affordable housing production, and rising housing costs.

Socioeconomic Vulnerability Indicators

Oregon Community Explorer data reveal overlapping patterns of vulnerability related to income, disability status, language access, and vehicle availability. Areas with comparatively lower median household incomes are often located near major transportation corridors (Highway 99W) and creek systems (Cedar Creek) and tend to overlap with higher renter concentrations, higher disability rates, and lower vehicle access.

Climate Change and Environmental Equity

Research shows that people living in close proximity to major roads face higher concentrations of noise and air pollutants that can be harmful to their health.

According to estimates from the U.S. Centers for Disease Control and Prevention, approximately 4% of the U.S. population, about 11.3 million people live within 500 feet of a major highway. This proximity increases their exposure to traffic-related air pollution and raises the risk of negative health outcomes²

The Population Reference Bureau highlights that greater exposure to traffic-related air pollution and noise among residents near roads and highways is linked to higher risks for heart disease, stroke, and diabetes. These exposures are also associated with negative changes in HDL cholesterol and other markers of metabolic syndrome³

Studies reveal that neighborhood-level exposures to noise from road and aviation transportation are amplified in areas with higher proportions of minority racial and ethnic groups and lower socioeconomic status. Patterns observed for neighborhood-level road and

¹ <https://www.coalitioncommunitiescolor.org/leadingwithrace>

² <https://www.cdc.gov/mmwr/preview/mmwrhtml/su6203a8.htm>

³ <https://www.prb.org/resources/the-health-costs-and-benefits-of-living-near-roads-highways-and-light-rail/>

aviation noise reinforce existing evidence of disparities in noise exposure at home and school among Hispanic, Black, Asian, and low socioeconomic status Americans⁴.

Intersectional Impacts and Compounded Disadvantage

Intersectional Impact Analysis recognizes that vulnerability is often compounded when multiple characteristics coexist within the same population. Rather than evaluating variables in isolation, this approach considers how overlapping conditions, such as low income combined with disability or lack of vehicle access, may intensify disadvantages. This framework helps identify locations where residents may face layered barriers, supporting more equitable planning decisions, targeted investments, and policies that respond to the complexity of lived experiences.

Figure 12 shows the results of the intersectional impact analysis in Sherwood based on the following factors:

- Concentration of people of color
- Concentration of people with disabilities
- Concentration of residents who are housing cost-burdened
- Concentration of people with low incomes
- Concentration of people with no higher education
- Concentration of people in a household without a vehicle

Data for these factors from Oregon Community Explorer was used to develop a vulnerability score. The Vulnerability Score is a composite indicator designed to capture the relative concentration of populations that may experience greater barriers to mobility, health, and economic opportunity. Each factor (e.g., low income, disability, housing cost burden, vehicle access, educational attainment, and race/ethnicity) is ranked from lowest to highest by value. Each category is then sorted into four equal categories, and assigned a standardized score from 0 to 4. Higher scores represent census tracts where a larger share of residents exhibit characteristics commonly associated with increased vulnerability. Summing these scores provides an overall measure of relative need, allowing for consistent comparison across geographies while avoiding overreliance on any single demographic factor.

Areas south of Highway 99W, including the Town Center and the areas around Tualatin Sherwood Road commercial areas, exhibit overlapping socioeconomic vulnerabilities that illustrate how multiple forms of disadvantage compound one another. These areas have lower median household incomes and the lowest rates of owner-occupied housing in the city, indicating a higher concentration of renters and housing instability. The same areas also include relatively higher proportions of non-English speakers and higher percentages of people with disabilities, reflecting increased needs for accessible services and supportive infrastructure.

⁴ Collins, Timothy W. & Nadybal, Shawna & Grineski, Sara E., 2020. [Sonic injustice: Disparate residential exposures to transport noise from road and aviation sources in the continental United States](#)," [Journal of Transport Geography](#), Elsevier, vol. 82(C).

Transportation disadvantage further compounds these conditions, as these neighborhoods also contain the highest share of households without access to a private vehicle. In an auto-oriented city with limited intracity transit, the combination of lower income, limited housing stability, language barriers, disability, and reduced vehicle access significantly constrains residents' ability to reach employment, education, healthcare, and essential services.

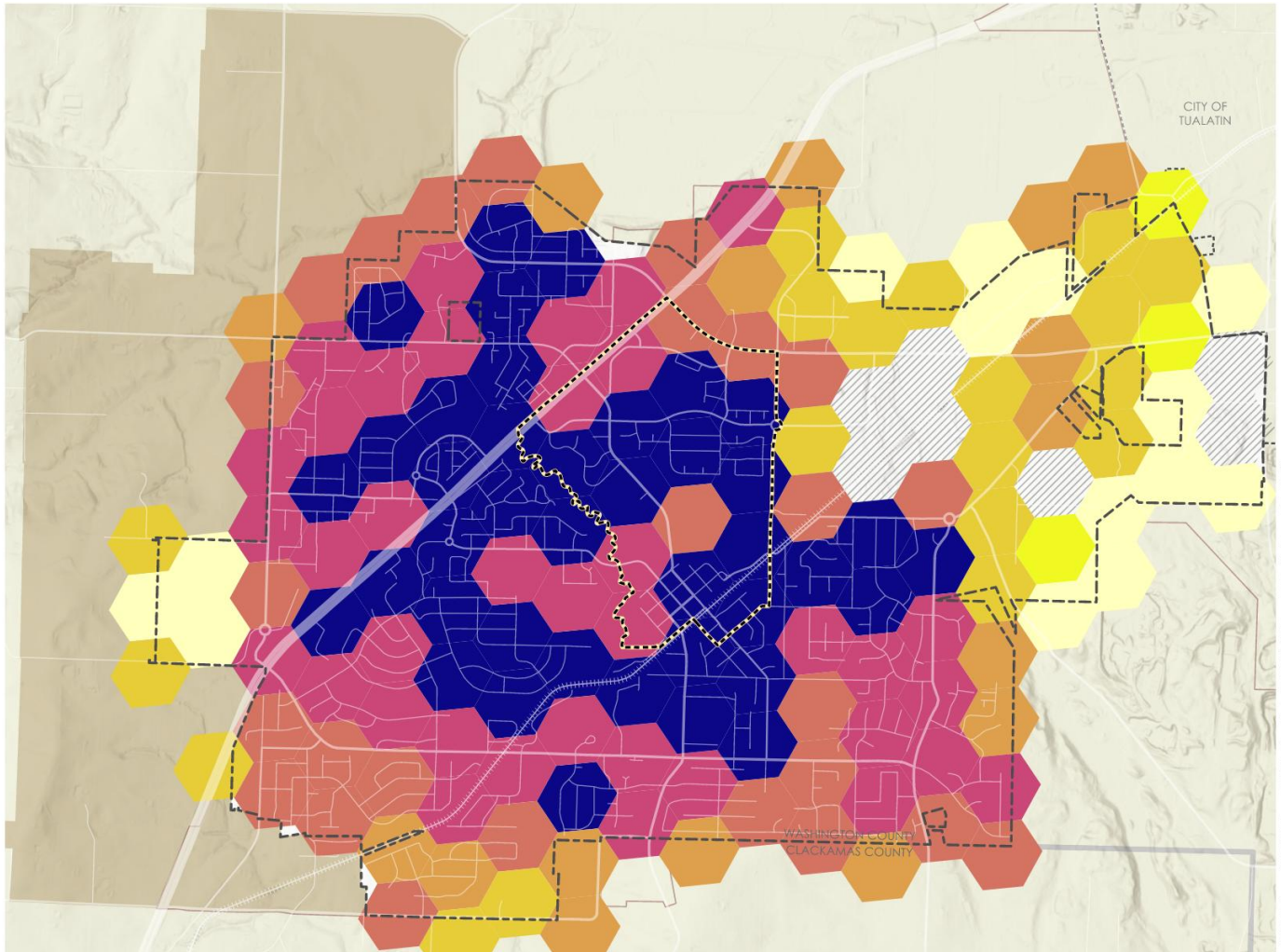


Figure 1. Vulnerability Analysis using Oregon Community Explorer Data (2020)